

Environmental Study Report Central Box Study Area

January 27th, 2017

Stantec Consulting Ltd.

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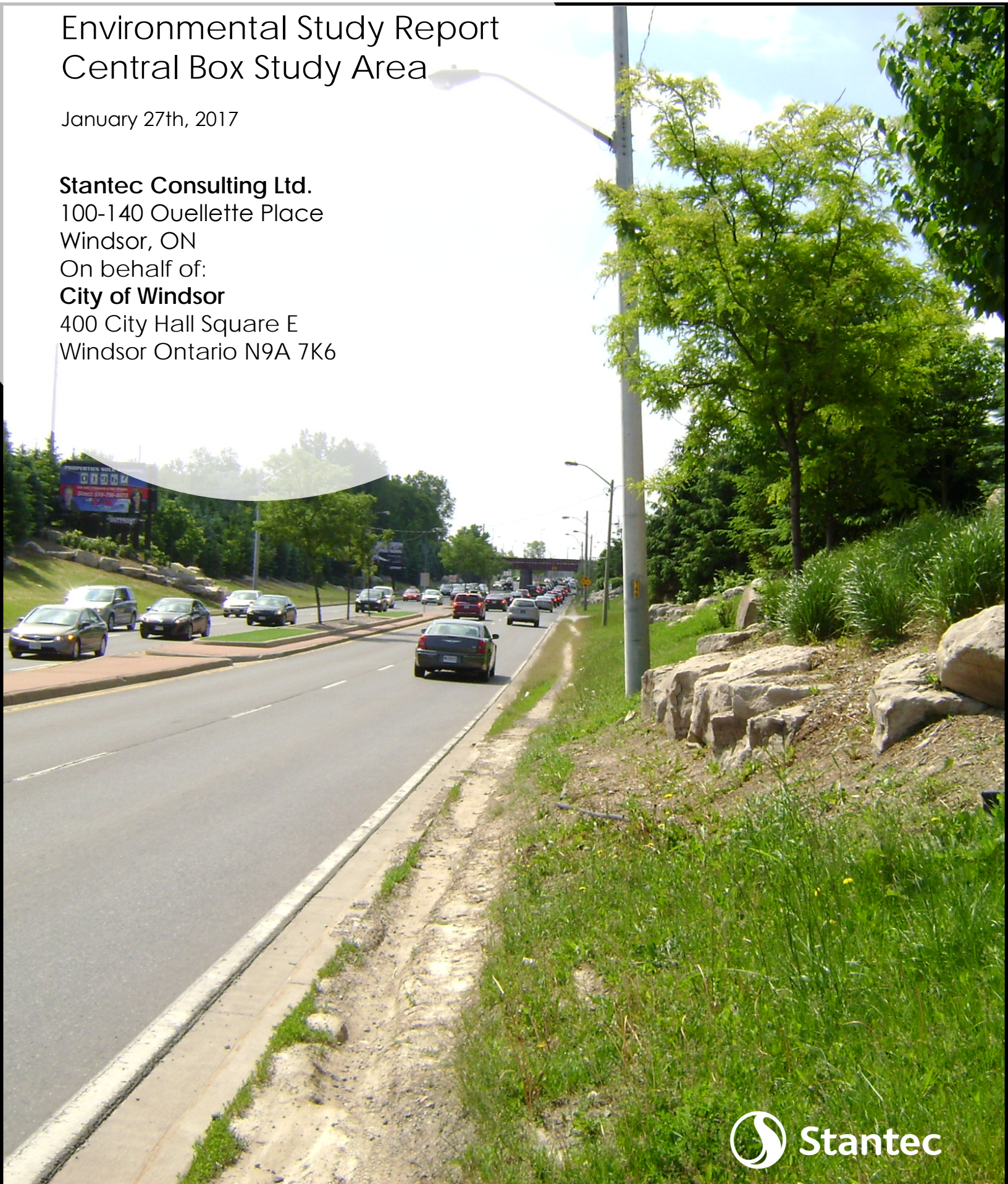
Windsor, ON

On behalf of:

City of Windsor

400 City Hall Square E

Windsor Ontario N9A 7K6



**Central Box Study Area
Schedule C Municipal Class
Environmental Assessment**

Final Environmental Study Report



Prepared for:
The Corporation of the City of
Windsor

Prepared by:
Stantec Consulting Ltd.

January 27th 2017

Sign-off Sheet

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Executive Summary

Introduction and Background (Section 1.1)

A Schedule C Municipal Class Environmental Assessment has been completed to identify transportation improvements within the Central Box study area. The study area is bounded by Eugenie Street to the north, Howard Avenue to the east, West Grand Boulevard/South Cameron Boulevard to the south and Dominion Boulevard to the west. While the study takes a holistic approach to improving traffic operations throughout the corridor, the study area was divided into the following corridors: Dominion Boulevard (between West Grand Boulevard and Ojibway Street); Dougall-Ouellette Avenue Corridor (including both Dougall Avenue and Ouellette Place/Avenue from West Grand Boulevard to Eugenie Street); Howard Avenue (from South Cameron Boulevard to Eugenie Street) and the East-West Corridors (including the E.C. Row Expressway between Dominion Boulevard and Howard Avenue, Eugenie Street, West Grand Boulevard, and various locations identified as potential new east-west connections). Figure E1 outlines the study area.



Figure E1 Central Box Study Area and Key Corridors

The study followed the planning process for Schedule C projects as outlined in the Municipal Engineer's Association Municipal Class Environmental Assessment process (2000 as amended in 2007, 2011, and 2015).

Consultation (Section 1.6)

An extensive public consultation program was followed throughout the study. All project notices (Notice of Commencement, Notice of Public Information Centres and Workshops, and Notice of Completion) were published in the Windsor Star newspaper in two editions, posted on the City's website (www.WindsorEAs.com), and were directly mailed to interested parties including Aboriginal and First Nations Communities, government agencies, and local community contacts. PIC 1 was held on May 6th 2015 to present the alternative solutions for public and agency review and comment. Community Workshops on Transportation Operations, Civic Ways, and Active Transportation were held on May 7th 2015 which consisted of small, round table discussions and mapping exercises to solicit targeted feedback on the existing issues and proposed alternatives. All public feedback was recorded, and where possible, incorporated into the evaluation of alternatives and recommendations. PIC 2 was held on December 1st 2015 to present the preliminary recommendations. Consultation was also undertaken with the Caldwell First Nation, and recommendations were included with regard to combating the establishment of invasive species.

Existing Conditions (Section 3.0)

The four study area corridors were assessed from a socio-economic, cultural, natural environment and operational perspective in order to identify opportunities and constraints and to inform the development of alternative solutions.

The Dougall Avenue-Ouellette Avenue corridor, the E.C. Row Expressway, and the Howard Avenue corridor are designated as Civic Ways in the City of Windsor's Official Plan, which are defined as roadway corridors intended to promote an attractive and welcoming arrival for visitors, and to complement and enhance the Municipality's capital investment in major infrastructure. The existing urban design elements were inventoried to provide guidance at a preliminary stage, and to inform future development in conjunction with transportation improvements.

A review of the natural environment was undertaken in order to identify and characterize natural heritage features within the study area, and to identify potential impacts and associated mitigation and/or compensation measures. The review was undertaken as a desktop review of available planning, policy, and reference documents supplemented by field investigations.

A data collection program was undertaken to characterize the function and operations within each corridor, which included historical daily traffic volumes, existing traffic volumes and speeds, turning movement counts, site observations, collision reports, and public input. A model of the study area was created using TrafficWare Synchro 8.0 software, which was then used to

determine the quality of operations within the corridor. Information on the active transportation network was also collected including the existing and planned network (identified in the BUMP), pedestrian/cyclists counts, and input from the public in order to identify needs and opportunities.

An overview of potential development activity within and adjacent to the Central Box study area was undertaken to identify future needs, and to provide a framework for identifying impacts of development on the existing transportation network. Based on historical growth, land use, and development information provided by the City of Windsor, a growth rate of 5% for a.m. and p.m. peak period traffic was identified for the 20-year planning period, representing a modest growth rate of 0.25% per year.

Alternative Solutions and Evaluation (Section 6.0)

Based on the unique problems and opportunities identified for each corridor, Alternative Planning Solutions were identified which included Travel Demand Management, Transportation Systems Management, Active Transportation Improvements, and the Construction of New Roadways. A combination of Planning Solutions were carried forward, and a long list of alternatives was developed for each corridor. The long-list of alternatives was pre-screened based on Connectivity and Circulation, Transportation Function, Urban Design Opportunities, and Cost and Constructability; a number of alternatives were carried forward into Phase 3 for which design alternatives were developed.

Phase 2 Public Consultation – PIC 1 and Community Workshops (Section 6.4)

Existing conditions, Transportation Planning Solutions, and the long list of alternatives were presented to the public for review and comment at PIC 1, and the Community Workshops held on May 6th and 7th, 2015. Comments from the public contained valuable input on active transportation operations and facilities, traffic operations, and general traffic conditions within the Central Box study area. Targeted feedback on the alternatives being considered was also obtained through the Community Workshops centred on Civic Ways, Active Transportation, and Traffic Operations.

Design Alternatives, Evaluation, and Recommended Strategy (Sections 8.0 and 9.0)

Design Alternatives were then identified and evaluated based on a range of criteria that assess potential impacts to the social/cultural, natural environment, technical/engineering, and economic environments. Alternatives were generally considered based on corridor, and intersection (e.g. Dominion Boulevard Corridor, and Dominion Boulevard Intersections).

The Recommended Strategy for each of the four corridors is outlined below.

Dominion Boulevard Corridor

The Recommended Strategy for Dominion Boulevard includes the following:

- Dominion Boulevard is widened to 3 lanes between Northwood Street and Ojibway Street, with a cross section including one lane in each direction, a two-way centre left turn lane, bicycle lanes and sidewalks (**Plate 3A**).
- Dedicated left turn lanes on all approaches to the Dominion Boulevard intersection with Northwood Street (**Plate 3A**).
- A new local road connection between Dominion Boulevard and Longfellow Avenue situated to the north of Northwood Street, and a multi-use trail connecting Longfellow Avenue and Alexandra Avenue (**Plate 3A**).
- Bicycle lanes along the corridor between Northwood Street and West Grand Boulevard, including the removal of part-time on-street parking (**Plate 4**).
- Dominion Boulevard north of Northwood Street to Ojibway Street is reclassified as a Class I Collector to match the existing function of the corridor. Alexandra Avenue is also reclassified as a Local Road to match the existing function.
- The existing configuration at the E.C. Row Expressway interchange with Dominion Boulevard is maintained.
- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization should be regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.

Dougall Avenue Corridor – Ouellette Avenue Corridor

The Recommended Strategy for the Dougall Avenue – Ouellette Avenue Corridor includes the following:

- A raised centre median on Ouellette Avenue between the Dougall Avenue/Eugenie Street and Dougall Avenue/Ouellette Avenue intersections (**Plate 5**);
- Bicycle lanes and sidewalks on Dougall Avenue north of the Ouellette Place intersection, and sidewalks along the east and west sides of Ouellette Avenue/Ouellette Place (**Plates 5 and 6**);
- Reconfiguration of Dougall Avenue/Ouellette Place to a conventional intersection operating under traffic signal control (**Plate 6**);

- Extension of the multi-use trail along the west boulevard of Dougall Avenue from South Cameron Boulevard to the recommended signalized intersection at Dougall Avenue and Ouellette Place, including a tunnel through the west embankment of the CN Rail overpass (**Plate 6A**);
- The existing U-turn restriction at the Van de Water Rail Yard access will be maintained. The proposed east-west connection will reduce or eliminate the need for passenger vehicle U-turns at this location.
- Reconfiguration of the channelized free-flow right turn movements at the E.C. Row Expressway off ramps to conventional right turn lanes under traffic signal control (**Plate 7**);
- A sidewalk on the west side of Dougall Avenue between the south E.C. Row Expressway ramp to connect with the existing sidewalk approaching West Grand Boulevard (**Plate 8**).
- Extension of the existing raised centre median on Dougall Avenue south of West Grand Boulevard (**Plate 8**).
- It is recommended that the existing northbound left turn restriction for trucks at the Dougall Avenue/E.C. Row Expressway north ramp terminal be removed. This will reduce the occurrences of trucks attempting U-turns at the Van de Water Rail Yard access, and recognizes the role and function of both Dougall Avenue and the E.C. Row Expressway as part of the City's Truck Route. This recommendation is also in line with the March 20th 2013 council meeting noting that the signage remains in place at least until the completion of the Parkway Project, which has since been completed. A test period for the removal of the signs and monitoring of the truck traffic impacts to the neighbourhood is advised prior to permanent removal of the restriction.
- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization shall be regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.

Howard Avenue

The Recommended Strategy for the Howard Avenue corridor includes the following:

- Bike lanes are proposed on Remington Avenue as an alternate cycling route to Howard Avenue in accordance with the BUMP (**Plate 10**).
- Reconfiguration of the channelized right turn at the E.C. Row Expressway north ramp terminal's westbound off ramp, and the south ramp terminal's eastbound off ramp to a standard right turn lane under traffic signal control (**Plate 10 and 11A**).
- Extension of the northbound left turn lane on Howard Avenue at the E.C. Row Expressway north ramp terminal to provide more storage (required removing part of the existing centre median) (**Plate 10**).

- Extension of the multi-use trail in the east boulevard between the Howard Avenue/Division Road intersection to the existing trail at the Devonshire Mall commercial access; a multi-use trail crossing between South Cameron Boulevard and Howard Avenue over the CN Rail line (**Plate 11**).
- Reconfiguration of the southbound approach of Howard Avenue at Division Road for a conventional right turn lane at the intersection for traffic continuing southbound on Howard Avenue and on the eastbound approach of Howard Avenue at Division Road for dual left turn movements for traffic continuing northbound on Howard Avenue (**Plate 11**).
- Reconfiguration of the intersection of South Cameron Boulevard and Howard Avenue to improve sight lines, turning operations, and additional storage for left and right turn movements on the South Cameron Boulevard approach (**Plate 11**).
- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization should regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.

In addition to the recommended improvements on Howard Avenue, several alternatives have been developed for more extensive improvements at the Howard Avenue/Division Road/South Cameron Boulevard/CN Rail Complex when traffic volumes warrant it. Although a significant reconstruction of this intersection and grade crossing complex are not required within the 20-year planning horizon used for traffic forecasting, it is recommended that property requirements shown in **Plate 16A and 16B** be protected to allow for construction of the ultimate design when warranted. Further discussion of the operational analysis for this ultimate design is provided in Section 8.5.3.1.

East-West Corridors

The Recommended Strategy within the East-West Corridor includes the following:

- Buffered bike lanes are proposed on Eugenie Street from Howard Avenue to Dougall Avenue, and the cycling route is extended to Remington Street via the multi-use trail in the south boulevard of Eugenie Street between Howard Avenue and Remington Street (**Plate 10A**).
- A New East-West Connection which includes an extension of Northwood Street easterly to Dougall Avenue with a grade-separated crossing (underpass) at the CN Rail line, and would be aligned with a westerly extension of Edinborough Street through to Dougall Avenue at a common intersection, including sidewalks and a multi-use trail (**Plate 9 and 9A**).
- An extension of Ojibway Street from Alexandra Avenue to South Cameron Boulevard, including a sidewalk on the north and multi-use trail on the south, which completes a

planned connection between Dominion Boulevard and South Cameron Boulevard (**Plate 3B**).

Implementation and Cost Estimates (Section 10.0)

The Recommended Strategy proposes improvements that will benefit the City of Windsor by providing a more versatile traffic network and promoting active transportation within the community.

The majority of the improvements recommended can move forward into the design phase for implementation once funding is available, and could be implemented in a 2-4 year timeframe. It is recommended that the improvements to the Dougall Avenue – Ouellette Place intersection be made a priority to reduce the historical collision frequency at the intersection. It is also recommended that the new East-West Connection be made a priority to improve network connectivity throughout the Central Box study area. Certain improvements should be implemented either in conjunction with or in a certain sequence with other improvements, and these are noted in the following table, along with an opinion of probable cost.

The estimates below are considered Class 4 (other definitions: Class IV, Level 2, Class C) estimates, generally referred to as preliminary, feasibility, schematic design, predesign, authorization or basic system cost opinions. It is used for detailed planning, evaluation of alternatives, confirmation of economic viability, preliminary budget approval, and cash flow projections. Cost estimates below do not include property acquisition values, rail crossing agreements, or environmental remediation.

E1 Dominion Boulevard Implementation and Cost Estimates

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Northwood Street to Ojibway Street	Three lane reconstruction and widening, urban cross section with sewers, utilities, illumination, sidewalks	Urbanization and widening of Northwood Avenue could be completed independent of the Northwood Street intersection improvements and the local road connection.	\$2,700,000
Connection between Dominion Boulevard and Alexandra Avenue	Local road between Dominion and Longfellow, multi-use trail between dominion and Alexandra, extension of Alexandra, storm and sanitary sewers, illumination, watermain extension	Project can be implemented separately from other corridor improvements. An alternative to construct multi-use trail as standalone is also viable.	\$750,000
Northwood Street to West	Reconstruction and widening to include intersection	Project recommended to be combined with or proceed	\$2,400,000

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Grand Boulevard	improvements, new bicycle lanes and widened sidewalks, storm sewers, utility relocations, illumination	following the Labelle Street improvements for continuity.	
Intersection improvements at Northwood Street	Widening for new and lengthened turning lanes, radii improvements, improved pedestrian and bicycle crossing, utility relocation, illumination, new traffic signals	Project should be implemented prior to the Northwood extension.	\$1,200,000
Intersection improvements at Labelle Street	Reconstruction and widening for new turning lanes, radii improvements, improved pedestrian and bicycle crossing, storm sewers, utility relocation, illumination, new traffic signals	Project should be done ahead of the Northwood Street to West Grand Boulevard improvements or combined with those improvements.	\$750,000
Corridor Subtotal			\$7,800,000.00

E2 Dougall Avenue Corridor – Ouellette Avenue Corridor Implementation and Cost Estimates

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Ouellette Avenue from Eugenie Street West to Dougall Avenue	Median, sidewalks, Ouellette Avenue / Ouellette Place intersection	The Ouellette Avenue / Ouellette Place intersection component needs to be completed following the Northwood Street extension to Edinborough Street	\$275,000
Dougall Avenue between Eugenie Street West and Ouellette Place	Widening to include bicycle lanes, barrier curbs and sidewalks, illumination.	Project recommended following or can be incorporated with the Dougall Avenue / Ouellette Place intersection improvements to reduce reconstruction costs at the intersection.	\$700,000
Dougall Avenue / Ouellette Place intersection improvements	New traffic signals, revised turning lanes on Dougall Avenue, new entrance reconfiguration, reconstruct median on Ouellette Place, illumination, incorporation	Project can be incorporated with the Dougall Avenue widening to Eugenie Street to provide full connection of the active transportation	\$500,000

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
	of multi-use trail and sidewalks	network. Should be incorporated prior to sidewalks along Ouellette Place and Ouellette Avenue to provide controlled crossing.	
Dougall Avenue between Ouellette Place and South Cameron Boulevard	Multi-use trail and tunnel under CN Rail, multi-use trail along South Cameron Boulevard to Northwood Street, illumination, utilities	Project implementation to be coordinated with the Northwood Street extension works. Should the Northwood Street extension be completed prior to this project, the tunnel may not be required and the active transportation network can be readjusted using the extension tunnel as the corridor's active transportation crossing of the CN Rail line.	\$5,300,000
E.C. ROW Expressway ramp improvements	Intersection at South Cameron Boulevard radius reconstruction, remove island, ramp widening and removals, multi-use trail, pedestrian crossings, illumination, new traffic signals at both ramp terminals	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$1,100,000
Dougall Avenue from the E.C. Row Expressway south ramp terminal to south of Grand Marais Road	Extend median on Dougall Avenue south of Grand Marais Road, reconstruct W-S E.C. Row Expressway Ramp, construct sidewalk, and provide illumination.	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$130,000
Corridor Subtotal			\$8,005,000.00

E3 Howard Avenue Corridor Implementation and Cost Estimates

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Remington Avenue	Add bicycle lanes and sidewalks, minor storm sewer work, illumination, utilities	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$1,600,000
E.C. ROW Expressway	Remove channelized right turn at the E-N/S and W-N/S ramp, partially remove median on Howard Avenue to extend northbound left turn lane at the north ramp terminal, include pedestrian signals at south ramp terminal and add pavement markings and signage	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$150,000
Howard Avenue / Division Road / South Cameron Boulevard intersection reconstruction	Traffic signal reconstruction, removal of channelized right turn lane, multi-use trails including east side of Howards Avenue northerly to Devonshire/Roundhouse access, new CN Rail crossing (on Howard and a new multi-use trail crossing), multi-use trail and sidewalk along South Cameron Boulevard, Howard Avenue / South Cameron Boulevard intersection, storm sewers, illumination	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution. Discussions with CN regarding crossing agreements and property must be undertaken during detail design which could influence the implementation schedule.	\$1,500,000
Corridor Subtotal			\$3,250,000.00

E4 East-West Corridor Implementation and Cost Estimates

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Ojibway extension from Dominion Boulevard to South Cameron	Widening of Ojibway between Dominion Boulevard and Alexandra Avenue, new roadway between Alexandra Avenue and South Cameron	Extension should be implemented in advance of the Northwood Street extension to Dougall Avenue in order to help alleviate the	\$1,900,000

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Boulevard	Boulevard, illumination, storm sewers, sidewalks	increase in traffic volumes on Northwood Street.	
Northwood Street extension to Dougall Avenue	New road alignment, traffic signals, Dougall avenue intersection with left turn lanes, tunnel, storm sewers, illumination, removal of South Cameron Boulevard, multi-use trails	Construct left turn lane for Edinborough but paint as median if done independently from the Edinborough Street extension. Multi-use trail along Dougall Avenue with tunnel may not be required if this moves forward first.	\$21,000,000
Edinborough Street extension to Dougall Avenue	New road construction (includes tie into to signals and new intersection work included in Northwood extension), illumination, storm sewers	Extension would ideally be incorporated with the Northwood Street extension. If property negotiations and/or environmental reviews require additional scheduling, the improvements could potentially follow the Northwood Street extension improvements.	\$1,400,000
Edinborough multi-use trail connection	Multi-use trail on the south side of Edinborough Street from Ouellette Avenue to Remington Street. Includes utilities, illumination, stormwater improvements, and full road reconstruction.	This project would ideally be incorporated within the Edinborough Extension to Dougall Avenue, but could be constructed independently.	\$1,200,000
Eugenie Street from Dougall Avenue to Remington Avenue	Widen road to incorporate bicycle lanes and sidewalks, new left turn lanes at McDougall Avenue intersection, intersection improvements with traffic signal reconstruction, illumination, utility relocations	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$3,500,000
Corridor Subtotal			\$29,000,000.00

Civic Ways Urban Design Implementation and Cost Estimates (Section 10.1.1)

The cost opinion below is based on the improvements shown on the Civic Way design panels presented at PIC 2 (provided in Appendix A8) and reflect current pricing from similar projects. Improvements related to the CN Railway bridge façade signage, street and way-finding signage and transit stop improvements have not been included in the costs below. Cost opinion for lighting and banners are included within the specific roadway improvements. Costs are considered conceptual, and actual final costs of the projects will be determined through the bidding and construction process.

E5 Civic Ways Implementation and Cost Estimates

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Dougall - Ouellette Avenue	Upgrades to median islands, parkette at Dougall Avenue and Ouellette Place, decorative treatments at CN Rail tunnel, signage and plaza features and decorative wall treatment at the E.C. Row Expressway, public art, decorative crosswalk and cross ride pavement, and boulevard planting.	Project can be implemented in stages, in conjunction with various roadway improvements.	\$1,800,000
Howard Avenue	Upgrades to median islands, parkette at Howard Avenue and Division Road, signage and plaza feature and planting at the E.C. Row Expressway, improvements at Howard Park, public art, decorative crosswalk and cross ride pavement, and boulevard planting.	Project can be implemented in stages, in conjunction with various roadway improvements.	\$850,000

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
E.C. Row Expressway	Naturalization of ditches and roadway edges at Dougall Avenue and Howard Avenue interchanges, distinct vertical features and tree planting.	Project can be implemented in conjunction with roadway improvements or as a stand-alone project.	\$450,000
Civic Ways Subtotal			\$3,100,000

Total Project Estimation

Based on the above cost estimates, the total cost estimate for all four corridors, including the Civic Ways elements, is \$51,155,000.

Environmental Impacts, Mitigation Measures, Permits and Approvals, and Implementation Considerations (Section 9.7-9.9, and Section 10)

Socio-Economic Impacts – Property Acquisition

Potential property acquisition has been identified on several recommended designs. The extent of property that may be required for each of the proposed improvements will be determined during detail design. The City of Windsor Real Estate Services may undertake the City's standard procedures for the acquisition of property identified within this ESR, or property identified through detail design of the proposed improvements.

Cultural Environment

Through the Stage 1 archaeological assessment conducted as part of this study, areas of archaeological potential were identified, and recommendations made for further study. Table E6 identifies recommendations for Stage 2 study prior to commencing construction.

Table E6 Recommendations for Stage 2 Archaeological Study

Plate Reference/Improvement	Recommendation for Further Study (as per Plate #)
Plate 3/3B – Ojibway Extension	Test pitting at a 5m interval is required.
Plate 9 – New East-West Connection/Northwood Street Extension	Pedestrian Survey at a 5m interval is required.

Plate 11 – Howard Avenue, South Cameron Boulevard, and CN Rail intersection	No further study required for minor modifications to intersection configuration within right of way; for disturbance to areas outside of the right of way, south of the intersection between Howard Avenue and Division Road, test pitting at 5m intervals is recommended.
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Natural Environment

Although the majority of recommended improvements involve work within existing right of ways, and recommendations have been made for enhanced roadside vegetation, during construction the potential exists for adverse impacts to naturalized areas. In addition to the direct impacts to features identified below, the following table identifies typical construction impacts and mitigation measures that should be carried forward into detail design.

Table E7 General Mitigation Measures

Potential Impact	Typical Recommended Mitigation and Enhancement Measures
Terrestrial Habitats and Species	
Removal or disturbance of significant trees or ground flora	<ul style="list-style-type: none"> • Relocate or replant any significant species in a timely manner following construction. • Minimize tree removal during construction. • Stabilize all disturbed areas upon completion of any grading works through re-vegetation of the disturbed areas utilizing native plant species (ex. seed and mulch, compost mix, tree and shrub planting).
Migratory Birds	<ul style="list-style-type: none"> • Avoidance of vegetation removal and disturbance during the recommended May 1 to July 31 nesting period for southern Ontario (to be confirmed through consultation with the MNRF prior to construction). If construction is necessary, nest searches must be completed within three days of clearing.
Stress on biological communities	<ul style="list-style-type: none"> • Avoid construction impacts during sensitive wildlife periods, such as breeding seasons for various bird species.
Introduction of invasive species through disturbance and material removal	<ul style="list-style-type: none"> • Restore disturbed areas as soon as possible. • Use only native species for all re-vegetation work. • Monitoring plans should include invasive species. • All soils removed from the project site containing invasive species material to be dealt with in a manner to prevent spreading to a new area;

	<ul style="list-style-type: none"> • Construction equipment should be cleaned prior to entering and exiting the construction site to prevent the transference of seed material.
Interference with ecological corridors and linkages	<ul style="list-style-type: none"> • Minimize vegetation disturbance in grassland areas to ensure habitat protection.

Species at Risk

The potential for impacts to Species at Risk and Species at Risk habitat (Butler’s Gartersnake and Dense Blazing Star) was identified for the construction of the Ojibway Street Extension and New East West Connection (Northwood Street Extension). Section 9.3.7.2 and 9.3.7.3 provide recommendations for further investigation during detailed design, and recommendations for mitigation measures. Detailed mitigation plans should be developed in coordination with the Ministry of Natural Resources and Forestry during detailed design, and included in contract documents.

Permitting and Approvals

The following permits may be required for works outlined in the above recommendations:

- A Permit to Take Water (PTTW) or registration with the Environmental Activity and Sector Registry (EASR) may be required through the Ministry of the Environment and Climate Change for some major and minor road construction (dewatering between 50,000-400,000 l/d, surface water taking for dust suppression, seeding material preparation, etc.). See O. Reg. 63/16 under Part II.2 of the *Environmental Protection Act* – Water Taking.
- A permit is required under the *Endangered Species Act* (issued by the Ministry of Natural Resources and Forestry) for any activities that may impact the habitat or individual species listed on the Species at Risk in Ontario List as endangered or threatened.
- A permit under Section 28 of the *Conservation Authorities Act* (issued by the Essex Region Conservation Authority) may be required for any works located within or adjacent to Conservation Authority Regulated Land.
- An Environmental Compliance Approval (ECA) and/or Certificate of Approval may be required for works related to the air, noise, or sewage discharges, including modifications to stormwater drainage systems.

Closing

Following the close of the 30-day review period and approval of the Environmental Study Report documenting the approved Municipal Class EA process, the projects outlined herein may proceed to detail design and construction.

Abbreviations

AADT	Average Annual Daily Traffic Volumes
AODA	Accessibility for Ontarians with Disabilities Act
ATR	Automatic Traffic Recorder
ATRIS	Aboriginal Treaty Rights and Information System
BUMP	Bicycle Use Master Plan
CAA	Conservation Authorities Act
CEAA	Canadian Environmental Assessment Act
Class EA	Municipal Class Environmental Assessment
CWA	Clean Water Act
CN	Canadian National
CNHS	Candidate Natural Heritage Site
DRTP	Detroit River Tunnel Partnership
EAA	Environmental Assessment Act
EB/WB	Eastbound/Westbound
EPA	Environmental Policy Area
ERCA	Essex Region Conservation Authority
ESA	Endangered Species Act
ESR	Environmental Study Report
LOS	Level of Service
LTL	Left Turn Lane
MEA	Municipal Engineers' Association

MNRF	Ministry of Natural Resources and Forestry
MOECC	Ministry of the Environment and Climate Change
MTCS	Ministry of Tourism, Culture, and Sport
MTO	Ministry of Transportation
MVE	Million Vehicles Entering
NHIC	Natural Heritage Information Centre
OP	Official Plan
PPS	Provincial Policy Statement
PIC	Public Information Centre
ROW	Right of Way
RTL	Right Turn Lane
SARA	Species at Risk Act
SARO	Species at Risk in Ontario List
SGRA	Significant Groundwater Recharge Area
TDM	Traffic Demand Management
TSM	Transportation Systems Management

1.0 INTRODUCTION

1.1 BACKGROUND

The City of Windsor initiated a Municipal Class Environmental Assessment (Class EA) to identify improvements to the Central Box area. The area is bounded by Eugenie Street to the north, Howard Avenue to the east, West Grand Boulevard/South Cameron Boulevard to the south, and Dominion Boulevard to the west (see Figure 1.1). As the title suggests, the area is centrally located within the City of Windsor, and the corridors within it function as important commuter routes to other areas of the City. Traffic volumes and road/intersection configurations and operations have created barriers for motorists as well as active transportation users traveling within and through the Central Box area. The Class EA is being undertaken to identify short term and long term improvements to the transportation network, including the implementation of active transportation facilities.



Figure 1.1 Central Box Study Area

1.2 ONTARIO ENVIRONMENTAL ASSESSMENT ACT

Municipalities in Ontario are subject to the provisions of the Ontario Environmental Assessment (EA) Act which sets out an environmental planning and decision-making process in which the Minister must give an approval before an undertaking may proceed. The purpose of this process is to assess the environmental effects of a proposed undertaking prior to implementation to minimize or mitigate those effects. The EA Act enables an approval of a “class of undertakings” by the Minister. These Class EA’s (as they are known), set out a self-assessment process to be followed by proponents when carrying out specific projects approved under the Class EA. These Class EA approvals have traditionally been for undertakings which are recurring, usually similar in nature, usually limited in scale and have a predictable range of environmental impacts. The City of Windsor is eligible to use the Municipal Class EA approvals process for the planning and implementation of their municipal infrastructure projects.

The Ontario Municipal Engineers’ Association (MEA) “Municipal Class Environmental Assessment (2000 as revised in 2007, 2011 and 2015) document provides municipalities with a five phase planning procedure approved under the EAA to plan and undertake all municipal sewage, water, stormwater management, and transportation projects.

Key components of the Class EA planning process include:

- Consultation with the public, Aboriginal communities, and review agencies early and throughout the process;
- Evaluation of a reasonable range of alternatives;
- Consideration of effects on the environment and ways to avoid/reduce impacts;
- Systematic evaluation of alternatives;
- Clear documentation; and
- Traceable decision making.

1.2.1 Types of Projects

The MEA Class EA document provides a framework by which projects are classified as Schedule A, A+, B, or C. Classification of a project is based on a variety of factors including the general complexity of the project and level of investigation required, and the potential impacts on the natural and social environment that may occur. It is the responsibility of the proponent to identify the appropriate schedule for a given project, and to review the applicability of the chosen schedule at various stages throughout the project. Each of the schedules require a different level of documentation and review to satisfy the requirements of the Class EA, and thus to comply with the EAA. The guidelines for classifying municipal transportation, water and wastewater projects are found in Appendix 1 of the MEA Municipal Class EA document.

Schedule A projects are limited in scale, have minimal adverse impacts on the natural and social environments, and include the majority of municipal sewage, Stormwater management,

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

water operations, and maintenance activities. These projects are pre-approved under the EAA and may be implemented without following the procedures outlined in the Class EA planning process. Examples of Schedule A projects include watermain and sewer extensions where all such facilities are located within the municipal road allowance, or an existing utility corridor. As such, these projects are pre-approved and do not require further planning and public consultation.

Schedule A+ projects are similarly pre-approved under the Municipal Class EA process, but require that potentially affected parties be notified prior to implementation. The public has a right to comment to municipal officials or their council on the project; however, since projects are pre-approved, there is no appeal process to the Minister of the Environment and Climate Change on these projects (i.e. Part II Order requests, as discussed below).

Schedule B projects have the potential for some adverse environmental and social impacts. The proponent is required to undertake a screening process involving mandatory contact with potentially affected members of the public, Aboriginal communities, and relevant review agencies to ensure that they are aware of the project and that their concerns are addressed.

Schedule B projects require that Phases 1 and 2 of the Municipal Class EA planning process be followed and a Project File report be prepared and submitted for a mandatory 30-day review by the public, agencies, and Aboriginal Communities. If all comments or concerns received within the 30-day review period can be addressed, the proponent may proceed to project implementation. If concerns are raised that cannot be resolved, then the Part II Order procedure may be invoked.

Schedule C projects have the potential for significant environmental impacts and must follow the full planning and documentation procedures specified in the Class EA document (Phases 1 through 4). An Environmental Study Report (ESR) must be prepared and filed for review by the public, review agencies and Aboriginal Communities. If concerns are raised that cannot be resolved, then the Part II Order procedure may be invoked. Schedule C projects generally include the construction of new facilities and major expansions to existing facilities.

For transportation projects, the approximate project cost and project description triggers the schedule of an undertaking based on Municipal Road Tables found in Appendix 1 of the Municipal Engineer's Association Municipal Class Environmental Assessment process (2000, as amended in 2007, 2011, and 2015).

1.2.2 5-Phase Planning Process

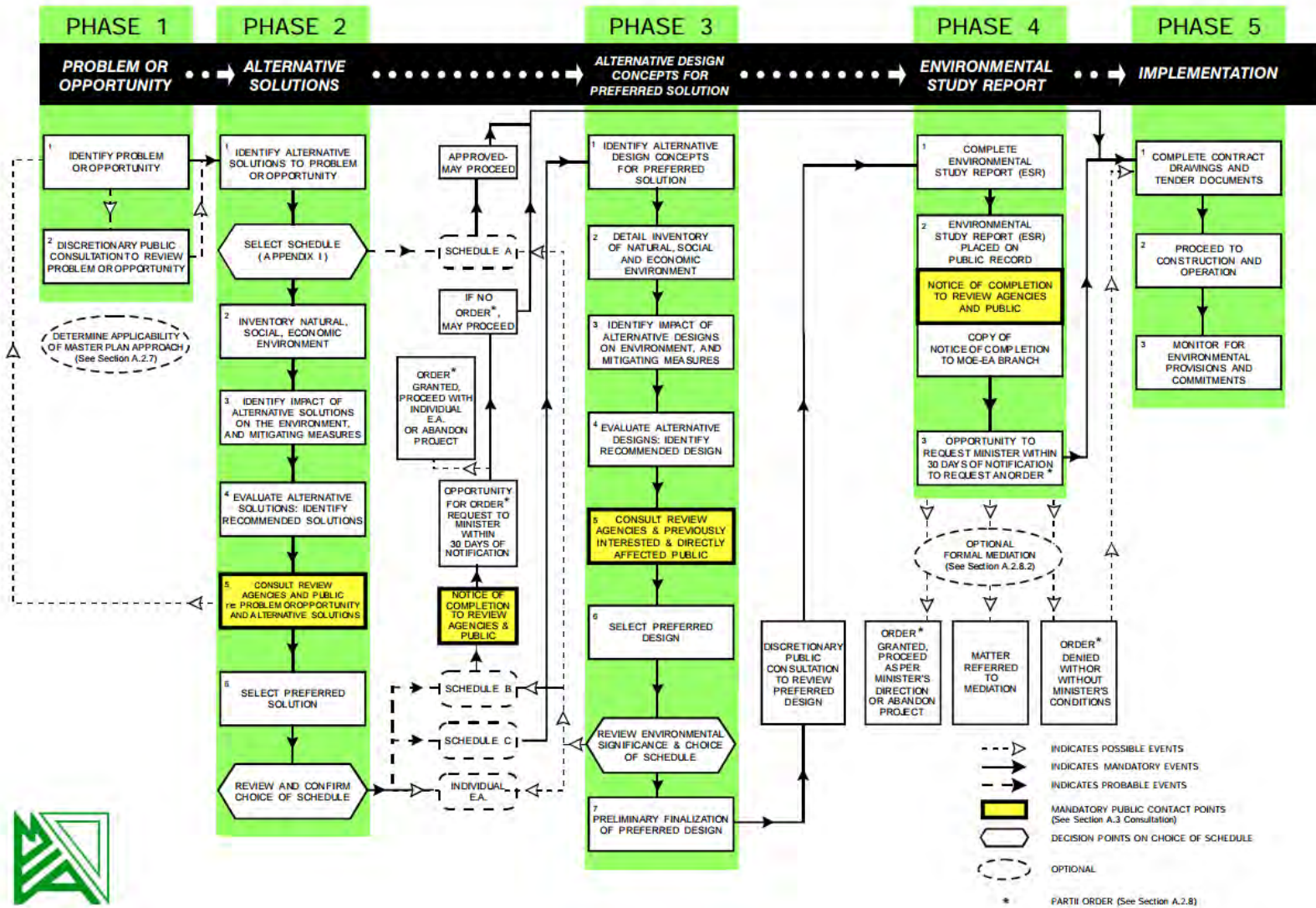
Figure 1.2 illustrates the process to be followed in the planning and design of projects covered by a Municipal Class EA. The figure incorporates steps considered essential for compliance with the requirements of the EAA. The five phases of the Class EA process are summarized below:

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

- Phase 1 Identify the problem (deficiency) or opportunity.
- Phase 2 Identify alternative solutions to the problem or opportunity by taking into consideration the existing environment and establish the preferred solution accounting for Aboriginal Community, public, and agency review and input. For Schedule B projects, the planning process is documented in a Municipal Class EA Project File and such documentation is made available for scrutiny by review agencies, Aboriginal Communities, and the public.
- Phase 3 For Schedule C projects only, alternative methods for implementing the preferred solution are developed and examined based upon existing environment, public, and review agency input, anticipated environmental effects and methods of minimizing negative effects and maximizing positive effects.
- Phase 4 For Schedule C projects only, the Class EA process followed is documented in an Environmental Study Report (ESR), which includes a summary of the rationale and the planning, design, and consultation program. The ESR and accompanying documentation is made available for review by the public, review agencies, Aboriginal Communities, and the public through a mandatory 30 day review period.
- Phase 5 Contract drawings and documents are completed, and the proponent proceeds to construction and operation with applicable approvals, permitting, and/or monitoring to ensure adherence to environmental provisions and commitments.

The Municipal Class EA process and associated documentation serves as a public statement of the decision making process followed by municipalities for the planning and implementation of necessary infrastructure.

Figure 1.2 – Municipal Class Environmental Assessment Planning Process



1.2.3 Changing the Project Status – ‘Part II Order’

The planning process as outlined above encourages the identification and resolution of concerns throughout the project, and it is the obligation of the proponent to adequately address concerns raised by the public, Aboriginal communities, and agencies. If an interested party feels as though their concerns have not been adequately addressed, and that the proposed undertaking needs to be subject to a more in-depth planning process, a request for a Part II Order may be submitted to the Minister of the Environment. Under the provisions of Section 16 of the *Environmental Assessment Act* (EAA), the minister or delegate may require a proponent to comply with Part II of the EAA by elevating the status of the project, and/or completing an Individual EA before proceeding to implementation. The Ministry may also deny the request, and/or impose conditions on the proposed undertaking.

In accordance with Section A.2.8 of the MEA document, a Part II Order request shall comply with the following:

- Must be made in writing to the Minister of the Environment and Climate Change or delegate with a copy to the proponent;
- Must be made upon the completion of the planning process (after a Notice of Completion is issued, outlining the public review period) so that all potential environmental impacts and impact management measures are understood; the request must be received by the Municipality and the Minister before the 30 day review period lapses.
- Must not be made for the sole purpose of delaying, stopping, or frustrating the planning and implementation of a project subject to the Class Environmental Assessment process;
- Must focus on potential environmental effects of the project, the Class EA process, and not on decision made outside the Class EA process (for example, land use planning decisions made under the Planning Act or issues related to municipal funding of projects);
- Must not raise issues that are not related to the project; and
- Should be withdrawn promptly by the requester if the proponent has satisfied the concerns of the requester.

It is the proponent's responsibility to provide several opportunities for public, Aboriginal community, and agency review and input as well as that of these stakeholders to bring their concerns to the attention of the proponent early in the planning process. Every reasonable effort must be made by the proponent to address the concerns brought forward. If concerns have not been addressed upon the issuance of a Notice of Completion, any member of the public, Aboriginal community, or agency can submit a request with the following information to the Minister of the Environment and Climate Change or delegate with a copy to the Municipality/proponent within the 30-day review period as outlined in the Notice (requests submitted after this time may not be considered):

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

- The project name and proponent;
- Environmental impacts of the project and their significance;
- The adequacy of the planning process;
- The availability of other alternatives to the project (where appropriate as some projects may not have any alternative);
- The adequacy of the public consultation program and the opportunities for public participation;
- The involvement of the requester in the planning of the project;
- The nature of the specific concerns which remain unresolved;
- Details of any discussions held between the requester and the proponent;
- The benefits of requiring the proponent to undertake a high level of assessment (e.g. an individual environmental assessment); and
- Any other important matters considered relevant.

More information on submitting a Part II Order request can be found in Section A.2.8 of the MEA Municipal Class EA document.

1.3 CANADIAN ENVIRONMENTAL ASSESSMENT ACT

Under the Canadian Environmental Assessment Act (CEAA) 2012, an environmental assessment focuses on potential adverse environmental effects that are within federal jurisdiction, including:

- Fish and fish habitat;
- Other aquatic species;
- Migratory birds;
- Federal lands;
- Effects that cross provincial or international boundaries;
- Effects that impact on Aboriginal peoples, such as their use of lands and resources for traditional purposes;
- Changes to the environment that are directly linked to or necessarily incidental to any federal decisions about a project.

CEAA2012 applies to projects described in the Regulations Designating Physical Activities and to projects designated by the Minister of the Environment. The work undertaken as part of this project is not described within the Regulations Designating Physical Activities or designated by the Minister of the Environment, and therefore is not subject to the requirements under the CEAA 2012.

1.4 STUDY AREA

The study area is bounded by Eugenie Street to the north, Howard Avenue to the east, West Grand Boulevard/South Cameron Boulevard to the south and Dominion Boulevard to the west.

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While the study takes a holistic approach to traffic movements throughout the corridor, it was divided into four main corridors based on the City of Windsor's Request for Proposal (23-14):

- Dominion Boulevard extending from West Grand Boulevard to Ojibway Street;
- Dougall-Ouellette Avenue Corridor including Dougall Avenue from West Grand Boulevard to Eugenie street, and Ouellette Place/Ouellette Avenue from its intersection with Dougall Avenue to Eugenie Street;
- Howard Avenue extending from South Cameron Boulevard to Eugenie Street; and
- The East-West Corridors including the E.C. Row Expressway between Dominion Boulevard and Howard Avenue, Eugenie Street, and various locations identified as potential new east-west connections.

Figure 1.3 illustrates the corridors within the study area.



Figure 1.3 Study Area Corridors

1.5 PROJECT APPROACH

The study has been undertaken in accordance with the Schedule C Municipal Class Environmental Assessment (Municipal Engineers' Association 2000, as amended in 2007, 2011, and 2015) process. At the outset of the project, an extensive review of background studies/reports and policies was undertaken; initial comments from the public and other stakeholders were compiled, as well as collision data and traffic counts provided by the City of Windsor from annual traffic reporting programs; and a data collection program was undertaken to collect updated traffic counts, including the observation of vehicle, pedestrian, and cyclists operations at several locations. While the study takes a holistic approach to understanding traffic movements throughout the entire Central Box area, data collection, analysis, and alternative solutions have been presented by corridor for organizational purposes.

Alternatives and recommendations were presented to the public and other stakeholders, and modified based on comments received. Throughout the process, direction was provided by the City of Windsor staff based on current City policies and guidelines.

The following chapters document the study process, following the guidelines for Phases 1 through 4 within the Municipal Class Environmental Assessment process.

1.5.1 Project Team

The study was undertaken by a Stantec Consulting Ltd. team which included engineers, planners, designers, and other industry specialists in coordination with City of Windsor staff. Throughout the project, six Project Meetings were held between Stantec staff, and the Central Box Study Area EA Steering Committee which included members from several City departments (Transportation Planning, Planning, Engineering, Public Works, Parks and Facilities, Real Estate Services).

1.6 CONSULTATION PLAN

Consultation with the public, agencies, and other stakeholders is vital to the success of the project. An extensive public consultation program was conducted, which included the generation of public awareness of the study through newspaper notifications, direct mailings, an online survey, two Public Information Centres (PICs) and Community Workshops. The study received additional publicity through local television and newspaper articles, some of which are included in Appendix A9.

At the outset of the project, a review of potentially interested government agencies, Aboriginal communities, local interest groups, businesses, and other stakeholders was undertaken, and a contact list was generated (included in Appendix A1). Throughout the project, any members of the public who expressed interest in the study were added to the project contact list.

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The following chart documents the points of contact throughout the study, the purpose for the communication, the date and distribution, and mode of communication used. The information presented at the PICs and Community Workshops, as well as the comments received in response to the material presented are discussed during the appropriate phases within the report, and are included in Appendices A5-A8.

Table 1.1 Points of Contact

Point of Contact	Purpose	Distribution and Mode of Communication	Date
Notice of Commencement (Found in Appendix A3)	<ul style="list-style-type: none"> To inform the public of the start of the study, outline the study area and objectives, and provide contact information of key study personnel. Comments on existing transportation conditions were solicited, and residents who wished to be added to the study contact list were directed to contact a member of the study team. 	<ul style="list-style-type: none"> All stakeholders identified through initial review were sent copies of the Notice via Canada Post. 	<ul style="list-style-type: none"> Tuesday, August 12th 2014
		<ul style="list-style-type: none"> The Notice, cover letter, and comment sheet was distributed to the Aboriginal Communities identified on the stakeholder list (with an information request to Ministry of Aboriginal Affairs) 	<ul style="list-style-type: none"> August 12th, 2014
		<ul style="list-style-type: none"> The Canada Post Unaddressed Admail feature was utilized to target property owners within and around the study area. A total of 5,914 notices were distributed (see Targeting Report in Appendix A3). 	<ul style="list-style-type: none"> August 13th, 2014

**CENTRAL BOX STUDY AREA
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Point of Contact	Purpose	Distribution and Mode of Communication	Date
		<ul style="list-style-type: none"> Published in the Windsor Star 	<ul style="list-style-type: none"> August 14th and August 16th 2014
Notice of Public Information Centre No. 1 (PIC) and Community Workshops	<ul style="list-style-type: none"> To provide the location, date, and time of PIC1 and the Community Workshop. To provide an overview of the information to be presented at the PIC. 	<ul style="list-style-type: none"> All stakeholders identified on project contact list, and anyone who expressed interest in the study (Canada Post and/or email). 	<ul style="list-style-type: none"> April 12th 2014
	<ul style="list-style-type: none"> Members of the public interested in attending the Community Workshops were asked to register in advance by contacting a member of the study team. 	<ul style="list-style-type: none"> Published in the Windsor Star Newspaper 	<ul style="list-style-type: none"> April 22th and April 25 2014
PIC1 and Community Workshops (Appendix A5 and A6)	<ul style="list-style-type: none"> To provide an overview of the existing conditions, planning alternatives being considered and preliminary screening/evaluation. 	<ul style="list-style-type: none"> PIC conducted in open house format, with participants encouraged to fill out and return comment sheets 	<ul style="list-style-type: none"> PIC: Wednesday May 6th, 2015 from 4pm-8pm.

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Point of Contact	Purpose	Distribution and Mode of Communication	Date
	<ul style="list-style-type: none"> To solicit public feedback on the work completed to date, and the alternatives being considered. 	<ul style="list-style-type: none"> Three separate workshops were held (Transportation Operations, Civic Ways, and Active Transportation) which included small, round-table discussions and mapping exercises. 	<ul style="list-style-type: none"> Community Workshops: Thursday May 7th 2015 from 9am-12pm.
Notice of PIC2	<ul style="list-style-type: none"> To provide the location, date, and time of PIC2 To provide an overview of the information to be presented at the PIC. 	<ul style="list-style-type: none"> All stakeholders identified on the project contact list, all members of the public who signed into PIC1 (Canada Post and/or email). Due to modifications to the study area and preliminary recommendations, properties fronting Remington Avenue were also sent the Notice directly. 	<ul style="list-style-type: none"> November 18th 2015
		<ul style="list-style-type: none"> Published in the Windsor Star Newspaper 	<ul style="list-style-type: none"> November 21 & 28, 2015
PIC2 (Appendix A8)	<ul style="list-style-type: none"> To provide an overview of the study to-date, the alternative design 	<ul style="list-style-type: none"> PIC conducted in open house format, and participants were 	<ul style="list-style-type: none"> December 1st, 2015 from 4pm to 8pm.

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Point of Contact	Purpose	Distribution and Mode of Communication	Date
	<p>concepts being considered, a summary of the evaluation process, and preliminary recommendations</p> <ul style="list-style-type: none"> To solicit public feedback on the preliminary recommendations. 	<p>encouraged to fill out and return comment sheets.</p>	
<p>Notice of Completion</p>	<ul style="list-style-type: none"> To provide an overview of the types of recommendations. To inform the public of the start of the 30-day review period, where the document will be made available, and to whom to direct comments and concerns. To provide an overview of the Part II Order process 	<ul style="list-style-type: none"> All stakeholders identified on the project mailing list including Aboriginal Communities, PIC participants, and other interested parties Published in the Windsor Star Newspaper 	<ul style="list-style-type: none"> July 22, 2016 Saturday July 20th, and 23rd, 2016;

1.6.1 TRACER Documentation System

All correspondence from the public, agencies, and Aboriginal Communities has been documented in a TRACER (Team Response and Commitment to Environmental Requirements) table. The TRACER tables document the contact information, date, comment/issue, response (if required), and how the comments have been addressed as part of the study. This format provides a comprehensive, transparent system for documenting stakeholder input in the study, and where possible, how that input has been incorporated into the study recommendations.



CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Separate TRACER tables have been maintained throughout the study and are referenced in the following chapters, as well as included in Appendices A3, A4, A5, and A8.

1.6.2 Agency Consultation

As part of the initial review of potentially interested stakeholders, a list of government and technical agencies were compiled (included in Appendix A1). This list included Municipal departments, the Essex Region Conservation Authority, federal, and provincial agencies. All project notifications listed in the table above were mailed directly to these agencies, and all additional correspondence received is included in the Agency TRACER table found in Appendix A2

1.6.3 Aboriginal Consultation

At the outset of the project, an initial review was completed to identify Aboriginal Communities that may have an interest in commenting on the project. This review included:

- A search of the Aboriginal and Treaty Rights Information System (ATRIS) administered by the Ministry of Indigenous Affairs and Northern Development Canada;
- A letter containing project information, Notice of Commencement, and a preliminary list of identified Communities was provided to the Ministry of Aboriginal Affairs to request additional information on active land claims (August 12th, 2014).

Based on the above review, the following Communities were included on the project contact list and engaged throughout the project:

- Walpole Island First Nation/Bkejwanong;
- Caldwell First Nation;
- Aamjiwnaang First Nation;
- Moravian of the Thames (Delaware Nation);
- Métis Nation of Ontario.

All correspondence is included in the Aboriginal Community TRACER table found in Appendix A4. In addition to providing all contact notification outlined in Table 1.1 Points of Contact, follow up information was provided including a digital copy of the PIC presentation materials, as well as follow-up emails and/or telephone calls.

Correspondence was received from Chief Hillier from the Caldwell First Nation requesting a meeting to discuss the project. The meeting was held between Chief Hillier and Stantec Project Manager Michael Mastronardi on March 14th, 2016. Meeting minutes are included in Appendix A4. Chief Louise Hillier and Brent Ryan-Lewis, Director of Operations, requested that provisions be provided in the Class EA document with regard to preventing the establishment of invasive

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SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

species where any soil disturbance is necessary, and the potential for disruption to archaeological material. Recommendations have been included in Section 9.7.

Correspondence was not received from the other Aboriginal Communities that were contacted.

1.6.4 Public Consultation, Public Information Centres (PICs), and Community Workshops

The first point of contact with the public, as identified in the table above, was the Notice of Commencement. Contact information for property owners within the study area was provided by the City of Windsor, which included 1,274 properties (see Appendix A3). In addition to properties within the immediate study area, areas contiguous to the study area were also sent the Notice of Commencement using the Canada Post Unaddressed Admail feature, which consisted of 5,914 properties. This feature allows proponents to provide the Notice directly to the distribution facilities, which are then delivered as part of the mail carriers' regular routes. Figure 1.4 below outlines the areas to which the Notice of Commencement was directly mailed, beginning on August 13th. The variously coloured streets shown on the Figure represent mail carrier routes to which the Notice of Commencement was distributed.

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Figure 1.4 Notice of Commencement Distribution Area

The Notice of Commencement included a map outlining the study area, an overview of the project objectives including traffic operations and the consideration for pedestrian and bikeway connections, traffic calming, and infrastructure elements. The public was encouraged to contact members of the study team with comments or concerns, and if they wished to be added to the study mailing list to receive project information.

Approximately 30 comments were received from members of the public in response to the Notice of Commencement, many of which expressed concern for pedestrian/cyclist safety within the study area (Appendix A3).

Public Information Centres (PICs) and Community Workshops were also a major component of the public consultation plan. The two PICs were held in open house format, at the Columbus Centre of South Windsor building located within the study area at 2401 Columbus Drive. Presentation materials were distributed throughout the room, both Stantec staff and City of Windsor staff were available to answer questions, and participants were encouraged to fill out comment sheets. The information presented at the PICs and the comments received are discussed within Sections 6.4 and 8.7 below.

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Community Workshops were held to solicit more targeted input from community members. Workshops were divided into three sessions, Transportation Operations, Active Transportation, and Civic Ways. Attendance ranged from approximately 5-15 participants per session. Each workshop consisted of a round table discussion where participants were encouraged to provide input regarding problematic areas, common routes, and suggested improvements. Summaries of the input received at the Community Workshops are included in Appendix A6, and further discussed in Section 7.2.

2.0 BACKGROUND DOCUMENTATION

2.1 PROVINCIAL AND MUNICIPAL POLICIES

2.1.1 Provincial Policy Statement

The Provincial Policy Statement (PPS) is the complementary policy document to the *Planning Act* (2005), issued under Section 3 of the *Act*, and sets a policy foundation for regulating the development and use of land within Ontario. It provides direction on matters of principal interest and supports the enhancement of the quality of life for all citizens in Ontario. Under Section 3 of the *Act*, all decisions affecting planning matters “shall be consistent with” the PPS.

Five general principles are established in the PPS that are further elaborated on in a detailed set of policies that generally address the following matters:

- Building Strong Healthy Communities (PPS Section 1) – Policies pertaining to the efficient development of land, the efficient use of infrastructure, employment areas, housing, parks and open space, water, wastewater, and stormwater servicing, transportation, waste management, energy conservation, air quality, and climate change, and long-term economic prosperity.
- Wise Use and Management of Resources (PPS Section 2) – Policies relating to the delineation and protection of Natural Heritage features, water, agricultural lands, minerals and petroleum, mineral aggregate resources, and cultural heritage and archaeology.
- Protecting Public Health and Safety (PPS Section 3) – Policies relating to development within, or in proximity to natural and human hazards.

Although all policies within the PPS shall be considered during the project, several policies of particular relevance to this project are highlighted below:

- 1.6.1 – *Transportation systems should be provided which are safe, energy efficient, facilitate the movement of people and goods, and are appropriate to address projected needs.*
 - 1.6.7.2 – *Efficient use shall be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.*

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

- o 1.6.7.3 – *As part of a multimodal transportation system, connectivity within and among transportation systems and modes should be maintained, and where possible, improved including connections which cross jurisdictional boundaries.*
- o 1.6.7.5 – *Transportation and land use considerations shall be integrated at all stages of the planning process.*

The alternatives considered within the study will be evaluated to ensure that the objectives of the PPS are met by providing for infrastructure that is appropriate to address the projected needs, promotes connectivity including alternative modes of transportation, and protects the natural environment.

2.1.1.1 Natural Environment – Policy Considerations

The Provincial Policy Statement (PPS 2014) provides direction for the long-term protection, restoration, and improvement of the diversity and connectivity of natural features, the ecological function and biodiversity of natural systems, and the quality and quantity of water at a watershed scale. Policy 2.1 of the PPS provides direction for the protection of the natural heritage features; features to be considered in accordance with the PPS include:

- Significant wetlands and significant coastal wetlands;
- Significant habitat of endangered and threatened species;
- Significant woodlands;
- Significant valleylands;
- Significant wildlife habitat;
- Significant areas of natural and scientific interest (ANSIs); and
- Fish habitat.

In Southern Ontario, development and site alteration is not permitted in significant habitat of endangered and threatened species or fish habitat except in accordance with provincial and federal requirements. Development and site alteration may be permitted on lands adjacent to significant wetlands, coastal wetlands and the habitat of endangered and threatened species if it is demonstrated that there will be no negative impacts on the natural features of the ecological functions for which the area was identified.

Development is not permitted within, or on lands adjacent to, the other significant natural heritage features unless the ecological function of these lands has been evaluated and has been demonstrated that no negative impacts on the features or their ecological function will occur.

The assessment, selection, and implementation of any preferred alternatives should be consistent with the context and direction provided by the policies in the PPS.

2.1.2 Endangered Species Act

The *Endangered Species Act* (ESA) identifies wildlife species considered to be at risk in Ontario and designates them as threatened, endangered, extirpated or of special concern. Provincial species at risk are identified and assessed by the Committee on the Status and Species at Risk in Ontario (COSSARO) which is a committee of wildlife experts and scientists, as well as those who provide Aboriginal traditional knowledge, who classify species according to their degree of risk.

The ESA protects species at risk and their habitats by prohibiting anyone from killing, harming, harassing or possessing protected species, as well as prohibiting any damage or destruction to the habitat of species identified on the Species at Risk in Ontario list (SARO). All species on the SARO list are provided with general habitat protections under the ESA, which protect areas that species depend on to carry out their life processes such as reproduction, rearing, hibernation, migration, or feeding. A species added to the SARO list is required to have a regulation approved by the Ministry of Natural Resources and Forestry (MNRF) within a set period of time to define species specific habitat requirements, which identifies boundaries, areas, or features of an area where the species lives, used to live, or is believed to be capable of living. This 'regulated habitat' replaces the general habitat description once approved.

Any activity that may impact a protected species or its habitat requires the prior issuance of a permit from the MNRF. Such permits may only be issued under certain circumstances, which are limited to activities required to protect human health and safety, activities that will assist in the protection or recovery of the species, activities that will result in an overall benefit to the species or activities that may provide significant social or economic benefit without jeopardizing the survival or recovery of the species in Ontario.

2.1.3 Conservation Authority Approval

The Central Box study area is located within the Detroit River Watershed, under the jurisdiction of the Essex Region Conservation Authority (ERCA). The ERCA is responsible for approval of development or site alteration along watercourses, shorelines, floodplains, wetlands and other areas prone to natural hazards. These areas, known as the 'Regulation Limit', are detailed in Ontario Regulation 158/06 Regulation of Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses, issued under Ontario Regulation 97/04 under the *Conservation Authorities Act*.

Any improvements identified within or adjacent to a regulated area may require a permit issued by the Essex Region Conservation Authority.

2.1.4 City of Windsor Official Plan

2.1.4.1 Land Use

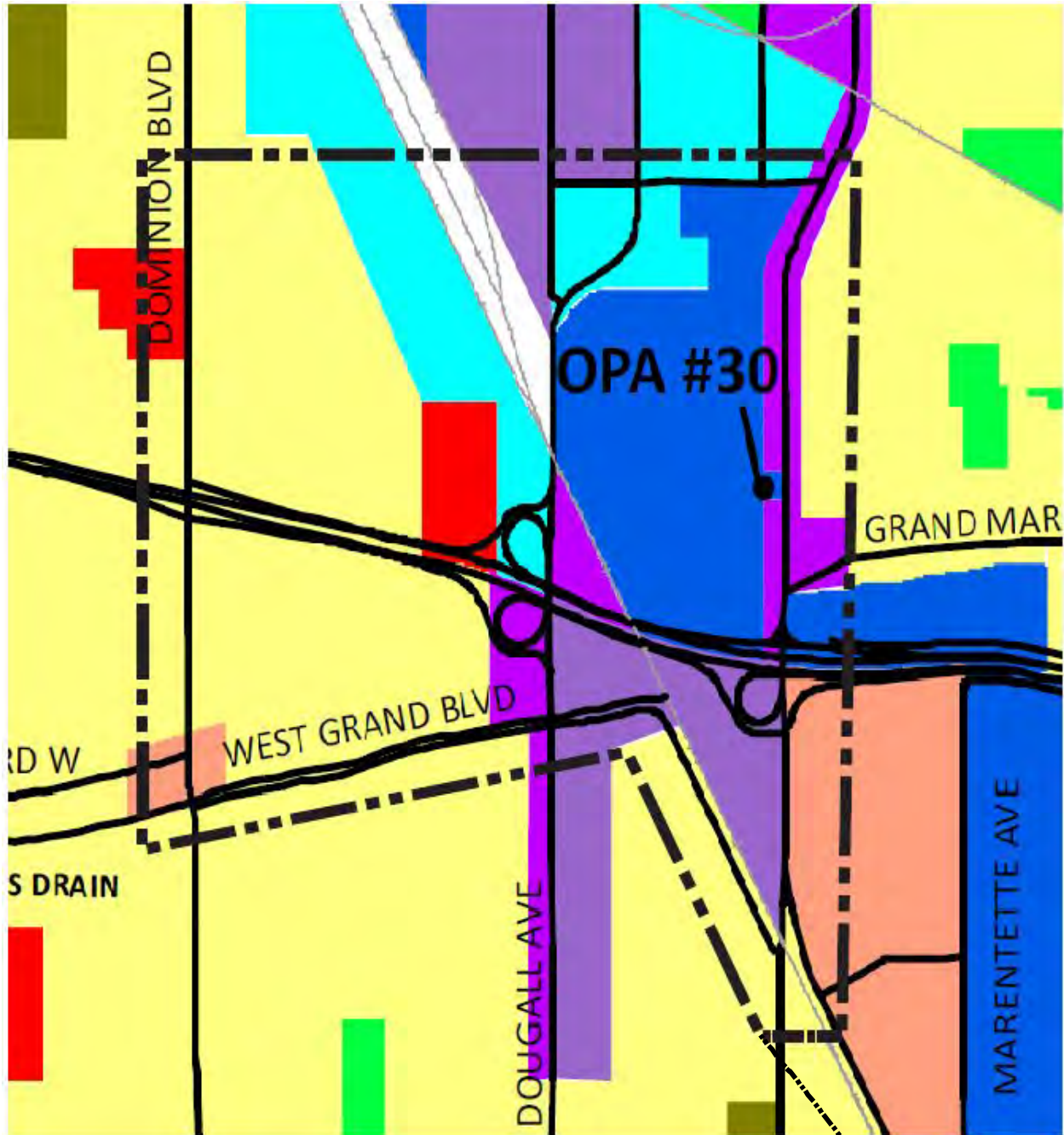
The City of Windsor Official Plan (OP) provides the guidance for the physical development of the City over a 20-year period, taking into consideration important social, economic, and environmental matters. The City's current OP was adopted by City Council in 2000 and approved by the Ministry of Municipal Affairs and Housing in 2002. The City recognizes the need to build a sustainable transportation system that balances all modes of transportation.

The OP is divided into three volumes; Volume I the Primary Plan, Volume II Secondary Plans and Special Policy Areas, and Volume II Right-of-Way Widths.

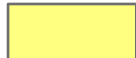







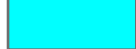





Based on a review of the City's Primary Plan including Secondary Plans and Special Policy Areas, the following policies/land use designations are relevant to the Central Box study area:

Land Use Designations

According to Schedule D – Land Use, the Central Box study area is comprised of Residential, Business Park, Major Institutional, Commercial, Mixed Use, and Industrial. Schedule D – Land Use is included in Figure 2.1.



Legend

 RESIDENTIAL	 WATERFRONT RECREATION	 MIXED USE	 FUTURE URBAN AREA
 OPEN SPACE	 WATERFRONT PORT	 NATURAL HERITAGE	 FUTURE EMPLOYMENT AREA
 BUSINESS PARK	 MAJOR INSTITUTIONAL	 INDUSTRIAL	 AIRPORT
		 COMMERCIAL CENTRE	 COMMERCIAL CORRIDOR



CITY OF WINDSOR
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City of Windsor Official Plan Schedule D - Land Use

PROJECT NO.

DRAWING NO.

Fig. 2.1

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

The large portion of lands in the west and south of the study area are designated as Residential. A primary objective of the Residential designation subject to policies within Section 6.3 of the Official Plan is to promote compact neighbourhoods which encourage a balanced transportation system, a range of housing types and complementary services.

The Business Park designation, located at the Dougall Avenue, Ouellette Place, and Eugenie intersections and along South Cameron Boulevard consisting of the Van de Water CN Rail Yard, provides for business and industrial uses of a similar quality and character to locate together in highly visible areas. Lands designated as Business Park are subject to policies within Section 6.6.4, and shall: be accessible and highly visible from Class I or Class II Arterial Road (Dougall Avenue classified as Class II Arterial as discussed below); allow Business Park traffic to be directed away from residential areas; be accessible by public transit; and have access to a designated truck route.

The Major Institutional designation located at Dominion Boulevard just north of Northwood Street contains the Holy Names High School, as well as the Windsor Islamic Association Dominion Mosque. Major Institutional lands are also located north of the E.C. Row Expressway, just west of Dougall Avenue, which contains the E.J. Lajeunesse Secondary School. Institutional land uses are to be located where there is access to a Class II Arterial Road, Class I or Class II Collector Road.

Commercial Centres are located south of the E.C. Row Expressway between South Cameron Boulevard and Division Road; along the east of Dougall Avenue south of the E.C. Row Expressway; and west of Dougall Avenue north of the Ouellette Place intersection. Commercial Centres are intended to provide multi-purpose shopping centres, creating community focal points with high development standards, with access to public transit, and integrated with safe active transportation facilities. Policies governing Commercial Centres are contained in Section 6.5.2 of the OP.

Commercial Corridors are located along Dougall Avenue south of the E.C. Row Expressway, and along Howard Avenue north of the E.C. Row Expressway. Commercial Corridors are intended to provide retail and service establishments, and buildings are encouraged directly to the front lot line, with off street parking provided in the rear of the site.

Mixed Use land designations are located south of E.C. Row Expressway, east of Howard Avenue, and include the Devonshire Mall Complex. Mixed land uses are intended to provide compact clusters of commercial, office, institutional, open space, and residential uses that encourage active transportation.

Industrial land uses are located between Dougall Avenue and Howard Avenue north of the E.C. Row Expressway, which includes the privately owned scrap yard. The designation intends to create appropriate separation of industrial uses from other sensitive land uses; however, this designation applies to older industrial uses where such separation was not achieved. Industrial

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

lands should have access to arterial roads, and should be landscaped to provide an appropriate buffer between parking, loading, storage, and service areas.

2.1.4.2 Transportation Policies

The road network within the study area consists of the City's municipal highway, minor and major arterial and collector roads and the local road system.

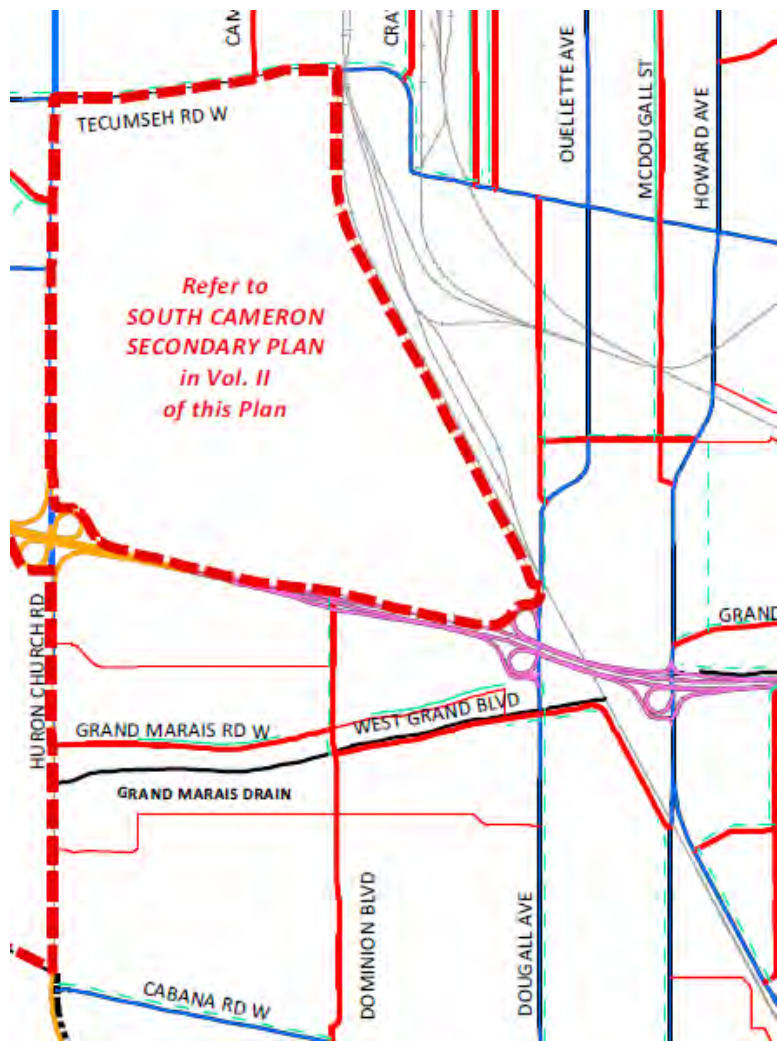
General objectives and policies regarding the transportation network are located in Section 7.2 of the OP. The main objectives of the transportation network policies relevant to the study are to create and maintain a safe and efficient transportation network in which multi-modal forms of transportation, including public transit, and active transportation play a more balanced role. Additional Official Plan policies that are relevant to the Central Box Class EA, and which shall inform the development and evaluation of alternative solutions are discussed below.

Travel Demand Management (TDM) policies are included in Section 7.2.22, which encourage employers to manage travel demand by promoting ride-sharing and carpooling; promoting the use of bulk or special transit pass purchases which offer a discount on regular transit prices; and encouraging employers to alternate work hours to reduce peak hour traffic and parking demands.

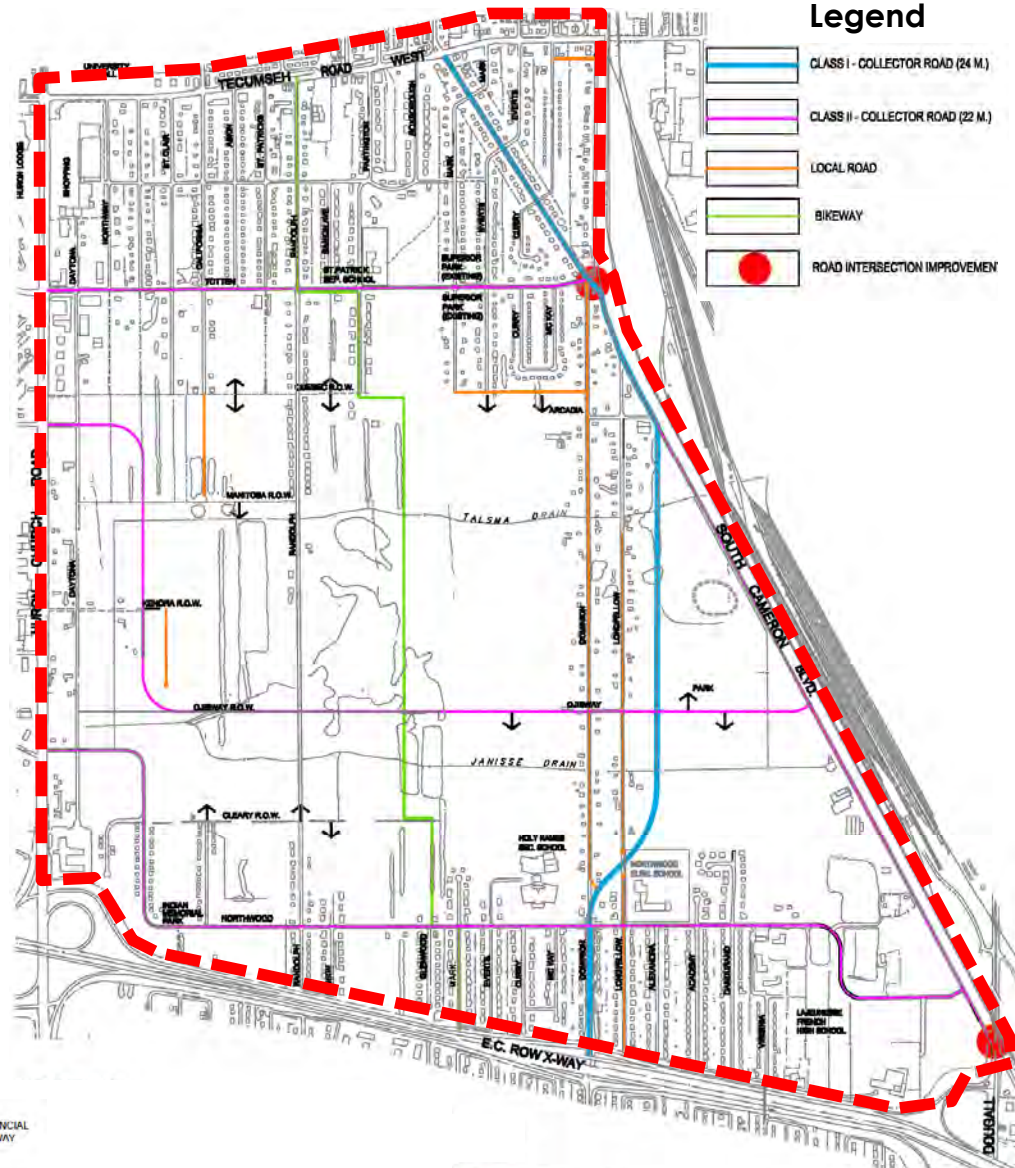
In accordance with Policies 7.2.2.14 and 7.2.2.15, on-street parking will be discouraged on Class II Arterial Roads and Class I Collector Roads, and may be restricted or removed where roadway space is required for turning lanes, bike lanes, transit operations, or more generally to improve the flow of traffic.

Section 7.2.2.25 states that road networks shall be designed to accommodate transit vehicles, as well as to encourage pedestrian and cycling.

The Official Plan road network is identified on Schedule F, and Schedule SC-2 of the South Cameron Secondary Plan, included below in Figure 2.2



Legend



Legend



CITY OF WINDSOR
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City of Windsor Official Plan Schedule F and South Cameron Secondary Plan Schedule SC-2 - Road Network

PROJECT NO.

DRAWING NO.

Fig. 2.2

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

With reference to the Road Network Policies (OP Section 7.26) and the City’s Traffic Calming for Residential Areas Policy Paper, 2005 and 2015 , a summary of the characteristics of the road classifications found in the CBSA are presented in the table below.

Table 2.1 Official Plan Road Classifications

Classification	Key Characteristics	Central Box Example
Expressway	Controlled access highway, minimum right-of-way of 100m, designed for high volumes of traffic, access via full or partial interchange with Arterials (Class I or II), Expressways, or Provincial Highways, no cycling facilities	E.C. Row Expressway
Class II Arterial	May be designated as controlled access, minimum right-of-way of 42m, designed for high volumes of traffic, new intersections not permitted with Provincial Highways and discouraged with local roads and property accesses, cycling facilities may be permitted, on-street parking may be removed for capacity or safety reasons	Dougall Avenue Ouellette Place Ouellette Avenue Howard Avenue
Class I Collector	Designed for moderate volumes of traffic (up to 9,000 vehicles per day), minimum right-of-way of 28m, new intersections not permitted with Provincial Highways and Expressways, property access may be permitted with some controls, cycling facilities may be permitted, on-street parking may be removed for capacity or safety reasons	Dominion Boulevard (south of Northwood Street) Eugenie Street
Class II Collector	Designed for moderate volumes of traffic (up to 6,000 vehicles per day), minimum right-of-way of 26m, new intersections not permitted with Provincial Highways, Expressways, and Class I Arterials, property access may be permitted with some controls, cycling facilities may be permitted, on-street parking may be permitted	Bruce Avenue Northwood Street
Local	Designed for low volumes of traffic (up to 3,000 vehicles per day) minimum right-of-way of 20m, new intersections not permitted with Provincial Highways, Expressways, and Arterials (Class I or II), property access may be permitted with some controls, cycling facilities permitted, on-street parking may be permitted	Dominion Boulevard (north of Northwood Street) Longfellow Avenue

Policies in Section 7.2.6.16 and 7.2.6.17 state that the construction of new roads will be encourage where they are identified as part of the Official Plan or approved Secondary Plans, or if the benefit to the existing roadway is determined through a comprehensive analysis and public consultation process. New roads should improve the level of service and road capacity, minimize negative impacts to the social and natural environments, and provide for/improve existing cycling and transit facilities, where feasible.

Policy 7.2.2.9 states that Council shall establish and maintain a truck route system to direct truck traffic away from sensitive land uses, and to provide appropriate access to industries and

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businesses. The City of Windsor has published a Truck Route Map which identifies Truck Routes, Limited Hours Truck Routes (8AM-6PM), and MTO Controlled Truck Routes. Truck Routes within the Central Box study area include the E.C. Row Expressway, Dougall Avenue, Howard Avenue, Ouellette Avenue, Eugenie Street, Edinborough Street, McDougall Street, South Cameron Boulevard, and Grand Marais Road E (east of Howard Avenue).

2.1.4.3 Infrastructure

The infrastructure policies contained in Section 7.3 are intended to ensure that appropriate servicing (water, stormwater, sanitary) is available for existing and future growth within the City of Windsor, and is implemented in a coordinated, sustainable manner. Policy 7.3.4.3 contains provisions for council to implement measures to reduce demands on the sewerage system by, among other measures, directing drainage to new storm sewers or storm relief systems.

2.1.4.4 Urban Design – Civic Ways

The Urban Design policies and guidelines found in Section 8 of the OP are intended to promote a memorable, livable city, and to improve the quality of life and for present and future generations. Schedule G – Civic Image of the OP identified Civic Ways throughout the City. Three Civic Ways are identified within the Central Box study area (Dominion Boulevard/Ouellette Place, Howard Avenue, and the E.C. Row Expressway); design recommendations have been incorporated into the scope of the Class EA to benefit from the extensive public consultation program in creating a unified and long lasting impression of Windsor for both residents and visitors.

Within Section 8.11.2.12-13 of the OP, Civic Ways are defined as significant roadway corridors within the City, and are to be designed to:

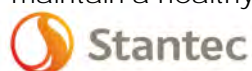
- Promote and present an attractive and unifying image of Windsor
- Maintain a sense of welcome and arrival for travelers
- Create a memorable impression of Windsor; and
- Complement and enhance the Municipality's capital investment in major infrastructure.

The significance of roads designated as Civic Ways is recognized by:

- Enhancing public right-of-way along major entry points into Windsor consistent with a highly attractive and distinctive image using unifying elements such as landscaping, fixtures, and boulevard and median treatments;
- Protecting and enhancing significant views and vistas, public space and heritage resources along the Civic Way.

2.1.4.5 Natural Environment Policies

The Natural Environment policies found in Section 5 of the OP are intended to promote and maintain a healthy, sustainable natural environment. The natural heritage system is identified on



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Schedule B – Greenway System, Schedule C – Development Constraints, and Schedule D – Land Use, and contains several designations used to apply varying levels of protection to areas more and less susceptible to development. The ‘Natural Heritage’ land use designation identified on these three Schedules has been applied to the City’s most environmentally significant and sensitive areas, in which development is not permitted.

Environmental Protection Areas (EPAs) A and B are applied to environmentally significant and/or sensitive natural area that may be able to tolerate appropriately designed development. Development or infrastructure projects within EPAs are subject to the completion of an Environmental Evaluation Report (EER) to the satisfaction of the Municipality to determine the development boundaries and potential impacts to the significant features. As per Policy 5.3.4.7, the requirement for an EER for projects adjacent to an EPA will be determined by the Municipality on a site-by-site basis, with regard to provincial policy and appropriate guidelines.

Section 5.3.5 contains policies regarding Candidate Natural Heritage Sites, which are defined as potentially significant and/or sensitive environmental areas. Similarly to policies regarding EPAs, Section 5.3.5.3 requires proponents of development or infrastructure projects within or adjacent to a Candidate Natural Heritage Site may be required by the Municipality to complete an EEA to evaluate the significance, identify potential impacts, and delineate the development boundaries.

In coordination with the Essex Region Conservation Authority, the City of Windsor has completed a Candidate Natural Heritage Site inventory, updated in 2010 which identifies several significant Natural Heritage Features. Two Candidate Natural Heritage Sites (CNHS) are located within the general study area: CNHS #26, located on both the north and south sides of Northwood Street in the vicinity of Rockwell Boulevard and Columbus Drive; and CNHS #29 located just outside of the study area between Longfellow Avenue and South Cameron Boulevard north of Ojibway Street.

2.1.5 South Cameron Secondary Plan

2.1.5.1 Land Use

The South Cameron Secondary Planning area is located between Everts Ave (west of Dominion Blvd) and S Cameron Blvd, north of the E.C. Row Expressway, south of Tecumseh Road West. The majority of the lands within the South Cameron Secondary Planning area are designated as Residential within the OP. The South Cameron Secondary Plan completed in 1995 contains more specific, neighbourhood oriented policies to enhance the natural environment, creating a neighbourhood that is centrally located and focused on the community park/woodland located north of Ojibway Street. The Secondary Plan also contains guidance for the development of land, including mandatory noise and vibration clauses that must be included on all agreement of purchase, lease and sale, and registered on title for properties located in

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the vicinity of the Van de Water Rail Yard, Huron Church Road, and the E.C. Row Expressway (identified on Schedule SC-3). An Ontario Municipal Board decision in 1998 effectively restricted any residential development on large parcels of vacant land within 300 metres from the Van de Water Railway Yard due to noise, vibration, and safety concerns.

The Development Concept (Schedule SC-1) identifies potential neighbourhood parks east of Longfellow Avenue, in the vicinity of Ojibway Street.

Special Policy Areas

Special Policy Area 18 is identified on Schedule A of the OP, located at the north-east corner of Grand Marais Road E and Howard Avenue. Notwithstanding the Commercial Corridor designation, additional permitted uses for this area include a lodging house. There are no transportation related policies included in this Special Policy Area.

2.1.5.2 Transportation Policies

The Secondary Plan identifies a number of transportation network improvements relevant to the Central Box Study Area Class EA, particularly in regards to the Dominion Boulevard Corridor. The Road Network identified on Schedule SC-2 provided above in Figure 2.2 above is intended to direct residential traffic from local areas to collector and arterial roads; however, the Secondary Plan acknowledges that the existing developments and land ownership act as barriers to the implementation of a traditional road hierarchy. Measures should be implemented to maintain low traffic speeds, reduce traffic volumes and maintain safe intersections. As outlined in Section 4.7.8 of the South Cameron Secondary Plan, proposed improvements relevant to the Central Box study area include:

- An additional north-south Class I Collector Road (24 m wide right-of-way) is identified: Alexandra Avenue is connected to Dominion Boulevard to the west, and extended north through the existing woodlot to South Cameron Boulevard. Dominion Boulevard between the new Alexandra Avenue extension and Totten Road would be classified as Local Road.
- The Ojibway right-of-way is extended east to South Cameron Boulevard, becoming a Class II Collector.
- Intersection improvements are identified at South Cameron Boulevard and Dougall Avenue, and Dominion Boulevard at South Cameron Boulevard.
- Sidewalks shall be provided on all Class I Collector Roads and on at least one side of Class II Collector and Local Roads.
- A north-south bikeway is identified west of Dominion Boulevard, either on designated public roads, or a right-of-way having a minimum of 10m.
- Interim traffic control measures will be investigated in consultation with residents including a one-way street system along Dominion Boulevard and Longfellow Avenue.

2.1.6 City of Windsor Traffic Calming Policy (2015)

The City of Windsor recently updated the Traffic Calming Policy in order to provide a simple and transparent framework for identifying where and how traffic calming measures should be implemented. The objectives of the Traffic Calming Policies are to improve the neighbourhood environment, minimize user conflicts, encourage an appropriate speed for motorized traffic in residential neighbourhoods, discourage cut-through traffic, reduce the number and severity of collisions, and enhance safety and convenience for all road users. The policies are divided into those for existing roads, and those for new neighbourhoods.

The process for evaluating the applicability of traffic calming measures (for existing neighbourhoods) begins with a concern submitted to the City's Public Works – Transportation Planning Division. The street is initially evaluated for eligibility; the subject street must be a Local or Collector Road with a posted speed of 50km/h or lower, more than 150 metres in length, and must not have been evaluated for traffic calming within the last 5 years. The City then undertakes a speed and volume study. If speed and volume thresholds are met, the individual who raised the concern is required to circulate a petition to solicit local support. The Policy continues to discuss the process of identifying and evaluating the applicability of traffic calming measures, which includes several opportunities for public participation, and prioritization based on need and City resources.

2.2 RELEVANT MUNICIPAL STUDIES/PROJECTS

2.2.1 City of Windsor Bicycle Use Master Plan (BUMP) (2001)

The BUMP guides the development of a visible and connected cycling network for Windsor to provide for bicycle use as a viable transportation alternative to motor vehicles. The network has been planned to accommodate commuting, leisure and tourism based travel by connecting, improving and expanding Windsor's existing on and off-road cycling network. A primary network has been proposed to function as the spine of the system providing direct connections across the city. A secondary network provides neighbourhood connections to the primary network.

On Map 2 within the BUMP identifies several barriers to cycling transportation relevant to the Central Box study area:

- Barrier #4 – The narrow CN Rail underpass on Dougall Avenue just north of South Cameron Boulevard;
- Barrier #5 – The relatively narrow underpass on Howard Avenue at the E.C. Row Expressway, with free flowing on/off ramps;

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- Barrier #6 – Busy intersections at South Cameron Boulevard, Howard Avenue, and Division Road in close proximity to double rail lines.

General design guidance is provided in the BUMP for the construction of the cycling network and its supporting facilities. Facilities included in the BUMP are painted bike lanes, shared lanes, paved shoulders and multi-use trails. Figure 2.3 is taken from Map 4 of the BUMP showing the ultimate Recommended Cycling Network.

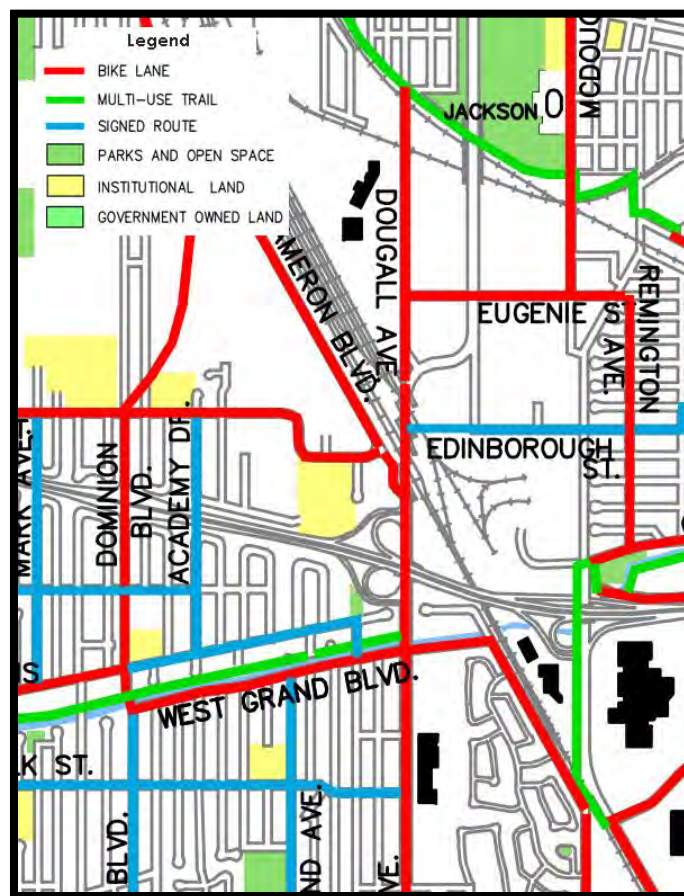


Figure 2.3 BUMP - Recommended Cycling Network

2.2.2 Provincial/Division Road Municipal Class Environmental Assessment (2007)

The City of Windsor completed a Municipal Class EA to identify capacity, safety, and operational improvements along the Provincial Road and Division Road corridors including Provincial Road from the City limits, just beyond Walker Road, to the junction with Division Road

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just before its intersection with Howard Avenue. The study was undertaken to address capacity and operational issues related to significant commercial and residential development. The Preferred Design for Division Road approaching Howard Avenue included two southbound through lanes, a northbound left turn lane, and a northbound through-right turn lane at the approaching the Howard Avenue/Division Road intersection.

The recommendations of the Provincial/Division Road Class EA will be considered during the development of designs as part of this study.

2.2.3 Howard Avenue Municipal Class Environmental Assessment (2003)

The City of Windsor completed a Municipal Class EA to investigate safety, capacity, and operational improvements along Howard Avenue between Highway 3 and Division Road, including the Dougall Avenue Parkway interchange, and the South Cameron Boulevard/Division Road/CN Rail intersection, within the Central Box study area. Collision rates obtained for the period between January 1998 and July 2001 identified collision rates that were significantly higher than average: 58 collisions at the Howard Avenue and Division Road/South Cameron intersections, with 467 mid-block collisions recorded on Howard Avenue between Division Road and South Cameron Boulevard. The recommendations of the study for this intersection included the extension of Howard Avenue along the South Cameron right of way in order to improve the intersection skew angle, with Howard Avenue and Division Road intersecting at roughly the existing location. This alternative was chosen due to the improvement to existing traffic operations, and minimal property acquisition (potentially two existing residential lots), and less capital costs.

Improvements to this intersection are being considered as part of this study, and the recommendations of the Howard Avenue Class EA will be reviewed during the identification of alternative solutions.

2.2.4 Central Corridor Network Transportation Review (2004)

A Transportation Review of the Central Corridor Network was undertaken in 2005. The study area was similar to the Central Box study area, and was bounded by Eugenie Street to the north, Lillian Street to the east, Sydney Avenue to the south, and South Cameron Boulevard/Avondale Avenue/Bruce Avenue to the west. The study identified limited north-south and east-west roadway corridors crossing the Detroit River Tunnel Partnership railway line, resulting in traffic congestion on the main study area corridors.

The review recommended that studies be carried out to investigate improvements to the Ouellette Avenue/Dougall Avenue corridor from Eugenie Avenue to West Grand Boulevard, as well as the east-west road links between the Howard Avenue and Ouellette Avenue/Dougall

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Avenue Corridors (from Eugenie Avenue to West Grand Boulevard). These studies could be undertaken separately or as one study under the provisions of the Municipal Class EA process.

2.2.5 Windsor Area Long Range Transportation Study – WALTS (1999)

A study was conducted to determine impacts of population and employment growth on the need for roads, transit, cycling, and walking facilities by the year 2016 within the City of Windsor, Towns of LaSalle and Tecumseh, Townships of Sandwich South and Maidstone, and the Village of St. Clair Beach (later amalgamated into the Towns of LaSalle, Tecumseh, and Lakeshore).

Specific findings of the study relevant to the Central Box study area are summarized below:

- 1996 base year and 2016 capacity deficiencies on Dominion Boulevard, Dougall Avenue – Ouellette Avenue, and Howard Avenue;
- Recommended operational and/or capacity improvements within the Dougall Avenue-Ouellette Avenue and Howard Avenue corridors, and widening of McDougall Street to four lanes;
- Recommended the extension of Edinborough Street to connect Dougall Avenue and Howard Avenue;
- Noted that a new alignment was being considered for Dominion Boulevard;

Evaluation of the transportation system performance also concluded that limitations to cycling and walking were mainly due to a lack of suitable trail, sidewalk, and bikeway routes, and the study included recommendations for the continued development of on-road and off-road bikeways/trails, and improvement to pedestrian mobility through pedestrian-supportive design guidelines for sidewalks, pedestrian crossings, school zones, and for persons with special needs. Recommendations also included doubling transit mode share (from 3% to 6%) by 2016, and reducing home based auto trips by 10% with a variety of Travel Demand Management strategies.

2.2.6 Urban Design Studies

Several studies have been undertaken and documents prepared which relate to the development of urban design guidelines within the City of Windsor. Some of these documents have resulted from public engagement initiatives and provide a context in which urban design/civic way guidelines may be formulated and incorporated into the recommended improvements within the Central Box study area. The background documents reviewed include:

- WindsorSEEN: A Municipal Urban Design Agenda for the Windsor Community (March 29, 2004);

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- Urban Design Ideas Charrette (City of Windsor, March, 2006);
- Bicycle Use Master Plan (BUMP) (April 2001);
- Windsor Municipal Heritage Register (October 5, 2015);
- Site Plan Review Standards Manual (City of Windsor);
- City of Windsor Facility Accessibility Standards (FADS) (November 6, 2006);
- Sign By-Law 250-2004 (City of Windsor);
- Landscaping in the Right-of-Way: Engineering Best Practice – BP3.2.2 (City of Windsor, March 20, 2015);
- Guidelines for Tree Planting on the Right of Way (City of Windsor, March 1999);
- Huron Church Road Urban Design Master Plan & Development Guidelines (Brook McIlroy Planning + Urban Design / Pace Architects, Poulos and Chung Engineers Ltd., February 2006);
- Urban Design Guidelines for Development along Arterial Mainstreets (City of Ottawa, May 24, 2006).

These documents have been reviewed to inform the development of Civic Way guidelines for the Central Box study area with the intent to create a unified and long lasting impression of Windsor for both residents and visitors.

3.0 EXISTING CONDITIONS

Preparation of a physical description of the study area is an integral component of the Class EA planning process. This section of the report has been prepared to present the existing conditions of the Central Box study area including a discussion on the civic way corridors, the cultural environment, the natural environment and the existing transportation network.

3.1 EXISTING CONDITIONS – CIVIC WAYS

Civic Way urban design improvements have been incorporated into the scope of the Central Box Class EA in order to provide guidance at a preliminary stage, and to inform future development in conjunction with transportation improvements.

There are 3 Civic Way corridors within the Central Box study area: Dougall Avenue/Ouellette Place, Howard Avenue, and the E.C. Row Expressway. The following summary provides a description of the conditions that will inform urban design recommendations for the three significant roadways within the study area. Additionally, during the Civic Ways Community Workshop, residents were asked to identify elements in the community that they deemed important to the identity and character of the community. These elements and themes identified throughout the consultation process have been incorporated into the Civic Ways design recommendations.

Refer Appendix A5 for PIC1 Existing Conditions panels for photo inventory of key urban design element locations.

3.1.1 Dougall Avenue/Ouellette Place

The southern limit of the study area along Dougall Avenue is located just south of West Grand Boulevard and ends at the northern extent of the study area just north of Eugenie Street. Adjacent commercial land use exists along the Dougall/ Ouellette corridor, primarily along the northern and southern limits with a large expanse of land in between which includes the E.C. Row Expressway underpass and on/off ramps, a private scrap yard facility, and the CN Rail CASO Subdivision. The roadway at this time primarily serves vehicular traffic. In commercial areas, buildings are typically set back from the street and include parking lots along the road frontage.

3.1.1.1 Heritage

The Municipal Heritage Register designates the Arcata/Capri Pizzeria sign, constructed in 1972, as a neighbourhood landmark. The sign is located along Dougall Avenue at the southern limit of the study area.

3.1.1.2 Views and Vistas

No significant views or vistas were identified along the Dougall Avenue/Ouellette Place corridor.

3.1.1.3 Pedestrian Amenities

Sidewalks are present in some locations along the roadway with minimal offsets from vehicular traffic. Sidewalks are present on both sides of the road along the southern portion of Dougall Avenue but end just south of the CN Rail Bridge. The remaining stretch is without sidewalks, with the exception of the sidewalks along the east side approaching Eugenie Street. Worn footpaths/bike paths on either side of Dougall Avenue begin where the sidewalks end south of the CN Rail underpass and extend north to the intersection of Dougall Avenue and Ouellette Place. The Dougall Avenue/South Cameron multi-use trail connects to Dougall Avenue at Grand Marais Road West. The trail crosses to the west side of Dougall Avenue at the traffic light and runs north along Dougall Avenue under the E.C. Row Expressway and connects to South Cameron Boulevard north of the interchange. A sidewalk exists on the east side of the E.C. Row underpass, providing a north-south pedestrian connection. A signed bicycle route along Grand Marais Road West also connects to the multi-use trail from the west, south of the interchange at Dougall Avenue.

Select bus stops along Dougall Avenue include street furniture. The bus stop located south of the E.C. Row Expressway provides a standard bus shelter with a bench, two decorative seats and a refuse/recycling container. The stop located north of the E.C. Row Expressway includes a paved area, a bench, and a refuse/recycling container.

3.1.1.4 Lighting

Street lighting along the corridor is a typical roadway style pole and fixture. No separate pedestrian lighting is provided for and overhead hydro lines are located intermittently along the corridor.

3.1.1.5 Street Trees and Landscaping

Very few trees are located along the street and those present are generally set behind the public sidewalk and/or overhead hydro lines. Large planted berms are located along the roadway at the CN Rail crossing to screen views into industrial lands. The plantings are a combination of salt/drought tolerant deciduous and coniferous tree and shrub plantings, and natural stone. The roadway edge in this location is maintained turf grass. Also present in this location are privately owned billboards that are integrated into the berm plantings.

3.1.1.6 Decorative Pavement and Median Treatments

Stamped terracotta coloured concrete pavement is located along roadway edges and within median islands. This pavement type is also used to highlight the multi-use trail crossing south of the E.C. Row Expressway. A decorative median treatment can be found north of West Grand Boulevard extending north to the Ouellette Place/Dougall Avenue intersection. This decorative median treatment is also present along Ouellette Place south of where it becomes Ouellette Avenue. The median treatment includes terracotta coloured concrete paved edges with a raised landscape curb in the centre. This raised area contains a combination of tree pits, coloured concrete and AstroTurf.

3.1.1.7 E.C. Row Expressway Interchange

The approaches to the E.C. Row Expressway, as well as the underpass have decorative elements. Tree groves are planted in a natural pattern and are located within the western clover leafs (currently sponsored by Jamieson Laboratories). These trees are part of the holiday light program each winter. Precast concrete walls with coniferous trees and hardy perennials are located on either side of the expressway to assist with the transition in grade between the E.C. Row Expressway and Dougall Avenue.

3.1.1.8 Ouellette Avenue North of Study Area

North of the study area, Ouellette Avenue changes into a civic Main Street. Urban design elements have been incorporated into the streetscape. These include decorative combination roadway/pedestrian lighting with banners, light gray and charcoal gray unit paver banding, natural metal benches, tree surrounds, and trash receptacles. Raised concrete tree planters with low decorative natural steel railings are also provided.

3.1.2 Howard Avenue

The study area along Howard Avenue begins where Howard Avenue intersects with South Cameron Boulevard and Division Road and ends just north of Eugenie Street East. The roadway at this time primarily serves vehicular traffic. Howard Avenue is bound by commercial land use north and south of the E.C. Row Expressway. Commercial buildings, including the Devonshire Mall are typically set back from the right of way and have parking lots located along the road frontage. Commercial land use is also included north of the E.C. Row Expressway and Howard Park.

3.1.2.1 Views and Vistas

No significant views or vistas were identified along the Howard Avenue Corridor.

3.1.2.2 Pedestrian Amenities

Various bus stops exist along Howard Avenue, some of which provide street furniture. The bus stops located at the Devonshire Mall entrance and south Edinborough Street supply a typical style bus shelter, recycled plastic seating and advertising signage. The Edinborough Street location also includes a refuse/recycling container. The stop found on the north side of Edinborough includes a recycled plastic bench and a refuse/recycling container. The bus stop north of McDougall Avenue includes a bus shelter, recycled plastic seating, advertising signage and a refuse/recycling container. Lastly, a single recycled plastic bench is located at the southbound stop south of Eugenie Street East.

Howard Park fronts onto Howard Avenue north of the E.C. Row Expressway. One bench and trash receptacle is located near the Expressway off ramp. A raised circular precast concrete planter and decorative paving feature is located at the corner of Howard Avenue and Grand Marais Road East. The planter also serves to screen views and/or bury above grade utilities.

The Grand Marais Drain multi-use trail runs east-west, connecting Howard Avenue through Howard Park. The trail continues along the west side of Howard Avenue south under the E.C. Row Expressway. The trail transitions to the west side of Howard Avenue at the main entrance to Devonshire Mall. The multi-use trail in front of the mall has limited shade or screening from the roadway and parking lot. A disconnect exists where the trail ends at Division Road and starts again as the Dougall Avenue/ South Cameron Boulevard Multi-Use Trail where South Cameron meets Howard Avenue. A sidewalk is provided south of the E.C. Row Expressway along commercial frontage where trails do not exist. North of the E.C. Row Expressway and Howard Park sidewalks are present on both sides of the roadway. Sidewalks are located along the curb and extend to the northern study area boundary.

3.1.2.3 Lighting

Street lighting along the corridor is a typical roadway style pole and fixture, similar to that found along Dougall Avenue. No separate pedestrian lighting is provided and overhead hydro lines are located intermittently along the corridor.

3.1.2.4 Street Trees and Landscaping

Roadway edges consist of manicured turf grass and include limited street trees within the boulevard south of the E.C. Row Expressway. North of the E.C. Row Expressway and Howard Park include manicured turf grass and few street trees located behind the sidewalk.

3.1.2.5 Decorative Pavement and Median Treatments

Median island pavement along the corridor makes use of stamped terracotta coloured concrete. This decorative pedestrian pavement is also in place at the intersection south of the

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E.C. Row Expressway. The median treatment mimics that which was used along Dougall Avenue, including terracotta coloured concrete paved edges with a raised landscape curb in the centre. This raised area contains a combination of tree pits, coloured concrete and AstroTurf.

3.1.2.6 E.C. Row Expressway Interchange

Similar to Dougall Avenue, tree groves planted in a natural pattern are located south of the E.C. Row Expressway, within the open space created by the interchange ramps. Small stone walls with sponsorship signage are also present within the tree groves. The trees are part of the holiday light program each winter. Precast concrete walls with coniferous trees and hardy perennials are located on either side of the expressway to assist with the transition in grade between the E.C. Row Expressway and Howard Avenue. In this case the walls extend under the Expressway. A separation between the east and westbound lanes of the Expressway exists where it crosses Howard Avenue. Decorative landscape features can be found in the space between the lanes. These include ornamental stainless steel light columns, hardy deciduous and coniferous vegetation, AstroTurf mounds and coloured concrete pavement. Raised landscape planters with a combination of perennial planting and AstroTurf are found within the boulevard.

3.1.2.7 Howard Avenue North of the Study Area

Decorative streetscape elements have been incorporated recently along the Howard Avenue streetscape north of the study area, where Howard Avenue runs under the CN Rail line. Sidewalks have been set back from the curb with a stamped terracotta coloured concrete edge treatment. Tree pits are located within this edge treatment between the sidewalks and curb. Decorative pavement and raised tree pits are also located in the median which separates the north and southbound lanes, on either side of the railway bridge. A bronze pendant style pedestrian light fixture has been added to the roadway light post to further light the sidewalks. Concrete retaining walls have been painted white and include decorative concrete posts and bronze metal railings. The underpass walls have been further ornamented with bronze painted maple leaves.

3.1.3 E.C. Row Expressway

The E.C. Row Expressway has a typical cross-section including a manicured turf grass ditch to separate east and westbound lanes. Turf grass along the roadway edge is also manicured.

3.1.3.1 Views and Vistas

Prefabricated noise barriers extend along either side of the roadway where residential land use backs onto the E.C. Row Expressway. Sightlines open up moving east along the Expressway as you approach the interchange at Dougall Avenue from the west. A line of trees helps to provide privacy for adjacent institutional uses from the E.C. Row Expressway.

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The raised nature of the E.C. Row Expressway allows view into industrial lands located on the north side between Dougall Avenue and Howard Avenue. Some Deciduous vegetation exists between the Expressway and the industrial lands, which provides some screening through parts of the year. The tree groves within the interchange cloverleaves can be seen while driving on the E.C. Row Expressway. There is limited visibility of the landscape features along Howard Avenue, between the east and westbound lanes of the Expressway. No significant view or vistas were identified along the E.C. Row Expressway.

3.1.3.2 Lighting

Roadway lighting includes a roadway pole and fixture style typical to large, high speed road applications.

3.1.3.3 Overpasses/Bridges

A concrete and chain-link pedestrian bridge over the E.C. Row Expressway connects residential neighbourhoods east and west of Dominion Boulevard. No ornamentation exists on or around the pedestrian bridge. The overpass at Howard Avenue has a decorative rectangular pattern on the outside of the walls.

3.2 EXISTING CONDITIONS – CULTURAL ENVIRONMENT

3.2.1 Built Heritage and Cultural Heritage Landscapes

The City of Windsor has several Heritage Conservation Districts, designated under Part V of the *Heritage Act*: the Sandwich Heritage District is located approximately 4 kms north west of the study area; The Victoria Street Heritage District located approximately 3 kms north of the study area; and the Walkerville Conservation District located approximately 2.5 kms north of the study area.

Five Heritage Sites as designated under Part IV of the Ontario Heritage Act are identified within the study area (Windsor Municipal Heritage Register October 2015). The Windsor Mosque, located at 1320 Northwood Street; the Windsor Gas Co./Woodall Construction building located at 620 North Service Road/E.C. Row Expressway; the Arcata Pizzeria Sign, located at 3021 Dougall Avenue; the Nicola Budimir Memorial Library building located at 1310 Grand Marais Road W; and the Yorkdale Square Sign located at 1341 Grand Marais Road W. A map showing these properties based on the City of Windsor's *MappMyCity* online application is shown on Figure 3.1.

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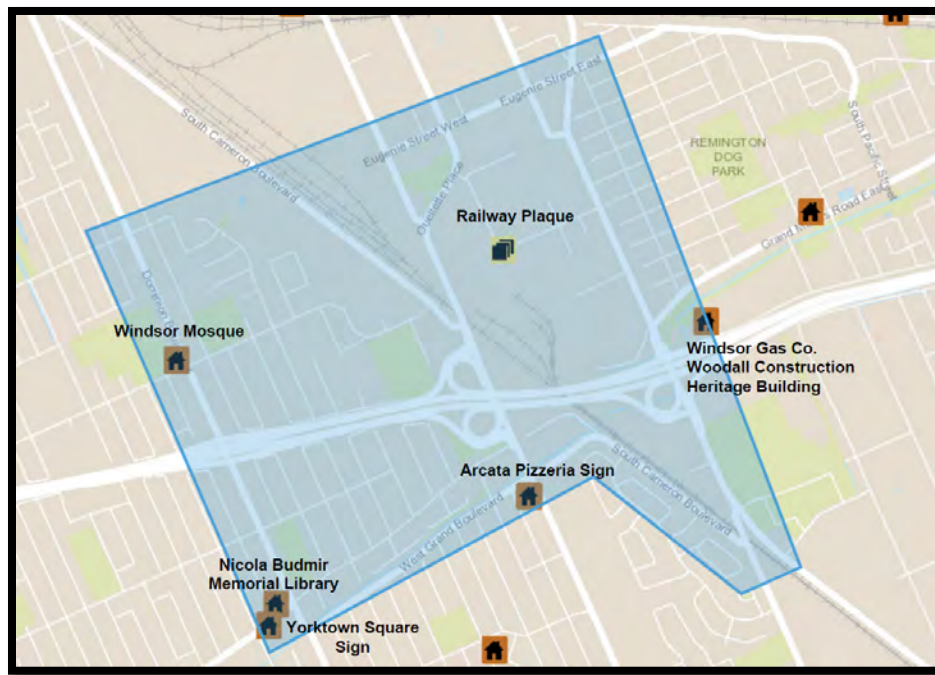


Figure 3.1 Registered Cultural Heritage Sites - City of Windsor MappMyCity

It is not anticipated that major construction works will occur in close proximity to Cultural Heritage Resources; where potential impacts are identified during the evaluation of design solutions, recommendations will be made for the completion of a Heritage Impact Assessment (HIA) to determine impacts and provide any necessary mitigation measures to protect the City's Cultural Heritage Resources. *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* checklist has been completed and provided in Appendix A2.

