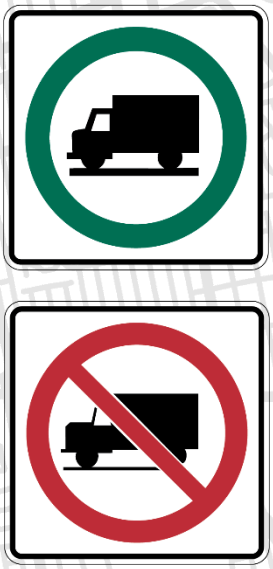
THE CITY OF WINDSOR
ONTARIO, CANADA



Draft Report

Phase 1: Needs and Opportunities

City of Windsor
Truck Route Study

Date
April 4, 2024

Prepared for
The City of Windsor

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ARCADIS

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1. Introduction

The City of Windsor ("the City") has embarked on a Truck Route Study to review and update its truck route network, addressing the changing context, needs and priorities in Windsor.

The study will recommend an updated truck route network that better meets the needs of both residents and stakeholders, ensuring that goods can be moved efficiently and safely to support economic activity and provide essential and valuable services, while also minimizing or managing the negative impacts of goods movement to provide a good quality of life for the community. Given recent and planned changes to the City's land use, including new industrial areas and new residential development, there is a need to ensure that the City's truck route network appropriately serves both current and future conditions.

In developing the most suitable truck route network for the City of Windsor and determining the most appropriate truck route treatments, the study must address the varied and often competing perspectives of the private sector, residential communities and other citizen groups with respect to goods movement and heavy vehicle traffic, while also aligning with the City's other transportation, land use, climate emergency, economic development, safety and fiscal goals.

1.1. Report Purpose

This report presents a summary of relevant context and background information to inform the Truck Route Study, documents draft truck route network principles, objectives and related criteria that will serve as the basis for assessing candidate truck route network segments and networks, and outlines needs and opportunities related to truck movements in the City of Windsor.

The report is informed by the first round of engagement of the study, which aimed to gain a comprehensive understanding of needs, concerns and opportunities related to the truck route network in the City of Windsor.

1.2. Report Structure

Following this introduction, which also contains a study overview, this document is structured as follows:

- Section 2 outlines the current truck route network in the City of Windsor and the regulations governing the network, and describes variations of municipal truck route network treatments in selected other municipalities;
- Section 3 presents an overview of trucking activity in Windsor such as current truck volumes on Windsor roadways, and describes the socio-economic context that drives trucking activity;
- Section 4 provides an overview of the Windsor transportation networks to inform truck route network development, with a focus on the road network but also describing networks for other modes transportation modes that interact with and need to be considered in truck network development;
- Section 5 summarizes relevant elements of the policy and planning context;
- Section 6 reviews the approach of selected other jurisdictions in defining or updating their truck route networks;
- Section 7 presents a strategic framework for the City of Windsor truck route network, outlining principles, objectives and criteria, as well as a process to develop the truck route network in the remaining study phases; and
- Section 8 summarizes needs and opportunities related to goods movement and truck traffic in the City of Windsor based primarily on engagement inputs; and
- Section 9 outlines next steps in the study.

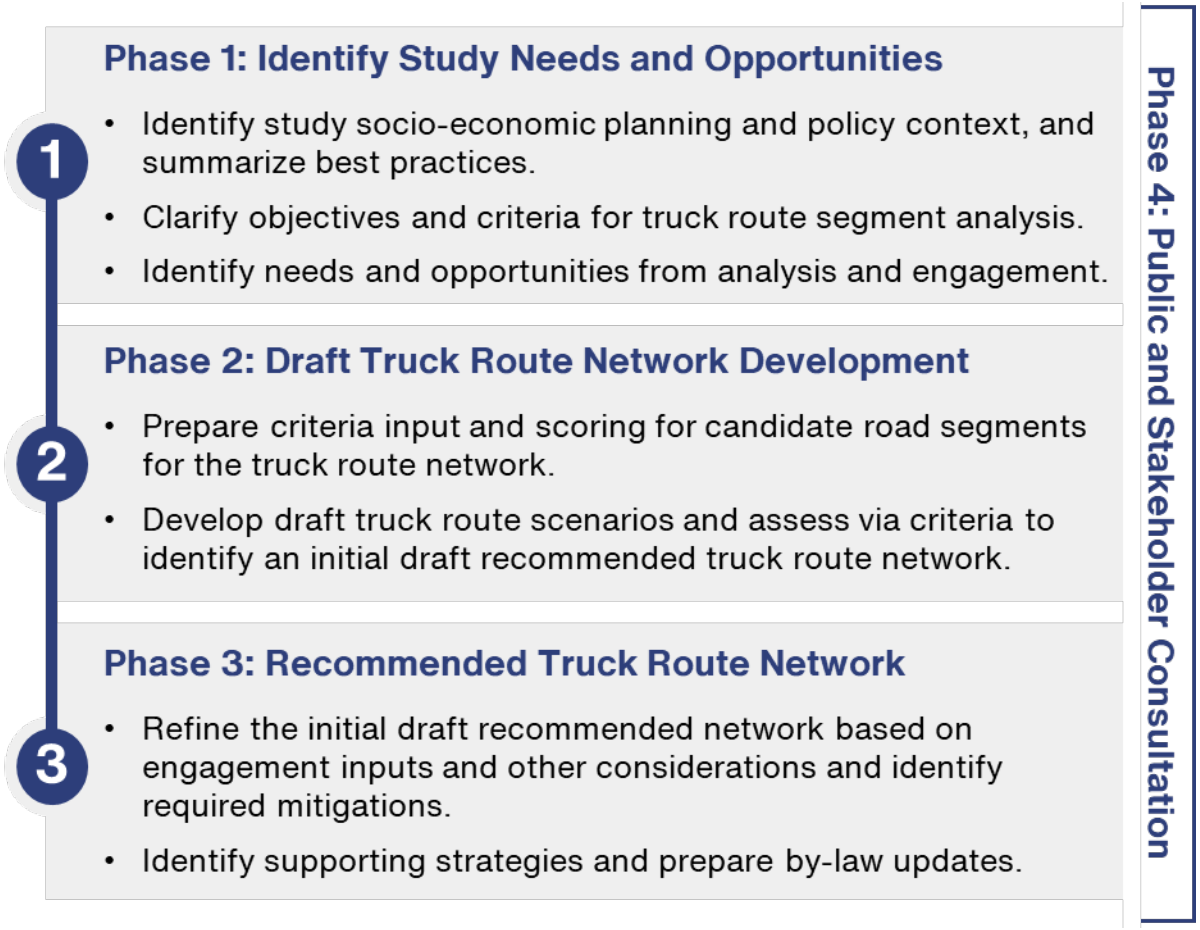
1.3. Study Overview

The City of Windsor Truck Route Study includes the following four phases:

- Phase 1: Identify Study Needs and Opportunities;
- Phase 2: Draft Truck Route Network Development;
- Phase 3: Recommended Truck Route Network; and
- Phase 4: Consultation and Communications – which takes place concurrently with the first three phases.

Exhibit 1.1 summarizes these study phases. Two rounds of engagement, corresponding to Phase 1 and Phase 2 of the Truck Route Study, will feature customized consultation and engagement activities. There will also be an opportunity for the public to respond to the final study report. The Truck Route Study was initiated in July 2023 and is planned to be completed by spring 2024.

Exhibit 1.1: Study Process Overview



2. Truck Route Networks in Windsor and Beyond

Defining truck route networks is common practice among Canadian municipalities to guide and manage trucking activity, providing truck drivers with a cohesive network of suitable roads for accessing freight generators, while avoiding the infiltration of truck through traffic into residential and other sensitive areas.

The economy of Ontario relies on the effective and efficient movement of trucks, and truck route networks provide rules that balance economic needs and the trucking industry with the desire to minimize the negative impacts of trucks on sensitive land uses and people (Ontario Trucking Association, 2011)[1].