The extensive public input gathered throughout the study did not unearth information regarding unidentified cultural heritage resources. Specifically, as part of the Civic Ways component of the study, research was conducted to identify significant elements of the various streetscapes within the Central Box Area.

3.2.2 Archaeological Resources

As part of the Municipal Class Environmental Assessment process, a Stage 1 archaeological assessment was completed and submitted to the Ministry of Tourism, Culture, and Sport (MTC) for the Central Box study area to identify potential impacts to archaeological resources. The objectives of the Stage 1 report were as follows:

- To provide information about the study area's geography, history, previous archaeological fieldwork, and current land conditions;

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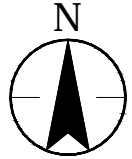
- To evaluate in detail the study area's archaeological potential which will support recommendations for Stage 2 survey for all or parts of the property; and
- To recommend appropriate strategies for Stage 2 survey.

Though the majority of the study area consists of previously disturbed land with no archaeological potential, some undeveloped areas within the study area may contain archaeological resources. The results of field investigations and background research undertaken as part of the Stage 1 assessment are included on Figure 3.2 below, which identifies areas of archaeological potential and recommendations for further study. The full Stage 1 assessment is included in Appendix D2.

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 2014-11-27 10:58am BY: kbuchanan



LEGEND



- APPROXIMATE EXTENT OF PROJECT AREA
- AREA OF ARCHAEOLOGICAL POTENTIAL – TEST PITTING AT A 5.0m INTERVAL REQUIRED
- AREA OF ARCHAEOLOGICAL POTENTIAL – PEDESTRIAN SURVEY AT A 5.0m INTERVAL REQUIRED
- AREA OF ARCHAEOLOGICAL POTENTIAL – FROM THE CITY OF WINDSOR ARCHAEOLOGICAL MANAGEMENT PLAN
- PREVIOUSLY ASSESSED – AMICK CONSULTANTS LTD. (2012, 2013)
- NO ARCHAEOLOGICAL POTENTIAL – EXTENSIVE LAND DISTURBANCE DUE TO EXISTING DEVELOPMENT
- PHOTO LOCATION AND DIRECTION

NOTES:
 1. COORDINATE SYSTEM: NAD 1983 UTM ZONE 17N
 2. 2013 ORTHOPHOTOGRAPHY COURTESY OF THE CITY OF WINDSOR.

NOVEMBER 2014



**CITY OF WINDSOR
 CENTRAL BOX STUDY AREA ESR
 STAGE 1 ARCHAEOLOGICAL ASSESSMENT**

PROJECT NO. 165620021	ARCHAEOLOGICAL POTENTIAL 0 150 450 750m 	Figure Fig. 3.2
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3.3 EXISTING CONDITIONS – NATURAL ENVIRONMENT

As part of the Municipal Class Environmental Assessment process, a review of the natural environment was undertaken in order to characterize the significance and sensitivity of the features within the study area, identify potential impacts of the proposed alternatives, to inform the evaluation process, and to identify potential permitting requirements for proposed works based on provincial, municipal, and regulatory policies. The review generally consisted of a desktop investigation of available planning, policy, and reference documentation, supplemented by field investigations.

Data sources consulted in the natural environment review included the following:

- City of Windsor Official Plan and Zoning Bylaw
- The Essex Regional Natural Heritage System Study (ERNHSS 2013);
- The Candidate Natural Heritage Site Inventory (CNHS);
 - The CNHS was initiated by the City of Windsor as part of the Official Plan review process, and was undertaken to assess the sensitivity of the natural heritage areas within the City in order to afford appropriate levels of protection by means of the policies within the Official Plan. For development applications or infrastructure projects within or adjacent to areas identified within the CNHS, Council may require the completion of an Environmental Evaluation Report.
- The Natural Heritage Information Centre (NHIC) Biodiversity Explorer. Ontario Ministry of Natural Resources and Forestry, accessed September 3, 2014;
- Field investigations involving a rare plant survey conducted in the Fall of 2014;
- Consultation with the ERCA;
- The Natural Heritage Assessment Report prepared as part of the Grand Marais Drain Concrete Channel Environmental Assessment.

3.3.1 Existing Natural Features

3.3.1.1 Aquatic Resources

The Grand Marais Drain runs west-east along the south border of the study area. Several studies have been completed on the Drain, including the Grand Marais Drain Concrete Channel, and Grand Marais Drain Study Class EAs completed in 2012 and 2013, respectively. A review of the NHIC database (September 2014) and the fish and mussel Species at Risk Mapping prepared by

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Fishers and Oceans Canada (2015) confirms that no species at risk (endangered, threatened, or special concern) occur in the Grand Marais Drain within the Central Box study area.

3.3.1.2 Terrestrial Resources

The Central Box study area generally consists of urbanized, developed land, lacking in substantial terrestrial resources in terms of wetlands, woodlots, and vegetation patches; however, a review of the City's OP and Candidate Natural Heritage Site Inventory (CNHS) has identified the following significant areas within or adjacent to the Central Box study area:

- The South Cameron Woodlot - located approximately 400m west of Dominion Boulevard between Ojibway Street and Totten Road; identified as Natural Heritage on Schedule D – Land Use. As discussed in Section 2.1.6 above, development is not permitted within areas designated as Natural Heritage, and development or site alteration adjacent to Natural Heritage areas may be subject to the completion of an Environment Evaluation Report (EER). The extent of 'adjacent land' to be determined by Council on a site-specific basis.
- An Environmental Policy Area (EPA) is designated on Schedule C of Windsor's Official Plan, at the eastern end of Northwood Street, east of Virginia Park Avenue including areas on the northeast and southwest of Northwood Street. This area corresponds with Site #26 within the CNHS. As discussed above in Section 2.4.6, for projects within or adjacent to EPAs Council may require the completion of an Environmental Evaluation Report.
- Site #29 identified within the CNHS is located just north of the study area, and portions of this site are identified as EPAs on Schedule C of the Official Plan. As discussed above in Section 2.4.6, for projects within or adjacent to EPAs Council may require the completion of an Environmental Evaluation Report.

3.3.1.2.1 Flora

A search was completed of the NHIC database for records of at-risk floral species within the general study area. The following chart lists species identified in a search of NHIC records since 1985 within the 1km squares within the study area along with their classification on the Species at Risk in Ontario (SARO) list and provincial status rank (S-rank).¹ The full NHIC records along with accompanying mapping are included in Appendix D.

¹ Provincial Status Ranks, or subnational ranks (S-ranks) are determined by the Ministry of Natural Resources and Forestry (MNRF) as part of the Natural Heritage Information Centre to set protection priorities. These ranks are not legal designations, and are assigned on the basis of only those factors within the political boundaries of Ontario. Rankings include: S1 Critically Imperilled (extremely rare, vulnerable to due to steep declines or other factors); S2 Imperilled (few populations, or otherwise vulnerable due to steep declines or

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Table 3.1 NHIC Floral Species at Risk

Species	SARO Classification	S-Rank
Dense Blazing Star (<i>Liatris spicata</i>)	Threatened	S2
Swamp Rose-mallow (<i>Hibiscus moscheutos</i>)	Special Concern	S3
Riddell's Goldenrod (<i>Solidago riddellii</i>)	Special Concern	S3

Field investigations were conducted on September 25th, 2014 to identify rare species; due to the immense size of the study area, field surveys were restricted to issue areas originally identified within the Request for Proposal prepared by the City of Windsor. No floral species listed on the Species at Risk in Ontario (SARO) list were identified within the areas surveyed. The following table documents the rare species identified, along with the provincial status ranking. The full results of the field investigation and accompanying map are included in Appendix D1.

Table 3.2 Summary of Results from Rare Plant Surveys

Area	Rare Plant Species Identified	Provincial Status Rank
Howard Avenue/South Cameron Boulevard Intersection	Eastern Stiff-leaved Goldenrod (<i>Solidago rigida</i> ssp. <i>rigida</i>)	S3
	Missouri Ironweed (<i>Vernonia missurica</i>)	S3?
CN Rail crossing at Howard Avenue	Eastern Stiff-leaved Goldenrod (<i>Solidago rigida</i> ssp. <i>rigida</i>)	S3
Areas along/beneath the E.C. Row Expressway	Prairie Milkweed (<i>Asclepias sillivantii</i>)	S3
	Eastern Stiff-leaved Goldenrod (<i>Solidago rigida</i> ssp. <i>rigida</i>)	S3

other factors); and S3 Vulnerable (few populations, vulnerable due to recent and widespread declines or other factors).

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The '?' qualifier denotes inexact or uncertain ranking, with insufficient data to confirm ranking.

3.3.1.2.2 Faunal

A search of the Natural Heritage Information Centre (NHIC) Biodiversity Explorer for 1 km squares encompassing the study area resulted in the identification of 1 at-risk wildlife species. Butler's Gartersnake, listed as Endangered on the Species at Risk in Ontario (SARO) list was identified in areas to the north-west of the study area, generally north of the E.C. Row Expressway, west of Virginia Park Avenue. Butler's Gartersnake is afforded General Habitat Protection under the Endangered Species Act (ESA).

Habitat for Butler's Gartersnake typically consists of moist areas, such as dense grasslands and old fields (Ministry of Natural Resources and Forestry). Suitable habitat is located to the north west, outside of the study area, within the South Cameron Woodlot complex (also identified as a Provincially Significant Wetland); similar habitats may also be present to the west of Dominion Boulevard. For works impacting areas outside of existing right of ways, additional surveys should be completed in consultation with the Ministry of Natural Resources and Forestry to comply with the regulations of the ESA.

3.3.2 Conservation Authority

The Central Box study area is located within the Detroit River Watershed, under the jurisdiction of ERCA, which is responsible for development or site alteration within the Regulated Limited as defined by Ontario Regulation 158/06 *Regulation of Development, Interference with Wetlands, and Alterations to Shorelines and Watercourses*.

The approximate Area of Regulated Limit available on the ERCA interactive online mapping application is shown on Figure 3.3 below. Through consultation with ERCA staff, it was determined that portions of the Regulated Limit shown crossing Dominion Boulevard are likely remnants of historical watercourse layers, and may no longer be applicable. It is not anticipated that recommendations within this Class EA will impact ERCA Regulated Lands.



Figure 3.3 Approximate ERCA Regulated Limit

3.3.3 Drinking Water Source Protection

Drinking Water Source Protection represents the first barrier in the protection of drinking water. Protecting surface and groundwater from becoming contaminated or overused will ensure a sufficient supply of clean, safe drinking water. The Clean Water Act 2006 (CWA) is intended to protect existing and future sources of drinking water as part of the government's overall commitment to protecting human health and the environment. The CWA sets out a framework for source protection planning on a watershed basis with South Protection Areas established based on the watershed boundaries of Ontario's 36 Conservation Authorities.

A review of the Essex Region Source Water Protection Approved Assessment Report (AAR updated in 2015) indicates that the City of Windsor generally encompasses an area of low intrinsic groundwater vulnerability (Map 4.1). Maps 4.7 and 4.8 identify one Significant Groundwater Recharge Area (SGRA) located in the south-east portion of the study area, in the vicinity of the E.C. Row Expressway at Howard Avenue. Since the SGRA within the study area is within an area of low intrinsic groundwater vulnerability, it is assigned a vulnerability score of 2.

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SGRAs are defined as areas in which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer. SGRAs are assigned vulnerability scores of 2, 4, or 6, and since significant threats can only occur in areas with a vulnerability score of 8-10, SGRAs can only be subject to moderate to low threats through the 'vulnerability scoring approach' at this time. Additionally, only SGRAs with high intrinsic groundwater vulnerability can have moderate and low level drinking water threats. At this time, policies within the Essex Region Source Protection policies relevant to moderate-low drinking water threats generally relate to outreach and education efforts; there are no anticipated impacts to Source Water Protection policies related to any of the proposed undertakings.

3.4 EXISTING TRANSPORTATION NETWORK

The following chapters provide an overview of the existing transportation network within the Central Box study area, including road characteristics, transit routes, historic/existing traffic volumes, active transportation facilities, and operational and safety analysis of the main road networks within each corridor. A full record of the data collected can be found in the Existing Transportation Conditions Report found in Appendix B1.

3.4.1 Data Collection and Methodology

Transportation data collected as part of this study included historical daily traffic volumes provided by the City of Windsor, existing traffic and turning movement counts collected as part of this study, site observations, collision reports for the five year period between 2009-2013, and information provided by the public in response to the publication of the Notice of Commencement.

A comprehensive model of the Central Box road network was created with Synchro software (TrafficWare Synchro 8.0) to represent signalized and unsignalized intersections along the main roads within each corridor. The base year (2014) a.m. and p.m. peak hour traffic data collected as part of this study was input to the model, along with recent signal timing plans provided by the City of Windsor.

The Synchro software was then used to determine the quality of intersection operations, which is typically measured in terms of level of service (LOS) and volume to capacity (v/c) ratio during the peak hour periods. The LOS is assigned on the basis of average delay per vehicle and includes deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections, LOS ranges from LOS A for 10 seconds or less average delay, to LOS F for average delay greater than 80 seconds. For unsignalized intersections, the LOS ranges from LOS A for 10 seconds or less average delay to LOS F for average delay greater than 50 seconds, and the LOS is only calculated for those movements that conflict with opposing free flow traffic. Acceptable intersection operations are generally considered to be LOS D or better. However,

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during peak hours, LOS E may be considered acceptable and especially for left turn movements.

A detailed list of the data sources and data collection program including the locations and dates of the historical and existing traffic counts, as well as further details related to the traffic analysis is included in the Existing Transportation Conditions Report found in Appendix B1.

3.4.2 Dominion Boulevard Corridor

Detailed characteristics of the Dominion Boulevard corridor are illustrated in Table 3.3 below.

Table 3.3 Dominion Boulevard Road Characteristics

Road	From	To	Classification	Speed (km/ h)	# of Lanes	Truck Route
Dominion Boulevard	West Grand Boulevard	Northwood Street	Class I Collector	50	4	No
	Northwood Street	Ojibway Street	Local	50	2	No

Dominion Boulevard is considered a main north-south corridor for the City of Windsor linking residential neighbourhoods with the E.C. Row Expressway and the downtown area. The horizontal and vertical alignment of Dominion Boulevard is fairly tangent with little to no curvature, except approaching West Grand Boulevard where it crosses the Grand Marais Drain.

Dominion Boulevard between West Grand Boulevard and Northwood Street is generally a four lane urban roadway with curb and gutter, and storm sewers, and is classified as a Class I Collector with 3.5m lanes and auxiliary lanes. Sidewalks exist on both sides of the right of way, and on-street parking is permitted along the northbound and southbound curb lanes during certain off peak hours of the spring and summer months.

Dominion Boulevard between Northwood Street and Ojibway Street is a two lane rural roadway with roadside ditches, and is classified as a local road with two 3.5m lanes and auxiliary lanes. Parking has been observed on the shoulder.

The intersections with Ojibway Street, Northwood Street, Labelle Street, and Grand Marais Road west were reviewed and no significant geometric deficiencies were identified which could lead to any safety or operational concerns, with a few notable exceptions:

- Substandard taper lengths for left turn lane widths at the Northwood Street intersection;

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- Lack of opposing left turn lane runout for eastbound traffic at the Northwood Street intersection;
- Small corner radii at the Northwood Street intersection, making bus turning difficult;
- Substandard taper lengths at the E.C. Row Expressway ramp terminals, which are constraints by the diamond configuration and available distances.

3.4.2.1 Transit Routes

The Transit Windsor routes that provide service within the Dominion Boulevard Corridor are identified in the table below.

Table 3.4 Dominion Boulevard Transit Routes

Route Name (Key Roadway)	Operational Characteristics
Dominion 5 (Dominion Boulevard)	<p><u>Service Route:</u> Windsor International Transit Terminal – St. Clair College via Dominion Boulevard and Mount Royal Drive (SB) via Glenwood Avenue and Labelle Street Loop (NB);</p> <p><u>Hours/Days of Operations:</u> Monday – Friday (6:05 a.m. – 11:53 p.m.), Saturday (7:15 a.m. – 8:15 p.m.), Sunday and Holidays (9:30 a.m. – 7:30 p.m.);</p> <p><u>Route Frequency/Headways:</u> 25 minute headways (weekday peak hours), 60 minutes (Saturdays, Sundays and Holidays);</p> <p><u>Accessibility:</u> Wheelchair accessible buses run every 60 – 90 minutes (Weekdays and Saturdays), All Sunday and Holiday trips are wheelchair accessible</p>

3.4.2.2 Active Transportation Facilities and Traffic

Sidewalks currently exist on Dominion Boulevard within the study area (from West Grand Boulevard to Ojibway Street), as well as on intersecting streets. It was noted that the existing sidewalk on Northwood Street ends at Virginia Park Avenue, with no pedestrian facilities provided to South Cameron Boulevard. Existing bicycle routes are part of a developing cycling network that was identified through the 2001 Bicycle Use Master Plan (BUMP). On-street bike lanes exist on Northwood Street from Longfellow Avenue to Academy Drive, and Mark Avenue to Randolph Avenue. Signed routes exist on Northwood Street from Mark Avenue to Longfellow Avenue.

Although not implemented to-date, the BUMP identifies bike lanes on Dominion Boulevard from West Grand Boulevard to Northwood Street, with an eventual connection north to South Cameron Boulevard and bike lanes along Northwood Street to South Cameron Boulevard.

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Based on the traffic data collected, there was relatively little pedestrian and cyclist traffic (113 total pedestrian crossings at the Dominion Boulevard/Northwood Street intersection during the a.m. peak period); however, in relation to counts in other areas of the Central Box study area, the total pedestrian counts were higher within the Dominion Boulevard/Northwood Street area owing to the institutional land uses within the area including elementary schools, high schools, and mosque.

The BUMP identifies a bike lane on Dominion Boulevard from West Grand Boulevard to Northwood Street, continuing north via a new roadway to the east of Dominion Boulevard, neither of which has been implemented at this time.

3.4.2.3 Daily Traffic Volumes and Speed

The 2014 weekday average daily traffic volumes collected via automatic traffic recorders (ATRs) are listed in the table below along with the most recent of the historical daily traffic volumes available. The current and previously collected data are also compared to determine how traffic has changed along Dominion Boulevard in recent years, and the rate of change.

Table 3.5 Dominion Boulevard Daily Traffic Volumes

ATR Road Sections/Ramps	Count Date		Two-Way Weekday Average Volume			
	Previous	Current	Previous	Current	%/ Change	%/ Year
Dominion Boulevard South of Ojibway Street	-	November 2014	-	15,389	-	-
Dominion Boulevard North of E.C. Row	September 2010	November 2014	21,400	21,230	nil	nil
Dominion Boulevard @ E.C. Row: WB On-Ramp	-	October 2014	-	10,886	-	-
Dominion Boulevard @ E.C. Row: WB Off-Ramp	September 2010	-	10,900	-	-	-
Dominion Boulevard @ E.C. Row: EB On-Ramp	September 2010	-	10,200	-	-	-
Dominion Boulevard @ E.C. Row: EB Off-Ramp	-	October 2014	-	11,060	-	-
Dominion Boulevard South of E.C. Row	September 2010	November 2014	22,000	22,326	2%	<1%
Dominion Boulevard North of Grand Marais Road	-	November 2014	-	9,859	-	-

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ATR Road Sections/Ramps	Count Date		Two-Way Weekday Average Volume			
	Previous	Current	Previous	Current	%/ Change	%/ Year
Northwood Street East of Dominion Boulevard	April 2011	November 2014	4,810	5,086	6%	2%
Northwood Street West of Columbus Avenue	September 2010	October 2014	1,790	1,887	5%	1%
Labelle Street West of Dominion Boulevard	October 2010	September 2014	6,200	5,977	(4%)	(1%)
Grand Marais Road East of Dominion Boulevard	September 2010	October 2014	2,800	2,545	(9%)	(2%)
Grand Marais Road West of Dominion Boulevard	October 2010	September 2014	8,700	8,052	(7%)	(2%)

(#) indicate negative growth, or a decrease in traffic volumes.

Dominion Boulevard is currently classified as a Local Street north of Northwood Street. The City's threshold daily traffic volume (two-way) for a Local Road is 3,000 vehicles, whereas the November 2014 traffic counts show that it is carrying approximately 15,400 vehicles per day, which is five times greater than the daily threshold. While there were no historical daily traffic volumes for comparison, it is clear from the information in various background studies and input from the public that the volume of traffic on this section of Dominion Boulevard (from Northwood Street to Ojibway Street) has been an issue for some time.

South of Northwood Street Dominion Boulevard is classified as a Class I Collector. The City's threshold daily traffic volume (two-way) for a Class I Collector is 9,000 vehicles, whereas the November 2014 traffic counts show that it is carrying approximately 21,000 vehicles per day in the vicinity of the interchange. This volume is more than two times the daily threshold. Where it was possible to compare the current and historical counts, it was found that there has been little change in the past four years.

The 2010 daily traffic data provided by the City also included speed data that is collected as part of the automatic traffic recorder counts. While the posted speed limit is 50 km/h for Dominion Boulevard, the 85th percentile speeds (85% of all vehicles traveling at or below this speed) were found to be at least 10 km/h higher, and specifically:

- North of Northwood Street, 64 km/h northbound and 61 km/h southbound;
- North of the E.C. Row Expressway, 63 km/h northbound and 61km/h southbound; and

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- North of Grand Marais Road W, 61 km/s in both the northbound and southbound directions.

It is clear that Dominion Boulevard within the Central Box has characteristics that are not typical of roads with a Collector or Local road classification (i.e. higher volumes, four lane cross section, an expressway interchange, higher speeds, etc.), but rather, its characteristics are consistent with an Arterial Road classification. As an Arterial Road, the daily volumes would be within general planning level capacities of 15,000 vehicles per day for two lane roads and 30,000 vehicles per day for four lane Arterial Roads.

3.4.2.4 Intersection Traffic/Operations

The existing signalized intersection weekday traffic volumes for the a.m. and p.m. peak hours are listed in the table below along with the most recent of the historical intersection count volumes.

Table 3.6 Dominion Boulevard Intersection Peak Hour Traffic Volumes

Intersection	Count Date Month-Year		Volume Entering							
	Previous	Current	AM Peak Hour				PM Peak Hour			
			Previous	Current	% Change	%/ Yr.	Previous	Current	% Change	%/ Yr.
Dominion Boulevard/ Northwood Street	Dec-12	Oct-14	2,226	2,275	2%	1%	2,249	2,180	(3%)	(2%)
Dominion Boulevard/ E.C. Row South Ramp Terminal	Jun-06	Oct-13	2,480	2,782	12%	2%	1,636	2,982	82%	9%
Dominion Boulevard/ Labelle Street	Dec-12	Oct-14	1,858	2,030	9%	5%	2,281	1,728	(24%)	(13%)
Dominion Boulevard/ Grand Marais Road	Nov-09	Oct-14	1,926	2,019	5%	1%	1,913	1,818	(5%)	(1%)

(#) indicate negative growth, or a decrease in traffic volumes.

The results of the a.m. and p.m. peak hour intersection operational analysis for base year conditions (either 2013 or 2014) are presented in the table below, and are illustrated in Figure 3.4. Cells highlighted in yellow represent a level of service (LOS) or volume/capacity ratio (v/c) that is below acceptable operations. Acceptable intersection operations are generally considered to be LOS D or above; however, LOS E may also be acceptable during peak periods, especially for left turn movements. The v/c ratio provides a measure of traffic volume demand relative to the theoretical capacity of the intersection, where an at-capacity condition would be represented by a c/v ratio of 1.0 (the volume of traffic is equal to the capacity of the roadway).

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Table 3.7 Dominion Boulevard Intersections Peak Hour Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Dominion Boulevard/ Ojibway Street <i>Unsignalized</i>	EB	Left/Through/Right	F	156	1.12	78	E	41	0.49	18
	WB	Left/Through/Right	F	103	0.74	30	F	95	0.60	21
	NB	Left	A	9	0.06	2	A	10	0.11	3
		Through/Right	Unopposed Movement							
	SB	Left	A	10	0.06	2	A	9	0.02	1
Through/Right		Unopposed Movement								
Dominion Boulevard/ Northwood Street <i>Signalized (76/80)⁴</i>	EB	Left/Through/Right	D	47	0.89	97	C	25	0.27	25
	WB	Left	F	80	0.89	39	E	66	0.89	55
		Through/Right	C	22	0.17	18	C	25	0.26	24
	NB	Left/Through- Through/Right	C	23	0.92	101	B	13	0.67	72
	SB	Left/Through- Through/Right	B	14	0.37	38	B	15	0.43	51
	Overall Intersection			C	28	0.95	-	B	20	0.77
Dominion Boulevard/ E.C. Row North Ramp Terminal <i>Signalized (80/80)</i>	WB	Left	C	23	0.52	60	C	29	0.66	69
		Left/Through	C	24	0.53	61	C	29	0.67	70
		Right	E	58	0.96	130	D	36	0.79	94
	NB	Left	A	5	0.22	2	A	7	0.17	2
		Dual Through	A	6	0.45	16	A	5	0.23	12
	SB	Through- Through/Right	B	20	0.62	77	C	22	0.75	117
	Overall Intersection			C	23	0.74	-	C	23	0.72
Dominion Boulevard/ E.C. Row South Ramp Terminal <i>Signalized (80/80)</i>	EB	Left	C	34	0.38	24	C	33	0.33	22
		Through	C	31	0.01	2	C	31	0.00	2
		Right	C	31	0.02	< 1	C	31	0.04	8
	NB	Through- Through/Right	C	21	0.77	103	B	19	0.65	83
	SB	Left	D	36	0.89	95	E	79	1.08	146
		Dual Through	A	3	0.37	27	A	5	0.43	52
	Overall Intersection			B	17	0.85	-	C	26	1.02
Dominion Boulevard/ Labelle Street <i>Signalized (76/80)</i>	EB	Left/Through/Right	D	53	0.92	93	D	36	0.69	45
	WB	Left/Through/Right	B	20	0.10	12	C	25	0.04	8
	NB	Left/Through- Through/Right	B	15	0.52	68	A	5	0.30	31
	SB	Left/Through- Through/Right	B	10	0.47	44	A	4	0.49	34
	Overall Intersection			B	19	0.66	-	A	8	0.53
Dominion	EB	Left/Through-	C	29	0.66	34	C	29	0.35	20

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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Boulevard/ Grand Marais Road Signalized (76/80)		Through/Right								
	WB	Left/Through- Through/Right	C	22	0.15	11	C	27	0.11	9
	NB	Left/Through- Through/Right	A	9	0.48	52	A	6	0.42	26
	SB	Left/Through- Through/Right	A	4	0.45	45	A	7	0.48	81
	Overall Intersection			B	12	0.53	-	B	10	0.46
Dominion Boulevard/West Grand Boulevard Unsignalized	EB	Left/Through/Right	C	15	0.05	1	B	11	0.00	< 1
	WB	Left/Through/Right	C	22	0.56	25	E	40	0.72	40
	NB	Left	A	8	0.02	1	⁵ -	-	-	-
		Through- Through/Right	Unopposed Movement							
	SB	Left	B	10	0.25	8	A	10	0.31	10
		Through/Right	Unopposed Movement							
¹ Delay in seconds; ² v/c greater or equal to 0.85 or LOS F are highlighted (if any); ³ 95 th Percentile queue length in metres; ⁴ Cycle lengths (AM/PM); ⁵ No volume recorded.										

Legend

Level of Service

A – B: Minimal Delay

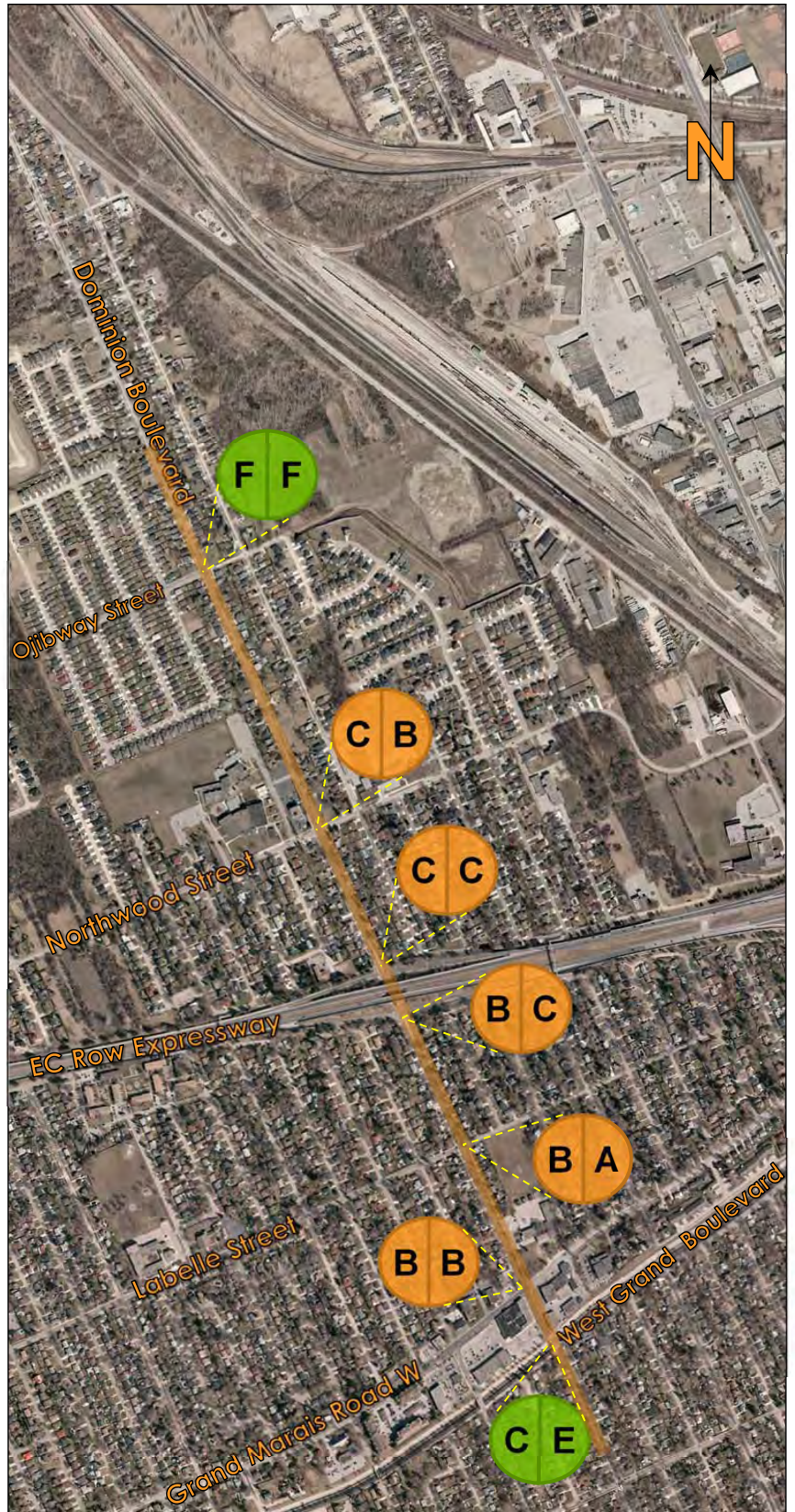
C – D: Busy/Acceptable

E – F: Capacity/Congestion

AM Peak Hour



PM Peak Hour



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Dominion Boulevard Peak Hours Level of Service

PROJECT NO.

DRAWING NO.

Fig. 3.4



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3.4.2.4.1 Dominion Boulevard at Ojibway Street

The analysis shows that there are very long delays experienced at the stop-controlled approaches of Ojibway Street at Dominion Boulevard during the peak hours. The resultant poor level of service is due to the high through volumes on Dominion Boulevard, and limited gaps for traffic to enter from Ojibway Street. To examine the potential need for signalization, the eight hour traffic data and collision experience for this intersection was analyzed using the Ontario Traffic Manual (OTM) Book 12 methodology for signal justification. It was found that the traffic volumes throughout the day were not high enough to meet the thresholds established for signalization. Additionally, the collision experience at this intersection at an average of less than 3 collisions per year is less than the threshold for this aspect of the criteria, which is an average of 5 collisions per year over a three year period and a type susceptible to correction with signalized control.

3.4.2.4.2 Dominion Boulevard at Northwood Street

The Dominion Boulevard/Northwood Street intersection was subject to additional focus as part of the data collection and analysis for this study. With several elementary and high schools and a mosque within close proximity, traffic volumes and operating conditions at this intersection are strongly influenced by vehicle trips to and from these institutions. Therefore, data was collected for different conditions to better reflect the operating conditions during these peak times. The key findings related to the impact of the local area schools on traffic volumes and operations at Dominion Boulevard at Northwood Street are as follows:

- With all schools in session, the traffic volume entering the intersection during the a.m. peak hour (7:45 to 8:45 a.m.) was approximately 830 vehicles higher than when the schools were not in session. This represents approximately 35% of the a.m. peak hour volume under 'normal' conditions with the schools in session. The same comparison for the p.m. peak hour (3:15 to 4:15 p.m.) showed a difference of approximately 260 vehicles, or 10% of the p.m. peak hour volume under 'normal' conditions.
- In comparing conditions with either elementary or high schools in session, it was found that high schools had the greatest impact on the traffic volumes. With the high schools not in session, the a.m. peak hour intersection traffic volumes were approximately 720 vehicles lower, representing a reduction of approximately 30%. With the public schools not in session, the difference was approximately 320 vehicles representing a reduction of approximately 15%.
- The differences in volumes show corresponding differences in intersection traffic operations. Under 'normal' conditions, the analysis showed that the intersection operates with reasonable overall delay, but approaching capacity during both peak hours with the a.m. peak hour being the busiest condition. With either the elementary or high

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schools not in session, there is considerably less overall delay and the intersection operates well within capacity.

It should also be understood that the analysis of intersection operations focuses on the busiest 15 minute period during the peak hour, and therefore, the effect of the concentration of school traffic in 15-20 minute periods around the beginning and end of the school day are accounted for in the results as presented.

3.4.2.4.3 Dominion Boulevard at West Grand Boulevard, Labelle Street, and E.C. Row Expressway

The remaining signalized intersections (West Grand Boulevard, Grand Marais Road, Labelle Street, and the E.C. Row Expressway) along the Dominion Boulevard corridor were found to operate at a good overall level of service (C or better). Dominion Boulevard at the E.C. Row Expressway South Ramp Terminal, however, is operating at or near capacity. Additionally, several individual turning movements are operating with long delays and approaching capacity as indicated by the yellow highlighting in Table 3.7 above. Based on the analysis, and in consideration of the previous discussion of the relatively high daily traffic volumes, it can be concluded that this corridor operates close to capacity during the busiest hours of the day.

3.4.2.4.4 Left Turn Lane Queuing

To identify potential deficiencies in the storage lane length for left turn movements, the 50th percentile (i.e. the average queue) and the 95th percentile left turn queues were calculated within the Synchro model, and were compared to the existing left turn storage lengths (and taper lengths) for the intersections with exclusive left turn lanes. The results are presented in the table below; cells highlighted in yellow indicate a deficiency in turn lane storage.

Table 3.8 Dominion Boulevard Left Turn Lane Storage Vs. Queue Length

Intersection	Movement	Storage Lane Length in Metres (Taper Length)	Percentile Queue Length in Metres ^{1,2}			
			AM Peak Hour		PM Peak Hour	
			50 th	95 th	50 th	95 th
Dominion Boulevard/ Ojibway Street (<i>unsignalized</i>)	NBL	50 (25)	-	2	-	3
	SBL	15 (35)	-	2	-	1
Dominion Boulevard/ Northwood Street (<i>signalized</i>)	WBL	25 (35)	13	39	25	55
Dominion Boulevard/ E.C. Row North Ramp Terminal (<i>signalized</i>)	WBL	115 (55)	36	60	43	69
	NBL	75 (-)	2	2	1	2
Dominion Boulevard/ E.C. Row South Ramp	EBL	45 (35)	12	24	10	22
	SBL	75 (-)	43	95	92	146

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Intersection	Movement	Storage Lane Length in Metres (Taper Length)	Percentile Queue Length in Metres ^{1,2}			
			AM Peak Hour		PM Peak Hour	
			50 th	95 th	50 th	95 th
Terminal (signalized)						
Dominion Boulevard/ West Grand Boulevard (signalized)	NBL	15 (15)	-	1	-	< 1
	SBL	55 (-)	-	8	-	10

¹ 50th percentile queues are not calculated for unsignalized intersections; ² Queue lengths that exceed storage lane lengths (if any) are highlighted.

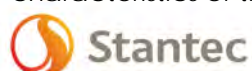
A deficiency in storage length for the 95th percentile queue length (i.e. queue length may exceed turn lane length) was identified at the Dominion Boulevard/Northwood Street westbound left turn lane. This can be considered minor in that the average queue length can be accommodated by the storage lane. The 95th percentile queue would only be experienced during two to three signal cycles during the peak hour, and the taper can accommodate part of the queue before it interferes with the adjacent through lane.

While not included in the table above, the eastbound Northwood Street approach to Dominion Boulevard consists of a single, wide lane that is shared by left turn, straight through, and right turn movements. The peak hour volumes on this approach, however, are predominantly right turns (e.g. 320 right turns versus 60 through and 60 left turns in the a.m. peak hour). Due to the width of the lane, some left turn and through movements can navigate around right turning vehicles; however, long queue lengths are apparent on this approach both in the analysis and through field observations. These queues can temporarily block driveways (e.g. the mosque) and public street intersections (e.g. McKay Avenue) on Northwood Street. Additionally, this lane arrangement does not allow for the alignment of eastbound left turns with westbound left turns since the west bound approach has a dedicate left turn lane and the eastbound approach does not. This offset in alignment can have safety implications due to the adverse effect on sight lines as well as making the driving task generally more difficult.

A left turn storage deficiency also exists for the Dominion Boulevard southbound left turn to the E.C. Row Expressway eastbound on-ramp, which is currently served by a relatively long advanced green phase. The storage length for this turning movement is limited by the proximity of the North and South ramp terminals. The overflow condition was observed in the field during the busiest signal cycles during the a.m. peak hour and p.m. peak hour, and it causes temporary back-ups in both southbound traffic on Dominion Boulevard and westbound traffic on the E.C. Row Expressway off-ramp (north ramp terminal).

3.4.2.5 Active Transportation

Pedestrian counts within the entire Central Box study area is relatively low, reflecting the characteristics of the low density residential, commercial, and industrial land uses, including the



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auto-oriented nature of the area and the lack of connected active transportation facilities. Within the Central Box study area intersections within the Dominion Boulevard Corridor experience relatively high volumes of pedestrian traffic due to the institutional land uses within the corridor, including elementary schools, high schools, and a mosque. Further details on the pedestrian and cyclists counts collected as part of this study are discussed in Section 4.5.4-5 of the Existing Conditions Report found in Appendix B1.

Bicycle volumes collected at several Dominion Boulevard intersections were found to be relatively low at an average of four or less each hour. Dedicated bicycle facilities, however, are generally not present along the corridor; therefore, conditions are not comfortable for a broad group of cyclists with varying levels of comfort and ability. The counts collected, site observations, and public input to-date show that there is existing demand for bicycle use along the corridor and suggests the possibility of latent demand if dedicated facilities were present.

Key constraints in terms of active transportation for the Dominion Boulevard corridor were identified as follows:

- Existing sidewalks on Dominion Boulevard are 1.2m wide, which is below the Accessibility of Ontarians with Disabilities Act (AODA) minimum width of 1.5m.
- 85th percentile speeds along Dominion Boulevard are greater than 60km/h which presents the need for exclusive operating space for cyclists, particularly in the section of Dominion Boulevard north of Northwood Street which is designated as a Local road, but is functioning as a Collector or Arterial road; and
- Similarly, with daily traffic greater than 10,000 vehicles (two-way), separation of bicycle facilities should be considered; however, the presence of frequent residential driveways result in many potential conflict zones, making physically separation undesirable.

3.4.2.6 Collisions

Collision reports for the 5-year period of 2009-2013 inclusive were reviewed. A detailed summary of both intersection and mid-block collisions is provided in Appendix B1 as part of the Existing Conditions Report, along with collision diagrams for intersections that experienced 25 or more collisions. The following chart provides an overview of the collisions experienced in these intersections, including the number of collisions along with the percentages of collisions that resulted in 'property damage only' (PDO) or 'injuries' (INJ). There were no collision-related fatalities within Dominion Boulevard corridor during the time period examined.

Table 3.9 Dominion Boulevard Higher Collision Intersections

Intersection (signalized unless noted)	Collisions by Year					Total and Severity ¹		
	'09	'10	'11	'12	'13	2009-13	% PDO	% INJ



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Intersection (signalized unless noted)	Collisions by Year					Total and Severity ¹		
	'09	'10	'11	'12	'13	2009-13	% PDO	% INJ
Dominion Boulevard/Northwood Street	3	5	4	9	7	28	86%	11%
Dominion Boulevard/E.C. Row N. Ramp Terminal	3	4	9	4	7	27	85%	11%
Dominion Boulevard/Labelle Street	8	6	3	5	10	32	63%	34%
Dominion Boulevard/Grand Marais Road	9	1	3	6	6	25	68%	28%

¹Percentage breakdown of PDO (collisions where there as property damage only) and INJ (collisions where injuries were reported) may not add up to 100%. This is due to a small number of collisions being included in the summary reports that did not specify either category (i.e. listed as "non-reportable" or "other". No fatalities were reported in the summaries.

Additionally, 16 mid-block collisions occurred on the section of Dominion Boulevard between Ojibway Street and Northwood Street.

Collisions between motorized vehicles and pedestrians, and motorized vehicles and cyclists were extracted from the collision data. There is no information available for collisions between cyclists and pedestrians, since this type of incident is not recorded on standard motor vehicle accident forms. The collision reports for intersections and mid-block locations within the Dominion Boulevard corridor are outlined in the table below.

Table 3.10 Motor Vehicle Collisions with Pedestrians/Cyclists at Intersections (2009-2013 – Most Recent 5-year data)

Intersection (all signalized)	Number of Collisions	
	Vehicle-Pedestrian	Vehicle-Bicycle
Dominion Boulevard/E.C. Row North Ramp Terminal	-	3
Dominion Boulevard/E.C. Row South Ramp Terminal	-	1
Dominion Boulevard/Labelle Street	-	2
Dominion Boulevard/Grand Marias Road	2	-
Dominion Boulevard/West Grand Boulevard	1	-
Mid-Block Location		
Dominion Boulevard: Ojibway Street-Northwood Street	-	2
Dominion Boulevard: Grand Marias Road-West Grand Boulevard	1	-
Dominion Boulevard: West Grand Boulevard-Norfolk Street	-	1

For a full analysis of the collision data for the Dominion Boulevard Corridor, including collision diagrams, and predominant collision types and patterns, refer to Section 5.4.4 of the Existing Conditions Report found in Appendix B1. Some highlights of the collision experiences are as follows:

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- The highest volume of collisions within the entire Central Box study area occurred at the Dominion Boulevard/Labelle Street intersection, with a collision rate of 0.9 collisions per million vehicles entering (MVE), which is higher than the City's 2012 Road Safety Report average of 0.51 MVE for signalized intersections.
 - Approximately 60% of collisions were turning or right angle impacts and 35% of collisions resulted in injuries, which is greater than the City average of 23%. The number of collisions involving cyclists was reported at 2.²
- The highest mid-block collision rate of 0.61 per million vehicle kilometres (MV-KM) occurred for the section of Dominion Boulevard between Ojibway Street and Northwood Street, but is lower than the City's 2012 Road Safety Report average of 0.98 for a collector road classification (this road section is classified as a Local Street; however the City's report does not include an average rate for Local Roads).

Based on the intersection collision patterns, the following can be concluded:

- The absence of exclusive left turn lanes on Dominion Boulevard at Northwood Street, in combination with relatively high north-south through and turning traffic movements likely contributes to a higher incidence of rear-end collisions;
- The rear-end collisions at the Dominion Boulevard/E.C. Row Expressway north ramp terminal may be attributable to speed (especially for off ramp movements) as well as southbound motorists on Dominion Boulevard focused on the downstream signal at the south ramp terminal for access to the eastbound on-ramp); and
- With the higher incidence of turning movement and right angle collisions at the Dominion Boulevard at Labelle Street and Grand Marais Road, poor sight lines likely play a role, as the Dominion Street/Labelle Street intersection has somewhat constrained geometry due to the proximity of residential properties.
- For the 16 collisions that occurred in the mid-block sections of Dominion Boulevard between Ojibway Street and Northwood Street, 55% were rear end impacts, and 20% were turning impacts. This is indicative of the conflicting movements between the relatively high through traffic and occasional turning movements to or from the frequent driveways along this section of road.

² This intersection received media attention during the study (August 2015) when a group of pedestrians were narrowly missed by a car which mounted the curb to avoid hitting another vehicle.

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3.4.3 Dougall Avenue/Ouellette Place Corridor

The Dougall Avenue – Ouellette Place Corridor includes the section of Ouellette Avenue from Eugenie Street to the intersection of Ouellette Place and Dougall Avenue, with the parallel section of Dougall Avenue from Eugenie Street, and continuing south to just south of West Grand Boulevard (in order to include the private accesses within approximately 50m south of the intersection). Detailed characteristics of the corridor are illustrated in Table 3.11 below.

Table 3.11 Dougall Avenue - Ouellette Place Road Characteristics

Road	From	To	Classification	Speed km/h	# of Lanes	Truck Route
Dougall Avenue	West Grand Boulevard	E.C. Row Expwy	Class II Arterial	50	4	Yes
	E.C. Row Expwy E	South Cameron Boulevard	Class II Arterial	60	4	Yes
	South Cameron Boulevard	Ouellette Place	Class II Arterial	60	4	Yes
	Ouellette Place	Eugenie Street W	Class 1 Collector	50	2	Yes
Ouellette Place	Dougall Avenue	Ouellette Avenue	Class II Arterial	60	4	Yes
Ouellette Avenue	Ouellette Place	Eugenie Street	Class II Arterial	60	4	Yes

Dougall Avenue is considered a main north-south corridor for the City of Windsor linking commuter traffic from within the City, and from Highway 401 and the E.C. Row Expressway to the downtown area. The horizontal and vertical alignment of Dougall Avenue is fairly tangent with little to no curvature, except at the north study limit where Ouellette Place starts and transitions to Ouellette Avenue. The curves have a radius of approximately 165m, which is consistent with the posted speed requirements for a roadway at a 6% superelevation.

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Dougall Avenue from Eugenie Street southerly to Ouellette Place is an illuminated two lane urban roadway with curb and gutter, and is classified as a Class I Collector with two 5.25m wide lanes. Sidewalks do not exist in this section and there is room for parking on the boulevard/shoulder, although it is signed for no parking.

Dougall Avenue from Ouellette Place southerly to West Grand Boulevard is generally a four lane illuminated urban roadway with curb and gutter and storm sewers, and is classified as a Class II Arterial with four 3.5m wide lanes plus auxiliary lanes. Sidewalks and a multi-use trail exist on both sides of the right of way at the E.C. Row Expressway interchange southerly, and pedestrians have been observed within the right of way north of the interchange on dirt paths. No on-street parking is permitted along Dougall Avenue within the study limits.

Ouellette Place/Ouellette Avenue is a four lane illuminated urban roadway with curb and gutter and a centre 2.2 m wide median, which contain plantar boxes and has a mountable section from Ouellette Avenue/Hildegard Street north to Eugenie Street. This section of road is classified as a Class II Arterial roadway and has four 3.5m wide lanes plus auxiliary lanes. Sidewalks do not exist in this section of roadway.

The intersections with Eugenie Street, Ouellette Avenue/Eugenie Street, South Cameron Boulevard, and West Grand Boulevard were reviewed and no significant geometric deficiencies were identified which could lead to any safety or operational concerns, with a few notable exceptions:

- Dougall Avenue intersects with Ouellette Place on a curve, operates on stop control on Dougall Avenue, and includes a right channelized ramp with a stop condition. The merge ramp is on a skew approximately 35 degrees, which makes merging sightlines difficult to achieve. Detailed analysis of the operations at this intersection can be found in Section 3.4.3.3 below.
- Substandard sight distances at the South Cameron Boulevard intersection with Dougall Avenue due to the CN Rail underpass structure.
- Turning movement conflicts occur at the business access points in close proximity to the intersections at Eugenie Street and at West Grand Boulevard, as storage lengths and auxiliary lanes are limited.

3.4.3.1 Transit Routes

The Transit Windsor routes that provide service within the Dougall Avenue-Ouellette Place corridor are identified in the table below.

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Table 3.12 Dougall Avenue - Ouellette Place Transit Routes

Route Name (Key Roadway)	Operational Characteristics
Dougall 6 (Dougall Avenue-Ouellette Avenue)	<p><u>Service Route:</u> Windsor International Transit Terminal to St. Clair College;</p> <p><u>Hours/Days of Operations:</u> Monday – Friday (5:55 a.m. – 10:43 p.m.), Saturday (5:56 a.m. – 11:01 a.m.), Sundays and Holidays (9:00 a.m. – 7:26 p.m.);</p> <p><u>Route Frequency/Headways:</u> 30 – 40 minute headways (weekday peak hours), 40 – 60 minutes (Saturdays), 60 – 70 minutes (Sundays and Holidays);</p> <p><u>Accessibility:</u> Wheelchair accessible buses runs every 60 – 80 minutes (Weekdays and Saturdays), All Sunday and Holiday trips are wheelchair accessible</p>

3.4.3.2 Daily Traffic Volumes

The 2014 weekday average daily traffic volumes collected via automatic traffic recorders (ATRs) are listed in the table below along with the most recent of the historical daily traffic volumes available. The current and previously collected data are also compared to determine how traffic has changed along the corridor in recent years, and the rate of change.

Table 3.13 Dougall Avenue - Ouellette Place Daily Traffic Volumes

ATR Road Sections/Ramps	Count Date		Two-Way Weekday Average Volume			
	Previous	Current	Previous	Current	%/Change	%/Year
Dougall Avenue South of Eugenie Street	Oct 2010	Oct 2014	11,300	9,922	(12%)	(3%)
Ouellette Avenue South of Eugenie Street	July 2005	Oct 2014	37,500	31,414	(16%)	(2%)
Dougall Avenue North of South Cameron Boulevard	Oct 2007	Oct 2014	50,400	42,737	(15%)	(2%)
Dougall Avenue @ E.C. Row: WB Off-Ramp	Sept 2010	Oct 2014	8,200	7,696	(6%)	(2%)
Dougall Avenue @ E.C. Row: WB On-Ramp	Sept 2010	Oct 2014	7,400	5,926	(20%)	(5%)
Dougall Avenue @ E.C. Row: EB Off-Ramp	Sept 2010	Oct 2014	7,300	8,558	17%	4%
Dougall Avenue @ E.C. Row: EB On-Ramp	Sept 2010	Oct 2014	8,300	8,705	5%	1%
Dougall Avenue North of West Grand Boulevard	Nov 2005	Nov 2014	43,100	39,108	(9%)	(1%)

(#) indicates negative growth, or a decrease in traffic volumes.

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The base year daily traffic volumes are approximately 32,000 vehicles at the north end (Ouellette Avenue section), and approximately 43,000 vehicles at the south end of the corridor. With the section of Dougall Avenue running parallel to Ouellette Place carrying approximately 10,000 vehicles, it can be concluded that the entire north-south corridor is accommodating 40,000 to 45,000 vehicle trips per day. A review of historical volumes over the past 10 years showed a previous high of approximately 50,000 vehicles per day, which results in a decrease in traffic of 1% to 2% per year.

3.4.3.3 Intersection Traffic/Operations

The existing signalized intersection weekday traffic volumes for the a.m. and p.m. peak hours are listed in the table below along with the most recent of the historical intersection count volumes.

Table 3.14 Dougall Avenue - Ouellette Place Intersection Traffic Volumes

Intersection	Count Date		Volume Entering							
	Month-Year		AM Peak Hour				PM Peak Hour			
	Previous	Current	Previous	Current	% Change	%/ Yr.	Previous	Current	% Change	%/ Yr.
Dougall Avenue/ Eugenie Street	Jun 13	Oct 14	1,032	974	(6%)	(6%)	1,261	1,489	18%	18%
Ouellette Avenue/ Eugenie Street	May 08	Oct 14	3,207	3,636	13.4%	2%	4,553	3,727	(18%)	(3%)
Dougall Avenue/ E.C. Row North Ramp Terminal	Jan 13	Oct-14	3,540	4,124	17%	17%	3,783	4,865	29%	29%
Dougall Avenue/ E.C. Row South Ramp Terminal	Jan-13	Oct-14	3,396	3,915	15%	15%	3,759	4,260	13%	13%
Dougall Avenue/ West Grand Boulevard	Dec-12	Oct-14	3,315	3,103	(6%)	(3%)	4,428	3,840	(13%)	(7%)

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The results of the a.m. and p.m. peak hour intersection operational analysis for base year conditions (either 2013 or 2014) are presented in the table below, and are illustrated in Figures 3.2 and 3.3. Cells highlighted in yellow represent a level of service (LOS) or volume/capacity ratio (v/c) that is below acceptable operations. Acceptable intersection operations are generally considered to be LOS D or above; LOS E may also be acceptable during peak periods, especially for left turn movements. The v/c ratio provides a measure of traffic volume demand relative to the theoretical capacity of the intersection, where an at-capacity condition would be represented by a c/v ratio of 1.0 (the volume of traffic is equal to the capacity of the roadway).

Table 3.15 Dougall Avenue - Ouellette Place Peak Hour Intersection Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Dougall Avenue/ Eugenie Street <i>Signalized (70/70)⁴</i>	EB	Left/Through/Right	5-	-	-	-	5-	-	-	-
	WB	Left/Through	C	27	0.23	12	C	27	0.34	18
		Right	C	27	0.14	13	C	26	0.26	19
	NB	Left	5-	-	-	-	5-	-	-	-
		Through- Through/Right	A	9	0.25	26	B	11	0.25	31
	SB	Left	A	3	0.23	10	A	5	0.47	30
		Through- Through/Right	A	3	0.10	8	A	4	0.16	16
Overall Intersection			B	11	0.25	-	B	12	0.47	-
Dougall Avenue/ Ouellette Place <i>Unsignalized</i>	NB	Left	D	30	0.85	77	F	82	0.99	84
		Dual Through	Unopposed Movement							
	SB	Through- Through/Right	Unopposed Movement							
	SB	Right @ Stop Sign	B	15	0.34	12	F	329	1.62	204
Ouellette Avenue/ Eugenie Street <i>Signalized (102/110)</i>	EB	Left	D	35	0.10	9	D	38	0.31	24
		Dual Through	D	42	0.18	13	D	47	0.57	40
		Right	D	41	0.02	< 1	D	44	0.22	25
	WB	Left	D	52	0.80	79	F	165	1.25	144
		Through- Through/Right	D	46	0.47	35	C	34	0.19	18
	NB	Left	A	8	0.21	12	C	26	0.61	32
		Dual Through	E	79	1.11	315	C	21	0.53	100
		Right	B	12	0.14	17	B	15	0.07	7
	SB	Left	C	23	0.41	16	B	13	0.33	19
Dual Through		B	14	0.37	58	C	32	0.88	232	
Right		B	11	0.01	< 1	B	15	0.01	< 1	
Overall Intersection			E	55	0.99	-	D	45	1.01	-

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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Ouellette Avenue/ Ouellette Place <i>Unsignalized</i>	WB	Left	E	43	0.14	3	E	39	0.31	9
		Right	C	23	0.25	7	C	18	0.37	13
	NB	Through-Through/Right	Unopposed Movement							
		SB	Left	C	20	0.23	7	C	15	0.39
		Dual Through	Unopposed Movement							
Dougall Avenue/ South Cameron Boulevard <i>Unsignalized</i>	EB	Right	C	18	0.45	18	F	60	0.73	36
	NB	Dual Through	Unopposed Movement							
	SB	Through-Through/Right	Unopposed Movement							
Dougall Avenue/ E.C. Row North Ramp Terminal <i>Signalized (102/110)</i>	EB	Left	D	44	0.71	72	E	60	0.76	48
		Left/Through	D	45	0.71	73	E	60	0.76	48
		Right	A	< 1	0.13	< 1	A	< 1	0.27	< 1
	WB	Left/Through/Right	D	44	0.01	2	D	47	0.02	3
	NB	Left	B	17	0.67	36	E	61	0.89	98
		Dual Through	C	30	0.97	278	B	17	0.66	152
	SB	Dual Through	C	26	0.65	106	F	234	1.45	408
		Right	A	< 1	0.15	< 1	A	< 1	0.18	< 1
	Overall Intersection			C	27	0.90	-	F	122	1.13
Dougall Avenue/ E.C. Row South Ramp Terminal <i>Signalized (102/110)</i>	EB	Dual Left	D	40	0.75	70	D	43	0.51	37
		Right	C	32	0.19	20	D	51	0.66	50
	NB	Left	B	17	0.61	27	E	65	0.84	145
		Dual Through	A	8	0.78	63	A	3	0.39	32
	SB	Dual Through	C	21	0.46	109	B	10	0.93	32
		Right	A	< 1	0.25	< 1	A	< 1	0.35	< 1
Overall Intersection			B	16	0.80	-	B	17	0.86	-
Dougall Avenue/ West Grand Boulevard <i>Signalized (102/110)</i>	EB	Left	F	83	1.01	85	E	61	0.83	52
		Through/Right	C	33	0.38	40	D	49	0.69	67
	WB	Left	C	31	0.14	13	D	53	0.76	42
		Through/Right	D	50	0.73	63	E	55	0.78	77
	NB	Left	B	14	0.41	28	D	37	0.76	62
		Through-Through/Right	C	34	0.90	207	C	22	0.65	125
	SB	Left	D	39	0.29	20	C	30	0.62	25
		Dual Through	B	17	0.47	60	B	20	0.79	81
		Right	C	34	0.08	16	C	24	0.18	10
Overall Intersection			D	36	0.94	-	C	29	0.80	-

¹ Delay in seconds; ² v/c greater or equal to 0.85 or LOS F are highlighted (if any); ³ 95th Percentile queue length in metres; ⁴ Cycle lengths (AM/PM); ⁵ No volume recorded.

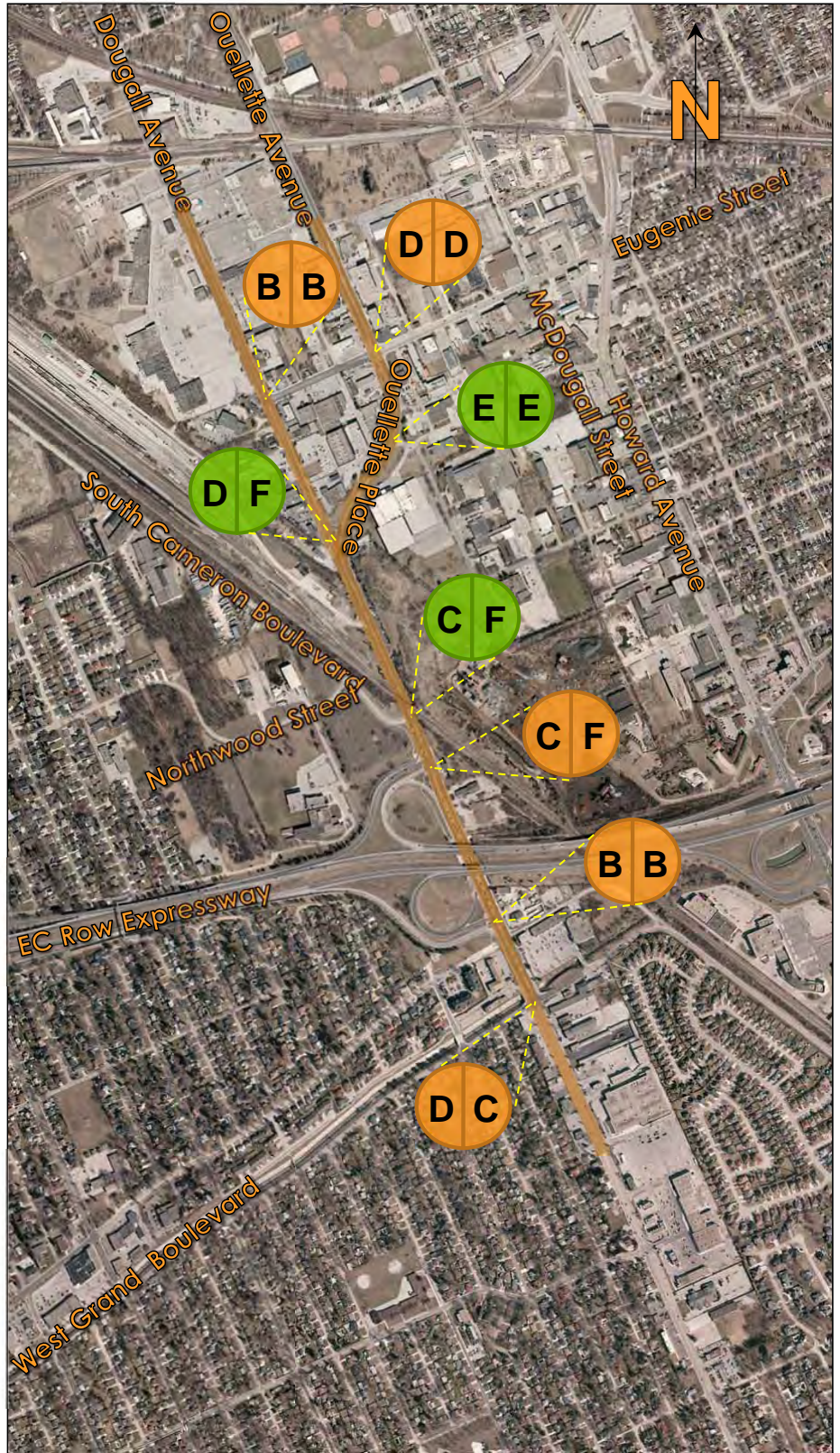
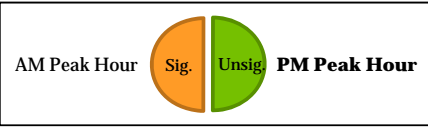
Legend

Level of Service

A – B: Minimal Delay

C – D: Busy/Acceptable

E – F: Capacity/Congestion



CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

Dougall Avenue - Ouellette Avenue Existing Level of Service

PROJECT NO.

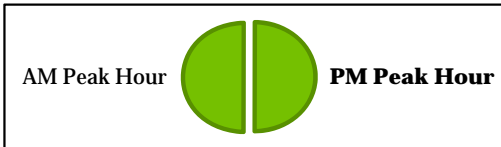
DRAWING NO.

Fig. 3.5



Legend

Level of Service
 A – B: Minimal Delay
 C – D: Busy/Acceptable
 E – F: Capacity/Congestion



CITY OF WINDSOR
 CENTRAL BOX STUDY AREA
 ENVIRONMENTAL ASSESSMENT

Dougall Avenue - West Grand Boulevard - Existing
 Levels of Service

PROJECT NO.

DRAWING NO.

Fig. 3.6

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

The analysis for the Dougall Avenue/Ouellette Place unsignalized intersection indicates long delays and traffic volumes greater than the theoretical capacities for the northbound left turn movement (from Dougall Avenue to Dougall Avenue), and the southbound stop-controlled right turn movements during the p.m. peak hour. Similarly, long delays are also apparent at the unsignalized intersection of Dougall Avenue/South Cameron Boulevard (the eastbound right turn), and Ouellette Place/Ouellette Avenue (westbound left turn). This is indicative of the limited availability of gaps in the heavy southbound traffic flow during the p.m. peak hour.

The analysis for the signalized intersections indicate the overall intersection level of service in the corridor is generally acceptable with the exception of the Dougall Avenue/E.C. Row Expressway north ramp terminal, which shows very long delays and volumes greater than the theoretical capacity during the p.m. peak hour. Notwithstanding the level of service results, two other major intersections in this corridor are at or approaching capacity during either or both a.m. and p.m. peak hours, namely Ouellette Place/Eugenie Street and Dougall Avenue/West Grand Boulevard intersections. There are also many individual through or turning movements approaching or exceeding their theoretical capacities.

Based on the analysis and in consideration of the relatively high daily traffic volumes, it can be concluded that this corridor operates at capacity during the busiest hours of the day.

3.4.3.3.1 Mid-Block Private Access Intersections

Since several conflict points exist due to private access along Ouellette Place between Eugenie Street and the Ouellette Place/Dougall Avenue intersection, several of these private access intersections were analyzed, as well as private access further south on Dougall Avenue. This analysis is shown on Figure 3.4 and on the table below.

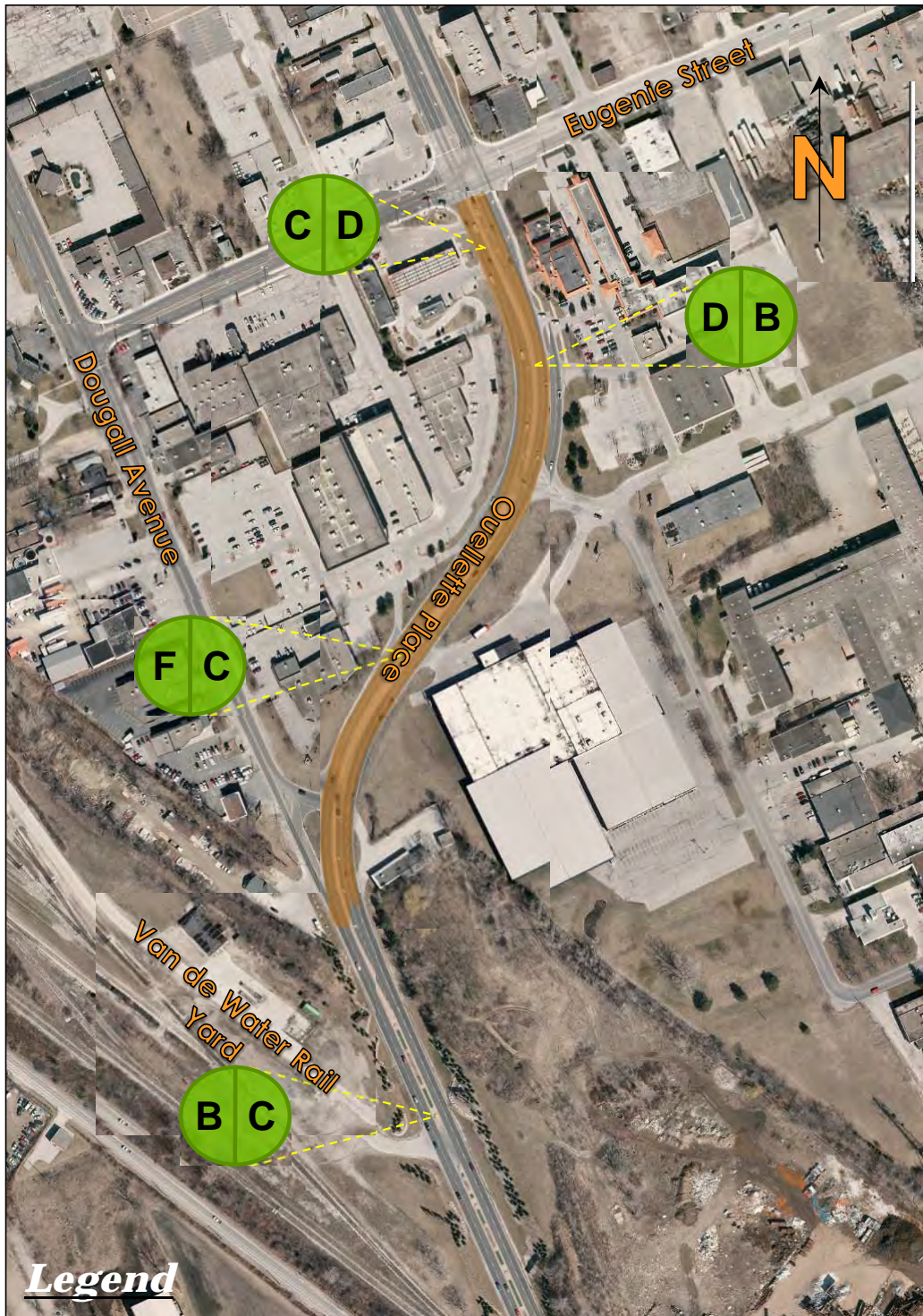
Table 3.16 Dougall Avenue - Ouellette Place Private Access Intersection Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour				
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³	
Ouellette Avenue/ Petro Canada Access Unsignalized	EB	Left	C	19	0.00	< 1	D	35	0.01	< 1	
		Right	A	10	0.02	1	B	11	0.07	2	
	NB	Left	A	9	0.02	< 1	C	17	0.04	1	
		Dual Through	Unopposed Movement								
SB	Through-Through/Right	Unopposed Movement									
Ouellette Avenue/ Tim Hortons- Staples Access Unsignalized	WB	Left/Right	D	25	0.23	6	B	12	0.07	2	
	NB	Through-Through/Right	Unopposed Movement								
		Left	C	17	0.00	< 1	A	10	0.01	< 1	
	SB	Dual Through	Unopposed Movement								
Ouellette Place/	EB	Right	B	11	0.02	< 1	B	10	0.12	3	

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

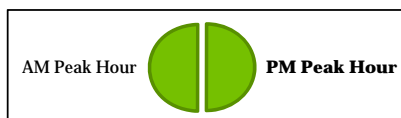
Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Office Plaza- Teppermans Access Unsignalized	WB	Left	F	65	0.02	< 1	C	23	0.01	< 1
		Right	A	< 1	0.00	< 1	B	13	0.00	< 1
	NB	Through- Through/Right	Unopposed Movement							
	SB	Dual Through	Unopposed Movement							
Dougall Avenue/ Van De Water Rail Yard Access Unsignalized	EB	Left/Right	B	12	0.01	< 1	C	24	0.02	< 1
	NB	Left/Through- Through ⁵	A	1	0.04	1	A	1	0.02	1
	SB	Through- Through/Right	Unopposed Movement							
Dougall Avenue/ Office Plaza Access Unsignalized	EB	Left	C	17	0.00	< 1	D	29	0.01	< 1
		Right	A	< 1	0.00	< 1	A	10	0.01	< 1
	NB	Left	A	9	0.00	< 1	⁴ -	-	-	-
		Dual Through	Unopposed Movement							
SB	Through- Through/Right	Unopposed Movement								
Dougall Avenue/ Capri Pizza- Commercial Access Unsignalized	WB	Left	A	< 1	0.00	< 1	C	24	0.04	1
		Right	C	16	0.02	< 1	B	15	0.08	2
	NB	Through- Through/Right	Unopposed Movement							
	SB	Left/Through- Through	A	< 1	0.01	< 1	A	1	0.03	1

¹ Delay in seconds; ² v/c greater or equal to 0.85 or LOS F are highlighted (if any); ³ 95th Percentile queue length in metres; ⁴ No volume recorded; ⁵ Represents U-Turn movements



Legend

Level of Service
 A – B: Minimal Delay
 C – D: Busy/Acceptable
 E – F: Capacity/Congestion



CITY OF WINDSOR
 CENTRAL BOX STUDY AREA
 ENVIRONMENTAL ASSESSMENT
 Ouellette Avenue - Ouellette Place Intersection Level of Service

PROJECT NO.

DRAWING NO.

Fig. 3.7

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

The operational analysis of the private access intersections indicate generally acceptable results with most movements to or from these driveways, operating at levels of service D or better. One poor level of service (F) is shown for left turns exiting the Teppermans property during the a.m. peak hour, however, the left turn demand is very low (1 vehicle).

While the analysis of the private access intersections shows relatively good operational performance, this has to be considered in conjunction with the observations that were made of traffic conditions and potentially hazardous traffic movements during peak periods. These include vehicles having to rely on courtesy gaps in queued traffic to enter or exit private commercial accesses (e.g. Tim Hortons – Staples access, Capri Pizza and commercial accesses south of West Grand Boulevard). Detailed observations and analysis of these accesses are included in the Existing Conditions Report found in Appendix B1. If it is concluded that restricting these private accesses to right turns only would be beneficial in terms of safety and efficiency, the analysis shows that only a relatively small number of left turn movements in or out of these commercial developments would be affected.

The traffic movements recorded at the Dougall Avenue/Van de Water Rail Yard Access included northbound to southbound U-turns, currently prohibited by signage and the accompanying by-law. Due to northbound traffic being physically restricted from making left turns directly onto South Cameron Boulevard by a raised centre median on Dougall Avenue, some motorists are traveling further north to the break in the median at the Van de Water Rail Yard access and making the illegal U-turn. This allows them to travel south on Dougall Avenue and make a right turn to South Cameron Boulevard westbound. This right-in/right-out access control at the South Cameron Boulevard intersection is in place for safety and operational reasons, related to the close proximity (approximately 100m) to the E.C. Row Expressway north ramp terminal intersections on Dougall Avenue. The U-turns occur primarily during the a.m. peak period (relatively frequent at an average of approximately 1 every two minutes). While the analysis shows that the U-turn operates at a high level of service and well within capacity, these turns are being made from the northbound through lane on Dougall Avenue and temporarily obstruct the high volume of a.m. peak hour traffic in that lane. This creates a hazardous situation as well as a reduction in the northbound through capacity.

3.4.3.4 Left Turn Lane Queuing

To identify potential deficiencies in the storage lane length for left turn movements, the 50th percentile (or average queue) and the 95th percentile left turn queues calculated within the Synchro model were compared to the existing left turn storage lengths (and taper lengths) for the intersections with exclusive left turn lanes. This comparison is presented in Table 3.17 below, with deficiencies in storage lengths highlighted in yellow.

Table 3.17 Dougall Avenue - Ouellette Place Left Turn Storage vs. Queue Length

Intersection	Movement	Storage Lane	Percentile Queue Length in Metres ^{1,2}
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		Length in Metres (Taper Length)	AM Peak Hour		PM Peak Hour	
			50 th	95 th	50 th	95 th
Dougall Avenue/ Eugenie Street (signalized)	NBL ³	50 (50)	-	-	-	-
	SBL	35 (TWLTL) ⁴	4	10	11	30
Ouellette Avenue/ Eugenie Street (signalized)	EBL	40 (TWLTL) ⁴	4	9	14	24
	WBL	90 (25)	49	79	97	144
	NBL	30 (45)	6	12	11	32
	SBL	50 (70)	5	16	9	19
Ouellette Avenue/ Ouellette Place (unsignalized)	WBL	15 (10)	-	3	-	9
	SBL	55 (40)	-	7	-	14
Dougall Avenue/ Ouellette Place (unsignalized)	NBL	80 (40)	-	77	-	84
Dougall Avenue/ EC Row North Ramp Terminal (signalized)	EBL	90 (-)	49	72	27	48
	NBL	50 (30)	20	36	37	98
Dougall Avenue/ E.C. Row South Ramp Terminal (signalized)	EBL	100 (-)	57	70	29	37
	NBL	50 (25)	14	27	69	145
Dougall Avenue/ West Grand Boulevard (signalized)	EBL	70 (60)	51	85	28	52
	WBL	45 (25)	6	13	27	42
	NBL	60 (TWLTL) ⁴	14	28	21	62
	SBL	55 (45)	4	20	19	25

¹ 50th percentile queues are not calculated for unsignalized intersections; ²Queue lengths that exceed storage lane lengths (if any) are highlighted; ³No volume recorded; ⁴Two-Way Left Turn Lane.

The queue analysis shows some storage deficiencies with respect to the average (50th percentile) and 95th percentile queues at the Ouellette Avenue/Eugenie Street intersection for the westbound left turn in the p.m. peak hour. This is a high volume left turn movement (over 400 vehicles) and was shown to exceed the theoretical capacity in the analysis. In this case, the storage lane deficiency can be considered to be minor since the overflow would be into the centermost through lane on Eugenie Street, while the curb lane can easily accommodate the relatively low eastbound through volume (100 vehicles).

Deficiencies were also identified for the Dougall Avenue northbound left turns for the E.C. Row Expressway eastbound and westbound on-ramps. The remaining deficiencies indicated in the analysis can be considered minor due to the relatively small differences between the storage lane lengths and the 95th percentile queue lengths, and/or the availability of relatively long taper sections or continuation of two-way left turn lanes.

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3.4.3.5 Active Transportation

In general, the combination of motor vehicles speeds, high volumes, intersection configurations, and the absence of active transportation facilities along Dougall Avenue, Ouellette Place, and Ouellette Avenue creates a very uncomfortable environment for walking and cycling. Although pedestrian and cyclists counts were relatively low, owing to the auto-oriented land uses along the corridor, it is clear from the well-worn desire lines as well as public input to-date that there is a desire and need for safe active transportation facilities along the corridor. Pedestrian and cyclist counts collected as part of this study are included in the Existing Conditions Report found in Appendix B1; the table below outlines existing facilities, and deficiencies in the network.

Table 3.18 Dougall Avenue - Ouellette Place Active Transportation Deficiencies

Street Name	From Street	To Street	Existing AT Facilities	Issues / Deficiencies	Bicycle Facility Identified in BUMP
Dougall Avenue	Eugenie Street	South Cameron Boulevard	Discontinuous sidewalks on the east side	Narrow shared curb lanes create uncomfortable conditions for cycling with existing motor vehicle speeds. Discontinuous sidewalks, steep grade in boulevards south of Ouellette Place contribute to uncomfortable and potentially unsafe conditions for pedestrians and bicycles using the boulevard. Strong, well-worn desire lines on both boulevards north of the South Cameron Boulevard intersection (through the CN Rail underpass) and continuing along the east side of Dougall Avenue-Ouellette Place indicates current and repeated use by pedestrians and cyclists	Bike lane
Ouellette Place / Ouellette Avenue	Dougall Avenue	Eugenie Street	Discontinuous sidewalk on east side south of Eugenie Street	A combination of motor vehicle speeds, roadway alignment and the absence of active transportation facilities creates a very uncomfortable and potentially unsafe environment for walking and particularly for cycling. Employment area on east side of Ouellette Place not accessible for cyclists or pedestrians	None
Dougall Avenue	Ouellette Place (north end of int.)	Ouellette Place (south end of int.)	None	Complicated intersection configuration and lack of pedestrian and bicycle crossings or facilities approaching this intersection contribute to very challenging and unsafe crossing conditions for active transportation users	Bike lane on Dougall Avenue

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Street Name	From Street	To Street	Existing AT Facilities	Issues / Deficiencies	Bicycle Facility Identified in BUMP
Dougall Avenue	Ouellette Place	South Cameron Boulevard	None	Narrow shared curb lanes, no sidewalks	Bike lane
Dougall Avenue	South Cameron Boulevard	Grand Marais Road W	Multi-use trail on west side	Multi-use trail ends at Grand Marais Road W, no crossrides at intersections, no pavement markings at driveways or ramps, signage at ramps indicates cyclists should dismount; little to no signage along facility indicating bikes should yield to pedestrians, no wayfinding signage or pavement markings to indicate correct riding/walking position on trail	Bike lane
Dougall Avenue	Grand Marais Road W	West Grand Boulevard	Sidewalk on east side	Multi-use trail ends at Grand Marais Road W, no bicycle or pedestrian facility on west side	Bike lane

3.4.3.6 Collision Data

Collision reports for the 5-year period of 2009-2013 inclusive were reviewed. A detailed summary of both intersection and mid-block collisions is provided in Appendix B1 as part of the Existing Conditions Report, along with collision diagrams for intersections that experienced 25 or more collisions. The following chart provides an overview of the collision experienced in these high collision intersections and mid-block locations (over 25), including the number of collisions along with the percentages of collisions that resulted in 'property damage only' (PDO) or 'injuries' (INJ). There were no collision-related fatalities within Dougall Avenue corridor during the time period examined.

Table 3.19 Dougall Avenue - Ouellette Place Collision Data

Intersection (signalized unless noted)	Collisions by Year					Total and Severity ¹		
	'09	'10	'11	'12	'13	2009-13	% PDO	% INJ
Dougall Avenue/Ouellette Place (unsignalized)	18	11	19	17	14	79	78%	20%
Dougall Avenue/West Grand Boulevard	12	16	18	8	12	66	82%	14%
Ouellette Avenue/Eugenie Street	7	7	9	6	3	32	75%	25%
Mid-Block Location								
Dougall Avenue between E.C. Row north and south ramp terminals	6	18	5	6	5	43	77%	23%

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Collisions between motorized vehicles and pedestrians, and motorized vehicles and cyclists were extracted from the collision data. There is no information available for collisions between cyclists and pedestrians, since this type of incident is not recorded on standard motor vehicle accident forms. The collision reports for intersections and mid-block locations within the Dominion Boulevard corridor are outlined in the table below.

Table 3.20 Dougall Avenue - Ouellette Place Motor Vehicle Collisions with Pedestrians/Cyclists

Intersection (all signalized)	Number of Collisions	
	Vehicle-Pedestrian	Vehicle-Bicycle
Ouellette Avenue/Eugenie Street	1	1
Dougall Avenue/West Grand Boulevard	-	2
Mid-Block Locations		
Dougall Avenue: Zehrs Plaza Access-Eugenie Street	-	2
Dougall Avenue: West Grand Boulevard-Nottingham Street	-	1
E.C. Row EB Off-Ramp approaching Dougall Avenue	1	-

For a full analysis of the collision data for the Dougall Avenue – Ouellette Corridor, including collision diagrams and a discussion of collision types, see the Existing Conditions Report found in Appendix B1.

- The highest intersection collision rate of 1.01 per million vehicles entering (MVE) occurred at the Dougall Avenue/Ouellette Place intersection, but since it is an unsignalized intersection, there is no average benchmark for comparison. It is however, twice the average rate for signalized intersections identified in the City's Road Safety Report (2012).
- The highest signalized intersection collision rate of 0.75 MVE occurred at Dougall Avenue/West Grand Boulevard, and is higher than the City's average of 0.51.
- The highest mid-block collision rate of 0.65 collisions per million vehicle kilometres (MV-KM) occurred between the E.C. Row Expressway north and south ramp terminals, but is lower than the City's average of 0.79 for the arterial road classification.

Based on the intersection collision patterns, the following can be concluded:

- It is likely that the skew angle of the southbound stop controlled approach on Dougall Avenue at Ouellette Place, in combination with the high volumes of southbound through traffic and a limited number of gaps to safely merge into traffic, contributes to a higher incidence of rear end collisions.

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- The rear end collisions experienced on Ouellette Avenue approaches to the Eugenie Street intersection may be partly attributable to the private access driveways located within close proximity to the intersection. Vehicles turning to or from these driveways may be adding complexity to the driving task for motorists approaching the signalized intersection.
- With the higher incidence of turning movement and right angle collisions at the Dougall Avenue/West Grand Boulevard intersection, a review of sight lines, signal timing (especially the potential for exclusive phases), and the proximity of nearby driveways will be undertaken.

For the 43 collisions that occurred in the mid-block section of Dougall Avenue between the E.C. Row Expressway north and south ramp terminals, 50% were rear end impacts and 15% could be considered either turning or side-swipe movements related to lane changes in the southbound direction. It is likely that many of these collisions occurred in the weaving section of southbound Dougall Avenue where vehicles exiting the freeway at the north ramp terminal (westbound to southbound movement) weave with vehicles entering the freeway at the south ramp terminal (southbound to eastbound movement). With high volumes of traffic at relatively low speeds in this section as vehicles negotiate the ramps and the weaving section, the collision severity is moderate with 23% resulting in injuries (matches the City-wide average).

3.4.4 Howard Avenue Corridor

The Howard Avenue corridor within the Central Box study area includes Howard Avenue from the South Cameron Boulevard/Division Road/CN Rail intersection complex, north to the Howard Avenue/Eugenie Street intersection. Detailed characteristics of the Howard Avenue corridor are illustrated in Table 3.21 below.

Table 3.21 Howard Avenue Road Characteristics

Road	From	To	Classification	Speed (km/ h)	# of Lanes	Truck Route
Howard Avenue	South Cameron Boulevard	Howard Avenue/ Division Road	Class II Arterial	50	2	Yes
	Division Road/ Howard Avenue	Devonshire Mall/ Roundhouse Entrance	Class II Arterial	60	6	Yes

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Road	From	To	Classification	Speed (km/ h)	# of Lanes	Truck Route
	Devonshire Mall/ Roundhouse Entrance	E.C. Row Expwy E/Sears (Devonshire Mall) Entrance	Class II Arterial	60	6	Yes
Howard Avenue (cont.)	E.C. Row Expressway E/Sears (Devonshire Mall) Entrance	Grand Marais Road E	Class II Arterial	60	6	Yes
	Grand Marais Road E	Eugenie Street E	Class II Arterial	60	4	Yes
McDougall Street	Howard Avenue	Eugenie Street E	Class I Collector	50 (not posted)	2	Yes

Howard Avenue is considered a main north-south corridor for the City of Windsor linking commuter traffic from within the City, from Highway 401, and the E.C. Row Expressway to the downtown area. The horizontal or vertical alignment of Howard Avenue is fairly tangent with little to no curvature, except at the north study limit where McDougall Avenue intersects with Howard Avenue. The curves have a radius of approximately 420m, which is consistent with the posted speed requirements for roads at a 6% superelevation.

Howard Avenue from Eugenie Street to Grand Marais Road E consists of a five lane urban roadway (four basic lanes and a centre tow-way left turn lane) with curb and gutter and storm sewers; a basic six lane urban roadway Grand Marais Road E to Division Road with access control (raised centre median between signalized intersection), and a basic two lane rural roadway with roadside ditches to the south of Division Road.

Remington Avenue runs parallel to Howard Avenue from Eugenie Street southerly to Grand Marais Road. This road is a two lane urban road with curb and gutter, and is classified as local road with 4.14m lanes. Parking is permitted on either side of the right of way.

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The Howard Avenue intersections with Eugenie Street, McDougall Avenue, and Grand Marais Road were reviewed and no significant geometric deficiencies were identified which could lead to safety or operational concerns.

The intersection of Howard Avenue and Division Road are in close proximity to the CN Rail line, as well as the intersection of South Cameron Boulevard and Howard Avenue. A channelized right turn lane under stop control provides southbound to southbound continuation onto Howard Avenue at Division Road; the point at which the channelized lane merges with Howard Avenue is skewed at approximately 80 degrees, which provides clear sightlines, but is only 8m south of the Division Street intersection, making visibility of northbound left turning vehicles from Division Road difficult. The intersection of South Cameron Boulevard includes a right turn channelization under stop control, with a skew of about 30 degrees making sight lines difficult.

3.4.4.1 Transit

The Transit Windsor routes that provide service within the Howard Avenue corridor are outlined in Table 3.22 below.

Table 3.22 Howard Avenue Transit Routes

Route Name (Key Roadway)	Operational Characteristics
Transway 1A (Howard Avenue)	<p><u>Service Route:</u> Windsor International Transit Terminal – Devonshire Mall; <u>Hours/Days of Operations:</u> Monday – Friday (6:00 a.m. – 11:47 p.m.), Saturday (6:50 a.m. – 11:13 p.m.), Sunday and Holidays (10:05 a.m. – 8:11 p.m.); <u>Route Frequency/Headways:</u> 20 minute headways (Weekday and Saturday peak hours), 30 minutes (Sundays and Holidays); <u>Accessibility:</u> All Transway 1A trips are wheelchair accessible</p>
South Windsor 7 (Howard Avenue)	<p><u>Service Route:</u> College Avenue Community Centre – Legacy Park/Silver City, including Service to Devonshire Mall; <u>Hours/Days of Operations:</u> Monday – Friday (7:15 a.m. – 7:43 p.m.), Saturday (7:15 a.m. – 7:43 p.m.), No Sunday or Holiday service; <u>Route Frequency/Headways:</u> 50 minute headways (weekdays and Saturdays); <u>Accessibility:</u> All South Windsor 7 trips are wheelchair accessible</p>
Parent 14 (Howard Avenue and Eugenie Street)	<p><u>Service Route:</u> Windsor International Transit Terminal – Devonshire Mall, including Remington Park; <u>Hours/Days of Operations:</u> Monday – Friday (7:07 a.m. – 6:39 p.m.), Saturday (7:53 a.m. – 6:05 p.m.), No Sunday or Holiday service; <u>Route Frequency/Headways:</u> 30 – 40 minute headways (weekdays), 60 minutes (Saturdays); <u>Accessibility:</u> Wheelchair accessible buses run every 60 minutes (weekdays), All Saturday trips are wheelchair accessible</p>

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SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

3.4.4.2 Daily Traffic Volumes

The 2014 weekday average daily traffic volumes collected via automatic traffic recorders (ATRs) are listed in Table 3.23 below along with the most recent historical daily traffic volumes available. The current and previously collected data are compared to determine how traffic has changed along Howard Avenue in recent years, and the rate of change.

Table 3.23 Howard Avenue Daily Traffic Volumes

ATR Road Sections/Ramps	Count Date		Two-Way Weekday Average Volume			
	Previous	Current	Previous	Current	%/ Change	%/Year
Howard Avenue South of Eugenie Street	Dec 2011	Oct 2014	25,700	25,806	<1%	<1%
Howard Avenue North of Grand Marais Road	July 2004	Nov 2014	43,100	37,796	(12%)	(1%)
Howard Avenue @ E.C. Row: WB On-Ramp	Nov 2010	Oct 2014	8,451	8,725	3%	1%
Howard Avenue @ E.C. Row: WB Off-Ramp	-	Oct 2014	-	9,556	-	-
Howard Avenue @ E.C. Row: SW EB On-Ramp	Nov 2010	Oct 2014	3,700	3,958	7.0%	2%
Howard Avenue @ E.C. Row: EB On-Ramp	-	Oct 2014	-	1,771	-	-
Howard Avenue @ E.C. Row: EB Off-Ramp	Nov 2010	Oct 2014	9,400	9,096	(3%)	(1%)
Howard Avenue SB at Stop Sign @ Division Road	-	Oct 2014	-	7,056	-	-
Eugenie Street East of Ouellette Avenue	Nov 2010	Oct 2014	13,000	12,984	nil	nil
McDougall Street South of Eugenie Street	Aug 2007	-	6,100	-	-	-
(#) indicates negative growth, or a decrease in traffic volumes						

The base year daily traffic volumes are approximately 26,000 vehicles at the north end (south of Eugenie Street), approximately 40,000 vehicles in the central section at the E.C. Row Expressway, approximately 30,000 vehicles in the vicinity of the Devonshire Mall, approximately 15,000 vehicles at the CN rail crossing, and approximately 12,000 vehicles south of South Cameron Boulevard. A review of available historical volumes showed that there has been little change in the daily traffic volumes over the past 5 to 10 years. From a planning perspective, the daily traffic

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volumes throughout the different sections of the corridor can be considered to be within their respective urban arterial road capacities.

3.4.4.2.1 Rail Traffic

According to the 2008 Community Based Strategic Rail Study, the Detroit River Tunnel Partnership (DRTP) owns the 2-track rail corridor that crosses Howard Avenue at grade approximately 80 m south of Division Road. Based on information in the 2003 Howard Avenue Class Environmental Assessment, there was an average of 6-8 train movements per day, and the majority of these trains carry out shunting maneuvers at slow speeds (15 mph or less) to/from the Van de Water Rail Yard. Background studies have identified operational and safety concerns with the existing crossing configuration and its proximity to both the Howard Avenue/South Cameron Boulevard, and Howard Avenue/Division Road intersections.

3.4.4.3 Intersection Operations

The existing signalized intersection weekday traffic volumes for the a.m. and p.m. peak hours are listed in Table 3.24 below along with the most recent historical intersection counts available.

Table 3.24 Howard Avenue Intersection Traffic Volumes

Intersection	Count Date Month-Year		Volume Entering							
			AM Peak Hour				PM Peak Hour			
	Previous	Current	Previous	Current	% Change	%/ Yr.	Previous	Current	% Change	%/ Yr.
Eugenie Street/ McDougall Avenue	May-08	Dec-13	1,749	1,479	(15.4%)	(3%)	2,024	1,731	(15%)	(3%)
Howard Avenue/ Eugenie Street	May-08	Nov-14	3,040	2,620	(13.8%)	(2%)	3,895	3,816	(2%)	(<1%)
Howard Avenue/ McDougall Street	Jun-07	Nov-14	2,301	2,244	(2.5%)	(<1%)	3,056	2,995	(2%)	(<1%)

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Intersection	Count Date Month-Year		Volume Entering							
			AM Peak Hour				PM Peak Hour			
	Previous	Current	Previous	Current	% Change	%/ Yr.	Previous	Current	% Change	%/ Yr.
Howard Avenue/ Edinborough Street	Jun-03	Dec-13	2,663	2,364	(11%)	(1%)	3,712	3,598	(3%)	(<1%)
Howard Avenue/ Grand Marais Road	Jun-07	Dec-13	3,150	2,990	(5.1%)	(1%)	4,101	4,091	nil	nil
Howard Avenue/ E.C. Row North Ramp Terminal	May-07	Dec-13	3,083	3,158	2%	<1%	4,085	4,952	21%	3%
Howard Avenue/ E.C. Row South Ramp Terminal	May-07	Dec-13	2,777	2,787	<1%	Nil	4,002	5,123	28%	4%
Howard Avenue/ Roundhouse Centre Access	Apr-05	Nov-14	1,866	2,174	16.5%	2%	2,853	3,413	20%	2%

(#) indicates negative growth, or a decrease in traffic volumes.

For intersections north of the E.C. Row Expressway, volumes showed slight decreases between the historical and current counts; for intersections south of the E.C. Row Expressway, the 2-4% increase may be attributable to comparing historical May counts to more current December counts. The latter counts may be higher due to the effect of holiday season shopping at the Devonshire Mall and Roundhouse Centre.

The results of the a.m. and p.m. peak hour intersection operational analysis for base year conditions (either 2013 or 2014) are presented in Table 3.25 below, and are illustrated in Figure 3.8. Cells highlighted in yellow represent a level of service (LOS) or volume/capacity ratio (v/c) that is below acceptable operations. Acceptable intersection operations are generally considered to be LOS D or above; LOS E may also be acceptable during peak periods,

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especially for left turn movements. The v/c ratio provides a measure of traffic volume demand relative to the theoretical capacity of the intersection, where an at-capacity condition would be represented by a c/v ratio of 1.0 (the volume of traffic is equal to the capacity of the roadway).

Table 3.25 Howard Avenue Peak Hour Operational Analysis

Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
McDougall Street/ Eugenie Street <i>Signalized (102/110)⁴</i>	EB	Left/Through-Through/Right	B	12	0.42	35	B	16	0.39	48
	WB	Left/Through-Through/Right	B	12	0.27	37	A	8	0.25	25
	NB	Left	C	22	0.23	16	D	50	0.69	36
		Through/Right	C	20	0.26	30	C	23	0.16	24
	SB	Left	C	24	0.12	15	C	28	0.19	25
		Through/Right	C	27	0.37	51	D	42	0.74	114
	Overall Intersection			B	16	0.40	-	C	23	0.51
Howard Avenue/ Eugenie Street <i>Signalized (102/110)</i>	EB	Left	F	89	1.00	44	F	103	1.04	137
		Through/Right	B	12	0.18	3	D	42	0.64	102
	WB	Left	C	28	0.07	8	C	28	0.16	12
		Through/Right	C	33	0.51	55	C	29	0.31	44
	NB	Left	A	3	0.46	12	D	45	0.80	60
		Through-Through/Right	A	6	0.62	68	C	23	0.68	83
	SB	Left	B	12	0.32	14	C	24	0.69	36
		Dual Through	B	16	0.34	56	C	29	0.81	159
		Right	B	14	0.13	13	B	18	0.19	23
	Overall Intersection			B	17	0.74	-	C	35	0.89
Howard Avenue/ McDougall Street <i>Signalized (102/110)</i>	EB	Left	C	33	0.11	6	C	24	0.10	6
		Through/Right	D	42	0.11	18	C	33	0.74	68
	WB	Left/Through/Right	D	42	0.00	< 1	D	38	0.01	< 1
	NB	Left	A	1	0.36	6	D	42	0.64	68
		Through-Through/Right	A	1	0.45	18	B	10	0.40	102
	SB	Left	B	13	0.01	1	A	3	0.01	< 1
		Through-Through/Right	B	11	0.27	59	A	8	0.68	155
Overall Intersection			A	7	0.43	-	B	14	0.69	-
Howard Avenue/ Edinborough	EB	Left	D	42	0.10	7	D	40	0.26	21
		Through/Right	D	42	0.09	13	E	56	0.77	63
	WB	Left	D	43	0.21	13	D	47	0.51	16

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Intersection	Approach/Movement	AM Peak Hour				PM Peak Hour				
		LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³	
Signalized (102/110)	Through/Right	D	43	0.18	17	D	39	0.10	13	
		NB	Left	A	1	0.22	1	C	32	0.79
	Through-Through/Right	A	2	0.63	9	B	19	0.57	161	
		SB	Left	A	4	0.08	< 1	A	5	0.21
	Through-Through/Right	A	7	0.34	30	C	26	0.97	290	
		Overall Intersection		A	7	0.55	-	C	27	0.92
Howard Avenue/ Grand Marais Road Signalized (102/110)	EB	Left/Through	C	27	0.03	5	C	32	0.04	7
		Right	C	27	0.01	< 1	C	32	0.01	< 1
	WB	Left/Through	D	52	0.87	107	E	56	0.84	91
		Right	C	29	0.25	31	C	33	0.12	18
	NB	Left	A	9	0.06	4	C	24	0.14	3
		ThroughThrough-Through/Right	C	25	0.74	160	B	12	0.48	87
	SB	Left	C	27	0.50	23	A	9	0.44	4
		Through-Through/Right	B	18	0.37	81	F	110	1.21	398
	Overall Intersection		C	27	0.76	-	E	71	1.07	-
	Howard Avenue/ E.C. Row North Ramp Terminal Signalized (102/110)	WB	Left	D	42	0.55	47	D	50	0.78
Left/Through			D	42	0.56	48	D	50	0.78	87
Right			A	1	0.40	< 1	A	< 1	0.23	< 1
NB		Left	A	6	0.41	14	F	123	1.14	204
		Triple Through	A	4	0.37	32	A	9	0.36	55
SB		Triple Through	A	6	0.27	31	E	68	1.10	98
		Right	A	< 1	0.09	< 1	A	< 1	0.12	< 1
Overall Intersection		A	7	0.47	-	D	51	1.08	-	
Howard Avenue/E.C. Row South Ramp Terminal Signalized (102/110)	EB	Left	D	46	0.81	90	F	81	0.99	152
		Through	C	32	0.42	48	D	47	0.79	115
		Right	A	< 1	0.19	< 1	A	< 1	0.24	< 1
	WB	Right	C	25	0.18	22	D	41	0.78	127
	NB	Triple Through	A	6	0.44	18	A	9	0.54	40
		Right	B	10	0.01	< 1	A	7	0.06	6
	SB	Triple Through	A	9	0.32	46	A	2	0.63	15
		Right	A	< 1	0.14	< 1	A	< 1	0.29	< 1
	Overall Intersection		B	12	0.55	-	B	15	0.77	-
	Howard Avenue/ Roundhouse Centre-	EB	Left	D	37	0.22	19	D	54	0.74
Through-Through/Right			D	41	0.07	8	D	45	0.17	15
WB		Left	D	36	0.06	8	D	41	0.38	31

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Intersection	Approach/Movement		AM Peak Hour				PM Peak Hour			
			LOS	Delay ¹	v/c ²	Q ³	LOS	Delay ¹	v/c ²	Q ³
Devonshire Mall Access <i>Signalized (102/110)</i>		Through-Through/Right	D	41	0.07	7	D	46	0.19	15
	NB	Left	A	8	0.15	7	B	12	0.34	11
		ThroughThrough-Through/Right	B	13	0.38	54	B	19	0.43	70
	SB	Left	B	17	0.51	35	C	26	0.65	70
		ThroughThrough-Through/Right	A	9	0.29	35	B	12	0.47	42
Overall Intersection			B	14	0.47	-	C	22	0.69	-
Howard Avenue/ Division Road <i>Signalized (102/110)</i>	EB	Left	F	250	1.46	260	E	78	1.00	161
		Through/Right	C	23	0.17	25	C	25	0.41	68
	WB	Left	B	15	0.01	2	B	15	0.12	13
		Through	B	15	0.04	9	B	16	0.25	44
		Right	B	14	0.02	< 1	B	14	0.04	6
	NB	Left	B	18	0.19	11	E	73	0.87	67
		ThroughThrough-Through/Right	C	24	0.61	42	D	42	0.69	84
	SB	Left	C	20	0.13	9	D	45	0.82	61
		Dual Through	C	29	0.46	58	E	78	1.04	162
	Overall Intersection			F	90	0.90	-	D	55	0.94
Howard Avenue/ South Cameron Boulevard <i>Unsignalized</i>	EB	Left	D	28	0.26	8	F	56	0.59	24
		Right	B	11	0.07	2	C	17	0.23	7
	NB	Left/Through	A	3	0.10	3	A	2	0.06	2
	SB	Through/Right	Unopposed Movement							
Division Road/ Sydney Avenue <i>Signalized (102/110)</i>	WB	Left	D	43	0.04	4	D	49	0.45	29
		Right	D	43	0.05	12	D	46	0.10	16
	NB	Through-Through/Right	A	7	0.42	53	A	7	0.39	54
	SB	Left	A	3	0.19	5	A	2	0.20	< 1
		Dual Through	A	1	0.22	3	A	< 1	0.28	2
	Overall Intersection			A	6	0.37	-	A	9	0.39

¹ Delay in seconds; ² v/c greater or equal to 0.85 or LOS F are highlighted (if any); ³ 95th Percentile queue length in metres; ⁴ Cycle lengths (AM/PM); ⁵ No volume recorded.

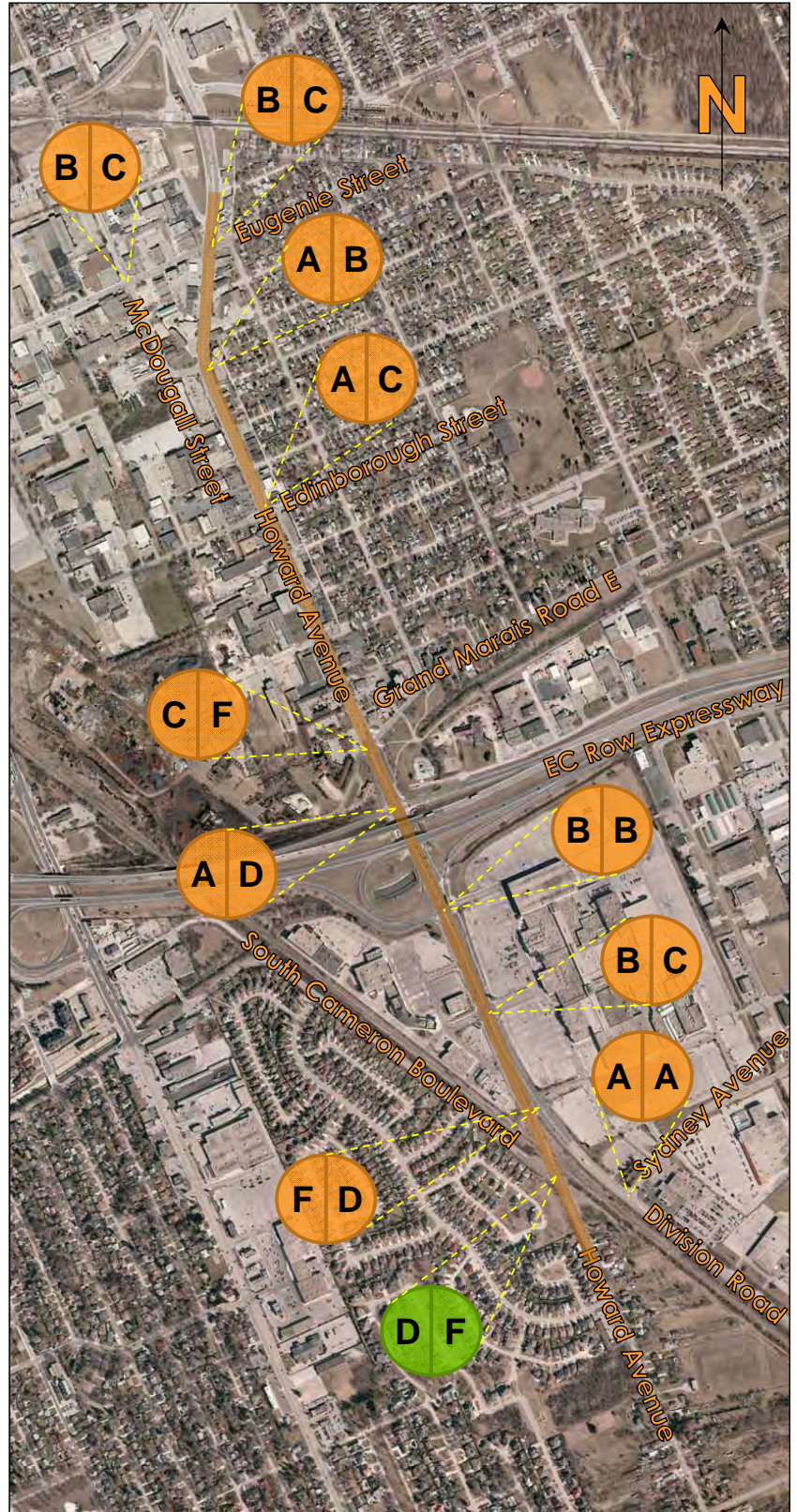
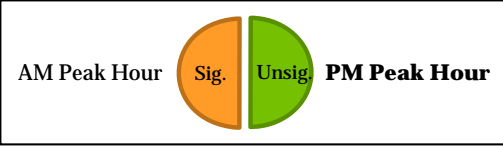
Legend

Level of Service

A – B: Minimal Delay

C – D: Busy/Acceptable

E – F: Capacity/Congestion



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Howard Avenue Existing Levels of Service

PROJECT NO.

DRAWING NO.

Fig. 3.8

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For the signalized intersections, the analysis shows that the overall intersection levels of service within the corridor are generally acceptable with the exception of the Howard Avenue/Grand Marais Road E. intersection, which shows very long delays and critical volumes greater than the theoretical capacity during the p.m. peak hour. The most critical p.m. peak hour traffic movements include the westbound left turns from Grand Marais Road E (approximately 300 vehicles in a shared left/through lane, although with minimal westbound through traffic) and the high volume of southbound through traffic on Howard Avenue (approximately 2,300 vehicles in two through lanes).

The Howard Avenue intersections with Edinborough Street, E.C. Row Expressway north ramp terminal, and Division Road intersections are also approaching capacity in the p.m. peak hour. The Division Road intersection also shows near capacity conditions during the a.m. peak hour, which is largely attributable to the high volume and the eastbound to northbound left turn movement that represents the continuation of northbound travel from Howard Avenue south of Division Road to Howard Avenue north of Division Road.

3.4.4.4 Left Turn Lane Queueing

To identify potential deficiencies in the storage lane length for left turn movements, the 50th percentile (or average queue) and the 95th percentile left turn queues calculated within the Synchro model were compared to the existing left turn storage lengths (and taper lengths) for the intersections with exclusive left turn lanes. This comparison is presented in Table 3.26 below.