[1] Ontario Trucking Association (2011). *Local Truck Routes: A Guide for Municipal Officials*. <http://ontruck.org/wp-content/uploads/2016/04/OTA-Local-Truck-Routes-A-Guide-FINAL_public.pdf> Accessed September 2023.

2.1. Windsor Truck Route Network and Regulations

The City currently has a designated 251-kilometre (centre-line) truck route network that spans much of the municipality, as shown in Exhibit 2.1.

Windsor's truck route network is governed by Part IX of Traffic By-law 9148 (1987, last amended in January 2018)[2], which defines the truck route network, subject to seasonal reduced load limits. In the by-law, "trucks" that must use the truck route network are those vehicles with 4,500 kg or more gross vehicle weight or registered gross weight. The by-law states the following:

- No truck shall be operated on any highway in the City of Windsor other than the highways set out in its truck route network "when properly worded or marked signs have been erected and are on display".
- Trucks are allowed to use other roads only as the shortest access and egress between their origin/destination and the designated truck route.
- The only roads trucks are allowed to park along are designated truck route roads.

Vehicles exempted from being required to use the truck route network are as follows:

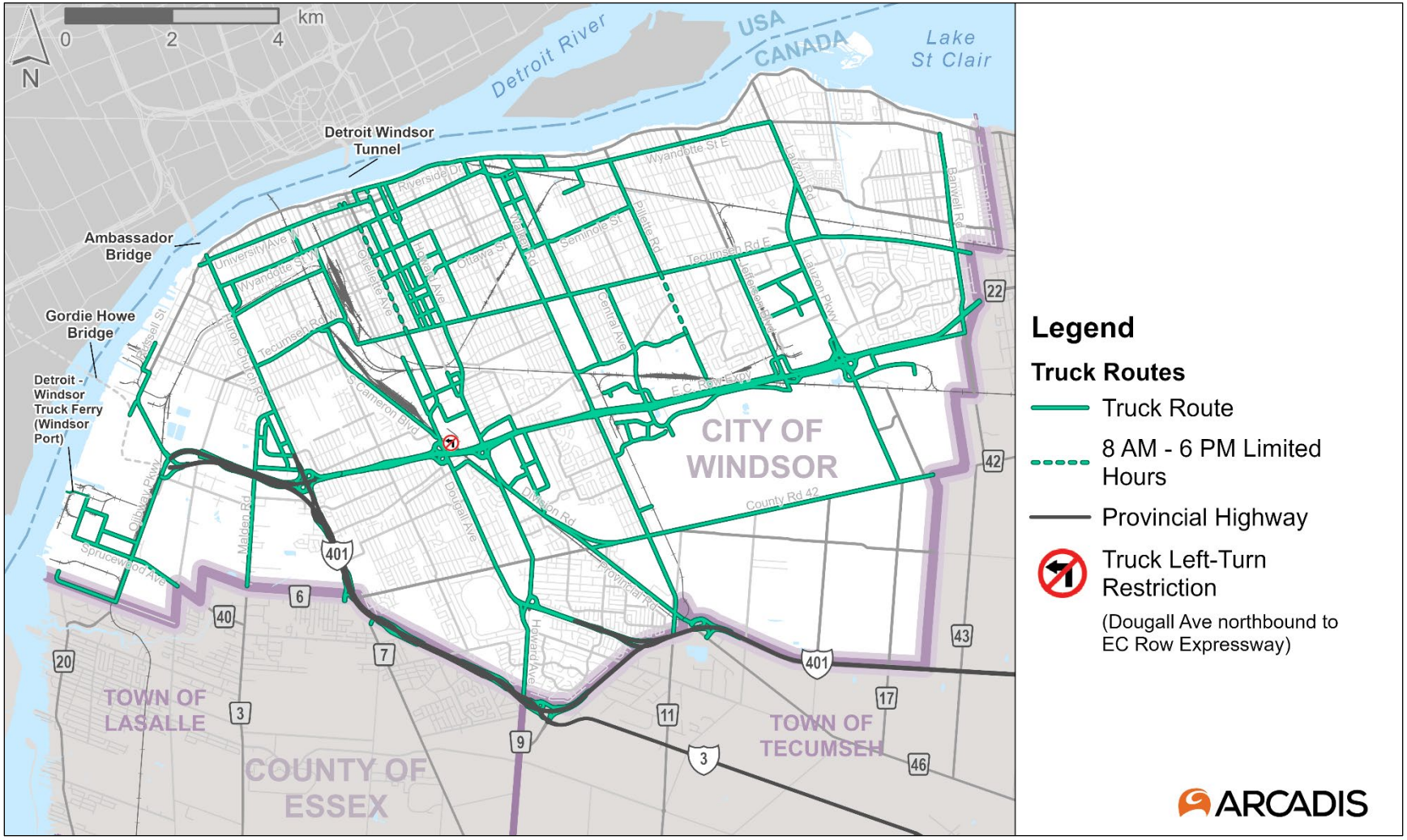
- City of Windsor vehicles;
- emergency vehicles;
- public transit vehicles;
- coal and oil trucks on delivery;
- privately owned commercial vehicles proceed to and from the residence of the owners; and
- any vehicles taking the most direct route between the truck route network and the pick-up/drop-off or service location.