Table 3.26 Howard Avenue Left Turn Storage vs. Queue Length

Intersection	Movement	Storage Lane Length in Metres (Taper Length)	Percentile Queue Length in Metres ^{1,2}			
			AM Peak Hour		PM Peak Hour	
			50 th	95 th	50 th	95 th
McDougall Street/ Eugenie Street (signalized)	NBL	50 (25)	7	16	20	36
	SBL	25 (20)	6	15	13	25
Howard Avenue/ Eugenie Street (signalized)	EBL	50 (-)	36	44	80	137
	WBL	20 (30)	3	8	4	12
	NBL	40 (30)	5	12	28	60
	SBL	35 (25)	6	14	17	35
Howard Avenue/ McDougall Street (signalized)	EBL	15 (35)	3	6	5	6
	NBL	30 (15)	3	6	32	68
	SBL	15 (10)	< 1	1	< 1	< 1
Howard Avenue/ Edinborough Street (signalized)	EBL	20 (35)	2	7	11	21
	WBL	25 (-)	5	13	7	16
	NBL	40 (30)	< 1	1	8	48

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Intersection	Movement	Storage Lane Length in Metres (Taper Length)	Percentile Queue Length in Metres ^{1,2}			
			AM Peak Hour		PM Peak Hour	
			50 th	95 th	50 th	95 th
	SBL	30 (20)	< 1	< 1	2	4
Howard Avenue/ Grand Marias Road (signalized)	NBL	30 (25)	2	4	1	3
	SBL	45 (25)	12	23	3	4
Howard Avenue/ E.C. Row North Ramp Terminal (signalized)	WBL	115 (70)	30	47	61	87
	NBL	100 (35)	8	14	128	204
Howard Avenue/ E.C. Row South Ramp Terminal (signalized)	EBL	200 (-)	69	90	90	152
Howard Avenue/ Roundhouse-Devonshire Mall Access (signalized)	EBL	50 (-)	9	19	33	61
	WBL	80 (-)	2	8	17	31
	NBL	60 (40)	4	7	6	11
	SBL	160 (30)	9	35	44	70
Howard Avenue/ Division Road (signalized)	EBL	115 (-)	193	260	94	161
	WBL	130 (-)	< 1	2	6	13
	NBL	60 (60)	5	11	39	67
	SBL	80 (30)	3	9	28	61
Howard Avenue/ South Cameron Boulevard (unsignalized)	EBL	15 (-)	-	8	-	24
Division Road/ Sydney Avenue (signalized)	WBL	40 (35)	1	4	17	29
	SBL	55 (50)	1	5	< 1	< 1

¹ 50th percentile queues are not calculated for unsignalized intersections; ²Queue lengths that exceed storage lane lengths (if any) are highlighted.

3.4.4.4.1 Northbound E.C. Row Expressway Westbound On-Ramp

A significant deficiency in left turns storage is shown for the northbound E.C. Row Expressway westbound on-ramp during the p.m. peak hour, owing to the high volume of turns and high opposing southbound through traffic. Since the intersection operates close to capacity, increasing the length of the northbound advanced green to help manage the queue length would put the southbound approach over capacity. The piers of the overpass present a constraint in the construction of dual left turn lanes; there is currently room to increase storage length by removing a portion of the centre median. This would accommodate the average queue length during the p.m. peak hour, but by definition, 50% of the queues would still exceed the available storage.

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3.4.4.4.2 Howard Avenue/Division Road/Devonshire Mall Access

A significant deficiency in left turn storage exists for the eastbound left turn lane on the Howard Avenue approach to the Howard Avenue/Division Road/Devonshire Mall access intersection. Both the 50th and 95th percentile queues for this approach in the a.m. peak hour exceed the left turn storage lane length, and continue south of the CN Rail line to or beyond the Howard Avenue/South Cameron intersection. Through and right turn movements are relatively low in comparison to left turn demand.

3.4.4.4.3 Howard Avenue/South Cameron Boulevard

A small, but important deficiency is shown for the Howard Avenue/South Cameron Boulevard intersection, and specifically, for the eastbound left turn movement. The analysis shows that this movement may occasionally exceed the relatively short 15m storage provided. The presence of a left turn queue that exceeds the available storage blocks the channelized eastbound right turn lane. Widening the South Cameron Boulevard leg of this intersection would be required to increase the left turn storage, and allow the intersection to operate more efficiently.

3.4.4.4.4 Remaining Intersections

Deficiencies at the intersections of Howard Avenue with Eugenie Street, McDougall Street, Edinborough Street, and the Roundhouse-Devonshire Mall access can be considered minor due to the relatively small differences between the storage lane lengths and the 95th percentile queue lengths, the availability of relatively long taper sections, the continuation of two-way left turn lanes, and/or the continuation of a through lane leading into a 'left only' turn lane.

3.4.4.5 Active Transportation

In general, the Howard Avenue corridor is characterized by a lack of appropriate active transportation facilities, particularly north of the E.C. Row Expressway, discontinuous facilities south of Expressway, and the absence of designated pedestrian/bicycle crossing at intersections and commercial accesses. The high speeds and volumes of traffic along Howard Avenue and the observed pedestrian/cyclist activity within the corridor support the addition of a continuous, dedicated bicycle facility with some form of separation. The lack of active transportation facilities at the CN Rail crossing on Howard Avenue north of South Cameron Boulevard, forcing cyclists and pedestrians to share the roadway with motor vehicles, presents additional safety concerns. Collisions involving pedestrian or cyclists and vehicles throughout the Howard Avenue corridor total 12 for the five year period from 2009-2013, with 8 of these occurring at 6 different intersections/commercial accesses.

Table 3.27 below outlines the existing facilities within the corridor, and identified deficiencies in the network.

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Table 3.27 Howard Avenue Active Transportation Deficiencies

Street Name	From Street	To Street	Issues / Deficiencies	Existing AT Facilities	Bicycle Facility Identified in BUMP
Howard Avenue	Memorial Drive	McDougall Street	(North of study area) Shared roadway facility uncomfortable for a broad group of cyclists, particularly at underpass	Sidewalks on both sides - multi-use trail begins west side of Howard Avenue north of Memorial Drive	None
Howard Avenue	McDougall Street	Grand Marais Road East	Narrow shared roadway facility is uncomfortable for cyclists at motor vehicle speeds of 50km + Driveways and intersections present several conflict zones	Sidewalks on both sides	None
Howard Avenue	Grand Marais Road E	E.C. Row EB Off Ramp	Multi-use trail ends at Grand Marais Road E; no crossrides at intersections, no pavement markings or warning signage at driveways or ramps, no right-of way priority or wayfinding signage	Multi-use trail on E side	Multi-use trail
Howard Avenue	E.C. Row Expressway EB Off Ramp	Main Entrance - Devonshire Mall	No bicycle facility on west side of Howard Avenue - no crossrides at intersections, no pavement markings or warning signage at driveways or ramps, no right-of way priority or wayfinding signage	Multi-use trail on east side	Multi-use trail

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Street Name	From Street	To Street	Issues / Deficiencies	Existing AT Facilities	Bicycle Facility Identified in BUMP
Howard Avenue	Main Entrance - Devonshire Mall	Plaza Access Road / Division Road	No facility for bicycles or pedestrians on east side of Howard Avenue. Multi-use trail ends at intersection with Plaza Access Road; no crossrides at intersections, no pavement markings or warning signage at driveways or ramps, no right-of way priority or wayfinding signage.	Multi-use trail on west side	Multi-use trail
Howard Avenue	Division Road (at intersection)	Division Road (at intersection)	Pedestrians and cyclists observed crossing at this intersection from multi-use trail on west side of Howard Avenue to/from the commercial centre on the east side of Division Road. Pedestrian signals on the south leg of Division Road intersection direct pedestrians to cross at this location, but no pedestrian crossing provided across Howard Avenue.	Pedestrian crossing signal. No sidewalks, no bicycle facilities	N/A
Howard Avenue	Mall Access Road / Division Road	South Cameron Boulevard	No bicycle or pedestrian facilities at this location. Desire lines/pedestrians observed crossing rail line before South Cameron/Howard intersection. No pedestrian/cyclist treatments over at-grade rail crossing; complicated intersection with Division Road, no pedestrian or bicycle crossing to east side of Howard Avenue and plazas on east side. Observed pedestrians and cyclists crossing at this location.	Narrow asphalt shoulder on east side	Multi-use trail

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Street Name	From Street	To Street	Issues / Deficiencies	Existing AT Facilities	Bicycle Facility Identified in BUMP
Howard Avenue	South Cameron Boulevard	Kenilworth Drive	Narrow sidewalk on east side, difficult crossing from sidewalk to South Cameron Boulevard particularly for pedestrians with mobility issues. No pedestrian crossing or sidewalk on South Cameron at this intersection	Sidewalk on east side	Bike lane
Division Road	Howard Avenue	Marentette Avenue	Motor vehicle speeds and volumes, heavy trucks and lack of AT facilities	No AT facilities	Bike lane
Division Road	Sydney Avenue (at intersection)	Sydney Avenue (at intersection)	SB pedestrians or cyclists on Division Road accessing Sydney Avenue - no signalized intersection to facilitate crossing / left turns.	Sidewalks	Bike lane
Remington Avenue	Grand Marais Road E	Eugenie Street	Existing multi-use trail in east boulevard of Howard Avenue heads east to the Grand Marais Road E/Remington Avenue intersection.	No AT facilities	Bike lane

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3.4.4.6 Collision Data

Collision reports for the 5-year period of 2009-2013 inclusive were reviewed. A detailed summary of both intersection and mid-block collisions is provided in Appendix B1 as part of the Existing Conditions Report, along with collision diagrams for intersections that experienced 25 or more collisions. The following chart provides an overview of the collision experienced in these high collision intersections and mid-block locations (over 25), including the number of collisions along with the percentages of collisions that resulted in 'property damage only' (PDO) or 'injuries' (INJ). There were no collision-related fatalities within the Howard Avenue corridor during the period examined.

Table 3.28 Howard Avenue Collision Data

Intersection (signalized unless noted)	Collisions by Year					Total and Severity ¹		
	'09	'10	'11	'12	'13	2009-13	% PDO	% INJ
Howard Avenue/E.C. Row North Ramp Terminal	17	14	8	19	13	71	73%	27%
Howard Avenue/E.C. Row South Ramp Terminal	5	14	8	16	17	60	73%	27%
Howard Avenue/Eugenie Street	10	12	12	6	15	55	78%	20%
Howard Avenue/Grand Marais Road	6	6	8	6	17	43	77%	23%
Howard Avenue/Edinborough Street	13	11	3	8	2	37	76%	14%
Howard Avenue/Division Road	4	7	6	12	4	33	79%	21%

Additionally, 40 mid-block collisions occurred in the section of Howard Avenue between the E.C. Row Expressway eastbound off ramp and the Devonshire Mall/Roundhouse Plaza access, and 30 collisions on Howard Avenue between Charles Street and Grand Marais Road E, just north of the E.C. Row Expressway.

For a full discussion of the predominant collision types and patterns along Howard Avenue, see Section 5.6.4 in the Existing Conditions Report found in Appendix B1. Based on the intersection collision patterns, the following can be concluded:

- The predominance of rear end collisions experienced along Howard Avenue may be attributed to many factors including the frequency of private accesses north of the E.C. Row Expressway and their proximity to the intersections; relatively closely spaced signalized intersections; higher speeds as related to traffic exiting from the free flow, high speed E.C. Row Expressway, and the presence of channelized right turn lanes at several Howard Avenue intersections with the potential driver expectation of free flow movement (this is particularly the case for the 40 mid-block collisions between the E.C. Row Expressway and the Devonshire Mall/Roundhouse Plaza access).

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- The collision experience at the Howard Avenue/Division Road intersection may be attributable to the challenging intersection geometry, including the proximity to an at-grade rail crossing.

It is noted in the 2003 Howard Avenue Class Environmental Assessment, that 467 mid-block collisions were reported for the short section (approximately 150m) of Howard Avenue between Division Road and South Cameron Boulevard for the period from January 1998 to July 2001 (three and a half year period, averaging 133 collisions per year). A further 58 collisions (average of 17 per year) were reported for the Howard Avenue/Division Road/South Cameron intersection complex. For comparison, the current data for the 2009-2013 period showed significantly lower mid-block collisions (only 4 total, averaging less than 1 per year), and a significantly lower number of intersection collisions (total of 51, averaging 10 per year).

3.4.5 East-West Connectivity

The Central Box study area generally has poor east-west connectivity between the three major north-south corridors; the E.C. Row Expressway is the main east-west connector, with limited local connections. Details of the east-west routes within the Central Box area are outlined in Table below.

Road	From	To	Classification	Speed (km/h)	# of Lanes	Truck Route
Eugenie Street W	Dougall Avenue	Ouellette Avenue	Class I Collector	50 (not posted)	4	Yes
Eugenie Street E	Ouellette Avenue	Howard Avenue	Class I Collector	50 (not posted)	4	Yes
South Cameron Boulevard	Howard Avenue	West Grand Boulevard	Class I Collector	50	2	Yes
	Dougall Avenue	North Study Area Limit	Class II Collector	50	2	Yes
West Grand	Dominion	Dougall Avenue	Class I Collector	50	2	No

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Road	From	To	Classification	Speed (km/h)	# of Lanes	Truck Route
Boulevard	Boulevard					
	Dougall Avenue	South Cameron Boulevard	Class I Collector	50	2	Yes
Grand Marais Road W	Dominion Boulevard	Longfellow Avenue	Class II Collector	50	4	No
	Longfellow Avenue	Bruce Avenue	Class II Collector	50	2	No
E.C. Row Expressway	Howard Avenue	Dominion Boulevard	Expressway	100	4	yes

The poor east-west connectivity within the study area can be attributed to the physical barriers created by the following features:

- The CN Rail line that runs diagonally through the area, and limits the alternatives for connections between Dominion Boulevard, Dougall Avenue and Howard Avenue.
- Large properties occupied by industrial land uses, i.e. the Van de Water Rail Yard, and Zalev's Scrap Yard that limits the alternatives for connections between Dominion Boulevard, Dougall Avenue and Howard Avenue.
- Large properties occupied by commercial land uses, i.e. the Roundhouse Centre and the commercial development along the east side of Dougall Avenue south of West Grand Boulevard, in combination with the large residential subdivision on the lands between these two commercial sites. This residential area centred on Kenilworth Drive precludes a direct connection between Dougall Avenue and Howard Avenue.

The E.C. Row Expressway running east-west and bisecting the Central Box study area also imposes limitations on alternatives for east-west travel in the vicinity of the Dougall Avenue interchange due to intersection spacing requirements north and south of the ramp terminals. This includes the restriction on South Cameron Boulevard to right turns only at its intersection with Dougall Avenue to the north of the north ramp terminal, and the discontinuity of Grand Marais Road W at Dougall Avenue.

Consequently, east-west travel within the Central Box study area is limited to the following:

- Circuitous and discontinuous routing via South Cameron Boulevard between Dominion Boulevard, Dougall Avenue, and Howard Avenue;

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

- Circuitous routing via Ouellette Avenue and Edinborough Street between Dougall Avenue and Howard Avenue;
- A direct route via West Grand Boulevard between Dominion Boulevard and Dougall Avenue, but indirect to Howard Avenue via South Cameron Boulevard; and
- The use of the E.C. Row Expressway for short trips from one interchange to the next which results in an increase in weaving traffic volumes between the closely spaced Dominion Boulevard, Dougall Avenue and Howard Avenue interchanges. This is supported by the 1993 E.C. Row Expressway Traffic Evaluation and Planning Study, which noted that a significant portion of the peak hour traffic consisted of local trips between Dominion Boulevard and Howard Avenue.

3.4.5.1 E.C. Row Expressway Interchange Ramps

A review of the E.C. Row Expressway interchange geometrics at Dominion Boulevard, Dougall Avenue, and Howard Avenue was completed, and it was found that there were no significant deficiencies which could lead to any safety or operational concerns. The north/south-west ramps at Dominion Boulevard and Dougall Avenue have a Length of Curve (L_c) that is slightly shorter than desirable; however, the overall length of the speed change lanes still meets the Ontario Traffic Manual standard, and will not affect the operations at the ramps.

South Cameron Boulevard is primarily a two lane rural roadway with ditches, is classified as either a Class I or Class II Collector, and could be considered a partial east-west corridor. However, the corridor's continuity is broken by the physical barriers of the CN Rail tracks and the E.C. Row Expressway. Undesired / illegal traffic movements on Dougall Avenue were noted for vehicles who desired to use South Cameron Boulevard as an east-west corridor.

3.4.5.2 Transit

It is noted that there is no Transit Windsor service on the east-west routes discussed above, which results in circuitous travel and longer travel times for transit users making east-west trips between the major north-south corridors in the Central Box study area.

3.4.5.3 Active Transportation

East-west travel for active transportation users is constrained. No continuous east-west route currently exists to facilitate east-west travel across the Central Box study area. The facilities and/or deficiencies associated with the existing east-west routes are summaries in Table 3.29 below.

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Table 3.29 Active Transportation East-West Corridors

Street Name	From Street	To Street	Issues / Deficiencies	Existing AT Facilities	Bicycle Facility Identified in BUMP
Eugenie Street	Dougall Avenue	Ouellette Avenue	Shared roadway uncomfortable for cyclists and pedestrians at motor vehicle speeds of 50km + Driveways and intersections present several conflict zones	Sidewalks on both sides	Bike lane
Eugenie Street	Ouellette Avenue	Howard Avenue	Shared roadway uncomfortable for cyclists and pedestrians with existing motor vehicle speeds Driveways and intersections present several conflict zones	sidewalks on both sides	bike lane
Eugenie Street	Howard Avenue	South Pacific Avenue	No significant issues	Sidewalks on north side of street	Bike lane (Remington to South Pacific Avenue)
South Cameron Boulevard	Totten Street	Dougall Avenue	Narrow shared curb lanes are uncomfortable with motor vehicle speeds of 50km + and truck traffic for a broad group of cyclists. Good facility for travelling a considerable distance without stops / intersections.	Multi-use trail on SW side from Northwood Street to Dougall Avenue	Bike lane
South Cameron Boulevard	Grand Marais Road West	Howard Avenue	Comfortable facility, observed use by cars as paved shoulder to pull over, no signage or pavement markings to indicated bicycles should yield to pedestrians, no visible buffer or separation from motor vehicles	Multi-use trails (Dougall Avenue- South Cameron Trail) - west boulevard	Bike lane from West Grand Boulevard to Howard Avenue
Northwood Street	Virginia Park Avenue	South Cameron	Narrow shared roadway and curved road impedes sight lines and creates uncomfortable conditions for pedestrians and	No AT facilities from Virginia	Bike lane

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Street Name	From Street	To Street	Issues / Deficiencies	Existing AT Facilities	Bicycle Facility Identified in BUMP
		Boulevard	cyclists	Park Avenue to South Cameron Boulevard to (sidewalks on both sides west of Virginia Park Avenue)	
Edinborough Street	Ouellette Avenue	Lillian Avenue	Wide curb lane makes a more comfortable shared roadway but sharp curve at Ouellette Avenue may compromise shared space for cyclists at curb if not delineated. Good potential for an east-west connection	Partial sidewalk on north side	Signed route
Grand Marais Road W	Bruce Avenue	Dougall Avenue	Short section of bicycle lanes missing, would connect trail end to existing bike lanes and to N-S route on Bruce Avenue	Sidewalk on south side	Bike lane
Grand Marais Road W	Dougall Avenue	South Cameron Boulevard	Route ends at Dougall Avenue sidewalk, no bicycle connection to signalized intersection to the north, May create personal safety concerns with travelling behind plaza, may have conflict with vehicles accessing loading area	Shared roadway with a short portion of multi-use trail just east of Dougall Avenue	None
West Grand Boulevard	Dominion Boulevard	South Cameron Boulevard	Narrow shared curb lanes with motor vehicle speeds of 50km+ are uncomfortable for a broad group of cyclists. Pedestrian bridge over Grand Marais Drain on north side at Virginia Park Avenue but no sidewalk on north side	Signed bicycle route; sidewalk on south side (gap near South Cameron Boulevard)	Bike lane

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3.4.5.4 E.C. Row Traffic Operations – Weaving Conditions

The weaving lengths, i.e. the sections in which cars are both attempting to merge into and out of traffic from the on and off ramps, were reviewed along the E.C. Row Expressway. Best practices suggest that any weaving lengths should be kept above 600 metres to ensure appropriate space for merging and existing. For shorter lengths, analysis should be undertaken, since any length creating a lower operational speed could be considered a weaving problem. Based on our review, the weaving length between Dominion Boulevard and Dougall Avenue is 465 metres, and between Dougall Avenue and Howard Avenue is 335 metres.

Analysis was undertaken in order to better understand the weaving conditions along the E.C. Row Expressway between the closely spaced interchanges within the study area. A summary of the results is provided below, and detailed traffic volumes and results of analysis using HCS+ software are included in Appendix B2.

Traffic counts were collected for the E.C. Row Expressway specifically between the section of Dominion Boulevard and Dougall Avenue, and video counts were undertaken in April 2015 during the a.m. and p.m. peak periods to capture ramp and mainline (through traffic) volumes in both the eastbound and westbound directions. Specifically, the video counts were utilized to determine merging, diverging and through movements. It should be noted that during data collection, construction was underway on a section of the E.C. Row Expressway just east of the Howard Avenue interchange; modifications were made to the traffic data using 2014 ramp volumes to account for possible discrepancies from the impact of the construction on traffic volumes.

For the section between Dougall Avenue and Howard Avenue, the existing 2014 on and off ramp volumes were used along with volumes within the 1993 Traffic Evaluation and Planning Study – E.C. Row Expressway (Dillon Consulting) to determine the a.m. and p.m. peak period merge, diverge, and through percentages. These were subsequently applied to the existing ramp volumes to obtain the weaving volumes for analysis. Truck percentages were also determined with reference to the 1993 Study.

Using HCS+ software, the level of service (LOS) was determined for both the weaving sections along the Expressway, as well as for the on and off ramps. The results are presented in Table 3.30 and 3.31 below.

Table 3.30 Weaving Section Analysis – E.C. Row Expressway

Direction	Weaving Section	AM Peak Hour	PM Peak Hour
EB	Dominion Boulevard – Dougall Avenue (465 m weaving section)	LOS B	LOS B (LOS B)
	Dougall Avenue – Howard Avenue (335 m weaving section)	LOS B	LOS C (LOS C)
WB	Howard Avenue – Dougall Avenue	LOS B	LOS B

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Existing Conditions

	(335 m weaving section)		
	Dougall Avenue – Dominion Boulevard (465 m weaving section)	LOS B	LOS B

The results indicate that the weaving sections between Dominion Boulevard and Howard Avenue are currently operating at LOS C or better in both the eastbound and westbound directions, which is an acceptable LOS.

Table 3.31 Ramp Analysis – E.C. Row Expressway

Direction	E.C. Row Expressway Section	Merge/Diverge	AM Peak Hour	PM Peak Hour
EB	Dominion Boulevard – Dougall Avenue	Merge (on-ramp)	LOS B	LOS B (LOS B)
		Diverge (off-ramp)	LOS B	LOS B (LOS B)
	Dougall Avenue – Howard Avenue	Merge (on-ramp)	LOS B	LOS B (LOS B)
		Diverge (off-ramp)	LOS B	LOS B (LOS B)
WB	Howard Avenue – Dougall Avenue	Merge (on-ramp)	LOS D	LOS C
		Diverge (off-ramp)	LOS C	LOS B
	Dougall Avenue – Dominion Boulevard	Merge (on-ramp)	LOS C	LOS B
		Diverge (off-ramp)	LOS D	LOS C

The ramp analysis indicates that operations at the on and off ramps are all operating at good/acceptable LOS during both the a.m. and p.m. peak periods.

3.4.5.5 E.C. Row Expressway – Collision Data

Collision data was provided by the City of Windsor for the entire section of the E.C. Row Expressway for the 5-year period from 2007 through to 2011. This data included collision history along the mainline, collector, transfer, and ramp facilities, and is outlined in the technical memorandum included in Appendix B2.

Tables 3.32 and 3.33 below include the collision data provided by the City of Windsor. ‘Predicted Collisions’ were determined based on a formula that takes into consideration the collision rate, estimated daily traffic, and section length to identify a reasonable number of collisions that may

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be expected; 'Excess Collisions' are collision numbers above the predicted collisions, and identify potential safety concerns.

Table 3.32 E.C. Row Expressway Mainline Midblock Collisions

Road Section	Count Date	Section Length (km)	Est. Average AADT (2007-2011) ¹	Total Collisions (2007-2011)	Collision Rate (collisions per MVkm)	Predicted Collisions	Excess Collisions (2007-2011)
<i>EB Direction</i>							
Huron Church to Dominion	1991 2006	0.37	25,800	31	1.80	7	24
Dominion to Dougall	1991 2006	1.14	29,100	27	0.45	24	3
Dougall to Howard	2006 2010	0.74	36,440	53	1.08	19	34
<i>WB Direction</i>							
Howard to Dougall	2006 2010	0.74	36,320	17	0.35	19	-2
Dougall to Dominion	1991 2006	1.14	29,240	15	0.25	24	-9
Dominion to Huron Church	1991 2006	1.17	19,740	22	0.52	17	5
¹ Estimated averaged AADT (Average Annual Daily Traffic) over 5 year period was based upon growth rate from historical volumes.							

Table 3.33 E.C. Row Expressway Ramp Collisions

Ramp Section	Count Date	Section Length	Est. Average AADT (2007-2011) ¹	Total Collisions (2007-2011)	Collision Rate (collisions per MVkm)	Predicted Collisions	Excess Collisions (2007-2011)
<i>Dominion Boulevard</i>							
EB Off-Ramp	2004	0.56	1,100	3	2.67	0	3
WB On-Ramp	2010	0.55	980	1	1.02	0	1
WB Off-Ramp		0.55	11,100	5	0.45	5	0
EB On-Ramp		0.53	10,420	4	0.40	4	0
<i>Dougall Avenue</i>							
WB On-Ramp	2004	0.57	7,640	1	0.13	3	-2

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Existing Conditions

Ramp Section	Count Date	Section Length	Est. Average AADT (2007-2011) ¹	Total Collisions (2007-2011)	Collision Rate (collisions per MVkm)	Predicted Collisions	Excess Collisions (2007-2011)
EB Off-Ramp	2010	0.63	7,560	6	0.70	4	2
WB Off- Ramp		0.51	8,360	14	1.79	3	11
EB On-Ramp		0.48	8,560	0	0.00	3	-3
<i>Howard Avenue</i>							
WB On-Ramp	2000	0.43	8,680	1	0.15	3	-2
EB Off-Ramp	2004	0.56	9,580	8	0.82	4	4
WB Off-Ramp	2010	0.68	10,340	2	0.16	6	-4
EB On-Ramp (N-E)		0.75	3,800	2	0.38	2	0
EB On-Ramp (S-E)		0.68	5,380	1	0.15	3	-2
¹ Estimated averaged AADT over 5 year period based upon growth rate from historical volumes;							

3.5 EXISTING INFRASTRUCTURE

3.5.1 Dominion Boulevard

3.5.1.1 Utilities / Illumination

Dominion Boulevard within the study area is serviced by existing underground utilities including sanitary sewers, watermains, gas mains, underground hydro and telecommunication lines. Streetlights are located on both sides of the street and traffic signals/infrastructure is located at the Northwood Street, E.C. Row Expressway Ramp Terminals, Labelle Street and Grand Marais Road West intersections. The section of roadway south of Northwood Street has storm sewers, and the section of roadway north of Northwood Street is flanked by roadside ditches and culverts to drain stormwater runoff.

Alexandra Avenue is serviced by existing underground utilities including sanitary sewers, watermains, gas mains, underground hydro and telecommunication lines. Streetlights are located on the west side of the street.

3.5.1.2 Stormwater Management

Stormwater runoff from Dominion Boulevard south of Northwood Street is collected by existing curbside catch basins, connecting to storm sewers on either side of the roadway, which ultimately outlet to Grand Marais Drain.

Stormwater runoff along Dominion Boulevard from Northwood Street to Ojibway Street drains into existing roadside ditches with sections of covered culverts. The roadside ditches drain into

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an existing storm sewer system west of Dominion Boulevard, which conveys flow via a storm trunk sewer along Cleary Street to St. Clair Avenue which ultimately outlets to Grand Marais Drain. This section of Dominion Boulevard falls under the *South Cameron Planning Area Functional Design Report Sanitary and Storm Drainage* dated October, 1992 prepared by M.M. Dillon Limited.

3.5.2 Dougall Avenue – Ouellette Place

3.5.2.1 Utilities / Illumination

Dougall Avenue within the study area is serviced by existing underground utilities including storm sewers, watermains, gas mains, overhead and underground hydro and telecommunication lines. Streetlights and hydro poles are located on both sides of the roadway and traffic signals/infrastructure is located at the Eugenie Street West, E.C. Row Expressway Ramp Terminals and West Grand Boulevard. Sanitary sewers are located on Dougall Avenue between Ouellette Place and Eugenie Street West and Dougall Avenue south of West Grand Boulevard. There is also a section of sanitary sewer north of the E.C. Row Expressway and south of the CN Rail Crossing that crosses Dougall Avenue from the South Cameron Boulevard easement to Bruce Avenue.

Ouellette Place, between Dougall Avenue and Ouellette Avenue, and Ouellette Avenue, between Ouellette Place and Eugenie Street, are serviced by existing underground utilities including storm sewers, watermains, gas mains, overhead and underground hydro and telecommunication lines. Streetlights are located on both sides of the roadway and traffic signals/infrastructure is located at the intersection of Ouellette Avenue and Eugenie Street.

3.5.2.2 Stormwater Management

Stormwater runoff from Dougall Avenue, Ouellette Place and Ouellette Avenue within the study area is collected by existing curbside catch basins with a network of storm sewers that ultimately outlets to Grand Marais Drain.

3.5.2.3 CN Rail Crossing

The overpass structure located at Dougall Avenue just north of the South Cameron Boulevard intersection is part of the CN Rail CASO Subdivision (Mi. 222.71 CASO Sub).

Through consultation with CN Rail staff included in Appendix A2, it was determined that CN Rail no longer owns the land associated with the section of the rail lines at the Dougall Avenue overpass. Borealis is the current landowner, and CP Rail/CN Rail have operating rights. There are currently two trains that operate on this section of track; one in the morning, and another in the evening.

There were no plans identified by CN Rail staff for major reconstructions of the overpass structure. Through initial consultation, staff stated that CN Rail would be open to modifications to the

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existing overpass structure in the form of a pedestrian tunnel, provided a complete geotechnical review is undertaken and approved by CN Rail.

3.5.3 Howard Avenue

3.5.3.1 Utilities / Illumination

Howard Avenue within the study area is serviced by existing underground utilities including storm sewers, roadside drains at the south limit of the study area, sanitary sewers north of E.C. Row Expressway, a trunk feedermain and local watermains, gas mains, overhead and underground hydro and telecommunication lines. Streetlights and hydro poles are located on both sides of the roadway and traffic signals/infrastructure is located at Eugenie Street, McDougall Avenue, Edinborough Street, Grand Marais Road East, E.C. Row Expressway Ramp Terminals, Devonshire Mall Entrance and Division Road intersections.

Remington Avenue is serviced by existing underground utilities including storm sewers, watermains, gas mains, overhead hydro and telecommunication lines. Short sections of sanitary sewers are located between Hildegard Street and Eugenie Street East. Streetlights as well as the majority of hydro poles are located on the east side of the roadway.

3.5.3.2 Stormwater Management

Stormwater runoff from the section of Howard Avenue in the vicinity of South Cameron Boulevard drains into an existing network of open roadside storm sewers that ultimately outlet to Grand Marais Drain. Stormwater from the remainder of Howard Avenue within the study area drains into existing curbside catch basins with a network of storm sewers that ultimately outlets to Grand Marais Drain.

Stormwater from Remington Avenue drains into existing curbside catch basins which is then conveyed via a storm sewer system that ultimately outlets to Grand Marais Drain.

3.5.3.3 CN Rail Crossing

The at-grade crossing on Howard Avenue between South Cameron Boulevard and Division Road is part of the CN Rail CASO Subdivision (Mi. 221.80 CASO Sub). The rail line consists of two tracks, leading north to CN's Van de Water Rail Yard, and southeast past the City of Windsor boundary. According to the 2008 *Community Based Strategic Rail Study*, the Detroit River Tunnel Partnership (DRTP) owns this section of the rail corridor, while CN Rail owns and operates the rail infrastructure. Based on information in the 2003 *Howard Avenue Municipal Class Environmental Assessment*, there was an average of 6 to 8 trains movements per day, and the majority of these trains are carrying out shunting maneuvers at slow speeds (15mph or less) to and from the Van de Water Rail Yard. Through communication with CN Rail staff included in Appendix A2, CN Rail does not complete safety assessments for rail lines operating at 15mph or lower; no safety concerns have been identified by CN Rail.

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Exposure index is typically used as an indication of the level of disruption experienced by motorists due to train activity. Exposure index takes into account the daily traffic volumes and train volumes. An exposure index that exceeds 200,000 typically identifies a significant disruption, and grade separation should be considered. The exposure index for the Howard Avenue CN Rail crossing is calculated at approximately 120,000, not representing a significant disruption.

Unspecified operational and safety concerns were identified at this location in the 2008 Community Based Strategic Rail Study, likely due to its proximity to both the Howard Avenue/South Cameron Boulevard and Howard Avenue/Division Road intersections.

3.5.4 East-West Corridor

3.5.4.1 Utilities / Illumination

Eugenie Street, between Dougall Avenue and Howard Avenue, is serviced by existing underground utilities including storm sewers, sanitary sewers, watermains, gas mains, overhead and underground hydro and telecommunication lines. Streetlights and hydro poles are located on both sides of the roadways and traffic signals/infrastructure is located at the Dougall Avenue Ouellette Avenue, McDougall Avenue and Howard Avenue intersections.

The E.C. Row Expressway corridor within the study area is serviced with underground hydro for street lighting and stormwater runoff is conveyed via roadside ditches that outlet to storm sewers. Streetlights are located on both sides of the roadway and along the on and off ramps. Traffic signals/infrastructure is located at all ramp terminals along Dominion Boulevard, Dougall Avenue and Howard Avenue.

South Cameron Boulevard within the study area is serviced by underground utilities including sanitary sewers, watermains west of Dougall Avenue, gas mains, overhead hydro and telecommunication lines. Streetlights are located on one side of the roadway between Howard Avenue and West Grand Boulevard. There are no streetlights on South Cameron Boulevard between Dougall Avenue and the north study area limit. The roadway is flanked by roadside ditches and culverts to drain stormwater runoff.

3.5.4.2 Stormwater Management

A drain is located within the existing right-of-way east of Alexandra Avenue which outlets to an existing storm sewer at the Ojibway Street/Alexandra Avenue intersection, which ultimately outlets to the Grand Marais Drain. This area falls under the *South Cameron Planning Area Functional Design Report Sanitary and Storm Drainage* dated October, 1992 prepared by M.M. Dillon Limited.

Stormwater runoff from Eugenie Street between Dougall Avenue and Howard Avenue drains into existing curbside catch basins with a storm sewer system that ultimately outlets to Grand Marais Drain.

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Stormwater runoff from the E.C. Row Expressway drains into existing roadside ditches with sections of covered culverts, that outlet into storm sewers, which ultimately outlet to the Grand Marais Drain.

Stormwater runoff from South Cameron Boulevard drains into existing roadside drains with sections of covered culverts, which ultimately outlets to the Grand Marais Drain.

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Future Trends – Traffic Forecasting

4.0 FUTURE TRENDS – TRAFFIC FORECASTING

The analysis of the existing traffic conditions within each corridor was presented in the preceding chapters. In order to accommodate future needs, and to provide a framework for identifying impacts of potential improvements on the existing transportation network, a future growth model was prepared for the Central Box study area. Future growth was determined in consultation with the City of Windsor based on the potential for future development located within and adjacent to the Central Box study area within a 20 year planning horizon. Details on the future development areas and traffic forecasting methodology is included in Appendix C1. The total traffic generated by the new developments was compared to the existing (2014) traffic entering and exiting the study area to estimate the resultant growth in traffic.

Based on the forecasting exercise, it was determined that the range in a.m. and p.m. peak hour traffic growth due to the new developments within a 20-year period would range from 2.5%-3.6% for the a.m., and 3.8%-5.1% for the p.m. peak hour over the 20 year planning period.

In order to account for population and employment growth beyond the specific development areas provided by the City, i.e. general City-wide growth that may use the transportation network within the Central Box area, a 5% growth rate for both a.m. and p.m. peak periods was agreed upon. This 5% growth represents a modest growth rate of 0.25% per year. This was determined to be an appropriate growth rate model, and supported by historic traffic counts, which showed a range of approximately a 3%-4% increase to a 3%-4% decrease in traffic volumes.

This forecasting model was applied to the peak hour traffic movement analysis for the existing study area road network, as well as being used as the basis for manual reassignments of traffic to develop alternative forecasts with the addition of new or improved east-west links within the road network. The latter forecasts were used to assist in confirming how additional east-west connectivity would improve traffic operations within the study area, including the E.C. Row Expressway by diverting local traffic to alternate routes.

4.1 FUTURE TRAFFIC OPERATIONS

Analysis of the existing road network within the study area was undertaken with the addition of the forecasted traffic volumes. The results of the analysis are included in Appendix C2. The application of the modest growth rate of .25% per year or 5% over the 20 year planning period did not identify additional operational concerns, and was generally used to identify basic lane requirements during the development of alternative solutions. The analysis is also referenced during the evaluation in Section 8.0 below, representing the “Do Nothing” scenario.

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Public Consultation-Phase 1

5.0 PUBLIC CONSULTATION-PHASE 1

During this phase of the study, consultation initiatives were undertaken to better understand the existing conditions within the Central Box study area from the perspective of residents and commuters. The following section describes the points of contact and information received from the community prior to the first Public Meeting.

5.1 NOTICE OF COMMENCEMENT

The Notice of Commencement for the Central Box Class EA was published on August 14th and 16th in the Windsor Star newspaper (refer to Appendix A3). The Notice provided an overview of the project, and solicited initial comments from the public on transportation conditions within the Central Box study area. All comments received in response to the Notice of Commencement are included in Appendix A3 and are briefly summarized below.

Dominion Boulevard

- Safety concerns (for vehicles, pedestrians, and cyclists) noted in the area around Northwood Street and Dominion Boulevard due to high traffic volumes during school pick-up/drop off times;
- General congestion issues along Dominion Boulevard in the vicinity of Northwood Street, and poor compliance with on-street parking restrictions;
- An advanced left turn signal requested at Grand Marais Road;
- Signals requested at Ojibway Street and Dominion Boulevard.

Dougall Avenue – Ouellette Place

- Safety concerns related to operations/existing configuration of the Dougall Avenue/Ouellette Place intersection potentially affecting access to businesses in the area;
- The Dougall Avenue corridor between Ouellette Place and Grand Marais Road is too narrow for safe and efficient movement of emergency vehicles during peak periods;
- The Dougall Avenue/Ouellette Place corridor is a major barrier for active transportation and persons with physical disabilities. The CN Rail underpass is of particular concern.

Howard Avenue

- Active transportation facilities needed on Howard Avenue from South Cameron Boulevard south of the study area;
- Difficult traffic operations at the South Cameron Boulevard/Howard Avenue/Division Road/CN Rail intersection complex, including difficult left turns from South Cameron Boulevard onto Howard Avenue.

5.2 PUBLIC SURVEY

An online survey was also developed and published on the City of Windsor's Environmental Assessment website (www.windsoreas.ca) prior to the first Public Information Centre. This survey contained questions relating to transportation operations, active transportation, and other potential issues throughout the study area. The online survey was made available to residents, business owners, and others as a platform to provide input on existing transportation issues and priorities. The survey results are included in Appendix A7.

78 survey responses were received. Key findings are summarized below, with select survey responses shown in Figure 5.1 and Figure 5.2 below:

- The three highest priority improvements:
 1. Improve/provide facilities for pedestrians and cyclists
 2. Improve intersection safety
 3. Improve traffic flow/congestion within the Central Box study area

- The three highest priority corridors:
 1. Dougall Avenue – Ouellette Avenue Corridor
 2. Dominion Boulevard Corridor
 3. E.C. Row Expressway

- The three highest priority intersections:
 1. Dougall Avenue at Ouellette Place,
 2. Dougall Avenue at the E.C. Row Expressway
 3. Dominion Boulevard at Northwood Street

- The three most common barriers to walking and cycling within the Central Box study area:
 1. Lack of dedicated bicycle facilities
 2. Lack of sidewalks
 3. Difficult or complicated intersections

- Top three most preferred urban design elements with respect to Civic Ways:
 1. Street Trees
 2. Landscaping/plantings along roadways
 3. Street Furniture (benches, bike parking and other amenities)

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Public Consultation-Phase 1

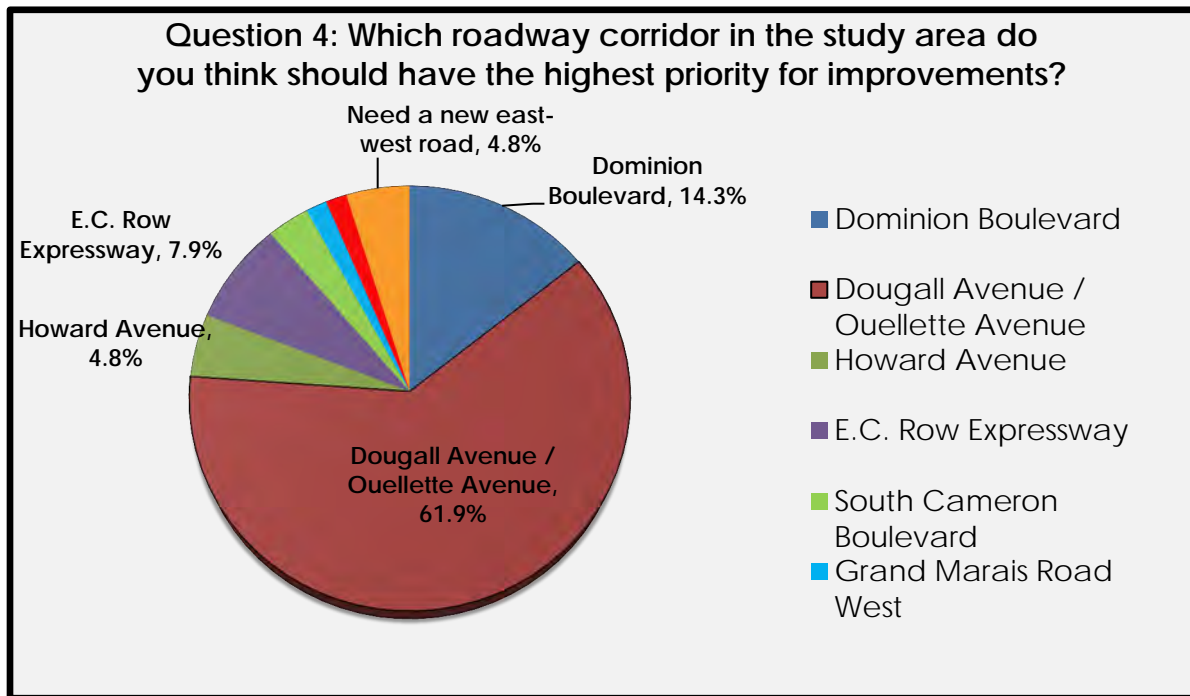


Figure 5.1 Survey Results

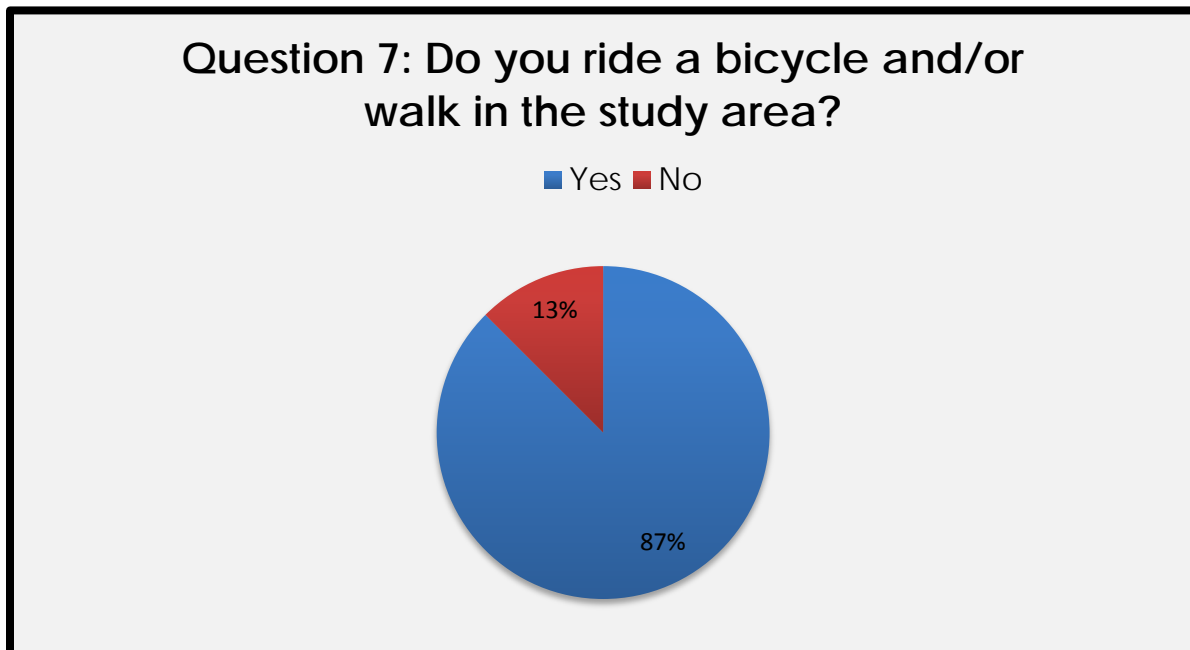


Figure 5.2 Survey Results

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Phase 2 – Alternative Planning Solutions

6.0 PHASE 2 – ALTERNATIVE PLANNING SOLUTIONS

As part of Phase II of the Class EA process, defining the framework and criteria for evaluating the alternative solutions for each corridor has been undertaken and all reasonable and feasible solutions that could be implemented to address the problem and/or deficiency have been identified. The following sections describe the problems and opportunities identified through the review of existing conditions, the transportation planning solutions considered, and the evaluation criteria and methodology utilized to develop the preferred planning solutions.

6.1 TRANSPORTATION NEEDS – PROBLEMS AND OPPORTUNITIES

Based on the review of the existing transportation network and traffic forecasting, the problems and opportunities within each corridor are summarized in the table below.

Table 6.1 Dominion Boulevard Problems and Opportunities

PROBLEMS	OPPORTUNITIES
ROAD NETWORK	
<ul style="list-style-type: none"> The 2 lane section of the corridor is operating at capacity; Role and function are not consistent with the Class I Collector and Local OP designations 	<ul style="list-style-type: none"> Designate Dominion Boulevard as a Class II Arterial and widen north of Northwood Street to a 3 or 4 lane cross section <u>or</u> Re-align via Alexandra Avenue as in the South Cameron Secondary Plan (2 or 3 lane cross section)
INTERSECTION OPERATIONS AND SAFETY	
<ul style="list-style-type: none"> Delays experienced accessing Dominion Boulevard from side streets and driveways; Surges in traffic related to institutional operating hours; Queue length storage for access to E.C. Row Expressway, and substandard taper lengths; Collision experience related to geometric design 	<ul style="list-style-type: none"> Widen north of Northwood Street to a 3 or 4 lane cross section to increase capacity and improve turning and access opportunities; Re-align via Alexandra Avenue (as outlined in South Cameron Secondary Plan) to address existing functional issues north of Northwood Street Examine opportunities to manage left turn queuing through signal timing adjustments, or geometric improvements (includes reconfiguration of E.C. Row Expressway interchanges); Examine intersection sight lines and geometrics for intersections prone to right angle collisions (i.e. Labelle Street)
ACTIVE TRANSPORTATION	
<ul style="list-style-type: none"> No cycling facilities along Dominion Boulevard; Limited/discontinuous active transportation facilities on intersecting streets (particularly 	<ul style="list-style-type: none"> Installation of bike lanes on Dominion as per BUMP; Enhance pedestrian crossings and visibility at

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PROBLEMS	OPPORTUNITIES
Northwood Street/Ojibway Street) for access to institutional land uses (schools, mosque, etc.).	intersections

Table 6.2 Dougall Avenue - Ouellette Avenue Problems and Opportunities

PROBLEMS	OPPORTUNITIES
ROAD NETWORK	
<ul style="list-style-type: none"> Corridor operating at capacity for a four lane arterial; Cross section constrains at CN Rail underpass; 	<ul style="list-style-type: none"> Widen Dougall Avenue and Ouellette Avenue to provide six basic lanes from Eugenie Street to West Grand Boulevard, including reconstruction of CN Rail underpass structure.
INTERSECTION OPERATIONS AND SAFETY	
<ul style="list-style-type: none"> Several intersections operating at or above capacity; Left turn lane storage deficiencies; Safety concerns related to merging and/or weaving 	<ul style="list-style-type: none"> Geometric improvements to improve skewed intersection alignments; Consider traffic control measures (signalization/roundabout) to improve operations at unsignalized intersections; Modification of right turn channelization to conventional right turns; Lengthening left turn storage lanes where required and feasible; Consider effects of general widening and new east-west intersections on operations, capacity, and traffic control requirements; Consider potential removal of northbound left turn restriction for trucks at E.C. Row Expressway north ramp terminal.
ACTIVE TRANSPORTATION	
<ul style="list-style-type: none"> Discontinuous sidewalks on the east side of Dougall Avenue; Discontinuous multi-use trail on west side of Dougall Avenue 	<ul style="list-style-type: none"> Provision of pedestrian and bicycle facilities on at least one side, preferably in the west boulevard to connect to existing multi-use path at South Cameron Boulevard; Provision of a dedicated active transportation crossing underneath the CN rail underpass; Upgrading of existing multi-use trail at driveway/ramp crossings and intersections to improve visibility, and clarify right of way (e.g. converting free flow right turn movements to conventional right turns).
Access Management	
<ul style="list-style-type: none"> Existing turning operations at commercial accesses along Ouellette Avenue and Ouellette Place result in concerns for the safety and efficiency of the arterial road and neighbouring intersections. 	<ul style="list-style-type: none"> Consider alternatives to modify the existing mountable median/drainage gutter to better facilitate left turn movements to and from private accesses (i.e. reconstruct to provide a centre left turn lane with a smoother surface); Consider alternatives to physically restrict mid-block left turns to and from private accesses (i.e. raised centre median on Dougall Avenue,

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PROBLEMS	OPPORTUNITIES
	channelization, and/or signed turn restrictions)
<ul style="list-style-type: none"> Northbound left turns from Dougall Avenue approaching Ouellette Place to Dougall Avenue heading north may exceed left turn storage length during peak hours. 	<ul style="list-style-type: none"> Consider partial signalization of this intersection as an interim measure that would facilitate the management of the northbound left turn queue, while having minimal effect on other traffic movements at the intersection. Consider full signalization of this intersection to facilitate all turning movements at this intersection.
<ul style="list-style-type: none"> Existing turning operations at the private access on Dougal Avenue south of West Grand Boulevard results in concerns related to safety and efficiency of operations along the arterial road. 	<ul style="list-style-type: none"> Consider extending the existing raised centre median on the south left of Dougall Avenue to a point that is south of the driveways that are located within the function area of the intersection. Based on the traffic data collected at these driveways, restricting access would affect a relatively small number of left turn movements.
<ul style="list-style-type: none"> Illegal U-turns recorded on Dougall Avenue northbound at the Van de Water Rail Yard access, resulting in safety and efficiency concerns since this northbound to southbound U-turn is made from the centermost through lane on Dougall Avenue. 	<ul style="list-style-type: none"> Consider increasing enforcement of the signed illegal U-turn movement; Consider options to relocate Van de Water Rail Yard access, close the access, and/or close the gap in the raised centre median; With or without relocating the Van de Water access (relocating would be preferred), consider removing the U-turn restriction and creating a northbound left turn lane by removing part of the existing raised centre median and landscaping.

Table 6.3 Howard Avenue Problems and Opportunities

PROBLEMS	OPPORTUNITIES
ROAD NETWORK	
<ul style="list-style-type: none"> No significant issues; corridor generally operating within capacity. 	<ul style="list-style-type: none"> Monitor growth within the corridor.
INTERSECTION OPERATIONS AND SAFETY	
<ul style="list-style-type: none"> Several intersections have inadequate left turn storage lane lengths that can result in delay and negative impacts on capacity in adjacent lanes, complicated by the at-grade CN rail crossing which may pose safety concern with proximity to adjacent intersections (should rail traffic increase). 	<ul style="list-style-type: none"> Lengthen left turn storage lanes where required and feasible; Consider dual left turn lane operations for the Howard Avenue eastbound approach to the Howard Avenue/Division Road/Devonshire Mall access intersection; Evaluate train volumes, safety, and traffic operations to determine the potential need for

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	improvements of the at-grade rail crossing at the Howard Avenue/Division Road/CN Rail/South Cameron Boulevard intersection complex.
ACTIVE TRANSPORTATION	
<ul style="list-style-type: none"> • Partial sidewalks and partial multi-use trail on east and west sides. • Frequency of commercial driveways, high speeds and volumes of traffic, right of way width constraints north of the E.C. Row Expressway 	<ul style="list-style-type: none"> • Provide sidewalks on both sides and bicycle facilities south of E.C. Row Expressway; • Consider alternate north-south cycling route to avoid conflict points with commercial driveways.

Table 6.4 East-West Problems and Opportunities

PROBLEMS	OPPORTUNITIES
ROAD NETWORK	
<ul style="list-style-type: none"> • General discontinuity of existing east-west roadways, providing circuitous routing between major north-south corridors. 	<ul style="list-style-type: none"> • Develop longer term alternatives for connecting Northwood Street and Edinborough Street to form a mid-block east-west collector between Eugenie Street and the E.C. Row Expressway. • Monitor traffic growth and operations on the E.C. Row Expressway to determine capacity improvements, including widening that would also improve the operations of the weaving sections between Dominion Boulevard, Dougall Avenue, and Howard Avenue interchanges.
INTERSECTION OPERATIONS AND SAFETY	
<ul style="list-style-type: none"> • Restricted access to South Cameron Boulevard from Dougall Avenue, limiting its function as an east-west route. 	<ul style="list-style-type: none"> • Develop interim alternatives for improved access to South Cameron Boulevard
ACTIVE TRANSPORTATION	
<ul style="list-style-type: none"> • General discontinuity of existing east-west travel routes; <p>EUGENIE STREET</p> <ul style="list-style-type: none"> • No cycling facilities implemented on Eugenie Street (cycling facilities identified in the BUMP) 	<ul style="list-style-type: none"> • Inclusion of active transportation facilities on any potential new east-west roads. • Installation of bike lanes (buffered or separated) from Dougall Avenue to Howard Avenue.
<p>NORTHWOOD STREET</p> <ul style="list-style-type: none"> • Discontinuous bike lanes • No facilities for pedestrians/cyclists east of Virginia Park Avenue 	<ul style="list-style-type: none"> • Continuation of bike lanes and sidewalks, potentially providing active transportation connection east to Dougall Avenue.
<p>SOUTH CAMERON BOULEVARD</p> <ul style="list-style-type: none"> • Discontinuous multi-use trail on southwest side from Northwood Street to Dougall Avenue. • Safety concerns at intersections (Dougall Avenue, and Howard Avenue). 	<ul style="list-style-type: none"> • Continuation of multi-use trail on all sections of South Cameron Boulevard; • Upgrade existing trails with pavement markings, signage, buffer, etc. • Upgrade existing intersections with pavement markings.

6.2 TRANSPORTATION PLANNING SOLUTIONS

In order to address the problems and opportunities identified for each corridor, the following planning solutions were considered:

Option #1 Do Nothing

The 'Do Nothing' alternative provides a scenario against which other alternatives can be evaluated. This scenario includes the forecasted growth occurring with no improvements to the transportation network.

Option #2 Travel Demand Management

Travel Demand Management (TDM) represents a broad range of initiatives that reduce the demand for vehicle capacity, resulting in more efficient use of the existing transportation network. This may include encouraging alternative modes of transportation (active transportation or public transit); carpooling; redistribution of travel demand to different areas or at different times, and/or parking policies and land use management.

Option #3 Transportation Systems Management

Transportation Systems Management is intended to enhance the capacity of the existing system at an operational level. This approach is designed to improve traffic flow, air quality, and movement of vehicles and goods, as well as enhance system accessibility and safety. Many of these strategies can be implemented at a low cost but are effective in nature and may include the following:

- Signal timing optimization;
- Turning lanes;
- Grade separations;
- Pavement markings;
- Lane assignment changes;
- Signage and lighting;
- Improvement to bottlenecks (insufficient acceleration and deceleration lanes, sharp horizontal and vertical curves, narrow lanes).

By implementing these types of improvements travel conditions including capacity reliability and safety especially during peak hours may be improved.

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Option #4 Active Transportation

Active transportation is a form of human powered transportation including walking, cycling, skateboarding, inline skating etc. These modes of human powered transportation not only provide health benefits and promote physical activity but they aid in reducing road congestion and contribute to the reduction of greenhouse gas emissions. Providing safe facilities for pedestrians, cyclists, and other forms of active transportation is an important element in the City of Windsor's transportation network.

Option #5 Construct New Roadways

The construction of new roadways can reduce congestion and provide alternate routes for commuters. This solution is mostly applied to reduce a high level of congestion along a corridor. The implementation of this option is complex and costly however the construction of a new road can draw vehicles away from nearby congested roads and improve the flow of traffic on the surrounding network. The construction of new roadways will be considered, where appropriate to address issues of capacity and connectivity.

6.2.1 Potential Transportation Planning Solutions

The transportation system within the Central Box study area requires improvements through a combination of measures including Active Transportation and TDM, transportation systems management and the construction of new roads due to the following:

- The Dominion Boulevard, Dougall Avenue-Ouellette Avenue, and Howard Avenue corridors have traffic volumes that are at or near roadway capacity.
- There are several intersections that require operational and/or geometric design improvements to improve safety and to increase efficiency during the busiest time periods.
- In the past 5 years, traffic volumes have demonstrated modest decreases with only a few roadways or intersections showing modest growth. Future traffic growth in the major corridors is constrained by their existing capacity and by current traffic demands.
- Improving east-west connectivity (other than the E.C. Row Expressway) will improve mobility and circulation for all modes of transportation, but especially for travel by transit, walking, and cycling.
- There are many gaps in the active transportation network as well as potential improvements to existing facilities that are needed to support and encourage these modes of transportation.
- Other than the E.C. Row Expressway, east-west routes are either discontinuous or circuitous, and there are several major physical barriers that would require complex and

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higher cost improvements to overcome (e.g. rail grade separations, property acquisition, etc.).

- There are several inconsistencies between the observed traffic volumes and operational characteristics and the functional classifications of certain roadways within the Official Plan (e.g. Dominion Boulevard).

Table 6.5 documents the results of the evaluation taking into consideration the comments received from the public up to this point in the study, and identifies the Planning Solutions carried forward to the development of design alternatives.

Table 6.5 Planning Solutions Carried Forward

CORRIDOR	ALTERNATIVES AND KEY RATIONALE
Dominion Boulevard	<ul style="list-style-type: none"> • North of Northwood Street: Restrict Access or Widen Dominion Boulevard (3 or 4 lanes) or Realign along Alexandra Avenue. • Provide Bike Lanes (conventional or separated) and Widen Sidewalks. • Various Intersection Improvements (traffic control, turn lanes, pavement markings, etc.). <p>Addresses Active Transportation, Traffic Operations, and Safety Issues.</p>
Dougall Avenue-Ouellette Corridor	<ul style="list-style-type: none"> • Provide Sidewalks (both sides) and Multi-Use Trail (west side); • Grade Separation for Multi-Use Trail at Rail Crossing; • General Widening (6 lanes) in Proximity to E.C. Row Expressway Interchange; • Various Intersection Improvements (traffic control, turn lanes, pavement markings, etc.); <p>Addresses Active Transportation, Traffic Operations, and Safety Issues.</p>
Howard Avenue Corridor	<ul style="list-style-type: none"> • North of E.C. Row Expressway: Provide Bike Lanes (separated) to McDougall Street and Sidewalks • South of E.C. Row Expressway: Multi-Use Trail (both sides) • Various Intersection Improvements (traffic control, turn lanes, pavement markings, etc.) • Improve or Grade Separate Rail Crossing <p>Addresses Active Transportation, Traffic Operations, and Safety Issues.</p>

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Phase 2 – Alternative Planning Solutions

CORRIDOR	ALTERNATIVES AND KEY RATIONALE
East-West Corridors	<ul style="list-style-type: none"> • Increase Accessibility to South Cameron Boulevard West of Dougall Avenue (shorter term measure) • Improve South Cameron Boulevard /Howard Avenue Intersection (shorter term measure) • Northwood Street – Edinborough Street Connection With Rail Grade Separation • West Grand Boulevard and Grand Marais Road East Connection With At-Grade Rail Crossing • E.C. Row Expressway Widening and Operational Improvements <p>Addresses East-West Connectivity and Circulation Issues for All Transportation Modes.</p>

6.3 LONG LIST OF ALTERNATIVE SOLUTIONS

Based on the Planning Solutions discussed above, a long list of alternative solutions was identified. Prior to Public Information Centre No. 1 (discussed below in Section 6.4), the long list of alternatives was screened using the following pre-screening criteria to assess the suitability for addressing the problems and opportunities within the Central Box study area:

- **Connectivity and Circulation** – Alternative solutions should contribute to a network of streets that allow for improved connectivity for all road users (motor vehicles, pedestrians and cyclists) and reduce constraints on local mobility.
- **Transportation Function** – Alternatives solutions should recognize appropriate roles for roadways and intersections in the study area and within the overall transportation system to provide for safe and efficient operations.
- **Urban Design** – Alternative solutions should include provisions for Civic Ways and public realm design recognizing the relationship of streets to surrounding neighbourhoods.
- **Cost and Constructability** – Alternative solutions should aim to minimize capital construction costs, long term life-cycle costs, construction impacts, level of complexity associated with implementation, repair and maintenance.

The long list of alternatives considered, followed by the prescreening evaluation tables are included in Tables below.

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Table 6.6 Dominion Boulevard Long List of Alternative Solutions

DOMINION BOULEVARD CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
OJIBWAY TO NORTHWOOD		
Road Network	Operational deficiencies related to turning movements to residential driveways, traffic volumes, speed, and function are not consistent with the Local Road classification.	Non-structural improvements: <ol style="list-style-type: none"> 1. Additional warning signage 2. Encourage higher use of alternative modes of transportation (Traffic Demand Management – TDM) 3. Diversion to other streets 4. Designate to a high road classification (Collector or Arterial) Structural Improvements: <ol style="list-style-type: none"> 1. Modify existing roadway to restrict turns to right-in /right-out (omit left turns) using centre median 2. Widen existing roadway to 3 lanes with centre left turn lane 3. Widen to 4 lanes 4. Construct new road – realignment as illustrated in South Cameron Secondary Plan
Active Transportation Pedestrian Connectivity	Narrow sidewalks 1.2m (1.8m AODA standard)	Non-structural improvements: None Structural Improvements: <ol style="list-style-type: none"> 1. Widen sidewalk to AODA standard 2. Widen sidewalk to 2.0m (due to location within a heavy pedestrian area)
Active Transportation Bicycle Connectivity	Absence of dedicated facilities	Non Structural Improvements: <ol style="list-style-type: none"> 1. Signage with or without pavement markings Structural Improvements: <ol style="list-style-type: none"> 1. Widen pavement within existing ROW to accommodate designated bike lanes (1.5m City standard or 1.8m for local conditions) 2. Widen pavement within existing ROW to accommodate separated bike lanes (2.0m min.)
NORTHWOOD TO WEST GRAND		
Active Transportation Pedestrian Connectivity	Narrow sidewalks 1.2m (1.8m AODA standard)	Non Structural Improvements: None Structural Improvements: <ol style="list-style-type: none"> 1. Widen sidewalk to 2.0m (due to location within a heavy pedestrian area)

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DOMINION BOULEVARD CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
Active Transportation Bicycle Connectivity	Absence of dedicated facilities	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Bicycle Route signage with or without pavement markings <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Widen pavement within existing right of way to accommodate designated bike lanes (1.5m City standard or 1.8m for local conditions) 2. Widen pavement within existing right of way to accommodate separated bike lanes (2.0m min.)
DOMINION BOULEVARD INTERSECTIONS		
Intersection	Problem Summary	Planning Solutions
Dominion / Ojibway	Delay for Ojibway Street approaches under stop control, left turn storage deficiencies for vehicles turning left onto Ojibway from Dominion	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Addition of all-way stop <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Modify existing roadway to restrict turns to right-in /right-out (omit left turns) using centre median 2. Addition of traffic signals 3. Construct a roundabout
Dominion / Northwood	Temporary periods of congestion related to school and mosque related activities; safety concerns related to misalignment of turning movements from the eastbound and westbound approaches; absence of dedicated left turn lanes on all approaches; pedestrian and cycling facility deficiencies	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Signal timing adjustments <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Provide dedicated left turn lanes on all approaches 2. Increasing radii of northwest and southwest corners of Northwood Street approaches to provide for bus and truck turning movements 3. Improve pedestrian and bicycle crossing treatments
Dominion / EC ROW Ramp N-E	Southbound left turn demand occasionally exceeds available storage provided in the left turn lane	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Signal timing adjustments <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Reconfigure the interchange including major structural changes to the E.C. Row Expressway (e.g. construct a Single Point Urban Interchange [SPUI], requiring a longer overpass structure on the Expressway) 2. Close the interchange in accordance with existing road classification (Class

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DOMINION BOULEVARD CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
		1 Collectors do not typically have interchanges on expressways or freeways) 3. Convert free-flowing right turns to standard right turns with improved active transportation crossings
Dominion / Labelle	Collision history and severity; no designated turning lanes; potential site line deficiencies on some approaches due to vegetation and frequent driveways;	Non Structural Improvements: <ol style="list-style-type: none"> 1. Signage (larger street signs, traffic signal ahead) 2. With pavement markings, reconfigure existing two lane approaches on Dominion Boulevard as a dedicated left turn lane and shared through/right/turn lane. 3. Improve pedestrian crossing visibility with zebra crossing pavement markings. 4. Vegetation removal (as necessary) to improve sight lines Structural Improvements: <ol style="list-style-type: none"> 1. General widening of Dominion Boulevard to accommodate left turn lanes and maintain two through lanes 2. Increase corner radii to enhance visibility of the intersection as well as to accommodate right turning movements by larger vehicles (transit, emergency, delivery, etc.)

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Table 6.7 Dominion Boulevard Pre-Screening Evaluation

DOMINION AVENUE CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTIBILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
OJIBWAY TO NORTHWOOD									
Road Network Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification	Do Nothing	Existing operational deficiencies will continue				N/A		Does not address issue.	
	Non-Structural Improvements								
	Additional warning signage							Although signage could be implemented immediately at a relatively low cost, option is not sufficient in addressing operational deficiencies.	
	Encourage higher use of alternatives modes of transportation (Transportation Demand Management - TDM)							TDM measures could be implemented immediately, and should become part of the City's overall sustainable transportation strategy.	
	Diversion to other streets							There are no appropriate alternate routes with capacity to accept diverted traffic.	
	Designate to a higher road classification (Collector or Arterial)							Can be initiated immediately to address incongruity with planning/policy road designation; carried forward in conjunction with structural improvements.	
	Structural Improvements								
	Modify existing roadway to restrict turns to right-in/right-out using centre median (omit left turns)								Improves safety along the corridor, while limiting access to private driveways to right-in/right-out.
	Widen existing roadway to 3 lanes with centre left turn lane								Accommodates access to private driveways and through traffic.
	Widen to 4 lanes								Accommodates access to private driveways and through traffic.
New road – realignment as indicated in South Cameron Secondary Plan with lower volumes and improved driveway accesses								Allows this section of Dominion Boulevard to revert to a local road function; diversion of some traffic improves private driveway access and through traffic operations on Dominion Boulevard. Function of Alexandra Avenue would be changed to a Collector Road.	
Active Transportation Pedestrian Network Narrow sidewalks 1.2m (1.8m AODA recommended)	Do Nothing	No improvement to existing conditions.				N/A		Does not address the current lack of safe facilities for active transportation users.	
	Structural Improvements								
Widen sidewalk to AODA standard (1.8 m)								Provides pedestrian facilities in accordance with AODA standards.	

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.7 Dominion Boulevard Pre-Screening Evaluation

DOMINION AVENUE CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTIBILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
	Widen sidewalk to 2.0m to accommodate moderate to heavy pedestrian traffic	✓	✓	✓	✓	✗	✓	Provides pedestrian facilities for increased pedestrian traffic in areas with several pedestrian-oriented destinations (schools/mosque).	
Active Transportation Bicycle Network Absence of dedicated facilities (Dominion is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)	Do Nothing	No improvement to existing conditions. Limited/uncomfortable bicycle operations.						✗	Does not address existing deficiency in bicycle facilities.
	Non-Structural Improvements								
	Bicycle route signage with or without sharrow pavement markings	✓	✓	✗	✓	✗	✗	Shared bike route not recommended due to speeds and volumes of motor vehicle traffic in the corridor and narrow curb lane.	
	Structural Improvements								
	Widen pavement within existing right-of-way to accommodate designated bike lanes	✓	✓	✓	✓	✗	✓	In accordance with the BUMP; improves north-south connectivity for cyclists.	
Widen pavement within existing right-of-way to accommodate separated bike lanes	✓	✓	✓	✓	✓	✗	✓	In accordance with the BUMP; improves north-south connectivity with slightly increased comfort/safety level due to separation, but with additional widening required.	
NORTHWOOD TO WEST GRAND									
Active Transportation Pedestrian Network Narrow sidewalks 1.2m (1.8 m AODA recommended)	Do Nothing	No improvement to existing conditions.						✗	Existing sidewalks do not meet AODA standards.
	Structural Improvements								
Widen sidewalk to 1.8 m – 2.0 m to accommodate moderate to heavy pedestrian traffic	✓	✓	✓	✓	✓	✗	✓	Provides enhanced pedestrian facilities to accommodate additional pedestrian traffic.	
Active Transportation Bicycle Network Absence of dedicated facilities	Do Nothing	No improvement to existing conditions. Limited/uncomfortable bicycle operations.						✗	Does not address issue
	Non-Structural Improvements								
	Bicycle route signage with or without sharrow pavement markings	✓	✓	✗	✓	✗	✗	Shared bike route is not recommended due to speeds and volumes of motor vehicle traffic in the corridor.	
	Structural Improvements								
Widen pavement within existing right-of-way to accommodate designated bike lanes	✓	✓	✓	✓	✓	✗	✓	In accordance with the BUMP; improves north-south connectivity for cyclists.	
Widen pavement within existing right-of-way to accommodate separated bike lanes	✓	✓	✓	✓	✓	✗	✓	In accordance with the BUMP; improves north-south connectivity with slightly increased comfort/safety level due to separation, but with additional widening required.	

✗	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
✓	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.7 Dominion Boulevard Intersections Pre-Screening Evaluation

DOMINION BOULEVARD INTERSECTIONS	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
<u>Dominion Boulevard/Ojibway Street</u> Delay for traffic on Ojibway Street attempting to access or cross Dominion Boulevard and traffic turning left from Dominion onto Ojibway Street	Do Nothing	Existing operational deficiencies will continue.							No improvement on existing conditions.
	<u>Non-Structural Improvements</u>								
	All-way stop								Decreased level of services for Dominion Boulevard with an all-way stop.
	<u>Structural Improvements</u>								
	Modify existing roadway to restrict turns to right in/right out using centre median (omit left turns)								Reduces conflicting movements, but with a decrease in north-south connectivity.
	Addition of traffic signals								Existing and forecasted traffic volumes on Ojibway Street approaches do not meet provincial signalization warrants within the 20 year planning period.
Construct a roundabout								High cost and property impacts for minimal benefit to a relatively small number of vehicle movements.	
<u>Dominion Boulevard /Northwood Street</u> Temporary periods of congestion related to school and mosque related activities; eastbound and westbound left turning movements are not aligned; absence of dedicated left turn lanes on all approaches; pedestrian and cycling facility deficiencies	Do Nothing	Existing operational deficiencies will continue.							No improvement on existing conditions.
	<u>Non-Structural Improvements</u>								
	Signal timing adjustments								Signal timing adjustments are regularly reviewed by the City as part of their overall transportation strategy.
	<u>Structural Improvements</u>								
	Part A - Provide dedicated left turn lanes on all approaches Part B - Increasing radii of northwest and southwest corners of Northwood approaches to provide for bus and truck turning movements								Improves efficiency and safety for left turn movements. Intersection improvements to be incorporated into the design of overall corridor improvements.
Improve pedestrian and bicycle crossing treatments								Improves visibility of intersection and improves safety for active transportation users. To be incorporated into the design of corridor improvements.	
<u>Dominion Boulevard /EC ROW Expressway Ramp N/S-E</u> Southbound left turn demand occasionally exceeds available storage provided in the left turn lane	Do Nothing	Existing safety concerns will continue.							Does not improve safety/operation concerns relating to weaving/merging in the vicinity of ramp terminals, or address active transportation crossing.
	<u>Non-Structural Improvements</u>								
	Signal timing adjustments								Signal timing adjustments are regularly reviewed by the City as part of their overall transportation strategy.
<u>Structural Improvements</u>									

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.7 Dominion Boulevard Intersections Pre-Screening Evaluation

DOMINION BOULEVARD INTERSECTIONS	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>
	Reconfigure the interchange including major structural changes to the E.C. Row Expressway (e.g. construct a Single Point Urban Interchange [SPUI], requiring a longer overpass structure on the Expressway)	✓	✓	✓	✗	✗	✓	Requires a longer overpass structure on the expressway. Higher cost and complex project that could be considered in conjunction with major rehabilitation of E.C. Row Expressway.
	Close the interchange – in accordance with existing road classification	✗	✓	✓	✓	✗	✗	Class 1 collectors do not typically have interchanges on expressways or freeways, however, closing this interchange would have a significant impact on community mobility and accessibility.
	Convert free-flowing right turns to standard right turns with improve active transportation crossings.	✓	✗	✓	✓	✗	✓	Potential decrease in intersection level of service for vehicles; however, may mitigate safety concerns related to merging traffic, and an enhanced active transportation crossing.
Dominion Boulevard /Labelle Street	Do Nothing	Existing safety concerns will continue.					✗	Does not address significant safety concerns for vehicles and motorists.
Collision history and severity; no designated turning lanes; potential sight line deficiencies on some approaches due to vegetation (boulevard tree canopy) and frequent driveways	Non-Structural Improvements							
	Signage (larger street signs, 'traffic signal ahead')	✓	✓	✗	✓	✓	✓	Improvements to intersection visibility for drivers.
	Reconfigure existing two lane approaches on Dominion as a dedicated left turn lane and a shared through/right turn lane	✓	✗	✗	✓	✗	✓	Improved safety for left turns (sight lines and operations), but may reduce some traffic capacity at the intersection
	Improve pedestrian crossing visibility with zebra crossing pavement markings	✓	✓	✗	✓	✓	✓	Improves safety conditions for pedestrians.
	Vegetation removal (as necessary)	✓	✓	✗	✓	✓	✓	Improves intersection visibility.
	Structural Improvements							
	General widening of Dominion to accommodate left turn lanes and maintain two through lanes	✓	✓	✓	✗	✗	✓	Increases traffic capacity, but with high costs and significant property impacts
	Increase corner radii to both enhance visibility of the intersection as well as to accommodate right turning movements by larger vehicles (service, emergency, delivery, etc.)	✓	✓	✗	✗	✗	✓	Potential safety improvements, but with higher costs as traffic signals would have to be relocated. This improvement could be implemented at a future date in conjunction with a larger intersection reconstruction/rehabilitation projects

✗	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
✓	Addresses problem/opportunities identified for criterion/carried forward for design analysis

CENTRAL BOX STUDY AREA
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Table 6.8 Dougall Avenue Corridor – Ouellette Avenue Corridor Long List of Alternative Solutions

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
EUGENIE / OUELLETTE AVE. TO DOUGALL AVE. / OUELLETTE PLACE		
Road Network	Operational deficiencies related to turning movements at commercial accesses; centre median configurations; at or approaching capacity during peak hrs.	<p>Non-structural improvements:</p> <ol style="list-style-type: none"> 1. Signal timing adjustments 2. Encourage higher use of alternatives modes of transportation - TDM 3. Diversion to other streets <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Modify existing roadway to restrict turns to right-in /right-out (omit left turns) using centre median 2. Modify existing roadway to facilitate left turn movements by converting existing median to Two-Way Left Turn Lane or designated left turn lane 3. Widen roadway to 6 lanes
Active Transportation Pedestrian Connectivity	Minimal dedicated facilities	<p>Non-structural improvements: None</p> <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Construct sidewalks on both sides of the corridor (1.8m or 2.0m)
Active Transportation Bicycle Connectivity	Absence of dedicated facilities	<p>Non Structural Improvements: None</p> <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Construct multi-use trail (3.0m or 3.5m)
DOUGALL AVE. / OUELLETTE PLACE TO DOUGALL AVE. / WEST GRAND		
Area of Concern	Problem Summary	Planning Solutions
Road Network	Operational deficiencies related to access to east-west corridors (South Cameron); at or approaching capacity during peak hours; cross section constraints at CN underpass; merging and weaving along corridor	<p>Non-structural improvements: None</p> <p>Structural:</p> <ol style="list-style-type: none"> 1. Introduction of new east-west corridor 2. Widen roadway to 6 lanes 3. Reconfigure E.C. Row Expressway ramps to replace free flowing right turn movements at on and off ramps with conventional right turn movements.

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DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
Active Transportation Pedestrian Connectivity	Narrow sidewalks	Non-structural improvements: None Structural: 1. Widen sidewalk to 2.0m (due to location within a heavy pedestrian area)
Active Transportation Pedestrian/Bicycle Connectivity	Minimal dedicated facilities north of south Cameron; no facilities on east side of corridor; no crossing of CN Rail line; partial multi-use trail	Non-structural improvements: None Structural: 1. Construct multi-use trail along the west boulevard from Ouellette Place to Grand Marais Road (3.0m or 3.5m), including tunnel crossing under CN Rail underpass 2. Provide continuous sidewalks and on street bike lanes (requires new bridge) 3. Widen the roadway to provide separated bike lanes
DOUGALL – OUELLETTE PLACE INTERSECTIONS		
Intersection	Problem Summary	Planning Solutions
Dougall / Ouellette Place	Collision history (highest in the City); incomplete Active Transportation Network; skewed intersection geometric design; low compliance with stop control on Dougall Avenue approach; northbound left turn storage limitations; northbound to southbound U-turns	Non Structural Improvements: None Structural Improvements: 1. Improve geometric design to reduce skew angle of Dougall Ave. approach 2. Addition of traffic signals (full or partial) 3. Construct a roundabout 4. Remove southbound stop condition and provide an additional southbound lane for free flow traffic movement until reaching a merge point north of the Van de Water Rail Yard
Dougall / Van de Water	Illegal northbound to southbound U-turns	Non Structural Improvements: None Structural Improvements: 1. Allowing U-turns at CN's Van der Water yard access by providing a proper left turn lane and removing existing U-turn prohibition 2. Close median gap and restrict Van de Water access to right-in/ right-out only or relocate entrance
Dougall / South	No northbound access from Dougall Ave.; safety of the	Non Structural Improvements: None

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DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
Cameron	eastbound to southbound right turn movement into a potential weaving area on Dougall southbound; active transportation conflicts at channelized crossing	<p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Modify the intersection design by removing the channelizing island in the South Cameron Boulevard approach 2. Allow northbound left turns by removing a portion of the centre median, while maintaining the restriction of eastbound to northbound left turns from South Cameron Boulevard to Dougall Avenue 3. Construct a north-south multi-use trail crossing across the South Cameron Boulevard leg of intersection
Dougall / E.C ROW Ramps	Merging and weaving; active transportation conflicts at free flow ramp crossings; access to intersection from private properties (EMS and U-Haul); potential left turn storage issues at northbound left turn lanes to EC ROW ramps; truck U-turns occurring downstream of intersection due to northbound left turn restriction at E.C. Row Expressway north ramp terminal	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Signal timing adjustments 2. Remove northbound to westbound left turn truck turning restriction for access to the westbound E.C. Row Expressway <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Remove right turn channelization (free flow ramp movements) to conventional right turn lanes with trail crossing (includes review of signal timing adjustments with right turns being under signal control)
Dougall/West Grand Boulevard	Proximity of commercial accesses east and west of Dougall Avenue, and immediately south of West Grand Boulevard	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Signage (and supporting by-law) to prohibit left turns to or from commercial properties <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Extend centre median on south leg of Dougall Avenue to physically restrict commercial accesses to right turns only 2. Channelize entrances to restrict to right-in/right-out

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Table 6.9 Dougall Avenue – Ouellette Place Pre-Screening Evaluation

DOUGALL-OUELLETTE AVENUE CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
EUGENIE/OUELLETTE AVENUE TO DOUGALL AVENUE/ OUELLETTE PLACE									
Road Network Operational deficiencies - turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours	Do Nothing	Existing operational deficiencies will remain.							Does not address operational deficiencies.
	Non-Structural Improvements								
	Signal timing adjustments								Regularly reviewed by City
	Encourage higher use of alternatives modes of transportation – TDM								TDM measures could be implemented immediately, and should become part of the City's overall sustainable transportation strategy.
	Diversion to other streets								There are no appropriate alternate routes with capacity to accept diverted traffic.
	Structural Improvements								
	Modify existing roadway to restrict turns to right-in/right-out using centre median (omit left turns)								Reduces conflicting movements to improve safety conditions, with restricted access to commercial driveways.
	Modify existing roadway – replace median with a two-way left turn lane (TWLTL) or a designated left turn lane for a specific direction only								Facilitates left turn movements that are currently being made from the unmarked centre median area. No improvement to safety conditions.
Widen the roadway to 6 lanes								Provides increased vehicle capacity, but may negatively impact the operations of the corridor with the frequency of commercial accesses. Added safety concerns related to accessing commercial driveways, and the creation of weaving conditions. Feasibility issues relating to right of way constraints, which will require significant property acquisition and modification to the existing CN Rail overpass structure. Significant impacts to existing properties and accesses along the corridor.	
Active Transportation Pedestrian Network Minimal dedicated facilities	Do Nothing	Existing deficiencies and safety concerns will remain.							Does not address existing deficiencies and safety concerns.
	Structural Improvements								
Construct sidewalks on both sides of the corridor (1.8m - 2.0m)								Sidewalks wider than 1.5m standard would accommodate higher levels of pedestrian activity travelling to local destinations.	
Active Transportation Bicycle Network	Do Nothing	Existing deficiencies and safety concerns will remain.							Does not address existing network deficiencies or safety concerns.

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.9 Dougall Avenue – Ouellette Place Pre-Screening Evaluation

DOUGALL-OUELLETTE AVENUE CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
Absence of dedicated facilities (Dougall is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)	Structural Improvements								
	Construct a boulevard multi-use trail	✓	✓	✓	✓	✗	✓	Multi-use trail would improve connectivity for cyclists, with several conflict points with commercial driveways (bike lanes are not being considered due to the high speeds and volumes of traffic, and significant right of way constraints, i.e. CN Rail underpass).	
DOUGALL AVENUE/ OUELLETTE PLACE TO DOUGALL AVENUE/ WEST GRAND BOULEVARD									
Road Network Operational deficiencies: difficult to access east/west corridors (South Cameron), traffic demands are at or near capacity during peak hours, cross section constraints (property required) at CN underpass (if widened to 6 lanes), merging and weaving traffic along corridor	Do Nothing	Existing deficiencies and safety concerns will remain.						✗	Does not address issue.
	Structural Improvements								
	Introduction of new east-west corridor	✓	✓	✓	✗	✗	✓	Provides flexibility for circulation and diversion from Dougall Avenue.	
	Widen the roadway to 6 lanes	✓	✓	✓	✗	✗	✓	Provides increased vehicle capacity, but with added safety concerns related to accessing commercial driveways. Feasibility issues relating to right of way constraints (property acquisition and existing CN Rail overpass structure).	
	Reconfigure E.C. Row Expressway ramps to replace free flowing right turn movements at on and off ramps with conventional right turn lanes	✓	✓	✓	✓	✗	✓	Eliminates traffic weaving areas and reduces potential for mid-block collisions, but results in some reduction in the capacity for traffic at the ramp terminal intersections.	
Active Transportation Pedestrian and Bicycle Networks Disconnected sidewalk facilities and no bicycle facilities north of South Cameron Boulevard, no pedestrian or bicycle facilities crossing under CN Rail line, disconnected multi-use trail in west boulevard (Dougall is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)	Do Nothing	Existing deficiencies and safety concerns will remain.						✗	Does not address deficiency in active transportation facilities.
	Structural Improvements								
	Construct multi-use trail along the west boulevard between Dougall Avenue-Ouellette Place and Grand Maris Road and provide tunnel crossing under CN rail (no change to existing underpass at crossing of CN rail)	✓	✓	✓	✗	✗	✓	Provides connectivity for active transportation between existing sections of multi-use trail.	
	Provide continuous sidewalks on both sides of Dougall Avenue	✓	✓	✓	✗	✗	✓	Provides connectivity for pedestrians and access to commercial properties.	
	Widen the roadway to provide separated bike lanes	✓	✓	✓	✗	✗	✓	Requires widening of CN overpass. Separated facilities would likely be required due to vehicles volumes and speeds, requiring additional property/widening.	

✗	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
✓	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.9 Dougal Avenue Corridor – Ouellette Avenue Corridor Intersection Pre-Screening Evaluation

DOUGALL AVENUE INTERSECTIONS	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
Dougal Avenue/ Ouellette Place Collision history (highest in City), lack of active transportation facilities, geometric design with skewed intersection, drivers not obeying stop sign on Dougall approach, northbound left turn storage (long queues back up into travel lanes), northbound to southbound U-turns including large trucks	Do Nothing	Existing deficiencies and safety concerns will remain.							Does not address issue.
	Structural Improvements								
	Improve geometric design to reduce skew angle of Dougall Ave. approach								Improves sight lines at intersection where many rear end collisions occur.
	Add traffic signals (full or partial signalization options)								Manages northbound left turns, and/or provides a controlled pedestrian crossing.
	Construct a roundabout								Facilitates left turns and U-turns while maintaining traffic flow; however, significant property and construction impacts.
Remove southbound stop condition and provide an additional southbound lane for free flow traffic movement until reaching a merge point north of the Van de Water rail yard access								Does not address safety issues related to conflicts and merging southbound through traffic.	
Dougal Avenue /Van de Water Place Illegal northbound to southbound U-turns are occurring	Do Nothing							Does not address issue.	
	Structural Improvements								
	Allow U-turns at CN's Van der Water yard access by providing a proper northbound left turn lane (remove a portion of the existing centre median) and remove the existing U-turn prohibition								Facilitates north to south U-turns that are being made illegally today, and provides access to South Cameron Blvd (westbound).
Close the existing gap in the centre median and restrict the Van de Water access to right-in/ right-out only or relocate this access								Eliminates potential for illegal U-turns, but also reduces accessibility for legitimate access to rail yard.	
Dougal Avenue /South Cameron Boulevard No northbound access from Dougall Avenue, safety of the eastbound to southbound right turn movement into a potential weaving area on Dougall Avenue southbound, active transportation crossings of the South Cameron Boulevard leg of the	Do Nothing	Existing deficiencies and operational concerns will remain.							Does not address issue.
	Structural Improvements								
	Modify the intersection design by removing the channelizing island in the South Cameron Boulevard approach								Simplifies intersection operations and eliminates the potential for weaving traffic in the short curb lane section between South Cameron Blvd and E.C. Row Expressway north ramp terminal.
Allow northbound left turns by removing a portion of the centre median, while maintaining the restriction of eastbound to northbound left turns from South Cameron Boulevard to Dougall Avenue								Facilitates desired access to South Cameron Blvd (westbound), but creates a hazardous condition on Dougall Ave due to the close proximity of the E.C. Row Expressway north ramp terminal.	

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.9 Dougal Avenue Corridor – Ouellette Avenue Corridor Intersection Pre-Screening Evaluation

intersection	Construct a multi-use trail crossing across the South Cameron leg of the intersection	✓	✓	✓	✓	✗	✓	Improves safety and connectivity for active transportation.
E.C ROW Expressway Ramps Merging and weaving traffic; active transportation conflicts at free flow ramp crossings; uncontrolled access to intersection from private properties (EMS and U-Haul); potential left turn storage issues within northbound left turn lanes to EC ROW ramps; truck U-turns occurring downstream of intersection due to northbound to westbound left turn restriction at E.C. Row Expressway north ramp terminal.	Do Nothing	Existing safety and operational concerns will remain.					✗	Does not address issue.
	Non-Structural Improvements							
	Signal timing adjustments	✓	✓	✗	✓	✓	✓	Signal timing is regularly reviewed by the City of Windsor as part of their overall transportation strategy.
	Remove turning restriction signage (and supporting by-law) and allow trucks to make northbound left turns to access the westbound E.C. Row Expressway	✓	✓	✗	✓	✓	✓	Accommodates truck access to the E.C. Row Expressway (Dougall Ave is a designated truck route), and reduces or eliminates the potential for trucks making U-turns further north on Dougall Ave.
	Structural Improvements							
Remove right turn channelization (free flow ramp movements) and convert to conventional right turn lanes with multi-use trail crossing (includes a review of signal timing with right turns being under signal control)	✓	✓	✓	✓	✗	✓	Improves safety by removing existing traffic weaving areas (which are short and high volume), and reduces the potential for mid-block collisions, but may result in some reduction in traffic capacity at the ramp terminal. A review of signal timing with right turns under signal control is required.	
West Grand Boulevard Proximity of commercial driveways east and west of Dougall Avenue, and immediately south of West Grand Boulevard (within 70m of the intersection)	Do Nothing	Existing safety concerns will remain.					✗	Does not address issue.
	Non-Structural Improvements							
	Signage (and supporting by-law) to prohibit left turns to or from these properties	✗	✓	✗	✓	✗	✗	Does not address issue since the effectiveness of this alternative relies on drivers obeying the signage and enforcement by police since left turns would not be physically prevented.
	Structural Improvements							
Extend centre median on south leg of Dougall Ave. to physically restrict commercial driveway accesses to right turns only.	✗	✓	✓	✓	✗	✓	Addresses issue by physically restricting problem traffic movements.	
Channelize entrances (pork chop islands) to restrict to right-in/right-out	✗	✓	✗	✓	✗	✗	May increase safety concerns, since channelizing islands may be circumvented by left turning vehicles.	

✗	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
✓	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.10 Howard Avenue Long List of Alternatives

HOWARD AVENUE CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
Active Transportation Pedestrian/Bicycle Connectivity	Incomplete Active Transportation Network; higher speed/volume road with bicycle traffic in narrow shared curb lane; existing bicycle traffic currently utilizing sidewalks; frequent conflict points at commercial driveways	<p>Non-structural improvements: None</p> <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. North of EC ROW widen pavement/ROW to accommodate bicycle lanes and sidewalks (location dependent) 2. South of EC ROW – provide boulevard multi-use path along both sides of ROW north to McDougall St.
HOWARD AVENUE INTERSECTIONS		
Howard / McDougall	Incomplete Active Transportation Network; higher speed/volume road with bicycle traffic; narrow shared curb lanes; proposed bicycle routes (BUMP) connected to McDougall - currently no intersection treatment to facilitate left turns	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Provide bicycle route signage with or without pavement markings <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Provide intersection treatments to facilitate northbound left turns by bicycles from Howard Avenue to McDougall Street (e.g. bike box)
Howard / EC Row -North Ramp Terminal	Insufficient northbound left turn lane storage; active transportation conflicts at free flow ramp crossings;	<p>Non Structural Improvements:</p> <ol style="list-style-type: none"> 1. Signal timing adjustments <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Lengthen northbound left turn storage lane by removing a portion of the existing centre median 2. Upgrade design of multi-use trail crossings at expressway ramps to improve visibility and clarify right of way between active transportation modes and motorists (including consideration of changing free flow right turn ramp movements to conventional right turns) 3. Upgrade design of multi-use trail crossings at commercial driveways to improve visibility and clarify right of way between active transportation modes and motorists.
Howard / South Cameron / Division / CN	At grade rail crossing; closely spaced intersections; stop sign	Non Structural Improvements:

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HOWARD AVENUE CORRIDOR		
Area of Concern	Problem Summary	Planning Solutions
Rail	compliance; incomplete Active Transportation Network; queuing on South Cameron approach to Howard; sight line issues due to vegetation and geometry; pedestrian and cycling safety at intersection/rail crossing	<ol style="list-style-type: none"> 1. Additional warning signage 2. Signal timing adjustments 3. Use pavement markings to provide cross walks 4. Use pavement markings to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue where it intersects with Division Road (i.e. one dedicated left turn lane and one shared left/through/right curb lane) 5. Vegetation removal where it obstructs sight lines at South Cameron Boulevard/Howard Avenue <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Reconfigure the intersection with either an at-grade or grade-separated rail crossing 2. Construct a roundabout, grade separated from rail 3. Provide multi-use trail crossings for pedestrians and cyclists

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Table 6.11 Howard Avenue Corridor Pre-Screening Evaluation

HOWARD AVENUE CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
Active Transportation Pedestrian/Bicycle Network Incomplete active transportation networks, higher speed/volume road with bicycle traffic in narrow shared curb lanes, observed bicycle traffic is using sidewalks, frequent conflict points at commercial driveways (Howard Avenue – south of E.C. Row Expressway is identified as a bicycle route (multi-use trail) in the Windsor Bicycle Use Master Plan)	Do Nothing	Existing deficiencies and safety conditions will remain.							Does not address issue.
	Structural Improvements								
	North of E.C. Row Expressway, widen pavement/right-of-way to accommodate separated bicycle lanes and sidewalks north to McDougall Street								Provides bicycle facilities, but with significant right of way constraints (adjacent commercial properties, E.C. Row Expressway overpass structure, etc.);
	South of E.C. Row Expressway – provide boulevard multi-use trail along both sides of Howard Avenue							Connects the existing active transportation network.	

Howard Avenue Intersections

HOWARD AVENUE INTERSECTIONS	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	<u>NOTES</u>	
Howard Avenue / McDougall Street Incomplete active transportation network, higher speed/volume road with bicycle traffic in narrow shared curb lanes, proposed bicycle routes are connected to McDougall Street - currently no intersection treatment to facilitate left turns by bicycles (except as part of mixed traffic) (McDougall Street – north of Eugenie Street is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)	Do Nothing	Existing deficiencies and operational concerns will remain.							Does not address issue.
	Non-Structural Improvements								
	Provide bike route signage with or without sharrow pavement markings								Shared bike route not recommended due to speeds and volumes of motor vehicle traffic in the corridor.
	Structural Improvements								
	Provide intersection treatments to facilitate northbound left turns by bicycles from Howard Avenue to McDougall Street (e.g. bike box)							Requires implementation of bicycle facilities on Howard Avenue and McDougall Street.	
Howard Avenue/ EC Row Expressway North Ramp Terminal Insufficient northbound left turn lane	Do Nothing	Existing operational and safety concerns will remain.							Does not address issue.
	Non-Structural Improvements								

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.11 Howard Avenue Corridor Pre-Screening Evaluation

storage; unconventional active transportation crossings (Howard is identified as a bicycle route (multi-use trail transitioning to bike lanes) in the Windsor Bicycle Use Master Plan)	Signal timing adjustments	✓	✓	✗	✓	✓	✓	Signal timing regularly review by the City of Windsor as part of their overall transportation program.
	Structural Improvements							
	Lengthen northbound left turn storage lane by removing a portion of the centre median	✓	✓	✗	✓	✗	✓	Would accommodate the current demand for left turns and increase safety and efficiency.
	Upgrade design of multi-use trail crossings at expressway ramps (including consideration of changing free flow right turn ramp movements to conventional right turn lanes at the ramp intersections)	✓	✓	✓	✓	✗	✓	Improves visibility and clarifies right-of-way between active transportation modes and motorists.
Upgrade design of multi-use trail crossings at commercial driveways to improve visibility and clarify right of way between active transportation modes and motorists.	✓	✓	✓	✓	✗	✓	Improves visibility and clarifies right-of-way between active transportation modes and motorists.	
Howard Avenue/South Cameron Boulevard/Division Road /CN Rail At grade rail crossing, closely spaced intersections, drivers not obeying stop signs, incomplete Active Transportation Network, insufficient queue lengths on South Cameron Blvd approaching Howard Ave., and Howard Ave. approaches to Division Road; sight line issues (difficult to see oncoming traffic) due to vegetation and intersection geometry; pedestrian and cycling safety concerns. (Howard is identified as a bicycle route (multi-use trail transitioning to bike lanes) in the Windsor Bicycle Use Master Plan)	Do Nothing	Existing operational and safety concerns will remain.					✗	Does not address issue
	Non-Structural Improvements							
	Additional warning signage	✓	✓	✗	✓	✓	✓	Minor improvement to safety conditions.
	Signal timing adjustments	✓	✓	✗	✓	✓	✓	Signal timing regularly review by the City of Windsor as part of their overall transportation program.
	Use pavement markings to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue where it intersects with Division (i.e. one dedicated left turn lane and one shared left/through/right curb lane)	✓	✓	✗	✓	✓	✓	Provides more space for left turning vehicles and helps shorten the queue of vehicles waiting to turn left.
	Vegetation removal where it blocks sight lines for drivers at South Cameron Boulevard/Howard Avenue	✓	✓	✗	✓	✓	✓	Enhances safety for left turn movements from South Cameron Blvd. to Howard Ave.
	Structural Improvements							
	Reconfigure the entire intersection with either an at-grade or grade separated rail crossing	✓	✓	✓	✗	✗	✓	Provides the opportunity to improve safety and operations for the intersection and rail crossing.
Construct a roundabout, grade separated from rail	✓	✓	✓	✗	✗	✓	Feasibility of this alternative to be confirmed. Potential for improved efficiency and intersection safety as well as eliminating vehicle-train conflicts by bridging over or tunneling under the rail crossing.	
Provide multi-use trail crossings for pedestrians and cyclists	✓	✓	✓	✗	✗	✓	Provides safe crossing for active transportation modes, and opportunity to provide connectivity with existing multi-use trail on Howard Avenue.	

✗	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
✓	Addresses problem/opportunities identified for criterion/carried forward for design analysis

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Table 6.12 East-West Corridors Long List of Alternative Solutions

EAST-WEST CORRIDOR		
AREA OF CONCERN	PROBLEM	OPPORTUNITY
Road Network	Limited and circuitous east-west connections for all modes of transportation, incomplete Active Transportation Networks	<p>Non-structural improvements: None</p> <p>Structural Improvements:</p> <ol style="list-style-type: none"> 1. Extend Northwood Street easterly to Edinborough Street with a grade-separated crossing of the CN Rail line including active transportation facilities 2. Extend Eugenie Street to Ojibway Street with a grade-separated crossing of the Van de Water rail yard including active transportation facilities 3. Improve the E.C. Row Expressway (increase capacity through general widening) 4. Improve the accessibility of the South Cameron Boulevard intersection at Dougall Avenue (possibly in conjunction facilities northbound to southbound U-turns on Dougall Avenue) 5. Improve the South Cameron Boulevard/Howard Avenue intersection (several alternatives including lengthening turn lanes, signalization, and/or Howard Avenue/CN Rail grade separation) 6. Connect West Grand Boulevard to Grand Marais Road East via a new roadway and active transportation facilities by utilizing the gap created by the existing E.C. Row Expressway overpass of the CN Rail (this includes an at-grade crossing of the CN Rail) 7. Implement Active Transportation Facilities on Eugenie Street between Dougall Avenue and Howard Avenue as per BUMP

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Table 6.13 East-West Connectivity Pre-Screening Evaluation

EAST-WEST CORRIDOR	ALTERNATIVES	<u>CONNECTIVITY AND CIRCULATION</u>	<u>TRANSPORTATION FUNCTION</u>	<u>URBAN DESIGN</u>	<u>COST AND CONSTRUCTABILITY</u>	<u>IMPLEMENT IN SHORT TERM</u>	<u>CARRY FORWARD</u>	NOTES	
Road Network Limited and circuitous east -west connections for all modes of travel, incomplete active transportation networks (Eugenie Street is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)	Do Nothing	Existing deficiencies will remain.							Does not address issue.
	Structural Improvements								
	Extend Northwood Street east to Edinborough Street with a grade separated crossing of the CN rail including active transportation facilities								Improves circulation, accessibility, and mobility for all modes of transportation, but would be a complex project with higher costs.
	Extend Eugenie Street to Ojibway Street with a grade separated crossing of the Van de Water rail yard including active transportation facilities								Would be a higher cost and extremely complex project due to the length of the crossing, the number of tracks, and the need to maintain rail operations during construction.
	Improve the E.C. Row Expressway (increase capacity through general widening)								To be considered as part of longer term solutions, accommodates anticipated growth in east-west expressway traffic (2005 Essex-Windsor Regional Transportation Master Plan).
	Improve the accessibility of the South Cameron Boulevard intersection at Dougall Avenue (may include allowing northbound to southbound U-turns on Dougall Avenue)								Represents a shorter term alternative to address an observed travel pattern, and improve vehicle circulation at a lower cost.
	Improve the South Cameron Boulevard/Howard Avenue intersection (several alternatives lengthening turn lanes, signalization, and/or as part of Howard Avenue/CN rail grade separation)								Partially or fully addresses observed operational and capacity issues as well as safety concerns related to the at-grade rail crossing.
(Grand Marais Road and West Grand Boulevard are identified as bicycle routes (bike lanes) in the Windsor Bicycle Use Master Plan)	Connect West Grand Boulevard. to Grand Marais Road East via a new roadway with active transportation facilities (this would require property acquisition and an at-grade crossing of the CN rail with active warning devices)							Provides a longer term alternative to improve east-west circulation, accessibility, and mobility for all modes of transportation, but would be a complex project with higher costs, and extensive property requirements.	

	Does not address problems/opportunities identified for criterion/not carried forward for design analysis
	Addresses problem/opportunities identified for criterion/carried forward for design analysis

6.4 CIVIC WAYS – OPPORTUNITIES AND CONSTRAINTS

Through a review of the existing conditions, opportunities and constraints associated with each of the three Civic Ways within the study area (Dougall Avenue, Howard Avenue, and E.C. Row Expressway) were identified to inform the development of design concepts. Opportunities and Constraints are identified on Figures 6.1-6.3 below.

Dougall Corridor Civic Way Opportunities & Constraints

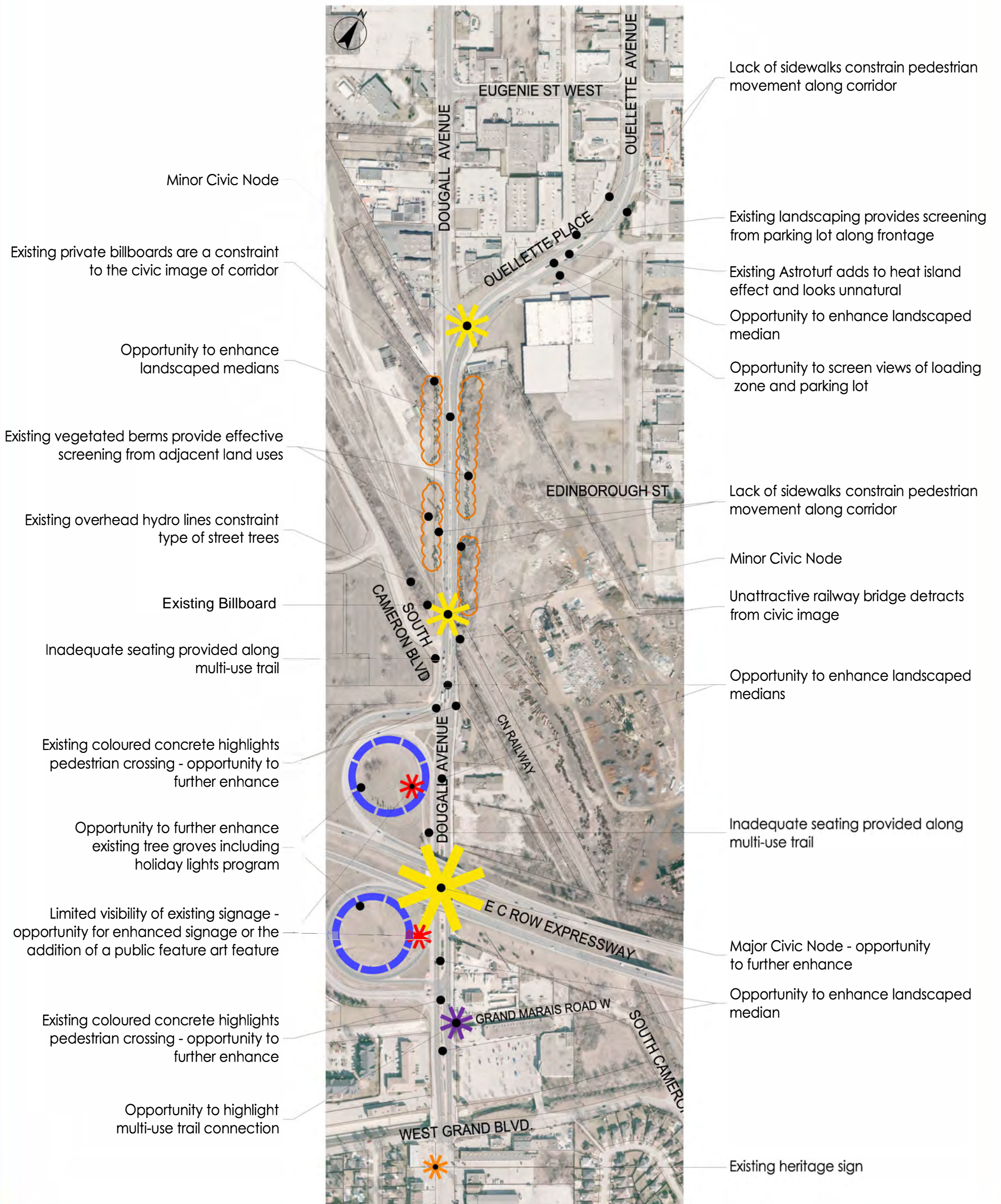


Figure 6.1 Dougall Corridor Civic Way Opportunities and Constraints

Howard Corridor Civic Way Opportunities & Constraints

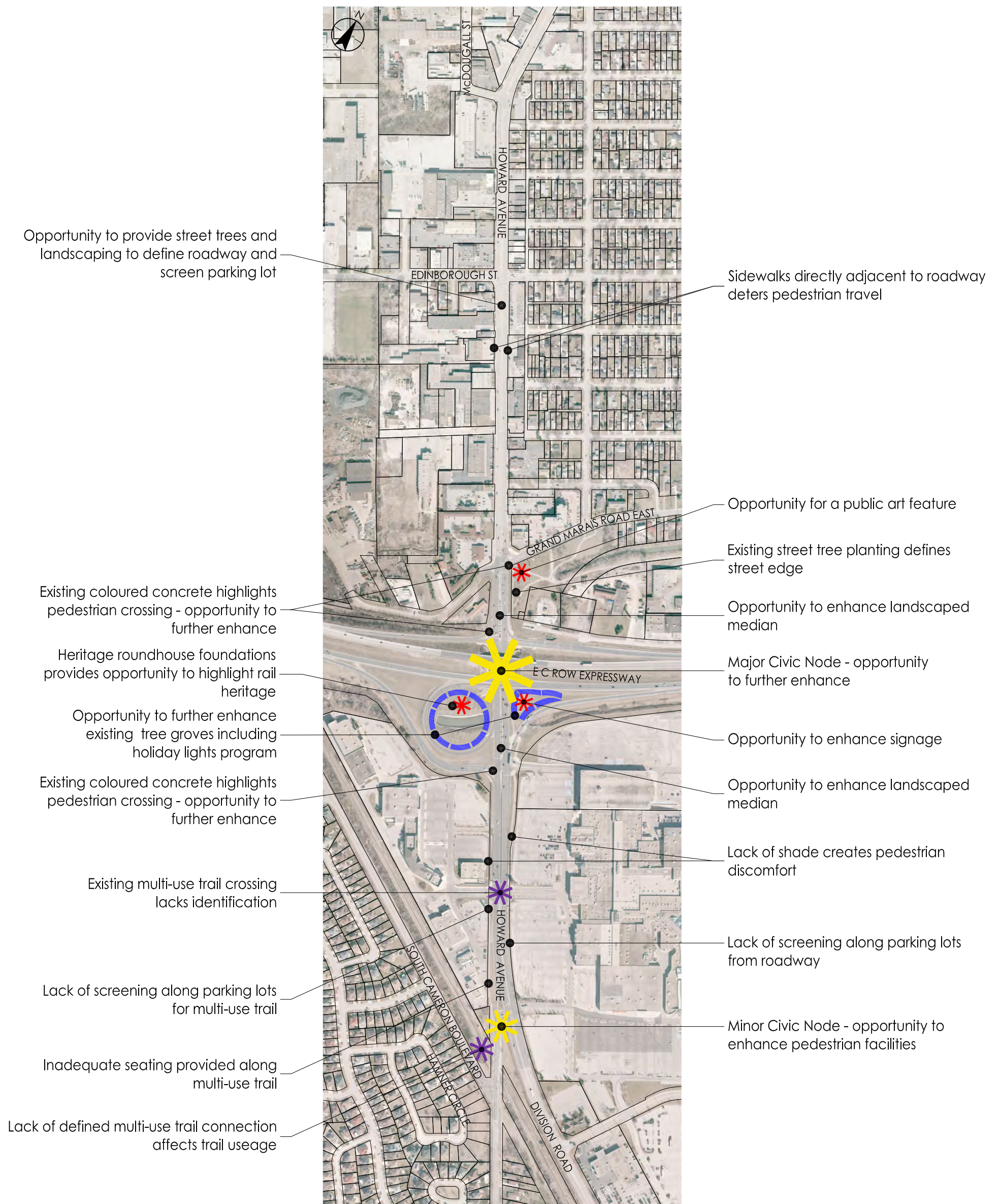


Figure 6.2 Howard Avenue Civic Way Opportunities and Constraints

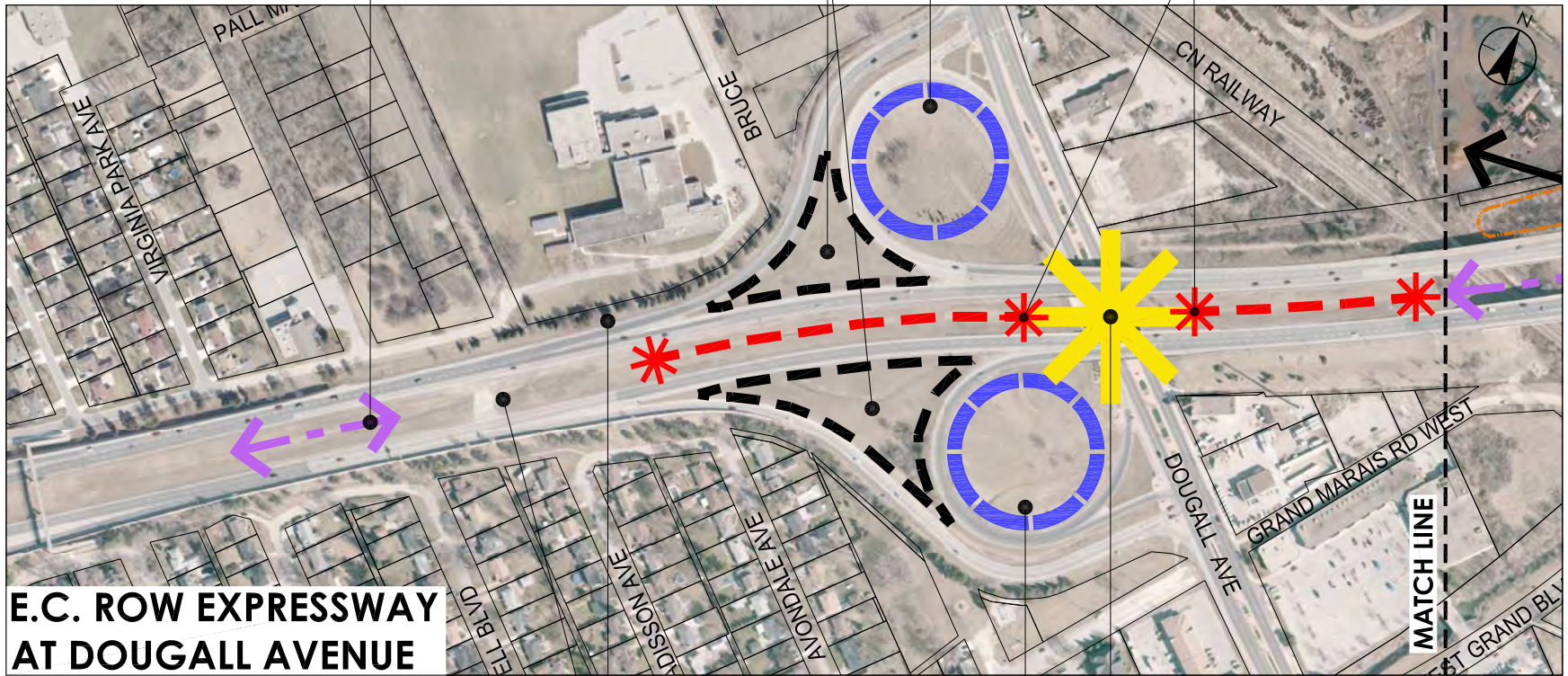
E.C. ROW Expressway Civic Way Opportunities & Constraints

The high speed of vehicles and the requirement for clear sight lines are constraints to urban design

Opportunity to naturalize with low-growing no-cut turf

Opportunity to further enhance existing tree grove including holiday lights program

Potential areas for Vertical Feature to highlight civic node



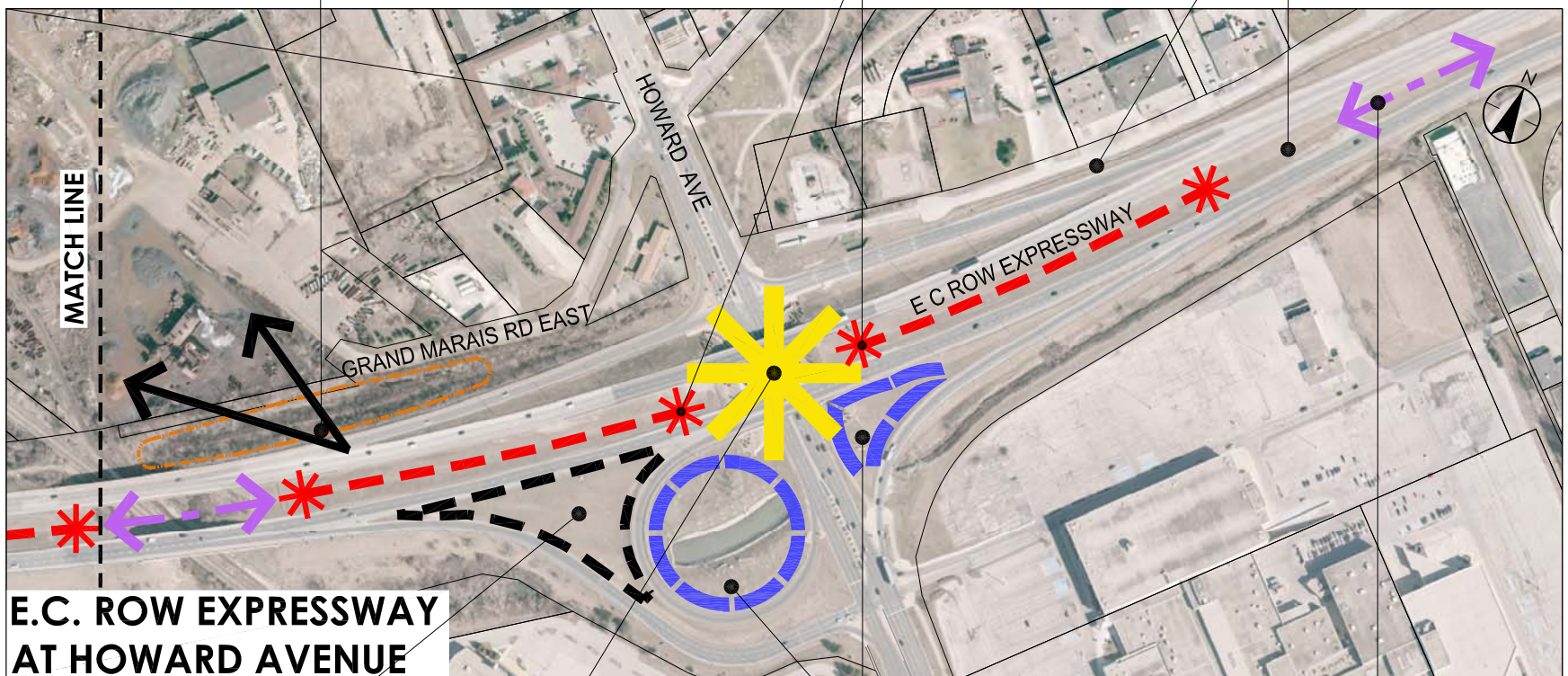
Turf maintenance within central ditch and expressway edges - opportunity to naturalize to improve habitat value and slow/treat road storm water runoff

Opportunity to further enhance existing tree grove including holiday lights program

Turf maintenance within central ditch and expressway edges - opportunity to naturalize to improve habitat value and slow/treat road storm water runoff

Opportunity to screen view

Potential areas for Vertical Feature to highlight Civic Node



Opportunity to naturalize with low-growing no-cut turf

Opportunity to further enhance existing tree grove with holiday lights program

Major Civic Node

The high speed of vehicles and the requirement for clear sight lines are constraints to urban design

Figure 6.3 E.C. Row Expressway Civic Way Opportunities and Constraints

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Public Consultation – Phase 2

7.0 PUBLIC CONSULTATION – PHASE 2

7.1 PUBLIC INFORMATION CENTRE NO. 1

Information collected to-date, the Transportation Planning Solutions, the Long List of Alternatives, and the Pre-Screening Evaluation were presented to the public for review and comment at Public Information Centre No. 1 (PIC 1) on May 6th, 2015 from 4pm-8pm in open house format. Over 120 residents were in attendance, and staff members from the City of Windsor and Stantec were on hand to answer questions. Display materials presented at PIC 1 are provided in Appendix A5, and included the following:

- Study introduction, problem and opportunity statement, and overview of the Class EA process;
- Maps of the study area, key issues, feedback received to-date, a description of the existing transportation/active transportation network, socio-economic features, and natural environment;
- A summary of the traffic analysis including traffic volumes and level of service for each corridor, and the planning alternatives being considered;
- Planning Solutions, Pre-Screening Evaluations, and a discussion of next steps.

21 comment sheets were returned following PIC 1. Comments were generally submitted in the form of identifying issues and offering solutions. The desire for active transportation facilities throughout the corridor was included in over half of the comments received. The need for intersection improvements was the second most frequent comment, particularly at the intersections of Dominion Boulevard at Northwood Street, South Cameron Boulevard at Dougall Avenue, and the Howard Avenue/South Cameron Boulevard/CN Rail intersection complex. All comments received, as well as how those comments have been addressed as part of the study, have been included in Appendix A5.

A summary of the comments received in response to materials presented at PIC 1 by corridor is provided below:

Dominion Boulevard

- Cycling infrastructure (several comments supported the removal of on-street parking on Dominion);
- Need for left turn lanes/signals, particularly at Northwood (listed as a priority in almost half of all comments);

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Public Consultation – Phase 2

- Several comments against the diversion of Dominion to Alexandra Ave (as identified in the South Cameron Secondary Plan) in terms of tree removal and the effects of increased traffic on existing property owners along Alexandra Avenue.

Dougall Avenue – Ouellette Avenue

- Intersection improvements at Dougall Avenue and South Cameron Boulevard (for both vehicles and active transportation);
- Active Transportation concerns along the entire corridor, but particularly CN underpass.

Howard Avenue

- Improvements needed at Howard Avenue/South Cameron Boulevard/CN Rail crossing intersection complex.

East-West Corridor

- Many comments in favour of a new east-west connection from Northwood Street to Edinborough Street.

7.2 COMMUNITY WORKSHOPS

Three Community Workshops were held in conjunction with PIC1 on Thursday, May 7th, 2015, from 9am-12pm. The workshops were divided into small focus groups dedicated to Civic Ways, Active Transportation, and Traffic Operations. The Workshops were held to provide members of the community a more hands-on opportunity to contribute to the project, to provide the study team with more targeted, constructive input on how the community experiences the study area, and to provide comment on the alternatives presented.

Information received during the Community Workshops including maps, diagrams, and input specific to each corridor are included in Appendix A6. A summary of the general feedback received is provided below.

Active Transportation

Twenty three residents participated in the Active Transportation Workshop. Participants were asked to identify the routes along which they currently walk and cycle, to identify the barriers or problems they experience, and any positive aspects of these routes. Participants were then asked to comment on the alternatives that are being put forward for the next phase of the study. In general, participants perceived the Central Box study area as a significant barrier for travelling between South Windsor, and the downtown or Walkerville neighbourhoods. Several cyclists described uncomfortable experiences and near misses while sharing the roadway with motor vehicles. Specific concerns were voiced regarding cycling with children.

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The Dougall Avenue – Ouellette Avenue corridor was identified as the corridor that presents the most significant barriers and safety concerns for pedestrians and cyclists, as well as being a critical north-south connection particularly for cyclists travelling between South Windsor, the downtown area, and Walkerville. The lack of direct, continuous east-west connections was also identified as a primary concern among participants.

Traffic Operations

Twenty three residents participated in the Traffic Operations Workshop. Participants were asked to discuss traffic issues and potential solutions for each of the study area corridors, including the alternatives being put forward for the next phase of the study. The primary focus of the majority of participants was on operational and safety issues that they experience during the peak hours of the day. This included suggested changes to signal timing, additional traffic signals or other controls, removal of on-street parking, the impact of local schools on traffic operations, the need for access management, and a desire to reduce truck traffic. On a larger scale, the lack of east-west road connectivity was a major concern. While many stated a general impression that traffic has been increasing at a high rate, there were few concerns expressing the capacity of the road system – i.e. the need to widen roads to add capacity.

Civic Ways

Fifteen residents participated in the Civic Ways Workshop. All workshop participants felt there was value in Civic Way enhancements and that improvements would be beneficial to the local community and to Windsor as a whole. Participants want to see more beautiful, green, walkable and active civic ways in the Central Box study area. The large majority of participants would like Civic Way enhancements to reflect the native Carolinian forest/prairie theme used in the Windsor Essex Parkway and the Detroit River International Crossing. There is a strong desire for the incorporation of sustainable features in the design as well as elements to highlight Windsor's varied history.

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Phase 3 – Design alternatives

8.0 PHASE 3 – DESIGN ALTERNATIVES

This section of the report describes the steps undertaken to address Phase 3 of the Class EA process which consists of the development and assessment of Alternative Design Concepts. The alternative design concepts were developed based on those alternatives presented and carried forward from the Pre-Screening evaluation presented at PIC 1. The Design Concepts were then assessed based on how well they could address deficiencies and potential environmental impacts. Based on the results of the assessment, recommendations were identified.

8.1 EVALUATION METHODOLOGY AND IMPACT ASSESSMENT

A qualitative evaluation based on the environmental components outlined in **Table 8.1**, representing a broad definition of the environment described in the EAA, and the criteria outlined in **Table 8.2** were used. The goal of the evaluation was to meet as many of the objectives as possible; reduce potential impacts where feasible and appropriate; reduce existing/future deficiencies and address City and agency requirements.

Table 8.1 Environmental Components

Environmental Component	Description
Economic/ Financial	Considers the potential costs including but not limited to capital construction, operational, and implementation costs of the design.
Social/Cultural	Considers the potential effects on residents, neighbourhoods, businesses, community character, social cohesion, community features, and historical/archaeological and heritage components in addition to municipal and provincial development objectives.
Natural Environment	Considers the potential effects on significant natural and physical elements of the environment (i.e. air, land, water, and biota) including natural heritage and environmentally sensitive policy areas.
Technical/ Engineering	Considers the technical suitability and other engineering aspects of the transportation system.

Table 8.1 Design Evaluation Criteria

Environmental Component	Evaluation Criteria	Notes
Social/Cultural	Property Access	The ability to maintain or restrict property access.
	Property Acquisition	Ability to incorporate improvements within existing City owned right of way, or if additional property is

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Phase 3 – Design alternatives

	Requirements	required.
	Impacts to Emergency Response Times	Impacts on the ability for emergency response vehicles to navigate through the study area.
	Streetscape and Aesthetics	Impact to streetscape, including opportunities to implement enhanced landscaping/Civic Way features.
	Public Safety	Overall impacts to safety conditions.
	Impacts to potential Archaeological and Built Cultural Heritage	Disruption to identified and unidentified archaeological and Built Heritage resources, and requirements for further investigation.
	Impacts to Aboriginal/First Nations Treaty Rights	Impacts to treaty rights, as well as concerns expressed by Aboriginal/First Nations communities.
Natural Environment	Impacts to Existing Vegetation	Impacts to existing vegetation including roadside trees.
	Terrestrial Resources	Includes impacts to identified aquatic and terrestrial features, rare species or species listed under the Endangered Species Act, or lands subject to Provincial, Municipal, or Conservation Authority Policy (i.e. Conservation Authority Regulated Land).
	Special Habitat Areas	Includes habitats protected by the Endangered Species Act (species identified on the Species at Risk in Ontario (SARO) list, Migratory Birds Act, Official Plan, and Conservation Authority Policy.
Technical/ Engineering	Corridor Capacity & Level of Service (LOS)	Effects on the capacity and level of service identified through the analysis of traffic data, which take into consideration the forecasted traffic volumes.
	Planning Objectives	Meets applicable municipal policies/guidelines, including road classifications and general transportation policy. Also includes recommendations within relevant studies, including the Bicycle Use Master Plan (BUMP),

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Phase 3 – Design alternatives

		and relevant Environmental Assessments.
	Network Connectivity	Impact to connectivity within the study area, and to other areas of the City of Windsor.
	Overall Safety	Impact to collision frequency and overall safety conditions for motorists, pedestrians, and cyclists.
	Pedestrian & Cycling Accommodation	The ability to incorporate appropriate active transportation facilities within a given design in accordance with provincial guidelines (Ontario Traffic Manual Book 18).
	Transit Services	Impacts on existing and future transit routes.
	Rail Impacts/Structures	Impacts to existing rail operations, and requirements for consultation with rail companies during detailed design. Impacts to any additional structures within the corridor.
Economic	Initial Capital Costs	Relative costs associated with the implementation of the design.
	Operation and Maintenance Costs	Acknowledgement of any additional costs associated with the operations of the designs.

After various evaluation criteria were developed, they were applied to each of the alternative design solutions identified for each corridor to identify potential effects on the environment. To provide an impartial, traceable and consistent evaluation as required by the Class EA process, a matrix format was used to document the advantages and disadvantages of each alternative relative to the evaluation criteria outlined above. This evaluation process has been reviewed and accepted through public and agency consultation as part of other Class EAs.

Once the evaluation was completed, the recommended alternatives for each corridor were identified. Upon establishment of generic impacts, recommended measures were identified to mitigate any negative impacts, where possible.

8.2 TRANSPORTATION ANALYSIS

As part of the evaluation process an operational assessment of the 20 year horizon traffic forecasts was undertaken to identify/confirm future deficiencies, and assist in the development and evaluation of road network improvements. The details of the analysis are provided in Appendix F, and include an assessment of the following road network conditions:

- “Do nothing” condition – i.e. future traffic volumes excluding network and intersection improvements (except for optimized signal timing within existing cycle lengths and phasing);
- A condition assessment with intersection capacity improvements where warranted (e.g. additional through or turning lanes) and optimized signal timing and phasing within existing cycle lengths. The intersection capacity improvements are reflected in the alternative intersection design concepts;
- A condition assessment including intersection capacity improvements where warranted, optimized signal timing and phasing within existing cycle lengths, and improvements to east-west connectivity represented by an easterly extension of Northwood Street to Dougall Avenue and an easterly extension of Ojibway Street from Alexandra Avenue to South Cameron Boulevard (completing the link between Dominion Boulevard and South Cameron Boulevard).

This approach represents an iterative process and demonstrates the operational benefits at the key intersections within the study area as capacity is increased and as east-west connectivity is improved. The results focused on typical intersection measures of effectiveness – level of service based on delay, volume to capacity ratios, and queue length as required to identify auxiliary left turn storage requirements as well as to determine potential impacts on upstream intersections. These operational measures form part of the evaluation and assist in determining the required improvements.

The following sections describe the options and design alternatives that were considered for each corridor, based on those alternatives carried forward from the Pre-Screening Evaluation. References to Design Plates are provided, where applicable, and Plates are included at the end of each corridor discussion. Following the Design Plates, tables are provided which detail the evaluation based on the criteria discussed above.

8.3 DOMINION BOULEVARD DESIGN ALTERNATIVES

8.3.1 Dominion Boulevard Corridor

OJIBWAY STREET TO NORTHWOOD STREET

Issue: Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification.

- Option 1: Higher use of alternative modes of transportation

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Phase 3 – Design alternatives

- Option 2: Modify existing roadway to restrict turns to right-in/right-out using centre median (omit left turns)
- Option 3: Widen existing roadway to 3 lanes with centre left turn lane (**Plate 1**);
- Option 4: Widen to 4 lanes;
- Option 5: New Road – Realignment as indicated in South Cameron Secondary Plan with lower volumes on Dominion Boulevard and improved driveway access (**Plate 2 and 2A**):
 - This alternative involves a new road being constructed between Dominion Boulevard north of Northwood Street and Alexandra Avenue. This new Collector Road may eventually extend north of Ojibway Street to connect with South Cameron Boulevard (as identified in the South Cameron Secondary Plan). There would be no access to the new road from Longfellow Avenue, and cul-de-sacs would be constructed on Longfellow Avenue north and south of the new road.
- Option 6: 'Hybrid' Option – Widen Dominion Boulevard to 3 lanes including a centre turn lane and bicycle lanes, with a new Local Road connection between Dominion Boulevard and Longfellow Avenue, with a multi-use trail continuing from Longfellow Avenue to Alexandra Avenue (**Plate 3 and 3A**).
 - This option was developed in response to significant opposition to Option 5 received at PIC 1 and Community Workshops. Residents were generally opposed to the resulting increase in traffic to be diverted from Dominion Boulevard to Alexandra Avenue. This option was developed to utilize existing City owned property, mitigate public concern by generally maintaining existing road classifications, as well as to encourage neighbourhood permeability and access to future City parklands planned to the east in the area between Dandurand Boulevard and South Cameron Boulevard.

NORTHWOOD STREET TO WEST GRAND BOULEVARD

Issue: Absence of dedicated bicycle facilities, narrow sidewalks.

- Implement active transportation facilities, including widened sidewalks and on-street bicycle lanes.
 - This design includes the widening of pavement and removal of part-time on-street parking to accommodate bicycle lanes, as identified in the BUMP (**Plate 4**).

8.3.2 Dominion Boulevard Intersections

DOMINION BOULEVARD AT OJIBWAY STREET

Issues: Delays for Ojibway Street Approaches to Dominion Boulevard; left turn storage for vehicles turning left onto Ojibway Street from Dominion Boulevard.

- Option 1: Modify existing roadway to restrict turns to right-in, right-out using a centre median.
- Option 2: Construct a roundabout.
- Option 3: Signalize (when warranted by increased traffic volumes);
 - Current and forecasted traffic volumes do not warrant signalization based on Ontario Traffic Manual (OTM) Book 12 methodology for signal justification, which includes thresholds for traffic volumes and collision frequency.

DOMINION BOULEVARD AT NORTHWOOD STREET

Issues: Periods of congestion related to school/mosque activities; safety concerns related to misaligned turning movements; absence of dedicated left turn lanes on all approaches.

- Option 1: Signal timing adjustments.
- Option 2: Provide dedicated left turn lanes on all approaches (**Plate 3, 3A, and 4**).
- Option 3: Increase radii of northwest corners of Northwood Street approaches to accommodate bus turning movements (**Plates 3, 3A, and 4**).
- Option 4: Improve pedestrian and bicycle crossing treatments (see Detail 4 on **Plate 6A**).

DOMINION BOULEVARD AT E.C. ROW EXPRESSWAY

Issue: Occasional storage deficiencies for southbound left turn lanes.

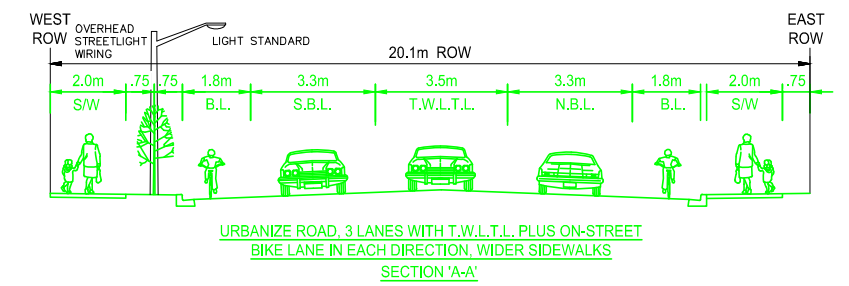
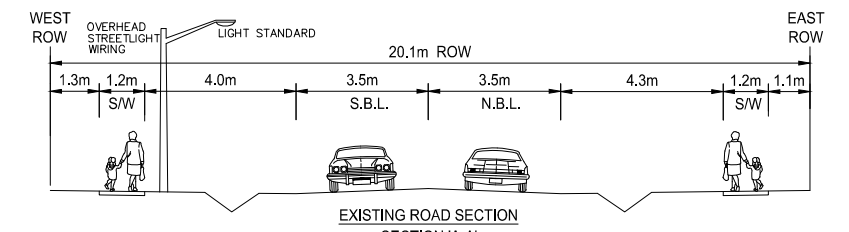
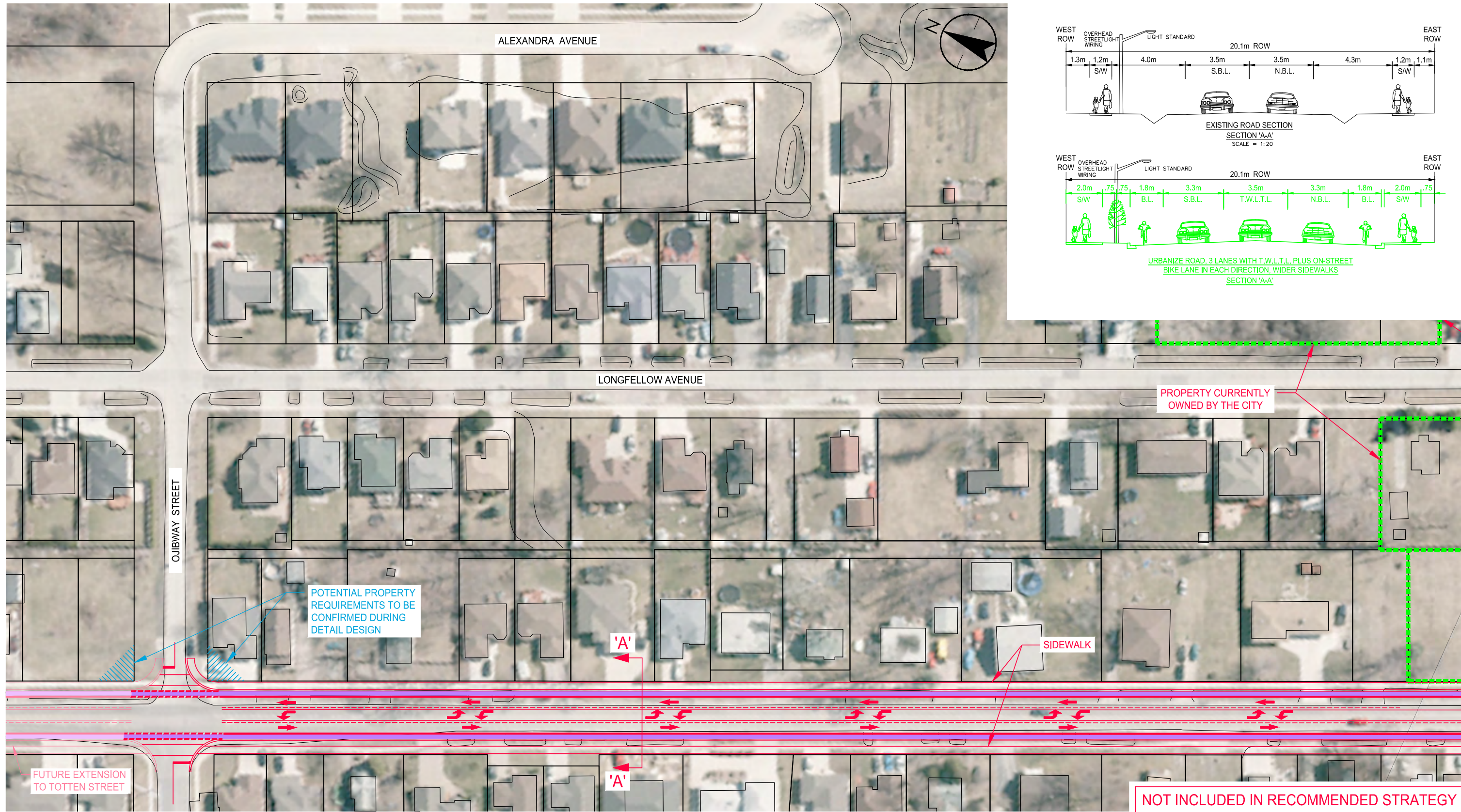
- Option 1: Signal timing adjustments.
- Option 2: Reconstruct the interchange structure as a Single Point Urban Interchange (SPUI).
 - The SPUI design is similar in form to a diamond interchange, but has the advantage of allowing opposing left turns to proceed simultaneously by compressing the two closely spaced intersections of a diamond into one single intersection over or under the free-flowing road. Along Dominion Boulevard, combining the two existing ramp terminal intersections into a single intersection would require reconstruction of most of the existing interchange (**PLATE 6B**).

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DOMINION BOULEVARD AT LABELLE STREET

Issues: High collision frequency and severity; no designated turning lanes; potential site line deficiencies on approaches due to vegetation canopy and frequent private driveways.

- Option 1: Improve signage;
- Option 2: Convert existing through lanes to dedicated left turn lanes (via pavement markings only).
- Option 3: Improve pedestrian crossing treatments with zebra crossing pavement markings (see Detail 4 on **Plate 6A**).
- Option 4: General widening of Dominion Boulevard corridor to accommodate dedicated left turn lanes while maintaining two through lanes (**Plate 4**).
- Option 5: Increase corner radii to improve safety for turning vehicles (see **Plate 4**).



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

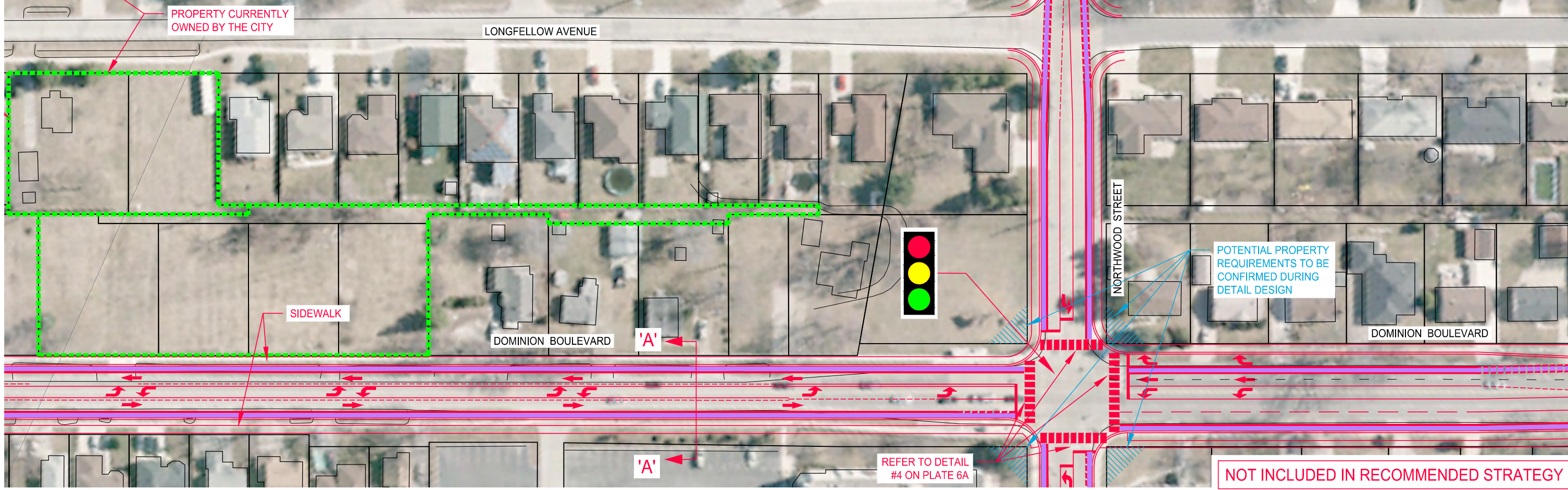
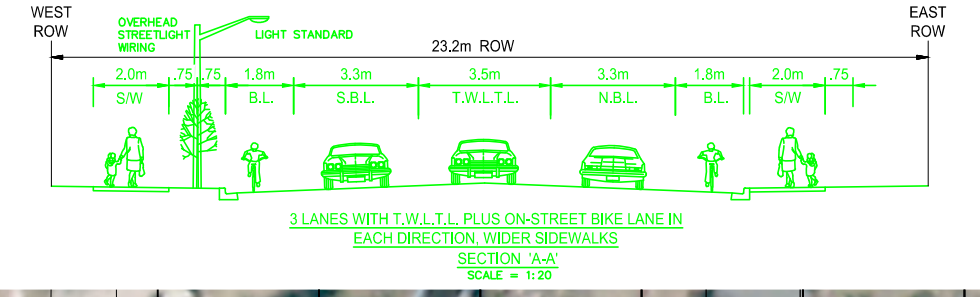
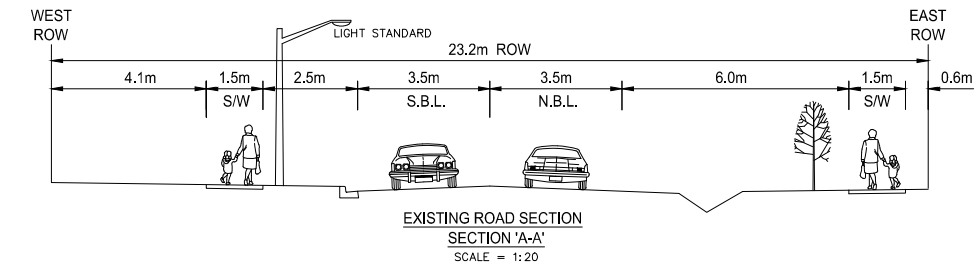
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



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Dominion Boulevard - Northwood Street to Ojibway Street
Option 3 - Widen to 3 Lanes with Centre Turn Lane

PROJECT NO. 165620021	SCALE 1:1000	GRAPHIC SCALE 0 10 30 50m	DRAWING NO. PLATE 1
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- LEGEND**
- N.B.L. - NORTHBOUND LANE
 - S.B.L. - SOUTHBOUND LANE
 - W.B.L. - WESTBOUND LANE
 - E.B.L. - EASTBOUND LANE
 - R.T.L. - RIGHT TURN LANE
 - L.T.L. - LEFT TURN LANE
 - T.W.L.T.L. - TWO WAY LEFT TURN LANE
 - P.L. - PARKING LANE
 - S/W - SIDEWALK
 - B.A. - BUFFER AREA
 - M.T. - MULTI-USE TRAIL
 - B.L. - BIKE LANE

- NOTES:**
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

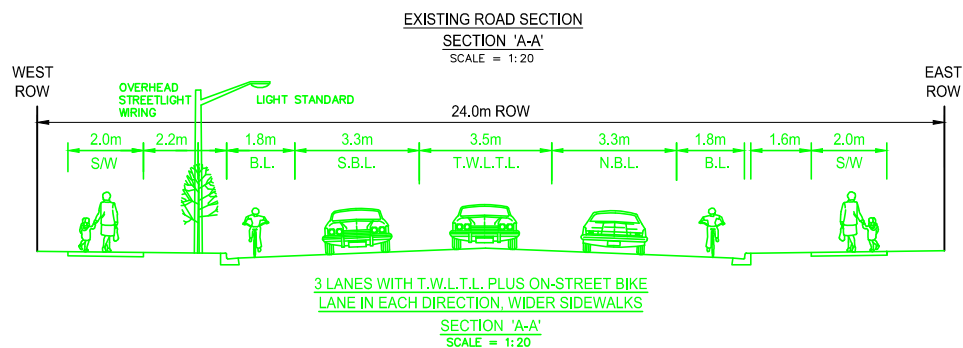
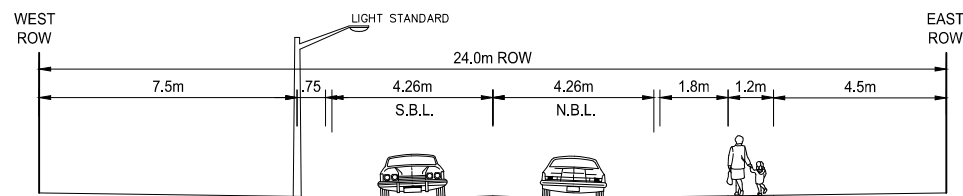
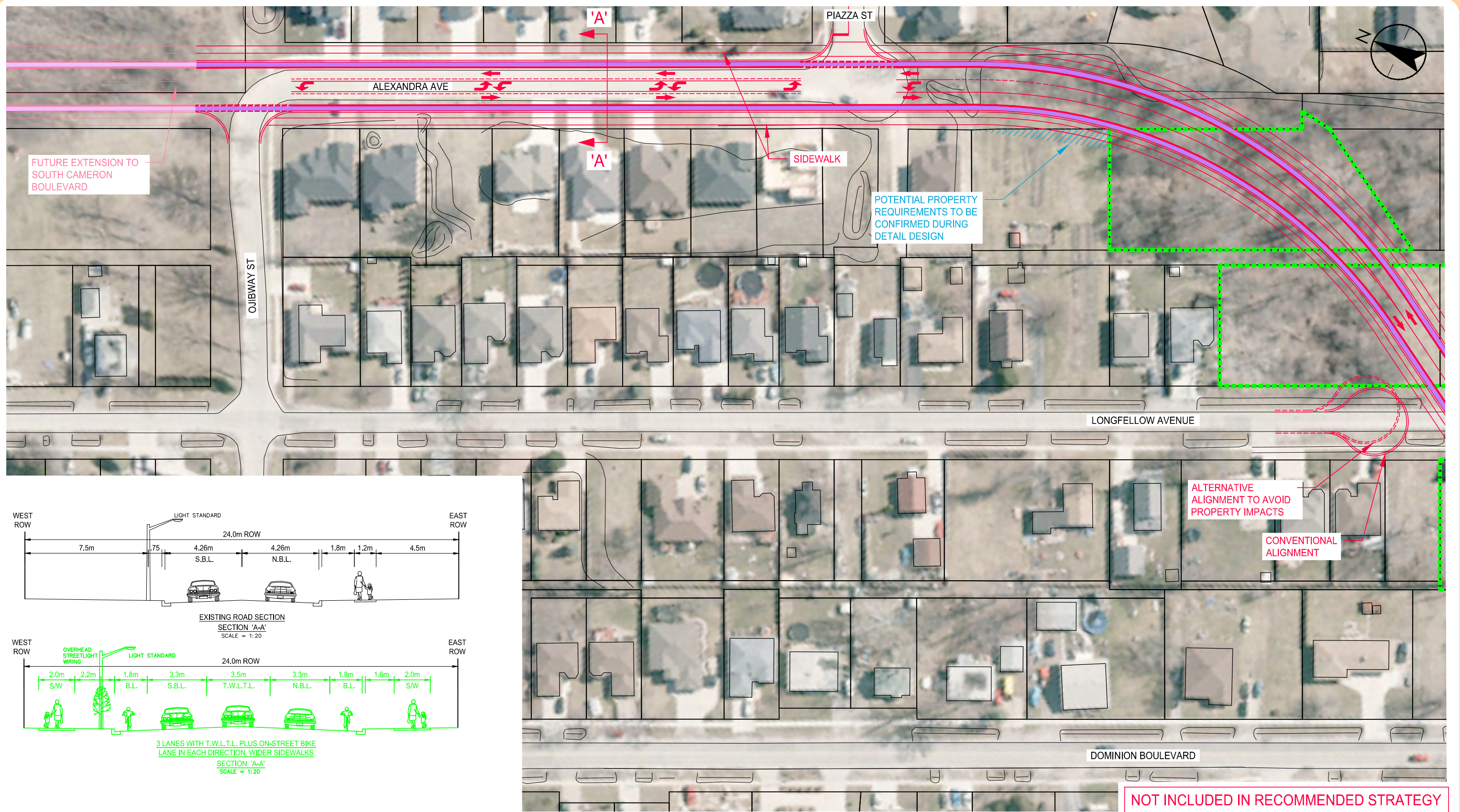


CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

Dominion Boulevard - Northwood Street to Ojibway Street
Option 3 - Widen to 3 Lanes with Centre Turn Lane

PROJECT NO. 165620021	0 10 30 50m 	DRAWING NO. PLATE 1A
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



- LEGEND**
- N.B.L. - NORTHBOUND LANE
 - S.B.L. - SOUTHBOUND LANE
 - W.B.L. - WESTBOUND LANE
 - E.B.L. - EASTBOUND LANE
 - R.T.L. - RIGHT TURN LANE
 - L.T.L. - LEFT TURN LANE
 - T.W.L.T.L. - TWO WAY LEFT TURN LANE
 - P.L. - PARKING LANE
 - S/W - SIDEWALK
 - B.A. - BUFFER AREA
 - M.T. - MULTI-USE TRAIL
 - B.L. - BIKE LANE

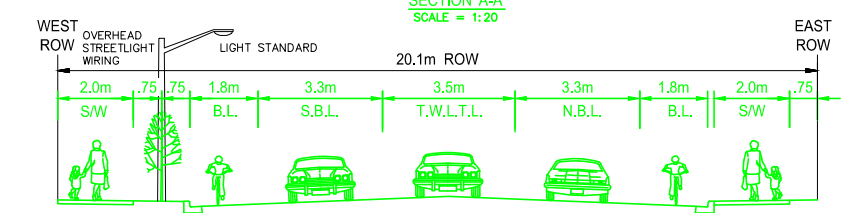
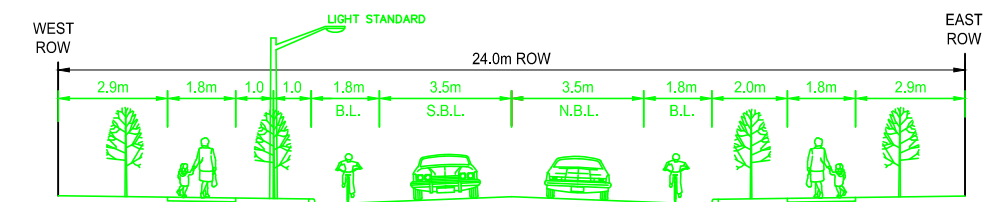
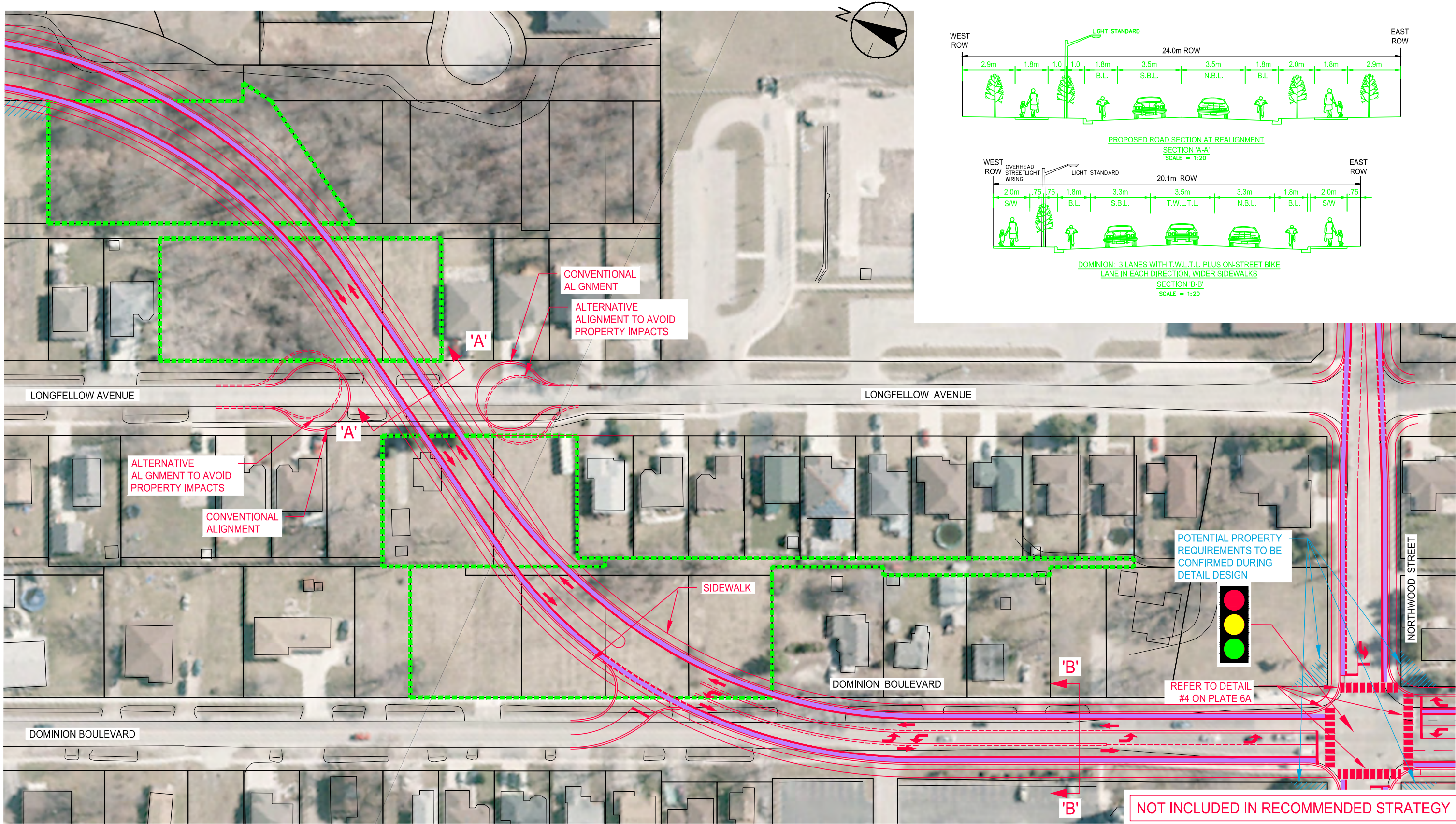
- NOTES:**
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

Dominion Boulevard - Northwood Street to Ojibway Street
Option 5 - Alexandra Avenue Extension

PROJECT NO. 165620021		DRAWING NO. PLATE 2
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LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

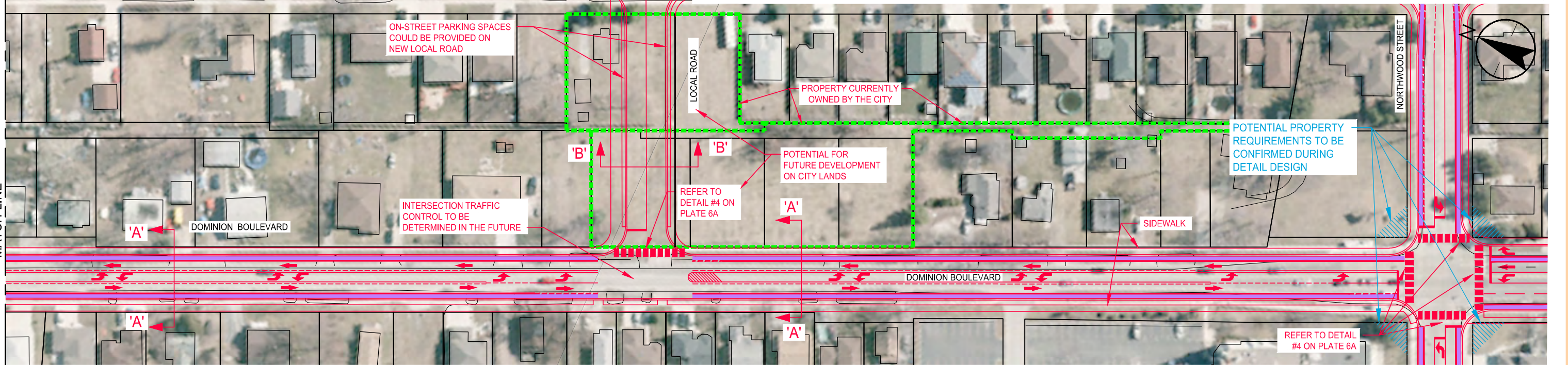
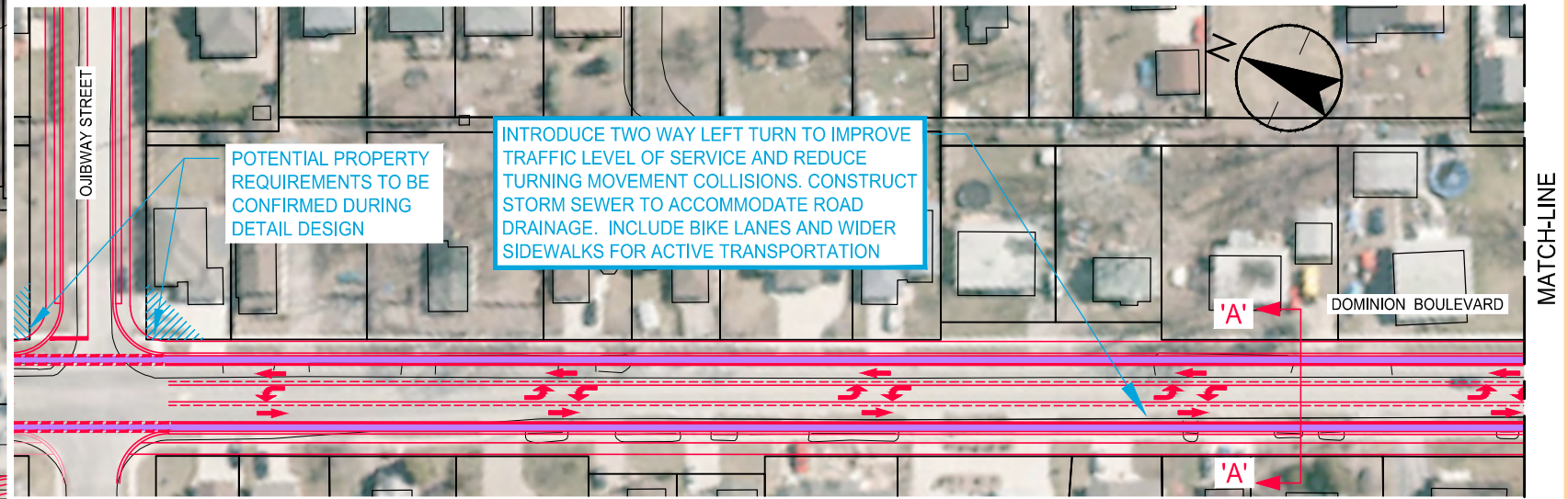
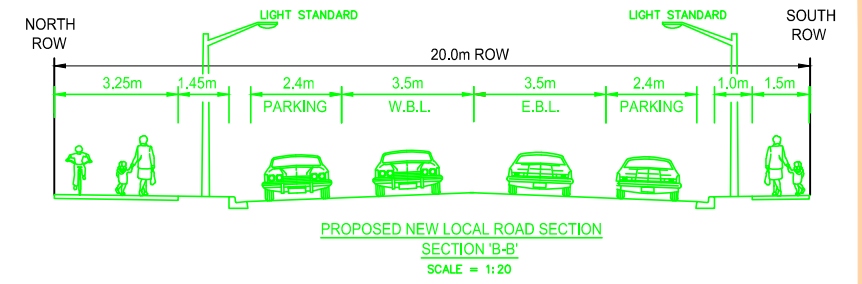
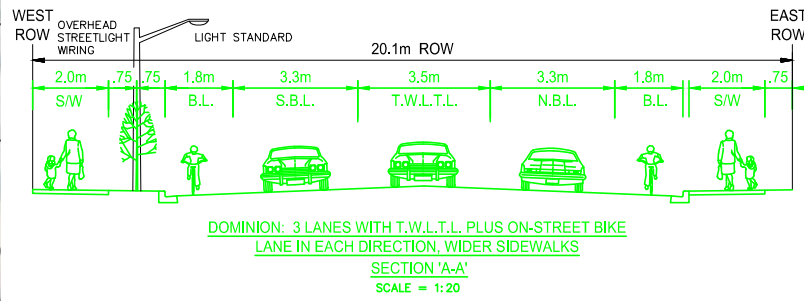
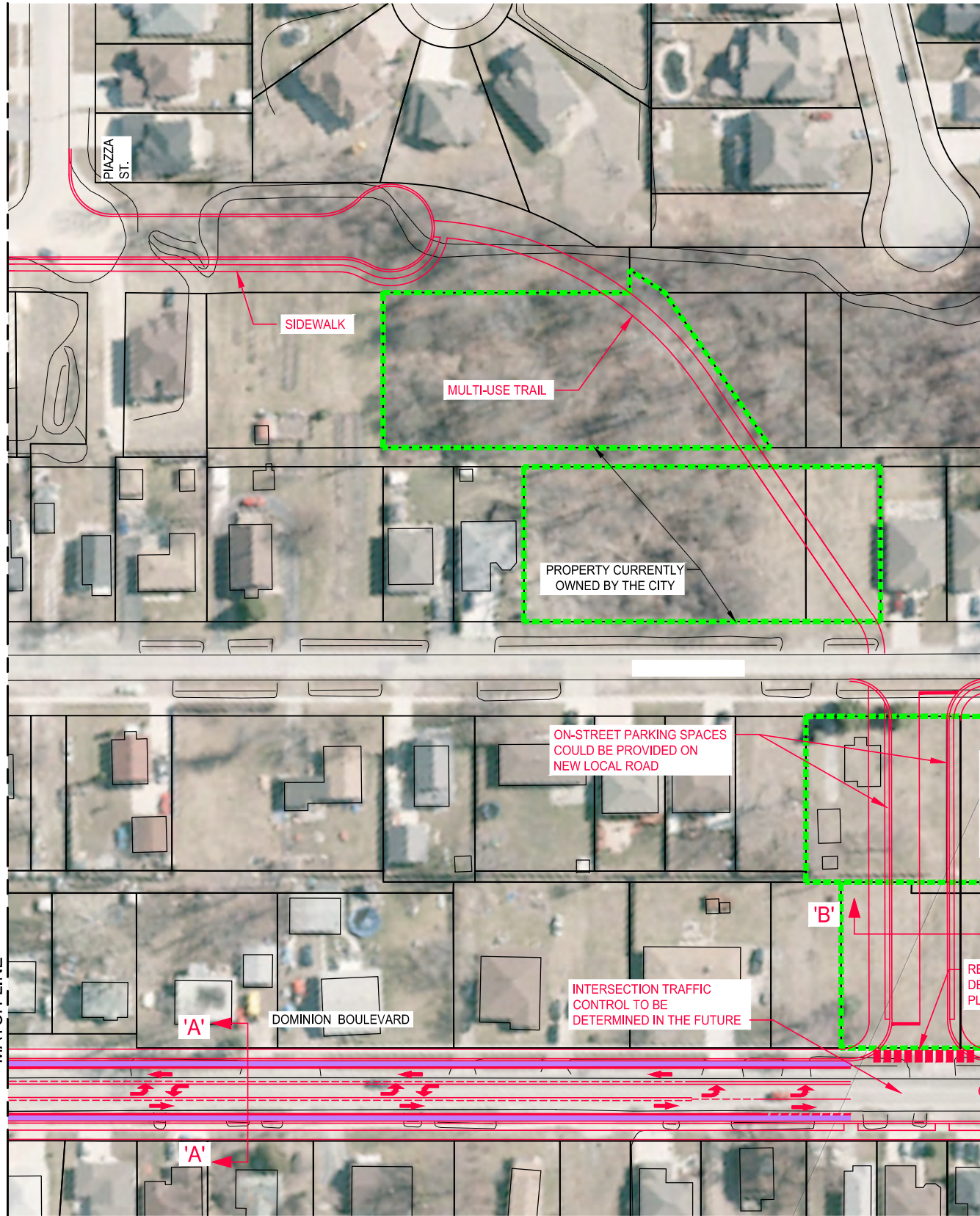
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

Dominion Boulevard - Northwood Street to Ojibway Street
Option 5 - Alexandra Avenue Extension

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 2A
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LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

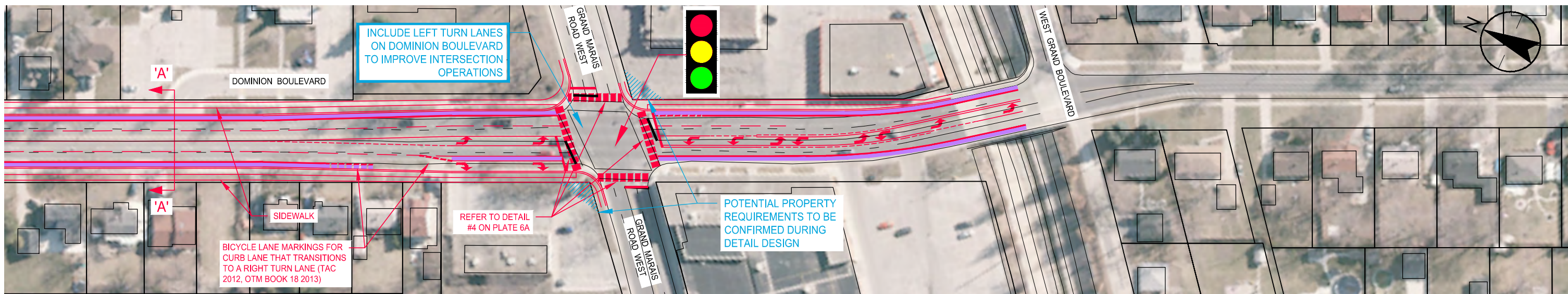
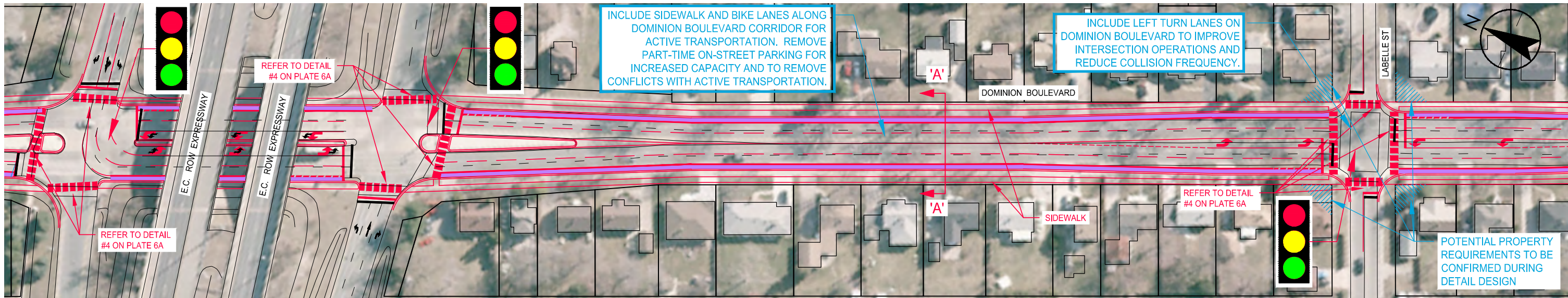
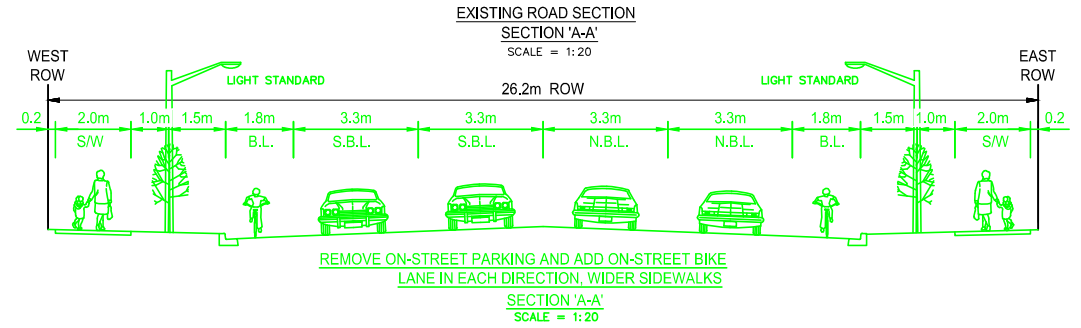
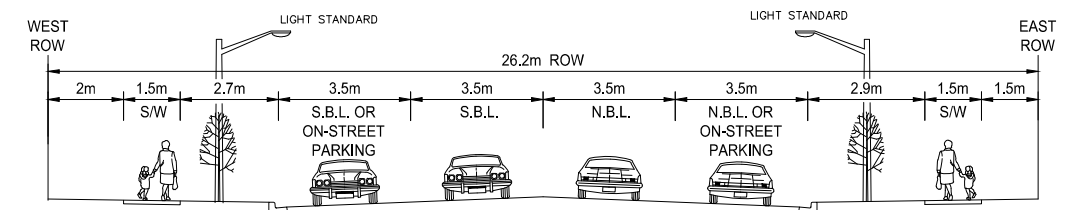
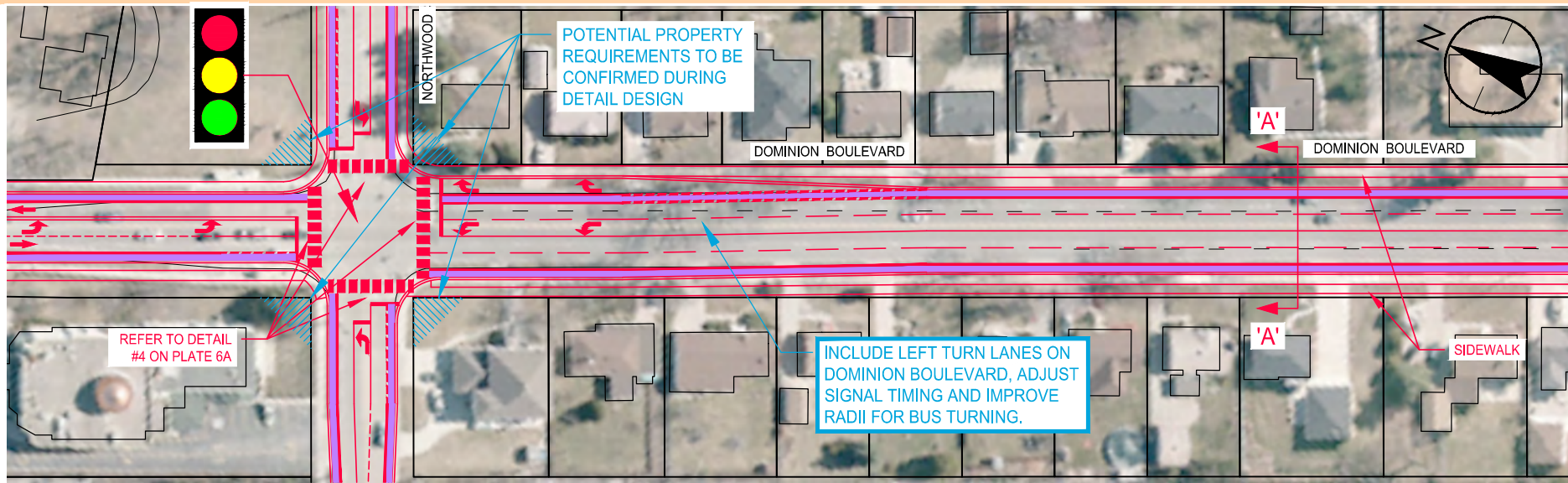
- NOTES:**
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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Dominion Boulevard - Northwood Street to Ojibway Street
Option 6 - Dominion Improvements, Local Road and Multi-Use Trail

PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 3A
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LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

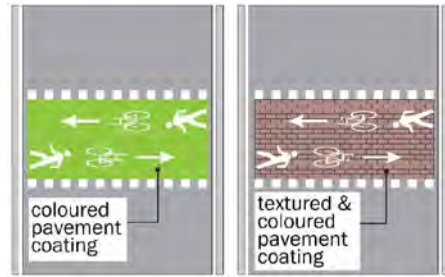
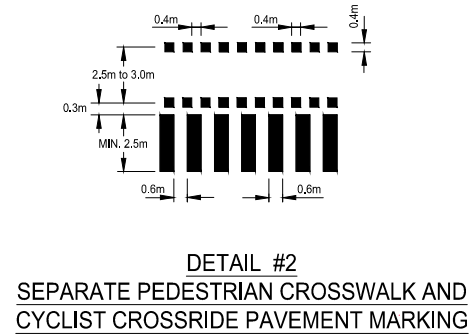
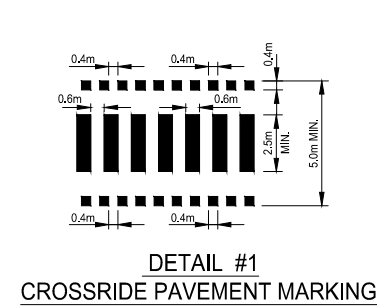
- NOTES:**
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
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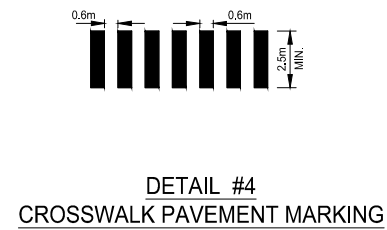
**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**Dominion Boulevard - Northwood Street to West Grand Boulevard
On-Street Bicycle Lanes**

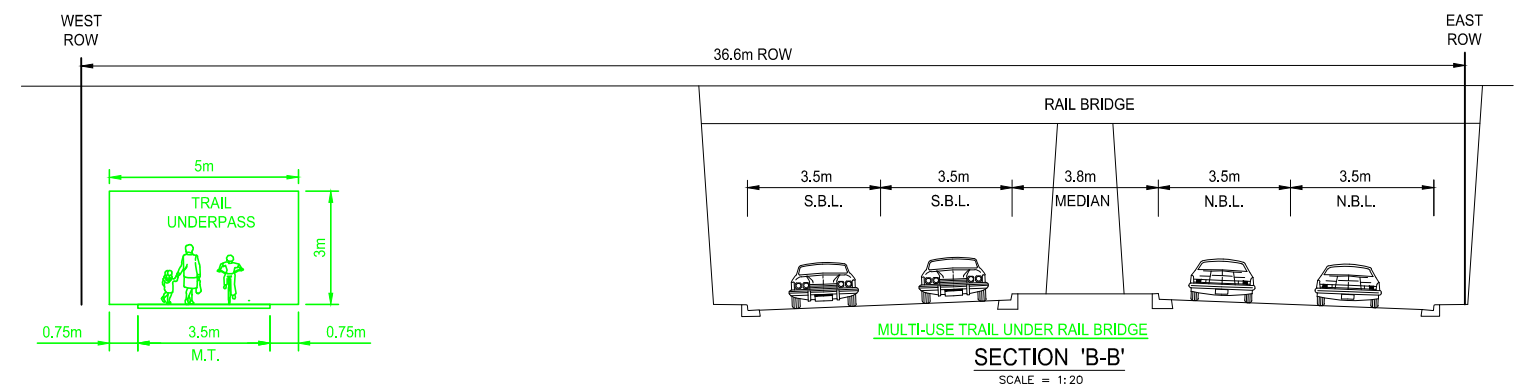
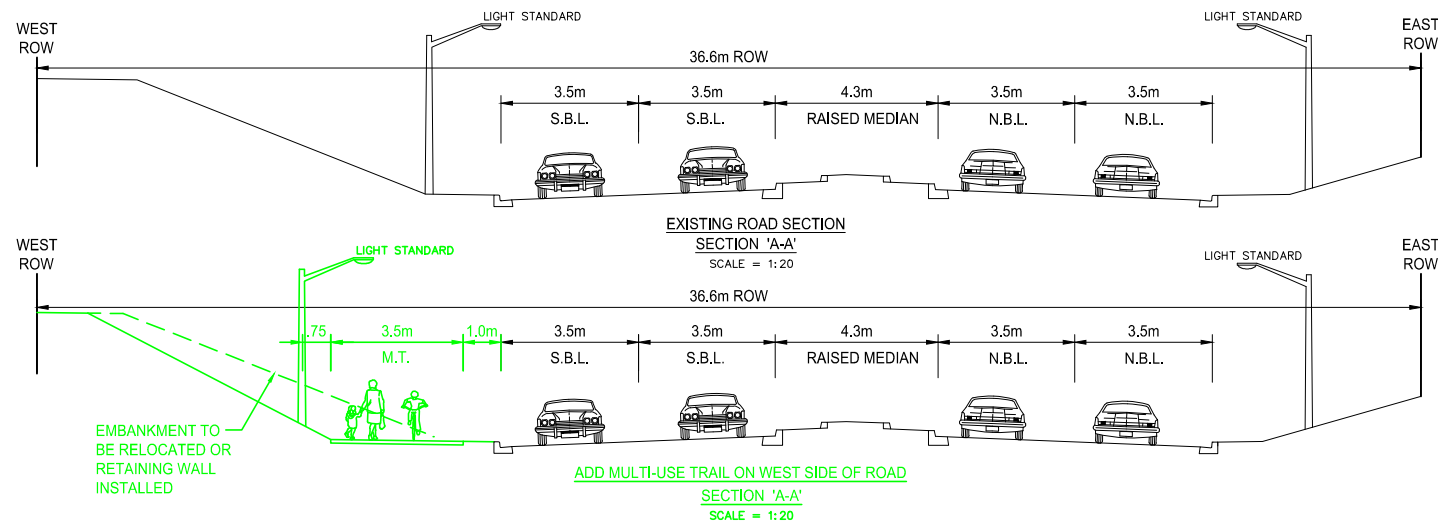
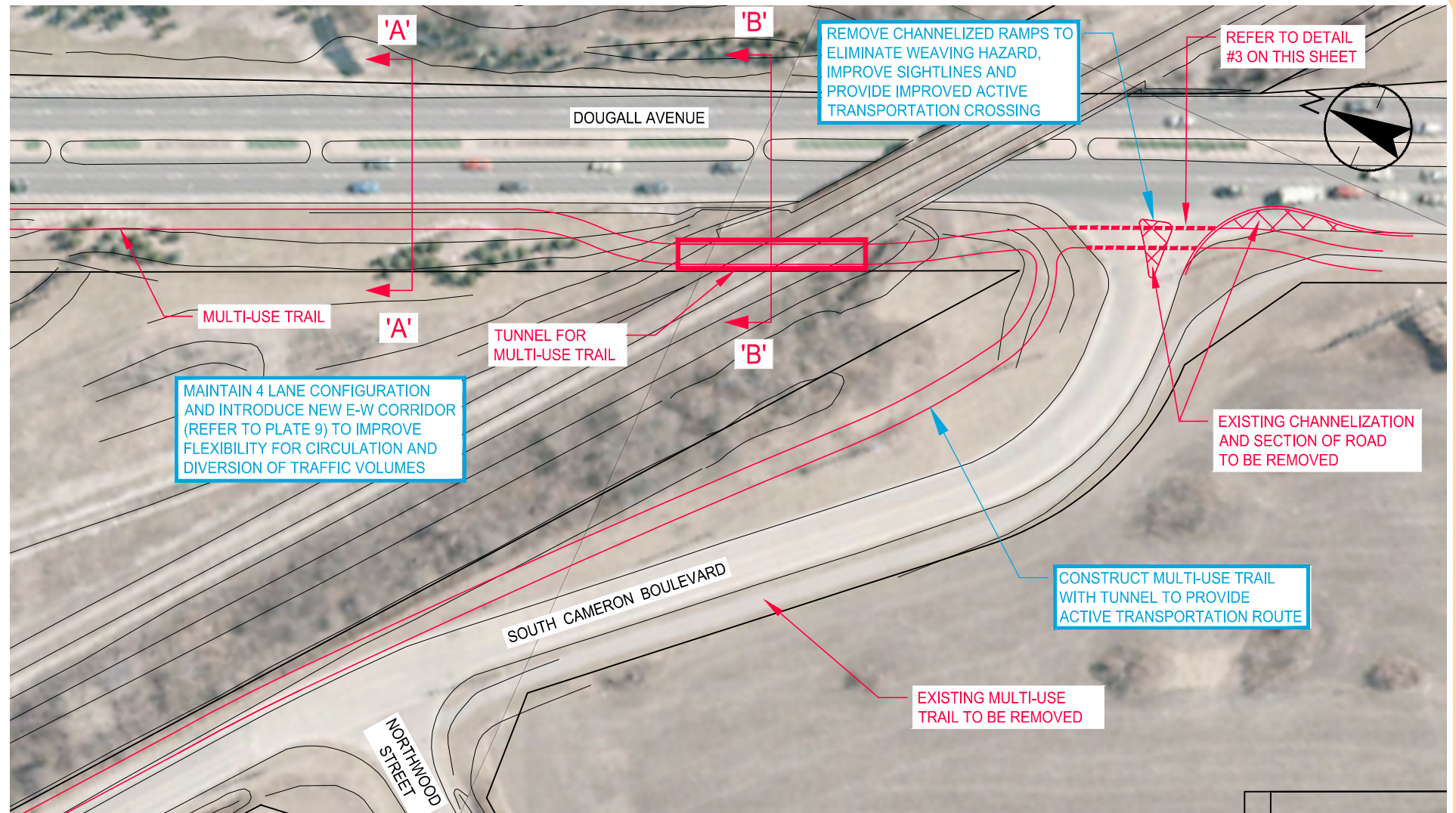
PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 4
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DETAIL #3
CROSSRIDE PAVEMENT MARKING



DETAIL #4
CROSSWALK PAVEMENT MARKING



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

- NOTES:**
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 - ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

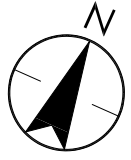
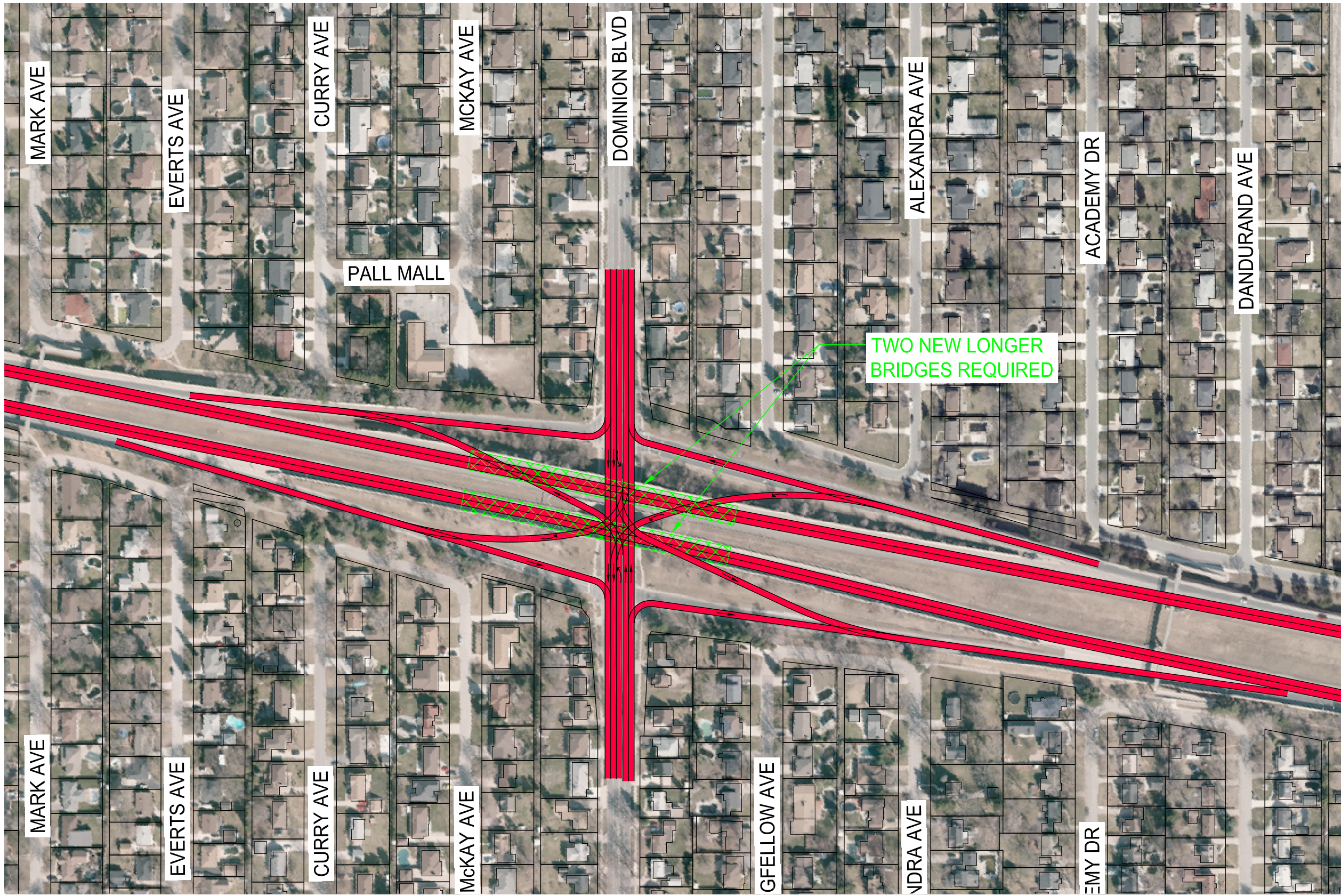


**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Dougall Avenue - Ouellette Place to South Cameron Boulevard
Option 1

PROJECT NO. 165620021	SCALE 1:1000	0 10 30 50m	DRAWING NO. PLATE 6A
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2014-12-05 10:07am By: kfox



CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

E C ROW SINGLE POINT URBAN INTERCHANGE (SPUI) - DOMINION AVE			
PROJECT NO.	165620021	1:2500	DRAWING NO.
			PLATE 6B

8.3.3 Dominion Boulevard – Evaluation

The evaluation tables for the Dominion Boulevard design alternatives are provided in Table 8.2 and 8.3, followed by an overview of the Preliminary Recommendations. The details of the preferred designs are discussed in Section 9 below.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Table 8.2 Dominion Boulevard Corridor Evaluation

DOMINION AVENUE CORRIDOR ROAD NETWORK	OJIBWAY TO NORTHWOOD Issue: Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification				
		NON -STRUCTURAL IMPROVEMENTS	STRUCTURAL IMPROVEMENTS		
Options					
Evaluation Criteria	Do Nothing No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	OPTION 1 Higher use of alternative modes of transportation	OPTION 2 Modify existing roadway to restrict turns to right-in/right-out using centre median (omit left turns)	OPTION 3 Widen existing roadway to 3 lanes with centre left turn lane	OPTION 4 Widen to 4 lanes
<p>Social/Cultural Impacts</p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> Operational issues relating to turning movements into residential driveways will continue; No property required; No impact to emergency response times; Safety concerns related to vehicle turning movements are not mitigated; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access and emergency response times (with the exception of an overall reduction in traffic volumes); No property required; No impacts to streetscape/aesthetics; No impacts to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Would significantly impact private driveway access; Widening can be incorporated into existing right of way, with some property required at intersections. Potential impacts to emergency response times due to circuitous driveway access; Opportunity to enhance streetscape with planted medians, etc.; May improve safety conditions by reducing conflicting turning movements; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Would facilitate driveway access with two-way left turn lane; Widening can be incorporated into existing right of way, with some property required at intersections. No impact to emergency response times; May reduce frequency of collisions with dedicated left turn lanes; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> May aggravate existing driveway access issues with motorists having to cross additional lanes of traffic; Additional property required along right of way; No impact to emergency response times; Potential safety conflicts with no designated turning lanes; No impact to archaeological/built heritage or Aboriginal treaty rights.
<p>Natural Environmental</p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas 	<ul style="list-style-type: none"> No impact. 	<ul style="list-style-type: none"> Positive impacts to the natural environment with an overall reduction in carbon emissions from reduced vehicle traffic. No impacts to habitats. 	<ul style="list-style-type: none"> Little-no roadside vegetation; No anticipated impacts to habitats. 	<ul style="list-style-type: none"> Little-no roadside vegetation; No anticipated impacts to habitats; Small portion of the Essex Region Conservation Authority Regulated Limit runs across Dominion Boulevard south of Ojibway Street. A Section 28 permit may be required. 	<ul style="list-style-type: none"> Little-no roadside vegetation No anticipated impacts to habitats; Small portion of the Essex Region Conservation Authority Regulated Limit runs across Dominion Boulevard south of Ojibway Street. A Section 28 permit may be required.
<p>Technical/ Engineering</p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> Corridor exceeds the guidelines for Local Road classification; consideration could be made for reclassifying as a Collector Road. Road network not consistent with network outlined within the South Cameron Secondary Plan. 	<ul style="list-style-type: none"> Potential to improve level of service through the corridor with a decrease in peak hour traffic volumes; In line with municipal/provincial policies for promoting alternatives modes of 	<ul style="list-style-type: none"> Would improve corridor LOS; May improve overall safety by reducing conflicting turning movements; Traffic volumes exceed guidelines for Local Road classification; consideration could be made for 	<ul style="list-style-type: none"> Would improve corridor LOS and increases through traffic capacity; May reduce collision frequency with dedicated left turn lanes; Traffic volumes exceed guidelines for a Local Road 	<ul style="list-style-type: none"> Would improve through traffic capacity, but conflict may occur with vehicles accessing private driveways; Traffic volumes exceed guidelines for a Local Road classification (more consistent with Collector Road function);

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Table 8.2 Dominion Boulevard Corridor Evaluation

DOMINION AVENUE CORRIDOR ROAD NETWORK	OJIBWAY TO NORTHWOOD				
	Issue: Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification				
		NON -STRUCTURAL IMPROVEMENTS	STRUCTURAL IMPROVEMENTS		
Options					
Evaluation Criteria	<p>Do Nothing No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)</p>	<p>OPTION 1 Higher use of alternative modes of transportation</p>	<p>OPTION 2 Modify existing roadway to restrict turns to right-in/right-out using centre median (omit left turns)</p>	<p>OPTION 3 Widen existing roadway to 3 lanes with centre left turn lane</p>	<p>OPTION 4 Widen to 4 lanes</p>
	<ul style="list-style-type: none"> Recommendations for bike lanes on Dominion Boulevard as per BUMP are not implemented. 	<p>transportation;</p> <ul style="list-style-type: none"> Traffic volumes currently exceed guidelines for local road classification; consideration could be made for reclassifying as Collector Road. Not consistent with network outlined in the South Cameron Secondary Plan. May involve the encouragement of active transportation modes; May involve an increase in transit routes. 	<p>reclassifying as a Collector Road.</p> <ul style="list-style-type: none"> Not consistent with network outlined in the South Cameron Secondary Plan. No direct impact to existing active transportation operations; No impact to existing transit routes. 	<p>classification (more consistent with Collector Road function);</p> <ul style="list-style-type: none"> Not consistent with network outlined in the South Cameron Secondary Plan. Opportunity to concurrently implement bike lanes and sidewalk improvements to accommodate safe active transportation facilities; No impact to existing transit routes. 	<ul style="list-style-type: none"> Not consistent with network outlined in the South Cameron Secondary Plan. Opportunity to concurrently implement bike lanes and sidewalk improvements to accommodate safe active transportation facilities; No impact to existing transit routes.
<p>Economic</p> <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with public campaigns; additional costs may be associated with improvements to active transportation and transit infrastructure; 	<ul style="list-style-type: none"> Moderate capital costs associated with installing centre median, with the potential for pavement widening. 	<ul style="list-style-type: none"> High capital costs associated with extending pavement within right of way, as well as urbanizing cross section (installation of storm sewers); Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Higher capital costs associated with extending pavement and urbanizing (installation of storm sewers) as well as property acquisition costs along the corridor; Regular operation and maintenance costs.
<p>RESULTS</p>	<p>The Do Nothing alternative does not address the identified issues, and is used as a benchmark for the evaluation of other alternatives.</p>	<p>RECOMMENDED While not sufficient as a standalone alternative to address existing corridor issues, should be incorporated into the City's regular transportation planning strategy/program.</p>	<p>NOT RECOMMENDED due to the significant impacts to accessing private driveways.</p>	<p>RECOMMENDED as part of the hybrid option to improve neighbourhood connectivity, implement active transportation facilities, and improve corridor LOS.</p>	<p>NOT RECOMMENDED due to the higher cost for relatively little benefit (i.e. increased capacity, but no improvement to driveway access, etc.).</p>

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Table 8.2 Dominion Boulevard Corridor Evaluation

DOMINION AVENUE CORRIDOR ROAD NETWORK	OJIBWAY TO NORTHWOOD Issues: Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification.		NORTHWOOD STREET TO WEST GRAND BOULEVARD Issues: Absence of dedicated bicycle facilities and narrow sidewalks.
STRUCTURAL IMPROVEMENTS			
Options	OPTION 5 New road – realignment as indicated in South Cameron Secondary Plan with lower volumes on Dominion Boulevard and improved driveway accesses	OPTION 6 'Hybrid' of Option 3 and 5 – Widen roadway to 3 lanes with centre turn lane and bike lanes, with new local road connection between Dominion Boulevard and Longfellow Avenue with a Multi-Use trail continuing to Alexandra Avenue	ACTIVE TRANSPORTATION IMPROVEMENTS
Evaluation Criteria	Implement Active Transportation Facilities (widen sidewalks to AODA standards (at minimum) and provide on-street bike lanes)		
<p><u>Social/Cultural Impacts</u></p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> Lower volumes of traffic north of the new road intersection may improve property access for this section of Dominion Boulevard; Significant property impacts for residents along Alexandra Avenue; New road will largely utilize right of way currently owned by the City; Significant public opposition expressed by residents in terms of tree removal, general property impacts to existing residences, increased traffic on a current cul-de-sac. Potential impacts to archaeological resources for Alexandra Avenue extension north of Ojibway Street as shown in South Cameron Secondary Plan 	<ul style="list-style-type: none"> Would facilitate driveway access with two-way left turn lane; Widening can be incorporated into existing right of way, with some property required at intersections. Improvements can be incorporated into existing City-owned right of way; Opportunity to enhance the pedestrian realm/streetscape with multi-use trail, and facilitates access to future parks planned by the City to the east of Ojibway street/west of South Cameron Boulevard; May reduce frequency of collisions with dedicated left turn lanes; No impact to archaeological resources/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impacts to property access; Pavement widening can be incorporated into existing right of way (with property potentially required at intersection as identified in intersection analysis); No impacts to emergency response times; Tree required along Dominion Boulevard to accommodate pavement widening, impacting streetscape; Removal of part-time on-street parking in order to implement on-street bike lanes, and remove safety conflicts between parked cars and cyclists; Overall safety improvement for cyclists by providing dedicated facilities; No impact to archaeological/built heritage or Aboriginal treaty rights.
<p><u>Natural Environmental</u></p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas (specially designated or protected habitats, migration routes, specific policies) 	<ul style="list-style-type: none"> Significant tree/vegetation removal required for construction of new road, including Alexandra Avenue extension north of Ojibway Street to South Cameron Boulevard through existing woodlot. Tree removal should be conducted outside of bird nesting period (refer to current MNRF nesting period) NHIC contains records for 1 species at risk in the general vicinity (Butler's Gartersnake); suitable habitat should be determined in consultation with MNRF; Small portion of the Essex Region Conservation Authority Regulated Limit runs across Dominion Boulevard south of Ojibway Street. A Section 28 permit may be required. 	<ul style="list-style-type: none"> Less tree/vegetation removal required than Option 5; Tree removal should be conducted outside of bird nesting period (refer to current MNRF nesting period) NHIC contains records for 1 species at risk in the general vicinity (Butler's Gartersnake); suitable habitat should be determined in consultation with MNRF; Small portion of the Essex Region Conservation Authority Regulated Limit runs across Dominion Boulevard south of Ojibway Street. A Section 28 permit may be required. 	<ul style="list-style-type: none"> Tree removal required along Dominion Boulevard; Tree removal should be conducted outside of bird nesting period (refer to current MNRF nesting period)
<p><u>Technical/ Engineering</u></p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> May improve LOS for Ojibway Street at Dominion Boulevard with some traffic diverted to new Alexandra Avenue extension; Function of Dominion Boulevard would be consistent with existing Local Road classification, and consistent with network outlined in the South Cameron Secondary Plan. Alexandra Avenue would be classified as a Collector Road. Would improve overall neighbourhood connectivity; 	<ul style="list-style-type: none"> Improves corridor LOS and increases through traffic capacity; May reduce collision frequency with dedicated left turn lanes; Some traffic diverted via new Local Road, but traffic volumes on Dominion Boulevard would not be consistent with Local Road classification. Not consistent with road network outlined in the South 	<ul style="list-style-type: none"> Potential increase in capacity for through traffic with removal of part-time on-street parking; Consistent with BUMP and existing road classification; Provides active transportation facilities; supported by OP Policies 7.2.2.14 and 7.2.2.15 which state that on-street parking may be removed to facilitate the construction of bicycle lanes; No impact to existing transit routes.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Table 8.2 Dominion Boulevard Corridor Evaluation

DOMINION AVENUE CORRIDOR ROAD NETWORK	OJIBWAY TO NORTHWOOD Issues: Operational deficiencies related to turning movements to residential driveways, traffic volumes at or approaching capacity of a 2-lane road and exceed the thresholds for a Local street classification.		NORTHWOOD STREET TO WEST GRAND BOULEVARD Issues: Absence of dedicated bicycle facilities and narrow sidewalks.
	STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS
Options	OPTION 5 New road – realignment as indicated in South Cameron Secondary Plan with lower volumes on Dominion Boulevard and improved driveway accesses	OPTION 6 'Hybrid' of Option 3 and 5 – Widen roadway to 3 lanes with centre turn lane and bike lanes, with new local road connection between Dominion Boulevard and Longfellow Avenue with a Multi-Use trail continuing to Alexandra Avenue	Implement Active Transportation Facilities (widen sidewalks to AODA standards (at minimum) and provide on-street bike lanes)
Evaluation Criteria			
	<ul style="list-style-type: none"> May improve safety conditions on Dominion Boulevard north of Northwood Street due to decreased traffic volumes, but may create concerns relating to the proximity of intersections and volumes accessing the new Road. (Northwood Street/new road). 	<ul style="list-style-type: none"> Cameron Secondary Plan. Opportunity to concurrently implement bike lanes and sidewalks improvements, and provides greater neighbourhood connectivity for active transportation including future parks planned by the City east of Ojibway Street/west of South Cameron Boulevard. No impact to existing transit routes. 	
<p>Economic</p> <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> Higher capital cost associated with constructing extension of Alexandra to Dominion Boulevard, and future extension north to South Cameron Boulevard; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> High capital costs associated with extending pavement within right of way, as well as urbanizing Dominion Boulevard cross section (installation of storm sewers) and construction of new Local Road, but total cost than Option 5 (which includes future Alexandra Avenue extension northward). Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs associated with tree removal and pavement widening; Regular operation and maintenance costs.
RESULTS	NOT RECOMMENDED due to the significant public opposition expressed at PIC1, and greater overall environmental and economic impacts.	RECOMMENDED due to the improvement to traffic capacity and LOS, incorporation of active transportation facilities and improvement to neighbourhood permeability (i.e. facilitates access to future City parks just west of South Cameron Boulevard), lower overall environmental impacts, and mitigation of public concerns regarding perceived property impacts in Alexandra Avenue neighbourhood.	RECOMMENDED in conjunction with intersection improvements proposed along corridor.

Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTION	AT OJIBWAY STREET			
	Issues: Delays for Ojibway Street Approaches to Dominion Boulevard: left turn storage for vehicles turning left onto Ojibway Street from Dominion Boulevard.			
Options	Do Nothing No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Modify existing roadway to restrict turns to right-in, right-out using a centre median	Option 2 Construct Roundabout	Option 3 Signalize (when warranted by increased traffic volumes)
<u>Social/Cultural Impacts</u> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> Motorists would experience significant delays when accessing Dominion Boulevard from Ojibway Street approaches; No property required; No impacts to emergency response times; No impacts to archaeological/cultural heritage; No impacts to Aboriginal treaty rights 	<ul style="list-style-type: none"> Significantly limits access to neighbouring subdivision (access limited to McKay/Dominion intersection); Little property required (widening may be required to accommodate centre median); Emergency response times may be increased for subdivision to the west of Dominion Boulevard; Potential increase in safety for pedestrians due to restricting left turns. No impact to archaeological/built heritage No impact to archaeological/built heritage, or Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> Facilitates access to neighbouring subdivisions; Significant property acquisition required, including the potential for full acquisition of corner properties. Opportunities for median planters/ landscaping May improve emergency response times due to increased LOS. No impact to archaeological/built heritage, or Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> Facilitates access to neighbouring subdivisions; Little property required to accommodate signals; No impact to emergency response times. No impact to archaeological/built heritage, or Aboriginal lands/treaty rights.
<u>Natural Environmental</u> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas 	<ul style="list-style-type: none"> No Impacts. 	<ul style="list-style-type: none"> Little-no plants along existing right of way; No anticipated impacts to migratory/other birds or significant wildlife habitat. 	<ul style="list-style-type: none"> Little-no plants within immediate area; No anticipated impacts to migratory/other birds or significant wildlife habitat. 	<ul style="list-style-type: none"> Little-no plants within immediate area; No anticipated impacts to migratory/other birds or significant wildlife habitat.
<u>Technical/ Engineering</u> <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> LOS for Ojibway Street approaches would remain poor (F) with significantly increased delays for all turning movements from the Ojibway Street approaches to Dominion Boulevard (over 4.5 times greater delay for a.m. peak hour) (see Future Conditions Analysis in Appendix C2); Traffic volumes would exceed thresholds for Local Road classification. 	<ul style="list-style-type: none"> Would reduce back-up from left-turning vehicles and improve LOS; Traffic volumes would exceed thresholds for Local Road classifications; Would limit access to neighbouring subdivisions; Does not impact current transit routes, but limits future transit options. Accommodates pedestrian/cycling traffic. May improve collision frequency/overall safety due to elimination of left turn movements. 	<ul style="list-style-type: none"> Would improve intersection LOS; Road classification would remain the same; Would maintain/facilitate access to neighbouring subdivisions; May impact existing transit route (Route 5 – Dominion Boulevard); footprint/property impacts would increase due to increased radii to accommodate bus traffic. Difficult to accommodate pedestrian and cyclist traffic; 	<ul style="list-style-type: none"> Would improve intersection LOS; Road classification would remain the same; Would maintain/facilitate access to neighbouring subdivisions; No impact to existing transit route; Improves safety for pedestrians and cyclists.
<u>Economic</u> <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Small capital costs associated with centre median, with the potential for property acquisition costs. Standard operation and maintenance costs. 	<ul style="list-style-type: none"> Highest capital costs associated with extensive property acquisition, and road works. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs, with the potential for property acquisition costs. Regular operation and maintenance costs

Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTION		AT OJIBWAY STREET			
		Issues: Delays for Ojibway Street Approaches to Dominion Boulevard: left turn storage for vehicles turning left onto Ojibway Street from Dominion Boulevard.			
Options	Do Nothing No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Modify existing roadway to restrict turns to right-in, right-out using a centre median	Option 2 Construct Roundabout	Option 3 Signalize (when warranted by increased traffic volumes)	
RESULTS	The Do Nothing alternative does not address the identified issues, and is used as a benchmark in the evaluation of other alternatives.	NOT RECOMMENDED due to the significant impacts to connectivity to the neighbouring subdivision: only 1 access would be provided (McKay at Dominion) for over 250 homes.	NOT RECOMMENDED due to the high cost and complicated implementation involving full property acquisition. This level of cost and construction would not be warranted should improvements be made within the corridor (widening, realignment, etc.)	RECOMMENDED when warranted. Current traffic volumes are below general standards for signalization; other improvements along the corridor may also alleviate existing operational deficiencies. Signalization should be reinvestigated when traffic volumes increase.	

DOMINION BOULEVARD INTERSECTIONS		AT NORTHWOOD STREET				
		Issues: Periods of congestion related to school/mosque activities; safety concerns related to misaligned turning movements; absence of dedicated left turn lanes on all approaches.				
	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Signal Timing Adjustments	Option 2 Provide dedicated left turn lane on all approaches (Plates 3, 3A, and 4)	Option 3 Increase radii of northwest and southwest corners of Northwood Street approaches to accommodate bus turning movements	Option 4 Improve pedestrian and bicycle crossing treatments	
Social/Cultural Impacts	<ul style="list-style-type: none"> Intersection will continue to experience periods of congestion related to near-by institutional land uses; No property required; No impact to emergency response times; Safety concerns relating to vehicle turning movements and pedestrian and cyclists safety are not mitigated; No impacts to archaeological/build heritage; No impacts to Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> Minimal impact to property access; No property required; No impact to overall safety, No impact to archaeological/built heritage, or Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> Facilitates access to neighbouring subdivisions; Some property required along right of way to accommodate widening; No impact to streetscape/ aesthetics; Improvement to safety conditions for motorists with alignment of turning movements and dedicated lanes; No impact to archaeological/ built heritage. 	<ul style="list-style-type: none"> Minimal impact to property access; Some property required along right of way; No impact to streetscape/ aesthetics; Improves safety conditions for right turning movements (especially for larger vehicles), but does not improve safety conditions for pedestrians and cyclists due to the increased crossing distance, potential site line issues with turning vehicles, and decrease in storage space for waiting pedestrians. 	<ul style="list-style-type: none"> No impact to property access; No property required; Enhances the pedestrian realm/streetscape; No impact to archaeological/built heritage or Aboriginal/treaty rights. 	

Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTIONS	AT NORTHWOOD STREET				
	Issues: Periods of congestion related to school/mosque activities; safety concerns related to misaligned turning movements; absence of dedicated left turn lanes on all approaches.				
	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Signal Timing Adjustments	Option 2 Provide dedicated left turn lane on all approaches (Plates 3, 3A, and 4)	Option 3 Increase radii of northwest and southwest corners of Northwood Street approaches to accommodate bus turning movements	Option 4 Improve pedestrian and bicycle crossing treatments
<p>Natural Environmental</p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> – aquatic habitats – terrestrial habitats – migratory/other birds: (e.g. waterfowl, songbirds) – special habitat areas 	<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Little-no vegetation within immediate area; No anticipated impacts to migratory/other birds or significant wildlife habitat. 	<ul style="list-style-type: none"> Little-no vegetation within immediate area; No anticipated impacts to migratory/other birds or significant wildlife habitat. 	<ul style="list-style-type: none"> No impact.
<p>Technical/ Engineering</p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> Slight decrease in overall LOS and exceeds intersection capacity (from LOS C/B to E/C in a.m./p.m. peak hours); Increased delays for northbound left turns onto Northwood Street, and westbound left turns onto Dominion Boulevard during a.m. peak hour; Identified deficiencies for active transportation users are not addressed; 	<ul style="list-style-type: none"> Potential to improve intersection LOS; Road classification would remain the same; May facilitate connectivity with neighbouring subdivision; No impact to existing transit route; No impact to pedestrian and cyclist safety. 	<ul style="list-style-type: none"> Would improve intersection LOS; Road Classification would remain the same; Would facilitate access to neighbouring subdivisions; Improves overall safety and collision frequency with dedicated and aligned left turn movements Opportunity to improve safety for pedestrians with more defined turning movements and the ability to incorporate bicycle lanes. 	<ul style="list-style-type: none"> No impact to LOS or road classification; Allows for transit access should additional routes be considered by Transit Windsor; Allows for the incorporation of improved pedestrian and bicycle treatments. May improve rear-end collision frequency. 	<ul style="list-style-type: none"> No impact to LOS or road classification; No impact to transit routes; Improves visibility of pedestrian and cyclist crossing;
<p>Economic</p> <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> No capital costs; Typically part of regular transportation program maintenance. 	<ul style="list-style-type: none"> Moderate capital costs. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Cost to be incorporated into concurrent intersection/corridor improvements. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Minimal capital costs, and can be implemented with or without concurrent intersection/corridor improvements.
<p>RESULTS</p>	<p>The Do Nothing alternative does not address the identified issues, and is used as a benchmark in the evaluation of other alternatives.</p>	<p>RECOMMENDED</p> <p>Though not sufficient to improve conditions as a standalone alternative, signal timing adjustments should be completed as part of the regular transportation program and reviewed regularly to ensure the efficiency of intersection operations.</p>	<p>RECOMMENDED in order to reduce collision frequency with the alignment of left turn lanes which improves sightlines for turning movements as well as increasing intersection LOS.</p>	<p>RECOMMENDED in order to reduce collision frequency for turning vehicles and to allow for future transit access.</p>	<p>Recommended in order to improve visibility/safety for pedestrians and cyclists.</p>

Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTIONS	AT E.C. ROW EXPRESSWAY		
	Issue: Occasional storage deficiencies for southbound left turn lanes, and substandard taper lengths.		
Options	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Signal Timing Adjustments	Option 2 Construct a Single Point Urban Interchange
<p><u>Social/Cultural Impacts</u></p> <ul style="list-style-type: none"> • Property Access; • Property Acquisition Requirements; • Impacts to Emergency Response Times; • Streetscape and Aesthetics • Public Safety • Archeological and Cultural Heritage • Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> • No impact to existing property access; • No property required; • No impact to emergency response times; • Safety concerns relating to vehicle turning movements and pedestrian and cyclists safety are not mitigated; • No impacts to archaeological/build heritage; • No impacts to Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> • No impacts. 	<ul style="list-style-type: none"> • Property acquisition would be required, and significant construction impacts for near- complete reconstruction of interchange; • May improve emergency response times; • No impacts to archaeological/built heritage or Aboriginal treaty rights.
<p><u>Natural Environmental</u></p> <ul style="list-style-type: none"> • Impacts to Existing Vegetation; and • Terrestrial Resources <ul style="list-style-type: none"> – aquatic habitats – terrestrial habitats – migratory/other birds: (e.g. waterfowl, songbirds) – special habitat areas 	<ul style="list-style-type: none"> • No impacts. 	<ul style="list-style-type: none"> • No impacts. 	<ul style="list-style-type: none"> • Construction impacts to vegetation, including rare plants identified along are beneath E.C. Row Expressway; • No anticipated impacts to migratory/other birds or significant wildlife habitat.
<p><u>Technical/ Engineering</u></p> <ul style="list-style-type: none"> • Corridor Capacity, Level of Service (LOS), and Queuing Deficiencies; • Planning Objectives ; • Network Connectivity; • Overall Safety; • Pedestrian & Cycling Accommodation; • Transit Services 	<ul style="list-style-type: none"> • North and South ramp terminals maintain acceptable level of service (C) for most movements; south ramp terminal approaches capacity, and existing storage deficiencies for southbound left turns continue; • Substandard taper lengths are not addressed, which relate to storage deficiencies; longer queues occasionally extend into through lane, disrupting through traffic. • Does not address identified collision patterns; • No impact to existing pedestrian/cyclist operations/safety or transit routes. 	<ul style="list-style-type: none"> • May improve intersection LOS; however, extending advanced left turn signal may cause capacity issues for through traffic; LOS and capacity issues will improve for both north and south terminals with implementation of new east-west corridor. • Substandard taper lengths are not addressed, which relate to storage deficiencies; longer queues occasionally extend into through lane, disrupting through traffic. • Does not address identified collision pattern; • No impact to existing pedestrian/cyclist operations/safety, or transit routes. 	<ul style="list-style-type: none"> • Would improve interchange LOS, and addresses identified left turn- queue length deficiencies; maintains a Good (C) LOS, however analysis shows overall SPUI intersection operating at or above capacity (may require general widening of Dominion Boulevard north and south of the new interchange to accommodate dual left turn lanes); • General safety improvement (left turning traffic turn simultaneously without crossing the path of opposing left turns); may improve identified collision pattern; • Not a desirable option for the incorporation of pedestrian and cyclist traffic; • No impact to transit operations.

CENTRAL BOX STUDY AREA
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Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTIONS	AT E.C. ROW EXPRESSWAY		
	Issue: Occasional storage deficiencies for southbound left turn lanes, and substandard taper lengths.		
Options	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Signal Timing Adjustments	Option 2 Construct a Single Point Urban Interchange
<u>Economic</u> <ul style="list-style-type: none"> • Initial Capital Cost • Operation And Maintenance Costs 	<ul style="list-style-type: none"> • No capital costs; • Regular operation and maintenance costs. 	<ul style="list-style-type: none"> • No capital costs; • Typically part of regular transportation program maintenance. 	<ul style="list-style-type: none"> • Extensive capital costs associated with complete reconstruction of the interchange.
<u>RESULTS</u>	<p>No structural improvements are being recommended at the interchange. Although occasional storage deficiencies may persist, the issue does not warrant complete reconstruction of the intersection. Physical constraints (proximity of on and off ramps within an urban setting) limit the ability to provide additional storage and provide standard taper lengths; however, recommendations being made throughout the Central Box area will contribute to a reduction in local E.C. Row trips (i.e. between Dominion Boulevard/Dougall Avenue) and the Dominion Boulevard on and off ramps will maintain an acceptable LOS.</p>	RECOMMENDED	NOT RECOMMENDED
		<p>Although not sufficient to address the storage/taper length issue as a standalone alternative, signal timing adjustments should be completed as part of the regular transportation program and reviewed regularly to ensure the efficiency of intersection operations.</p>	<p>The extensive cost and construction impacts are not relative to the achieved benefit and projected needs. Other alternatives being considered are intended to reduce local E.C. Row trips (i.e. between Dominion Boulevard/Dougall Avenue), and alleviate existing deficiencies at the Dominion Boulevard on and off ramps.</p>

Table 8.3 Dominion Boulevard Intersection Design Evaluation

DOMINION BOULEVARD INTERSECTIONS	AT LABELLE STREET					
		Issues: High collision frequency and severity; no designated turning lanes; potential site line deficiencies on approaches due to vegetation canopy and frequent private driveways.				
Options	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Improve signage	Option 2 Convert existing through lanes to dedicated left turn lanes (via pavement markings only)	Option 3 Improve pedestrian crossing treatments with zebra crossing pavement markings	Option 4 General Widening of Dominion to accommodate left turn lanes and maintain 2 through lanes	Option 5 Increase corner radii to improve safety for turning movements
<p>Social/Cultural Impacts</p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> No impacts to existing property access; High collision frequency and safety concerns related to turning movements are not mitigated; No impacts to archaeological/cultural heritage; No impacts to Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access; No property required; No impacts to emergency response times; Opportunity to improve streetscape with high quality signage; Improves safety with increased intersection visibility; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> May facilitate driveway access and neighbourhood connectivity with dedicated turn lanes; May impact emergency response times with decreased through traffic capacity; May improve safety/reduce vehicle collision frequency with dedicated turn lanes, but no improvement to pedestrian/cyclist safety at intersection. 	<ul style="list-style-type: none"> No impact to property access; No property required; No impact to emergency response times; Enhances the pedestrian realm/streetscape; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Facilitates property access/connectivity with dedicated left turn lanes; Some property required to accommodate widening at intersection; No impact to streetscape/aesthetics; May reduce collision frequency by providing dedicated and aligned left turn movements. No impact to archaeological/built heritage. 	<ul style="list-style-type: none"> Minimal impact to property access; Some property required along right of way; No impact to streetscape/aesthetics; Improves safety conditions for right turning movements (especially for larger vehicles), but does not improve safety conditions for pedestrians and cyclists due to the increased crossing distance, potential site line issues with turning vehicles, and decrease in storage space
<p>Natural Environmental</p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Trimming of overhead vegetation required (as part of regular maintenance); No impact to aquatic/terrestrial/ significant wildlife habitat. 	<ul style="list-style-type: none"> No impacts to roadside vegetation. No impact to habitats. 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Tree removal may be required along Dominion Boulevard to accommodate widening (mitigation/ compensation to be provided). Tree removal should be conducted outside of bird nesting period (refer to current MNRF nesting period). 	<ul style="list-style-type: none"> Potential tree removal may be required; Tree removal should be conducted outside of bird nesting period (refer to current MNRF nesting period).

CENTRAL BOX STUDY AREA
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Table 8.3 Dominion Boulevard Intersection Design Evaluation

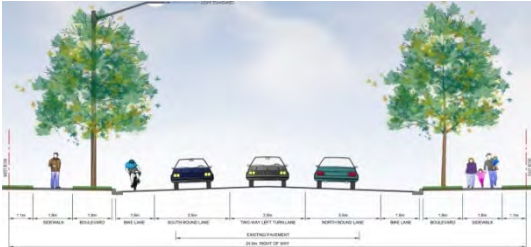
DOMINION BOULEVARD INTERSECTIONS	AT LABELLE STREET					
		Issues: High collision frequency and severity; no designated turning lanes; potential site line deficiencies on approaches due to vegetation canopy and frequent private driveways.				
Options	DO NOTHING No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1 Improve signage	Option 2 Convert existing through lanes to dedicated left turn lanes (via pavement markings only)	Option 3 Improve pedestrian crossing treatments with zebra crossing pavement markings	Option 4 General Widening of Dominion to accommodate left turn lanes and maintain 2 through lanes	Option 5 Increase corner radii to improve safety for turning movements
Technical/ Engineering <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> Forecasted traffic increase will not significantly impact LOS and capacity at the intersection. High collision frequency and safety concerns regarding pedestrians, cyclists, and vehicle turning movements will not be addressed. 	<ul style="list-style-type: none"> No change to intersection LOS and general connectivity; General safety improvement and potential reduction in collision frequency. No direct impact to pedestrian and cyclist operation of the intersection. No impact to existing transit operations. 	<ul style="list-style-type: none"> Would decrease LOS for corridor/ intersection due to decrease through traffic capacity. May reduce frequency of vehicle collisions with dedicated left turn lanes, but no direct impact to pedestrian/cyclist safety. No impact to transit routes. 	<ul style="list-style-type: none"> No impact to LOS and general connectivity; Improves visibility of intersections/ increases safety for pedestrians/cyclists at intersection. No impact to transit routes. 	<ul style="list-style-type: none"> Would improve intersection LOS; Road Classification would remain the same; Would decrease collision frequency due to dedicated left turn lanes; Allows for the accommodation of bicycle lanes during widening; No impact to transit routes. 	<ul style="list-style-type: none"> No impact to LOS or road classification; Allows for transit access should additional routes be considered by Transit Windsor; Allows for the incorporation of improved pedestrian and bicycle treatments. May improve rear-end collision frequency.
Economic <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> No capital costs; Regular maintenance costs including overhead vegetation maintenance. 	<ul style="list-style-type: none"> No capital costs; Regular maintenance costs including overhead vegetation maintenance. 	<ul style="list-style-type: none"> Minimal capital costs associated with the modification to pavement markings and signage. Regular operation and maintenance. 	<ul style="list-style-type: none"> Minimal capital costs associated with pavement treatments; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Higher capital costs associated with pavement widening. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Costs can be incorporated into concurrent intersection/corridor improvements. Regular operation and maintenance costs.
RESULTS	Forecasted traffic volumes may not have a significant impact on the operations of the intersection, but the safety concerns relating to vehicle turning movements (one of the highest collision rates in the Central Box area) and conflicts with pedestrians/cyclists will not be addressed.	RECOMMENDED in order to improve visibility of the intersection, improving safety for pedestrians and cyclists and reducing collision frequency.	NOT RECOMMENDED due to the decrease in LOS and through traffic capacity.	RECOMMENDED While not sufficient as a standalone alternative to address existing concerns, should be incorporated into design of intersection to improve safety for pedestrians/cyclists.	RECOMMENDED in order to improve level of service, and decrease collision frequency. Provides the opportunity to incorporate bicycle lanes.	RECOMMENDED in order to reduce collision frequency for turning vehicles and to allow for future transit access.