Most truck routes are available at all times, with truck traffic allowable only between 8 a.m. and 6 p.m. on a small number of designated truck route segments.

The truck route network also includes a left-turn restriction applicable only to trucks (Dougall Avenue northbound to EC Row Expressway).

[2] City of Windsor. <https://www.citywindsor.ca/cityhall/By-laws-Online/Documents/9148-traffic-by-law.pdf> Accessed September 2023.

Exhibit 2.1: Current City of Windsor Truck Route Network

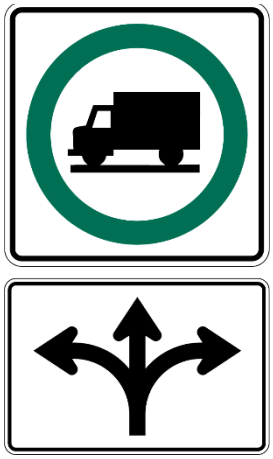


Note: The Detroit-Windsor Ferry, shown here and in other exhibits in this report, ceased operation in September 2023.

As noted in the by-law, the truck route network must have properly worded and marked signs on display to be in effect. The City of Windsor uses both permissive and prohibitive truck control signs, as shown in Exhibit 2.2, to guide the movement of truck traffic. Consistent with the *Ontario Traffic Manual (OTM) Book 5 – Regulatory Signs* (2000), permissive signing uses a green annular band symbol and indicates the preferred routing/direction for through truck traffic with a corresponding Movements Permitted Tab sign. Prohibitive signing uses a red annular band interdictory symbol and is used at critical locations to reinforce the truck route system.

Exhibit 2.2: Permissive vs. Prohibitive Truck Route Signage

Permissive Truck Route sign (Rb-61) and accompanying Movements Permitted Tab sign (Rb-61tTLR):



Prohibitive No Heavy Truck sign (Rb-62):

Image Source: OTM Book 5 – Regulatory Signs (2000), Sections 14 and 15

2.2. Purpose and Benefits of a Truck Route Network

A 2011 guide prepared by the Ontario Trucking Association (OTA)[3] summarizes the purpose and benefits of having a truck route network:

> The purpose of a truck route system is to provide rules that balance the needs of commerce and the trucking industry with the desire to minimize the impacts of trucks on sensitive land uses. As such, a truck route system

[3] Ontario Trucking Association (2011). *Local Truck Routes: A Guide for Municipal Officials*. <http://ontruck.org/wp-content/uploads/2016/04/OTA-Local-Truck-Routes-A-Guide-FINAL_public.pdf> Accessed September 2023.

> does not prohibit trucks from using any road within [the] municipality, but does require they use roads most suitable to the greatest extent possible, and limit their intrusion into the sensitive areas to the minimum possible.
>
> The purpose of truck route planning is to define the street network that is (A) safest for the movement of large vehicles, (B) supports local and regional commerce and (C) provides enough capacity and adequate design features to accommodate the anticipated volume, size and weight of vehicles (page 6).