8.3.4 Dominion Boulevard Corridor – Preliminary Recommendations

Off-road **multi-use trail** located on property currently owned by the City of Windsor to improve neighbourhood connectivity for Active Transportation, and provides an access route to future parkland to the east planned by the City. Refer to **Plate 3, 3A, and 3B**

A new local road connection with a multi-use trail in the north boulevard constructed between Dominion Boulevard and Longfellow Avenue utilizing property owned by the City of Windsor. Refer to **Plate 3, 3A, and 3B**.

Dominion Boulevard from Northwood Street to Ojibway Street to be converted to an urban cross section (curbs and storm sewers), **pavement widened to three lanes** within the existing right of way to include on-street bicycle lanes and a continuous two-way centre turn lane to facilitate driveway access. Refer to **Plate 3 and 3A**.

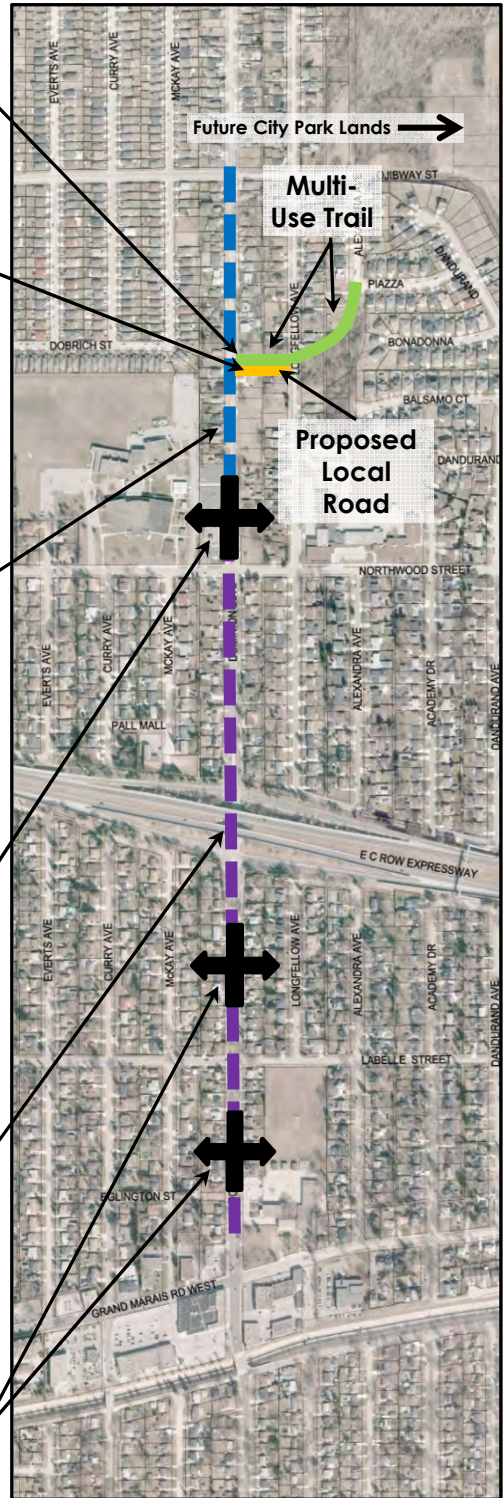


Dedicated left turn lanes are proposed on all approaches at the Northwood Street and Dominion Boulevard intersection, **corner radii are increased** to improve turning operations, and **pedestrian and bicycle crossings** are improved. Refer to **Plate 4**.

Pavement is widened from Northwood Street to West Grand Boulevard within the existing right of way, and **part-time on-street parking is removed** to increase capacity and **accommodate bike lanes**. Refer to **Plate 4**.



Left turn lanes are proposed at Dominion Boulevard at Grand Marais Road West, and Dominion at Labelle Street along with signal timing adjustments to improve intersection operations and reduce collision frequency (see **Plate 4**).



8.4 DOUGALL AVENUE DESIGN ALTERNATIVES

8.4.1 Dougall Avenue – Ouellette Avenue Corridor

EUGENIE STREET TO DOUGALL AVENUE/OUELLETTE PLACE

Issue: Operational deficiencies include turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours.

- Option 1: Signal timing adjustments.
- Option 2: Promote higher use of alternatives modes of transportation (Transportation Demand Management - TDM) as discussed in Section 4.1.
- Option 3: Modify existing roadway along Ouellette Avenue/Ouellette Place to restrict turns to right-in/right-out by extending existing centre median (**Plate 5**).
- Option 4: Modify existing roadway – replace unmarked center median with a two-way left turn lane (TWLTL) or a designated left turn lane for one direction.

Active Transportation Improvements

Issue: Minimal dedicated active transportation facilities and/or absence of dedicated facilities (Dougall Avenue is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan)

- Option 1: Construct sidewalks on both sides of the corridor.
- Option 2: Construct an in-boulevard multi-use trail in the east boulevard.
- Option 3: Construct bicycle lanes (on Dougall Avenue portion only) (**Plate 6**):
 - Bike lanes on this section of Ouellette Avenue/Ouellette Place were not included in design considerations; they were screened out early in the process due to the volume and speeds of traffic, skewed alignment of the corridor, and the frequency of commercial driveways. A shared, single file bicycle/vehicle lane with WC-24 signage (“Single File” – see OTM Book 18) was considered along the Dougall Avenue corridor as an interim condition to address existing active transportation needs along the corridor; however, due to the speeds and volume of traffic, a shared curb lane is not recommended as an interim condition according to OTM Book 18 guidelines, with respect to the speed differential and daily traffic volumes. This scenario was also considered with a reduction in the speed limit along the Dougall Avenue corridor, however this would not be sufficient in creating a suitable environment for cycling traffic.

**CENTRAL BOX STUDY AREA
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DOUGALL AVENUE/OUELLETTE PLACE TO WEST GRAND BOULEVARD

Issue: Operational deficiencies include difficulty accessing east/west corridors (South Cameron Boulevard), traffic demands are at or near capacity during peak hours, cross section constraints (property required) at CN Rail underpass (if widened to 6 lanes), merging and weaving traffic along corridor.

- Option 1: Introduce new east-west corridor
- Option 2: Widen the roadway to 6 lanes.

Active Transportation Improvements

Issue: Disconnected sidewalk facilities and no bicycle facilities north of South Cameron Boulevard, no pedestrian or bicycle facilities crossing under CN Rail line, disconnected multi-use trail in the west boulevard.

- Option 1: Construct a multi-use trail along the west boulevard between Dougall Avenue/Ouellette Place including a tunnel crossing under the CN Rail underpass to connect existing MUT (**Plate 6A**).
- Option 2: Provide continuous sidewalks on both sides of Dougall Avenue (including tunnel crossing under the CN Rail underpass in the west boulevard).
- Option 3: Widen the roadway to provide separated bike lanes.

8.4.2 Dougall Avenue – Ouellette Avenue Intersections

DOUGALL AVENUE/OUELLETTE PLACE

Issue: Collision history (highest in City), lack of active transportation facilities, geometric design with skewed intersection, drivers not obeying stop sign on Dougall Avenue approach, northbound left turn storage (left turn queues back up into northbound travel lanes), northbound to southbound U-turns including large trucks.

- Option 1: Improve geometric design to reduce skew angle of Dougall Avenue approach (**Plate 6**).
- Option 2: Install Traffic Signals (**Plate 6**).

DOUGALL AVENUE AT VAN DE WATER RAIL YARD ACCESS

Issue: Illegal northbound to southbound U-turns are occurring

- Option 1: Allow U-turns at CN's Van de Water Rail Yard access by providing a proper northbound left turn lane (by removing a portion of the existing centre median), and removing the existing left turn restriction.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Phase 3 – Design alternatives

- Option 2: Close the existing gap in the centre median and restrict the Van de Water access to right-in/right-out only, or relocate the access.

DOUGALL AVENUE AT SOUTH CAMERON BOULEVARD

Issue: No access to or from Dougall Avenue northbound, safety of the eastbound to southbound right turn movement into a potential weaving area on Dougall Avenue southbound, active transportation crossings of the South Cameron Boulevard leg of the intersection

- Option 1: Modify the existing design by removing the channelizing island to create a conventional right turn intersection configuration (**Plate 6A**).

DOUGALL AVENUE AT E.C. ROW EXPRESSWAY RAMPS

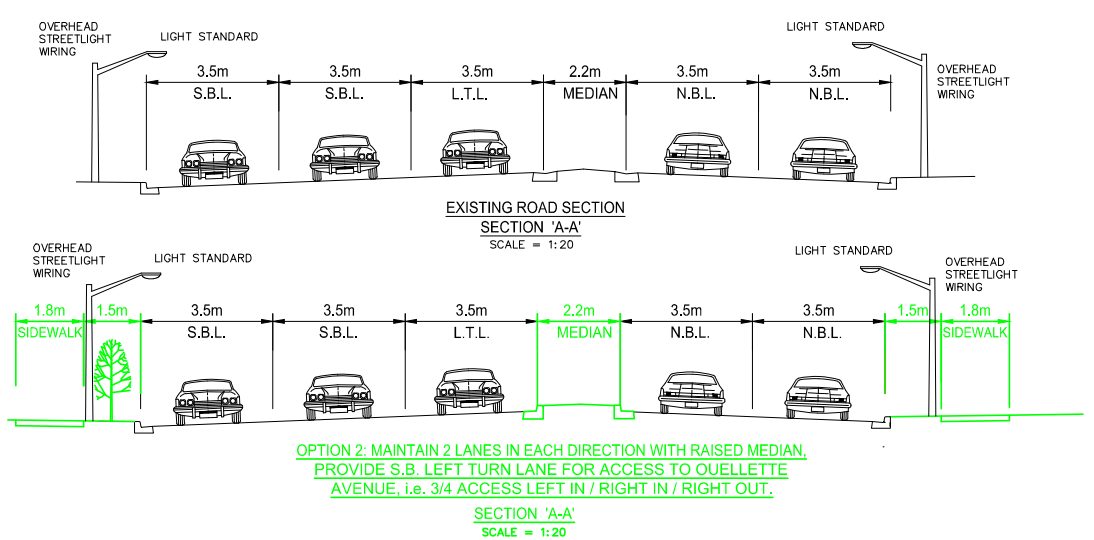
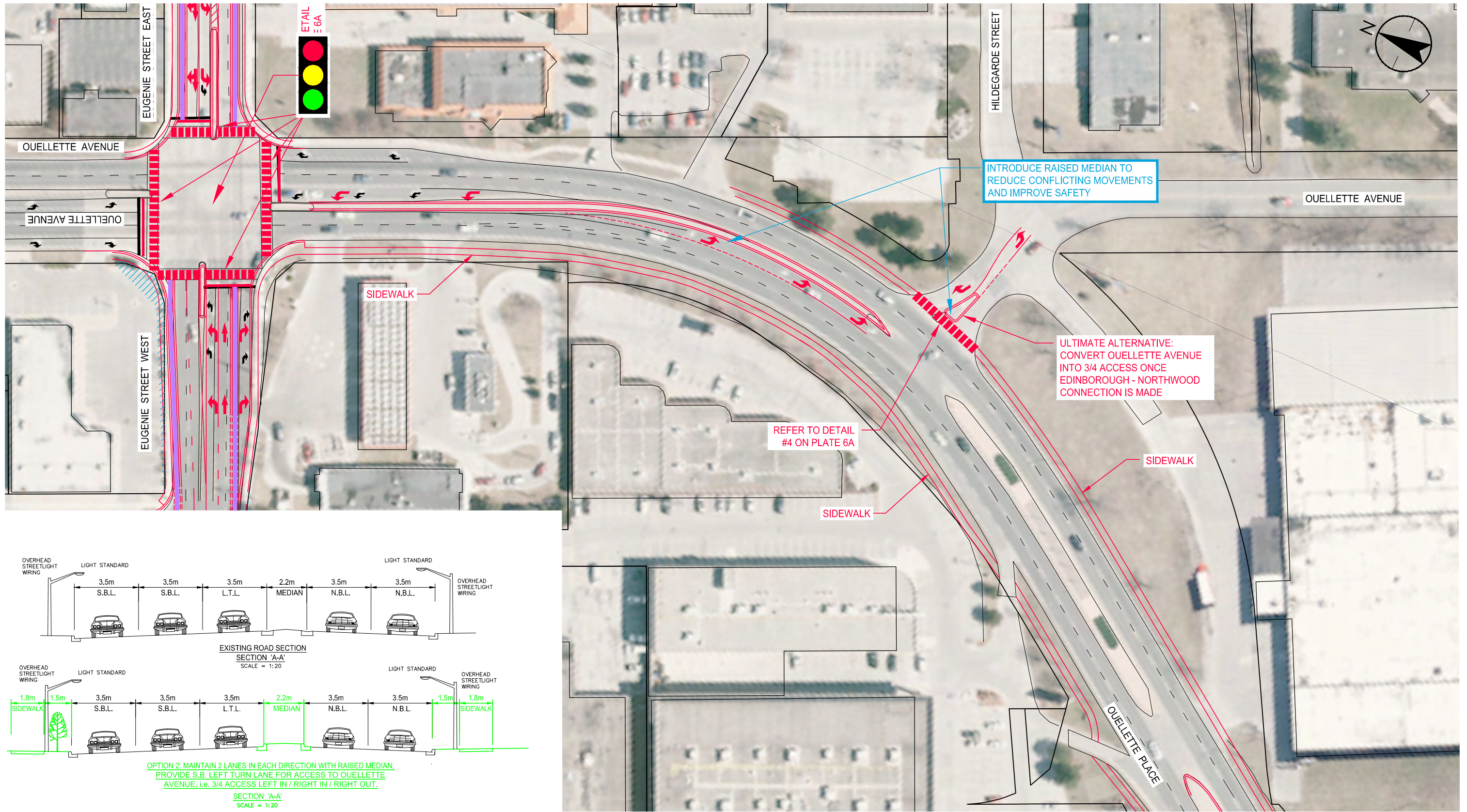
Issue: Active transportation conflicts at free flow ramp crossings; uncontrolled access to intersection from private properties (EMS and U-Haul); potential left turn storage issues within northbound left turn lanes to E.C. ROW ramps; truck U-turns occurring downstream of the E.C. Row Expressway north ramp terminal intersection due to northbound to westbound left turn restriction at this ramp terminal.

- Option 1: Signal timing adjustments.
- Option 2: Remove turning restriction signage (and supporting by-law) and allow trucks to make northbound left turns to access the westbound E.C. Row Expressway.
- Option 3: Remove right turn channelization (free-flow off ramp movements) and convert to conventional right turn lanes under traffic signal control (**Plate 7**).

DOUGALL AVENUE AT WEST GRAND BOULEVARD

Issue: Proximity of commercial driveways on east and west sides of Dougall Avenue, and immediately south of West Grand Boulevard

- Option 1: Extend centre median on south leg of Dougall Avenue approximately 70 m to physically restrict commercial driveway access to right-in/right-out (**Plate 8**).



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

NOTES:

1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

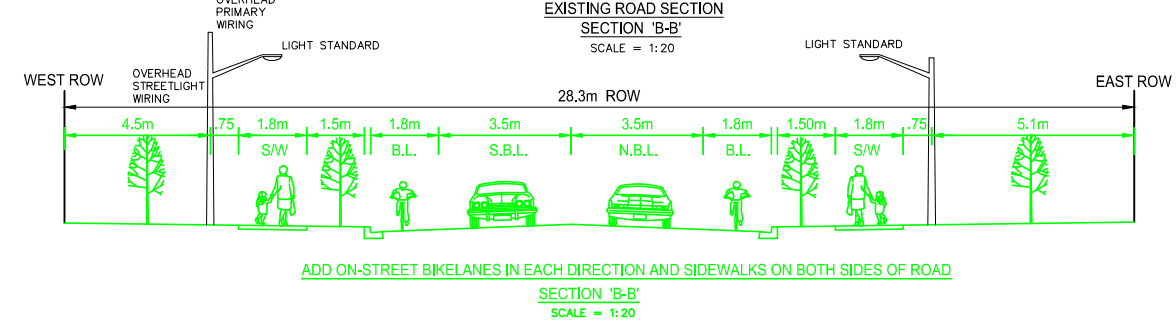
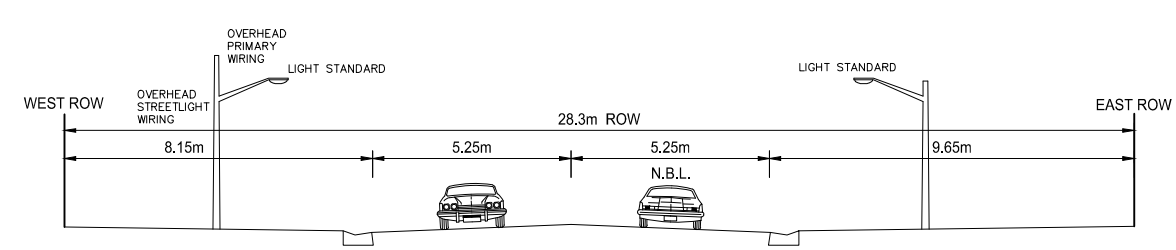
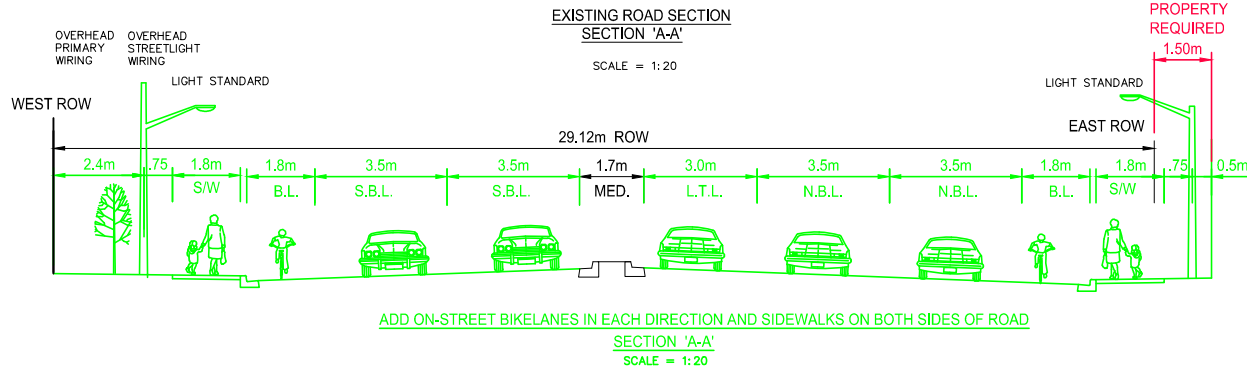
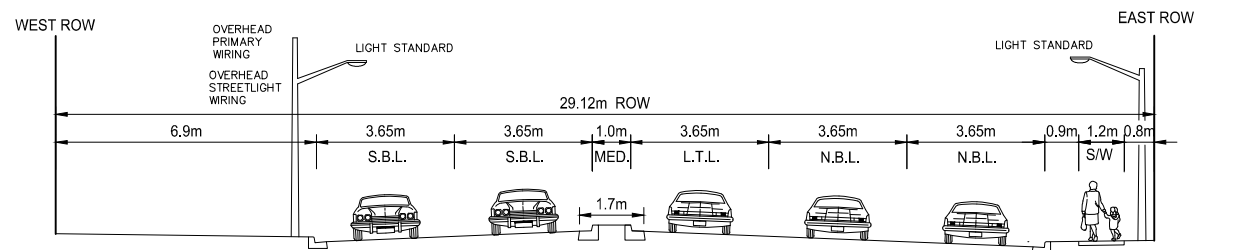
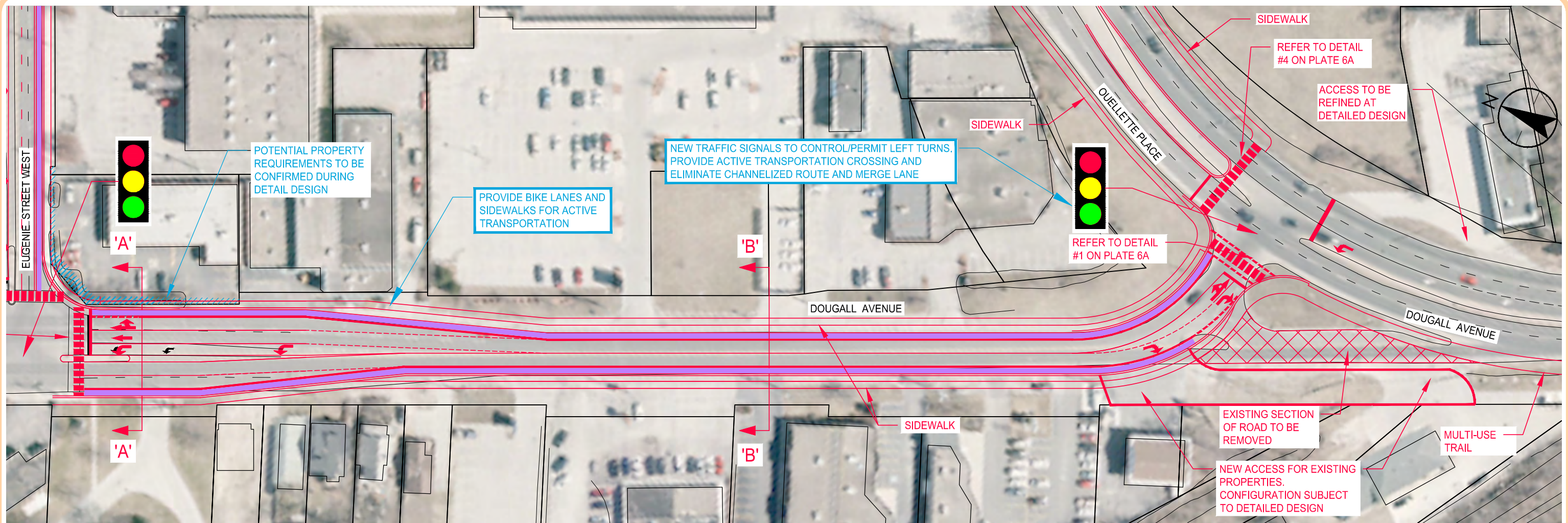


CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

Dougall Avenue - Ouellette Place - Eugenie Street to Dougall Avenue/Ouellette Place
Option 3 - Raised Centre Median

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 5
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

NOTES:

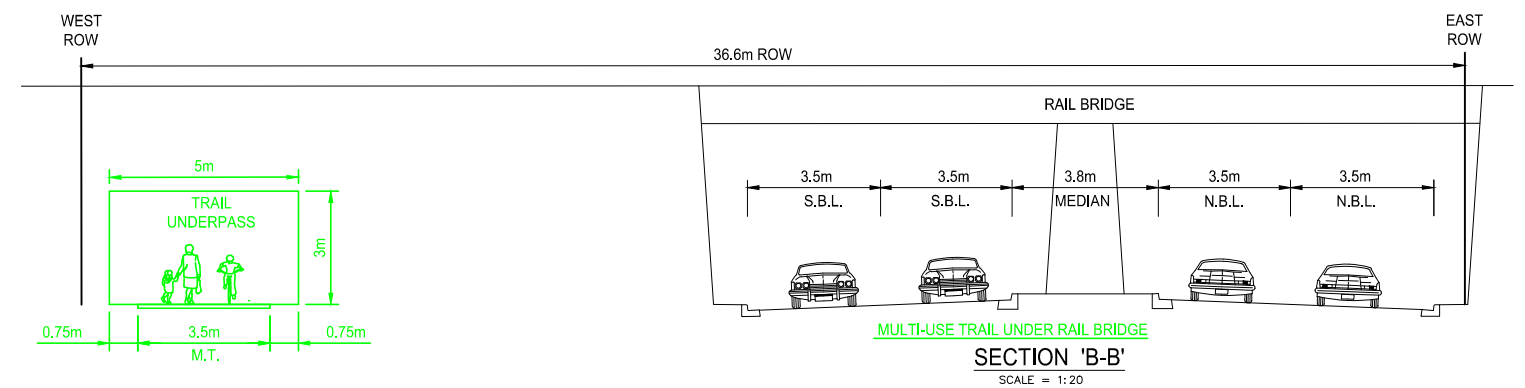
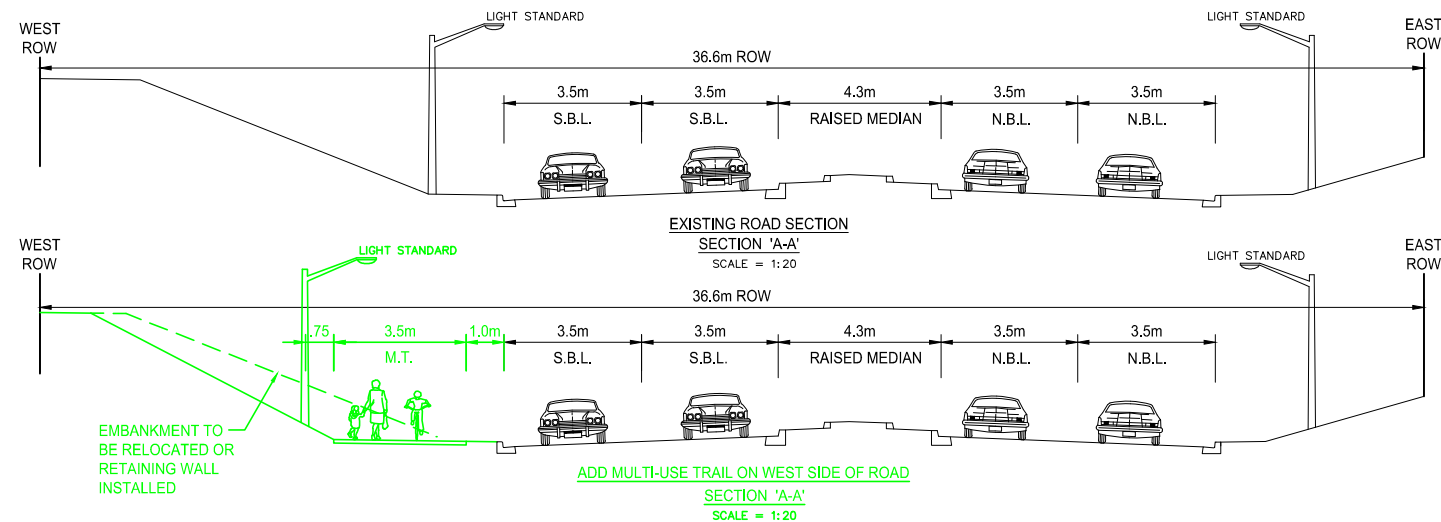
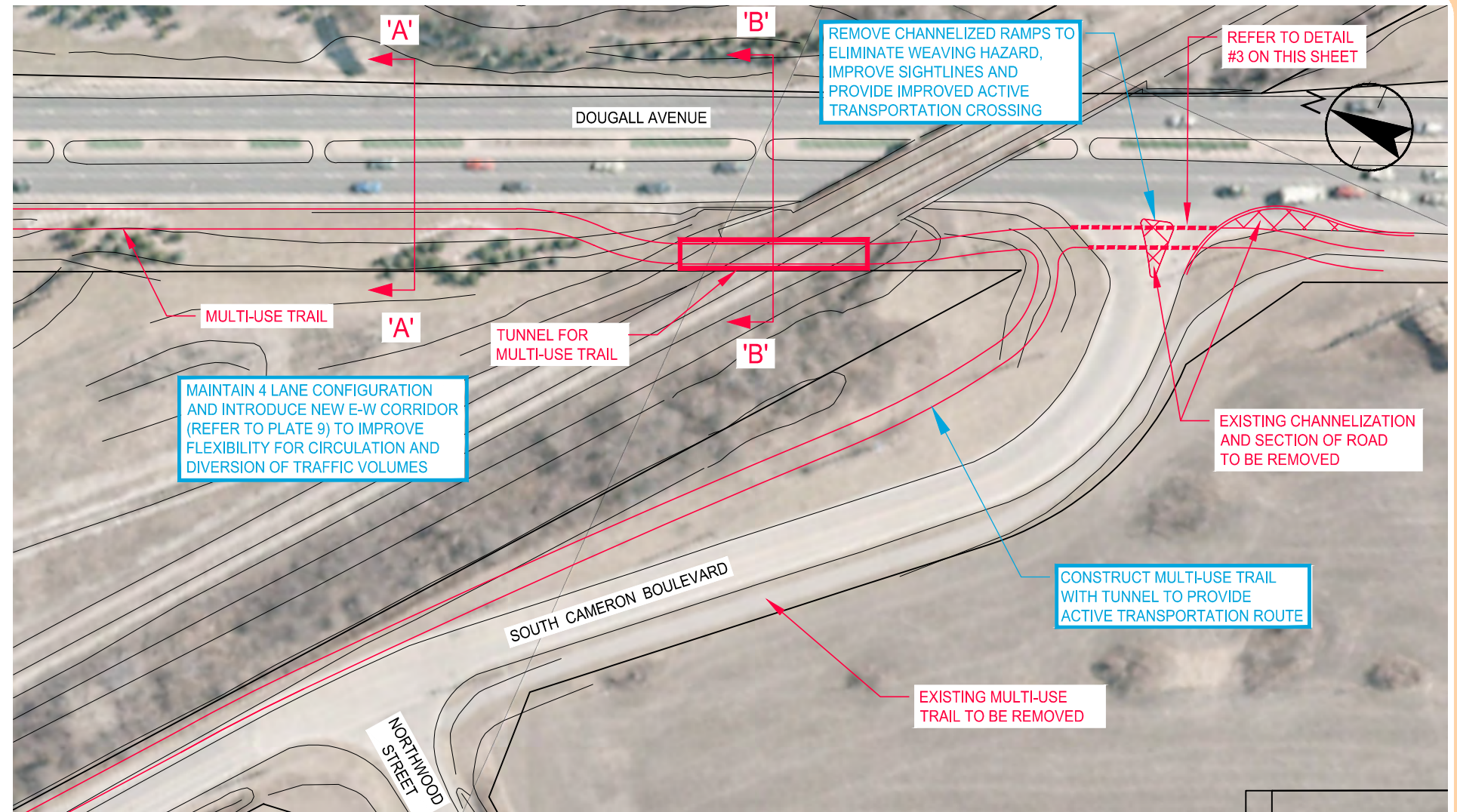
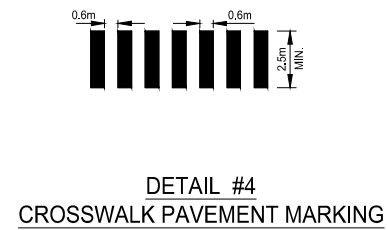
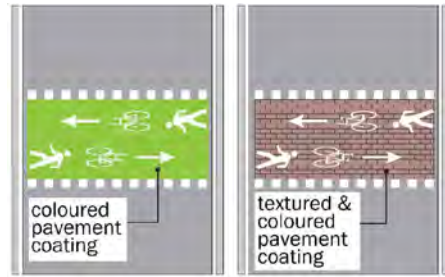
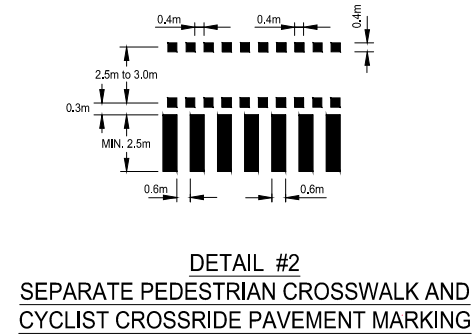
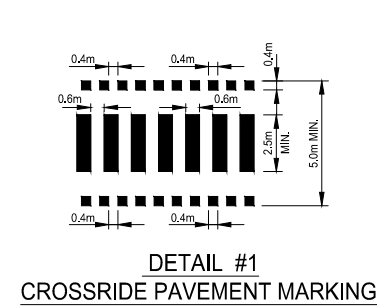
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- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**Dougall Avenue - Eugenie Street to Ouellette Place
Option 3 - Bicycle Lanes**

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 6
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LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

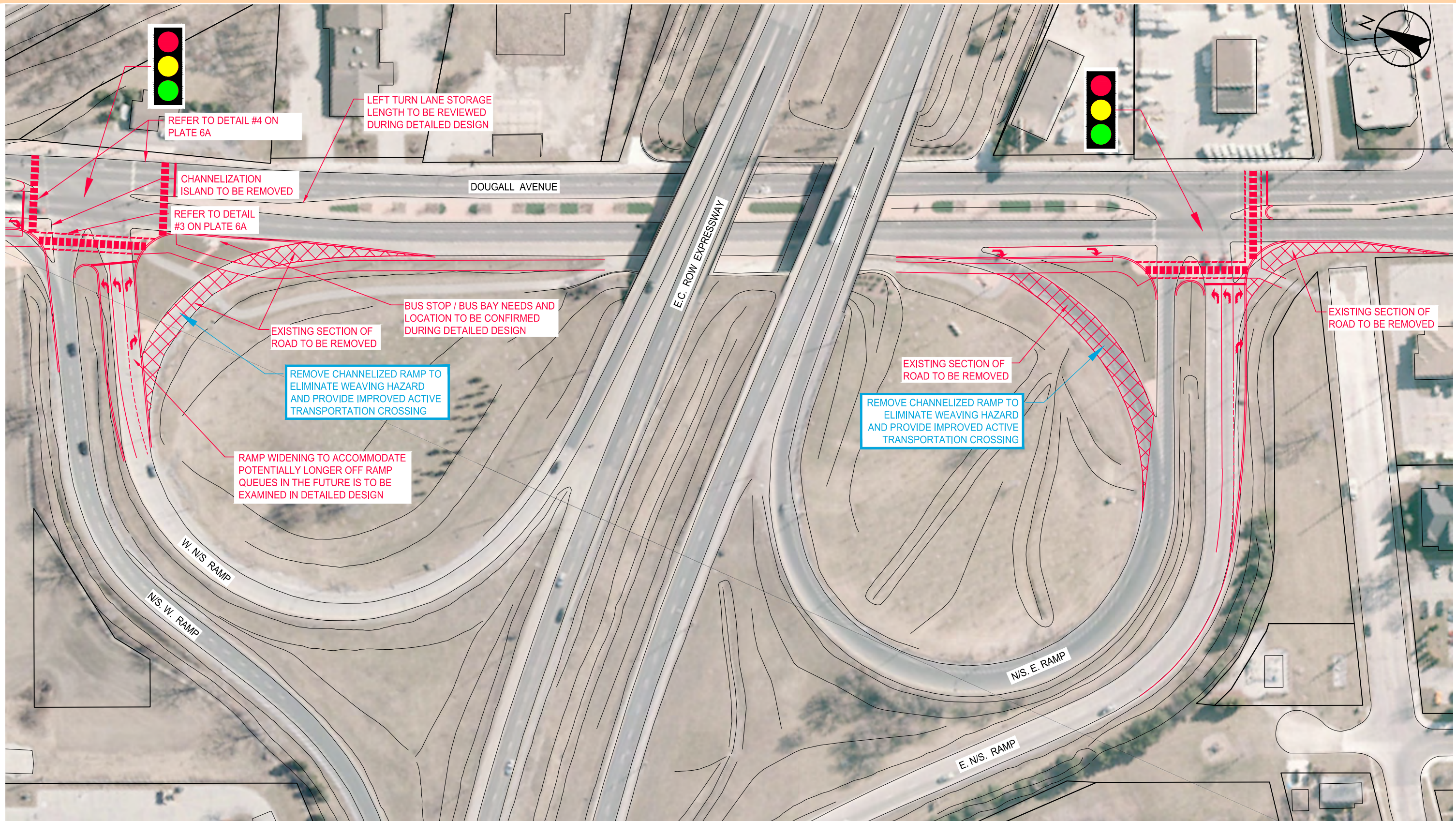
- NOTES:**
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 - ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Dougall Avenue - Ouellette Place to South Cameron Boulevard
Option 1

PROJECT NO. 165620021	SCALE 1:1000	0 10 30 50m	DRAWING NO. PLATE 6A
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LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

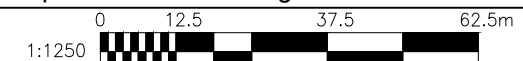
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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Dougall Avenue at E.C. Row Expressway Ramps
Option 3 - Remove Right Turn Channelization

PROJECT NO.
165620021



1:1250

DRAWING NO.

PLATE 7



LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

 BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

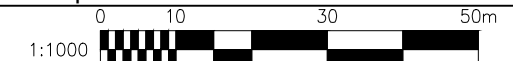
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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Dougall Avenue at West Grand Boulevard
Option 1 - Extend Raised Centre Median

PROJECT NO.
165620021



1:1000

DRAWING NO.
PLATE 8

8.4.3 Dougall Avenue – Ouellette Avenue – Evaluation

The evaluation tables for the Dougall Avenue design alternatives are provided in Table 8.4 and 8.5 followed by an overview of the Preliminary Recommendations. Details of the Preferred Designs are provided in Section 9.

Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		EUGENIE STREET TO DOUGALL AVENUE/OUELLETTE PLACE						
Issues: operational deficiencies including turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours, minimal dedicated active transportation facilities and/or absence of dedicated facilities.		NON STRUCTURAL IMPROVEMENTS		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
Options	DO NOTHING	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 1	OPTION 2	OPTION 3
Evaluation Criteria	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Signal Timing Adjustments	Promote higher use of alternative modes of transportation (TDM)	Modify existing roadway to restrict turns to right-in/right out by extending existing centre median	Modify existing roadway – replace unmarked centre median with a two-way left turn lane (TWLT) or a designated left turn lane for one direction only	Construct sidewalks on both sides of corridor	Construct an in-boulevard multi-use trail (MUT) in west boulevard	Construct bike lanes (on Dougall Avenue portion only)
Social/Cultural Impacts <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> Additional traffic volumes will increase safety concerns relating to left turns for adjacent commercial properties; No property required; No impact to archaeological/built heritage, or Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> Minimal impact to property access; No property required; No impact to overall safety, No impact to archaeological/built heritage, or Aboriginal lands/treaty rights. 	<ul style="list-style-type: none"> No impact to property access and emergency response times (with the exception of an overall reduction in traffic volumes); No property required; No impacts to streetscape/aesthetics; No impacts to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Physically restricts commercial property access from opposing direction (left turn access to Ouellette Avenue to be maintained); traffic analysis at private accesses showed that a relatively small number of left turn movements would be affected. No property required; Opportunity to improve streetscape (Civic Way) with decorative centre median concrete treatments and plantings; No impact to emergency response times; Improves overall safety for motorists and pedestrians by reducing conflicting turning movements; No impact to archaeological/built 	<ul style="list-style-type: none"> Facilitates turning movements that are currently being made from unmarked centre median; Minimal-no improvement to existing accesses; No impact to streetscape/aesthetics; No improvement to safety conditions; turning movements being made across busy travel lanes, with sight-line deficiencies caused by curved road alignment; No impact to archaeological/built heritage or Aboriginal treaty rights; 	<ul style="list-style-type: none"> Facilitates commercial property access for pedestrians; No property required; sidewalks can be installed within existing right of way; Opportunity to improve streetscape with decorative pavement markings and additional roadside trees/vegetation; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Facilitates commercial property access for active transportation users; No property required; MUT can be installed within existing right of way; Opportunity to improve streetscape with enhanced trees/vegetation; Improvement to safety conditions with separated bicycle/pedestrian facilities; No impact to archaeological/built heritage or Aboriginal treaty rights; 	<ul style="list-style-type: none"> Does not impact property existing property access; Minimal property may be required to accommodate bike lanes and sidewalks, particularly at the intersection of Dougall Avenue at Eugenie Street; Opportunity to improve streetscape with decorative pavement treatments; Improvement to safety conditions with dedicated cycling facilities, and the opportunity to concurrently install sidewalks; No impact to archaeological/built heritage or Aboriginal treaty

Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		EUGENIE STREET TO DOUGALL AVENUE/OUELLETTE PLACE						
Issues: operational deficiencies including turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours, minimal dedicated active transportation facilities and/or absence of dedicated facilities.		NON STRUCTURAL IMPROVEMENTS		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
Options	DO NOTHING	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 1	OPTION 2	OPTION 3
Evaluation Criteria	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Signal Timing Adjustments	Promote higher use of alternative modes of transportation (TDM)	Modify existing roadway to restrict turns to right-in/right out by extending existing centre median	Modify existing roadway – replace unmarked centre median with a two-way left turn lane (TWLT) or a designated left turn lane for one direction only	Construct sidewalks on both sides of corridor	Construct an in-boulevard multi-use trail (MUT) in west boulevard	Construct bike lanes (on Dougall Avenue portion only)
				heritage or Aboriginal treaty rights.				rights.
Natural Environmental	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Positive impacts to the natural environment with an overall reduction in carbon emissions from reduced vehicle traffic. No impacts to habitats. 	<ul style="list-style-type: none"> No impacts to existing roadside trees; Opportunity to implement additional roadside vegetation. No impact to significant habitats. 	<ul style="list-style-type: none"> No impact to existing roadside trees; No impact to significant habitats. 	<ul style="list-style-type: none"> No impact to existing roadside trees; Opportunity to implement additional roadside trees/vegetation; No impact to significant habitats. 	<ul style="list-style-type: none"> No impact to existing roadside trees; Opportunity to implement additional roadside trees/vegetation; No impact to significant habitats. 	<ul style="list-style-type: none"> Little-no roadside vegetation.
Technical/ Engineering	<ul style="list-style-type: none"> Corridor had seen a 1-2% decrease in traffic volumes per year over the past 10 years. Impacts of forecasted traffic volumes discussed within intersection evaluation. 	<ul style="list-style-type: none"> Potential to improve intersection LOS; however, modifications to signal timing may impact LOS/capacity of intersection approaches. Road classification would remain the same 	<ul style="list-style-type: none"> Potential to improve level of service through the corridor with a decrease in peak hour traffic volumes; In line with municipal/provincial policies for promoting alternatives modes of transportation; traffic volumes currently exceed guidelines for 	<ul style="list-style-type: none"> Maintains through capacity and LOS; Consistent with Collector Road classification; Access to commercial properties on south-west corner available from Eugenie Street; access to properties on east side of Ouellette Place 	<ul style="list-style-type: none"> Maintains through capacity and LOS; Facilitates access to commercial properties; No improvement to existing safety conditions; no improvement to sightlines; No impact to existing active transportation operations. 	<ul style="list-style-type: none"> No impact to vehicle operations; Improves safety conditions and connectivity for pedestrians; Consistent with recommendations in the BUMP (no cycling facilities identified on this section of road); Provides better pedestrian 	<ul style="list-style-type: none"> No impact to vehicle operations; Improves safety conditions for active transportation users; Improves east-west connectivity between Dougall Avenue and Howard Avenue; 	<ul style="list-style-type: none"> No impact to vehicle operations; Improves safety conditions for active transportation users with dedicated travel lane; Improves east-west connectivity, by providing connection to

Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		EUGENIE STREET TO DOUGALL AVENUE/OUELLETTE PLACE						
Issues: operational deficiencies including turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours, minimal dedicated active transportation facilities and/or absence of dedicated facilities.		NON STRUCTURAL IMPROVEMENTS		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
Options	DO NOTHING	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 1	OPTION 2	OPTION 3
Evaluation Criteria	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Signal Timing Adjustments	Promote higher use of alternative modes of transportation (TDM)	Modify existing roadway to restrict turns to right-in/right-out by extending existing centre median	Modify existing roadway – replace unmarked centre median with a two-way left turn lane (TWLT) or a designated left turn lane for one direction only	Construct sidewalks on both sides of corridor	Construct an in-boulevard multi-use trail (MUT) in west boulevard	Construct bike lanes (on Dougall Avenue portion only)
		<ul style="list-style-type: none"> May facilitate connectivity with neighbouring subdivision; No impact to existing transit route; No impact to pedestrian and cyclist safety. 	<p>local road classification;</p> <ul style="list-style-type: none"> May involve the encouragement of active transportation modes; May involve an increase in transit routes. 	<p>available via Ouellette Avenue;</p> <ul style="list-style-type: none"> Improves safety by reducing conflicting movements (sight-line deficiencies due to road curvature for left turns from commercial properties on east side, and motorists relying on courtesy gaps to complete left turns) Overall improvement to existing active transportation operations with reduction in mid-block turning movements. No impact to existing transit routes. 	<ul style="list-style-type: none"> No impact to existing transit routes. 	connectivity between transit routes/stops.	<ul style="list-style-type: none"> Not consistent with recommendations in the BUMP (provides bicycle facilities north on Dougall Avenue, with no facilities on Ouellette Place); Provides connectivity between transit routes/stops. 	<p>Eugenie Street for connection to Howard Avenue;</p> <ul style="list-style-type: none"> Consistent with recommendations in the BUMP; Does not impact existing transit routes.
Economic	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> No capital costs; Typically part of regular transportation program maintenance. 	<ul style="list-style-type: none"> Low capital costs associated with public campaigns; additional costs may be associated with improvements to active transportation and transit 	<ul style="list-style-type: none"> Low capital costs associated with modification of centre median; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with modification to existing centre median; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with construction of sidewalks; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs associated with construction of MUT; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs associated with expanding pavement to accommodate bicycle lanes; Regular operation and maintenance

Table 8.4 Dougall Avenue Corridor Evaluation

<i>DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR</i>		EUGENIE STREET TO DOUGALL AVENUE/OUELLETTE PLACE						
		Issues: operational deficiencies including turning movements at commercial driveways, centre median configurations, traffic demands at or near capacity during peak hours, minimal dedicated active transportation facilities and/or absence of dedicated facilities.						
		NON STRUCTURAL IMPROVEMENTS		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
<i>Options</i>	DO NOTHING	OPTION 1	OPTION 2	OPTION 3	OPTION 4	OPTION 1	OPTION 2	OPTION 3
<i>Evaluation Criteria</i>	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Signal Timing Adjustments	Promote higher use of alternative modes of transportation (TDM)	Modify existing roadway to restrict turns to right-in/right out by extending existing centre median	Modify existing roadway – replace unmarked centre median with a two-way left turn lane (TWLT) or a designated left turn lane for one direction only	Construct sidewalks on both sides of corridor	Construct an in-boulevard multi-use trail (MUT) in west boulevard	Construct bike lanes (on Dougall Avenue portion only)
			infrastructure;					costs.
<i>RESULTS</i>	The Do Nothing alternative does not address the identified issues, and is used as a benchmark for the evaluation of other alternatives.	RECOMMENDED Though not sufficient to improve conditions as a standalone alternative, signal timing adjustments should be completed as part of the regular transportation program and reviewed regularly to ensure the efficiency of intersection operations.	RECOMMENDED While not sufficient as a standalone alternative to address existing corridor issues, should be incorporated into the City's regular transportation planning strategy/program.	RECOMMENDED in order to improve through traffic operations and improve safety conditions by reducing conflicting turning movements.	NOT RECOMMENDED Little-no improvement to existing conditions in terms of the safety of left turning movements.	RECOMMENDED in order to improve pedestrian connectivity and safety within the Central Box area.	NOT RECOMMENDED Bicycle facilities to be implemented in accordance with the BUMP; frequency of commercial driveways and volumes of turning movements make facilities on Dougall Avenue more appropriate than this section of Ouellette Avenue.	RECOMMENDED in accordance with the BUMP to provide connectivity; recommended in conjunction with the installation of sidewalks on both sides of the corridor, as well as signalization of Dougall Avenue/Ouellette Place intersection to provide safe active transportation crossing.

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR	DOUGALL AVENUE/OUELLETTE PLACE TO WEST GRAND BOULEVARD				
	Issues: Operational deficiencies including difficulty accessing east/west corridors, traffic demands at or near capacity during peak hours, cross section constraints at CN Rail underpass, weaving and merging traffic along corridor. Disconnected sidewalk facilities and no bicycle facilities north of south Cameron Boulevard, no active transportation crossing under CN Rail line, disconnected multi-use trail in the west boulevard.				
	STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
Options	OPTION 1 Introduce new east-west corridor	OPTION 2 Widen the roadway to 6-lanes	OPTION 1 Construct multi use trail (MUT) along west boulevard between Dougall Avenue/Ouellette Place including a tunnel crossing under the CN Rail to connect existing MUT	OPTION 2 Provide continuous sidewalks on both sides of Dougall Avenue (including a tunnel crossing under the CN Rail)	OPTION 3 Widen the roadway to provide separated bike lanes
Evaluation Criteria					
<u>Social/Cultural Impacts</u>	<ul style="list-style-type: none"> • No impacts to property access; • Property required for construction of new east-west corridor; • Potential improvement to emergency response times; • Potential impact to archaeological resources; • No impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> • No direct impact to property access; design would require coordination with existing entrances, including the EMS ambulance station; • Significant property required along right of way; • Benefit to emergency response times and operations within the corridor; • Additional travel lanes create additional safety concerns for motorists and pedestrians/cyclists particularly at crossings; • Potential impacts to archaeological resources (west side of Dougall Avenue at north E.C. Row Expressway ramp, and south E.C. Row Expressway ramp); test pitting/pedestrian surveys required. • Potential impact to registered heritage property (Arcata Pizzeria Sign) located at 3021 Dougall Avenue. Heritage Impact Assessment may be required during detailed design to identify impacts/mitigation measures. 	<ul style="list-style-type: none"> • No impact to property access; • No property required; MUT can be incorporated into the existing right of way; • No impacts to emergency response times; • Opportunity to enhance Civic Way elements with additional roadside vegetation, decorative pavement treatments, parkettes, etc. • Provides safe, separated bicycle and pedestrian facilities to eliminate existing safety concerns particularly at CN Rail underpass; • No disruption to archaeological/built heritage, and no impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> • No impact to property access; • Property acquisition may be required along west side of right of way; • No impacts to emergency response times; • Opportunity to enhance Civic Way elements with additional roadside vegetation, decorative pavement treatments, etc.; • Provides facilities for pedestrians, but does not address cycling traffic; • No disruption to archaeological/built heritage and no impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> • No direct impact to property access; design would require coordination with existing entrances, including the EMS ambulance station; • Property acquisition required along right of way; • No impact to emergency response times; • Physically separated bicycle lanes can provide more comfortable environment for cyclists, but does not improve safety conditions for pedestrians; • Potential impacts to archaeological resources (west side of Dougall Avenue at north E.C. Row Expressway ramp, and south E.C. Row Expressway ramp); test pitting/pedestrian surveys required. • Potential impact to registered heritage property (Arcata Pizzeria Sign) located at 3021 Dougall Avenue. Heritage Impact Assessment may be required during detailed design to identify impacts/mitigation measures.
<u>Natural Environmental</u>	<ul style="list-style-type: none"> • Impacts to Existing Vegetation; and • Terrestrial Resources. 	<ul style="list-style-type: none"> • Potential disruption to rare plant species and Butler's Gartersnake species at risk during construction of new east-west corridor. Mitigation 	<ul style="list-style-type: none"> • Potential disruption to rare plant species in area surrounding the E.C. Row Expressway (Prairie Milkweed, Eastern Stiff-Leaved 	<ul style="list-style-type: none"> • Potential disruption to rare plant species (Eastern Stiff-Leaved Goldenrod) surrounding CN Rail crossing/Van de Water Rail Yard; 	<ul style="list-style-type: none"> • Potential disruption to rare plant species (Eastern Stiff-Leaved Goldenrod) surrounding CN Rail crossing/Van de Water Rail Yard;

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Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		DOUGALL AVENUE/OUELLETTE PLACE TO WEST GRAND BOULEVARD			
		Issues: Operational deficiencies including difficulty accessing east/west corridors, traffic demands at or near capacity during peak hours, cross section constraints at CN Rail underpass, weaving and merging traffic along corridor. Disconnected sidewalk facilities and no bicycle facilities north of south Cameron Boulevard, no active transportation crossing under CN Rail line, disconnected multi-use trail in the west boulevard.			
		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS	
Options	OPTION 1 Introduce new east-west corridor	OPTION 2 Widen the roadway to 6-lanes	OPTION 1 Construct multi use trail (MUT) along west boulevard between Dougall Avenue/Ouellette Place including a tunnel crossing under the CN Rail to connect existing MUT	OPTION 2 Provide continuous sidewalks on both sides of Dougall Avenue (including a tunnel crossing under the CN Rail)	OPTION 3 Widen the roadway to provide separated bike lanes
Evaluation Criteria					
<ul style="list-style-type: none"> • aquatic habitats • terrestrial habitats • migratory/other birds: (e.g. waterfowl, songbirds) • special habitat areas (specially designated or protected habitats, migration routes, specific policies) 	measures to be identified.	<ul style="list-style-type: none"> • Goldenrod, and Missouri Ironweed), and natural areas surrounding the CN Rail line/Van de Water Rail Yard (Eastern Stiff-Leaved Goldenrod) • Construction impacts on vegetated areas relating to reconstruction of CN Rail overpass. 	<ul style="list-style-type: none"> • mitigation/compensation measures to be implemented; • Opportunity to implement additional roadside vegetation. • No impact to other significant habitats. 	<ul style="list-style-type: none"> • mitigation/compensation measures to be implemented; • Opportunity to implement additional roadside trees/vegetation; • No other impacts to significant habitats. 	<ul style="list-style-type: none"> • and Missouri Ironweed), and natural areas surrounding the CN Rail line/Van de Water Rail Yard (Eastern Stiff-Leaved Goldenrod) • Construction impacts on vegetated areas relating to reconstruction/modifications to CN Rail overpass; more detailed investigation may be required to determine species/habitat significance.
<p><u>Technical/ Engineering</u></p> <ul style="list-style-type: none"> • Corridor Capacity & Level of Service (LOS) • Planning Objectives • Network Connectivity; • Overall Safety; • Pedestrian & Cycling Accommodation; • Transit Services; • Impact to existing utilities/structures 	<ul style="list-style-type: none"> • Improves overall connectivity with the Central Box area; • LOS for new intersection with Dougall Avenue will operate at an acceptable LOS, with northbound and eastbound left turns at LOS E/F during peak periods. • Provides additional east-west route for cyclists and pedestrians. 	<ul style="list-style-type: none"> • General increase in road capacity and LOS; • Additional capacity would remain consistent with Arterial Road classification; • Potential for added safety concerns related to weaving and private accesses; • Would require near-complete reconstruction of CN Rail overpass structure (no foreseeable CN Rail plans for significant modifications to structure). 	<ul style="list-style-type: none"> • No impact to existing traffic operations; • Not consistent with recommendations in the BUMP (identifies this section of Dougall Avenue as a bike lane route); • Provides connection between existing facilities south of South Cameron Boulevard to the future active transportation routes to the north (along Dougall Avenue north to Eugenie Street). • Tunnel required through existing CN Rail underpass embankments; geotechnical review required during detailed design to confirm alignment and the requirement of a retaining wall. Additional correspondence with CN Rail staff recommended during detailed design. 	<ul style="list-style-type: none"> • No impact to existing traffic operations; • Not consistent with recommendations in the BUMP (identifies this section of Dougall Avenue as a bike lane route); • Provides connectivity for pedestrians to areas in the north, but does not address the identified cycling need; • Tunnel required through existing CN Rail underpass embankments; geotechnical review required during detailed design to confirm alignment and the requirement of a retaining wall. Additional correspondence with CN Rail staff recommended during detailed design. 	<ul style="list-style-type: none"> • No impact to existing traffic operations; • Consistent with recommendations in the BUMP (identifies this section of Dougall Avenue as a bike lane route); • Provides north-south connectivity for cyclists to address the current cycling need; • Significant modifications/ reconstruction of the CN Rail overpass is required; • Does not address the need for pedestrian facilities within the corridor (particularly under the CN Rail overpass); • No impact to existing transit routes;

Table 8.4 Dougall Avenue Corridor Evaluation

DOUGALL AVENUE – OUELLETTE PLACE CORRIDOR		DOUGALL AVENUE/OUELLETTE PLACE TO WEST GRAND BOULEVARD				
		Issues: Operational deficiencies including difficulty accessing east/west corridors, traffic demands at or near capacity during peak hours, cross section constraints at CN Rail underpass, weaving and merging traffic along corridor. Disconnected sidewalk facilities and no bicycle facilities north of south Cameron Boulevard, no active transportation crossing under CN Rail line, disconnected multi-use trail in the west boulevard.				
		STRUCTURAL IMPROVEMENTS		ACTIVE TRANSPORTATION IMPROVEMENTS		
Options	OPTION 1 Introduce new east-west corridor	OPTION 2 Widen the roadway to 6-lanes	OPTION 1 Construct multi use trail (MUT) along west boulevard between Dougall Avenue/Ouellette Place including a tunnel crossing under the CN Rail to connect existing MUT	OPTION 2 Provide continuous sidewalks on both sides of Dougall Avenue (including a tunnel crossing under the CN Rail)	OPTION 3 Widen the roadway to provide separated bike lanes	
Evaluation Criteria						
Economic	<ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> Significant capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Highest cost option, with capital costs associated with road widening, property acquisition, and near-complete reconstruction of CN Rail underpass/E.C. Row interchange structure; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate-high capital costs for necessary studies/construction of MUT tunnel through CN Rail embankments; Regular operations and maintenance costs. 	<ul style="list-style-type: none"> Moderate-high capital costs for necessary studies/construction of sidewalks and tunnel through CN Rail embankments; Regular operations and maintenance costs. 	<ul style="list-style-type: none"> Significant capital costs associated with property acquisition, widening pavement, and modifications/reconstruction of existing CN Rail overpass and E.C. Row Expressway structure.
RESULTS	New east-west corridor design addressed in east-west corridor evaluation.	NOT RECOMMENDED due to the extensive property acquisition/impacts, costs, and impact on the existing CN Rail underpass structure. Introduction of new east-west corridor, and other intersection improvements to contribute to the improvement of existing capacity/LOS issues.	RECOMMENDED in order to connect the existing active transportation network. Addresses the existing safety concerns with pedestrians and cyclists using narrow grass space along right of way.	NOT RECOMMENDED Although this option provides safe pedestrian facilities along the corridor, the extensive construction is not appropriate in addressing existing active transportation deficiencies.	NOT RECOMMENDED Although this section of Dougall Avenue is identified as a future on-street bike lane route within the BUMP, it is not recommended due to high vehicle speeds and volumes, and right of way constraints including the existing CN Rail underpass structure and E.C. Row interchange structure. Connectivity within the active transportation network is provided by the MUT option, which connects Dougall Avenue with the network heading to areas in the north and east (via Eugenie Street).	

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Table 8.5 Dougall Avenue Intersection Evaluation

DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION		Dougall Avenue at Ouellette Place			Dougall Avenue at Van de Water Access	
INTERSECTION		Issues: Collision history (highest in the City), lack of active transportation facilities, geometric design with skewed intersection, drivers not obeying stop sign on Dougall Avenue approach, northbound left turn storage, northbound to southbound U-turns including large trucks.			Issues: Illegal northbound to southbound U-turns	
Options		DO NOTHING	OPTION 1	OPTION 2	OPTION 1	OPTION 2
Evaluation Criteria		No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Improve geometric design to reduce skew angle of Dougall Avenue approach	Install traffic signals	Allow U-turns at CN's Van de Water Yard access by providing a proper northbound left turn lane (by removing a portion of the existing centre median) and remove the existing U-turn prohibition	Close the existing gap in the centre median and restrict the Van de Water access to right-in/right-out only or relocate the access
<u>Social/Cultural Impacts</u> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 		<ul style="list-style-type: none"> Existing access is maintained; No property required; No impacts to emergency response times; No impact to streetscape/aesthetics; No impact to archaeological/cultural heritage features; No impact to Aboriginal lands or treaty rights. 	<ul style="list-style-type: none"> May impact access to commercial properties on the west side of Dougall Avenue; design will ensure access is maintained; No impacts to emergency response times; Opportunity to implement enhanced civic way features; May reduce rear end collisions due to sight line deficiencies for southbound stop controlled access to Dougall Avenue; No impact to archaeological/built heritage resources, or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Signalization / advanced turning phases may facilitate access to commercial properties north/west of the intersection; No impacts to emergency response times; Opportunity to implement enhanced Civic Way features and landscape features, including the utilization of channelized southbound access to Dougall Avenue under stop control to be removed; Reduces rear end collisions due to sight line deficiencies for southbound stop controlled access to Dougall Avenue; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Maintains existing access to Van de Water yard; No property required; No impact to emergency response times; No impact to streetscape; Does not significantly improve safety conditions; time restrictions on U-turns should be implemented (i.e. no U-turns 9am to 9pm, allowing U-turns during the morning peak periods when demand exists, and at other times when southbound traffic volumes are relatively light); U-turn prohibition for trucks should also be implemented, since turning radius would not be sufficient for truck turns; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Van de Water Rail Yard access would be restricted to southbound access only; No property required; No impact to emergency response times; Opportunity to implement enhanced Civic Way features/median planters; No impact to archaeological/built heritage resources or Aboriginal treaty rights.
<u>Natural Environmental</u> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas 		<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Little-no roadside vegetation. Opportunity to implement additional roadside vegetation; No impacts to significant habitats. 	<ul style="list-style-type: none"> Little-no roadside vegetation. Opportunity to implement additional roadside vegetation; No impacts to significant habitats. 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> No impacts.

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Table 8.5 Dougall Avenue Intersection Evaluation

DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION	Dougall Avenue at Ouellette Place			Dougall Avenue at Van de Water Access	
INTERSECTION	Issues: Collision history (highest in the City), lack of active transportation facilities, geometric design with skewed intersection, drivers not obeying stop sign on Dougall Avenue approach, northbound left turn storage, northbound to southbound U-turns including large trucks.			Issues: Illegal northbound to southbound U-turns	
Options	DO NOTHING	OPTION 1	OPTION 2	OPTION 1	OPTION 2
Evaluation Criteria	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Improve geometric design to reduce skew angle of Dougall Avenue approach	Install traffic signals	Allow U-turns at CN's Van de Water Yard access by providing a proper northbound left turn lane (by removing a portion of the existing centre median) and remove the existing U-turn prohibition	Close the existing gap in the centre median and restrict the Van de Water access to right-in/right-out only or relocate the access
(specially designated or protected habitats, migration routes, specific policies)					
<p>Technical/ Engineering</p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services; 	<ul style="list-style-type: none"> LOS would decrease for northbound left turns (from existing D/F to future E/F a.m. and p.m. peak periods respectively), and intersection exceeds capacity for both peak periods (see analysis in Appendix C1); Decreased LOS and increase delays for south/eastbound right turns at stop control during peak p.m. period (from existing LOS F and 329 second delay to LOS F and 424 second delay); see Appendix C1. 	<ul style="list-style-type: none"> No impact to capacity/LOS; Consistent with existing road classifications; Maintains connectivity for all directions; Improves sightlines for eastbound right turn movements, may reduce frequency of rear end collisions; Facilitates the incorporation of pedestrian/cyclist crossing with more conventionalized intersection design; No impact to existing transit routes; 	<ul style="list-style-type: none"> Improves LOS for northbound left turns onto Dougall Avenue (from existing D/F to C to E for a.m. and p.m. peak periods respectively); Improves LOS and significantly reduces delay for right turns at existing stop control heading southbound on Dougall Avenue during p.m. peak period (from LOS F to E, and delay from 424 seconds to 76); Consistent with existing road classifications; Maintains connectivity for all directions; Conventionalized intersection improves safety by reducing intersection skew and sight line deficiencies; Provides appropriate crossing for pedestrians and cyclists. No impact to existing transit routes; 	<ul style="list-style-type: none"> No impact to through capacity with dedicated left turn lane; Would facilitate turns being made illegally (mostly to access South Cameron Boulevard and for trucks accessing the E.C. Row Expressway westbound); Several restrictions should be placed on U-turns: no U-turns 9am to 9pm, allowing U-turns during the morning peak periods when demand exists, and at other times when southbound traffic volumes are relatively light); U-turn prohibition for trucks should also be implemented, since turning radius would not be sufficient for truck turns; Safety concerns inherent with U-turn movements; No impact to existing active transportation operations. 	<ul style="list-style-type: none"> Would reduce occasional disruption from vehicles waiting to turn from left through lane; Consistent with existing U-turn prohibition; Reduces safety concerns relating to existing U-turn movements; No impact to existing active transportation operations.

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Table 8.5 Dougall Avenue Intersection Evaluation

DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION	Dougall Avenue at Ouellette Place Issues: Collision history (highest in the City), lack of active transportation facilities, geometric design with skewed intersection, drivers not obeying stop sign on Dougall Avenue approach, northbound left turn storage, northbound to southbound U-turns including large trucks.			Dougall Avenue at Van de Water Access Issues: Illegal northbound to southbound U-turns	
INTERSECTION	DO NOTHING	OPTION 1	OPTION 2	OPTION 1	OPTION 2
Options	No improvements are implemented, and corridor experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Improve geometric design to reduce skew angle of Dougall Avenue approach	Install traffic signals	Allow U-turns at CN's Van de Water Yard access by providing a proper northbound left turn lane (by removing a portion of the existing centre median) and remove the existing U-turn prohibition	Close the existing gap in the centre median and restrict the Van de Water access to right-in/right-out only or relocate the access
Evaluation Criteria	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low-moderate capital costs, to be incorporated into overall intersection design; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs associated with intersection reconfiguration; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with signage removal and modifications to existing centre median; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with closing gap in existing median; Regular operation and maintenance costs.
Economic	<ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 				
RESULTS	The Do Nothing scenario does not address identified issues, and is used as a benchmark for the evaluation of other alternatives.	RECOMMENDED in order to improve safety conditions and reduce collision frequency. Conventionalizing intersection design also provides a signalized transition from MUT to bike lanes north on Dougall Avenue, and to connect sidewalks north on Ouellette Place.		NOT RECOMMENDED. Would facilitate U-turns being made illegally, and reduce disruption to through traffic by providing dedicated turn storage; not recommended due to the safety concerns inherent in U-turn movements. May be considered as an interim measure prior to implementation of new east-west connection. New east-west connection just north of the intersection will ultimately reduce the need for northbound access to South Cameron Boulevard; removal of truck turning restriction at E.C. Row Expressway will also reduce the need for large trucks attempting U-turns.	NOT RECOMMENDED due to the reduction in access to the Van de Water entrance for service vehicles.

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Table 8.5 Dougall Avenue Intersection Evaluation

DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION	Dougall Avenue at South Cameron Boulevard	Dougall Avenue at E.C. Row Expressway Ramps			Dougall Avenue at West Grand Boulevard
INTERSECTION	Issues: No access to or from Dougall Avenue northbound, weaving and merging traffic on Dougall Avenue, and unconventional active transportation crossing	Issues: Active transportation conflicts at free flow ramp crossings; uncontrolled access to intersection from private properties, potential left turn storage issues, truck U-turns occurring north of the interchange,			Issues: Proximity of commercial driveways on east and west sides of Dougall Avenue
Options	OPTION 1	OPTION 1	OPTION 2	OPTION 3	OPTION 1
Evaluation Criteria	Modify the existing design by removing the channelizing island at South Cameron Boulevard approach to create a conventionalized right turn	Signal timing adjustments	Remove turning restriction signage (and supporting by-law) and allow trucks to make northbound left turns to access the westbound E.C. Row Expressway	Remove right turn channelization (free-flow ramp movements) and convert to standard right turn lanes	Extend centre median on south leg of Dougall Avenue to physically restrict commercial driveway accesses to right-in/right-out
<p>Social/Cultural Impacts</p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> No impact to existing property access; No property acquisition required; No impacts to emergency response times; Opportunity to enhance streetscape with landscape/Civic Way features; Conventionalized intersection design improves crossing safety for pedestrians and cyclists, and may reduce collision frequency by improving sightlines for turning movements, and eliminating weaving hazards in proximity to E.C. Row Expressway ramps; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access; No property required; No impact to emergency response times; No impact to streetscape/aesthetics; No impact to archaeological/built heritage or Aboriginal treaty rights; 	<ul style="list-style-type: none"> Truck turning restriction was put in place due to concerns from the public regarding the impact of truck traffic on property (foundation cracking); Recommendation made (Report 125 of the Environment, Transportation & Public Safety Standing Committee) 	<ul style="list-style-type: none"> No impacts to existing property accesses; No property acquisition required; No impacts to emergency response times; Opportunity to implement enhanced Civic Way and streetscape elements; Improves safety conditions for active transportation users by removing free-flow vehicle movements, and removes weaving section on Dougall Avenue. No impacts to archaeological and cultural heritage features; No impacts to Aboriginal lands or treaty rights. 	<ul style="list-style-type: none"> Restricts commercial property access to right-in, right-out in close proximity to the intersection; No property required; No impacts to emergency response times; Opportunity to enhance streetscape with decorative median treatment; Reduces conflicting left turn movements, and lowers collision rate. No impacts to archaeological or cultural heritage features.
<p>Natural Environmental</p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas (specially designated or 	<ul style="list-style-type: none"> No impacts to existing roadside vegetation; No impacts to other significant habitats. 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Opportunities to enhance roadside vegetation. No impacts to significant habitats. 	<ul style="list-style-type: none"> No impacts.

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Table 8.5 Dougall Avenue Intersection Evaluation

DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION	Dougall Avenue at South Cameron Boulevard	Dougall Avenue at E.C. Row Expressway Ramps			Dougall Avenue at West Grand Boulevard
INTERSECTION	<p>Issues: No access to or from Dougall Avenue northbound, weaving and merging traffic on Dougall Avenue, and unconventional active transportation crossing</p>	<p>Issues: Active transportation conflicts at free flow ramp crossings; uncontrolled access to intersection from private properties, potential left turn storage issues, truck U-turns occurring north of the interchange,</p>			<p>Issues: Proximity of commercial driveways on east and west sides of Dougall Avenue</p>
Options	OPTION 1	OPTION 1	OPTION 2	OPTION 3	OPTION 1
Evaluation Criteria	<p>Modify the existing design by removing the channelizing island at South Cameron Boulevard approach to create a conventionalized right turn</p>	<p>Signal timing adjustments</p>	<p>Remove turning restriction signage (and supporting by-law) and allow trucks to make northbound left turns to access the westbound E.C. Row Expressway</p>	<p>Remove right turn channelization (free-flow ramp movements) and convert to standard right turn lanes</p>	<p>Extend centre median on south leg of Dougall Avenue to physically restrict commercial driveway accesses to right-in/right-out</p>
protected habitats, migration routes, specific policies)					
<p>Technical/ Engineering</p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services; 	<ul style="list-style-type: none"> Minimal impact to existing poor LOS (E) for right turns during peak period (poor level of service is due to volumes of traffic on Dougall Avenue southbound, with few gaps for right turning vehicles; Consistent with road classifications, and supported by the South Cameron Secondary Plan (identifies 'intersection improvements'); Conventionalized intersection improves crossing safety for pedestrians and cyclists, and may reduce collision frequency by improving sightlines for turning movements, and eliminating weaving hazards in proximity to E.C. Row Expressway ramps; Existing centre median restricting left turns onto Dougall Avenue northbound remains in place; No impact to existing transit routes. 	<ul style="list-style-type: none"> Potential for improvement to LOS (LOS F for north ramp terminal, and LOS B for south ramp terminal); Consistent with road classifications; No improvement to overall safety conditions; No impact to existing active transportation operations; No impact to existing transit routes. 	<ul style="list-style-type: none"> Removes the need for trucks to attempt U-turns at Van de Water Rail Yard access; Consistent with City of Windsor truck route designations (Dougall Avenue and E.C. Row Expressway both identified as truck routes), and consistent with function of the Expressway for movement of goods; No impact to overall safety conditions; No impacts to existing active transportation operations; No impacts to existing transit routes. 	<ul style="list-style-type: none"> Slight decrease in overall LOS with channelized right turns; Improves safety for active transportation users by creating a conventional intersection design, with clearly defined right of ways; Removes weaving section along Dougall Avenue, reducing number of side-swipe/rear end collisions; No impact to existing transit routes. 	<ul style="list-style-type: none"> No impact to LOS at the intersection; Improves safety by removing conflicting turning movements, and reduces high number of collisions in this area; No impact to existing active transportation operations; No impact to existing transit routes.

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Table 8.5 Dougall Avenue Intersection Evaluation

<i>DOUGALL AVENUE – OUELLETTE PLACE INTERSECTION</i>	Dougall Avenue at South Cameron Boulevard		Dougall Avenue at E.C. Row Expressway Ramps			Dougall Avenue at West Grand Boulevard
<i>INTERSECTION</i>	Issues: No access to or from Dougall Avenue northbound, weaving and merging traffic on Dougall Avenue, and unconventional active transportation crossing		Issues: Active transportation conflicts at free flow ramp crossings; uncontrolled access to intersection from private properties, potential left turn storage issues, truck U-turns occurring north of the interchange,			Issues: Proximity of commercial driveways on east and west sides of Dougall Avenue
<i>Options</i>	OPTION 1	OPTION 1	OPTION 2	OPTION 3	OPTION 1	
<i>Evaluation Criteria</i>	Modify the existing design by removing the channelizing island at South Cameron Boulevard approach to create a conventionalized right turn	Signal timing adjustments	Remove turning restriction signage (and supporting by-law) and allow trucks to make northbound left turns to access the westbound E.C. Row Expressway	Remove right turn channelization (free-flow ramp movements) and convert to standard right turn lanes	Extend centre median on south leg of Dougall Avenue to physically restrict commercial driveway accesses to right-in/right-out	
<i>Economic</i>	<ul style="list-style-type: none"> Minimal capital costs associated with median removal and pavement markings; may be incorporated into recommendations for MUT in west boulevard along Dougall Avenue. 	<ul style="list-style-type: none"> No capital costs; Typically part of regular transportation program maintenance. 	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Moderate capital costs associated with removal of portion of free-flow ramps; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low capital costs associated with extending existing centre median. Regular operation and maintenance costs 	
<i>RESULTS</i>	RECOMMENDED Conventionalization of the intersection improves safety for active transportation users and weaving/merging hazards along Dougall Avenue.	RECOMMENDED Though not sufficient to improve conditions as a standalone alternative, signal timing adjustments should be completed as part of the regular transportation program and reviewed regularly to ensure the efficiency of intersection operations.	RECOMMENDED Removal of the truck turning restriction has benefits from a transportation operation perspective, and is consistent with truck route designations of both Dougall Avenue and the E.C. Row Expressway.	RECOMMENDED Although intersection LOS would decrease slightly, this option is recommended in order to resolve safety concerns associated with weaving traffic on Dougall Avenue, and the Active Transportation crossing.	RECOMMENDED In order to eliminate conflicting turning movements in close proximity to intersection, and reduce collision frequency.	

**CENTRAL BOX STUDY AREA
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Phase 3 – Design Alternatives

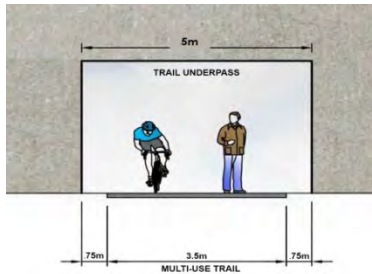
8.4.4 Dougall Avenue – Ouellette Avenue Corridor – Preliminary Recommendations

A raised centre median is proposed to reduce conflicting turning movements and improve safety. Refer to **Plate 5**.

Bike lanes and sidewalks are proposed on the portion of Dougall Avenue north of the Ouellette Place intersection, and **sidewalks** are proposed on both the east and west sides of Ouellette Place. Refer to **Plates 5 and 6**.

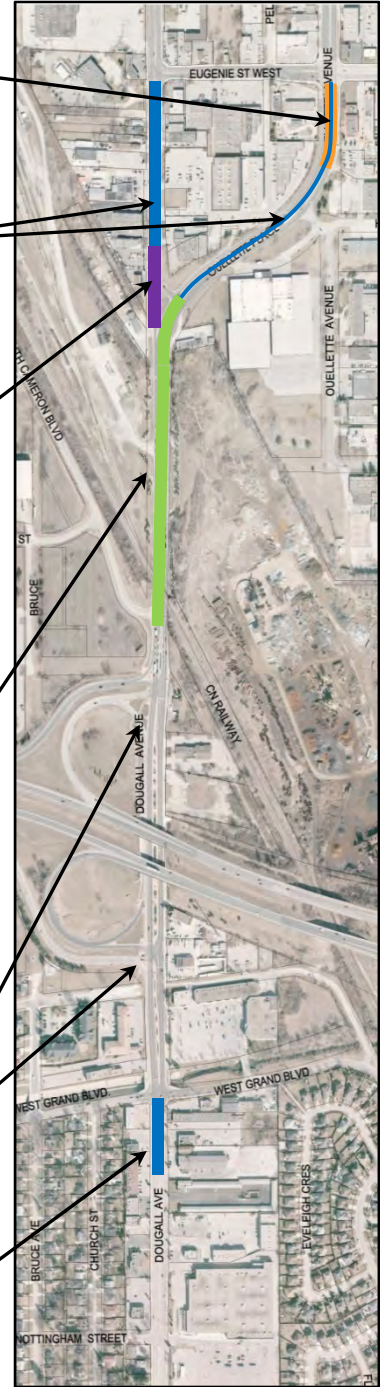
A traffic signal is proposed to facilitate left turns, and the stop controlled right turn onto Dougall Avenue is converted to a standard right turn at the new signalized intersection to: improve sightlines, reduce merging hazards, and to provide a safer Active Transportation crossing. Refer to **Plate 6**.

A proposed **multi-use trail** extends along the west Dougall Avenue boulevard from South Cameron Boulevard to the new signalized intersection, including a tunnel under the CN Rail crossing. Refer to **Plate 6A**.



The channelized ramps are **converted to standard right turn lanes** to improve sightlines, eliminate weaving hazards, and provide a safer Active Transportation crossing. Refer to **Plate 7**.

The proposed **extension of the raised median** reduces conflicting turning movements to improve safety and reduce the frequency of collisions. Refer to **Plate 8**.



8.5 HOWARD AVENUE DESIGN ALTERNATIVES

8.5.1 Howard Avenue Corridor

HOWARD AVENUE NORTH OF THE E.C. ROW EXPRESSWAY

The Howard Avenue Corridor is generally operating well and within capacity. There were no significant localized operational issues identified along the Howard Avenue Corridor north of the E.C. Row Expressway; therefore there were no design alternatives developed, and existing conditions will be maintained.

Active Transportation

Issue: Insufficient northbound left turn lane storage at north E.C. Row Expressway interchange; unconventional active transportation crossings.

- Option 1: Widen pavement/right of way along Howard Avenue to accommodate bicycle lanes and wider sidewalks.
- Option 2: Implement bicycle lanes on Remington Avenue as identified in the BUMP (Plate 10).

HOWARD AVENUE SOUTH OF THE E.C. ROW EXPRESSWAY

The Howard Avenue Corridor is generally operating well and within capacity. Safety concerns associated with right turn channelizations are addressed through the intersection alternatives below.

Active Transportation

Issues: Discontinuous multi-use trail along west boulevard, and pedestrian crossing safety at signalized intersection.

- Option 1: Connect existing multi-use trail and improve crossings at the commercial accesses.

8.5.2 Howard Avenue Intersections

HOWARD AVENUE AT MCDOUGALL STREET

Issue: Incomplete active transportation network, higher speed/volume road with bicycle traffic in narrow shared curb lanes, proposed bicycle routes are connected to McDougall Street - currently no intersection treatment to facilitate left turns by bicycles except as part of mixed traffic.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Phase 3 – Design alternatives

- Option 1: Provide left turn bike box to facilitate northbound left turns by bicycles from Howard Avenue to McDougall Street (requires implementation of bike facilities on Howard Avenue instead of Remington Avenue).

HOWARD AVENUE AT NORTH E.C. ROW EXPRESSWAY RAMP TERMINALS

Issue: Insufficient northbound left turn lane storage, active transportation conflicts at free-flow ramp crossing.

- Option 1: Signal timing adjustments.
- Option 2: Extend northbound left turn lane through existing centre median (for northbound left turn at north ramp terminal) (**Plate 10**).
- Option 3: Upgrade design of multi-use trail (MUT) crossings at ramp terminals (**Plate 10**).
 - This option involves converting the free-flow right turn movement at the westbound north ramp terminal to a conventional right turn by modifications to the existing channelizing median and curb line.

HOWARD AVENUE AT SOUTH CAMERON BOULEVARD/DIVISION ROAD/CN RAIL CROSSING

Issue: At grade rail crossing, closely spaced intersections, drivers not obeying stop signs (rolling stops), incomplete Active Transportation Network, motor vehicles queuing on South Cameron Boulevard approaching Howard Avenue, sight line issues (difficult to see oncoming traffic) due to vegetation and geometry, pedestrian and cycling safety.

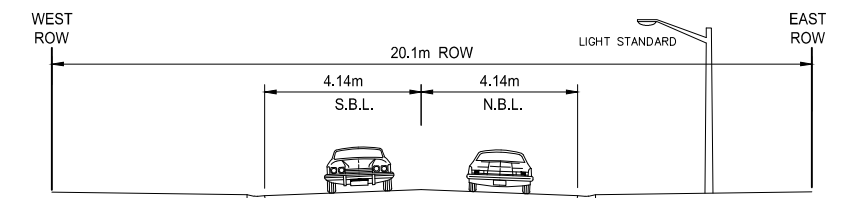
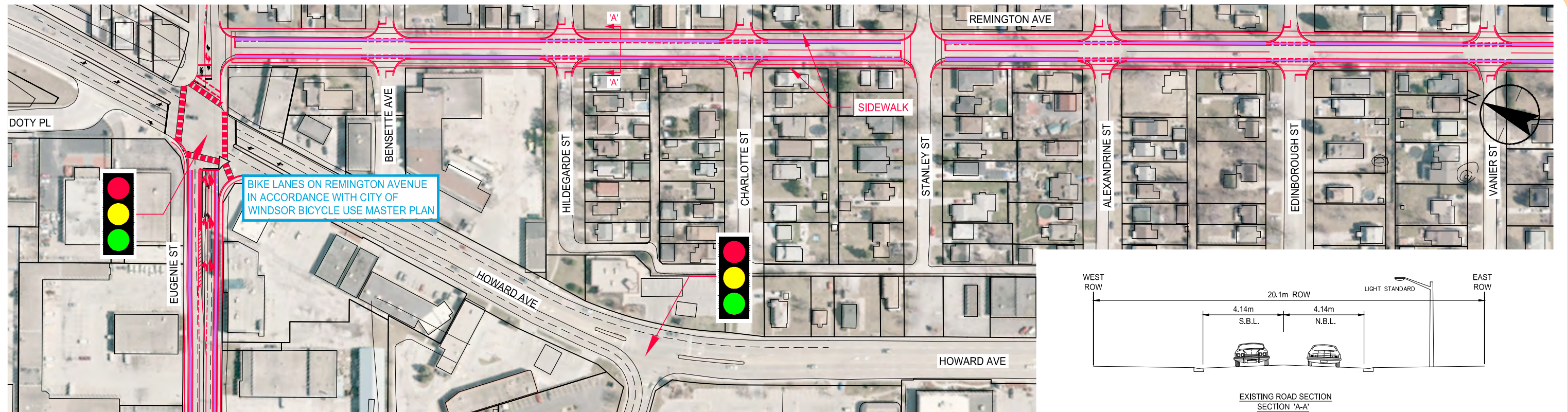
Non-Structural Improvements

- Option 1: Additional warning signage.
- Option 2: Signal timing adjustments.
- Option 3: Use pavement markings and signage to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue where it intersects with Division Road (**Plate 11**).
 - This design includes one dedicated left turn lane and one shared left/through/right curb lane.
- Option 4: Reconfigure the intersection with either an at-grade or grade separated rail crossing. The evaluation table below (Table 8.7) provides an evaluation of a design containing minor structural modifications (**Plate 11**), along with evaluation of more extensive intersection reconfigurations (**Plates 13, 15, 16, 17, and 18**). A more detailed discussion of these design variations follows the evaluation table. Active transportation facilities have been included in the designs, which include a multi-use trail on the east boulevard of the Howard Avenue approach to Division Road, and along the east side of

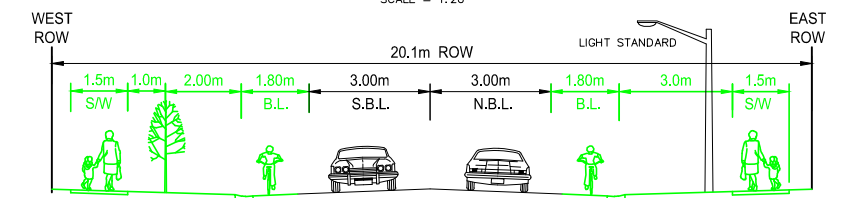
CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

South Cameron Boulevard. Two options for a dedicated multi-use trail rail crossing have also been included to provide a more direct route for navigating the intersection and to address the existing lack of rail crossing for pedestrians and cyclists.

- Option 4a: Minor modifications are made to the South Cameron Boulevard approach to Howard Avenue (**Plate 11**). The channelizing island is modified to create a more conventional right turn, and the South Cameron Boulevard approach is widened to provide designated left and right turn lanes under stop control for left turn movements, and under a channelized stop condition for right turn movements.
- Option 4b: The entire intersection complex is reconfigured. The alternative designs considered as part of the previous Howard Avenue Class EA were reviewed. Several designs were developed, including the connection of Sydney Avenue to Howard Avenue and South Cameron Boulevard, and the realignment of the Howard Avenue/South Cameron Boulevard intersection with the intersection of Division Road and the Devonshire Mall access. A more detailed discussion of the various designs follows the evaluation table below (**Plate 13, 15, 16, 17, and 18**).
- Option 5: Construct a roundabout, grade separated from CN Rail crossing.
 - Option 5a: Grade separated dual roundabouts connecting South Cameron Boulevard, Howard Avenue, Division Road, and the Devonshire Mall Access (**Plate 12**).
 - Option 5b: Grade separated roundabout connecting South Cameron Boulevard, Howard Avenue, and Division Road, with a signalized intersection at the Devonshire Mall Access (**Plate 14**).

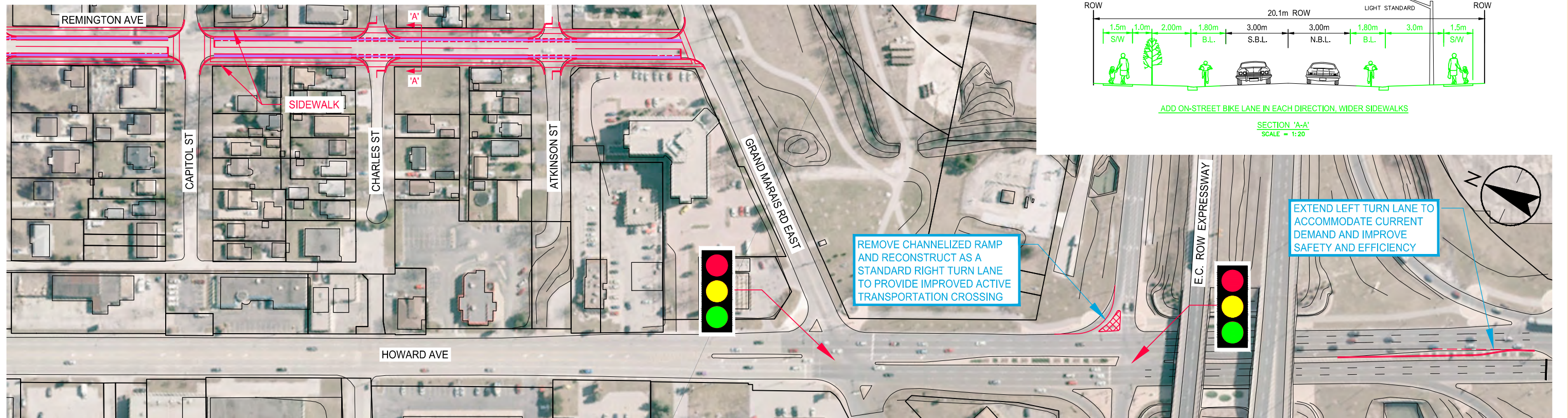


EXISTING ROAD SECTION
SECTION 'A-A'
SCALE = 1:20



ADD ON-STREET BIKE LANE IN EACH DIRECTION, WIDER SIDEWALKS

SECTION 'A-A'
SCALE = 1:20



LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

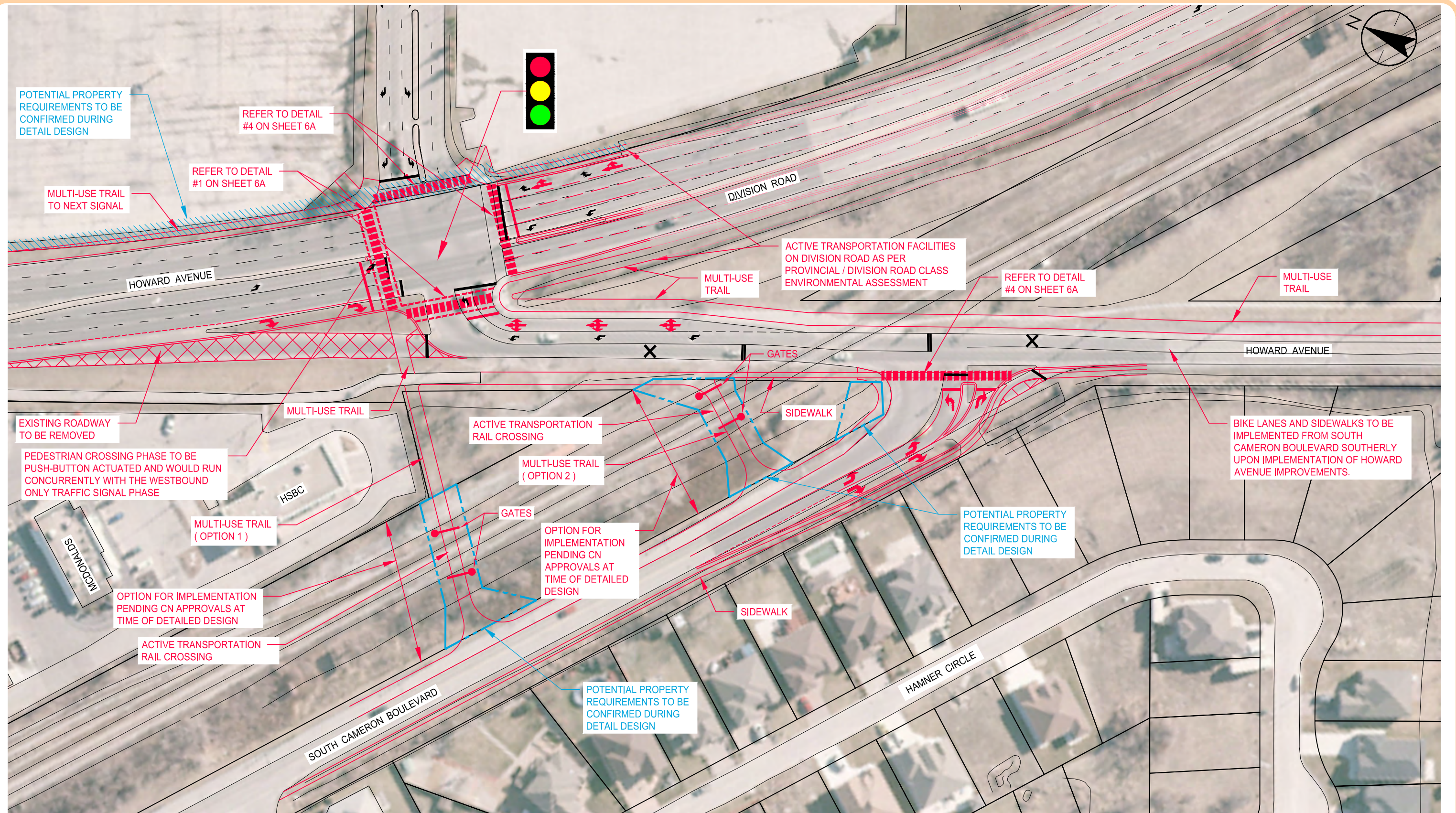
NOTES:

- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Howard Avenue - North of E.C. Row Expressway
Option 2 - Bicycle Lanes on Remington Avenue



LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

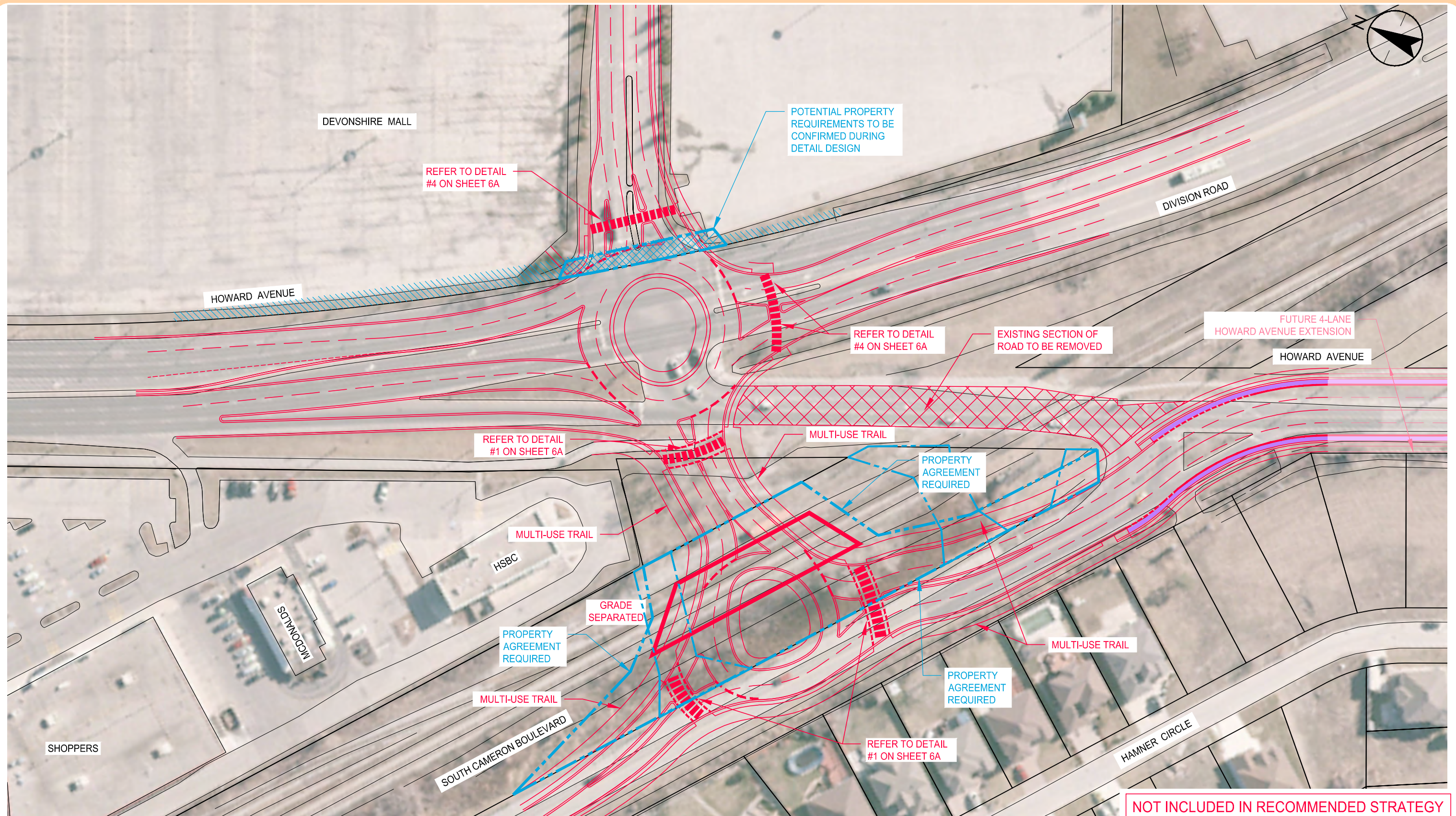
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Howard Avenue at South Cameron Boulevard/Division Road/CN Rail Crossing
Option 4a - Minor Modifications

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 11
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LEGEND	
N.B.L.	- NORTHBOUND LANE
S.B.L.	- SOUTHBOUND LANE
W.B.L.	- WESTBOUND LANE
E.B.L.	- EASTBOUND LANE
R.T.L.	- RIGHT TURN LANE
L.T.L.	- LEFT TURN LANE
T.W.L.T.L.	- TWO WAY LEFT TURN LANE
P.L.	- PARKING LANE
S/W	- SIDEWALK
B.A.	- BUFFER AREA
M.T.	- MULTI-USE TRAIL
B.L.	- BIKE LANE

NOTES:

1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

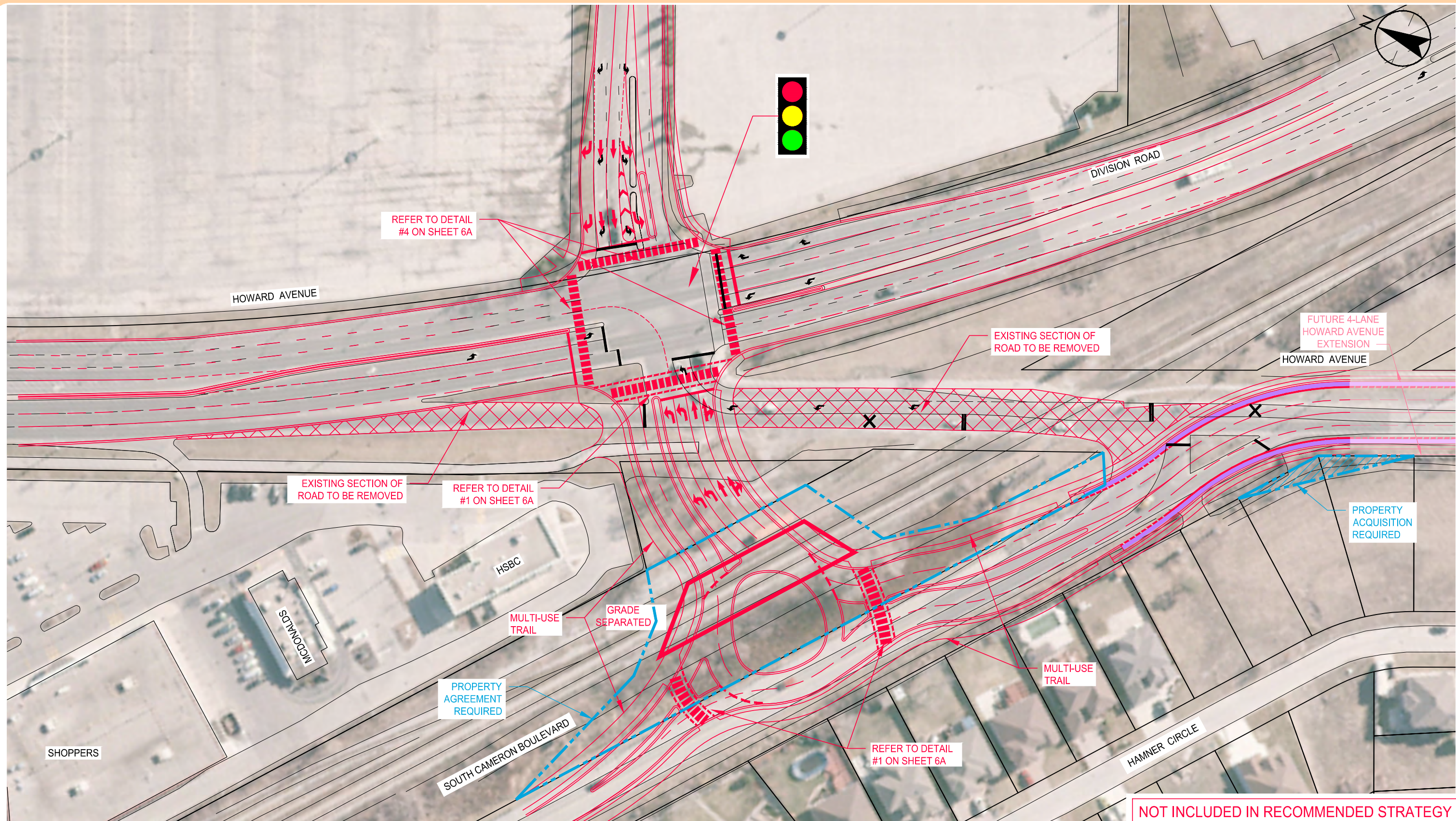


**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 2A
GRADE SEPARATED DOUBLE ROUNDABOUTS AT MALL ACCESS

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 12
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

NOTES:

1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 2C
GRADE SEPARATED ROUNDABOUT AND SIGNALIZED INTERSECTION AT MALL ACCESS

PROJECT NO. 165620021	SCALE 1:1000	GRAPHIC SCALE 0 10 30 50m	DRAWING NO. PLATE 14
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

8.5.3 Howard Avenue Evaluation

The evaluation for the Howard Avenue Corridor/Intersection design alternatives are provided in Table 8.6 and Table 8.7, which includes a brief discussion of the result of the evaluation. Details of the Recommended Designs are provided in Section 9.

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Table 8.6 Howard Avenue Corridor Evaluation

HOWARD AVENUE OPTIONS	NORTH OF E.C. ROW EXPRESSWAY Issues: incomplete active transportation network; high speeds and volumes of traffic, and frequent conflict points		HOWARD AVENUE AT E.C. ROW EXPRESSWAY RAMP TERMINALS Issues: Insufficient northbound left turn storage, active transportation conflicts at free-flow ramp crossings		
	Active Transportation Improvements		Non-Structural Improvements	Structural Improvements	Active Transportation Improvements
Options	OPTION 1	OPTION 2	OPTION 1	OPTION 2	OPTION 3
<i>Evaluation Criteria</i>	Widen pavement/right of way along Howard Avenue to accommodate bicycle lanes and wider sidewalks	Implement bicycle lanes on Remington Avenue as identified in the Bicycle Use Master Plan	Signal timing adjustments	Extent northbound left turn lane through existing centre median (for northbound left turns at the north ramp terminal)	Upgrade design of multi-use trail crossings at expressway ramps (convert free-flow right turn movement at north ramp terminal to conventional right turn lanes; improved signage, high visibility pavement markings at MUT crossing at south ramp terminal and commercial access, and install pedestrian signal at east crossing)
<u>Social/Cultural Impacts</u> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> May impact several commercial accesses/parking lots along right of way; Property acquisition required along both sides of corridor; No impact to emergency response times; No impact to streetscape; No impact to archaeological/built heritage resources; No impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impacts to existing property accesses. No property required; bicycle lanes can be incorporated into existing City owned right of way; No impact to emergency response times; No impact to streetscape; Lower volumes and speeds of traffic make more safe/comfortable environment for cyclists; No impact to archaeological/built heritage; No impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access, no property acquisition needed. No impact to emergency response times; No impact to streetscape; No impact to archaeological/built heritage; No impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access, no property acquisition needed; No impact to emergency response times; Existing landscaped centre medians to be removed to accommodate extended left turn lane; No impact to emergency response times; May reduce collision frequency associated with left turn queues occasionally extending into left through lane; No impact to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> No impact to property access; No property required; No impact to emergency response times; Opportunity to implement enhanced Civic Way elements/streetscape with additional vegetation and trees; Improves crossing safety for pedestrians and cyclists (more defined right of way, opportunity to include pedestrian/cyclists crossing signals, etc.) No impact to archaeological/built heritage or Aboriginal treaty rights.
<u>Natural Environmental</u> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas 	<ul style="list-style-type: none"> Little-no roadside vegetation; No impact to other significant habitats. 	<ul style="list-style-type: none"> No impact to roadside vegetation; No impact to significant habitats; 	<ul style="list-style-type: none"> No impact. 	<ul style="list-style-type: none"> Requires removal of trees in existing centre median; No impacts to other significant habitats. 	<ul style="list-style-type: none"> Little-no roadside vegetation; No impact to other significant habitats.

Table 8.6 Howard Avenue Corridor Evaluation

HOWARD AVENUE OPTIONS	NORTH OF E.C. ROW EXPRESSWAY Issues: incomplete active transportation network; high speeds and volumes of traffic, and frequent conflict points		HOWARD AVENUE AT E.C. ROW EXPRESSWAY RAMP TERMINALS Issues: Insufficient northbound left turn storage, active transportation conflicts at free-flow ramp crossings		
	Active Transportation Improvements		Non-Structural Improvements	Structural Improvements	Active Transportation Improvements
Options	OPTION 1	OPTION 2	OPTION 1	OPTION 2	OPTION 3
Evaluation Criteria	Widen pavement/right of way along Howard Avenue to accommodate bicycle lanes and wider sidewalks	Implement bicycle lanes on Remington Avenue as identified in the Bicycle Use Master Plan	Signal timing adjustments	Extent northbound left turn lane through existing centre median (for northbound left turns at the north ramp terminal)	Upgrade design of multi-use trail crossings at expressway ramps (convert free-flow right turn movement at north ramp terminal to conventional right turn lanes; improved signage, high visibility pavement markings at MUT crossing at south ramp terminal and commercial access, and install pedestrian signal at east crossing)
<p>Technical/ Engineering</p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services 	<ul style="list-style-type: none"> No impact to vehicle operations; Not consistent with the primary cycling network identified within the BUMP (no cycling facilities recommended on this section of Howard Avenue); Connects to future cycling routes north (Eugenie Street to McDougall Street); Frequent commercial driveways and volumes/speed of traffic create uncomfortable conditions for cyclists and motorists; No impact to existing transit routes. 	<ul style="list-style-type: none"> No impact to vehicle operations on Howard Avenue or Remington Street; does not require intersection treatments at McDougall Avenue. Consistent with recommendations in the BUMP; Connects cycling network between existing multi-use trail leading from Howard Avenue at the E.C. Row Expressway north ramp through Howard Park to Remington Street with future cycling routes to the north(Eugenie Street/McDougall Street); Intersection treatments should be considered at Remington Street at Eugenie Street to facilitate bike crossings; Lower volumes and speeds of traffic on Remington Street creates a more comfortable environment for cyclists; No impact to existing transit routes. 	<ul style="list-style-type: none"> Potential for improvement to LOS at north ramp terminal for northbound left turns, and southbound through lanes; Consistent with existing road classifications; No impact to existing active transportation operations; No direct impact to overall safety conditions; No impact to existing transit routes. 	<ul style="list-style-type: none"> Improves existing left turn storage deficiencies, and improves through capacity currently impacted by left turn queues extending into left through lane; Consistent with existing road classifications; No impact to existing active transportation operations. No impact to existing transit routes. 	<ul style="list-style-type: none"> Potential decrease in service for right turn movements; however current LOS is excellent (A), and right turn demand is low; modifications to intersection will cause negligible impact to intersection operations; Potential decrease in collision frequency with conventionalized intersection design, reducing sightline deficiencies; Consistent with existing road classification, and City wide policies encouraging active transportation usage; Significant improvement to safety conditions for pedestrian/cyclists crossing operations; No impact to existing transit routes.

Table 8.6 Howard Avenue Corridor Evaluation

HOWARD AVENUE OPTIONS	NORTH OF E.C. ROW EXPRESSWAY Issues: incomplete active transportation network; high speeds and volumes of traffic, and frequent conflict points		HOWARD AVENUE AT E.C. ROW EXPRESSWAY RAMP TERMINALS Issues: Insufficient northbound left turn storage, active transportation conflicts at free-flow ramp crossings		
	Active Transportation Improvements		Non-Structural Improvements	Structural Improvements	Active Transportation Improvements
Options	OPTION 1	OPTION 2	OPTION 1	OPTION 2	OPTION 3
Evaluation Criteria	Widen pavement/right of way along Howard Avenue to accommodate bicycle lanes and wider sidewalks	Implement bicycle lanes on Remington Avenue as identified in the Bicycle Use Master Plan	Signal timing adjustments	Extent northbound left turn lane through existing centre median (for northbound left turns at the north ramp terminal)	Upgrade design of multi-use trail crossings at expressway ramps (convert free-flow right turn movement at north ramp terminal to conventional right turn lanes; improved signage, high visibility pavement markings at MUT crossing at south ramp terminal and commercial access, and install pedestrian signal at east crossing)
<u>Economic</u>	<ul style="list-style-type: none"> Moderate-high capital costs associated with property acquisition, pavement widening, and reconstruction of sidewalks. 	<ul style="list-style-type: none"> Low-moderate capital costs associated with widening pavement to implement bicycle lanes on Remington Avenue. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> No capital costs; Typically part of regular transportation program maintenance. 	<ul style="list-style-type: none"> Low capital costs associated with modifications to existing centre median. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Low-moderate capital costs associated with intersection modification; Regular operation and maintenance costs.
<u>RESULTS</u>	NOT RECOMMENDED due to the extensive construction, property acquisition, and impacts to adjacent commercial properties.	RECOMMENDED The lower volumes and speeds of traffic make Remington Street a more desirable route for cyclists, and can be implemented in the interim with bicycle route signage and sharrow pavement markings.	RECOMMENDED Although not sufficient to improve conditions as a standalone alternative, signal timing adjustments should be completed as part of the regular transportation program and reviewed regularly to ensure the efficiency of intersection operations.	RECOMMENDED in order to address existing northbound left turn storage lane deficiency.	RECOMMENDED due to the improvement to safety conditions for active transportation users. Conventionalization of intersection design may also reduce frequency of rear end collisions associated with the channelized right turn.

Figure 8.7 Howard Avenue Intersection Evaluation

HOWARD AVENUE AT SOUTH CAMERON BOULEVARD/DIVISION ROAD/CN RAIL INTERSECTION COMPLEX						
Issues: At-grade rail crossing, closely spaced intersections, drivers not obeying stop signs, incomplete active transportation network, motor vehicles queuing on South Cameron Boulevard approaching Howard Avenue, sigh line issues due to geometry and vegetation, pedestrian and cycling safety						
HOWARD AVENUE ALTERNATIVES	Non-Structural Improvements		Structural Improvements			
			Option 4: Reconfigure the intersection with either an at-grade or grade separate rail crossing		Option 5: Grade-Separated Roundabout	
<i>Options</i>	Do Nothing No structural improvements will be made, and corridor will experience the forecasted 5% increase in traffic over the 20 year period (or .25% per year)	Option 3 Use pavement marks and signage to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue at Division Road (Plate 11)	Option 4a Minor modifications to the South Cameron Boulevard approach to Howard Avenue, and the creation of dedicated right and left turn lanes with additional storage (Plate 11)	Option 4b The entire intersection complex is reconstructed (Plates 13, 15, 16, 17, and 18)	Option 5a Grade separated dual roundabouts connecting South Cameron Boulevard, Howard Avenue, Division Road, and the Devonshire Mall Access (Plate 12)	Option 5b Grade separated roundabout connecting South Cameron Boulevard, Howard Avenue, and Division Road, with a signalized intersection at the Devonshire Mall Access (Plate 14)
<i>Evaluation Criteria</i>						
<p><u>Social/Cultural Impacts</u></p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 	<ul style="list-style-type: none"> Motorists will continue to experience delays at South Cameron Boulevard intersection; Active transportation users currently utilizing unspecified path north of the intersection, and are forced to share roadway/gravel shoulder with motorists while crossing CN Rail tracks. 	<ul style="list-style-type: none"> Mall access is maintained in existing location; No property required; No impacts to emergency response times; Areas of archaeological potential are identified south of the intersection complex between Howard Avenue and Division road: test pitting required at 5m intervals if construction is required for multi-use. 	<ul style="list-style-type: none"> No property acquisition required; No impact to emergency response times; Sightlines are improved particularly for right turn movements with the conventionalization of the intersection, which also provides a safer, better defined active transportation crossing; Opportunity to implement enhanced Civic Way elements such as parkettes and additional roadside vegetation; No impacts to archaeological resources associated with intersection improvements (test-pitting at 5m intervals required for any disruption to lands southeast of the intersection, between Howard Avenue and Division Road); No impacts to built heritage, or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Extensive property acquisition required, with several designs including several full residential/commercial properties; Modifications required to Devonshire Mall access to ensure lane balance with facing intersection; Potential modifications to additional commercial entrances; Opportunity to implement appropriate active transportation facilities, and enhanced Civic Way elements such as parkettes and additional roadside vegetation; Potential impacts to archaeological resources south of Howard Avenue/Division Road intersection; test-pitting at 5m intervals required prior to construction; No impacts to built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Some property acquisition required, including modifications to the existing Devonshire Mall access; No impacts to emergency response times; Opportunity to implement enhanced civic way features (central median planter); No impacts to archaeological/built heritage resources, or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Some property acquisition required, including modifications to the existing Devonshire Mall access; No impacts to emergency response times; Opportunity to implement enhanced civic way features (central median planter); No impacts to archaeological/built heritage resources, or Aboriginal treaty rights.

Figure 8.7 Howard Avenue Intersection Evaluation

HOWARD AVENUE ALTERNATIVES		HOWARD AVENUE AT SOUTH CAMERON BOULEVARD/DIVISION ROAD/CN RAIL INTERSECTION COMPLEX					
		Issues: At-grade rail crossing, closely spaced intersections, drivers not obeying stop signs, incomplete active transportation network, motor vehicles queuing on South Cameron Boulevard approaching Howard Avenue, sigh line issues due to geometry and vegetation, pedestrian and cycling safety					
Options		Non-Structural Improvements	Structural Improvements				
			Option 4: Reconfigure the intersection with either an at-grade or grade separate rail crossing		Option 5: Grade-Separated Roundabout		
Evaluation Criteria		Do Nothing No structural improvements will be made, and corridor will experience the forecasted 5% increase in traffic over the 20 year period (or .25% per year)	Option 3 Use pavement marks and signage to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue at Division Road (Plate 11)	Option 4a Minor modifications to the South Cameron Boulevard approach to Howard Avenue, and the creation of dedicated right and left turn lanes with additional storage (Plate 11)	Option 4b The entire intersection complex is reconstructed (Plates 13, 15, 16, 17, and 18)	Option 5a Grade separated dual roundabouts connecting South Cameron Boulevard, Howard Avenue, Division Road, and the Devonshire Mall Access (Plate 12)	Option 5b Grade separated roundabout connecting South Cameron Boulevard, Howard Avenue, and Division Road, with a signalized intersection at the Devonshire Mall Access (Plate 14)
Natural Environmental		<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> No impacts 	<ul style="list-style-type: none"> No species at risk records within the area; Construction of multi-use trail may impact rare species; mitigation/compensation measures should be implemented; Opportunity to implement additional roadside vegetation 	<ul style="list-style-type: none"> No species at risk records within the area; Potential impacts to rare plant species; mitigation/compensation measures should be implemented; Opportunity to implement additional roadside vegetation 	<ul style="list-style-type: none"> No species at risk records within the area; Potential impacts to rare plant species; mitigation/compensation measures should be implemented; 	<ul style="list-style-type: none"> No species at risk records within the area; Potential impacts to rare plant species; mitigation/compensation measures should be implemented;
Technical/ Engineering		<ul style="list-style-type: none"> Howard Avenue at Division Road/Mall access experiences a poor overall level of service (E) for both a.m. and p.m. peak periods; LOS F/E for eastbound left turns during a.m./p.m. peak periods, and E and F for all northbound and southbound movements. Queuing for eastbound left turns at Howard Avenue/Division Road will continue to exceed available 	<ul style="list-style-type: none"> Improves overall LOS at the intersection to C/D for a.m./p.m. peak periods; significant improves LOS and reduces delay for eastbound left turns; Significantly improves queue length storage for eastbound left turns; however 95th percentile queues may extend to South Cameron Boulevard intersection during; Improves overall network connectivity in conjunction with improvements to South Cameron Boulevard/Howard Avenue intersection; Active transportation 	<ul style="list-style-type: none"> Overall LOS at the intersection is improved with the provision of dedicated storage space for right and left turn movements; Small improvement to LOS for eastbound left turns during a.m. peak period, and reduced delays; Modification to the intersection geometrics improves sightlines for right turn movements, and allows for a more clearly defined active transportation crossing. 	<ul style="list-style-type: none"> Several designs considered that achieve good LOS; queuing deficiencies evident in many designs due to the proximity of intersections; All designs involve new at grade/grade separated rail operations. 	<ul style="list-style-type: none"> Overall good LOS for all roundabout approaches/exits; One segment of roundabout crosses over rail line; conceptual design feasible based on grading and clearance requirements; consultation with CN Rail required during detailed design to confirm requirements; Roundabouts provide challenges for the incorporation of active transportation facilities; Overall complex design and construction required, and complex operations from dual roundabouts may cause safety concerns (driver trepidation). 	<ul style="list-style-type: none"> Poor LOS, and queuing issues due to proximity to signalized intersection. One segment of roundabout crosses over rail line; conceptual design feasible based on grading and clearance requirements; consultation with CN Rail required during detailed design to confirm requirements; Roundabouts create challenges for the incorporation of active transportation facilities; Overall complex design and construction required, and complex

Figure 8.7 Howard Avenue Intersection Evaluation

HOWARD AVENUE AT SOUTH CAMERON BOULEVARD/DIVISION ROAD/CN RAIL INTERSECTION COMPLEX						
HOWARD AVENUE ALTERNATIVES	Issues: At-grade rail crossing, closely spaced intersections, drivers not obeying stop signs, incomplete active transportation network, motor vehicles queuing on South Cameron Boulevard approaching Howard Avenue, sigh line issues due to geometry and vegetation, pedestrian and cycling safety					
	Non-Structural Improvements	Structural Improvements				
		Option 4: Reconfigure the intersection with either an at-grade or grade separate rail crossing			Option 5: Grade-Separated Roundabout	
Options	Do Nothing No structural improvements will be made, and corridor will experience the forecasted 5% increase in traffic over the 20 year period (or .25% per year)	Option 3 Use pavement marks and signage to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue at Division Road (Plate 11)	Option 4a Minor modifications to the South Cameron Boulevard approach to Howard Avenue, and the creation of dedicated right and left turn lanes with additional storage (Plate 11)	Option 4b The entire intersection complex is reconstructed (Plates 13, 15, 16, 17, and 18)	Option 5a Grade separated dual roundabouts connecting South Cameron Boulevard, Howard Avenue, Division Road, and the Devonshire Mall Access (Plate 12)	Option 5b Grade separated roundabout connecting South Cameron Boulevard, Howard Avenue, and Division Road, with a signalized intersection at the Devonshire Mall Access (Plate 14)
Evaluation Criteria						
	storage, and occasionally extend to or beyond Howard Avenue/South Cameron Boulevard; <ul style="list-style-type: none"> Poor LOS for eastbound left turns at South Cameron Boulevard/Howard Avenue, with continued left/right lane queuing deficiencies impacting overall operations at the intersection. 	facilities can be incorporated as per BUMP (multi-use trail on Howard Avenue between South Cameron Boulevard and Division Road, and northward in west boulevard of Howard Avenue); <ul style="list-style-type: none"> Consultation required with CN Rail staff to sure compliance with intersection guidelines. 				operations from dual roundabouts may cause safety concerns (driver trepidation).
Economic <ul style="list-style-type: none"> Initial Capital Cost Operation And Maintenance Costs 	<ul style="list-style-type: none"> No capital costs; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Minimal capital costs associated with modifications to pavement markings. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Lowest capital costs in comparison to major structural reconstructions; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Significant costs associated with property acquisition, rail crossings, and road realignments; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Significant costs associated with the roadworks and rail overpass structures; Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Significant costs associated with roadworks and rail overpass structures; Regular operation and maintenance costs.
RESULTS	The Do Nothing alternative does not address the identified issues, and is used as a benchmark for the evaluation of other alternatives.	RECOMMENDED Improves LOS for most movements. It is recommended that southbound free-flow right turns for travel continuing southbound on Howard Avenue be converted to a	RECOMMENDED In conjunction with Option 3, minor modifications to intersection configuration with additional right and left turn storage adequately addresses existing deficiencies, and maintains acceptable LOS with forecasted increase in traffic	NOT RECOMMENDED Although several designs may improve LOS at the intersection complex, improvements are not relative to the extensive property acquisition and costs associated with the major reconstructions. Designs may be revisited if	NOT RECOMMENDED Although design results in good LOS, design is not recommended due to complex construction and operations, high cost, and limitations for the incorporation of active transportation facilities.	NOT RECOMMENDED Design does not provide acceptable LOS.

Figure 8.7 Howard Avenue Intersection Evaluation

HOWARD AVENUE AT SOUTH CAMERON BOULEVARD/DIVISION ROAD/CN RAIL INTERSECTION COMPLEX						
Issues: At-grade rail crossing, closely spaced intersections, drivers not obeying stop signs, incomplete active transportation network, motor vehicles queuing on South Cameron Boulevard approaching Howard Avenue, sigh line issues due to geometry and vegetation, pedestrian and cycling safety						
HOWARD AVENUE ALTERNATIVES		Non-Structural Improvements	Structural Improvements			
			Option 4: Reconfigure the intersection with either an at-grade or grade separate rail crossing		Option 5: Grade-Separated Roundabout	
Options	Do Nothing No structural improvements will be made, and corridor will experience the forecasted 5% increase in traffic over the 20 year period (or .25% per year)	Option 3 Use pavement marks and signage to provide eastbound to northbound dual left turn movements for northbound travel on Howard Avenue at Division Road (Plate 11)	Option 4a Minor modifications to the South Cameron Boulevard approach to Howard Avenue, and the creation of dedicated right and left turn lanes with additional storage (Plate 11)	Option 4b The entire intersection complex is reconstructed (Plates 13, 15, 16, 17, and 18)	Option 5a Grade separated dual roundabouts connecting South Cameron Boulevard, Howard Avenue, Division Road, and the Devonshire Mall Access (Plate 12)	Option 5b Grade separated roundabout connecting South Cameron Boulevard, Howard Avenue, and Division Road, with a signalized intersection at the Devonshire Mall Access (Plate 14)
Evaluation Criteria		conventional right turn lane at the intersection to improve sightlines and reduce safety conflicts with neighbouring intersection; however southbound right turns receive poor LOS during a.m. peak periods.	volumes, while at a significantly lower cost than more extensive intersection configurations.	significant changes occur to land use/traffic patterns in the area (e.g. major land re-development)		

8.5.3.1 Howard Avenue/South Cameron Boulevard/Division Road/CN Rail Intersection Complex - Additional Designs Considered

Several additional designs were developed for a major reconfiguration of the Howard Avenue/South Cameron/Division Road/CN Rail intersection complex. Although these major reconstructions were deemed to be unwarranted by the current safety conditions and traffic volumes as well as the project traffic demands, these designs may be revisited at a later date should conditions in the area change significantly. The discussion below outlines key strengths and weaknesses of the design concepts.

Plate 13

A new grade separated rail crossing was considered north of the existing South Cameron Boulevard/Howard Avenue intersection, connecting South Cameron Boulevard to Division Road in line with the Devonshire Mall access. An approximate 90 degree signalized intersection would be created at South Cameron Boulevard, Howard Avenue, and the new grade separated rail crossing. The existing portion of Howard Avenue between South Cameron Boulevard and Division Road would be removed. Minimal property is required for this design; however, consultation would be required with CN Rail to confirm grade separation clearance guidelines.

The design of Plate 13 results in an overall good level of service for all movements, with no significant queuing deficiencies at the intersections of Howard Avenue with Division Road and South Cameron Boulevard. In regards to the design of Plate 13, there are complexities related to the proximity of the roadway intersections which include queuing and the coordination of traffic signals.

Plate 15

This design is similar to Plate 13 above, with angled South Cameron Boulevard and Howard Avenue approaches to a signaled intersection and an at-grade rail crossing. The existing portion of Howard Avenue between South Cameron Boulevard and Division Road would be removed. Minimal property is required for this design; however, consultation would be required with CN Rail for approval of new rail crossing, and to confirm crossing design specifications.

This design results in an overall good LOS for all movements, with no significant queuing deficiencies at the intersections of Howard Avenue with Division Road and South Cameron Boulevard. The only exception would be the eastbound right turn movement at Howard Avenue and South Cameron Boulevard. During the p.m. peak hour the eastbound right turn movement would operate at a level of service F, it should be noted that even with the poor level of service the movement is operating well within capacity.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Phase 3 – Design alternatives

Similar to Plate 13, there are complexities with this design related to the proximity of the roadway intersections which include queuing and the coordination of traffic signals.

Plate 16, 16a, and 16b

A new at grade rail crossing is created south of the existing South Cameron Boulevard/Howard Avenue intersection, aligned with Sydney Avenue. South Cameron Boulevard is extended south-east, and Howard Avenue is realigned to connect with the new at-grade rail crossing through to a signalized intersection at Division Road/Sydney. The existing section of Howard Avenue between South Cameron Boulevard and Division Road is removed. Plate 16a was modified to increase the distance/queue space between the two intersections. Plate 16b was modified to improve connectivity for southbound travel on South Cameron Boulevard accessing Howard Avenue northward by maintaining the existing section of Howard Avenue between South Cameron Boulevard and Division Road. These designs require substantial property acquisition, including the full acquisition of several residential lots along Howard Avenue, as well as modifications to commercial properties along Sydney Avenue.

Analysis of the design plates 16/16a/16b was undertaken and it was determined that the intersections of Howard Avenue with South Cameron Boulevard and Division Road with Sydney Avenue would both operate overall at acceptable levels of service, with no significant queuing issues. All movements at each of the intersections are anticipated to operate at acceptable levels of service and within capacity.

It should be noted that the available queue space has been considered only for west of the rail line. Due to the reduced amount of space and minimum required distance of separation from the rail line, there is the potential for temporary and occasional spill back to the adjacent intersection.

The full analysis results have been provided for reference in Appendix F1.

Plate 17

This design is similar to Plate 16 with the exception of a new grade separated rail crossing. Howard Avenue and South Cameron Boulevard are realigned at a new signalized intersection south-east of the existing intersection, and a new grade separated rail crossing is created; Sydney Avenue is also realigned northward to meet the Howard Avenue extension at Division Road. The existing section of Howard Avenue between South Cameron Boulevard and Division Road is removed. This design requires substantial property acquisition, including full acquisition of several residential lots along Howard Avenue, as well as the acquisition of a commercial property on the north-east corner of Howard Avenue/Division Road. Consultation will also be required with CN Rail during detail design to confirm grade separation design specifications.

The operational analysis results of Plate 17 are similar to Plate 16. It was determined that the intersections of Howard Avenue with South Cameron Boulevard and Division Road with Sydney

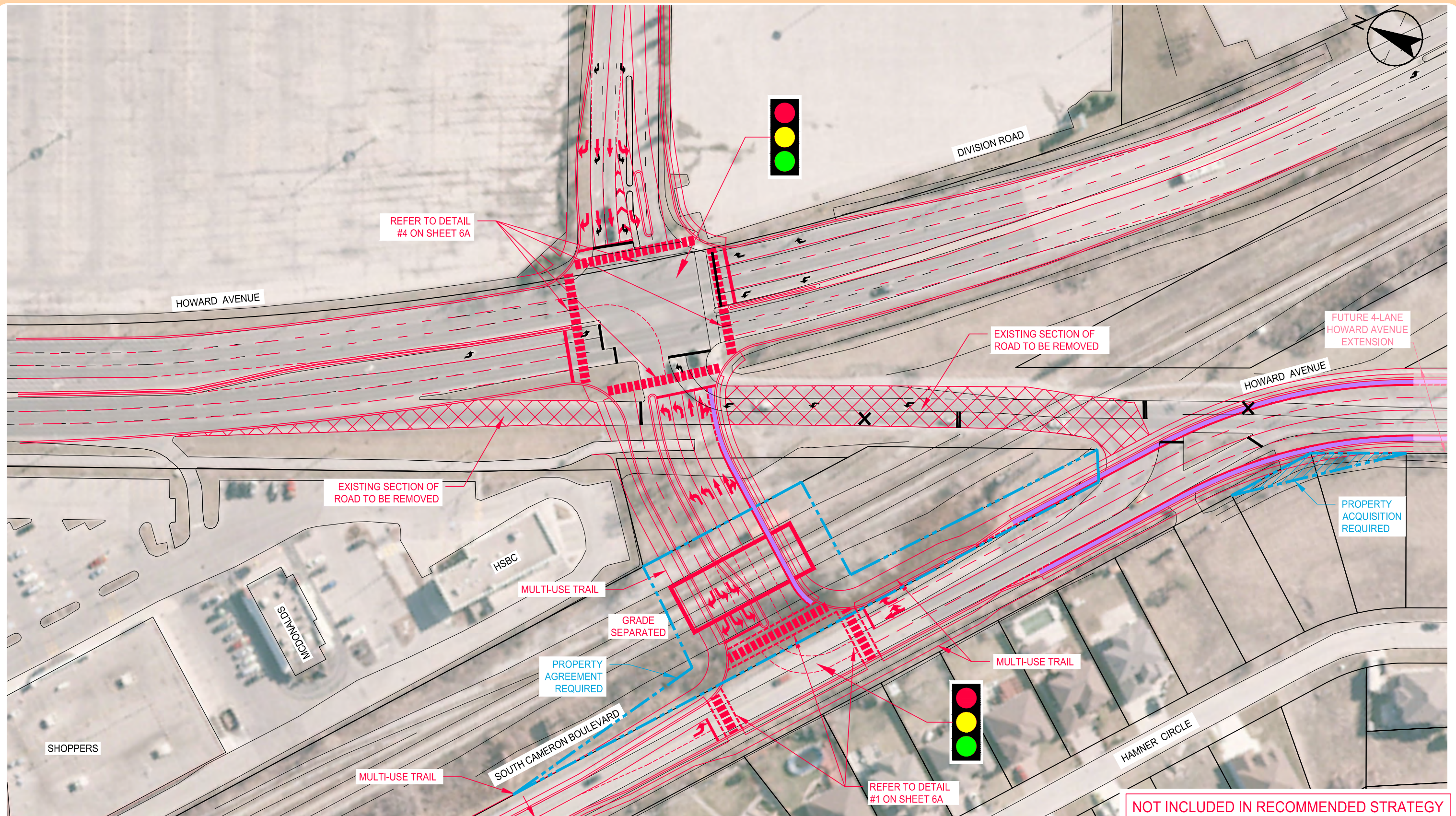
**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Avenue would both operate at an acceptable level of service, with no significant queuing issues. It should be noted that with these two intersections spaced closely there is the potential for the temporary and occasional spill back of queues.

Plate 18

South Cameron Boulevard is realigned eastward, creating a new at-grade rail crossing, and connecting to Howard Avenue in the location of the existing Howard Avenue/Division Road intersection. Howard Avenue is also realigned eastward with a grade-separated rail crossing to connect with Division Road and Sydney Avenue (Sydney Avenue is also realigned northward to align the intersection). The section of Howard Avenue between South Cameron Boulevard and Division Road is removed. The creation of two rail crossings represents an inherent weakness in this design.

The operational analysis indicates that the intersections of Howard Avenue with South Cameron Boulevard and Division Road with Sydney Avenue would both operate overall at acceptable levels of service, but with several individual movements operating with a poor level of service and approaching its theoretical capacity. Additionally, a sensitivity analysis was undertaken where traffic volumes to and from South Cameron Boulevard were increased by 50%, but with no reductions of volumes on Howard Avenue or Division Road. The sensitivity analysis approaches capacity "worst case", with both intersections anticipated to operate at poor levels of service and exceeding capacity.



NOT INCLUDED IN RECOMMENDED STRATEGY

LEGEND	
N.B.L.	- NORTHBOUND LANE
S.B.L.	- SOUTHBOUND LANE
W.B.L.	- WESTBOUND LANE
E.B.L.	- EASTBOUND LANE
R.T.L.	- RIGHT TURN LANE
L.T.L.	- LEFT TURN LANE
T.W.L.T.L.	- TWO WAY LEFT TURN LANE
P.L.	- PARKING LANE
S/W	- SIDEWALK
B.A.	- BUFFER AREA
M.T.	- MULTI-USE TRAIL
B.L.	- BIKE LANE

NOTES:

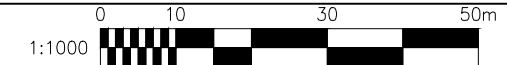
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

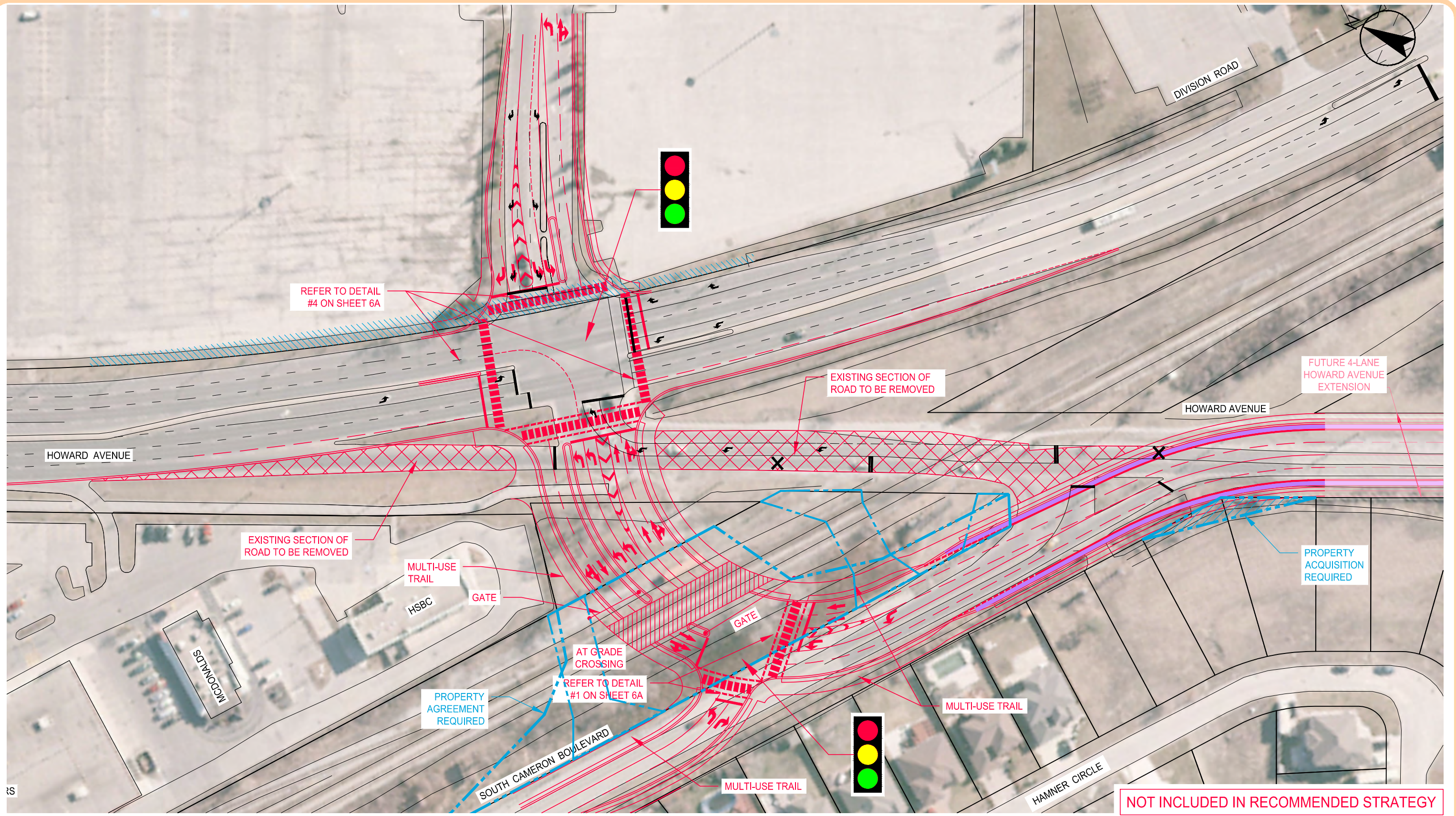
HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 2B
GRADE SEPARATED SIGNALIZED INTERSECTIONS AT MALL ACCESS

PROJECT NO.
165620021



DRAWING NO.
PLATE 13

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



- LEGEND**
- N.B.L. - NORTHBOUND LANE
 - S.B.L. - SOUTHBOUND LANE
 - W.B.L. - WESTBOUND LANE
 - E.B.L. - EASTBOUND LANE
 - R.T.L. - RIGHT TURN LANE
 - L.T.L. - LEFT TURN LANE
 - T.W.L.T.L. - TWO WAY LEFT TURN LANE
 - P.L. - PARKING LANE
 - S/W - SIDEWALK
 - B.A. - BUFFER AREA
 - M.T. - MULTI-USE TRAIL
 - B.L. - BIKE LANE

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

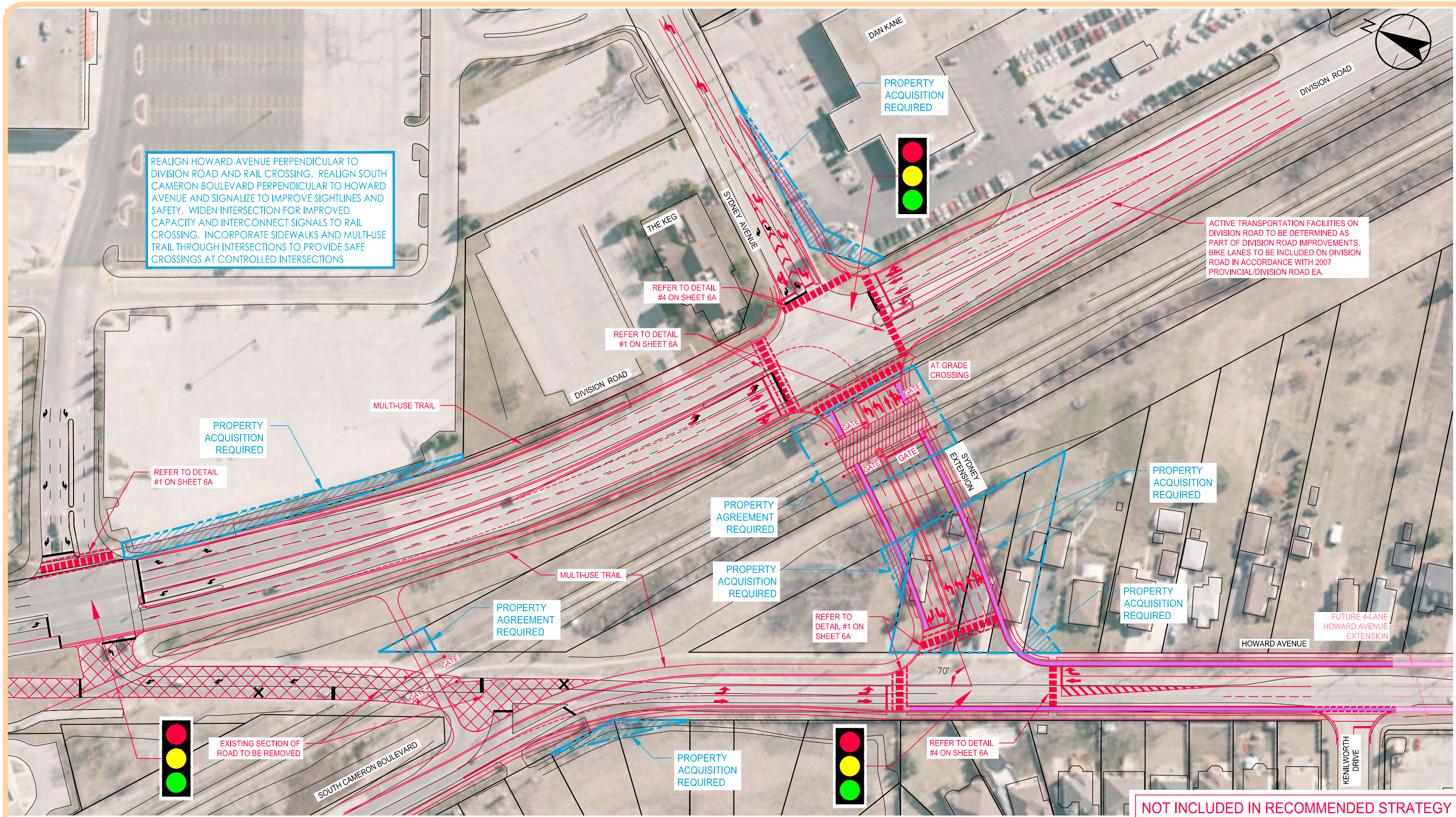
- NOTES:**
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



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HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 3
AT GRADE SIGNALIZED INTERSECTION AT MALL ACCESS

PROJECT NO. 165620021		DRAWING NO. PLATE 15
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LEGEND

N.B.L.	- NORTHBOUND LANE	P.L.	- PARKING LANE
S.B.L.	- SOUTHBOUND LANE	S/W	- SIDEWALK
W.B.L.	- WESTBOUND LANE	B.A.	- BUFFER AREA
E.B.L.	- EASTBOUND LANE	M.T.	- MULTI-USE TRAIL
R.T.L.	- RIGHT TURN LANE	B.L.	- BIKE LANE
L.T.L.	- LEFT TURN LANE		
T.W.L.T.L.	- TWO WAY LEFT TURN LANE		

NOTES:

1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

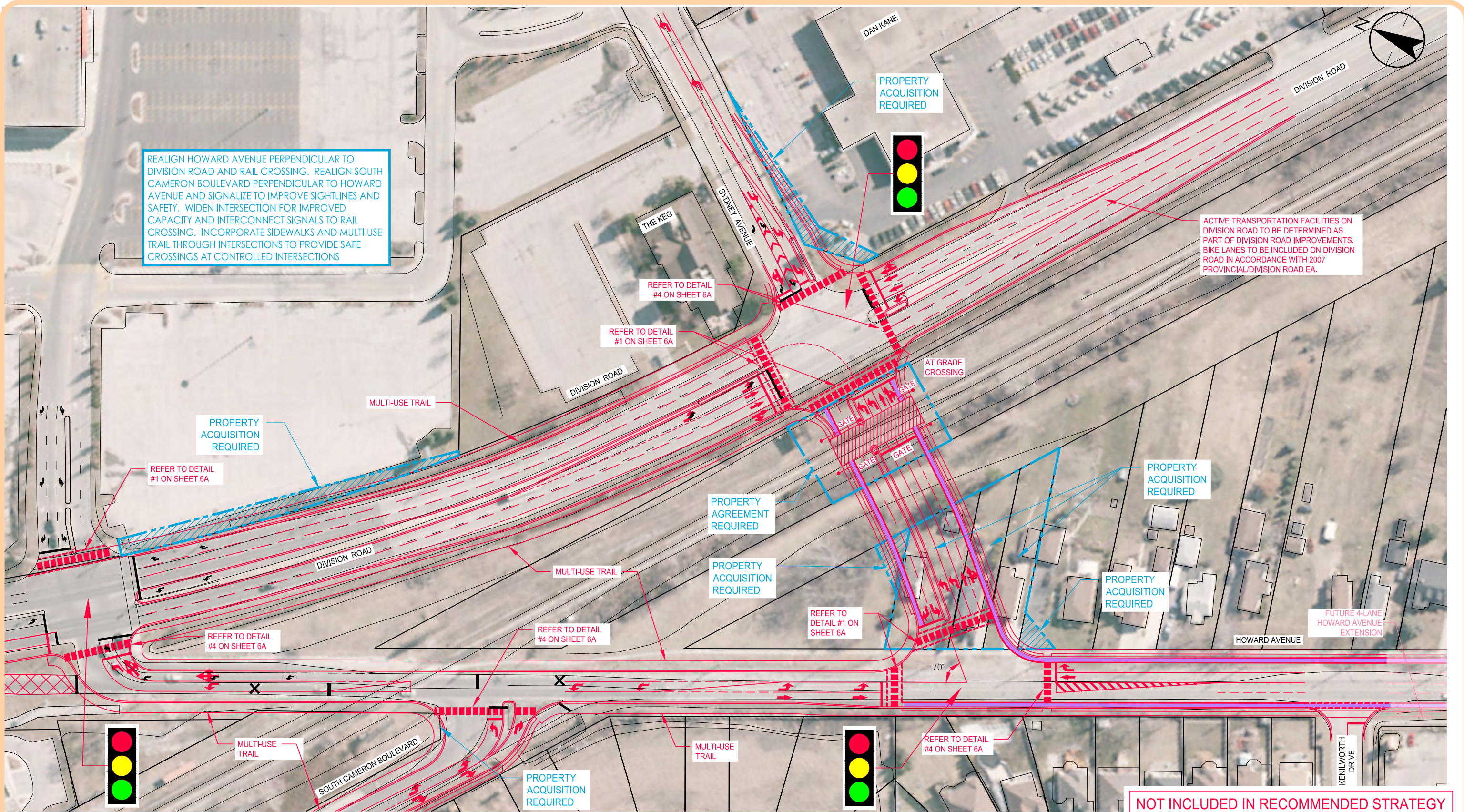


**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 5
AT GRADE SIGNALIZED INTERSECTION AT SYDNEY AVENUE

PROJECT NO. 165620021	1:1250	0 12.5 37.5 62.5m	DRAWING NO. PLATE 16A
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



LEGEND

- | | | | |
|------------|--------------------------|------|-------------------|
| N.B.L. | - NORTHBOUND LANE | P.L. | - PARKING LANE |
| S.B.L. | - SOUTHBOUND LANE | S/W | - SIDEWALK |
| W.B.L. | - WESTBOUND LANE | B.A. | - BUFFER AREA |
| E.B.L. | - EASTBOUND LANE | M.T. | - MULTI-USE TRAIL |
| R.T.L. | - RIGHT TURN LANE | B.L. | - BIKE LANE |
| L.T.L. | - LEFT TURN LANE | | |
| T.W.L.T.L. | - TWO WAY LEFT TURN LANE | | |

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

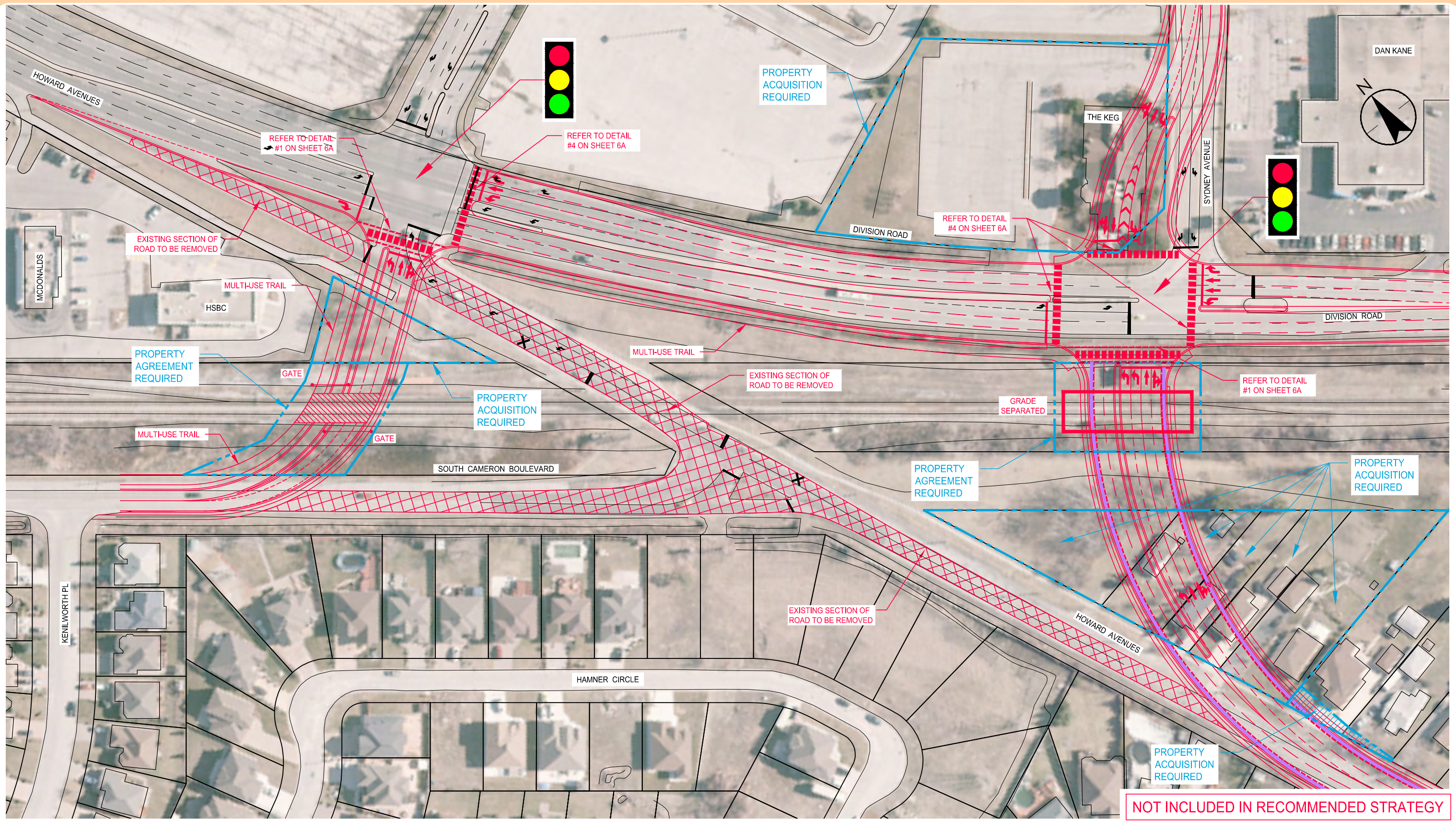
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



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CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING – OPTION 6
AT GRADE SIGNALIZED INTERSECTION AT SYDNEY AVENUE

PROJECT NO.	0	12.5	37.5	62.5m	DRAWING NO.
165620021	1:1250				PLATE 16B



NOT INCLUDED IN RECOMMENDED STRATEGY

LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



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CENTRAL BOX STUDY AREA
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HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING - OPTION 5B
SIGNALIZED INTERSECTION AT SYDNEY AVENUE & SOUTH CAMERON - OPTION 2

PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 18
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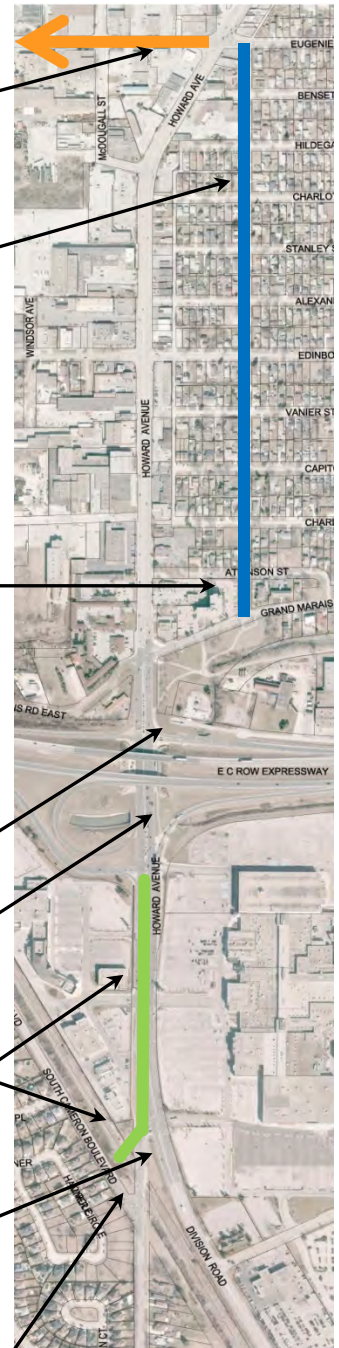
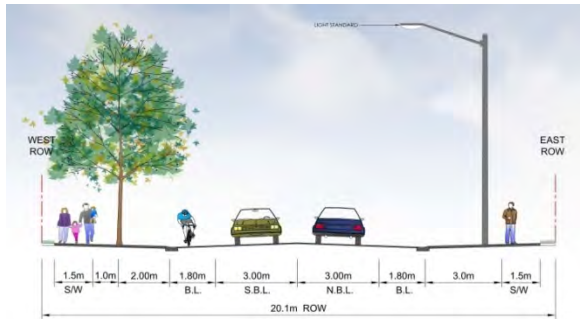
**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Phase 3 – Design Alternatives

8.5.4 Howard Avenue Corridor – Preliminary Recommendations

Buffered bike lanes are proposed on Eugenie Street from Howard Avenue to Dougall Avenue (see **Plate 10A**).

Bike lanes and **sidewalks** are proposed on Remington Avenue in accordance with the Bicycle Use Master Plan (BUMP). Remington Avenue has lower volumes and speeds of traffic, and fewer conflicts with commercial driveways, creating a safer environment for cyclists. This alternative also avoids significant property acquisition and impacts to commercial properties that would be required to implement Active Transportation facilities on Howard Avenue (see **Plate 10**).



The channelized right turn is removed at the north bound E.C. Row Expressway off-ramp, and is converted to a **standard right turn lane** to improve Active Transportation safety and operations. Signal timing adjustments are also proposed as part of the City's regular review (see **Plate 10**).

The **northbound left turn lane is extended** through a portion of the existing median to provide more vehicle storage to improve intersection operations (see **Plate 10**).

The existing **multi-use trail** on the west side of Howard is **extended**, and a **crossing over the CN Rail line** is proposed north of the South Cameron Boulevard and Howard Avenue intersection* (see **Plate 11**).

The intersection of Howard Avenue and Division Road is partially reconfigured to **standardize right turns** for traffic continuing south on Howard Avenue and include a **dual left turn movement** to improve intersection operations and Level of Service. Traffic signal adjustments are also proposed as part of the City's regular review (see **Plate 11**).

The intersection of South Cameron Boulevard and Howard Avenue is **reconfigured** to improve sight lines, improve turning operations, and provide additional storage for left and right turn lanes. **Additional warning signage** is also incorporated as part of the overall strategy to enhance safety of the intersections and rail crossing (see **Plate 11**).

*The multi-use trail CN Rail crossing is subject to CN Rail approval.

8.6 EAST-WEST CONNECTIVITY

8.6.1 East west Corridor Design Alternatives

Issues: Limited and circuitous east-west connections for all modes of travel, incomplete active transportation networks (Eugenie Street is identified as a bicycle route (bike lanes) in the Windsor Bicycle Use Master Plan); Grand Marais Road and West Grand Boulevard are identified as bicycle routes (bike lanes) in the Windsor Bicycle Use Master Plan)

- Option 1: Extend Northwood Street east to Dougall Avenue with a grade separated (underpass) CN Rail crossing and extend Edinborough Street west to Dougall Avenue at a common intersection, including active transportation facilities (**Plate 9**).
 - This alternative requires 1) realignment of South Cameron Boulevard and Northwood Street to a signalized T-intersection; 2) connecting Northwood Street and Edinborough Street at Dougall Avenue, creating a new east-west collector road link; 3) a new signalized at-grade intersection with Dougall Avenue.
 - This option could be implemented in phases, beginning with the extension of Northwood Street east to a signalized intersection with Dougall Avenue, including an underpass crossing the CN Rail line. The second phase involves the extension of Edinborough Street westward to the intersection at Dougall Avenue. The second phase would be subject to property acquisition and decontamination requirements.
- Option 2: Improve the E.C. Row Expressway (increase the capacity via general widening for a core collector system).
 - This option involves the construction of two additional lanes in each direction within the centre median area, separated from the existing expressway lanes. The purpose of core-collector system would be to provide additional mainline capacity, and to allow traffic to bypass the weaving sections between Dominion Boulevard and Howard Avenue. This alternative involves extensive reconstruction of the expressway. A large cost and disruption to traffic would be required to implement this alternative, which is not currently warranted by the traffic forecasts considered within this study.
- Option 3: Improve the accessibility of the South Cameron Boulevard and Dougall Avenue intersection (including consideration for facilitating U-turns on Dougall Avenue).
 - Represents a shorter term alternative to address an observed travel pattern, and improve vehicle circulation at a lower cost, however it does not address active transportation issues; increased safety risks with more frequent U-turns. Challenges

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Phase 3 – Design alternatives

to implement this option also include the close proximity to the CN Rail underpass and E.C. ROW ramp terminal, creating sightline and operational concerns.

- Option 4: Improve the South Cameron Boulevard/Howard Avenue intersection.
 - Several designs were developed, including lengthening turn lanes and signalization, and were evaluated under the Howard Avenue corridor as part of the assessment of the Howard Avenue/Division Road/CN Rail intersection. This alternative for improving east-west connectivity uses the existing road network as a base, and only partially addresses observed operational and capacity issues associated with the lack of east-west connectivity. The function and level of service of the intersection would be improved with the recommended design (**Plate 11**), but the benefit of the operations as part of an E-W corridor and traffic circulation is minimal.
- Option 5: Connect West Grand Boulevard to Grand Marais Road East via a new roadway with active transportation facilities, and an at-grade rail crossing under the E.C. Row Expressway overpass structure.
 - This provides a longer term alternative to improve east-west circulation, accessibility, and mobility for all modes of transportation, but would be a complex project with higher costs, and extensive property requirements. The at-grade crossing with the CN rail would be either skewed (less than ideal) or perpendicular with curves at the approaches (poor sightlines).
- Option 6: Extend Ojibway Street to South Cameron Boulevard.
 - The City of Windsor currently owns a portion of a right of way extending from the eastern end of Ojibway Street to South Cameron Boulevard. This would generally improve traffic operations within the area by increasing flexibility for local and through trips by making South Cameron Boulevard more accessible, and complete a planned connection between Dominion Boulevard and South Cameron Boulevard. Diversion of some traffic to South Cameron Boulevard would provide some relief to the Dominion Boulevard Corridor, as well as absorbing a portion of the traffic contributed by the proposed extension of Northwood Street.

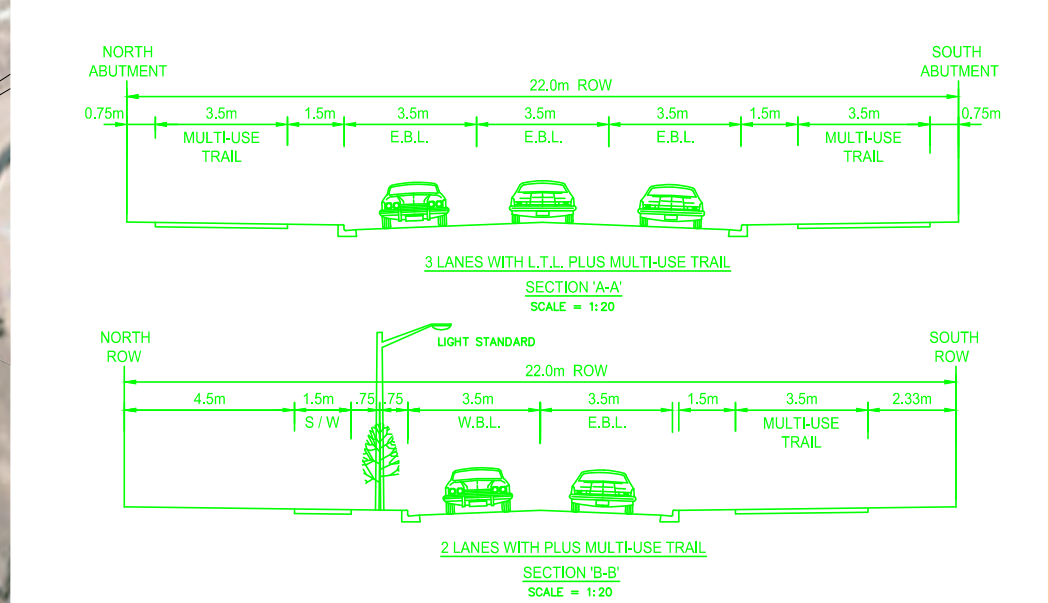
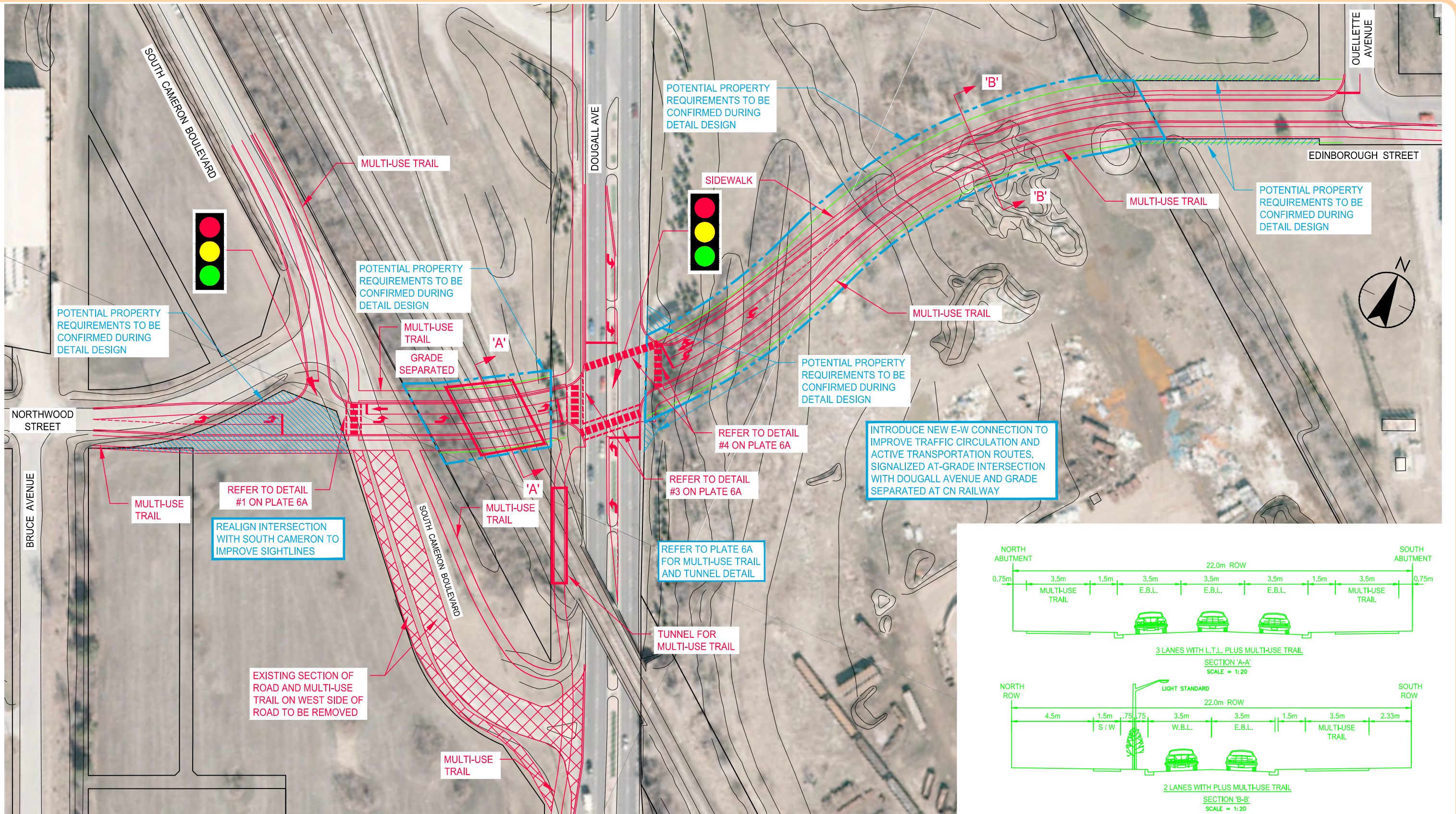
Active Transportation Improvements

- Implement buffered bicycle lanes on Eugenie Street between Dougall Avenue and Howard Avenue in accordance with the BUMP (**Plate 10A**).
 - The design involves the modification of existing lane configurations, including the removal of one through-lane in each direction. Buffered bicycle lanes were identified according to guidelines within the Ontario Traffic Manual Book 18 – Cycling Facilities which takes into consideration volumes and speeds of traffic.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Phase 3 – Design alternatives

Buffered (or separated) bicycle lanes provide a standard 1.5m travel lane, separated by a 0.5m painted buffer.



LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

NOTES:

- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.

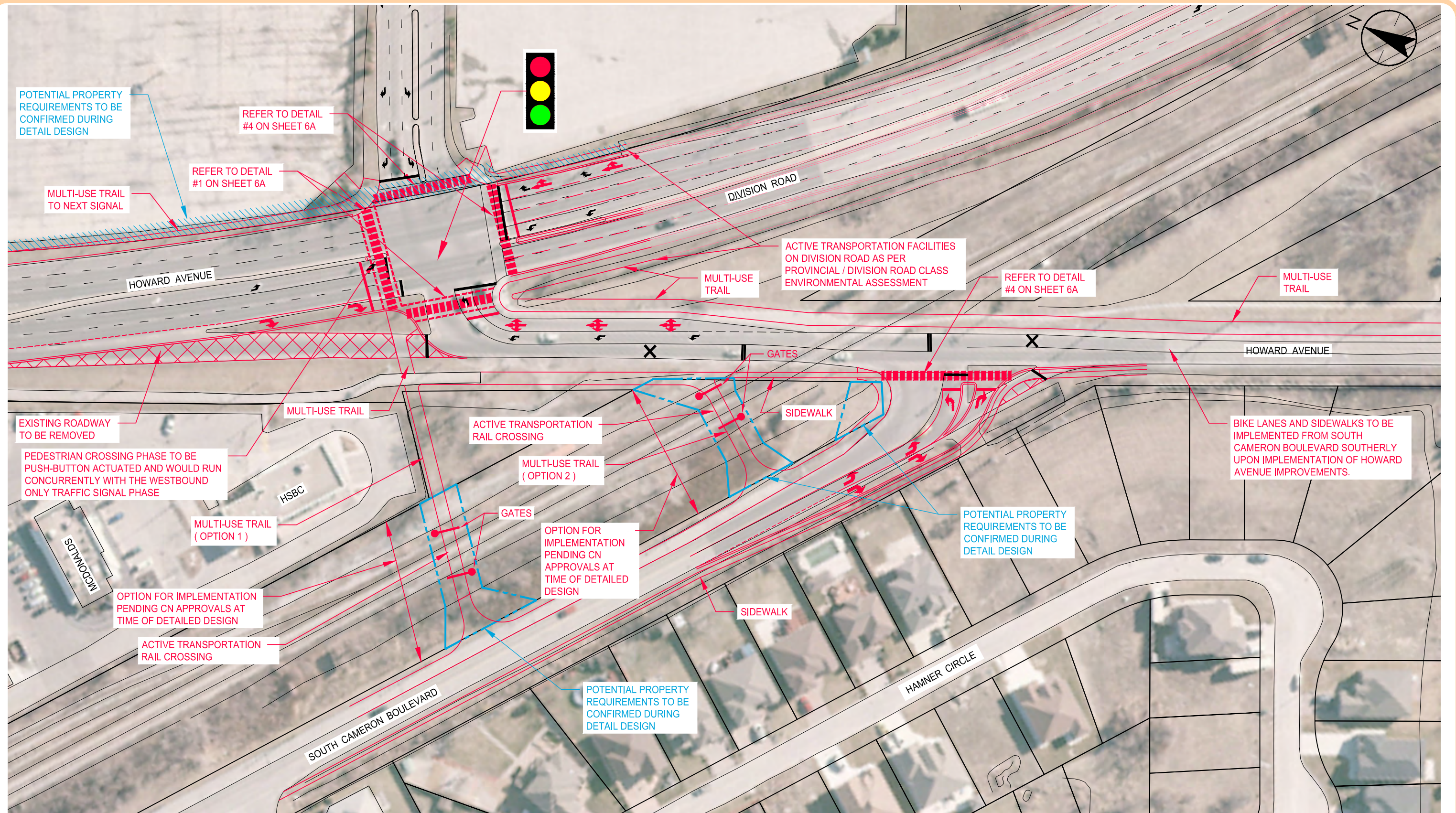


**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**East-West Corridors
Option 1- Northwood Street Extension**

PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 9
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BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)



LEGEND

- | | |
|-------------------------------------|------------------------|
| N.B.L. - NORTHBOUND LANE | P.L. - PARKING LANE |
| S.B.L. - SOUTHBOUND LANE | S/W - SIDEWALK |
| W.B.L. - WESTBOUND LANE | B.A. - BUFFER AREA |
| E.B.L. - EASTBOUND LANE | M.T. - MULTI-USE TRAIL |
| R.T.L. - RIGHT TURN LANE | B.L. - BIKE LANE |
| L.T.L. - LEFT TURN LANE | |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | |

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

NOTES:

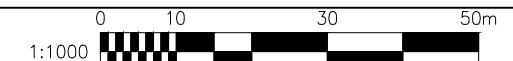
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



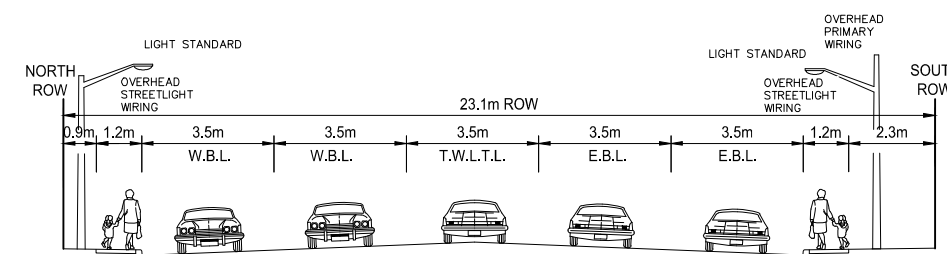
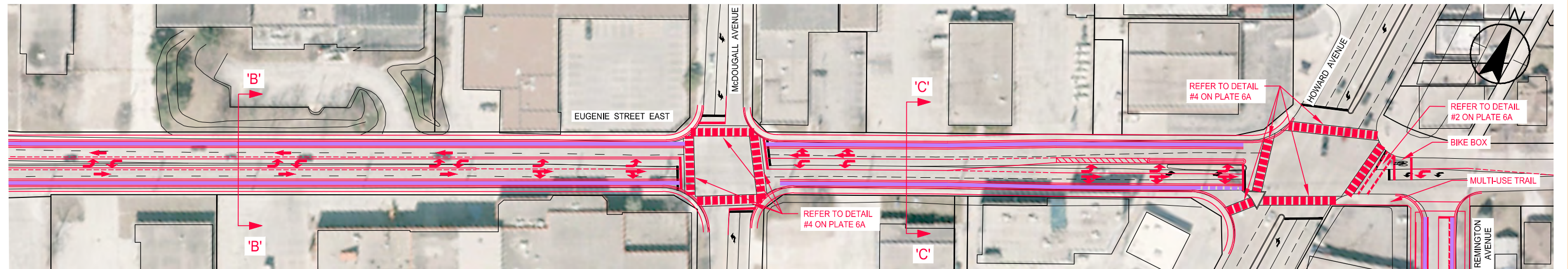
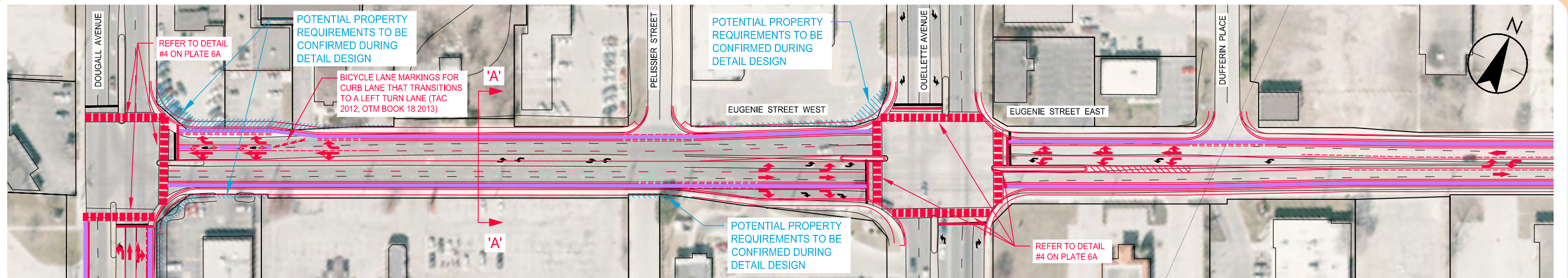
**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

Howard Avenue at South Cameron Boulevard/Division Road/CN Rail Crossing
Option 4a - Minor Modifications

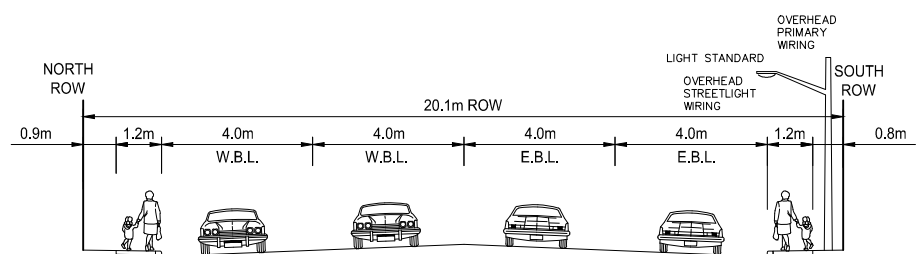
PROJECT NO.
165620021



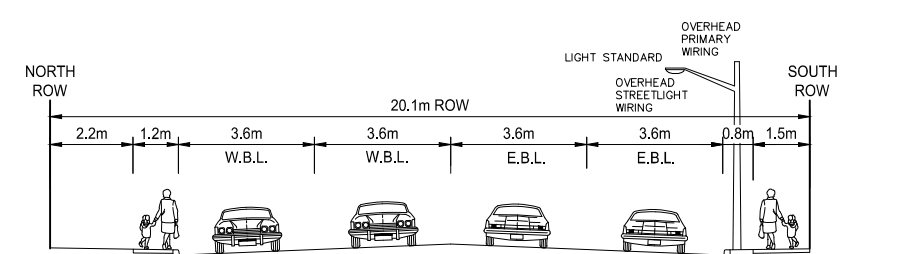
DRAWING NO.
PLATE 11



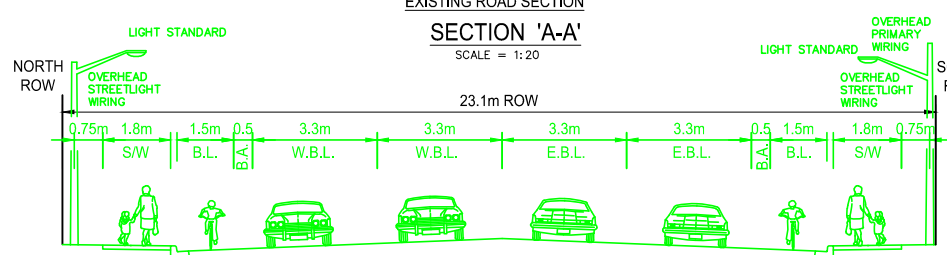
EXISTING ROAD SECTION
SECTION 'A-A'
SCALE = 1:20



EXISTING ROAD SECTION
SECTION 'B-B'
SCALE = 1:20

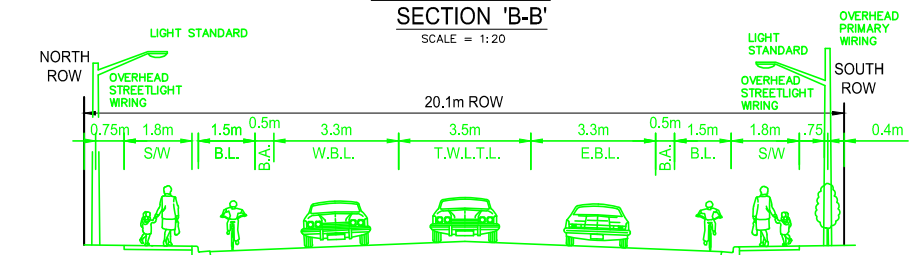


EXISTING ROAD SECTION
SECTION 'C-C'
SCALE = 1:20



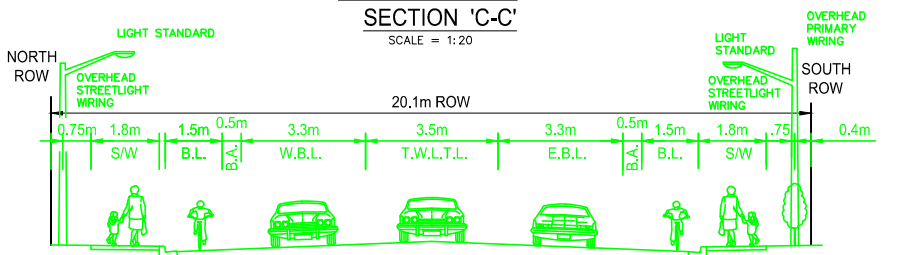
REMOVE CENTRE TURN LANE AND ADD SEPARATED ON-STREET BIKE LANE IN EACH DIRECTION, WIDER SIDEWALKS

SECTION 'A-A'
SCALE = 1:20



3 LANES WITH T.W.L.T.L. PLUS SEPARATED ON-STREET BIKE LANE IN EACH DIRECTION, WIDER SIDEWALKS

SECTION 'B-B'
SCALE = 1:20



3 LANES WITH T.W.L.T.L. PLUS SEPARATED ON-STREET BIKE LANE IN EACH DIRECTION, WIDER SIDEWALKS

SECTION 'C-C'
SCALE = 1:20

LEGEND

N.B.L. - NORTHBOUND LANE	P.L. - PARKING LANE
S.B.L. - SOUTHBOUND LANE	S/W - SIDEWALK
W.B.L. - WESTBOUND LANE	B.A. - BUFFER AREA
E.B.L. - EASTBOUND LANE	M.T. - MULTI-USE TRAIL
R.T.L. - RIGHT TURN LANE	B.L. - BIKE LANE
L.T.L. - LEFT TURN LANE	
T.W.L.T.L. - TWO WAY LEFT TURN LANE	

- NOTES:**
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 - ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**East-West Corridor
Bicycle Lanes on Eugenie Street**

PROJECT NO. 165620021	1:1250	0 12.5 37.5 62.5m	DRAWING NO. PLATE 10A
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**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Phase 3 – Design alternatives

8.6.2 East-West Corridor – Evaluation

The evaluation table for the East-West Corridor design alternatives is provided below, followed by an overview of the Preliminary Recommendations. Details of the Recommended Design are provided in Section 9.

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Table 8.8 East-West Corridor Evaluation

East-West Connectivity	East-West Corridor			
	Issues: limited and circuitous east-west connections for all modes of travel			
Options	Do Nothing No improvements are implemented, and the Central Box area experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1: Extend Northwood Street east to Edinborough Street with a grade-separated CN Rail crossing, including active transportation facilities	Option 2: Improve the E.C. Row Expressway (increase the capacity via general widening for a core collector system)	Option 3: Improve the accessibility of the South Cameron Boulevard and Dougall Avenue intersection (including consideration for facilitating U-turns on Dougall Avenue)
<u>Social/Cultural Impacts</u>	<ul style="list-style-type: none"> No impacts to property access; No property required; No impacts to emergency response times; No impacts to archaeological/built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Property acquisition required east of Bruce Avenue to Dougall Avenue, and east of Dougall Avenue to Edinborough Street; Property east of Dougall Avenue may require decontamination – extent of contamination/decontamination efforts to be determined; Potential impacts to archaeological resources in areas surrounding Northwood Street west of South Cameron Boulevard; Pedestrian surveys required at 5m intervals. No impacts to built heritage, or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Property acquisition may be required; No impacts to emergency response times; No impacts to archaeological resources; 1 Designated Heritage Property located at Windsor Gas Co./Woodall Construction building located at 620 North Service Road/E.C. Row Expressway; Heritage Impact Assessment may be required. No impact to Aboriginal treaty rights. 	<ul style="list-style-type: none"> No property required; Introduction of U-turns presents safety conflicts due to sightlines, and the proximity of intersections; No impacts to archaeological/built heritage, or Aboriginal treaty rights.
<u>Natural Environmental</u>	<ul style="list-style-type: none"> No impacts. 	<ul style="list-style-type: none"> Improvements are not located within, but are in proximity to Candidate Natural Heritage Site (site #26 identified in the CNHS 2010)/Environmental Policy Area (identified on Schedule C of the Official Plan); additional site investigation/an Environmental Evaluation Report may be required by council during detailed design; NHIC contains records for Dense Blazing Star (Threatened Species protected under the ESA) within the area; additional field investigation should be conducted during detailed design to confirm suitable habitats in consultation with MNRF to comply with ESA requirements. 	<ul style="list-style-type: none"> Potential disruption to Grand Marais Drain, and Essex Region Conservation Authority Regulated Lands during construction of additional overpass structure. 	<ul style="list-style-type: none"> No impacts.
<u>Technical/ Engineering</u>	<ul style="list-style-type: none"> Forecasted traffic volumes do not significantly impact LOS for weaving sections, or merge/diverge ramp movements (generally LOS C or above, with merge/diverge sections WB between Howard Avenue and Dougall Avenue receiving an acceptable LOS D)(see Appendix B2); Connectivity within the Central Box remains limited and circuitous for motorists, active transportation users, and transit; Collision rates are generally within expectation 	<ul style="list-style-type: none"> With local trips reassigned to the new east-west corridor, LOS for E.C. Row weaving sections remain similar to the future Do Nothing (LOS C or above) with reduced traffic density within weaving sections; merge/diverge similarly are not significantly affected, with increased LOS for eastbound and westbound merge sections between Dominion Boulevard and Dougall Avenue and reduced traffic densities for all ramp movements. 	<ul style="list-style-type: none"> Core collector system generally does not impact weaving section LOS (with an improvement to westbound section between Howard Avenue and Dougall Avenue); LOS for merge/diverge ramp movements is improved for most eastbound and westbound ramps(see Appendix #); Connectivity for local trips within the Central Box is not improved; Potential for decreases in collision frequency 	<ul style="list-style-type: none"> Left turns could be facilitated by removing a portion of the existing centre median in the location of the existing Van de Water Rail Yard access, however, safety concerns are introduced for U-turns within the busy corridor; Time restrictions should be placed on U-turns (i.e. no U-turns 9 a.m. to 9 p.m. to allow U-turns during the morning peak period when there is a demand for and at

Table 8.8 East-West Corridor Evaluation

<i>East-West Connectivity</i>		East-West Corridor			
		Issues: limited and circuitous east-west connections for all modes of travel			
<i>Options</i>	Do Nothing No improvements are implemented, and the Central Box area experiences the forecasted increase in traffic (5% over 20 years, or .25% per year)	Option 1: Extend Northwood Street east to Edinborough Street with a grade separated CN Rail crossing, including active transportation facilities	Option 2: Improve the E.C. Row Expressway (increase the capacity via general widening for a core collector system)	Option 3: Improve the accessibility of the South Cameron Boulevard and Dougall Avenue intersection (including consideration for facilitating U-turns on Dougall Avenue)	
	based on traffic volumes, with higher frequency for eastbound merging movements between Dougall Avenue and Howard Avenue, and the westbound Dougall Avenue off ramp; further investigation of collisions in these areas may identify opportunities for localized improvements.	<ul style="list-style-type: none"> Northwood Extension/Dougall Avenue signalized intersection may experience lower LOS during p.m. peak periods (particularly northbound left turns, southbound through/right, and eastbound through/right movements). Good LOS (C or above) for Northwood Street/South Cameron Boulevard intersection. Good LOS (C or above) for Dominion Boulevard/Northwood Street with proposed Dominion Boulevard improvements and Northwood extension. East-west connectivity within the Central Box would be significantly improved, including the active transportation network which would provide a new connection between bike lanes on Dominion Boulevard to Dougall Avenue, Eugenie Street, and to identified routes north of the study area; Underpass required under the CN Rail line. 	<p>due to reduced density within weaving sections and merge/diverge sections.</p> <ul style="list-style-type: none"> Does not address lack of east-west connectivity for active transportation modes or transit; Involves significant modification to/addition of Expressway overpass structures. 	<p>times when southbound traffic volumes are relatively light);</p> <ul style="list-style-type: none"> Active transportation deficiencies are not addressed; 	
<u>Economic</u>	<ul style="list-style-type: none"> N/A. 	<ul style="list-style-type: none"> Significant capital costs (less than Option 2 or Option 5) associated with new road construction, land acquisition, and potential decontamination requirements for section between Dougall Avenue and Edinborough Street (can be implemented as a separate phase at a later date). 	<ul style="list-style-type: none"> Significant capital costs associated with addition of 2 interior lanes in each direction; construction would involve modifications to/additional overpass structures. Regular operation and maintenance costs. 	<ul style="list-style-type: none"> Minimal capital costs associated modifications to existing centre median 	
<u>RESULTS</u>	East-west travel within the Central Box will remain limited and circuitous, with increased delays.	<p>RECOMMENDED</p> <p>in order to improve the identified deficiencies in east-west connectivity within the Central Box area for vehicular traffic, active transportation users, and provides an option for future transit connections. LOS for neighbouring intersections is impacted; however, it has been determined that intersections will operate at an acceptable LOS, and considering the identified constraints, the benefits to east-west connectivity for the Central Box area as a whole outweigh the minimal impact to operations at neighbouring intersections.</p>	<p>NOT RECOMMENDED</p> <p>The significant costs associated with the construction of additional lanes along the E.C. Row Expressway are not relative to the minimal benefit shown through analysis of future traffic conditions, and zero benefit to active transportation and transit deficiencies identified within the Central Box.</p>	<p>NOT RECOMMENDED</p> <p>Although not part of the Recommended Strategy, the City of Windsor may consider removing U-turn restriction at the Van de Water Rail Yard access, by implementing modifications to existing centre median, installing signage preventing trucks from making U-turn movement, and include time restricted U-turns as an interim measure. The new east-west connection at Northwood Street will</p>	

Table 8.8 East-West Corridor Evaluation

<i>East-West Connectivity</i>	East-West Corridor			
	Issues: limited and circuitous east-west connections for all modes of travel			
	Structural Improvements			Active Transportation Improvements
<i>Options</i>	Option 4: Improve the South Cameron Boulevard/Howard Avenue intersection (several designs considered within Howard Avenue alternatives)	Option 5: Connect West Grand Boulevard to Grand Marais Road East via a new roadway with active transportation facilities, and an at-grade rail crossing under the E.C. Row Expressway	Option 6: Extend Ojibway Street to South Cameron Boulevard partially utilizing existing right of way	Implement bicycle lanes on Eugenie Street between Dougall Avenue and Howard Avenue
<p><u>Social/Cultural Impacts</u></p> <ul style="list-style-type: none"> Property Access; Property Acquisition Requirements; Impacts to Emergency Response Times; Streetscape and Aesthetics Public Safety Archeological and Cultural Heritage Aboriginal/First Nations Lands, Treaty Rights 		<ul style="list-style-type: none"> Extensive property acquisition required, including potential impacts to existing commercial properties; No impacts to emergency response times; Potential impacts to archaeological material in area east of Howard Avenue at Grand Marais Road E; test pitting at 5m intervals may be required; 1 Designated Heritage Property located in the vicinity (Windsor Gas Co./Woodall Construction building located at 620 North Service Road/E.C. Row Expressway); Heritage Impact Assessment may be required. No impacts to Aboriginal treaty rights. 	<ul style="list-style-type: none"> City currently owns right of way for Ojibway extension, some property required along north portion of extension; Provides alternate route for EMS service calls to subdivisions to the west; Facilitates neighbourhood connectivity with parklands/SWM pond planned north and south of Ojibway extension; Potential impacts to archaeological resources; test pitting required at 5m intervals; No impacts to built heritage or Aboriginal treaty rights. 	<ul style="list-style-type: none"> Impacts to adjacent properties minimized with modifications to existing lane configurations; property acquisition to be confirmed during detailed design; No impacts to emergency response times; Separated/buffered bike lanes provide active transportation facilities in accordance with OTM Book 18 guidelines; No impacts to archaeological/built heritage resources, or Aboriginal treaty rights.
<p><u>Natural Environmental</u></p> <ul style="list-style-type: none"> Impacts to Existing Vegetation; and Terrestrial Resources. <ul style="list-style-type: none"> aquatic habitats terrestrial habitats migratory/other birds: (e.g. waterfowl, songbirds) special habitat areas (specially designated or protected habitats (Species at Risk), migration routes, specific policies) 	Several alternative designs have been evaluated under the Howard Avenue Corridor. Improvements to this intersection may improve operations for east-west travel in the south of the study area, however it does not address significantly impact overall east-west connectivity within the Central Box.	<ul style="list-style-type: none"> Potential disruption to Grand Marais Drain, and Conservation Authority Regulated Lands; consultation/permit required from Essex Region Conservation Authority; Potential disruption to rare plant species (Prairie Milkweed, Eastern Stiff-leaved Goldenrod, and Missouri Ironwood); consultation with MNRF during detailed design recommended to ensure compliance with ESA. 	<ul style="list-style-type: none"> NHIC identified records for 2 species at risk (Butler's Gartersnake – Endangered, and Dense Blazing Star - Threatened) both of which receive species and habitat protection under the ESA. Suitable habitat is likely to occur in the proposed road extension. Consultation with MNRF should be undertaken during detailed design to identify appropriate surveys and additional requirements to comply with the ESA; 	<ul style="list-style-type: none"> Little-no existing roadside vegetation.
<p><u>Technical/ Engineering</u></p> <ul style="list-style-type: none"> Corridor Capacity & Level of Service (LOS) Planning Objectives Network Connectivity; Overall Safety; Pedestrian & Cycling Accommodation; Transit Services; Structures/Rail services 		<ul style="list-style-type: none"> Potential benefit to LOS at E.C. Row ramps between Dominion-Howard Avenue. Improves overall east-west connectivity; Opportunity to include active transportation facilities; Complications due to new rail crossing, and potential modifications to E.C. Row overpass structure. 	<ul style="list-style-type: none"> With the proposed improvements to Dominion Boulevard, the unsignalized Ojibway Street intersection with Dominion Boulevard would receive a poor level of service, but delays experienced for the eastbound and westbound left/through/right movements would be significantly less than the Do Nothing scenario; 	<ul style="list-style-type: none"> Modifications to lane configurations results in minimal impacts to intersection LOS; Howard Avenue at Eugenie Street approaches capacity, but operates at a good LOS (C or above); Eugenie Street at McDougall Street operates at good LOS (C or above); Eugenie Street at Ouellette Avenue operates at reduced LOS and at capacity (F/E during a.m./p.m. peak periods);

Table 8.8 East-West Corridor Evaluation

<i>East-West Connectivity</i>		East-West Corridor		
		Issues: limited and circuitous east-west connections for all modes of travel		
		Structural Improvements		Active Transportation Improvements
				<ul style="list-style-type: none"> • Future east-west connection, and recommendations for improvements to the Dougall Avenue/Ouellette Place intersection may result in a redistribution of traffic, and alleviate traffic congestion at the intersection; • Implements active transportation facilities as identified in the BUMP, and is in line with City of Windsor policies promoting the use of alternatives modes of travel;
<u>Economic</u> <ul style="list-style-type: none"> • Initial Capital Cost • Operation And Maintenance Costs 		<ul style="list-style-type: none"> • Significant capital costs associated with property acquisition, rail crossing, and modifications to existing structures; • Regular operation and maintenance costs. 	<ul style="list-style-type: none"> • Moderate capital costs associated with small amount of property acquisition, and construction of road extension; • Regular operation and maintenance costs. 	<ul style="list-style-type: none"> • Moderate capital costs associated with pavement widening to include bike lanes and wider sidewalks.
<u>RESULTS</u>		<p>NOT RECOMMENDED due to the extensive costs, property acquisition, and impacts to surrounding properties including the Grand Marais Drain.</p>	<p>RECOMMENDED in conjunction with new east-west connection at Northwood Street in order to improve access to South Cameron Boulevard, and to help distribute the increase in traffic.</p>	<p>RECOMMENDED</p> <p>Although the intersection of Eugenie Street and Ouellette Avenue may operate at a poor level of service with additional delays, recommendations including the new east-west connection and improved accessibility of the Dougall Avenue/Ouellette Place intersection may alleviate future traffic congestion. Implementation of active transportation facilities is also supported by a number of City of Windsor policies for the promotion of alternatives modes of travel.</p>

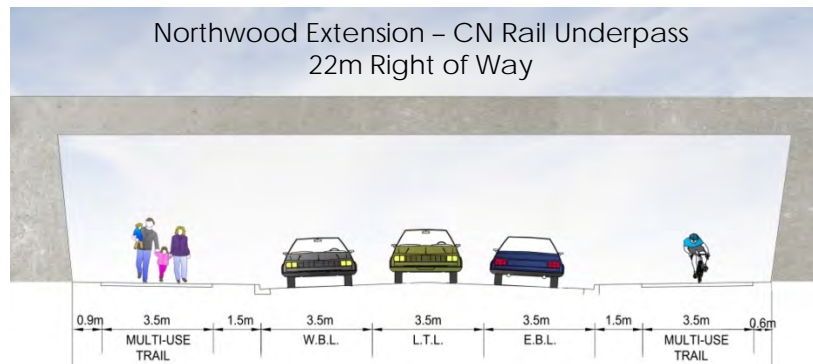
**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Phase 3 – Design Alternatives

8.6.3 East-West Corridors – Preliminary Recommendations



Two **new east-west connections** are proposed. **Northwood Street is extended easterly** to Dougall Avenue with a below-grade (underpass) crossing the CN Rail line, and would be aligned with a **westerly extension of Edinborough Street** through to Dougall Avenue.* The proposed road extensions include sidewalks and a multi-use trail, and the intersection at Dougall Avenue is signaled (see **Plate 9**). **Ojibway Street is extended** to South Cameron Boulevard, including sidewalks along both sides (see **Plate 3/3B**).



These two extensions **improve east-west connectivity** and capacity for vehicular traffic and Active Transportation, and provide potential routes for public transit.

Improved east-west connectivity for local traffic circulation should also **improve E.C. Row Expressway operations and safety** by reducing the use of the expressway for short-distance trips.

* The proposed extensions are subject to implementation scheduling, which may include the Northwood Street extension to Dougall Avenue, with the westerly extension of Edinborough Street as a separate phase, subject to property acquisition and investigation into decontamination requirements.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Phase 3 – Design alternatives

8.7 PUBLIC CONSULTATION – PHASE 3

The design solutions discussed above and a summary of the evaluations were presented to the public for comment at Public Information Centre No. 2 (PIC 2) held on Wednesday December 2nd, 2015 from 4pm-8pm in an open house format. Over 41 people signed the register, and staff members from the City of Windsor and Stantec were on hand to answer questions. Display materials presented at PIC 2 are provided in Appendix A8, and included the following:

- Introductory panels, and a description of the Class EA process;
- Problem and Opportunity Statement carried forward from PIC 1;
- An summary of the results of traffic analysis and traffic forecasting;
- Public input received to-date;
- Evaluation criteria used to assess the design alternatives;
- A list of alternatives being considered per corridor, a summary of the evaluation, preliminary recommendations and Design Plates;
- Next Steps;

Nine comment sheets were returned following PIC 2. Comments received from the public were favorable towards the preferred design solutions, and many concerns relating to traffic operations and safety for active transportation modes were reiterated from previously submitted comments; therefore, the preferred designs were not modified based on public comments. All comments received, as well as how comments were addressed as part of this study have been included in a TRACER table found in Appendix A8.

9.0 RECOMMENDED DESIGN ALTERNATIVES

9.1 DESIGN STANDARDS

The following design standards were referenced in the development of the Recommended Strategy:

- City of Windsor Development Manual
- Transportation Association of Canada Geometric Design Guide for Canadian Roads
- Ministry of Transportation of Ontario Geometric Design Standards
- Ministry of Transportation of Ontario Roadside Safety Manual
- Ontario Traffic Manual – Book 12 Traffic Signals
- Ontario Traffic Manual – Book 15 Pedestrian Crossing Facilities
- Ontario Traffic Manual – Book 18 Bicycle Facilities
- NACTO Urban Bikeway Design Guide (second edition)
- Velo Quebec Planning and Design for Pedestrians and Cyclists
- Roundabouts An Informational Guide Second Edition

9.2 DOMINION BOULEVARD

9.2.1 Recommended Strategy

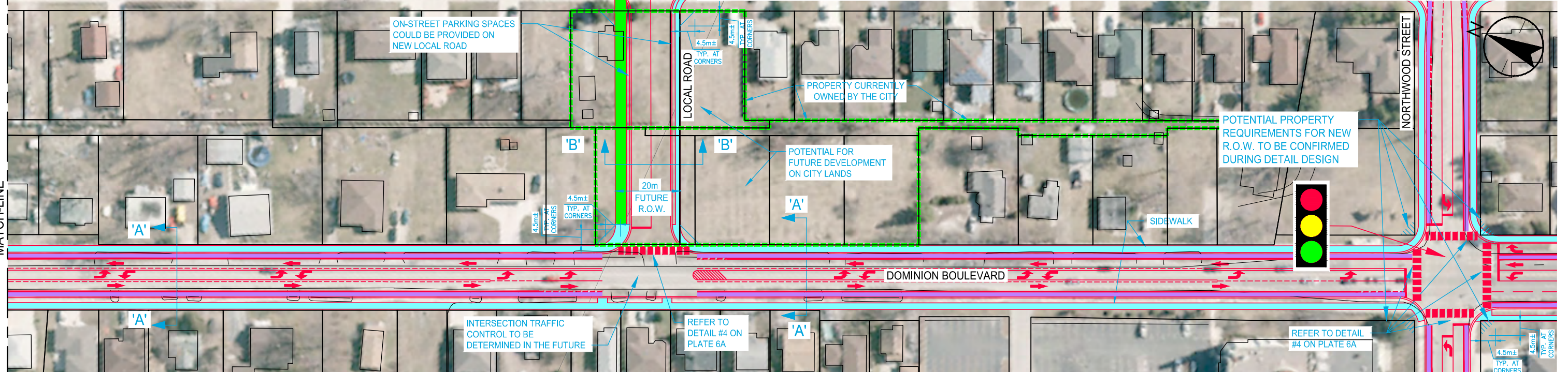
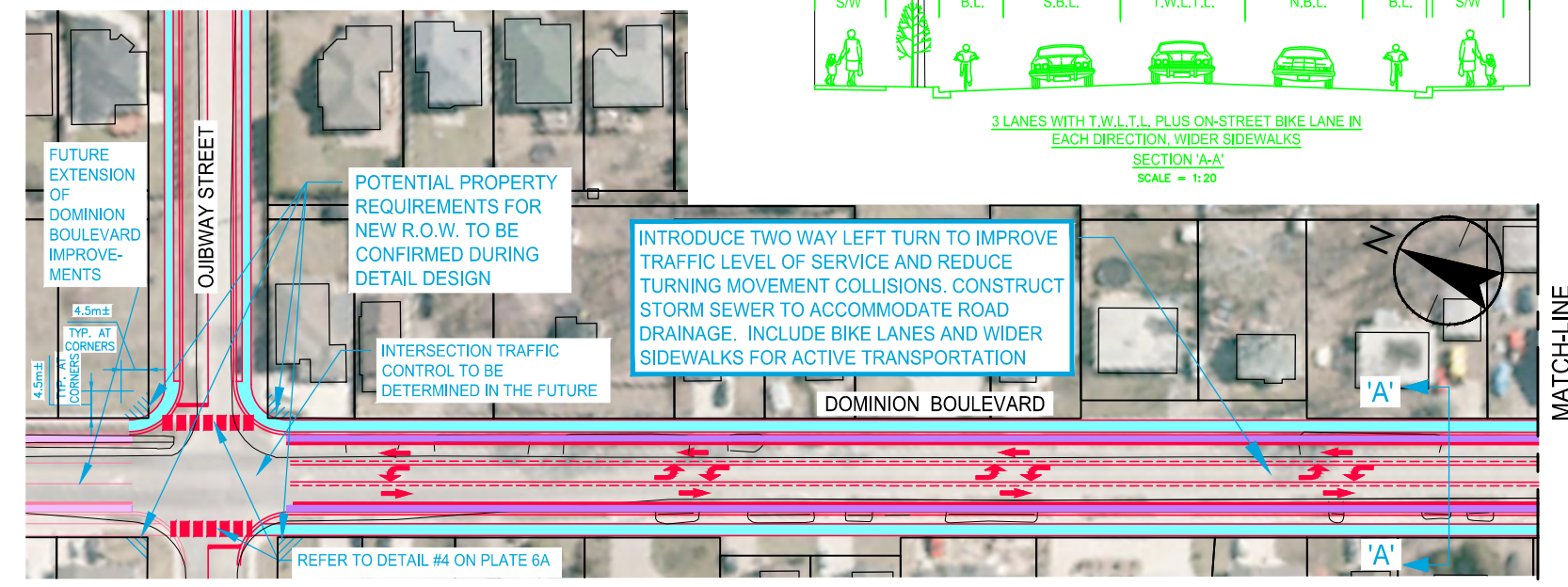
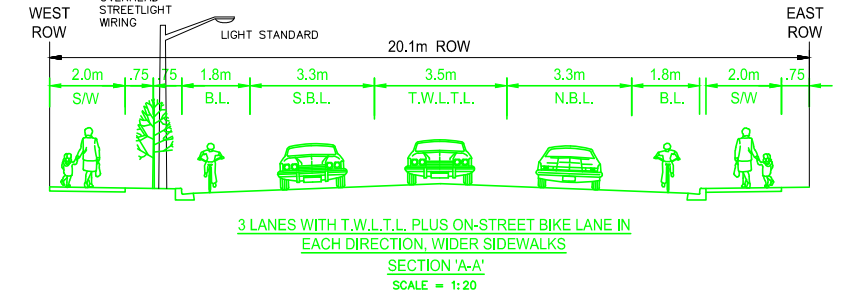
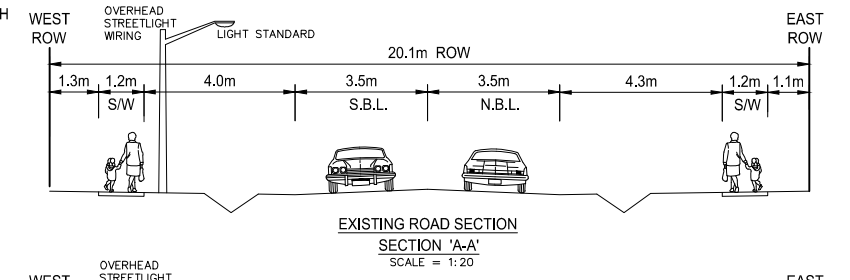
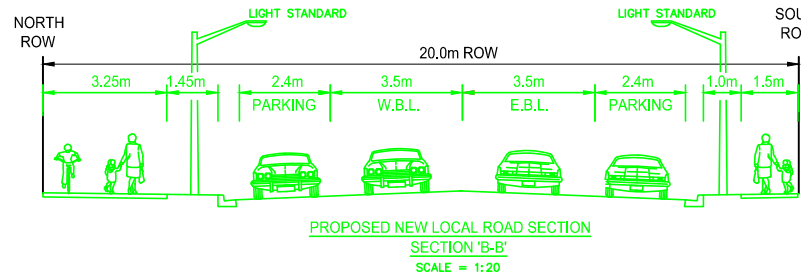
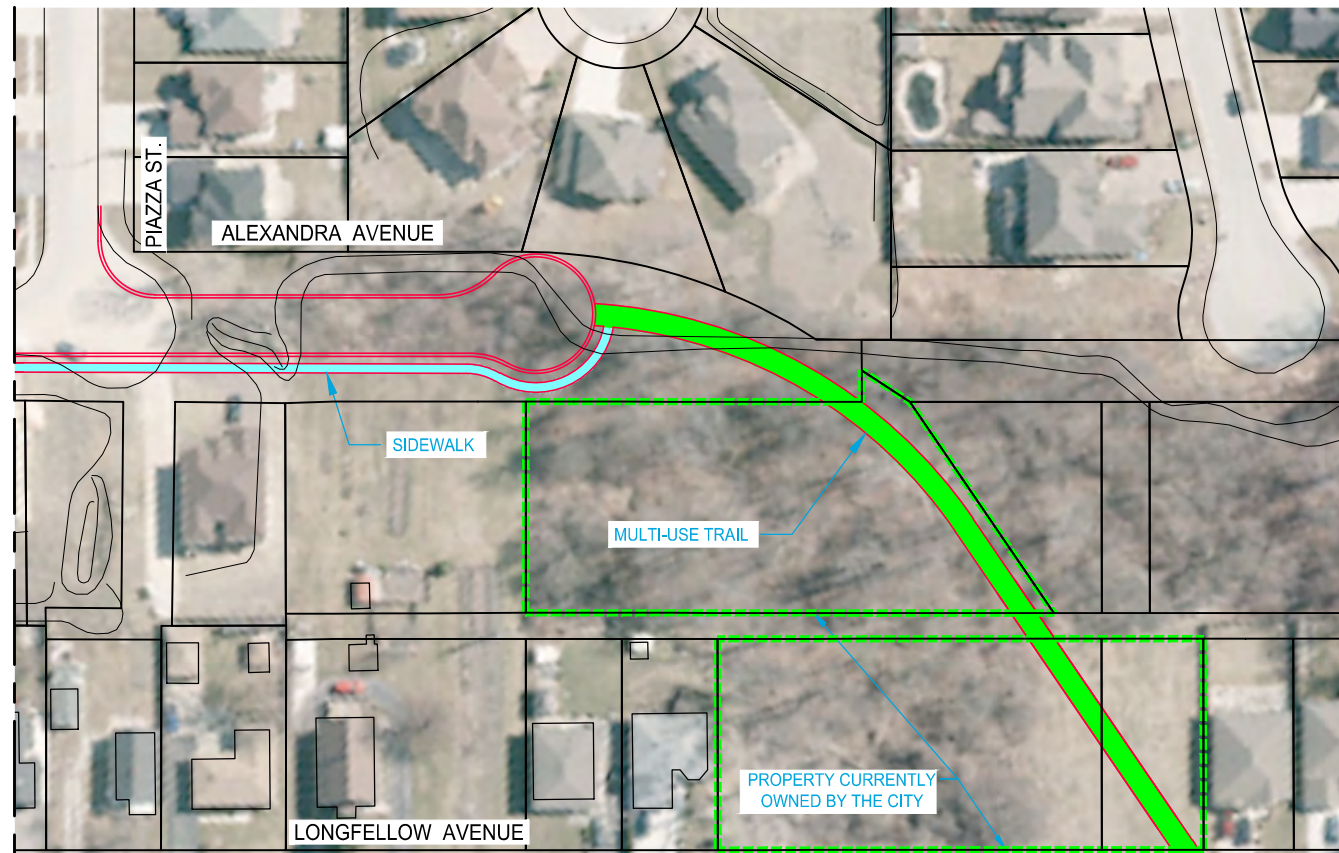
The Recommended Strategy for Dominion Boulevard includes the following:

- Dominion Boulevard is widened to 3 lanes between Northwood Street and Ojibway Street, with a cross section including one lane in each direction, a two-way centre left turn lane, bicycle lanes and sidewalks (**Plate 3A**).
- Dedicated left turn lanes on all approaches to the Dominion Boulevard intersection with Northwood Street (**Plate 3A**).
- A new local road connection between Dominion Boulevard and Longfellow Avenue situated to the north of Northwood Street, and a multi-use trail connecting Longfellow Avenue and Alexandra Avenue (**Plate 3A**).

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

- Bicycle lanes along the corridor between Northwood Street and West Grand Boulevard, including the removal of part-time on-street parking (**Plate 4**).
- Dominion Boulevard north of Northwood Street to Ojibway Street is reclassified as a Class I Collector to match the existing function of the corridor. Alexandra Avenue is also reclassified as a Local Road to match the existing function.
- The existing configuration at the E.C. Row Expressway interchange with Dominion Boulevard is maintained.
- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization shall be regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.



LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

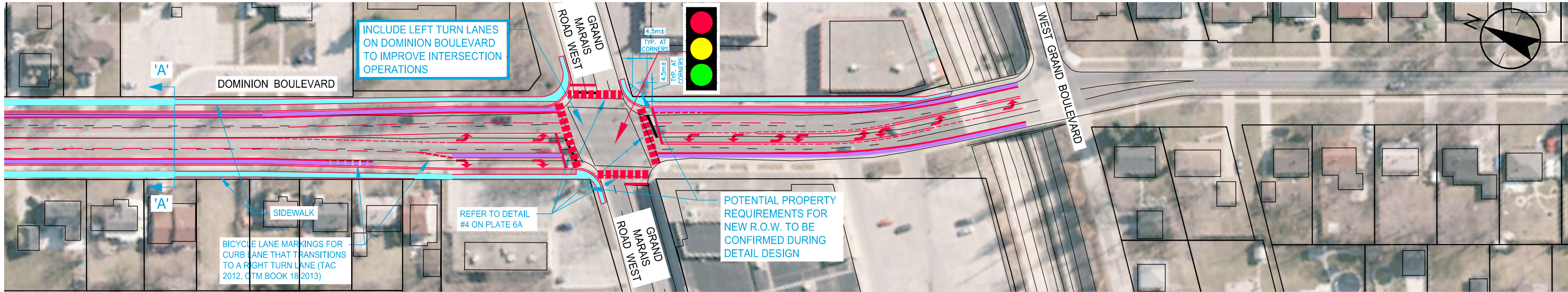
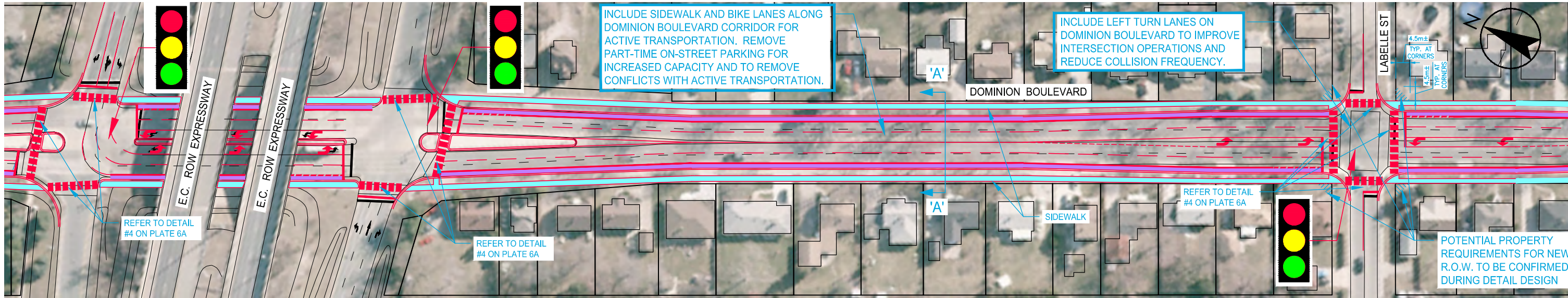
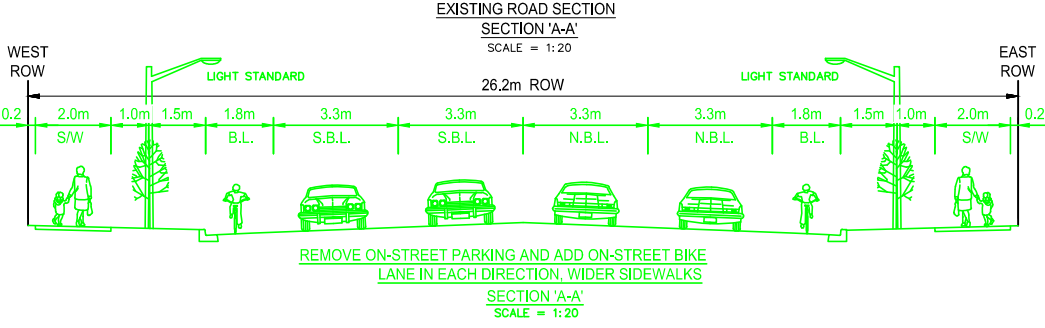
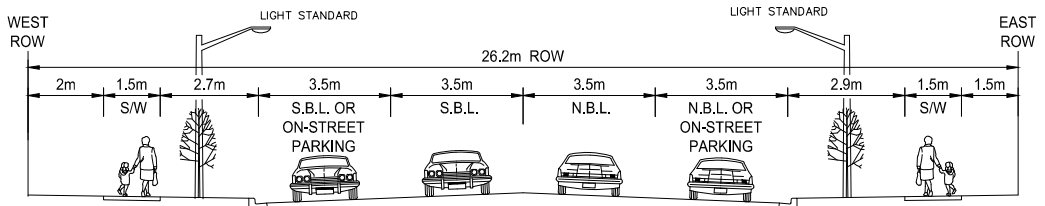
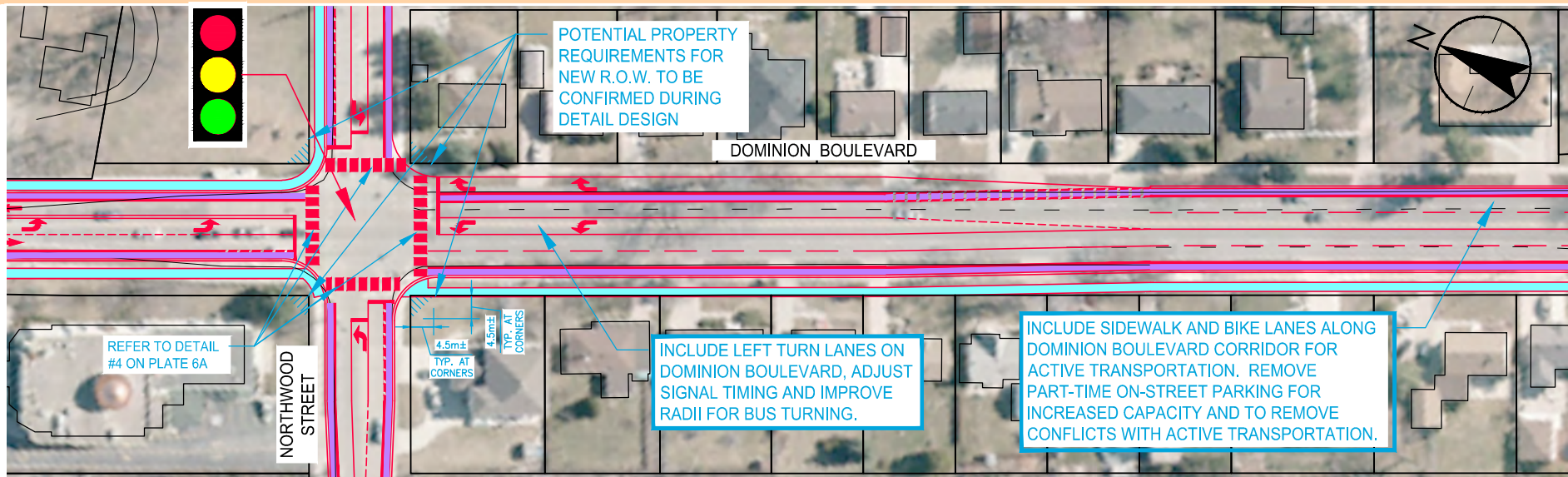
- NOTES:**
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 - ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

DOMINION BOULEVARD – NORTHWOOD STREET TO OJIBWAY STREET
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	1:1250	0 12.5 37.5 62.5m	DRAWING NO. PLATE 3A
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LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

NOTES:

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- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

DOMINION BOULEVARD – NORTHWOOD STREET TO WEST GRAND BOULEVARD
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 4
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CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.2.2 Key Rationale

The Recommended Strategy has improvements that address the following key transportation deficiencies and/or issues while minimizing the impact on established neighbourhoods (as compared to the alternative of replacing the existing role and function of Dominion Boulevard with an extension of Alexandra Avenue) and meeting future multi-modal transportation network needs. The key rationale for the Dominion Boulevard Corridor aspects of the Recommended Strategy includes:

- Accommodation of the north-south traffic demands in the Dominion Boulevard Corridor and at the key Dominion Boulevard intersections in a safer and more efficient manner; although deficiencies were identified at the E.C. Row Expressway interchange with Dominion Boulevard (insufficient left turn taper and storage lengths), property impacts, natural environment impacts, and cost associated with full reconstruction of the interchange were not deemed a relative option.
- Improved and safer vehicular access to the residential properties along Dominion Boulevard north of Northwood Street;
- Accommodation and encouragement of cycling and walking with the provision of proper facilities that provide safer conditions for these modes of travel;
- Improved mobility within, and accessibility to, both older and newer residential development east of Dominion Boulevard and north of Northwood Street by all transportation modes;
- Recognition of the role and function of Dominion Boulevard Corridor in terms of carrying north-south local and through traffic within this area of the City as well as the opportunity it provides in being a key part of an efficient bicycle and pedestrian network.

9.2.3 Design Criteria, Road Geometry and Cross Section

The horizontal and vertical alignments on Dominion Boulevard will be maintained through the recommended strategy. The design speed (60km/h) and posted speed (50km/h) along Dominion Boulevard will be maintained. The existing pavement width will be adjusted as outlined in the following sections.

A new roadway alignment is being proposed to connect Dominion Boulevard with Longfellow Avenue utilizing property owned by the City of Windsor that will help ease congestion at both the Ojibway Street and Northwood Street intersections. The new connecting local road has a design speed of 60km/h, and a proposed posted speed of 50km/h. The cross section will consist of two 3.5 m lanes and on-street parking, with a sidewalk and a multi-use trail connection. The new intersection of the Local Road with Dominion Boulevard will not warrant traffic signals, but this will be subject to ongoing monitoring. The multi-use trail will continue to the northeast and provide an active transportation connection with Alexandra Avenue. The existing Alexandra Avenue will be extended southerly to a new cul-de-sac to provide access for several

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

undeveloped residential lots. A sidewalk is recommended on Alexandra Avenue to connect to Ojibway Street and cyclists will share the local road network.

Dominion Boulevard between Ojibway Street and Northwood Street will be widened to a three lane section (two 3.3 m through lanes and a 3.5 m continuous two way left turn lane), and include dedicated bicycle lanes 1.8 m wide (see Figure 9.1). The cross section will be upgraded to an urban cross section with curb and gutter with new storm sewers. Sidewalks will remain on both sides and widened to 2.0 m.