The OTA guide further notes several reasons (benefits) for establishing a truck route system, which are to:

- help trucks avoid inappropriate residential streets (that is, avoid sensitive areas);
- reduce traffic congestion in the municipality and its surroundings (by providing a system that minimizes the use of and contributing to bottlenecks);
- increase route choices that will benefit businesses, carriers and consumers (i.e., a network that allows carriers and shippers to choose the most efficient, quickest and cost-effective route to deliver goods);
- improve the economic competitiveness and attractiveness of industrial sites (by ensuring that these sites can be accessed cost-effectively and quickly, while avoiding intrusion through sensitive areas); and
- provide a major benefit to the municipality's economy (by providing a well-connected and direct network so that that the costs attributed to delays and circuity are avoided).

2.3. Selected Municipal Truck Route Treatment Variations

Jurisdictions across Canada deploy varying truck route treatments to manage the movement of commercial goods along the road network. Examples include the following:

- Restricted truck route hours—e.g. time-restricted route segments in Windsor allow trucks from 8 a.m. to 6 p.m. only, whereas the City of Hamilton daytime route specify 7 a.m. to 7 p.m. only;
- Higher gross vehicle weight (GVW) limit—e.g. whereas many municipalities in Canada use 4,500 kg lower limit to specify which vehicles are required to use the truck route network, Vancouver uses a higher limit of 11,800 kg;

- Tiered truck route networks—e.g. Regina has three designated truck routes, with some overlap between each: a dangerous goods movement route, a heavy or long combination vehicle route, and a secondary or "pick-up/delivery" route for trucks with a maximum of 4 axles and maximum trailer length of 8.6 m;
- Restricted number of axles—e.g. Hamilton recently enacted a maximum 4-axle limit in its downtown area;
- Restricted vehicle length—e.g. In Vancouver, vehicles over 15.24 m in length are only permitted to travel in the downtown during the daytime (7 a.m. to 6 p.m.) and must use designated truck routes;
- Dangerous goods movement restrictions—e.g. Regina specifies that no vehicles carrying hazardous goods are allowed during peak commuting periods other than on designated dangerous goods routes;
- Truck turning restrictions—e.g. trucks may not always be allowed to turn between major routes, e.g. there are truck route restrictions between Highway 6 and Haldimand Road 20, two major routes in Hagersville, Ontario; and
- Truck-only lanes—e.g. Ottawa: southbound Waller Street[4].

The above treatments, among others, could be considered in the development of a revised City of Windsor truck route network.

3. Factors Driving Windsor Trucking Activity

Key drivers of trucking activity in the City of Windsor include the need to move goods between local and nearby businesses and to and from broader markets, and the local population's needs for consumer goods and provision of services. The socio-economic and industry drivers of trucking activity are outlined below.

The city's major role in broader transportation network connectivity including access to and from international border crossings is outlined in Chapter 3.3

3.1. Population in Windsor and Area

The City of Windsor is a single-tier municipality and major international border city, located at the western end of southwestern Ontario. With a population of 229,660

[4] Ottawa also has Canada's only truck-only road, a 300-m road section used by interprovincial truck traffic to bypass the downtown and major transit corridors.

(2021 Census), Windsor is the cultural and economic engine of the broader Windsor-Essex region.

The adjacent County of Essex, with a 2021 population of 193,200, is an upper-tier municipality with seven local municipalities, two of which share a border with the City: LaSalle and Tecumseh (the remaining being Amherstburg, Essex, Kingsville, Lakeshore and Leamington). The Essex Census Division, comprising the City of Windsor and County of Essex, is projected to grow from a combined population of 422,860 in 2021 to 594,160 in 2046[5], an increase of over 40% over the 25-year period.

Directly across the Detroit River from Windsor is the City of Detroit, Michigan, home to 620,376 people in the city and 4,345,761 people in the metropolitan region (2022 US Census Bureau). Together, the Detroit-Windsor area is the largest cross-border conurbation in North America, and serves as a critical commercial goods movement gateway.