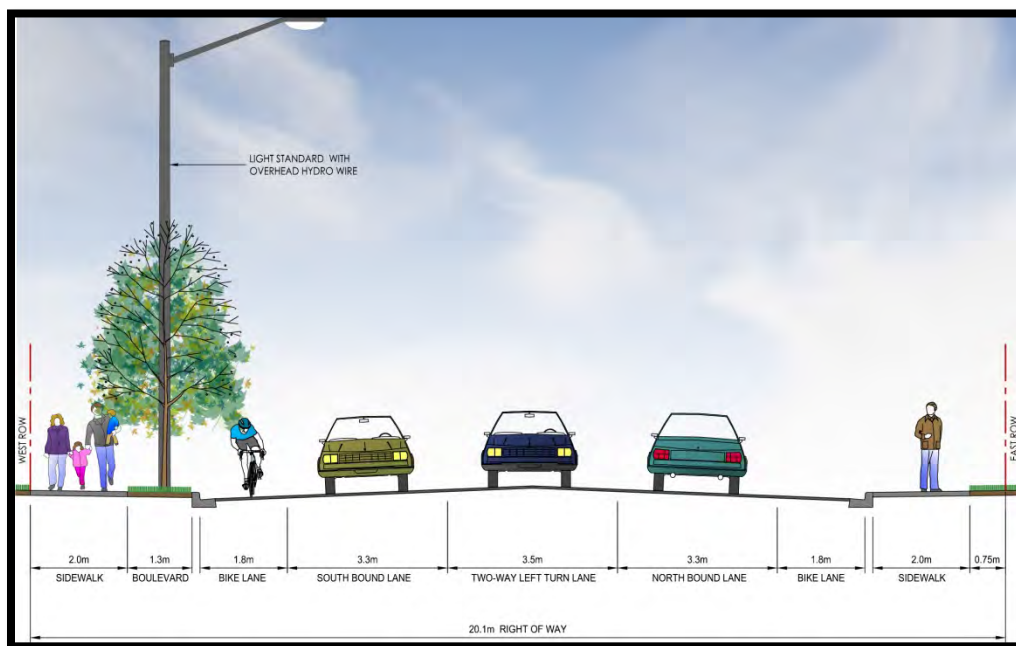


Figure 9.1 Dominion Boulevard Northwood Street to Ojibway Street Cross Section

Dominion Boulevard from Northwood Street to West Grand Boulevard will be widened / reconfigured to accommodate the growth in traffic and the new bicycle lanes. New lane widths will be 3.3 m wide to incorporate a road diet that will provide a visual indication to drivers to trend towards slower operating speeds to increase safety and minimize property impacts. Dedicated bicycle lanes at 1.8 m and sidewalks at 2.0 m are incorporated. See Figure 9.2.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

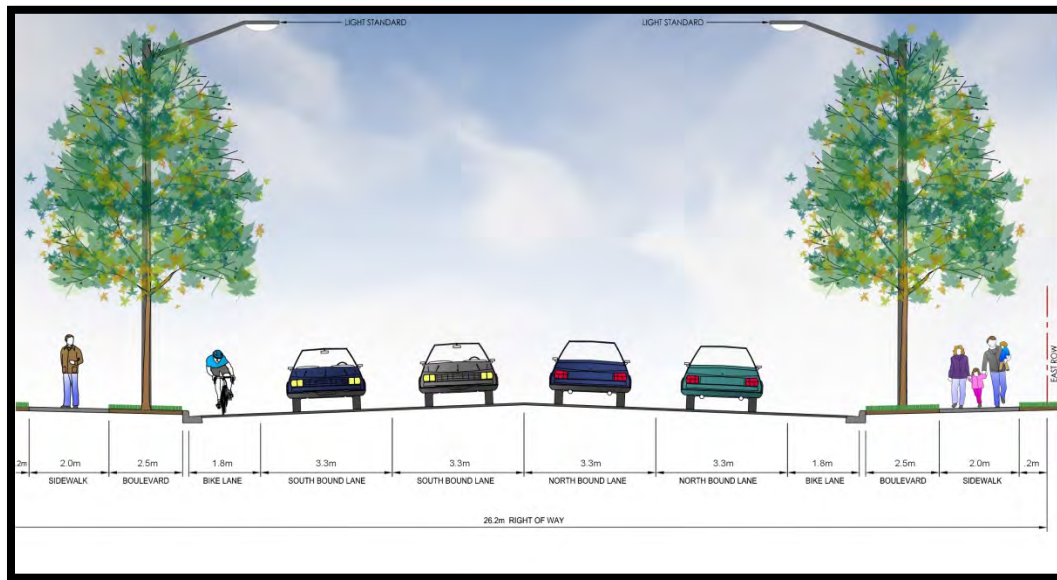


Figure 9.2 Dominion Boulevard Northwood Street to West Grand Cross Section

9.2.4 Intersections

The following provides an overview of the intersection improvements being recommended, and the resulting traffic operations. Full results of the traffic analysis are included in Appendix F2.

9.2.4.1 Ojibway Street

No structural modifications are recommended at the intersection. The existing stop control will be maintained and the intersection will be monitored for signal traffic warrants based on safety of operations and traffic volumes. With the provision of the east-west link, this intersection would see some operational improvements. Notably, the Ojibway Street eastbound and westbound approaches would operate with less delay and within its theoretical capacity compared to the 'Do Nothing' scenario.

Upon implementation of the Ojibway Street extension to South Cameron Boulevard and the new East-West connection (discussed below in Section 9.5), the intersection of Dominion Boulevard and Ojibway Street would operate at a slightly improved level of service as compared to the future Do Nothing scenario. It should be noted that with the future projected traffic volumes, traffic signal warrants are not met. In the event that traffic volumes increase and achieve the warrant thresholds, or if safety concerns relating to turning movements warrant investigation, this intersection would operate well under signal control. All movements would be anticipated to operate with minimal delay and well within capacity.

In the event that traffic volumes increase and achieve the warrant thresholds, or if safety concerns relating to turning movements warrant investigation, this intersection would operate

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

well under signal control. All movements would be anticipated to operate with minimal delay and well within capacity.

9.2.4.2 Northwood Street

The intersection is to remain signalized. New dedicated left turn lanes on all approaches to the intersection will be implemented, which improve the level of service and intersection capacity in relation to the future Do Nothing conditions. With the auxiliary turn lanes provided, all turn movements would operate within capacity and with less delay.

In addition, a new northbound right turn lane will be included to help the transition from the four lane section to the three lane section proposed for north of Northwood Street. Increased radii will be included to accommodate the bus turning movements at the intersection, and the pedestrian and bicycle crossings integrated.

9.2.4.3 E.C. Row Expressway

The interchange configurations remain the same as part of the Recommended Solution, with improvements to the pedestrian crossings and bicycle lanes on Dominion Boulevard. With the projected future traffic volumes, including the redistribution of local E.C. Row Expressway trips to the new East-West connection, both of these signalized intersections would operate at improved levels of service, acceptable delays, and well within their theoretical capacity.

9.2.4.4 Labelle Street

The intersection is to remain signalized. Although the existing configuration of the intersection without dedicated left turn lanes operates at an acceptable level of service with forecasted traffic volumes, the installation of dedicated left turn lanes is being recommended to address the existing safety concerns identified through a review of collision data, and will result in an overall improvement to the intersection operations.

Increased radii have been included to accommodate the bus turning movements at the intersection, and enhanced pedestrian and bicycle pavement crossings integrated.

9.2.4.5 Grand Marais Road West

The intersection is to remain signalized. New dedicated left turn lanes on the north and south approaches to the intersection will be implemented. Although the intersection will operate at an acceptable level of service with the forecasted traffic volumes, with the provision of dedicated left turn lanes, overall operations will improve.

In addition, a new southbound right turn lane will be included to help the transition from the four lane section to the three lane section approaching West Grand Boulevard. Increased radii will be included to accommodate the bus turning movements at the intersection, and the pedestrian and bicycle crossings integrated.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.2.5 Active Transportation

Active transportation facilities are recommended along Dominion Boulevard throughout the study area. Existing sidewalks are to be widened to 2.0 m to accommodate observed levels of pedestrian activity and expected users including school-age children. Bike lanes are recommended along Dominion Boulevard as identified in the City of Windsor Bicycle Use Master Plan and would be incorporated by widening the pavement within the existing right-of-way. Bike lanes would be 1.8 m wide to provide a safe and comfortable facility with existing and future motor vehicle volumes and observed speeds along the Dominion Boulevard corridor. The design of the bike lanes would be integrated into existing intersections and transit stops with high visibility pavement markings to indicate the correct positioning for road users in these potential conflict zones.

9.2.6 Structures

Structures along this corridor include the E.C. ROW Expressway twin underpasses. No recommendations for structural improvements are included as part of the Recommended Strategy.

The crossing at the Grand Marais Drain will be maintained at its current width and alignment, and will include two through lanes (one northbound and one southbound), bicycle lanes and a left turn lane with sidewalks.

9.2.7 Access Management

Accesses will be maintained according to existing conditions. Discussions with Holy Names Catholic High School and Windsor Mosque may be undertaken to review the potential future relocation of their entrance on Dominion Boulevard further north of the Northwood Street intersection. A traffic study should be undertaken at that time to evaluate the warrant of a dedicated left turn lane on Dominion Boulevard.

The introduction of a new two way left turn lane between Ojibway Street and Northwood Street will facilitate access to private properties and reduce the chance for turning movement collisions by separating the traffic.

9.2.8 Drainage and Stormwater Management

The section of Dominion Boulevard north of Northwood Street, including the new local road between Dominion Boulevard and Longfellow Avenue falls under the *South Cameron Planning Area Functional Design Report Sanitary and Storm Drainage* dated October, 1992 prepared by M.M. Dillon Limited. The Functional Design Report contains stormwater management boundaries and design criteria for sizing of future storm sewer systems, including a runoff coefficient of 0.35 for residential areas, and uses the standard City of Windsor 5-year Rainfall Intensity Curve (City of Windsor Standard Drawing AS-105). The roadway improvements for this section will require

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

backfilling of existing roadside ditches and installing new storm sewers along Dominion Boulevard, the Alexandra Avenue extension and the new local road between Dominion Boulevard and Longfellow Avenue, including private drain connections, subdrains, catch basins and leads, that will drain westerly to the storm trunk sewer along Cleary Street to St. Clair Avenue. Additional stormwater due to increased runoff coefficient shall be stored either by upsizing the proposed new storm sewers or by other means as determined during detail design, to mitigate impacts to the receiving storm system. For the purpose of this study, new storm sewers were sized to drain the roadway and abutting residential lands according to the Functional Design Report criteria.

The roadway improvements for the section of Dominion Boulevard south of Northwood Street is not anticipated to significantly impact the impervious levels and associated stormwater quantities outletting to the existing storm sewers on either side of the roadway. During detail design, a review of the existing storm system shall be conducted to determine if there is sufficient capacity to convey any additional stormwater produced as a result of the proposed improvements. In the event that sufficient capacity is unavailable, excess stormwater shall be stored to mitigate any potential adverse impacts to the receiving storm system. For the purpose of this study, it has been anticipated that the existing storm system capacity is sufficient.

9.2.9 Utilities/Illumination

To accommodate the proposed improvements to Dominion Boulevard, the relocation of above ground road surface features such as fire hydrants, hydro and street light poles, catch basins and traffic signal infrastructure will be required.

The new local road between Dominion Boulevard and Longfellow Avenue will require new streetlighting infrastructure, and infrastructure including storm sewers, sanitary, and water services will also require extension along the minor extension of Alexandra Avenue southward to accommodate existing undeveloped lots.

As mentioned previously, for Dominion Boulevard north of Northwood Street, the extension of Alexandra Avenue and the new local road between Dominion Boulevard and Longfellow Avenue, new storm sewers, private drain connections, subdrains, catch basins and leads will be required.

Utility companies may opt to add infrastructure along the new local road connecting Dominion Boulevard to Longfellow Avenue, which would be coordinated through the detail design phase.

9.2.10 Property Acquisition

Use of the 3.3 m lanes will reduce the amount of property being sought to implement these improvements. Property will be required at the intersections of Ojibway Street, Northwood Street, Labelle Street, and at Grand Marais Road to provide daylight sighting triangles and

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Recommended Design Alternatives

accommodate utility and traffic signal infrastructure relocations. The extent of the required property will be confirmed during the detail design phase.

9.3 DOUGALL AVENUE – OUELLETTE AVENUE

9.3.1 Recommended Strategy

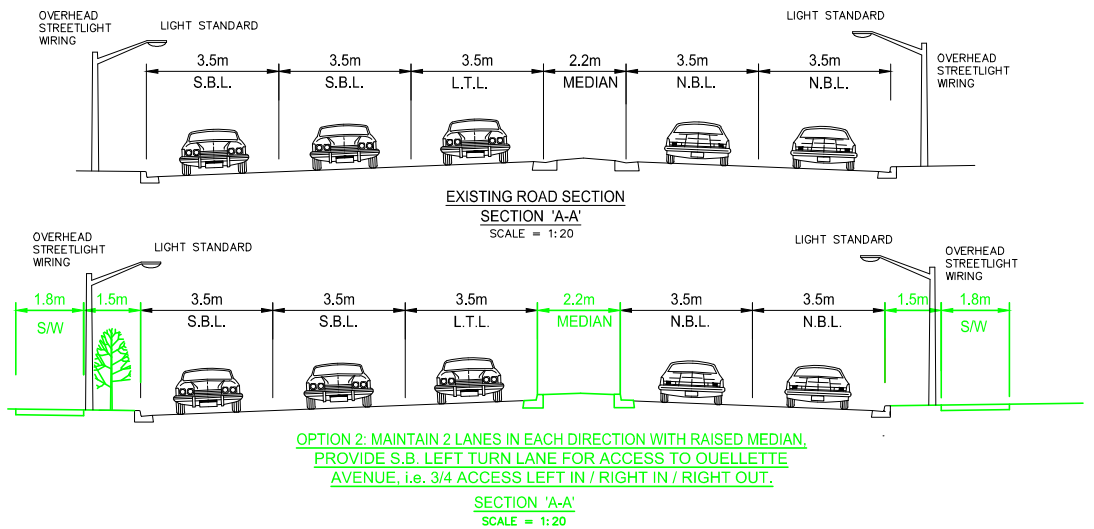
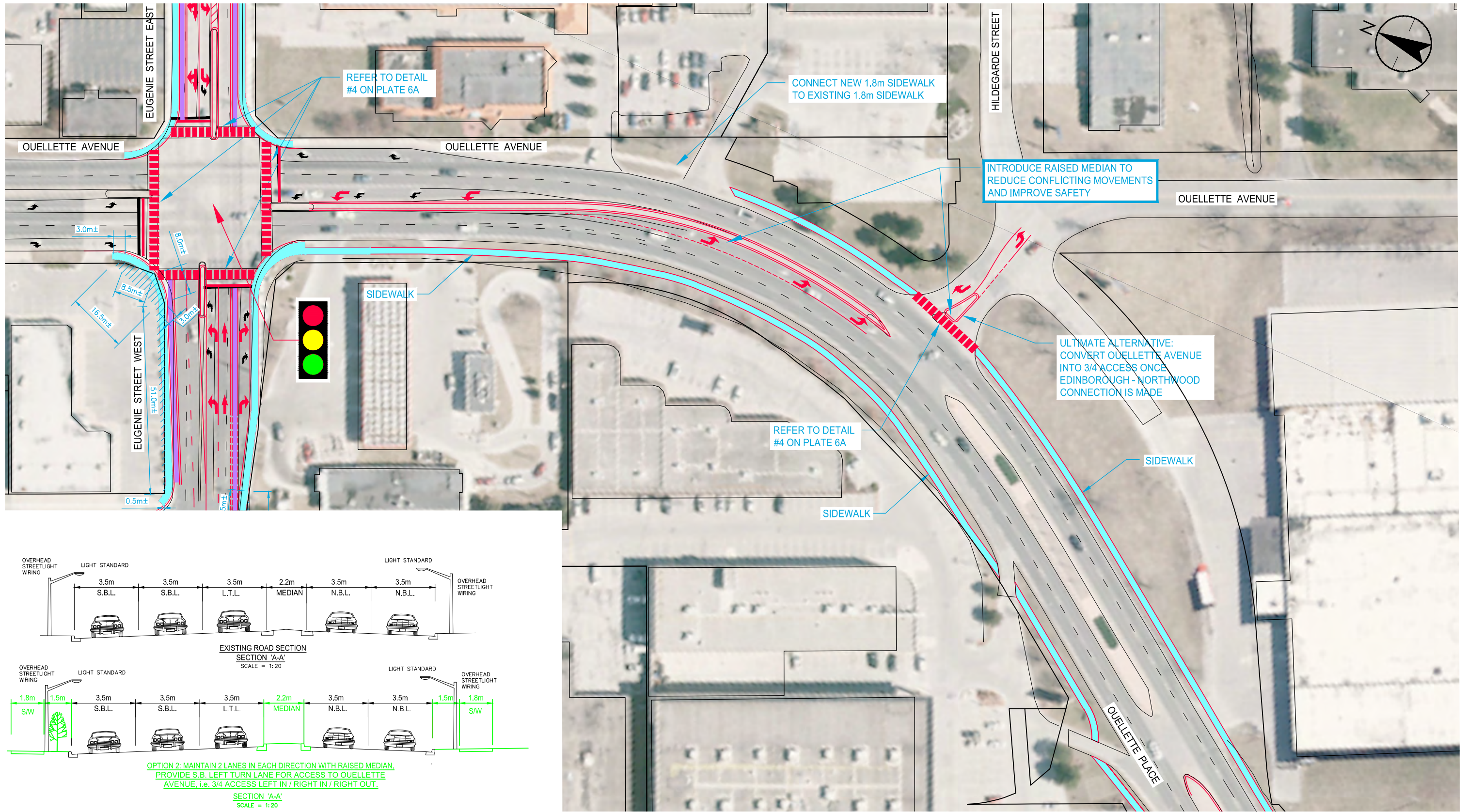
The Recommended Strategy for the Dougall Avenue – Ouellette Avenue Corridor includes the following:

- A raised centre median on Ouellette Avenue between the Dougall Avenue/Eugenie Street and Dougall Avenue/Ouellette Avenue intersections (**Plate 5**);
- Bicycle lanes and sidewalks on Dougall Avenue north of the Ouellette Place intersection, and sidewalks along the east and west sides of Ouellette Avenue/Ouellette Place (**Plates 5 and 6**);
- Reconfiguration of Dougall Avenue/Ouellette Place to a conventional intersection operating under traffic signal control (**Plate 6**);
- Extension of the multi-use trail along the west boulevard of Dougall Avenue from South Cameron Boulevard to the recommended signalized intersection at Dougall Avenue and Ouellette Place, including a tunnel through the west embankment of the CN Rail overpass (**Plate 6A**);
- The existing U-turn restriction at the Van de Water Rail Yard access will be maintained. The proposed east-west connection will reduce or eliminate the need for passenger vehicle U-turns at this location.
- Reconfiguration of the channelized free-flow right turn movements at the E.C. Row Expressway off ramps to conventional right turn lanes under traffic signal control (**Plate 7**);
- A sidewalk on the west side of Dougall Avenue between the south E.C. Row Expressway ramp to connect with the existing sidewalk approaching West Grand Boulevard (**Plate 8**).
- Extension of the existing raised centre median on Dougall Avenue south of West Grand Boulevard (**Plate 8**).
- It is recommended that the existing northbound left turn restriction for trucks at the Dougall Avenue/E.C. Row Expressway north ramp terminal be removed. This will reduce the occurrences of trucks attempting U-turns at the Van de Water Rail Yard access, and recognizes the role and function of both Dougall Avenue and the E.C. Row Expressway as part of the City's Truck Route. This recommendation is also in line with the March 20th 2013 council meeting noting that the signage remains in place at least until the completion of the Parkway Project, which has since been completed. A test period for the removal of the signs and monitoring of the truck traffic impacts to the neighbourhood is advised prior to permanent removal of the restriction.

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization shall be regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.



LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

- NOTES:**
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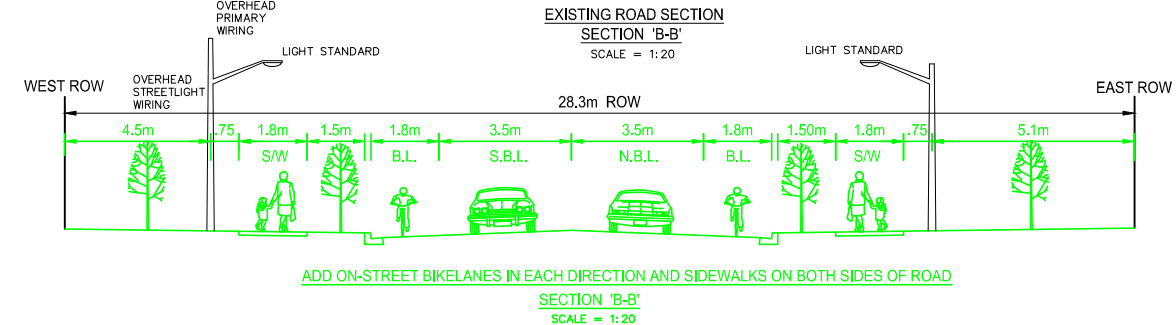
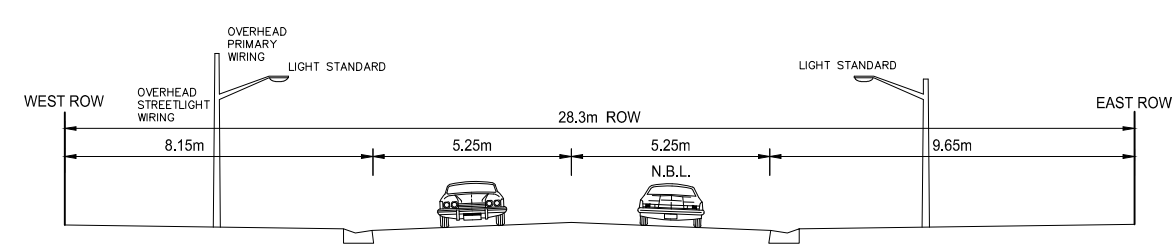
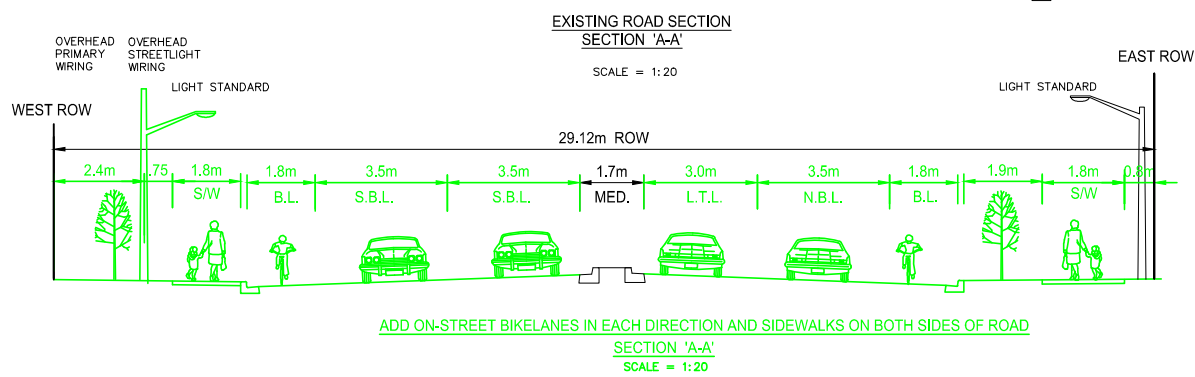
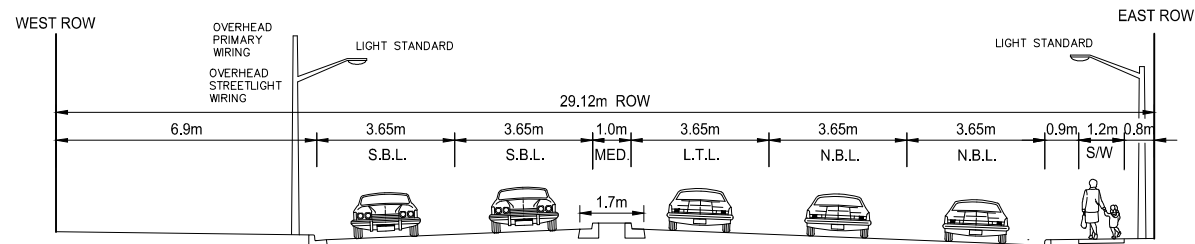
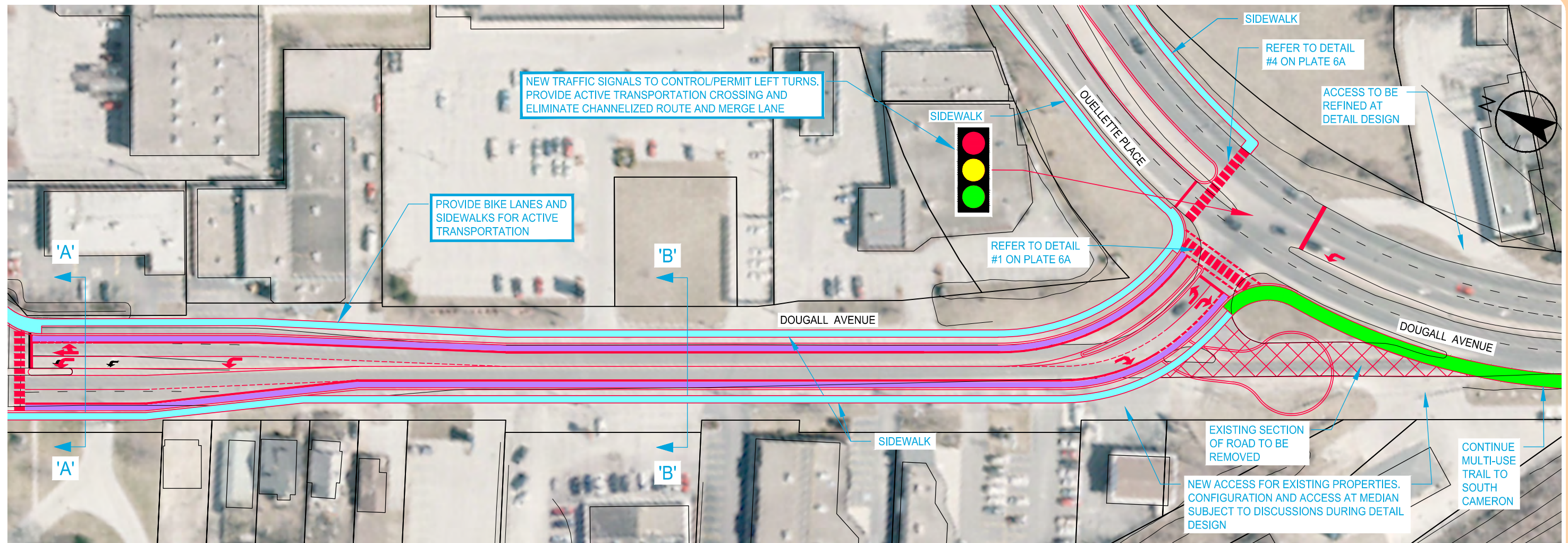


**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

OUELLETTE AVENUE – EUGENIE STREET TO OUELLETTE PLACE
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 5
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SEE PLATE 10A



LEGEND

- | | |
|-------------------------------------|---|
| N.B.L. - NORTHBOUND LANE | B.A. - BUFFER AREA |
| S.B.L. - SOUTHBOUND LANE | M.T. - MULTI-USE TRAIL |
| W.B.L. - WESTBOUND LANE | B.L. - BIKE LANE |
| E.B.L. - EASTBOUND LANE | R.O.W. - RIGHT OF WAY |
| R.T.L. - RIGHT TURN LANE | BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY) |
| L.T.L. - LEFT TURN LANE | CONCRETE SIDEWALK |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | ASPHALT MULTI-USE TRAIL |
| P.L. - PARKING LANE | |
| S/W - SIDEWALK | |

NOTES:

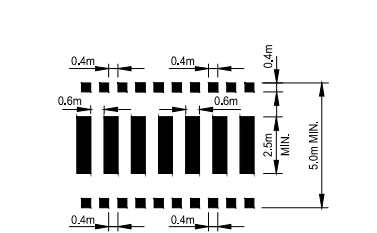
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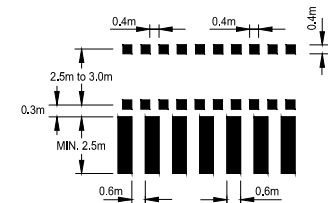
**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**DOUGALL AVENUE – EUGENIE STREET WEST TO OUELLETTE PLACE
RECOMMENDED SOLUTIONS**

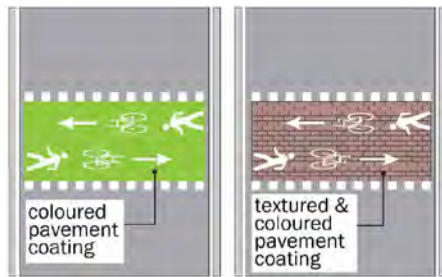
PROJECT NO. 165620021	1:1000	0 10 30 50m	DRAWING NO. PLATE 6
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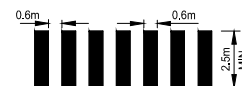
DETAIL #1
CROSSRIDE PAVEMENT MARKING



DETAIL #2
SEPARATE PEDESTRIAN CROSSWALK AND
CYCLIST CROSSRIDE PAVEMENT MARKING

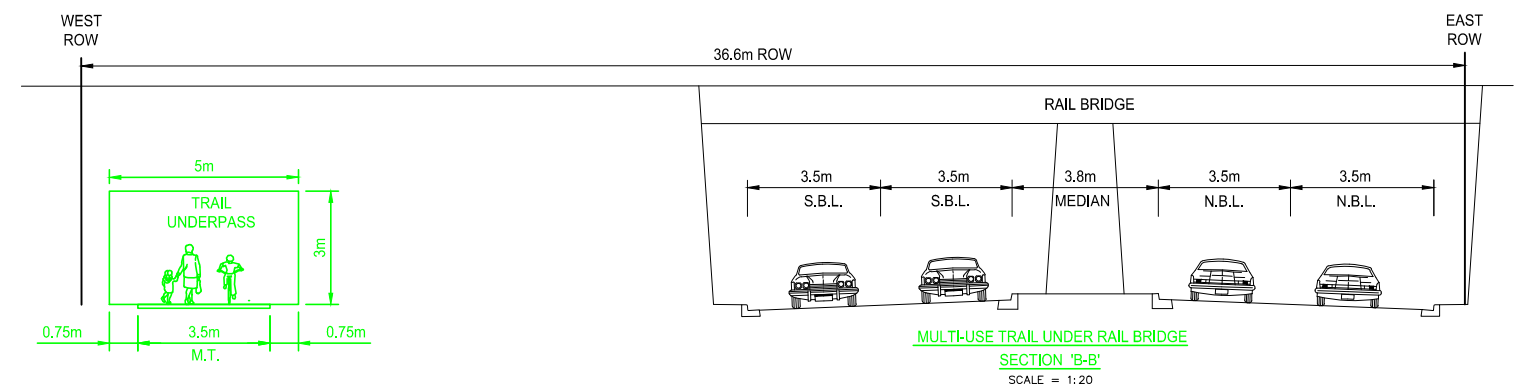
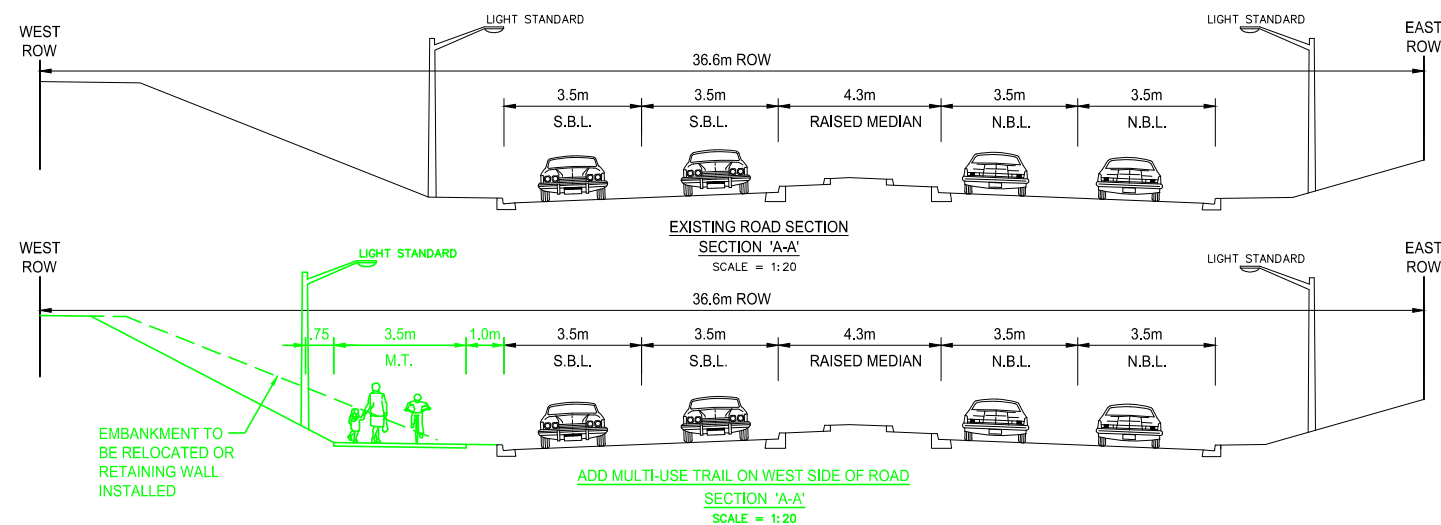
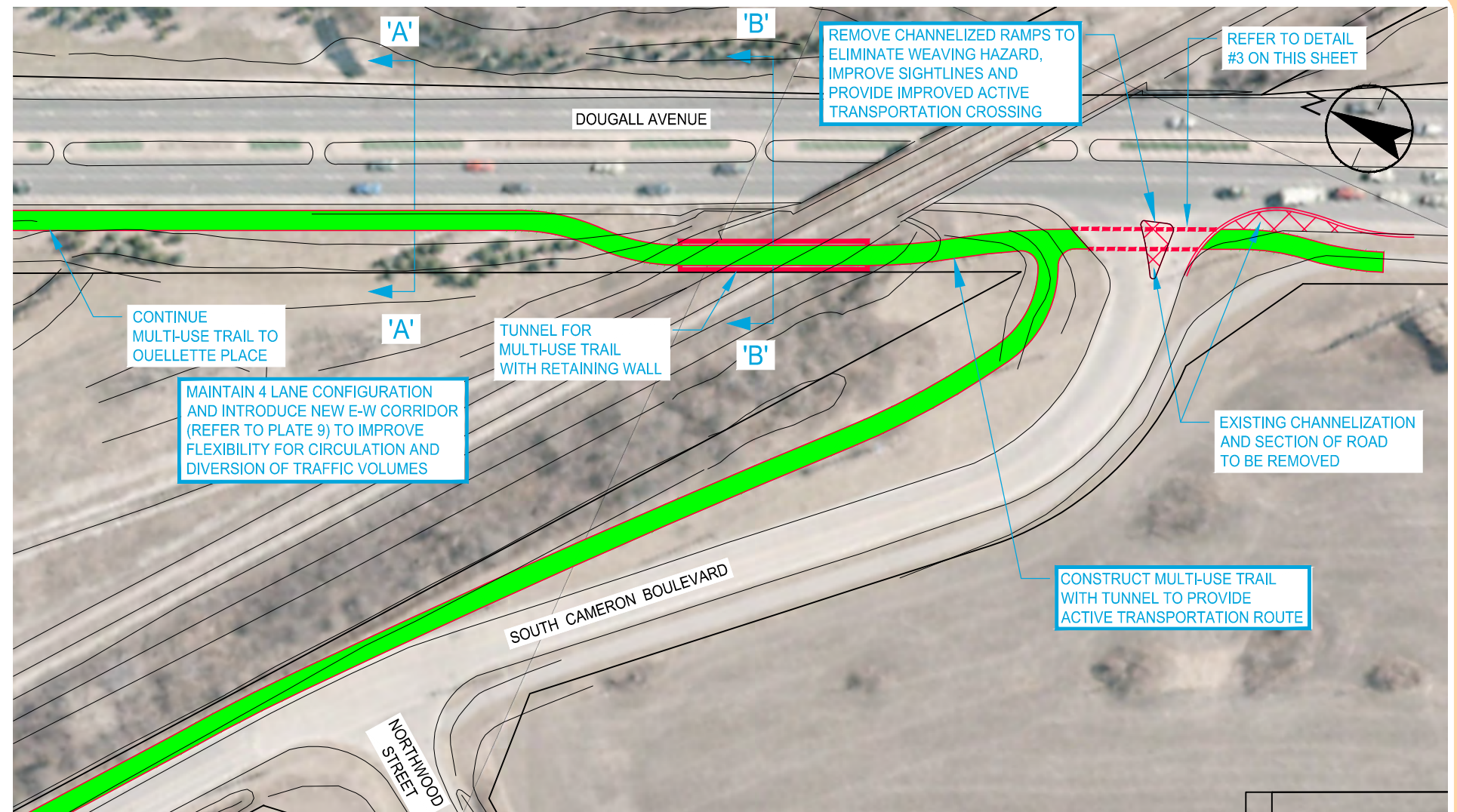


DETAIL #3
CROSSRIDE PAVEMENT MARKING



DETAIL #4
CROSSWALK PAVEMENT MARKING

NOTE: REFER TO ONTARIO
TRAFFIC MANUAL BOOK 18



LEGEND

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|-------------------------------------|---|
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| T.W.L.T.L. - TWO WAY LEFT TURN LANE | ASPHALT MULTI-USE TRAIL |
| P.L. - PARKING LANE | |
| S/W - SIDEWALK | |

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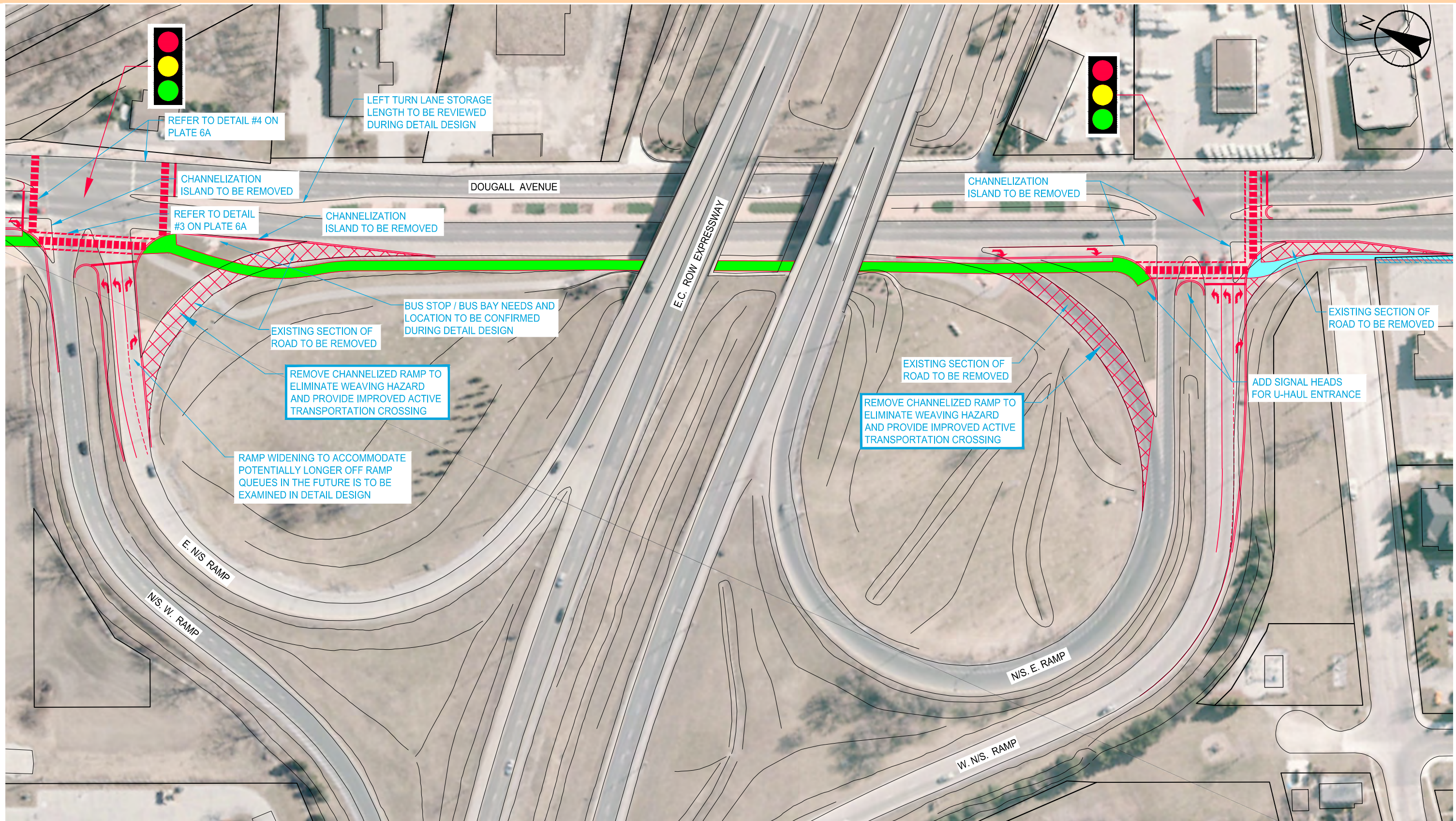
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CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

DOUGALL AVENUE – OUELLETTE PLACE TO SOUTH CAMERON BOULEVARD
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	SCALE 1:1000	GRAPHIC SCALE 0 10 30 50m	DRAWING NO. PLATE 6A
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LEGEND

- | | |
|-------------------------------------|---|
| N.B.L. - NORTHBOUND LANE | B.A. - BUFFER AREA |
| S.B.L. - SOUTHBOUND LANE | M.T. - MULTI-USE TRAIL |
| W.B.L. - WESTBOUND LANE | B.L. - BIKE LANE |
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| P.L. - PARKING LANE | |
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NOTES:

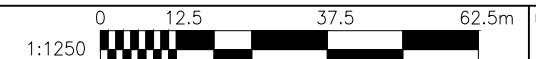
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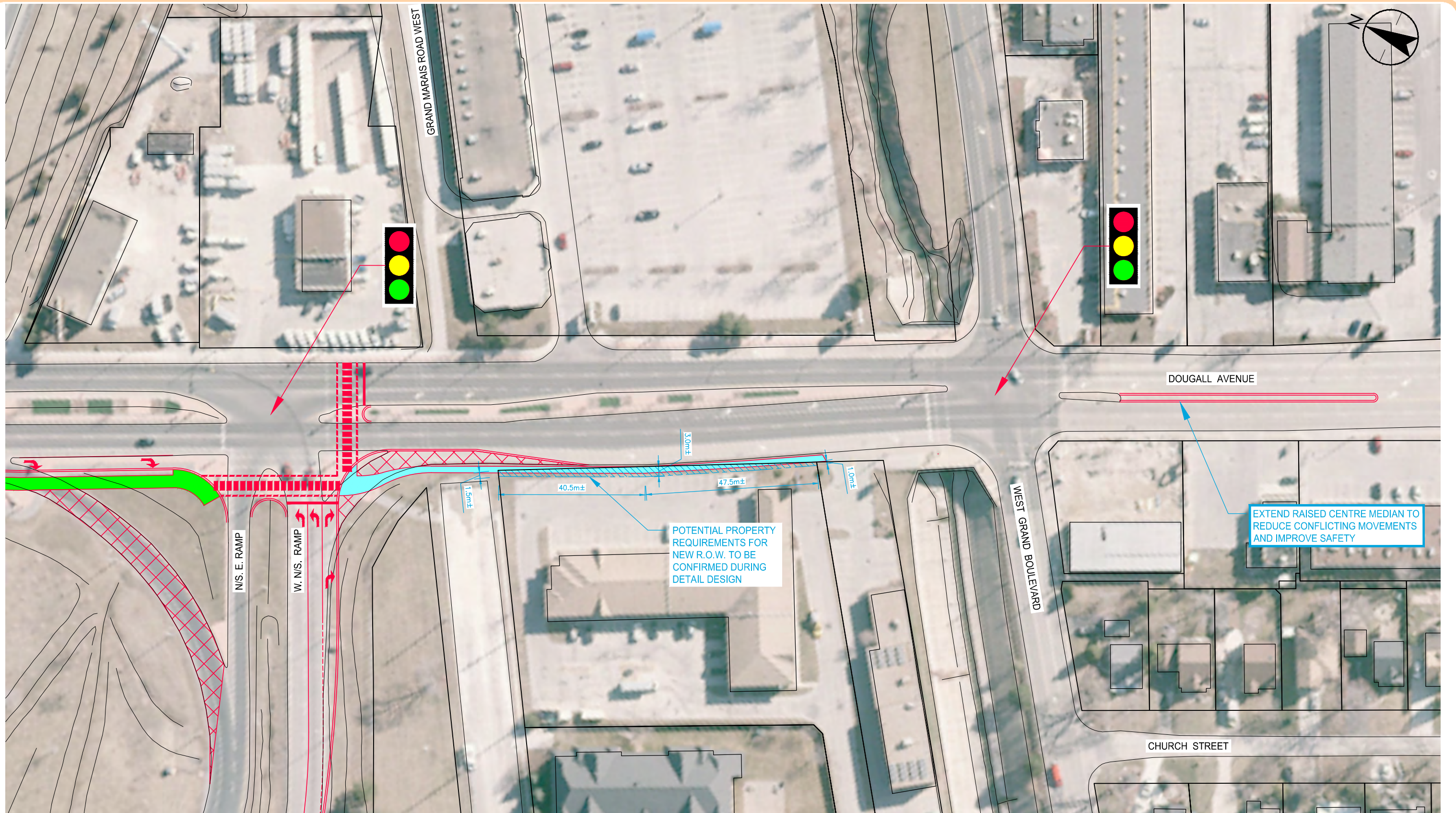
**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

DOUGALL AVENUE AT E.C. ROW EXPRESSWAY RAMP TERMINALS
RECOMMENDED SOLUTIONS

PROJECT NO.
165620021



DRAWING NO.
PLATE 7



LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

NOTES:

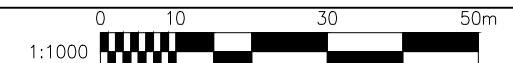
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

DOUGALL AVENUE AT WEST GRAND BOULEVARD
RECOMMENDED SOLUTIONS

PROJECT NO.
165620021



DRAWING NO.
PLATE 8

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.3.2 Key Rationale

The Recommended Strategy has improvements that address the following key transportation deficiencies and/or issues while minimizing property impacts and costs (as compared to a general six/seven lane widening of the corridor and a new, wider rail structure) and meeting future multi-modal transportation network needs. The key rationale for the Dougall Avenue-Ouellette Avenue Corridor aspects of the Recommended Strategy includes:

- Better accommodation of the north-south traffic demands along the corridor by means of the improved intersection at Dougall Avenue/Ouellette Place in combination with the recommended improvements to the east-west road network;
- Improved access management with regard to the commercial properties along Ouellette Avenue south of Eugenie Street and Dougall Avenue south of West Grand Boulevard, which contributes to safer and more efficient arterial road operations; the existing four lane section provides sufficient capacity for the arterial function, while contributing to safer and more efficient access for the existing properties along the corridor. Conversely, widening to a to a 6 lane section before warranted may cause additional safety concerns and operational issues;
- With the recommendation to implement the new East-West Connection and the signalization of the Dougall Avenue – Ouellette Place intersection in the short term, temporary measures at the Van de Water Rail Yard access (i.e. median reconstruction providing left turn lane for U-turn movements) are not recommended. Demand for these movements will be accommodated with the above improvements.
- Accommodation and encouragement of cycling and walking with the provision of proper facilities that provide safer conditions for these modes of travel as well as intersection modifications that would reduce the potential for conflicts between vulnerable road users and higher speed arterial road traffic;
- Improved mobility and accessibility by all transportation modes for the entire length of the Dougall Avenue-Ouellette Corridor within the study area;
- Recognition of both Dougall Avenue and the E.C. Row Expressway as designated truck routes.

9.3.3 Design Criteria, Road Geometry and Cross Sections

In general, the horizontal and vertical alignments on Dougall Avenue and on Ouellette Place – Ouellette Avenue will be maintained through the Recommended Strategy. The existing design speed (60-70km/h) and posted speeds (50-60km/h) on both roads will remain the same.

Ouellette Avenue – Ouellette Place from Eugenie Street to Dougall Avenue will be maintained as a four lane urban Class II Arterial roadway. A 1.8 m wide sidewalk will be added to each side of the right of way to connect to the section of existing 1.8 m sidewalk. The existing centre

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

median and intersection at Ouellette Avenue and Ouellette Place will be modified to improve safety as outlined in the Access Management section below.

Dougall Avenue north of Ouellette Place will be widened to accommodate the addition of 1.8 m bicycle lanes while maintaining the existing two to four lane cross section and auxiliary lanes. The cross section will be maintained as an urban cross section and barrier curb is introduced to replace the existing semi-mountable curb. Sidewalks will be included on both sides of the right of way and widened to 1.8 m from the existing 1.2 m.

The corridor of Dougall Avenue will be maintained with four through lanes. Active Transportation elements will be implemented to the cross section, as well as individual intersection improvements as outlined below.

9.3.4 Intersections

The following provides an overview of the intersection improvements being recommended, and the resulting traffic operations. Full results of the traffic analysis are included in Appendix F2.

9.3.4.1 Dougall Avenue / Eugenie Street

The intersection will be modified to incorporate bicycle lanes and sidewalks on both Dougall Avenue and Eugenie Street, and the modified cross section on Eugenie Street (see Section 9.5.3.2). To accommodate the incorporation of bicycle lanes and sidewalks, the northbound through lane and through-right lane will be merged into 1 northbound through-right lane. The intersection will continue to function well and operate at an acceptable level of service. All movements would operate at a level of service C or better, and well within the intersection's theoretical capacity.

9.3.4.2 Ouellette Avenue / Eugenie Street

The northbound left turn lane will be extended with the reconstruction of the median between Eugenie Street and Ouellette Avenue to improve vehicle storage and intersection safety. In addition, the intersection will be modified to incorporate the new sidewalk on the west side of Ouellette Avenue, and the new cross section and auxiliary lanes on Eugenie Street. See Section 9.3.6 for details.

Operational results under the recommended design would generate results comparable to those under the future Do Nothing scenario. Several movements would operate with high delays and be approaching or exceeding their capacity during the peak hour periods. These temporary periods of congestion can be considered a compromise as related to providing improved active transportation facilities with no or minimal property requirements.

9.3.4.3 Ouellette Avenue / Ouellette Place

The intersection will be maintained in its current state with the addition of a sidewalk crossing to connect the pedestrians on the west side of Ouellette Avenue until the new east-west corridor is

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Recommended Design Alternatives

completed. Once the new route is in place, the intersection will be reconstructed to a ¾ access, which will restrict the left turn movements from Ouellette Avenue to Ouellette Place. Under this configuration all movements will operate at acceptable levels of services and well within capacity.

9.3.4.4 Dougall Avenue / Ouellette Place / Ouellette Avenue

It is recommended that this intersection be reconfiguration to remove the channelized right turn under stop condition, and replaced with full traffic signals. The northbound left turn lane will be maintained, and the Dougall Avenue leg will incorporate a left turn and a conventional right turn lane. The intersection would operate with acceptable levels of service, within its theoretical capacity, and with safer conditions for both vehicle traffic and active transportation.

The multi-use trail on the west side of Dougall Avenue will transition to the sidewalk network proposed along Ouellette Place and north along Dougall Avenue.

The entrance on the east leg is subject to reconfiguration through discussions with the property owner. Should access to the signalized intersection be incorporated, the left turn lane would become a through-left. The channelized right turn lane is recommended for removal and the entrances currently adjacent to the right turn lane would be serviced using a separate shared entrance. The configuration of the shared entrance is subject to discussions and will be confirmed during detail design. The intersection improvements will benefit the properties by facilitating access from Ouellette Place.

Lands made available from the removal of the channelized southbound lane will be used to incorporate Civic Ways elements or offered for purchase once land access needs have been determined.

9.3.4.5 South Cameron Boulevard

The channelized ramp at the intersection will be removed to improve sightlines and provide an improved active transportation crossing. The southwest radius will be reconstructed to eliminate the weaving hazard with the E.C. ROW on ramp.

With the provision of the new east-west link (discussed in 8.6.3 and 9.5) Northwood Street would be extended easterly to intersect with Dougall Avenue. As such, the existing intersection location of South Cameron with Dougall Avenue may be removed, or reserved as a dedicated active transportation route.

9.3.4.6 E.C. ROW Expressway

The channelized north off ramp terminal (E-N/S ramp) will be reconfigured to a conventional intersection configuration with adjacent left and right turn lanes. With the removal of the free flow condition, additional storage is proposed by widening the ramp platform at the intersection with Dougall Avenue. The channelized right turn for southbound vehicles on Dougall Avenue will

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

also be removed and a conventional right turn lane will be implemented. This lane can be extended upon implementation of the Northwood Street extension when the intersection of South Cameron Boulevard and Dougall Avenue is closed. Lands made available by the removal of the merge ramps will be utilized by the incorporation of Civic Ways elements.

The channelized south on ramp (N/S-E ramp) will be reconfigured to a conventional right turn lane for access to the ramp. With the removal of the free flow condition, additional storage is proposed by converting the existing acceleration/deceleration lane into right turn storage for access to the E.C. ROW Expressway.

The removal of the free-flow channelized right turns will result in a slight decrease in level of service; however, the designs are being recommended to address two issues: to eliminate the weaving section on Dougall Avenue southbound between the E.C. Row Expressway north and south ramp terminals, which would improve traffic safety and improve the safety of active transportation crossings by eliminating the crossing of free flow traffic.

Signal heads are also recommended for vehicles exiting the commercial property at the south ramp terminal.

It is also recommended that the left turn restriction signage for trucks and accompanying Bylaw be removed to allow northbound trucks on Dougall to access the E.C. Row Expressway heading westbound. This is recommended to reduce the occurrences of trucks attempting U-turns at the Van de Water Rail Yard access, and recognizes the role and function of both Dougall Avenue and the E.C. Row Expressway as part of the City's Truck Route. This recommendation is also in line with the March 20, 2013 council meeting noting that the signage remains in place at least until the completion of the Parkway Project. A test period for the removal of the signs and monitoring of the truck traffic impacts to the neighbourhood is advised prior to permanent removal of the restriction.

9.3.4.7 West Grand Boulevard

The intersection will be maintained and the median on the south leg will be extended as noted below under the Access Management section, in order to reduce conflicting movements related to the close proximity of the commercial driveways south of the intersection.

9.3.5 Access Management

To improve corridor safety and reduce turning movement conflicts, the mountable median between Eugenie Street and Ouellette Place will be replaced with a raised median and maintain the dedicated left turn lanes. Similarly, the intersection at Ouellette Place and Ouellette Avenue will be reconstructed to a $\frac{3}{4}$ access, which will restrict the left turn movements from Ouellette Avenue to Ouellette Place. The intersection turning movement restriction would be implemented following the new east-west corridor connection between Edinborough Street and Northwood Street as described in Section 8.6.3 and 9.5.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

By removing the channelized right turn lane at Dougall Avenue/Ouellette Place/Ouellette Avenue, a full access can be provided to the adjacent properties to replace the existing right-in, right-out conditions.

Similarly, due to the close proximity of the commercial entrances to the signalized intersection of Dougall Avenue and West Grand Boulevard, the centre median south of West Grand Boulevard will be extended approximately 75 m to the south to reduce the number of turning movement and rear end collisions and improve safety along the overall corridor.

The entrance at the Van der Water Yard was reviewed for turning movement conflicts and illegal U-turns. As part of the recommended plan, the new east-west corridor connection will eliminate the need for northbound vehicles to use the entrance to turn southbound in order to access South Cameron Boulevard.

9.3.6 Active Transportation

9.3.6.1 Ouellette Place/Ouellette Avenue

1.8 m wide sidewalks are recommended on both sides of Ouellette Avenue – Ouellette Place between Dougall Avenue and Eugenie Street to connect to the existing section of sidewalk along Ouellette Avenue, and the proposed sidewalks on Dougall Avenue and Eugenie Street.

9.3.6.2 Dougall Avenue - Eugenie Street to Ouellette Place

1.8m wide sidewalks are recommended on both sides of Dougall Avenue between Eugenie Street and Ouellette Place to connect to proposed sidewalks on Ouellette Place / Ouellette Avenue, sidewalks on Eugenie Street and proposed active transportation facilities further south on Dougall Avenue. This section of Dougall Avenue is also recommended to include bicycle lanes. These lanes would be 1.8m wide to provide a safe and comfortable facility with existing and future motor vehicle volumes and observed speeds in this area, and to connect to proposed bicycle facilities north and south on Dougall Avenue and along Eugenie Street as identified in the Bicycle Use Master Plan. Pedestrian and bicycle crossings are recommended at the proposed signalized intersection at Dougall Avenue and Ouellette Place.

9.3.6.3 Dougall Avenue - Ouellette Place to Grand Marais Road West

A 3.5 m wide two-way multi-use trail is recommended for implementation in the west boulevard of Dougall Avenue between Ouellette Place and South Cameron Boulevard. This facility would connect to the existing multi-use trail between South Cameron Boulevard and Grand Marais Road West to provide pedestrian and bicycle access along this section of Dougall Avenue. A 5.0 m wide tunnel crossing is recommended at the CN Rail underpass to accommodate the multi-use trail and necessary clearances. Implementation of the tunnel would be subject to scheduling with the new East-West corridor Recommended Strategy (see Section 9.5), but efforts

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

should be made to prioritize safe active transportation facilities in this location to address the existing safety concerns.

Intersection improvements at trail crossings are recommended including the implementation of crossrides at signalized intersections and high visibility pavement markings at unsignalized intersections. Bicycle access further south would be accommodated by the existing shared bicycle route on Bruce Avenue.

Further to the information presented at the second Public Information Centre, a 1.8 m sidewalk is recommended in the west boulevard between the multi-use trail at the E.C. Row Expressway south ramp to Grand Marais Road West and the Comfort Inn driveway to provide a pedestrian connection to existing sidewalks further south. As the implementation of this sidewalk would require commercial property acquisition, parking lot reconfigurations, and utility relocations, it is recommended that the City make provisions for the implementation of this sidewalk should the property be redeveloped in the future or if Dougall Avenue is widened. If redevelopment does not occur, the City may implement this sidewalk through the acquisition of the required property.

9.3.7 Stormwater Management

The roadway improvements for the sections of Dougall Avenue, Ouellette Place and Ouellette Avenue within the study area are not anticipated to significantly impact the impervious levels and associated stormwater quantities outletting to the existing storm sewers. During detail design, a review of the existing storm system will be conducted to determine if there is sufficient capacity to convey any additional stormwater produced as a result of the proposed improvements. In the event that sufficient capacity is unavailable, excess stormwater shall be stored to mitigate any potential adverse impacts to the receiving storm system. For the purpose of this study, it is anticipated that existing storm system capacity is sufficient.

9.3.8 Structures

A 5.0 m multi-use trail tunnel is recommended under the CN Rail overpass structure. Alignment of the proposed tunnel shown on Plate 6A may be modified during detail design through consultation with CN Rail and the results of geotechnical surveys; however, alignment should ensure that sightlines are appropriate in order to maximize user comfort and security. A retaining wall will be required north of the tunnel.

9.3.9 Utilities and Illumination

Many of the improvements along Dougall Avenue, Ouellette Place and Ouellette Avenue within the study area will not require relocation of existing utilities or illumination infrastructure. Exceptions include the widening of Dougall Avenue between Ouellette Place and Eugenie Street, which will require relocation of hydro and streetlight poles as well as catchbasins; and the construction/relocation of the multi-use trail along the west side of Dougall Avenue south of

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

Ouellette Place, which will require the relocation of the streetlight pole line and traffic signal infrastructure at the E.C. Row Expressway ramp terminals. New traffic signals/infrastructure is recommended at the Dougall Avenue and Ouellette Place intersection.

9.3.10 Property Acquisition

Significant property requirements along the Dougall Avenue – Ouellette Place corridor are not anticipated, with the exception of the Dougall Avenue/Eugenie Street intersection, where additional property may be required in order to accommodate the recommended bicycle lanes, sidewalks, and necessary utility relocations. Property acquisition is also identified on the west boulevard of Dougall Avenue between the E.C. Row Expressway south ramp terminal and the Comfort Inn driveway to accommodate the proposed sidewalk.

The extent of the required property will be confirmed during the detail design phase.

9.4 HOWARD AVENUE

9.4.1 Recommended Strategy

The Recommended Strategy for the Howard Avenue corridor includes the following:

- Bike lanes are proposed on Remington Avenue as an alternate cycling route to Howard Avenue in accordance with the BUMP (**Plate 10**).
- Reconfiguration of the channelized right turn at the E.C. Row Expressway north ramp terminal's westbound off ramp, and the south ramp terminal's eastbound off ramp to a standard right turn lane under traffic signal control (**Plate 10 and 11A**).
- Extension of the northbound left turn lane on Howard Avenue at the E.C. Row Expressway north ramp terminal to provide more storage (required removing part of the existing centre median) (**Plate 10**).
- Extension of the multi-use trail in the east boulevard between the Howard Avenue/Division Road intersection to the existing trail at the Devonshire Mall commercial access; a multi-use trail crossing between South Cameron Boulevard and Howard Avenue over the CN Rail line (**Plate 11**).
- Reconfiguration of the southbound approach of Howard Avenue at Division Road for a conventional right turn lane at the intersection for traffic continuing southbound on Howard Avenue and on the eastbound approach of Howard Avenue at Division Road for dual left turn movements for traffic continuing northbound on Howard Avenue (**Plate 11**).
- Reconfiguration of the intersection of South Cameron Boulevard and Howard Avenue to improve sight lines, turning operations, and additional storage for left and right turn movements on the South Cameron Boulevard approach (**Plate 11**).

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

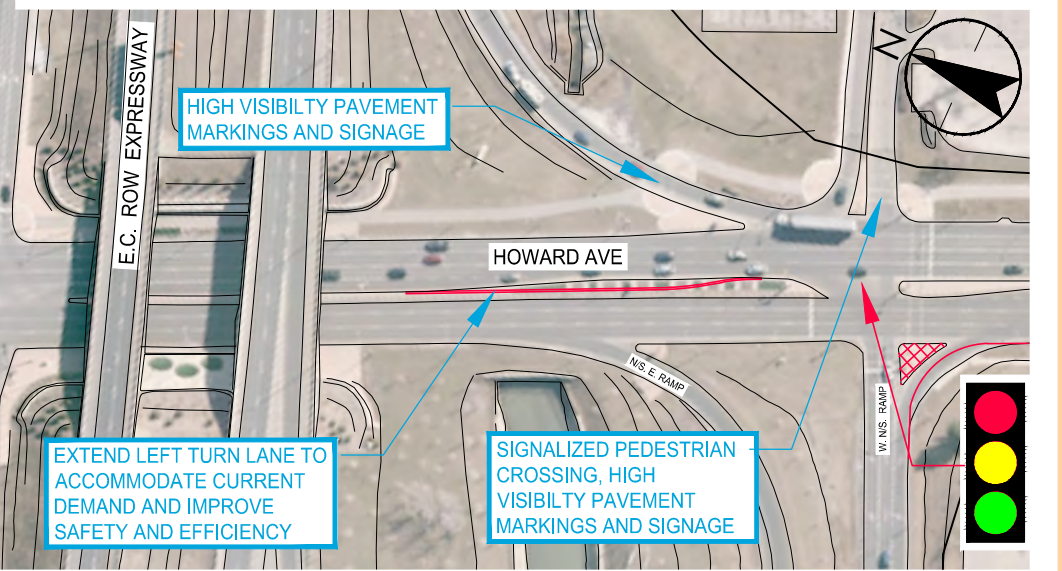
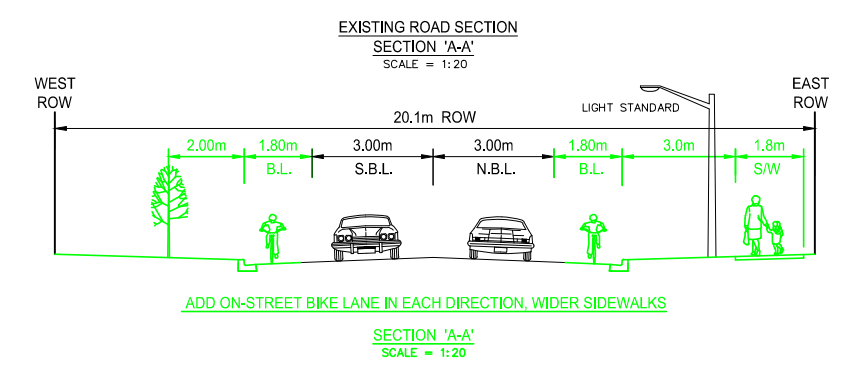
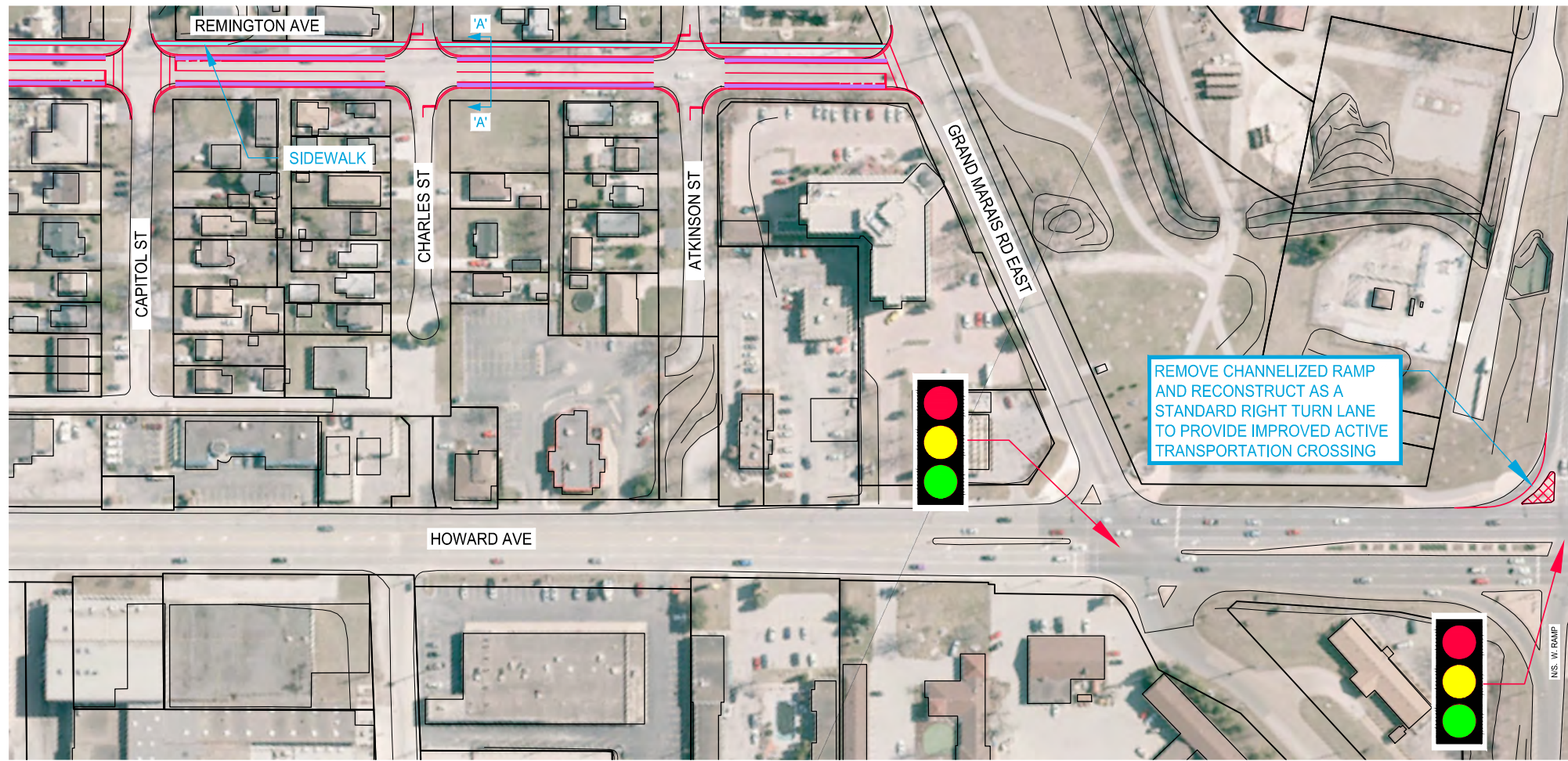
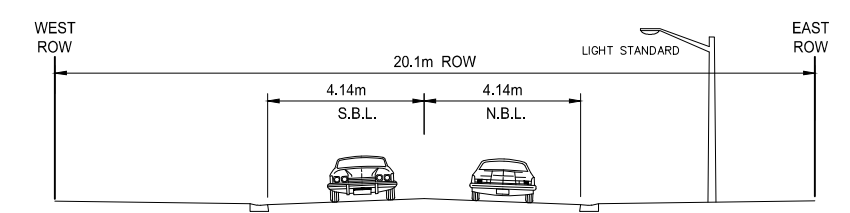
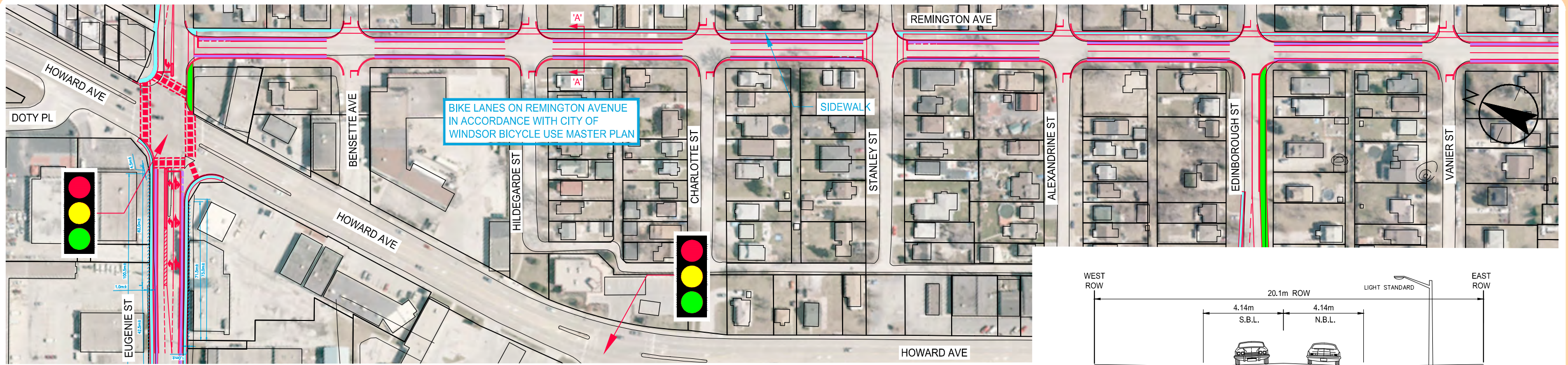
- Traffic Demand Management measures: the City shall encourage active transportation and public transit; opportunities for carpooling shall be explored.
- Signal timing optimization shall regularly reviewed by City staff to ensure the most efficient operations at intersections within the corridor.

In addition to the recommended improvements on Howard Avenue, several alternatives have been developed for more extensive improvements at the Howard Avenue/Division Road/South Cameron Boulevard/CN Rail Complex when traffic volumes warrant it. Although minor modifications to the intersection as shown in **Plate 11** were found to accommodate forecast traffic volumes up to the 20-year planning horizon, several movements would be at or near functional capacity, leaving very little reserve capacity for future growth beyond this planning horizon. To provide for transportation needs beyond the 20-year planning horizon, an ultimate configuration that provides additional capacity should be protected for.

The design concepts found on **Plates 16, 16A, and 16B** were considered as long term solutions for the additional designs considered for this intersection. All three design concepts were found to provide significant reserve capacity at the planning horizon analyzed; however, since the design concept on **Plate 16** has greater property impacts and shorter eastbound queue storage than the **Plate 16A and 16B** design concepts but no significant advantages over these other two design concepts, it is recommended that the design concept shown on **Plate 16A**, rather than the Plate 16 design, be considered the most-preferred long term solution.

To allow for flexibility in addressing future transportation needs, it is recommended that the existing City right-of-way needed for the design concept on **Plate 16B** be protected in case the additional capacity of the **Plate 16B** design concept be required in future. Since the additional property required for the design concept on **Plate 16B** (compared to the Plate 16A design concept) is already City-owned, there are no additional property impacts associated with protecting for the **Plate 16B** design in addition to protecting for the **Plate 16A** design.

Further discussion of the operational analysis for this ultimate design is provided in Section 8.5.3.1.



LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

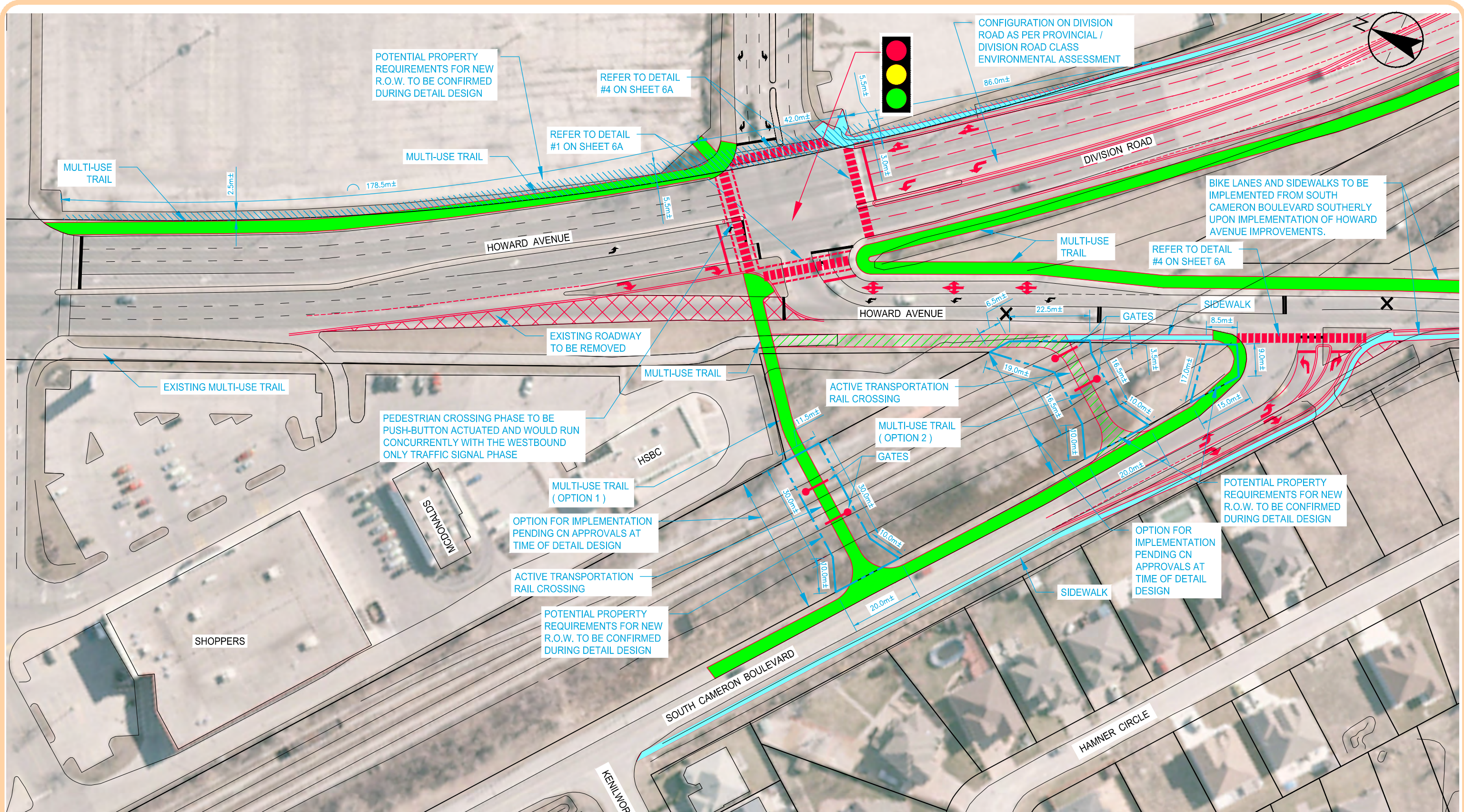
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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE ACTIVE TRANSPORTATION ALTERNATIVE ROUTE ON REMINGTON AVENUE
HOWARD AVENUE AND E.C.ROW - RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	SCALE 1:2000	GRAPHIC SCALE 0 20 60 100m	DRAWING NO. PLATE 10
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LEGEND

N.B.L. - NORTHBOUND LANE
 S.B.L. - SOUTHBOUND LANE
 W.B.L. - WESTBOUND LANE
 E.B.L. - EASTBOUND LANE
 R.T.L. - RIGHT TURN LANE
 L.T.L. - LEFT TURN LANE
 T.W.L.T.L. - TWO WAY LEFT TURN LANE
 P.L. - PARKING LANE
 S/W - SIDEWALK

B.A. - BUFFER AREA
 M.T. - MULTI-USE TRAIL
 B.L. - BIKE LANE
 R.O.W. - RIGHT OF WAY

BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)

CONCRETE SIDEWALK

ASPHALT MULTI-USE TRAIL

NOTES:

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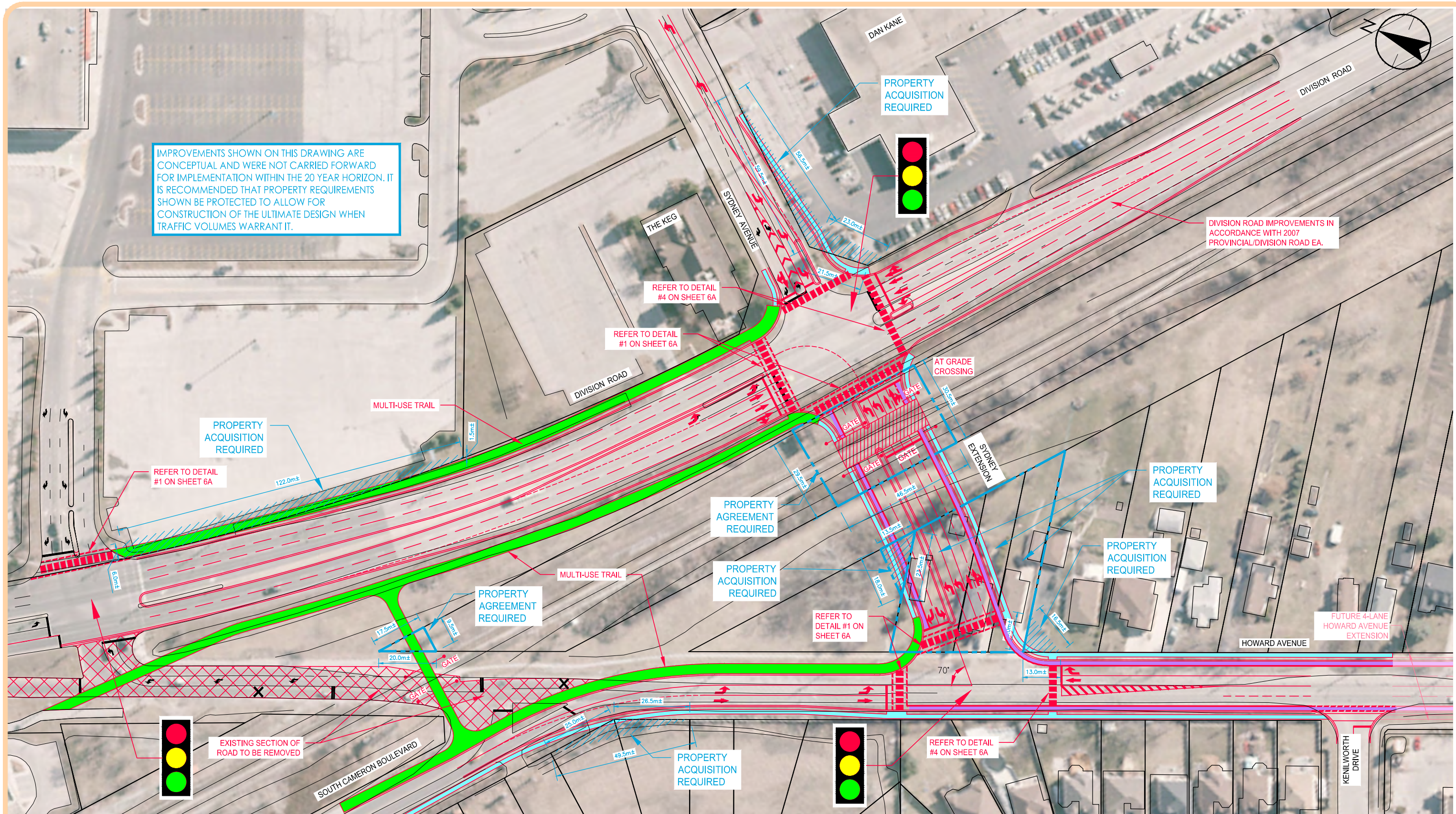
**CITY OF WINDSOR
 CENTRAL BOX STUDY AREA
 ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING
 RECOMMENDED SOLUTIONS

PROJECT NO.
 165620021



DRAWING NO.
 PLATE 11



IMPROVEMENTS SHOWN ON THIS DRAWING ARE CONCEPTUAL AND WERE NOT CARRIED FORWARD FOR IMPLEMENTATION WITHIN THE 20 YEAR HORIZON. IT IS RECOMMENDED THAT PROPERTY REQUIREMENTS SHOWN BE PROTECTED TO ALLOW FOR CONSTRUCTION OF THE ULTIMATE DESIGN WHEN TRAFFIC VOLUMES WARRANT IT.

DIVISION ROAD IMPROVEMENTS IN ACCORDANCE WITH 2007 PROVINCIAL/DIVISION ROAD EA.

REFER TO DETAIL #1 ON SHEET 6A

REFER TO DETAIL #4 ON SHEET 6A

REFER TO DETAIL #1 ON SHEET 6A

AT GRADE CROSSING

PROPERTY ACQUISITION REQUIRED

PROPERTY ACQUISITION REQUIRED

PROPERTY ACQUISITION REQUIRED

PROPERTY AGREEMENT REQUIRED

PROPERTY AGREEMENT REQUIRED

PROPERTY ACQUISITION REQUIRED

REFER TO DETAIL #1 ON SHEET 6A

FUTURE 4-LANE HOWARD AVENUE EXTENSION

EXISTING SECTION OF ROAD TO BE REMOVED

REFER TO DETAIL #4 ON SHEET 6A

LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
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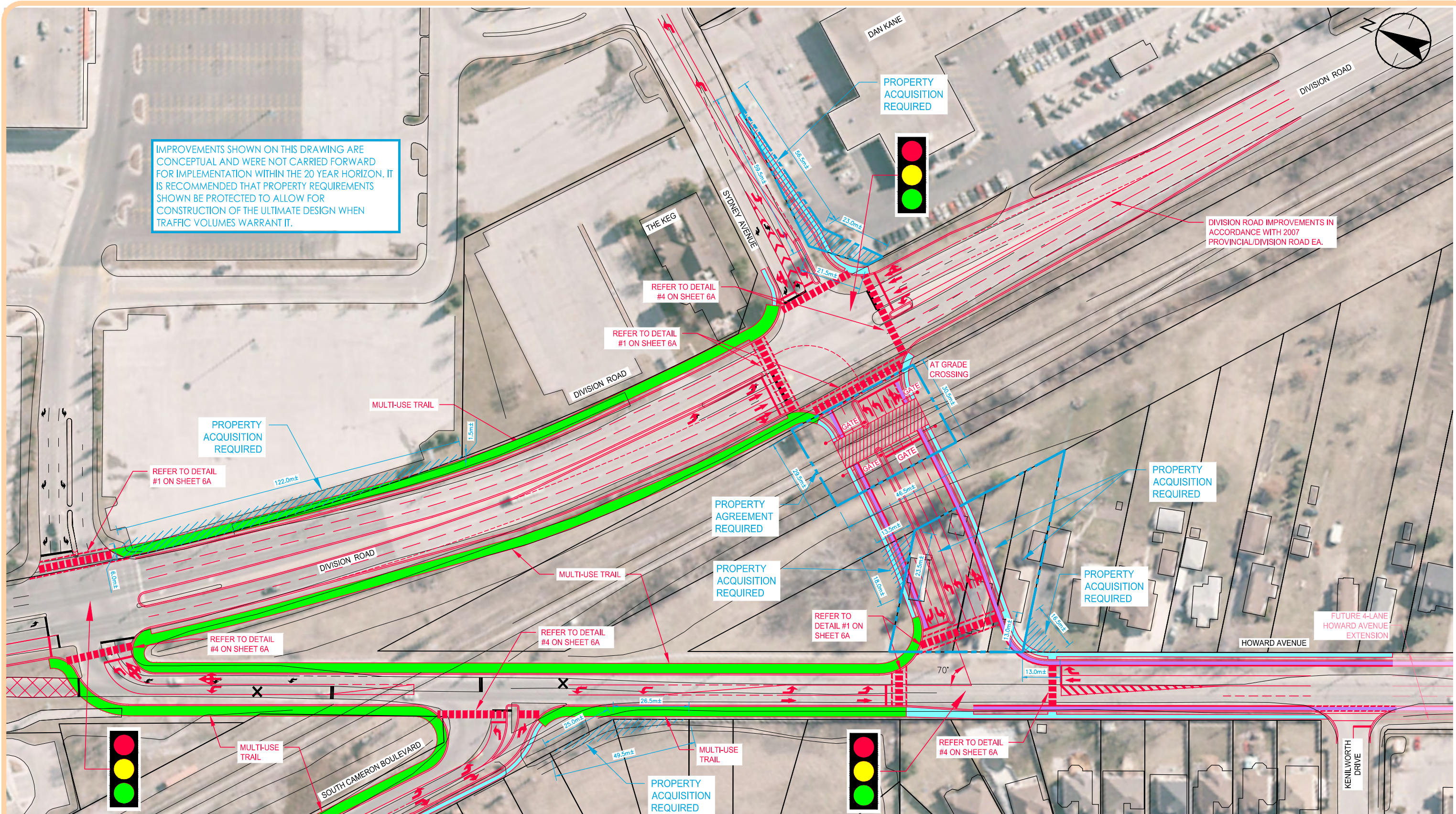
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CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING
CONCEPTUAL CONSIDERATIONS BEYOND 20 YEAR HORIZON

PROJECT NO. 165620021	SCALE 1:1250	GRAPHIC SCALE 0 12.5 37.5 62.5m	DRAWING NO. PLATE 16A
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IMPROVEMENTS SHOWN ON THIS DRAWING ARE CONCEPTUAL AND WERE NOT CARRIED FORWARD FOR IMPLEMENTATION WITHIN THE 20 YEAR HORIZON. IT IS RECOMMENDED THAT PROPERTY REQUIREMENTS SHOWN BE PROTECTED TO ALLOW FOR CONSTRUCTION OF THE ULTIMATE DESIGN WHEN TRAFFIC VOLUMES WARRANT IT.

DIVISION ROAD IMPROVEMENTS IN ACCORDANCE WITH 2007 PROVINCIAL/DIVISION ROAD EA.

LEGEND

- | | |
|-------------------------------------|---|
| N.B.L. - NORTHBOUND LANE | B.A. - BUFFER AREA |
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| S/W - SIDEWALK | |

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**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

HOWARD AVENUE / SOUTH CAMERON BOULEVARD / RAIL CROSSING
CONCEPTUAL CONSIDERATIONS BEYOND 20 YEAR HORIZON

PROJECT NO.
165620021



DRAWING NO.

PLATE 16B

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.4.2 Key Rationale

The Recommended Strategy has improvements that address the following key transportation deficiencies and/or issues while minimizing property impacts and costs to meet future multi-modal transportation network needs. The key rationale for the Howard Avenue Corridor improvements includes:

- Accommodation of the north-south traffic demands in the Howard Avenue Corridor and at the key Howard Avenue intersections in a safer and more efficient manner;
- Accommodation and encouragement of cycling and walking with the provision of proper facilities that provide safer conditions for these modes of travel as well as intersection modifications that would reduce the potential for conflicts between vulnerable road users and higher speed arterial road traffic;
- Improved mobility and accessibility along the entire length of the Howard Avenue corridor for all modes of transportation, including the use of Remington Avenue to north of the E.C. Row Expressway for cycling (and to a lesser extent, walking) in a safer environment;

9.4.3 Design Criteria, Road Geometry and Cross Sections

In general, the horizontal and vertical alignments on Howard Avenue will be maintained through the recommended strategy. The design speed (60km/h-70km/h) and posted speed (50km/h-60km/h) along the corridor and adjacent roads will be maintained.

Howard Avenue from Eugenie Street to Division Road will be maintained as a four lane urban Class II Arterial roadway with the existing sidewalks and multi-use trail network. Access will be maintained with the two way let turn lane. Though safety improvements could be recognized by introducing controlled access by a centre median with select entrance points, the impacts to the businesses would not justify the anticipated reduction in collisions.

Remington Avenue will be widened to accommodate the addition of 1.8 m bicycle lanes while maintaining the existing two lane cross section. The new through lanes will be a standard lane width of 3.0 m. The cross section will maintain the urban cross section and introduce standard barrier curb (updated recommendation from that presented at the Public Information Centre #2) to replace the existing mountable curb for roadside safety improvements. A 1.8 m sidewalk will be provided on the east side of the right of way in accordance with Official Plan guidelines for Local Roads.

9.4.4 Intersections

The following provides an overview of the intersection improvements being recommended, and the resulting traffic operations. Full results of the traffic analysis are included in Appendix F2.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Recommended Design Alternatives

9.4.4.1 Eugenie Street

The intersection will be maintained as a signalized intersection. Modifications to the intersection including the provision of crossrides are recommended as part of the implementation of bicycle lanes on Eugenie Street between Howard Avenue and Dougall Avenue. The intersection would operate well, though it should be noted that under the p.m. peak hour several movements would be approaching capacity.

9.4.4.2 McDougall Avenue

The intersection will be maintained as a signalized intersection. No new auxiliary lanes or additional improvements are proposed under the Recommended Strategy. Under the future horizon, this intersection would continue to operate well, with all movements at acceptable levels of service and each movement well within capacity.

9.4.4.3 Edinborough Street

The provision of the new east-west link would connect Dougall Avenue to Howard Avenue via a westerly extension of Edinborough Street connecting to the Northwood Street extension. There are no recommended changes in lane configuration at this intersection. Under the future horizon, the intersection would operate well, though it should be noted that under the p.m. peak hour several movements would be approaching capacity.

9.4.4.4 Charles Street

The intersection will be maintained as a signalized intersection. No new auxiliary lanes or additional improvements are proposed under the Recommended Strategy.

9.4.4.5 Grand Marais Road East

There are no recommended changes in lane configuration at this intersection. Under the future horizon, this intersection would continue to operate well. Several movements will be approaching or exceeding capacity during the p.m. peak hour.

9.4.4.6 E.C. ROW Expressway

The off ramp at the north ramp terminal (E-N/S Ramp) will be reconfigured to remove the channelization and introduce a conventional right turn to improve the safety of the active transportation crossing. As a result, several movements will be approaching or exceeding capacity during the p.m. peak hour. These temporary periods of congestion can be considered a compromise related to providing improved active transportation facilities with no property requirements.

The northbound left turn lane storage will also be increased by removing a portion of the existing median island, resulting in an improvement to the intersection capacity and safety.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

There are no recommended changes in lane configuration at the south ramp terminal with Howard Avenue. The intersection will continue to operate well under the future horizon. There would be a slight improvement in comparison to the Do Nothing scenario due to the provision of the east-west link. All movements would be at a level of service D or better and each movement would be operating within its theoretical capacity.

9.4.4.7 Devonshire Mall / Roundhouse Centre

The intersection will be maintained as a signalized intersection. The intersection will continue to operate well under the future horizon. All movements would be operating at an acceptable level of service and each movement would be operating within its theoretical capacity.

9.4.4.8 Howard Avenue/Division Road/South Cameron Boulevard

The Recommended Strategy includes the provision for additional left turn capacity from Howard Avenue to Howard Avenue at Division Road by converting the existing through/right lane to a through/right/left turn lane and keeping the signal operations for this leg as a separate phase. Reprogramming of the signal timing with the pedestrian crossing on the north leg will be required.

The existing northbound right turn lane on Division Road will be converted to a northbound through/right lane to improve intersection capacity and align with current driver behaviour and expectations.

The channelized right turn on both southbound Howard Avenue and southbound South Cameron Boulevard will be removed and adjusted to a conventional right turn lanes to improve the active transportation crossing safety and remove the merge with the poor skew angles and less than ideal sightlines.

Active transportation elements will be added to the intersections including sidewalks and a multi-use trail as noted in Section 9.4.5.

The existing lane configuration at the rail crossing along Howard Avenue is being maintained. Transport Canada Road/Railway Grade Crossing Technical Standards require that the horizontal and vertical alignments of the road approach and the road over the crossing shall be smooth and continuous, and that the width of the travelled road lanes and shoulders at the crossing surface shall not be less than the road approaches. As the existing condition meet the Transport Canada requirements, maintaining the existing configuration was deemed the most appropriate means of incorporating the proposed improvements, with the least impact to the rail right of way. Ongoing discussions with CN Rail will be required during detail design to confirm the requirements of a new rail crossing with gates to accommodate active transportation versus expansion of the current road crossing on Howard Avenue.

This recommended design is found to be the optimal solution for the 20-year planning horizon; the operational results will be greatly improved when compared to the Do Nothing scenario; however, it is recommended that the property required for the full reconstruction of the

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Recommended Design Alternatives

intersection shown on **Plates 16A, and 16B** be protected as City right of way for the future improvements.

9.4.5 Active Transportation

9.4.5.1 Remington Avenue

1.8 m wide bicycle lanes are recommended along Remington Avenue to provide an alternative north-south cycling route to Howard Avenue Grand Marais Road East and Eugenie Street East. 1.8 m bike lanes are recommended to provide extra space for cyclists with narrow adjacent travel lanes (3.0m). A 1.8 m sidewalk is recommended on the east side of Remington Avenue in accordance with the City's Official Plan guidelines for Local Roads classifications.

The proposed multi-use trail on the south boulevard of Eugenie Street between Remington Avenue and Howard Avenue, together with the crossrides proposed at the intersection will allow northbound cyclists on Remington Avenue to connect with the westbound bicycle lanes on Eugenie Street and will eliminate the need for a midblock crossing / left hand turn for bicycles at the Remington Street/Eugenie Street intersection.

9.4.5.2 Howard Avenue at the E.C. Row Expressway Ramp Terminal/Commercial Driveway

It is recommended that the free flow right turn ramp movement at the north-east ramp terminal be converted to a conventional right turn lane to improve the multi-use trail crossing.

In addition, it is recommended that the design of trail crossings at the south-east ramp terminal and commercial driveway (Sears/Devonshire Mall) be upgraded to improve safety and visibility for trail users and motorists. This includes the addition of a signalized pedestrian crossing at the east commercial access crossing, with high visibility pavement markings and additional signage. The pavement markings and signage would also be applied to the crossing of the S-E E.C. Row Expressway ramp.

9.4.5.3 E.C. Row Expressway to Division Road

In order to improve access for active transportation modes along this section of the corridor, it is recommended that a multi-use trail be constructed along the east boulevard between the Howard Avenue and Division Road intersection to connect with the existing multi-use trail at the main Devonshire Mall access. The design of new and existing intersection and driveway crossings should be upgraded to ensure that crossrides and up-to-date design treatments are used to improve safety and visibility for trail users and motorists.

Should Howard Avenue be redeveloped and/or if widening is identified in the future, provisions should be made to extend the existing multi-use trail in the west boulevard between the Howard Avenue/Division Road intersection and the Roundhouse commercial entrance up to the south-west E.C. Row Expressway ramp, replacing the existing sidewalk. The existing right-in/right-out Roundhouse access should also be reconstructed to remove the channelizing island and reduce

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

corner radii to improve safety and comfort for motorists, pedestrians and cyclists at the driveway crossing.

9.4.5.4 Division Road to South Cameron Boulevard

A 3.5 m wide multi-use trail is recommended on the east boulevard and a 1.5 m wide sidewalk on the west boulevard of Howard Avenue south of Division Road. Bicycle connections between the east boulevard trail and the multi-use trails on Howard Avenue north of Division Road should be provided at the signalized intersection of Howard Avenue and Division Road with crossrides at the north and west legs of the intersection. Pedestrian connections along Howard Avenue north and south of Division Road may occur through the Howard Avenue – Division Road intersection or along the multi-use trail / sidewalk in the west boulevard of Howard Avenue. An at-grade 3.5 m wide multi-use trail crossing of the rail corridor is recommended to connect the existing multi-use trail in the west boulevard of Howard Avenue (north of Division Road) to the existing multi-use trail on the east side of South Cameron Boulevard. This connection provides a direct, perpendicular rail crossing with safer crossing conditions for cyclists. In addition, improved pavement markings are recommended at both South Cameron Boulevard and Division Road intersections and a 1.5 m wide sidewalk is recommended on the west side of South Cameron Boulevard.

9.4.6 Structures/Rail Crossing

Structures along this corridor include E.C. ROW Expressway twin underpasses. No recommendations for structural improvements are included as part of the Recommended Strategy.

The existing CN Rail crossing on Howard Avenue between Division Road and South Cameron Boulevard is proposed to be maintained as part of the intersection recommendations outlined in Section 9.4.4.8.

9.4.7 Access Management

The existing access locations and configurations will be maintained as part of the Recommended Strategy.

9.4.8 Drainage and Stormwater Management

9.4.8.1 Howard Avenue/Division Road/South Cameron Boulevard/CN Railway

To accommodate the widening and construction of sidewalk along the west side of South Cameron Boulevard, the existing roadside drain along South Cameron Boulevard will be covered from Howard Avenue northwesterly to Kenilworth Place. It has been estimated that the existing 1200 mm dia. storm sewer at South Cameron Boulevard and Howard Avenue would be increased to 1500 mm dia. in this section.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

To accommodate the proposed multi-use trail located in the southwest quadrant of the Howard Avenue and Division Road intersection, it is proposed to extend the existing 750 mm dia. pipe approximately 10 m. A 750 mm dia. culvert was also assumed to be required under the multi-use trail between the CN Railway and South Cameron Boulevard, which would be confirmed during detail design.

Generally, the increase in impervious area and associated additional stormwater quantities due to construction of new sidewalks, multi-use trails and road widening is not anticipated to significantly impact the existing storm system. During detail design, a review of the proposed/existing storm system will be conducted to determine if sufficient capacity to convey any additional stormwater produced as a result of the proposed improvements. In the event that sufficient capacity is unavailable, excess stormwater will need to be stored to mitigate any potential adverse impacts to the receiving storm system. For the purpose of this study, it is anticipated that existing storm system capacity is sufficient.

9.4.8.2 Howard Avenue at the E.C. Row Expressway Ramp Terminals

The improvements to Howard Avenue in the vicinity of the E.C. Row Expressway Ramp Terminals will not impact the stormwater drainage to existing storm sewers. The reconfiguration of lanes will not significantly change the impervious area and will not affect downstream capacity at the outlet to Grand Marais Drain.

9.4.8.3 Remington Avenue

The roadway improvements for the section of Remington Avenue are not anticipated to significantly impact the impervious levels and associated stormwater quantities outletting to existing storm sewers. During detail design, a review of the existing storm system shall be conducted to determine if there is sufficient capacity to convey any additional stormwater produced as a result of the proposed improvements. In the event that sufficient capacity is unavailable, excess stormwater shall be stored to mitigate any potential adverse impacts to the receiving storm system. For the purpose of this study, it is anticipated that existing storm system capacity is sufficient.

9.4.9 Utilities/Illumination

The recommended widening of Remington Avenue will require the relocation of above ground road surface features such as fire hydrants, hydro and street light poles as well as catch basins.

The recommended adjustment at the Howard Avenue/E.C. Row Expressway North Ramp Terminal will require relocation of the traffic signal infrastructure within the existing channelization island.

The recommended improvements at the Howard Avenue/Division Road and Howard Avenue/South Cameron Boulevard intersections require drainage infrastructure improvements

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

as described in the stormwater management section, streetlight and hydro pole relocations as well as modifications to the traffic signal infrastructure at the Howard Avenue/Division Road intersection.

9.4.10 Property Acquisition

Significant property requirements along the Howard Avenue and Remington Avenue corridors are not anticipated. Intersection improvements at the Howard Avenue / Division Road / South Cameron Boulevard and the new potential CN Rail crossing will require property to accommodate the active transportation infrastructure. Property acquisition is also identified on the west boulevard of Howard Avenue between the Roundhouse Commercial access and the south-west E.C. Row Expressway ramp for the replacement of the existing sidewalk with a multi-use trail.

Although not identified for implementation within the 20-year planning period, it is recommended that the property required for the full reconstruction of the intersection shown on Plates 16, 16A, and 16B be designated as City right of way for the future improvements.

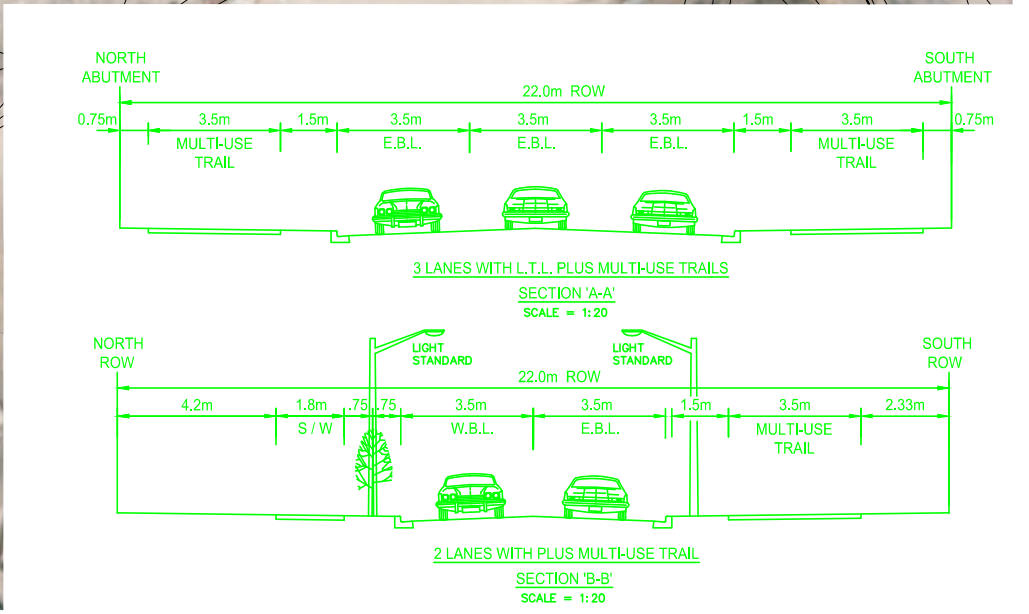
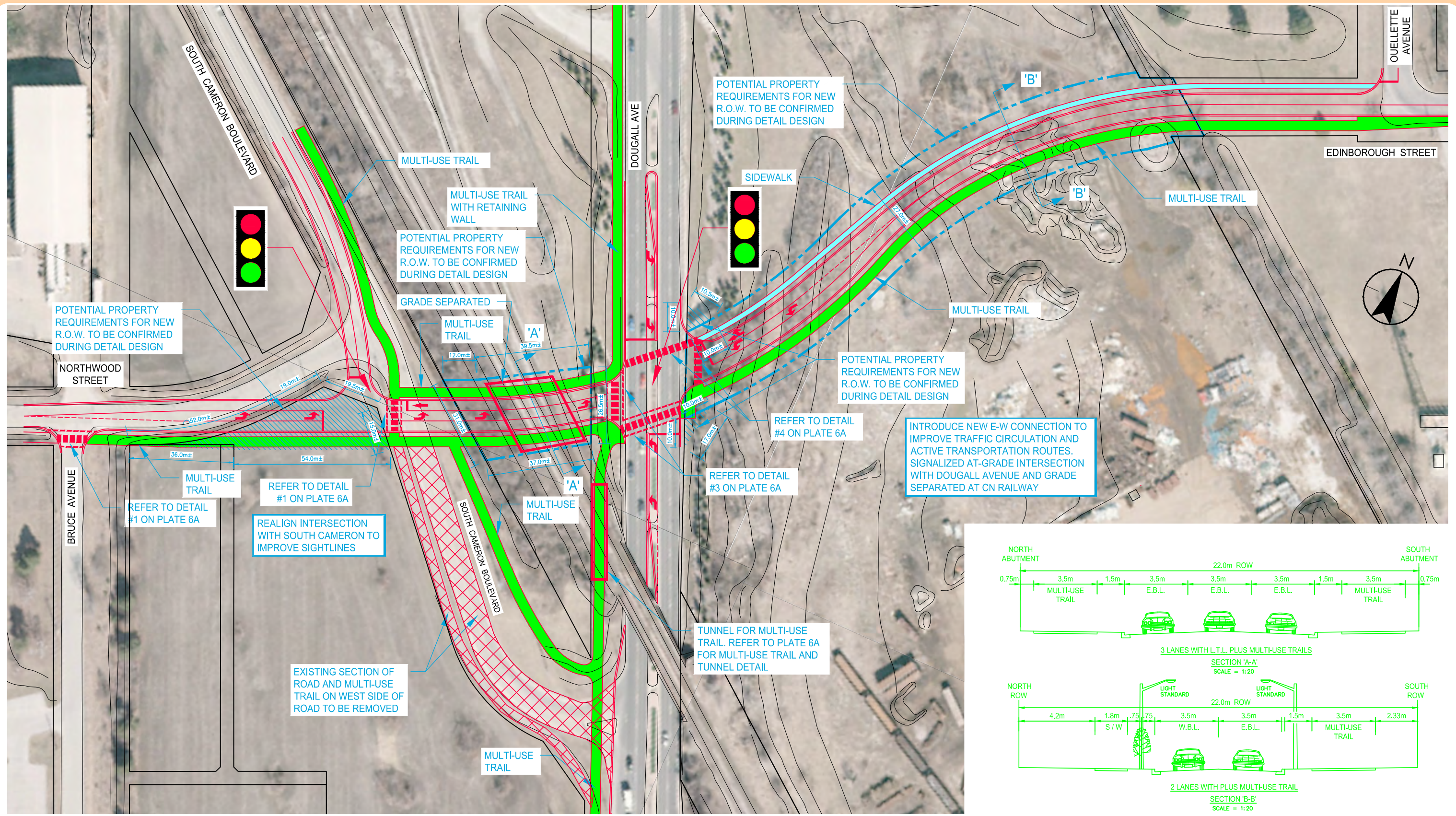
The extent of the required property will be confirmed during the detail design phase.

9.5 EAST-WEST CORRIDOR

9.5.1 Recommended Strategy

The Recommended Strategy within the East-West Corridor includes the following:

- Buffered bike lanes are proposed on Eugenie Street from Howard Avenue to Dougall Avenue, and the cycling route is extended to Remington Street via the multi-use trail in the south boulevard of Eugenie Street between Howard Avenue and Remington Street (**Plate 10A**).
- An extension of Northwood Street easterly to Dougall Avenue with a grade-separated crossing (underpass) at the CN Rail line, and would be aligned with a westerly extension of Edinborough Street through to Dougall Avenue at a common intersection, including sidewalks and a multi-use trail (**Plate 9 and 9A**).
- An extension of Ojibway Street from Alexandra Avenue to South Cameron Boulevard, including a sidewalk on the north and multi-use trail on the south, which completes a planned connection between Dominion Boulevard and South Cameron Boulevard (**Plate 3B**).



LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

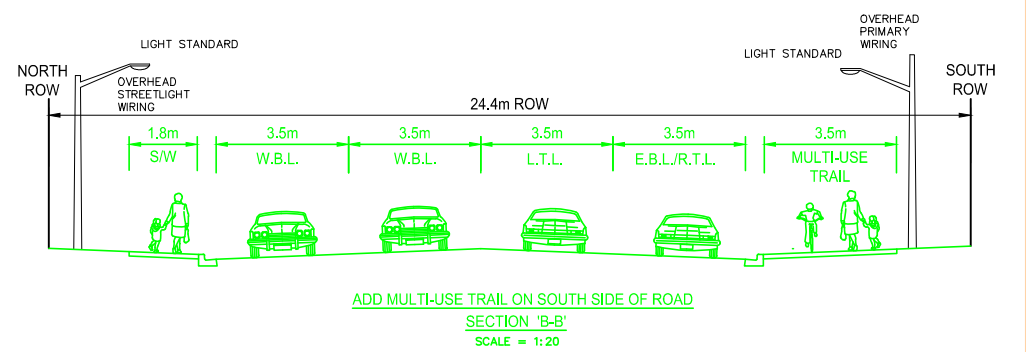
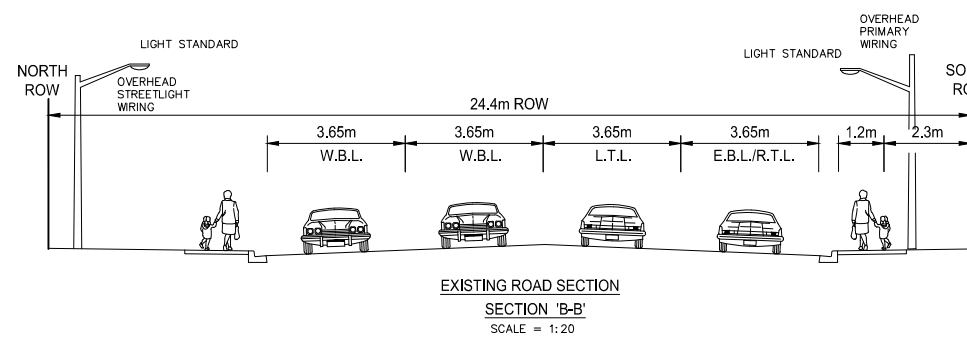
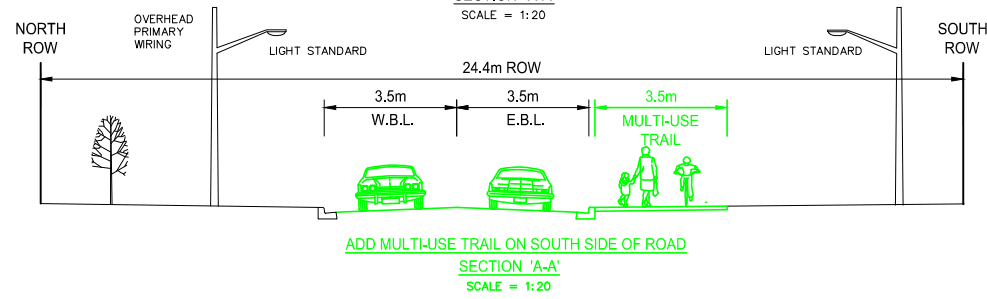
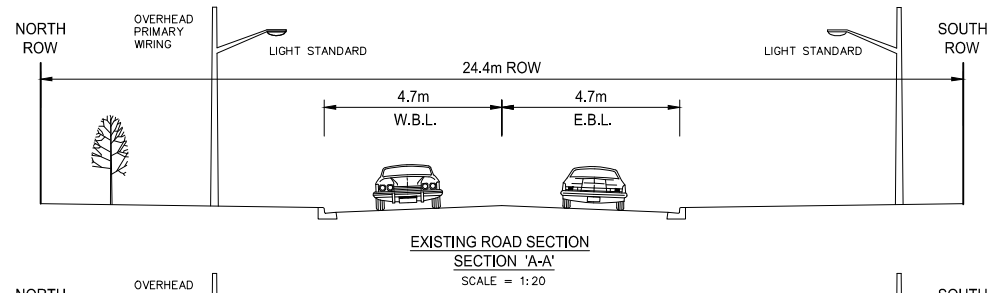
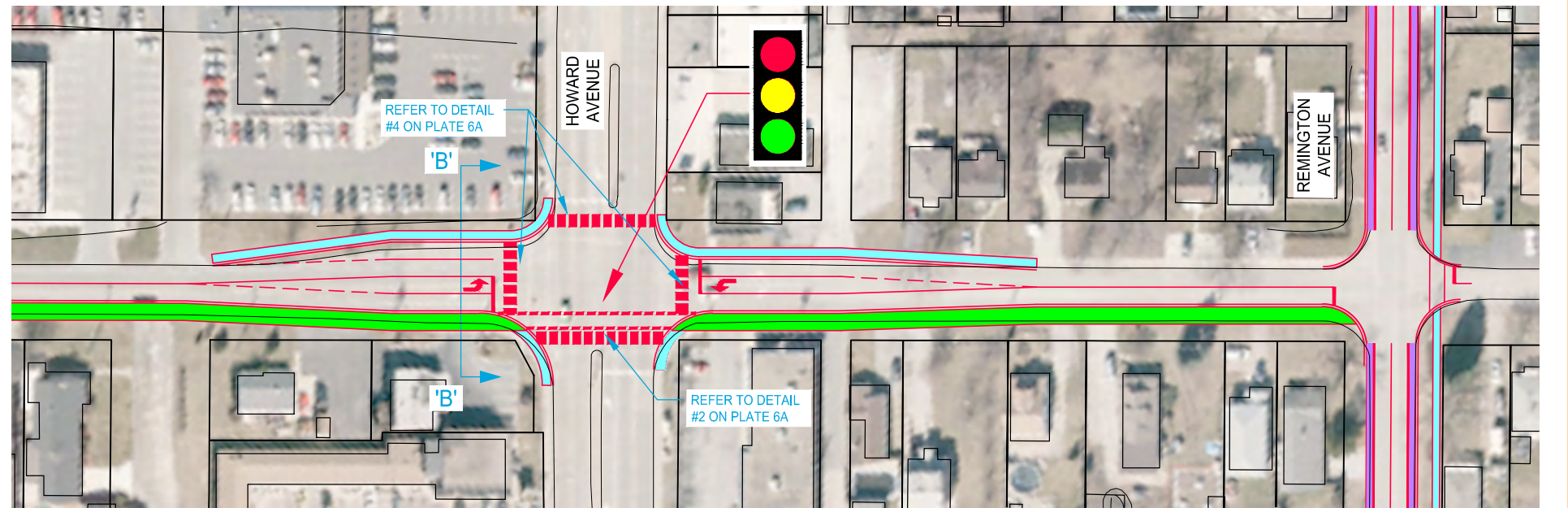
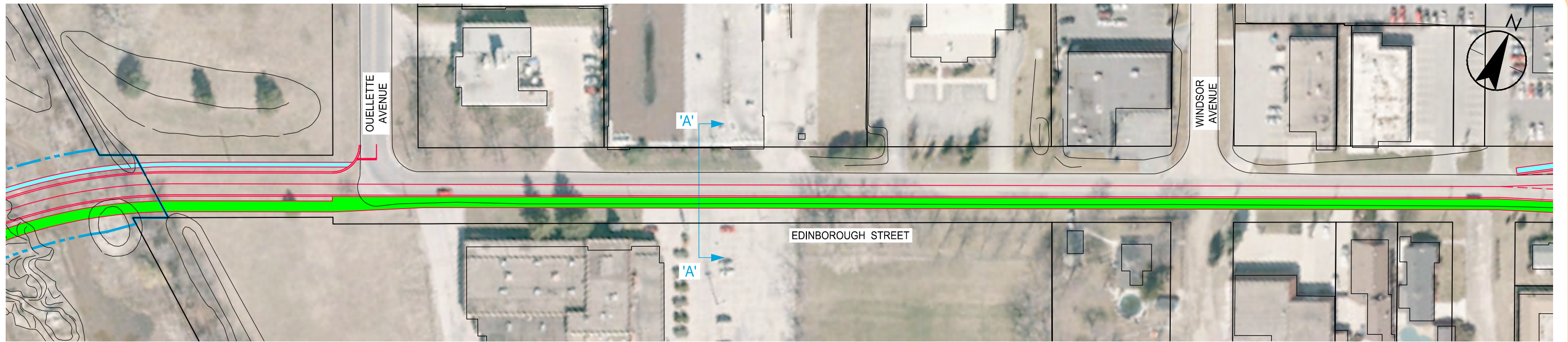
- NOTES:**
1. PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
 2. ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

**EAST-WEST CORRIDOR – NORTHWOOD STREET TO EDINBOROUGH STREET
RECOMMENDED SOLUTIONS**

PROJECT NO. 165620021	1:1250	0 12.5 37.5 62.5m	DRAWING NO. PLATE 9
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LEGEND

- | | |
|-------------------------------------|---|
| N.B.L. - NORTHBOUND LANE | B.A. - BUFFER AREA |
| S.B.L. - SOUTHBOUND LANE | M.T. - MULTI-USE TRAIL |
| W.B.L. - WESTBOUND LANE | B.L. - BIKE LANE |
| E.B.L. - EASTBOUND LANE | R.O.W. - RIGHT OF WAY |
| R.T.L. - RIGHT TURN LANE | BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY) |
| L.T.L. - LEFT TURN LANE | CONCRETE SIDEWALK |
| T.W.L.T.L. - TWO WAY LEFT TURN LANE | ASPHALT MULTI-USE TRAIL |
| P.L. - PARKING LANE | |
| S/W - SIDEWALK | |

NOTES:

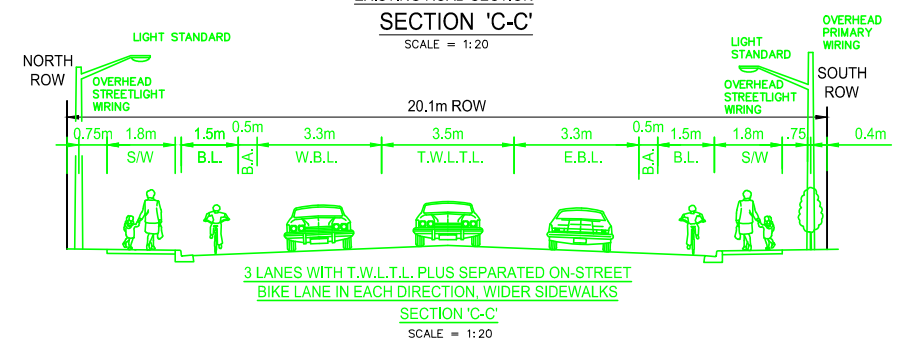
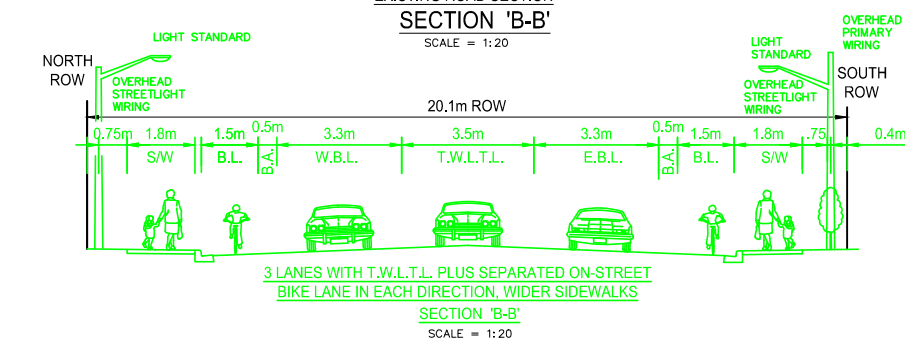
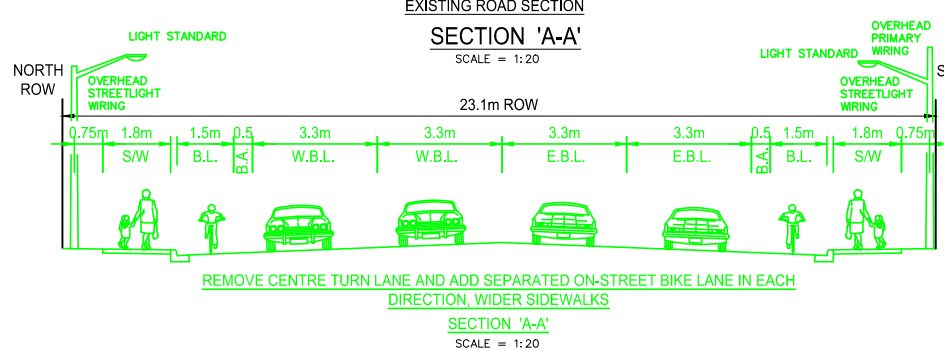
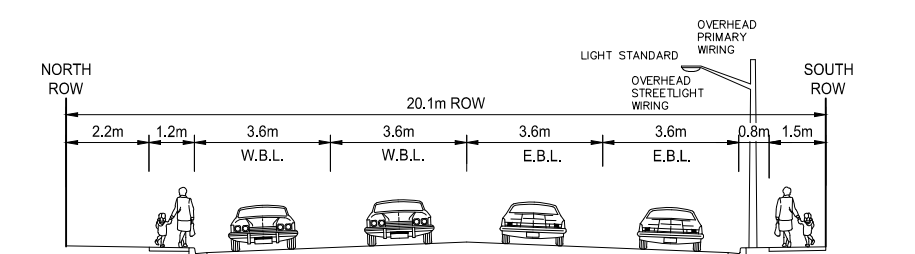
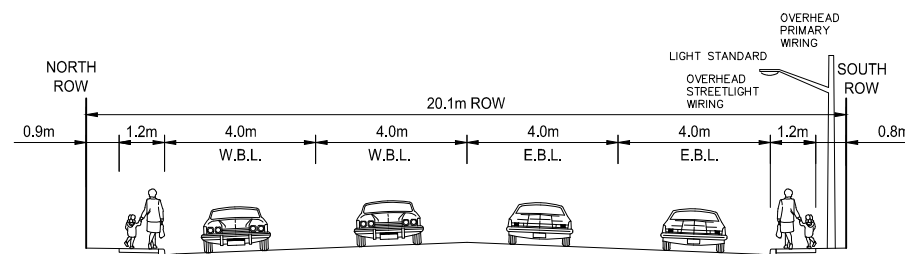
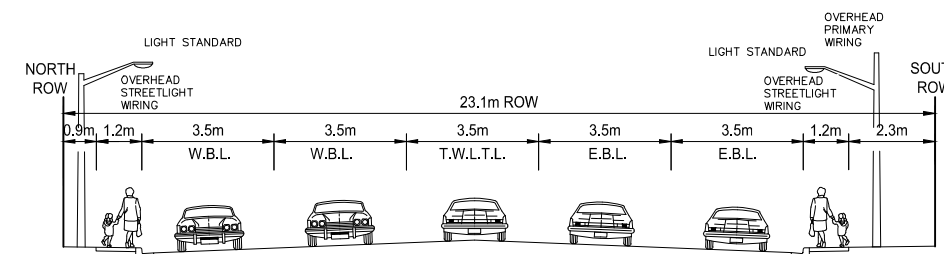
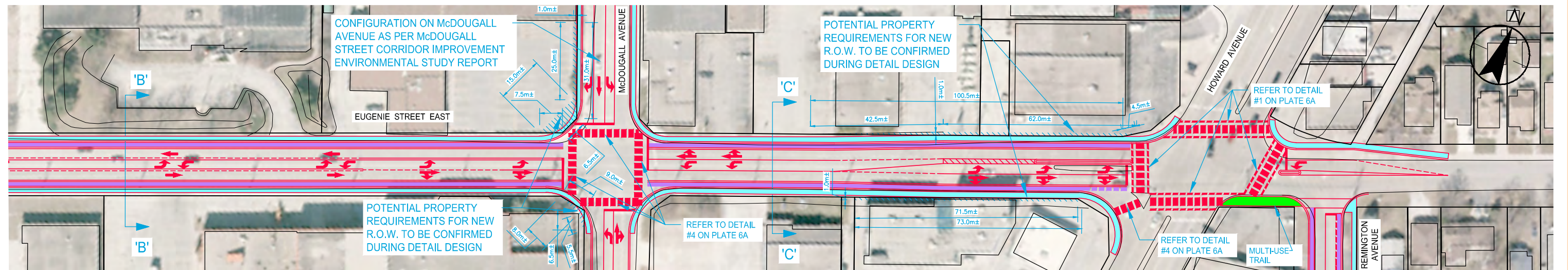
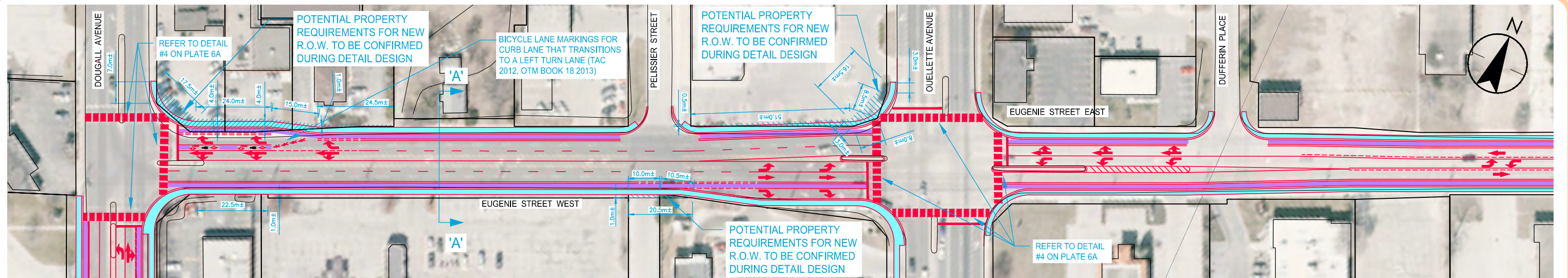
- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

EDINBOROUGH STREET – OUELLETTE AVENUE TO REMINGTON AVENUE
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	0 12.5 37.5 62.5m 1:1250	DRAWING NO. PLATE 9A
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LEGEND

N.B.L. - NORTHBOUND LANE	B.A. - BUFFER AREA
S.B.L. - SOUTHBOUND LANE	M.T. - MULTI-USE TRAIL
W.B.L. - WESTBOUND LANE	B.L. - BIKE LANE
E.B.L. - EASTBOUND LANE	R.O.W. - RIGHT OF WAY
R.T.L. - RIGHT TURN LANE	BIKE LANES (COLOR USED FOR ILLUSTRATIVE PURPOSE ONLY)
L.T.L. - LEFT TURN LANE	CONCRETE SIDEWALK
T.W.L.T.L. - TWO WAY LEFT TURN LANE	ASPHALT MULTI-USE TRAIL
P.L. - PARKING LANE	
S/W - SIDEWALK	

NOTES:

- PROPOSED CORRIDOR IMPROVEMENTS IN CONJUNCTION WITH SIGNAL TIMING ADJUSTMENTS AND PROMOTION OF HIGHER USE OF ALTERNATE MODES OF TRANSPORTATION.
- ALL PAVEMENT MARKINGS ARE FOR ILLUSTRATIVE PURPOSES ONLY.



**CITY OF WINDSOR
CENTRAL BOX STUDY AREA
ENVIRONMENTAL ASSESSMENT**

EUGENIE STREET – DOUGALL AVENUE TO HOWARD AVENUE
RECOMMENDED SOLUTIONS

PROJECT NO. 165620021	1:1250	0 12.5 37.5 62.5m	DRAWING NO. PLATE 10A
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CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.5.2 Key Rationale

The Recommended Strategy has improvements that address the following key transportation deficiencies and/or issues, which would provide significant transportation benefits within the study area and would meet future multi-modal transportation network needs (as compared to a general widening of the E.C. Row Expressway that would only improve conditions for automobile and truck traffic). The key rationale for the East-West Corridor aspects of the Recommended Strategy includes:

- Accommodation of east-west traffic circulation within the Central Box study area, which currently requires the use of the E.C. Row Expressway for short trips between closely spaced interchanges, or to use circuitous routing via other east-west roads a considerable distance north or south of the study area. The E.C. Row remains a major east-west route within the City, but local east-west trips will be supplemented by the proposed Northwood Street/Edinburgh Street extension.
- The encouragement of cycling and walking with the provision of the extension of existing roadways (primarily Northwood Street and Edinburgh Street, and to a lesser extent, Ojibway Street) and a grade separation (underpass) at the CN Rail line (Northwood Street extension), which would provide proper facilities that provide safer and more efficient travel for these modes;
- Improved mobility and accessibility for all modes of transportation within the Central Box study area, but especially for active transportation and transit that have no existing, direct east-west routes for continuous travel between Dominion Boulevard and Howard Avenue;
- In addition, the transportation planning benefits outlined above, operational and safety improvements would also be realized such as the reduction of turning movements at the E.C. Row Expressway ramp terminals in the study area, a reduction in weaving, merging, and diverging traffic on the sections of the E.C. Row Expressway between the study area interchanges, and the removal of the existing South Cameron Boulevard/Dougall Avenue intersection (which would reduce vehicle-vehicle conflicts and vehicle-active transportation conflicts) along with the potential conversion of the South Cameron Boulevard right-of-way between a realigned Northwood Street and Dougall Avenue for exclusive use by active transportation modes.

9.5.3 Design Criteria, Road Geometry, Cross Sections, and Intersection Operations

9.5.3.1 Ojibway Street Extension

This newly proposed extension of Ojibway Street would connect with South Cameron Boulevard to the west at a stop-controlled intersection. The profile of the new extension will generally follow

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

the existing grades, and utilize a design speed (60km/h) and posted speed (50km/h), which will remain consistent with the existing section of Ojibway Street. The proposed cross section includes a 1.8 m sidewalk on the north and a 3.5 m multi-use trail along the south. This new connection will help alleviate the anticipated increase in traffic along Northwood Street once the new connection under the CN Rail is completed. Ojibway Street west of the proposed extension requires widening according to current municipal standards for Local Roads.

The intersection with Dominion Boulevard would operate at a slightly improved level of service as compared to the Do Nothing scenario. It should be noted that with the future projected traffic volumes, traffic signal warrants are not met. In the event that traffic volumes increase and achieve the warrant thresholds, or if safety concerns relating to turning movements warrant investigation, this intersection would operate well under signal control. All movements would be anticipated to operate with minimal delay and well within capacity.

9.5.3.2 Eugenie Street

Eugenie Street West between Dougall Avenue and Ouellette Avenue will be maintained as a four lane urban section with the introduction of 1.5 m bicycle lanes with a 0.5 m buffer area and a widened sidewalk from 1.2 m to 1.8 m to meet AODA recommended standards. The existing lane widths of 3.5 m will be reduced to 3.3 m to include the improvements within the existing right of way of approximately 23.1 m. Widening at the auxiliary lanes at Dougall Avenue and at Ouellette Avenue will require utility relocations and property, the extents of which will be confirmed through detail design.

Subsequent to the material presented at the second Public Information Centre, the east leg of the Howard Avenue intersection has been slightly adjusted to improve the alignment of the eastbound and westbound traffic on Eugenie and create a safer condition by eliminating the jog previously shown.

1.5 m bicycle lanes with a 0.5 m buffer and 1.8 m sidewalks on both sides of the Eugenie Street E right of way are also recommended. The existing right of way is approximately 20.1 m, which is narrower than along Eugenie Street West, and cannot accommodate the proposed improvements without extensive property acquisition and building demolition/reconstruction. To accommodate the narrower right of way width, the recommended plan includes two through lanes with a continual two way left turn lane from Ouellette Avenue to Howard Avenue. This configuration matches the two lane section to the east of Howard Avenue and enables the introduction of dedicated left turn lanes at McDougall Avenue. This recommendation reduces the capacity along Eugenie Street, but with the inclusion of the two way left turn lane and dedicated left turn lanes, the level of service is comparable to analysis of future conditions under the 'Do Nothing' scenario, with the benefits of avoiding the substantial cost and social impacts required to maintain four through lanes.

CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.5.3.3 Northwood Street to Edinborough Street Connection

Northwood Street is proposed to be extended easterly and connect with Dougall Avenue by introducing a new grade separation (tunnel) at the CN Rail tracks. The newly formed intersection of Dougall Avenue with Northwood Street would operate at acceptable levels of service. It should be noted that the intersection would approach capacity in the p.m. peak hour due to the high volume of southbound traffic, but is recommended due to the overall benefits to traffic circulation within the entire Central Box area.

The profile of the Northwood extension will match the existing South Cameron Boulevard and Dougall Avenue grades, and will maintain the elevation of the CN Rail line while providing a minimum vertical clearance within the tunnel.

A new intersection is recommended for South Cameron Boulevard and Northwood Street that brings the intersection to a 90 degree connection with Northwood Street. The existing south leg of South Cameron Boulevard may be removed, or reserved for the exclusive use of active transportation modes. With the removal of the south leg, the southbound right turn lane onto the E.C. Row Expressway can be extended to the C.N Rail underpass.

The grade separation tunnel will provide partial obscurity to the sightlines looking east, which will compromise the safe left turning movement from South Cameroon Boulevard to Northwood Street. Therefore, traffic signals have been recommended at the South Cameron Boulevard intersection, which will be interconnected with the proposed traffic signals at the new Northwood Street and Dougall Avenue intersection. The recommended traffic signals at South Cameron Boulevard also provide active transportation users with a controlled crossing without detouring over to the Dominion Boulevard intersection.

The proposed cross section follows a standard collector width for the right of way and pavement at 22 m and 10.4 m respectively with auxiliary lanes. In the section between Dougall Avenue and Edinborough Street, the proposed pavement width for two through lanes is 7.0 m to match the existing Edinborough Street platform width. A multi-use trail is proposed for the south boulevard to accommodate cyclists, and a sidewalk is proposed for the north side.

Horizontal reverse curves with radii of 175 m have been proposed to make the corridor connection between Northwood Street and Edinborough Street. The radii meet a design speed of 60 km/h using 6 % superelevation. The intersection at Northwood Street and Dougall Avenue would be made at standard crossfall (with a 0% outside superelevation), and accepted based on the TAC guidelines Section 2.3.2.5, Reduced Superelevation Through Intersections.

**CENTRAL BOX STUDY AREA
SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT**

Recommended Design Alternatives

9.5.4 Active Transportation

9.5.4.1 Ouellette Place

Pedestrian access is recommended on Ouellette Place between Dougall Avenue and Eugenie Street via a 1.8m wide sidewalks on both side of Ouellette Place as part of the improvements for the Dougall Avenue-Ouellette Avenue corridor to improve the overall East-West Connectivity in the study area.

9.5.4.2 Eugenie Street

Separated bicycle lane (1.5 m wide with 0.5 m buffer) are recommended between Dougall Avenue and Howard Avenue. A short section of multi-use trail on the south boulevard of Eugenie Street between Remington Street and Howard Avenue and crossrides at the intersection are recommended to connect bicycle traffic continuing westbound from Remington Street to bicycle lanes on Eugenie Street and will eliminate the need for a midblock crossing / left hand turn for bicycles at the Remington Street/Eugenie Street intersection. 1.8 m wide sidewalks are recommended along both sides of the corridor.

9.5.4.3 Ojibway Street Extension

A 1.8 m sidewalk on the north and a 3.5 m multi-use trail on the south are included on the proposed extension of Ojibway Street. This would provide a pedestrian and cyclist connection between Dominion Boulevard and South Cameron Boulevard and pedestrian access to future parkland north and south of the proposed Ojibway Street Extension.

9.5.4.4 New East-West Corridor (Northwood Street to Edinborough Street)

The preferred active transportation solution for this corridor includes a 3.5 m multi-use trail on the south side of Northwood Street to its intersection with South Cameron Boulevard, and multi-use trails on both sides of the Northwood Street extension from South Cameron Boulevard to the new intersection with Dougall Avenue. The multi-use trail continues on the south side of the new corridor eastward to Remington Avenue.

These facilities will provide safer crossing conditions at the CN Rail underpass for pedestrians and cyclists. This proposed connection introduces the opportunity to reserve the section of South Cameron Boulevard between Northwood Street and Dougall Avenue for active transportation only. Implementation of this connection is subject to scheduling, property acquisition and potential decontamination of affected land.

9.5.4.5 South Cameron Boulevard at Dougall Avenue

Bicycle and pedestrian access in this section of South Cameron Boulevard is recommended by implementation of a 3.5 m wide multi-use trail in the north/north-east boulevard to provide a connection along the corridor that will integrate with proposed future connections on Northwood Street, Dougall Avenue, and a new east-west corridor between Northwood Street and Edinborough Street eastward. Upon implementation of the new east-west corridor, the

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multi-use trail in the north/northeast side of South Cameron Boulevard may be maintained to facilitate direct access to neighbourhoods and parklands to the northwest.

9.5.4.6 South Cameron Boulevard at Howard Avenue

The recommended active transportation strategy provides an opportunity for an improved east-west connection between Howard Avenue and Dougall Avenue in this area and connects pedestrian and cyclists between nearby residential areas and the commercial centre on Howard Avenue. See the Howard Avenue discussion in Section 9.4.5 above for the recommended improvements relating to active transportation in this area.

9.5.5 Structures / Rail Crossing

A grade separated single span crossing of the CN Rail is recommended as part of the Northwood Street Extension to Dougall Avenue. The proposed tunnel spans the 22 m right of way and incorporates the Northwood cross section of two 3.5 m through lanes, a 3.5 m left turn lane, a 3.5 m multi-use trail on both sides plus boulevard. A minimum clearance of 5.0 m will be achieved.

A foundations investigation and consultation with CN Rail will be required in detail design to finalize the tunnel features and loading requirements.

9.5.6 Drainage and Stormwater Management

The Ojibway Street and Alexandra Avenue extension falls under the *South Cameron Planning Area Functional Design Report Sanitary and Storm Drainage* dated October, 1992 prepared by M.M. Dillon Limited. The Functional Design Report contains stormwater management boundaries and design criteria for sizing of future storm sewer systems, including a runoff coefficient of 0.35 for residential areas, and uses the City of Windsor Intensity Curve. Local storm sewers will be required along the Alexandra Avenue extension and along Ojibway Street between Dominion Boulevard and South Cameron Boulevard, which will include private drain connections where appropriate, subdrains, catch basins and leads.

Stormwater from the Ojibway Street extension right-of-way shall be drained via the new local storm sewer connecting to the existing 1200 mm dia. storm sewer at Ojibway Street and Alexandra Avenue. The proposed Ojibway Street extension will also result in the enclosure of a portion of an existing linear swale that operates as a linear stormwater storage facility, located along the south side of Ojibway Street and abutting the rear of residential properties on Dandurand Avenue. Retrofits to the remaining linear swale may be required to maintain sufficient storage with the reduced length of swale. Details of the existing stormwater system in this area – including the linear swale, 1200 mm dia. storm sewer from swale to pump station 8RPS4164 and 900 mm dia. sewer downstream of the pump station, will be evaluated to determine the capacity that has been allocated to drain the remaining undeveloped lands between Alexandra Ave. and South Cameron Boulevard and the stormwater storage that may be required. For the purpose of this study, it is anticipated that existing storm system capacity is sufficient to accept the additional flows resulting from the proposed improvements.

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The new East-West Corridor roadway improvements, connecting Northwood Street to Edinborough Street and intersecting with Dougall Avenue, lies within the Grand Marais Drain drainage area. The roadway extension under the CN Rail Crossing will require a new storm sewer for road drainage, including, subdrains, catch basins and leads, and a stormwater pump station to discharge to existing storm sewers along Dougall Avenue. During detail design, a review of the existing storm system will be conducted to determine if there is sufficient capacity to convey any additional stormwater produced as a result of the proposed improvements. In the event that sufficient capacity is unavailable, excess stormwater shall be stored either by upsizing the proposed new storm sewers or by other means, to mitigate any potential adverse impacts to the receiving storm system. For the purpose of this study, it is anticipated that existing storm system capacity is sufficient.

The improvements to Eugenie Street will not impact the stormwater drainage to existing storm sewers. The sidewalk and road widening will not significantly change the impervious area and will not affect downstream capacity at the outlet to Grand Marais Drain.

9.5.7 Utilities/Illumination

There are currently no utilities or illumination infrastructure currently present within the proposed new East-West Corridor and Ojibway Street extension. The areas surrounding these proposed improvements include existing underground utilities such storm sewers, roadside drains, sanitary sewers, watermains, gas mains, overhead and underground hydro and telecommunication lines, streetlights and hydro poles.

The extension of Ojibway Street will require new sanitary sewer, watermains, hydro and streetlighting infrastructure. As mentioned previously, new storm sewers, private drain connections, subdrains, catch basins and leads will also be required.

The proposed new East-West Corridor will require new watermains, gas mains, sanitary sewers, hydro, streetlighting and traffic signal infrastructure. As mentioned previously, new storm sewers, private drain connections, subdrains, catch basins and leads will also be required. Utility relocations to accommodate new infrastructure will be determined during detail design.

The recommended improvements to Eugenie Street will require the relocation of above ground road surface features such as fire hydrants, hydro and street light poles, catch basins and traffic signal infrastructure.

Utility companies may opt to add infrastructure along the Ojibway Street extension and the new East-West Corridor between Edinborough Street and Northwood Street, which will be coordinated during detail design.

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9.5.8 Property Acquisition

The extension of Ojibway Street east of Alexandra will require property fronting along the existing woodlot approximately 10 m deep. This area is currently used as vehicular access to the lands to the east, and minimal vegetation impacts are required.

The revised intersection of South Cameron Boulevard and Northwood Street will require additional property within the southern quadrant of the existing intersection. The existing South Cameron Boulevard between Northwood Street and Dominion Avenue would be removed, and a multi-use trail incorporated into the right of way. The additional lands could then be utilized for landscape features, parkettes, or surplus as required to accommodate the future area development vision.

The lands under the CN Rail line will require negotiation for encroachment and a new crossing agreement developed to accommodate the recommended grade separated extension of Northwood Street to Dougall Avenue.

The connection of the Northwood Street extension between Dougall Avenue and Edinborough Street will require property acquisition. A detailed soils investigation and testing for contamination is recommended along the proposed alignment during detail design to confirm disposal and remediation requirements during detail design.

9.6 CIVIC WAYS RECOMMENDATIONS/GUIDELINES

These guidelines are intended to guide infrastructure improvements along the Civic Way corridors within the Central Box study area. This section outlines the recommended vision, themes, design goals and conceptual design improvements, key features and common design elements for Civic Ways within the Central Box study area. The following information was developed in consultation with the public, community stakeholders and the Project Team. Consideration was given for not only existing design elements within the study area, but throughout the City of Windsor. Future private realm improvements are encouraged to have regard for Civic Way design goals and overall recommendations.

9.6.1 Vision

Civic Way design will bring a sense of community to local residents and a feeling of welcome and arrival to visitors. These streetscapes will incorporate sustainable design principals, link the community to Windsor's cultural and natural heritage and identify the City as a place looking toward the future. The intent of Civic Way improvements is to provide a high quality aesthetic that will complement and enhance the functionality and enjoyment of these major transportation routes. The success of the Civic Ways will be achieved by establishing livable public spaces, identifiable landmarks and focal points and a human element.

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9.6.2 Themes

Various themes were considered through the consultation process that have local significance to Windsor's past and present. The Carolinian Forest and Tall Grass Prairie theme stood out and is consistent with the theme used for the Windsor Essex Parkway. There is a strong desire for sustainable and innovative features / elements to be incorporated in the design as well as elements that highlight Windsor's cultural heritage. The Civic Way Design Themes are as follows:

- Natural Heritage (Carolinian Forest and Tallgrass Prairies)
- Environmental Sustainability and Innovation
- Cultural Heritage (Rail / Automotive Industry) – minor theme illustrated through public art and industrial materials

9.6.3 Design Goals

To establish Dougall Avenue – Ouellette Place, Howard Avenue, and the E.C. Row Expressway within the study area as Civic Ways, the following design goals have been developed as a framework for the Civic Way Design Concepts.

CIVIC IMAGE

To create a welcoming, attractive, unifying and memorable image of Windsor that has regard for previously implemented Civic Way and urban design enhancements in the City of Windsor.

FUNCTIONALITY

To provide aesthetic improvements that do not affect the functionality of transportation routes and provide a high degree of visibility for drivers.

SCALE

To promote comfortable, defined pedestrian zones and provide amenities at an appropriate scale for both pedestrian and motorists.

NATURAL AND CULTURAL HERITAGE

To provide urban design elements that look toward the future while having regard for connections to the natural and cultural heritage of Windsor.

EMPHASIS

To enhance and emphasize distinct features, areas of interest, routes of travel and active transportation facilities.

SUSTAINABILITY



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To provide enhancements that make use of environmentally sustainable practices wherever possible.

SAFETY AND ACCESSIBILITY

To meet or exceed safety and accessibility standards.

COST

To have consideration for capital, operations and maintenance cost implications of design recommendations.

9.6.4 Design Concepts

Civic Way Design Concepts were developed for each of the significant roadway corridors based on the preferred transportation improvement alternatives identified in previous sections of this report, the opportunity and constraints analysis, and the vision, themes and goals listed above. It should be noted that the potential future east-west link across Dougall Avenue should also reflect the overall urban design recommendations provided in this document. Figures 9.3 through 9.5 show the design concepts for the three Civic Ways within the study area (Dougall Avenue, E.C. Row Expressway, and Howard Avenue), and Figure 9.6 outline the themes, goals, design elements, and plant pallet.

9.6.4.1 Key Design Features

The design concepts provide a vision for Civic Ways in the study area. Key design features are as follows:

Civic Nodes

Emphasis has been placed on the two locations where Civic Ways intersect within the study area. The locations include Howard Avenue and Dougall Avenue at the E.C. Row Expressway. It is recommended that the existing landscape feature at the Howard Avenue underpass be enhanced with hardy shrubs and perennials to replace existing astro-turf. The walls of the Dougall Avenue underpass should be enhanced with a decorative treatment consistent with the natural heritage theme. To further emphasis these Civic Nodes, the implementation of plaza entry features is recommended to provide a sense of welcome, a visual landmark, as well as a resting place along the multi-use trail. Consideration should be given to relocating the existing bus stop on Dougall Avenue to this plaza location.

Pocket Parks

Pocket parks will not only provide focal points and areas of interest along the roadways, but will provide resting places along the multi-use trail system. They also make use of urban space within the right-of-way that would normally be unused space. Howard Avenue at Division Road has been identified as a potential pocket park location within the study area. Pocket parks should

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be enhanced by low planting to provide separation from the roadway without blocking views and beautify the space. Low landscape walls, pedestrian lighting, decorative pavement and public art would further enhance the space.

Pedestrian Tunnel

The proposed pedestrian tunnel under the CN Rail line on Dougall Avenue provides a safe pedestrian / cycling connection along the route. The design of the tunnel should have consideration for user comfort and safety. Tunnel entrances and walls provide an opportunity to apply decorative / artistic treatments that add to the natural / cultural heritage theme on Dougall Avenue.

Decorative Median Islands

Median islands serve a functional purpose in roadway design, but also provide a unique opportunity to add to the vision of the streetscape. The existing median island design should be built upon and enhanced with consideration for durability and maintenance requirements. In areas that have adequate widths, require emphasis and / or controlled pedestrian crossing, it is recommended that a combination of decorative stainless steel cut-out panels and raised concrete planters be applied. A similar application / use of repetition without landscape curbs can be implemented in locations where the above conditions do not exist. In locations where widths do not allow for planting, the application of a decorative saw cut pattern in the coloured concrete paving should be considered.

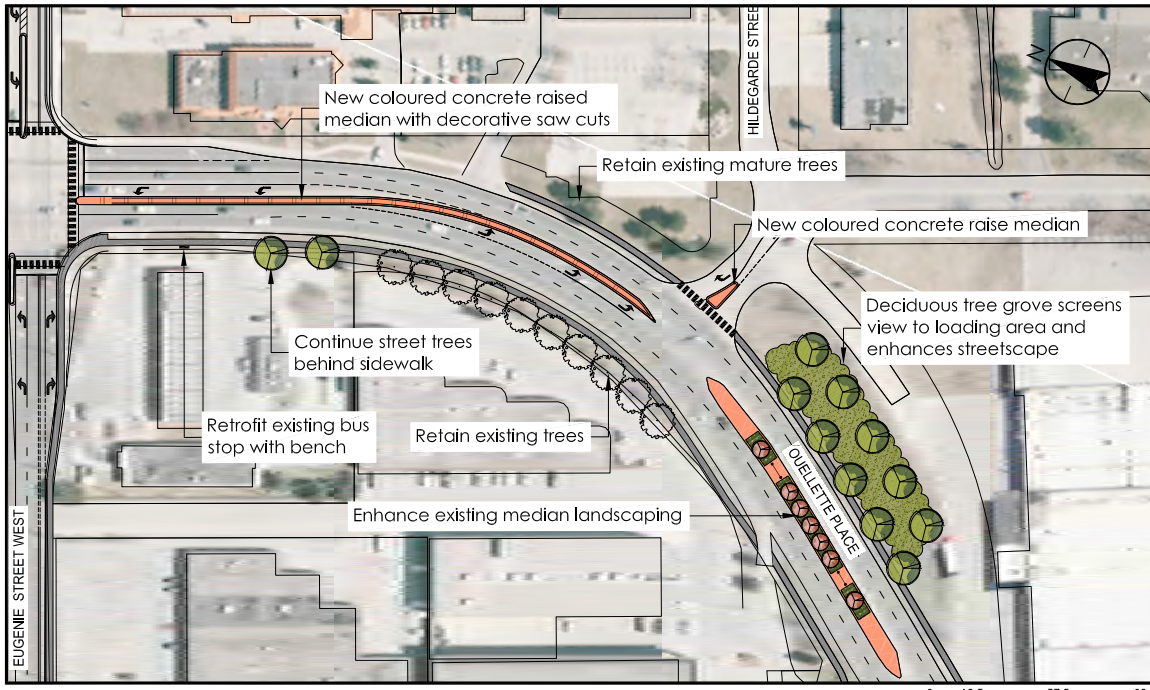
Multi-use Trails

Civic Way design should have regard for and support Active Transportation. Refer to Section 1.0 for recommendations relating to cycling routes and multi-use trails.

Street Trees and Landscaping

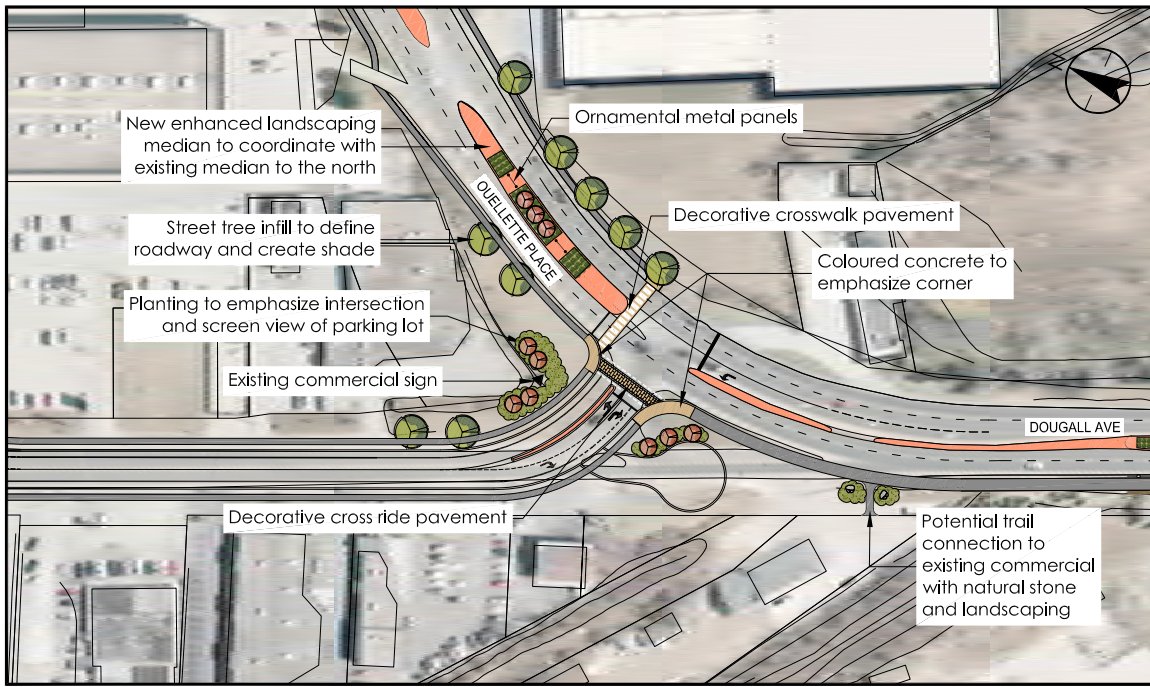
Implementing a consistent tree canopy and planting along Civic Ways is an important design feature. Trees soften urban environments, create continuity in the streetscape, provide shade, and combat air pollution. Planting of hardy, drought tolerant plant material should be implemented to highlight focal points and areas of interest, screen parking lots and offer seasonal interest. Native plant material should be implemented where possible. A common plant palette has been developed to provide guidance and create continuity.

Dougall - Ouellette Avenue Civic Way Improvements



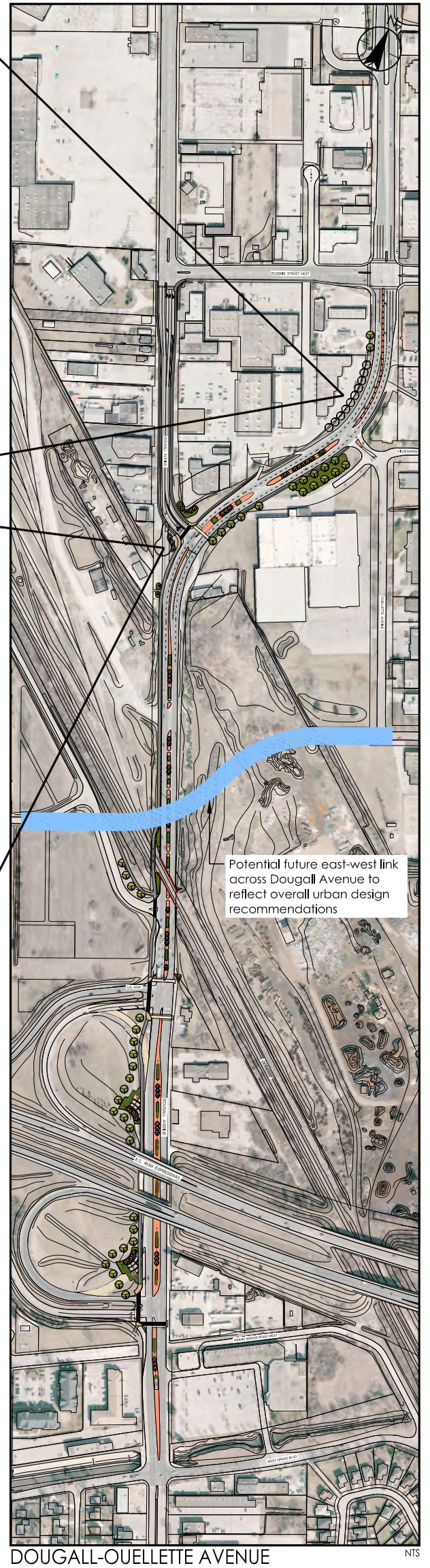
OUELLETTE AVENUE

0 12.5 37.5 62.5
1:1250



DOUGALL AVENUE AT OUELLETTE AVENUE

0 12.5 37.5 62.5
1:1250



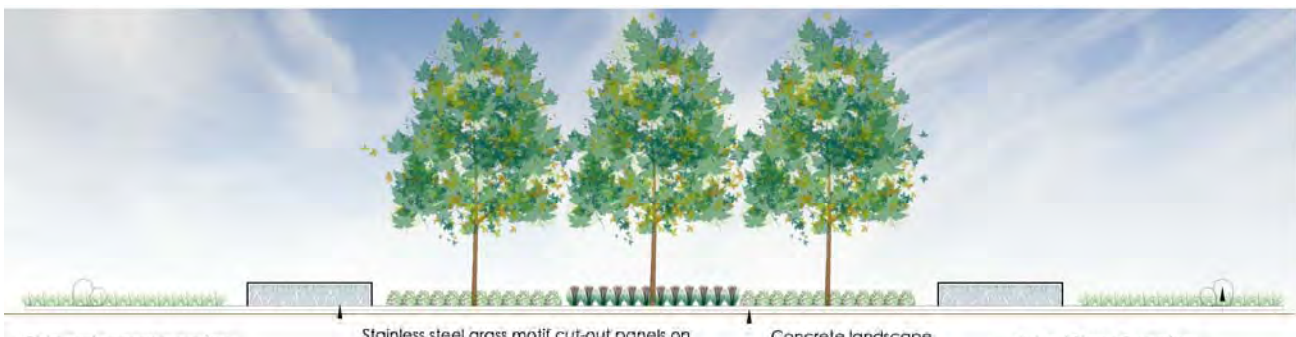
DOUGALL-OUELLETTE AVENUE

NTS



DECORATIVE MEDIAN ISLAND ELEVATION - OPTION 1

0 1.5 4.5 7.5
1:150

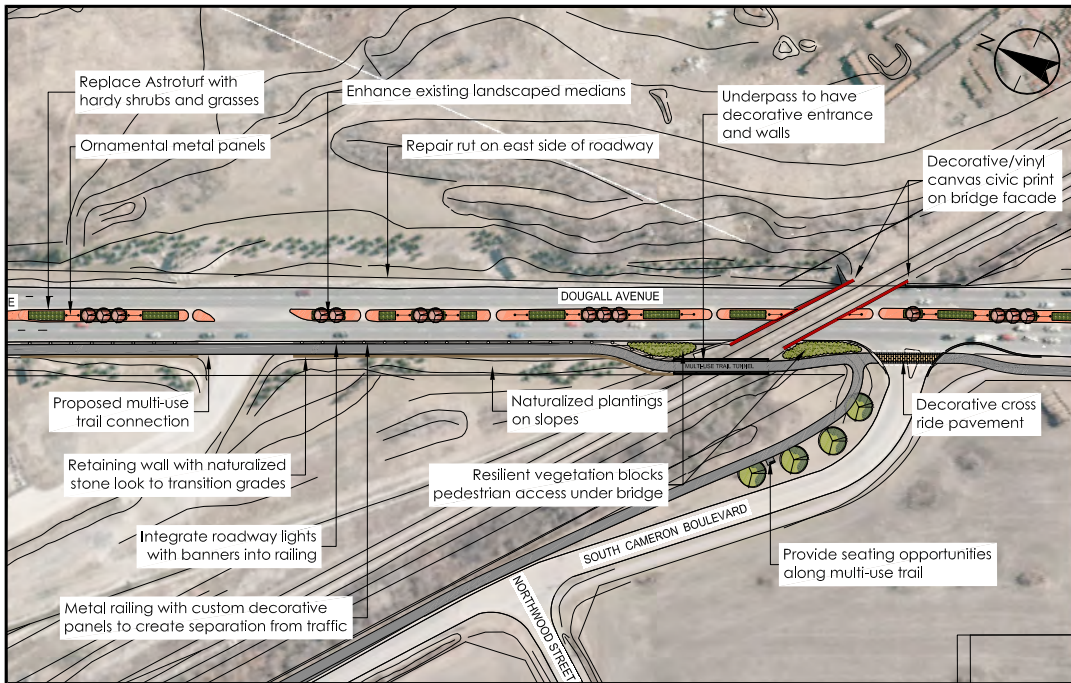


DECORATIVE MEDIAN ISLAND ELEVATION - OPTION 2

0 1.5 4.5 7.5
1:150

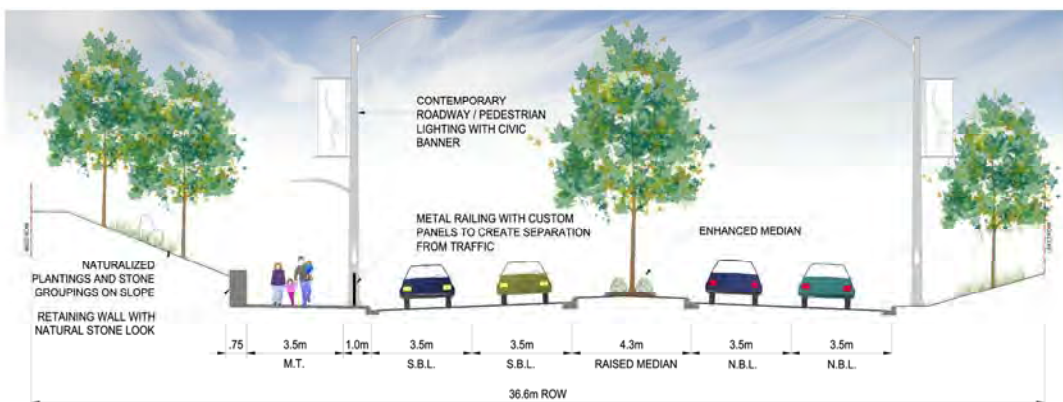
Figure 9.3 Dougall Avenue
Civic Way Improvements

Dougall - Ouellette Avenue Civic Way Improvements



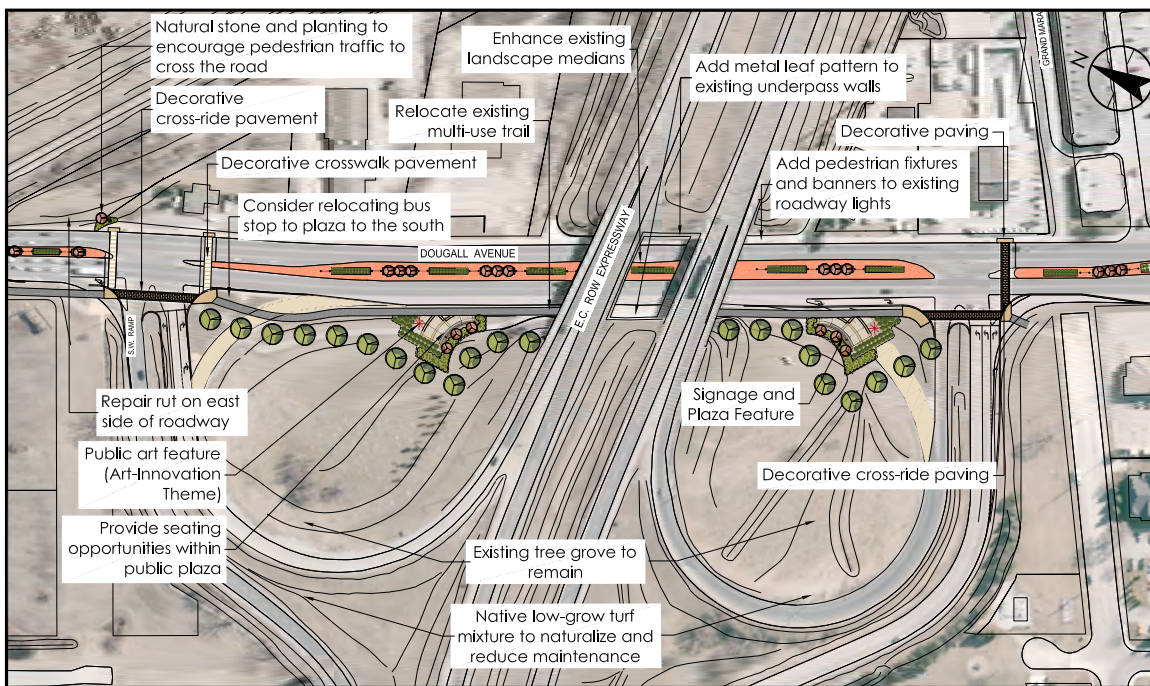
DOUGALL AVENUE AT CNR BRIDGE

0 15 45 75
1:1500



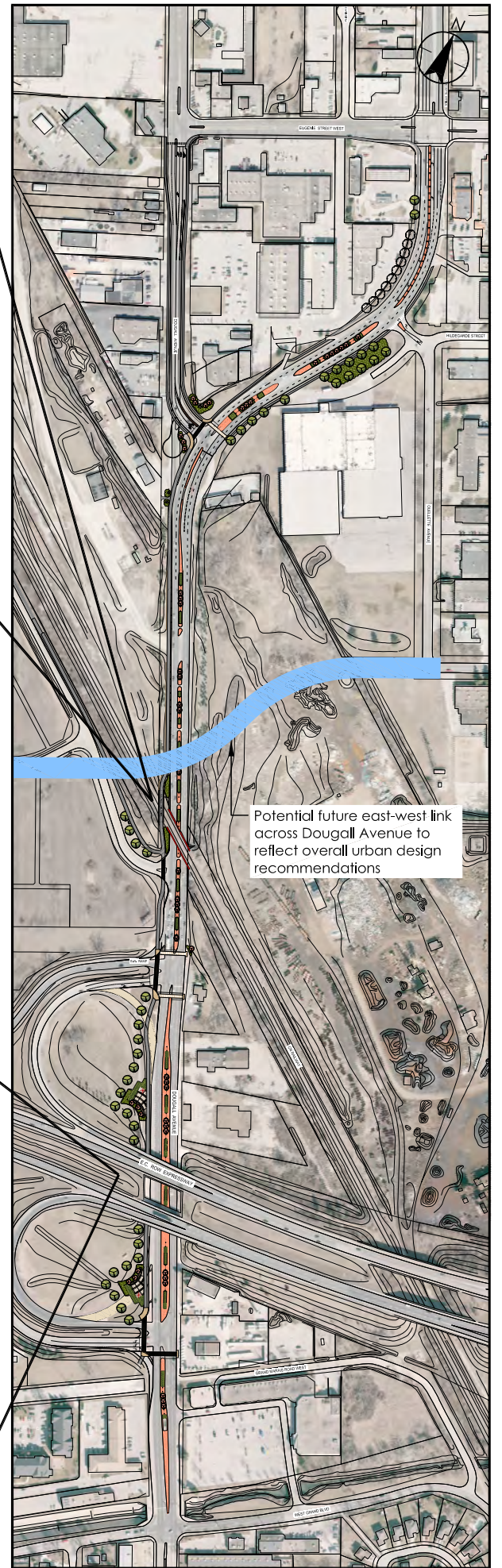
DOUGALL AVENUE AT CNR BRIDGE - CROSS SECTION

0 1.5 4.5 7.5
1:150



DOUGALL AVENUE AT E.C. ROW EXPRESSWAY

0 20 60 100
1:2000



DOUGALL-OUELLETTE AVENUE

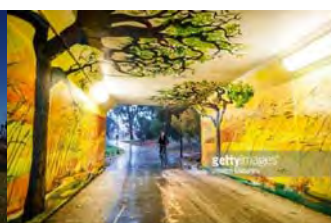
NTS



Decorative pedestrian tunnel entrances



Civic/historic message on bridge facade sign

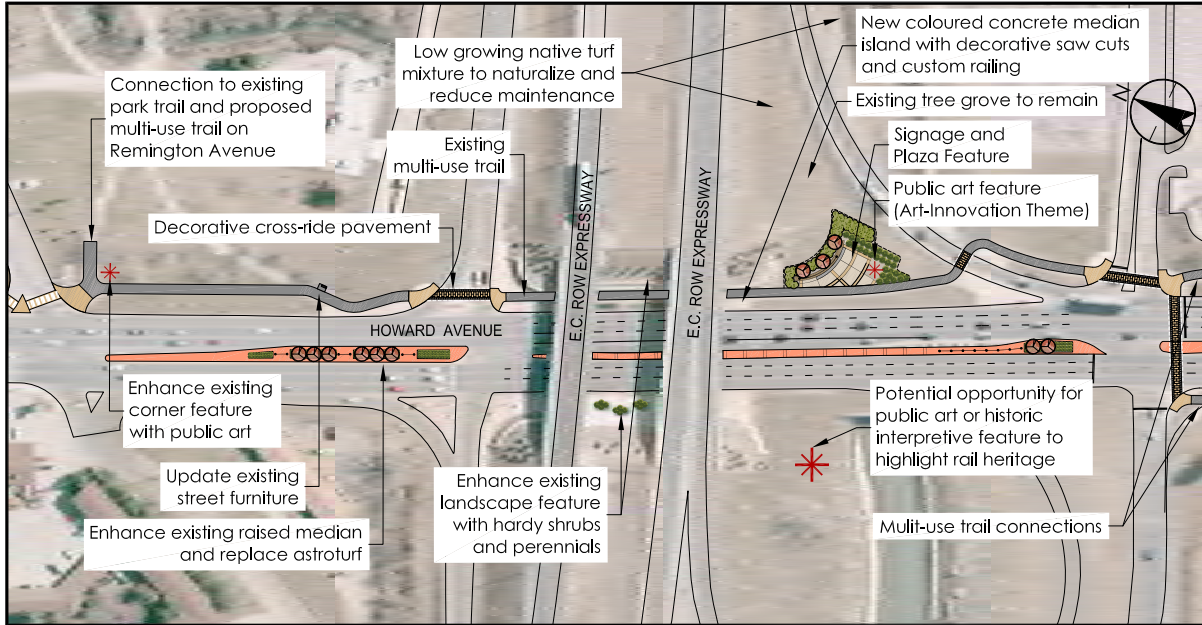


Decorative pedestrian tunnel treatments - potentially natural environment or cultural heritage themed

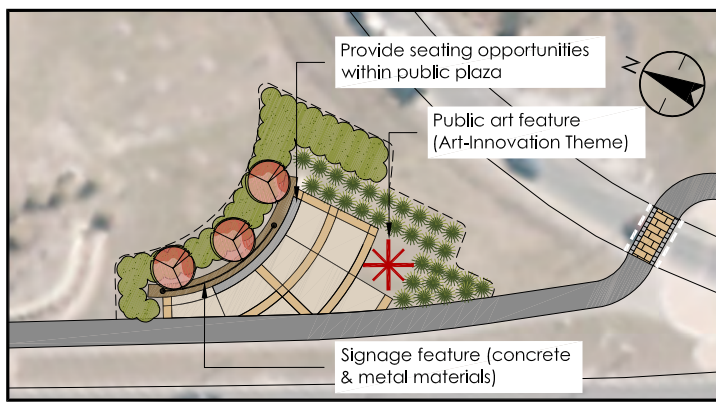


Figure 9.4 Dougall Avenue Civic Way Improvements

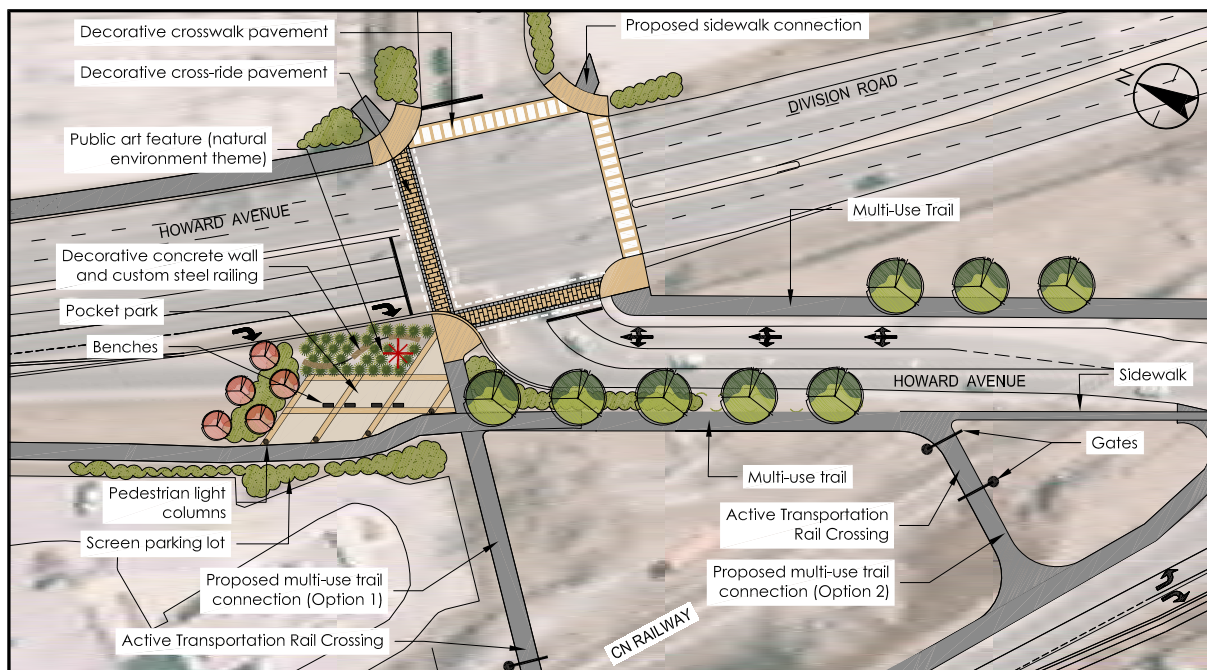
Howard Avenue Civic Way Improvements



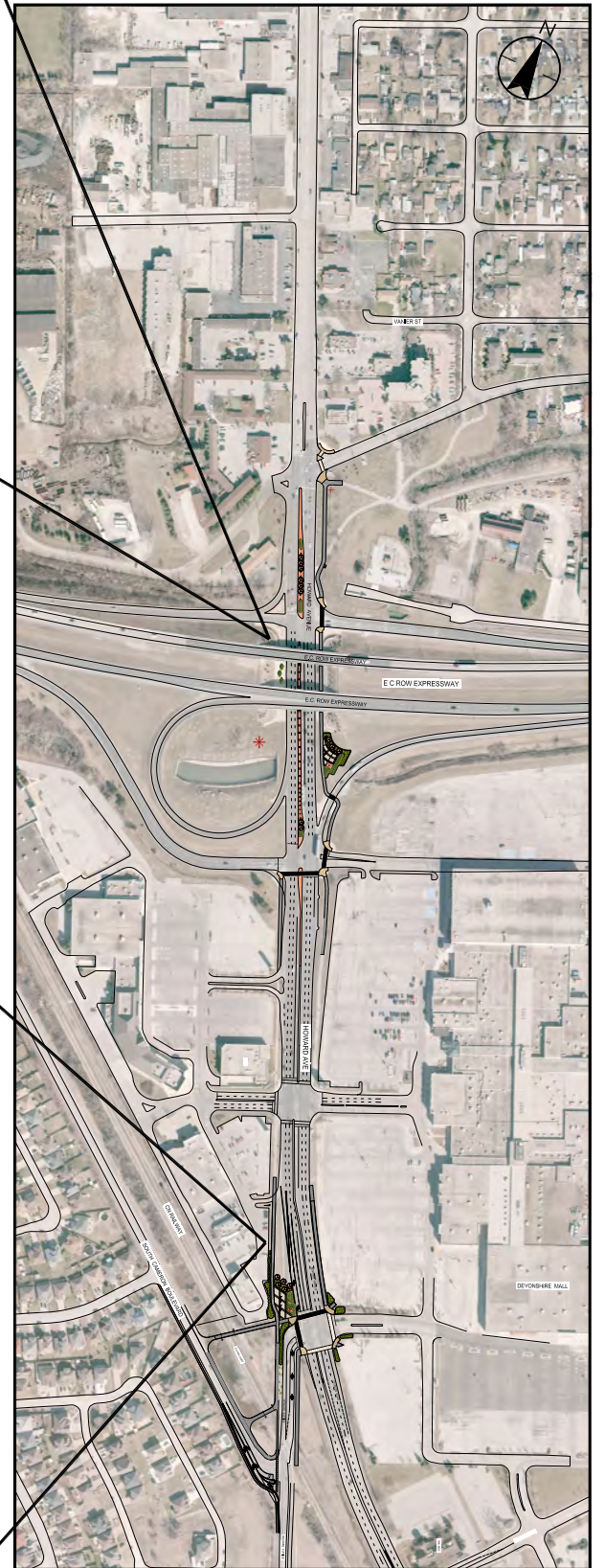
HOWARD AVENUE AT E.C. ROW EXPRESSWAY



SIGNAGE AND PLAZA FEATURE



HOWARD AVENUE AT DIVISION ROAD



HOWARD AVENUE

NTS



Signature entry walls on Dougall & Howard Avenue at E.C. Row Expressway



Solar



Wind



Wind

Environment and innovation themed public art feature for entry plazas



Decorative walls & mass plantings at Pocket Park



Natural environment themed public art as distinct features for Pocket Park



Raised concrete landscape median



Custom stainless steel railing panel



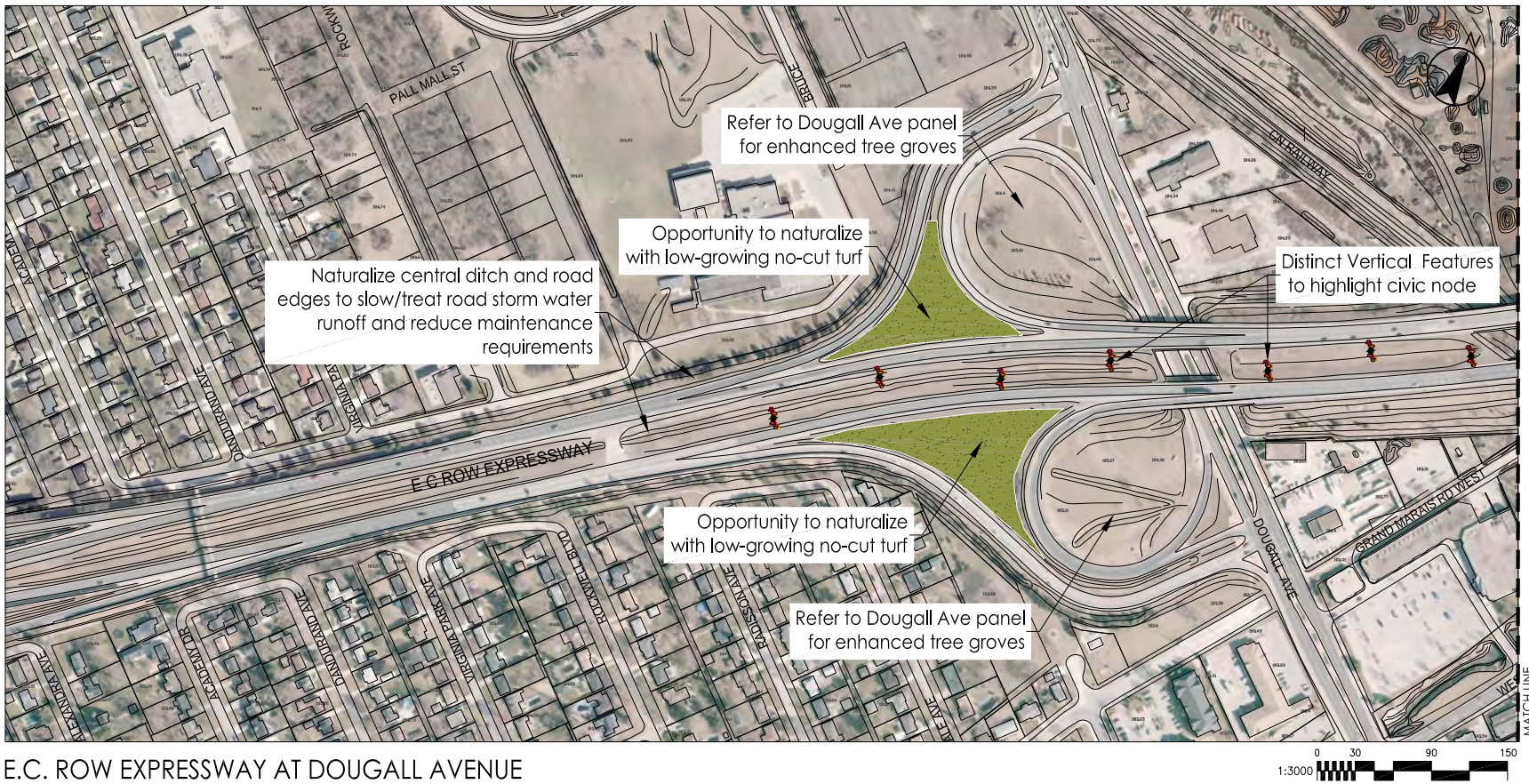
Existing Ouellette Avenue streetscape elements as inspiration



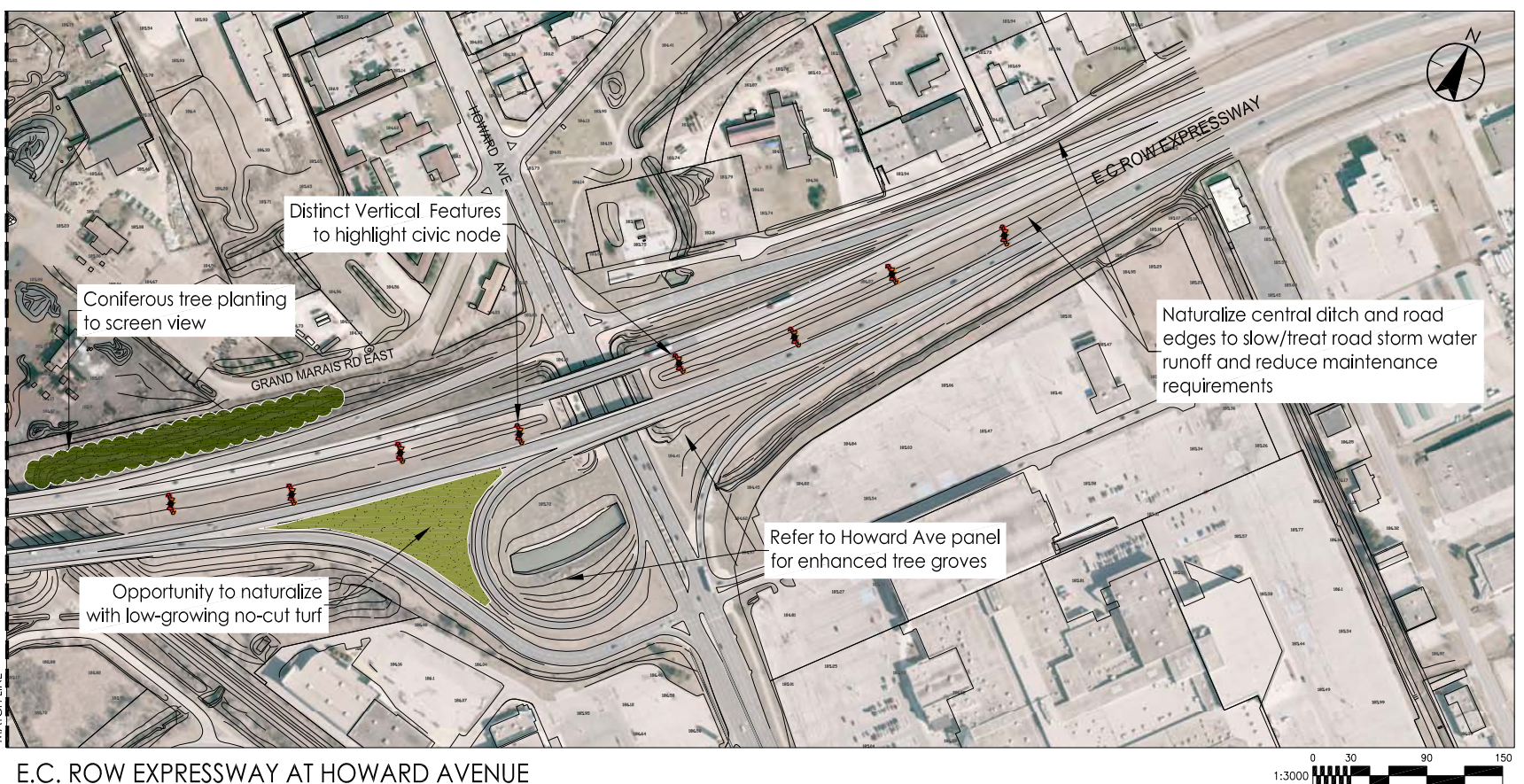
Decorative Light Column

Figure 9.5 Howard Avenue Civic Way Improvements

E.C. Row Expressway Civic Way Improvements



E.C. ROW EXPRESSWAY AT DOUGALL AVENUE



E.C. ROW EXPRESSWAY AT HOWARD AVENUE



Distinct natural environment public art feature as vertical element alternatives



Civic banner pole vertical alternative



LED pole vertical feature alternative



Naturalize with natives in open areas

Figure 9.6 E.C. Row Expressway Civic Way Improvements

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Recommended Design Alternatives

9.6.4.2 Common Design Elements

The intent of Civic Way design elements described in this section is to create a cohesive impression for Civic Ways using the design themes identified during the project, while having consideration for the local context and varying roadway conditions.

Site Furnishings

Benches, waste / recycling receptacles, railings, bollards and bus shelters should be standardized along Civic Ways within the study area to create visual unity and simplify maintenance requirements, while considering pedestrian comfort and accessibility.

- A group of street furniture should be selected which is consistent with the industrial and / or natural heritage and innovation themes;
- Street furniture should be complementary and consistent, and colours / materials should coordinate where possible;
- Local and / or Canadian-made furniture with recycled content, regionally-harvested materials, rapidly renewable materials or certified wood should be considered for its durability and application of sustainable practices;
- Street furniture should not conflict with pedestrian travel zones, or emergency, maintenance or snow removal vehicles and must be accessible to all users;
- Benches and trash / recycling receptacles should be located along the street at appropriate destination locations or areas of higher activity, i.e. transit stops;
- Benches should be placed at standard intervals along multi-use trails.

Lighting

Lighting affects the overall visual quality, usability and safety of a streetscape. Roadway lighting must be consistent with transportation and safety requirements. The style and type of lighting should reflect the Conceptual Civic Way Design and contribute to the goal of sustainable design.

- Lighting should be complementary and consistent, and colours / materials should coordinate with street furniture where possible;
- Full cut-off, night-sky friendly lighting should be used where possible to reduce light pollution;
- Selection of lighting should have consideration for energy efficiency (i.e. LED, solar), durability, quality of materials and resilience to Windsor's climate;
- Pedestrian scale lighting should be provided to highlight heavily used pedestrian connections, public spaces, where roadway lighting does not provide adequate lighting and where multi-use trails come in close proximity to roadways;
- Large banners that complement design themes should be implemented on all roadway light standards to provide interest and character to the streetscape;

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Recommended Design Alternatives

- Lighting receptacles should be implemented in areas recommended for seasonal light displays including median islands, Dougall Avenue and Howard Avenue signage / plaza features and E.C. Row Expressway tree groves;
- Distinct lighting should be considered as an option along the E.C. Row Expressway to highlight the Civic Nodes at Dougall Avenue and Howard Avenue.

Signage

Coordinated signage design along Civic Ways would provide an additional layer to the visual quality and distinctiveness of the streetscape. Consistent requirements for private commercial signage would provide a more attractive and uncluttered appearance.

- The design and implementation of custom, decorative street signs for Civic Ways would assist in their differentiation;
- Banners and interpretive signage should be incorporated along the streetscape to add visual interest and connect residents and visitors to unique features and history of the area;
- A coordinated wayfinding signage program should be put in place to help direct residents and visitors to distinct features, areas of interest and active transportation facilities;
- Decorative entry walls composed of industrial materials with a message consistent with the Civic Way theme should replace the existing signage located within the Civic Nodes (tree groves at the E.C. Row Expressway);
- Consideration should be given to incorporating signage with a civic or historic message on the Dougall CNR Bridge façade to improve the appearance;
- Distinctive civic banner poles should be considered as an option along the E.C. Row Expressway to highlight the Civic Nodes at Dougall Avenue and Howard Avenue;
- It is recommended that more stringent private signage (commercial signs, billboards) requirements be implemented for Civic Ways to improve roadway aesthetics.

Surface / Hardscape Design

The use of distinct paving materials in a streetscape not only helps to create an attractive, unifying visual image, but also provides traffic mitigation to improve safety for pedestrians and cyclists. Refer to Section 9.0 for recommendations regarding sidewalks, multi-use trails and bicycle lanes.

- The selection of paving materials should have consideration for aesthetics, safety, durability, ease of maintenance and cost;
- Hard surfaces must meet or exceed AODA and City of Windsor FADS requirements;
- Consistent, contrasting and textured paving materials should be used as shown in the Conceptual Civic Way Design to distinguish pedestrian and cycling routes for users and create driver awareness;

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- Median island paving should remain consistent and contrast with the roadway, but should also differ from paving used for pedestrian and cycling routes;
- Permeable pavement should be considered for public spaces where deemed functionally appropriate, i.e. pocket parks, entry plazas, to encourage sustainable stormwater management;
- Unique paving pattern within public spaces, such as pocket parks and entry plazas will differentiate the spaces from the public travel routes.

Street Trees

Trees along roadways help with traffic calming, assist in creating a desirable pedestrian environment, articulate the street edge, provide shade, and reduce water and air pollution. A continuous tree canopy along Civic Ways is an important component in establishing the Civic Way vision.

- Street trees should be implemented in accordance with City of Windsor standards wherever possible to articulate the street edge and provide shade;
- Where possible street trees should be placed between the roadway and the pedestrian route of travel to provide a physical barrier from traffic;
- Existing mature trees should be preserved;
- Tree species should be non-invasive, preferably native and tolerant to urban conditions;
- Trees should be implemented within decorative median islands along Civic Ways where space allows;
- Consideration for distinctive spring flowering and / or fall colour should be given during tree selection to enhance / highlight new infrastructure.

Landscaping

Planting has the ability to provide visual interest, reduce stormwater runoff and soften the appearance of hard surfaces. It is recommended that landscaping along Civic Ways use a planting palette to maintain consistency.

- Civic Way design should consider the incorporation of sustainable (low impact) stormwater management techniques such as rain gardens, bio-swales and infiltration areas;
- Low plantings should be used to screen parking lots located along the street frontage to reduce visual impacts and improve the pedestrian environment;
- Formal mass plantings should be used to highlight primary intersections, median islands, public spaces (pocket parks, plazas) and civic nodes;
- Naturalized plantings are encouraged to remain and be enhanced on berm slopes along Dougall Avenue at CNR;
- Tree groves at the Dougall Avenue and Howard Avenue E.C. Row Expressway interchanges should remain while accommodating new decorative entry wall and plaza;

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Recommended Design Alternatives

- The planting palette for Civic Ways (refer to Figure 9.6) should be used to guide plant selection to provide a cohesive impression, i.e. preferably native plants, seasonal interest, tolerant of the urban environment;
- Consideration should be given to naturalize E.C. Row Expressway roadsides with native low-grow no-cut turf to reduce to need for maintenance and slow / treat stormwater runoff;
- Coniferous tree planting to augment existing deciduous trees to further screening views into industrial lands along the E.C. Row Expressway should be considered;
- Maintain open views into and throughout pedestrian corridors when considering plant material selection.

Public Art

Although public art can be found throughout Windsor, it has not been incorporated within the Central Box study area to date. These design elements have the ability to inform the urban environment and infuse the community with character and interest. Community partnerships and design competitions should be considered for potential feature areas to create interest along the Civic Ways and tie in the themes identified through the consultation process.

- Public art should be located in order to act as an amenity for pedestrians and as points of interest for motorists along their route;
- Art should be original and meaningful to Windsor and the Central Box community;
- Dual purpose public art pieces are considered to be ideal, i.e. functional, interpretive, educational, interactive, historic, moveable;
- Permanent art pieces that highlight the Environmental Sustainability and Innovation Theme are recommended for the signage / entry plaza features on Dougall Avenue and Howard Avenue at the E.C. Row Expressway;
- Permanent / temporary public art pieces that highlight the Natural Heritage Theme are recommended for potential pocket parks located on Howard Avenue at Division Road and Dougall Avenue at Ouellette Avenue;
- Natural or Cultural Heritage Themed murals in the pedestrian tunnel on Dougall Avenue at the CNR should be considered;
- Natural Heritage Themed public art features should be considered as an option along the E.C. Row Expressway to highlight the Civic Nodes at Dougall Avenue and Howard Avenue;
- Funding partnerships with Federal, Provincial and Regional levels of government should be pursued for permanent public art pieces;
- Public art on municipal property shall be chosen in conjunction with the Windsor Public Art Advisory Committee and potentially the Creative Cities Initiative;
- Incorporate information plaque about art piece and artist.

Civic Way Design Elements

Street Furniture



Street Furnishing Family Alternative - Clean Lines Contemporary / Industrial

Street Furnishing Family Alternative - Curved Contemporary / Grass Motif

Lighting



High Efficiency LED Lighting Alternatives - Pedestrian and Roadway / Pedestrian Combination

Solar Lighting Alternative

Roadway Banners - Fabric or Metal

Holiday Lights Program - Expressway Tree Groves and Median Islands

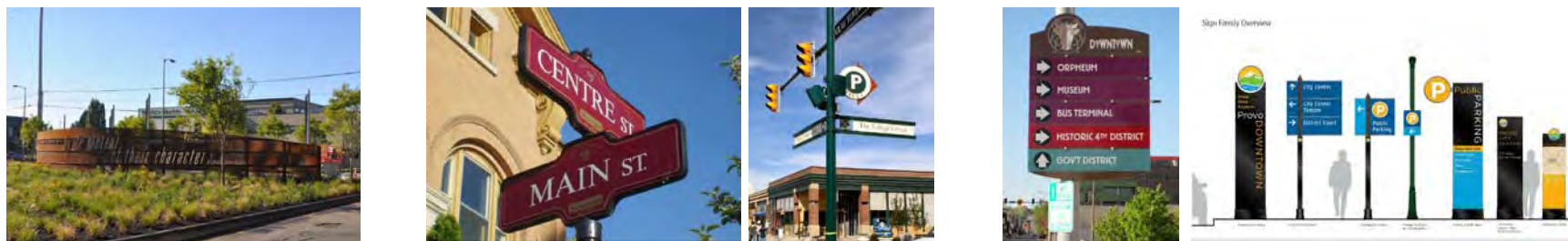
Paving Materials



Coloured / Textured Crosswalks and Crossrides at key intersections

Coloured concrete paving and tactile strips at key intersections

Signage



Decorative Entrance Sign Wall (Contemporary Materials)

Custom Street Signs to Complement Street Furniture

Coordinated Wayfinding Signage

Landscaping



Distinctive Spring Flowering / Fall Colour and Continuous Tree Canopy Coverage

Screen Parking Lots along road frontage with landscaping

Mass plantings to highlight primary intersections (use natives wherever possible)

Naturalized native road sides around Expressway

Plant Palette



Sycamore Red Bud Red Maple Serviceberry Bur Oak Hackberry Sumac Hawthorn Dogwood Viburnum Yew Switch Grass Reed Grass Black Eyed Susan Aster Coneflower

Figure 9.7 Civic Way Design Elements

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

9.6.4.3 Civic Way Implementation Recommendations

Providing Civic Way Design Guidelines in conjunction with recommendations for functional roadway improvements ensures that consideration is given to urban design early in the process. These urban design recommendations for Civic Ways can then be incorporated into future functional roadway improvements, when the opportunity presents itself and funding is available, in order to fulfill the requirements for Civic Way design stated in the Official Plan.

Partnerships

Residents and community stakeholders showed interest and excitement during the public consultation stage for Civic Way design recommendations within the Central Box. In the future, potential partnerships and/or involvement of local organizations (i.e. heritage, arts, horticulture, etc.) and institutions should be considered for future design and implementation of Civic Way design elements.

Sustainable Design

Sustainable Design was one of the main themes identified through the process and is part of the vision for the entire City of Windsor. Sustainable design practices and methods should be contemplated at the time of design and implementation of Central Box area streetscape improvements. Consideration should also be given to potential projects, which could incorporate sustainable project award programs such as the Envision™ Sustainable Infrastructure framework.

9.7 ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

9.7.1 Socio-Economic Environment and Property Acquisition

Potential property acquisition has been identified on several recommended designs. The extent of property that may be required for each of the proposed improvements will be determined during detail design. The City of Windsor Real Estate Services may undertake the City's standard procedures for the acquisition of property identified within this ESR, or property identified through detail design of the proposed improvements.

9.7.2 Cultural Environment

No impacts to Built Heritage resources have been identified as a result of the proposed improvements. For any urban design improvements that are implemented in conjunction with the recommended improvements, the guidelines found in Section 7.6 should be consulted, which were developed through the consultation process, taking into consideration the history and culture specific to the City of Windsor, and the neighbourhoods within which the improvements are identified.

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Recommended Design Alternatives

The Stage 1 archaeological assessment prepared as part of this ESR identifies several areas of archaeological potential, and provides recommendations for further study prior to any land disturbance (see Appendix D2, and Figure 3.2 above) which should be undertaken by an professional archaeologists registered with the Ontario Association of Professional Archaeologists, and the report should be submitted to the Ministry of Tourism, Culture, and Sport for review and registration. The following table summarizes the improvements that are subject to further archaeological study.

Table 9.1 Requirement for Additional Archaeological Surveys

Plate Reference/Improvement	Recommendation for Further Study (as per Plate #)
Plate 3/3B – Ojibway Extension	Test pitting at a 5m interval is required.
Plate 9 – New East-West Connection/Northwood Street Extension	Pedestrian Survey at a 5m interval is required.
Plate 11 – Howard Avenue, South Cameron Boulevard, and CN Rail intersection	No further study required for minor modifications to intersection configuration within right of way; for disturbance to areas outside of the right of way, south of the intersection between Howard Avenue and Division Road, test pitting at 5m intervals is recommended.

9.7.3 Natural Environment

In association with recommended improvements, the potential exists for indirect and direct environmental impacts on natural features that have been identified within the study area. Natural features were identified as part of this report, and potential impacts were identified and considered during the evaluation of alternatives. The following recommendations should be carried forward with respect to potential impacts to identified features associated with the recommended improvements.

9.7.3.1 General Wildlife and Vegetation Impacts and Associated Mitigation Measures

Although the majority of recommended improvements involve work within existing right of ways, and recommendations have been made for enhanced roadside vegetation, during construction the potential exists for adverse impacts to naturalized areas. In addition to the direct impacts to features identified below, the following table identifies typical construction impacts and mitigation measures that should be carried forward into detail design.

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Recommended Design Alternatives

Table 9.2 Mitigation Measures

Potential Impact	Typical Recommended Mitigation and Enhancement Measures
Terrestrial Habitats and Species	
Removal or disturbance of significant trees or ground flora	<ul style="list-style-type: none"> Relocate or replant any significant species in a timely manner following construction. Minimize tree removal during construction. Stabilize all disturbed areas upon completion of any grading works through re-vegetation of the disturbed areas utilizing native plant species (ex. seed and mulch, compost mix, tree and shrub planting).
Migratory Birds	<ul style="list-style-type: none"> Avoidance of vegetation removal and disturbance during the recommended May 1 to July 31 nesting period for southern Ontario (to be confirmed through consultation with the MNRF prior to construction). If construction is necessary, nest searches must be completed within three days of clearing.
Stress on biological communities	<ul style="list-style-type: none"> Avoid construction impacts during sensitive wildlife periods, such as breeding seasons for various bird species.
Introduction of invasive species through disturbance and material removal	<ul style="list-style-type: none"> Restore disturbed areas as soon as possible. Use only native species for all re-vegetation work. Monitoring plans should include invasive species. All soils removed from the project site containing invasive species material to be dealt with in a manner to prevent spreading to a new area; Construction equipment should be cleaned prior to entering and exiting the construction site to prevent the transference of seed material.
Interference with ecological corridors and linkages	<ul style="list-style-type: none"> Minimize vegetation disturbance in grassland areas to ensure habitat protection.

9.7.3.2 Direct Impacts - Ojibway Street Extension

Butler's Gartersnake SAR

Recent records within the Natural Heritage Information Centre (NHIC) administered by the Ministry of Natural Resources and Forestry indicated the potential for the presence of Butler's Gartersnake in the vicinity of the Ojibway Street extension, identified under the East-West Corridor improvements. Initial review has indicated that potential habitat occurs in the vicinity of the road extension. Prior to detail design, coverboard surveys may be required in consultation with the Ontario Ministry of Natural Resources and Forestry (MNRF). A permit under Section 17 (2)(b) of the ESA may be required prior to conducting surveys.

CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Recommended Design Alternatives

Detailed mitigation measures will be determined during detail design based on results of the coverboard surveys and consultation with the MNRF. The following represent general construction mitigation and avoidance measures that should be followed in respect to the Ojibway Street extension and Butler's Gartersnakes:

- All onsite personnel shall be made aware of the potential for Butler's Gartersnake individuals and habitat, an information fact sheet will form part of the project mobilization meeting and be available to all workers;
- If a Butler's Gartersnake is observed within the workspace, all machinery and equipment shall maintain an operating distance of 30m from the individual;
- In the event that a Butler's Gartersnake may enter the work area, it will be left to disperse from the area on its own ability; and
- If an injured or deceased Butler's Gartersnake is found, the specimen shall be placed in a non-airtight container maintained at an appropriate temperature and MNRF Species at Risk Staff will be contacted immediately.

Exclusionary Fencing

Exclusionary fencing should be installed to close off the construction area to prevent movement of Butler's Gartersnake into these areas. Fencing should adhere to the following specifications (based on MNRF Species at Risk Branch Reptile and Amphibian Exclusion Fencing Best Practices, 2013), to be confirmed through consultation with the MNRF:

- Fencing should be comprised of a light-duty geotextile affixed to wooden stakes that are located on the inside of the work space;
- Fencing should extend to 10-20 cm below ground to a height of 6-10 cm to increase effectiveness of excluding snakes;
- Where root substrate does not allow fencing to be buried to a depth of 10-15 cm, fencing will be weighted through physical means such as gravel or sand placed on top of the lower portion of the fencing;
- Fencing should be maintained during construction, or until Butler's Gartersnake have returned to their hibernacula, dependent on fall temperatures;
- Daily monitoring of exclusion fencing, equipment and activities during construction;
- Fencing shall be removed after construction and clean-up is completed;

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Recommended Design Alternatives

9.7.3.3 Ojibway Street Extension and New East-West Connection

Dense Blazing Star – SAR

NHIC records indicate the potential for Dense Blazing Star, listed as Threatened on the Species at Risk in Ontario list, in the vicinity of the Ojibway Street Extension and the new East-West Connection (Northwood Street Extension). Prior to detail design, targeted SAR surveys for Dense Blazing Star should be conducted during the flowering season prior to detail design, in consultation with the MNRF. A permit under Section 17 (2)(b) of the ESA may be required prior to conducting surveys.

Detailed mitigation and compensation plans should be developed based on the results of field surveys, and through consultation with the MNRF. Typically, these mitigation plans may include transplant of any species identified through the targeted SAR surveys.

9.8 ABORIGINAL CONSULTATION

The Consultation Plan undertaken as part of this study is discussed in Section 1.6 above, and the TRACER table outlining communications with Aboriginal and First Nations Communities is included in Appendix A4.

A meeting was held with Stantec Project Manager Michael Mastronardi, and Assistant Project Manager Tina Hawco and Chief Hillier and Brent Ryan-Lewis, Director of Operations, on March 15th, 2016. Meeting minutes are included in Appendix A4.

Chief Hillier and Brent Ryan-Lewis of Caldwell First Nation requested that provisions for the prevention of the establishment of invasive species during construction be included in the ESR, including the restoration of disturbed soil immediately with native plants and grasses, as well as the cleaning of equipment prior to entering and exiting construction sites (included in Table 9.2 above). A request was also made for the completion of an archaeological assessment for projects located within areas of archaeological potential (identified in Table 9.1 above).

9.9 PERMITS AND APPROVALS

The following permits may be required for works outlined in the above recommendations:

- A Permit to Take Water (PTTW) or registration with the Environmental Activity and Sector Registry (EASR) may be required through the Ministry of the Environment and Climate Change for some major and minor road construction (dewatering between 50,000-400,000 l/d, surface water taking for dust suppression, seeding material preparation, etc.). See O. Reg. 63/16 under Part II.2 of the *Environmental Protection Act – Water Taking*.

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Recommended Design Alternatives

- A permit is required under the *Endangered Species Act* (issued by the Ministry of Natural Resources and Forestry) for any activities that may impact the habitat or individual species listed on the Species at Risk in Ontario List as endangered or threatened.
- A permit under Section 28 of the *Conservation Authorities Act* (issued by the Essex Region Conservation Authority) may be required for any works located within or adjacent to Conservation Authority Regulated Land.
- An Environmental Compliance Approval (ECA) and/or Certificate of Approval may be required for works related to the air, noise, or sewage discharges, including modifications to stormwater drainage systems.

**CENTRAL BOX STUDY AREA
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Implementation Considerations

10.0 IMPLEMENTATION CONSIDERATIONS

10.1 PHASING, IMPLEMENTATION AND OPINION OF PROBABLE COST

The Recommended Strategy proposes improvements that will benefit the City of Windsor by providing a more versatile traffic network and promoting active transportation within the community.

It was noted that several intersections would not be able to efficiently accommodate the forecasted traffic volumes, and this is based on a marginal increase in traffic volumes being anticipated throughout the network over the next 20 years. This concludes that the benefits from the Recommended Strategy would also be recognized in the short term based on the existing traffic operations, and planning should be considered in the short term.

The majority of the improvements recommended can move forward into the design phase for implementation once funding is available, and could be implemented in a 2-4 year timeframe. Certain improvements should be implemented either in conjunction with or in a certain sequence with other improvements, and these are noted in the following table, along with an opinion of probable cost.

It is recommended that the improvements to the **Dougall Avenue – Ouellette Place intersection** be made a priority to reduce the historical collision frequency at the intersection. It is also recommended that **the new East-West Connection be made a priority** to improve network connectivity throughout the Central Box study area, as the operations of the individual improvements take into account the redistribution of traffic from this new connection.

The estimates below are considered Class 4 (other definitions: Class IV, Level 2, Class C) estimates, generally referred to as preliminary, feasibility, schematic design, predesign, authorization or basic system cost opinions. It is used for detailed planning, evaluation of alternatives, confirmation of economic viability, preliminary budget approval, and cash flow projects. The actual final costs of the projects will be determined through the bidding and construction process. The cost opinion is based on elemental units using historical costs, standard estimate references, and historical data from similar projects. Property acquisition values and CN rail crossing agreements have not been included in the costs below.

Costs associated with environmental remediation have not been included in the estimates below.

Table 10.1 Dominion Boulevard

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Northwood Street to Ojibway Street	Three lane reconstruction and widening, urban cross section with sewers, utilities, illumination, sidewalks	Urbanization and widening of Northwood Avenue could be completed independent of the Northwood Street intersection improvements and the local road connection.	\$2,700,000
Connection between Dominion Boulevard and Alexandra Avenue	Local road between Dominion and Longfellow, multi-use trail between dominion and Alexandra, extension of Alexandra, storm and sanitary sewers, illumination, watermain extension	Project can be implemented separately from other corridor improvements. An alternative to construct multi-use trail as standalone is also viable.	\$750,000
Northwood Street to West Grand Boulevard	Reconstruction and widening to include intersection improvements, new bicycle lanes and widened sidewalks, storm sewers, utility relocations, illumination	Project recommended to be combined with or proceed following the Labelle Street improvements for continuity.	\$2,400,000
Intersection improvements at Northwood Street	Widening for new and lengthened turning lanes, radii improvements, improved pedestrian and bicycle crossing, utility relocation, illumination, new traffic signals	Project should be implemented prior to the Northwood extension.	\$1,200,000
Intersection improvements at Labelle Street	Reconstruction and widening for new turning lanes, radii improvements, improved pedestrian and bicycle crossing, storm sewers, utility relocation, illumination, new traffic signals	Project should be done ahead of the Northwood Street to West Grand Boulevard improvements or combined with those improvements.	\$750,000
Corridor Subtotal			\$7,800,000.00

Table 10.2 Dougall Avenue Corridor – Ouellette Avenue Corridor

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Ouellette Avenue from Eugenie Street	Median, sidewalks, Ouellette Avenue / Ouellette Place intersection	The Ouellette Avenue / Ouellette Place intersection component needs to be	\$275,000



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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
West to Dougall Avenue		completed following the Northwood Street extension to Edinborough Street	
Dougall Avenue between Eugenie Street West and Ouellette Place	Widening to include bicycle lanes, barrier curbs and sidewalks, illumination.	Project recommended following or can be incorporated with the Dougall Avenue / Ouellette Place intersection improvements to reduce reconstruction costs at the intersection.	\$700,000
Dougall Avenue / Ouellette Place intersection improvements	New traffic signals, revised turning lanes on Dougall Avenue, new entrance reconfiguration, reconstruct median on Ouellette Place, illumination, incorporation of multi-use trail and sidewalks	Project can be incorporated with the Dougall Avenue widening to Eugenie Street to provide full connection of the active transportation network. Should be incorporated prior to sidewalks along Ouellette Place and Ouellette Avenue to provide controlled crossing.	\$500,000
Dougall Avenue between Ouellette Place and South Cameron Boulevard	Multi-use trail and tunnel under CN Rail, multi-use trail along South Cameron Boulevard to Northwood Street, illumination, utilities	Project implementation to be coordinated with the Northwood Street extension works. Should the Northwood Street extension be completed prior to this project, the tunnel may not be required and the active transportation network can be readjusted using the extension tunnel as the corridor's active transportation crossing of the CN Rail line.	\$5,300,000
E.C. ROW Expressway ramp improvements	Intersection at South Cameron Boulevard radius reconstruction, remove island, ramp widening and removals, multi-use trail, pedestrian crossings, illumination, new traffic signals at both ramp terminals	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$1,100,000

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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Dougall Avenue from the E.C. Row Expressway south ramp terminal to south of Grand Marais Road	Extend median on Dougall Avenue south of Grand Marais Road, reconstruct W-S E.C. Row Expressway Ramp, construct sidewalk, and provide illumination.	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$130,000
Corridor Subtotal			\$8,005,000.00

Table 10.3 Howard Avenue

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Remington Avenue	Add bicycle lanes and sidewalks, minor storm sewer work, illumination, utilities	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$1,600,000
E.C. ROW Expressway	Remove channelized right turn at the E-N/S and W-N/S ramp, partially remove median on Howard Avenue to extend northbound left turn lane at the north ramp terminal, include pedestrian signals at south ramp terminal and add pavement markings and signage	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$150,000
Howard Avenue / Division Road / South Cameron Boulevard intersection reconstruction	Traffic signal reconstruction, removal of channelized right turn lane, multi-use trails including east side of Howards Avenue northerly to Devonshire/Roundhouse access, new CN Rail crossing (on Howard and a new multi-use trail crossing), multi-use trail and sidewalk along South Cameron Boulevard, Howard Avenue / South Cameron Boulevard intersection, storm sewers,	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution. Discussions with CN regarding crossing agreements and property must be undertaken during detail design which could influence the implementation schedule.	\$1,500,000

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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
	illumination		
Corridor Subtotal			\$3,250,000.00

Table 10.4 East-West Corridor

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Ojibway extension from Dominion Boulevard to South Cameron Boulevard	Widening of Ojibway between Dominion Boulevard and Alexandra Avenue, new roadway between Alexandra Avenue and South Cameron Boulevard, illumination, storm sewers, sidewalks	Extension should be implemented in advance of the Northwood Street extension to Dougall Avenue in order to help alleviate the increase in traffic volumes on Northwood Street.	\$1,900,000
Northwood Street extension to Dougall Avenue	New road alignment, traffic signals, Dougall avenue intersection with left turn lanes, tunnel, storm sewers, illumination, removal of South Cameron Boulevard, multi-use trails	Construct left turn lane for Edinborough but paint as median if done independently from the Edinborough Street extension. Multi-use trail along Dougall Avenue with tunnel may not be required if this moves forward first.	\$21,000,000
Edinborough Street extension to Dougall Avenue	New road construction (includes tie into to signals and new intersection work included in Northwood extension), illumination, storm sewers	Extension would ideally be incorporated with the Northwood Street extension. If property negotiations and/or environmental reviews require additional scheduling, the improvements could potentially follow the Northwood Street extension improvements.	\$1,400,000
Edinborough multi-use trail connection	Multi-use trail on the south side of Edinborough Street from Ouellette Avenue to Remington	This project would ideally be incorporated within the Edinborough Extension to	\$1,200,000

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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
	Street. Includes utilities, illumination, stormwater improvements, and full road reconstruction.	Dougall Avenue, but could be constructed independently.	
Eugenie Street from Dougall Avenue to Remington Avenue	Widen road to incorporate bicycle lanes and sidewalks, new left turn lanes at McDougall Avenue intersection, intersection improvements with traffic signal reconstruction, illumination, utility relocations	Project can be implemented separately or in conjunction with any of the other component of the Recommended Solution.	\$3,500,000
Corridor Subtotal			\$29,000,000.00

10.1.1 Civic Way Cost Estimates and Implementation

The cost opinion below is based on the improvements shown on the Civic Way design panels presented at PIC 2 (provided in Appendix A8) and reflect current pricing from similar projects. Improvements related to the CN Railway bridge façade signage, street and way-finding signage and transit stop improvements have not been included in the costs below. Cost opinion for lighting and banners are included within the specific roadway improvements. Costs are considered conceptual, and actual final costs of the projects will be determined through the bidding and construction process.

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Dougall - Ouellette Avenue	Upgrades to median islands, parkette at Dougall Avenue and Ouellette Place, decorative treatments at CN Rail tunnel, signage and plaza features and decorative wall treatment at the E.C. Row Expressway, public art, decorative crosswalk and cross ride pavement, and boulevard planting.	Project can be implemented in stages, in conjunction with various roadway improvements.	\$1,800,000

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Implementation Considerations

Improvement	Scope	Implementation Considerations	Cost (excludes contingency & engineering)
Howard Avenue	Upgrades to median islands, parkette at Howard Avenue and Division Road, signage and plaza feature and planting at the E.C. Row Expressway, improvements at Howard Park, public art, decorative crosswalk and cross ride pavement, and boulevard planting.	Project can be implemented in stages, in conjunction with various roadway improvements.	\$850,000
E.C. Row Expressway	Naturalization of ditches and roadway edges at Dougall Avenue and Howard Avenue interchanges, distinct vertical features and tree planting.	Project can be implemented in conjunction with roadway improvements or as a stand-alone project.	\$450,000

10.1.2 Total Project Estimate

Based on the above cost estimates which do not include property acquisition or environmental remediation, the total cost estimate for all four corridors including the Civic Ways elements is \$51,155,000.

10.1.3 Official Plan Integration

As part of the Recommended Strategy for the Dominion Boulevard corridor, Dominion Boulevard from Northwood Street to Ojibway Street may be reclassified as a Class I Collector, consistent with the classification of Dominion Boulevard to the south of Northwood Street. Similarly, Alexandra Avenue may be reclassified as a Local Road. It is also recommended that the left turn restriction for trucks accessing the E.C. Row Expressway on Dougall Avenue be removed from the City of Windsor’s Truck Route Map.

10.1.4 Monitoring and Maintenance

The following section outlines ongoing maintenance and monitoring commitments as identified through the study. The recommendations for further investigation including archaeological surveys and Species at Risk confirmation should be carried forward into detail design and written into contract documents.



CENTRAL BOX STUDY AREA SCHEDULE C MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

Implementation Considerations

10.1.4.1 Transportation

Operational analyses and review of the transportation network within the Central Box area will be regularly conducted by City staff. The following locations should be flagged for potential traffic signal warrants:

- Dominion Boulevard at Ojibway Street– current and forecasted traffic volumes do not meet traffic signal warrants at this location; however, operations should be regularly reviewed for signalization warrants in terms of volumes and safety of operations.
- Dominion Boulevard at New Local Road – current and forecasted traffic volumes do not meet traffic signal warrants at this location; however, operations should be regularly reviewed for signalization warrants in terms of volumes and safety of operations.

10.1.4.2 Environmental Impacts

To provide environmental protection and compliance with applicable regulations, specific monitoring requirements should be undertaken which are suitable to the sensitivity of the surrounding environment and scale of the project. Monitoring of environmental impacts and the effectiveness of any mitigation measures implemented as part of this project should consider the following:

- During detail design, environmental constraints should be identified and specific attention paid to timing restrictions and reporting requirements, and conveyed appropriately to designers, contract administrators, and contractors;
- High risk or particularly sensitive areas should be identified on the construction drawings and routinely evaluated. Greater frequency of inspection may be required for protection measures adjacent to soil stockpiles, protection feature areas (such as habitat for Species at Risk), and locations where potential run off may discharge to water courses.
- Regular inspections should occur during all construction stages and should be based on the requirements identified in the permits and approvals obtained during detail design;
- During inactive construction periods where the site is left along for 30 days or longer, a monthly inspection should be conducted;
- A site inspection should be undertaken following completion of all restoration work to ensure construction has been implemented satisfactorily.

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Municipal Class EA ESR Filing Procedure

11.0 MUNICIPAL CLASS EA ESR FILING PROCEDURE

The Environmental Study Report (ESR) was presented to the City of Windsor Council at their meeting on July 18, 2016. Following a Council Resolution acknowledging receiving the report and instructing that the report be tabled for the 30-day Review Period, the Notice of Completion was published in the Windsor Star Newspaper on July 20th, 2016 and July 23rd, 2016. As well, the draft Environmental Study Report was placed on public record for the mandatory 30-day review period beginning on Monday, July 25th, 2016 at Windsor City Hall (350 City Hall Square W., 2nd Floor); City of Windsor Library, Central Branch (850 Ouellette Avenue); the Public Works – Operations location (1266 McDougall Street), and Stantec Consulting Ltd. (#100-140 Ouellette Place). The Notice of Completion was also mailed/and emailed out to each of the previously identified review agencies, special interest groups, and interested persons. This Notice is included in Appendix A10 and outlined the project's completion, provided an overview of the recommendations, the thirty-day review period and the right to request the Minister of the Environment and Climate Change (MOECC) to issue an Order to Comply with Part II of the EA Act.

Comments and/or concerns were to be submitted to the City of Windsor within the 30-day public review period ending August 25th, 2016. Anyone who had outstanding concerns may have requested the Minister of the Environment and Climate Change to issue an Order to Comply with Part II of the EA Act within the 30-day review period, if the concern cannot be addressed (as outlined in Section 1.2.3 of this ESR). The work undertaken in preparing this report represents the completion of the Municipal Class EA Process for the Central Box Study Area. No Part II order requests were received by the MOECC within the stipulated timeframe. The Final Central Box Study Area Environmental Study Report was finalized (including documenting the correspondence received and responded to during the 30-day review period- in Appendix 10) and issued under date of January 27th 2017.