3.2. Windsor's Economy and Industry

Windsor's strategic location on the Canada-United States border and proximity to major markets has positioned the city as an important transportation hub and strong manufacturing centre. The Windsor-Detroit truck crossings—Ambassador Bridge, Detroit-Windsor Tunnel, and until recently the Detroit-Windsor Truck Ferry—carry in total about one-third of Canada's total value in road trade with the United States[6].

Windsor is known as the Automotive Capital of Canada and has a century-old heritage of automotive manufacturing that has helped develop and shape the city to what it is today, becoming uniquely dependent on manufacturing jobs[7]. Benefiting from its proximity to Detroit and the headquarters of the "Big Three" car manufacturers located there—General Motors (GM), Ford Motor Company and

[5] Government of Ontario. Population Projections. <https://data.ontario.ca/dataset/population-projections>. Accessed September 2023.

[6] Government of Ontario (2015). *Highway 401 Section of the New Rt. Hon. Herb Grey Parkway Now Complete.* <https://news.ontario.ca/en/release/35009/highway-401-section-of-the-new-rt-hon-herb-gray-parkway-now-complete> Accessed September 2023

[7] Windsor Works - Public First (2021). <https://www.citywindsor.ca/mayorandcouncil/Documents/Windsor-Works-Report.pdf> Accessed September 2023.

Stellantis (formerly Chrysler)—Windsor has grown to house the largest automotive cluster in Canada, including supporting manufacturing operations for Detroit factories, and has become a front runner in the development of connected and autonomous vehicles (CAVs)[8]. After decades of decline in the auto sector, $17 billion in investment in the province's automotive sector since 2021 has contributed to Windsor's recent boom, including $5 billion in investment by Stellantis and LG Energy Solutions in the production of a new battery manufacturing plant in the city[9].

Other important economic generators in Windsor include tourism attractions, most notably Caesars Windsor, a major employer and one of the largest casinos in Canada.

Moving forward, the City hopes to solidify its position as a hub for new innovation and the auto sector, as well as build on existing health manufacturing strengths and become a world leader in cross-border technology[7].

3.2.1. Employment Areas

The City of Windsor Official Plan (2012, also discussed in Section 5.2.2) includes an Urban Structure Plan, shown in Exhibit 3.1. The Urban Structure Plan identifies a hierarchy of nodes based on their scale and variety of land uses, as well as their local and regional importance:

- Growth Centres serve as areas for commercial, recreation, cultural and institutional investment, accommodate major transit infrastructure, serve as key employment centres, and accommodate a significant share of population and employment growth.
- Major Activity Centres—including Regional Employment Centres and Regional Commercial Centres—also play an important role.

The Urban Structure Plan identifies eight Regional Employment Centres (indicated by circles in the exhibit) and seven Regional Commercial Centres (indicated by

[8] Perspective (2021). <https://perspective.ca/canadas-automotive-capital-windsor-essex/> Accessed September 2023.

[9] NPR (2023). *After years of decline, the auto industry in Canada is making a comeback.* <https://www.npr.org/2023/03/12/1129639900/after-years-of-decline-the-auto-industry-in-canada-is-making-a-comeback#:~:text=Canada's%20automotive%20industry%20is%20primarily,title%20of%20Canada's%20automotive%20capital?> Accessed September 2023.

white asterisk/star shapes) in the city, plus neighbouring Regional Economic Centre and Regional Commercial Centres. These employment and commercial districts generally correspond to the City's industrial and commercial land use zones, respectively, as shown in Exhibit 3.2. It is important that the truck route network provide connectivity to these employment and commercial districts.

Among the major employment areas are the following:

- In the west end of Windsor, the industrial area and Windsor Port in the Ojibway and Sandwich planning districts, including the West Windsor Dock;
- The lands north of Windsor International Airport and flanking either side of the CN and CPKC rail corridor, comprising the planning districts of Walker Farm, Fontainbleu and Forest Glade;
- Underdeveloped agricultural lands at the southern periphery of Windsor, known as Sandwich South and previously annexed by the City in 2003 from the Town of Tecumseh, which are now designated as a Future Employment Area as per the City of Windsor Official Plan.

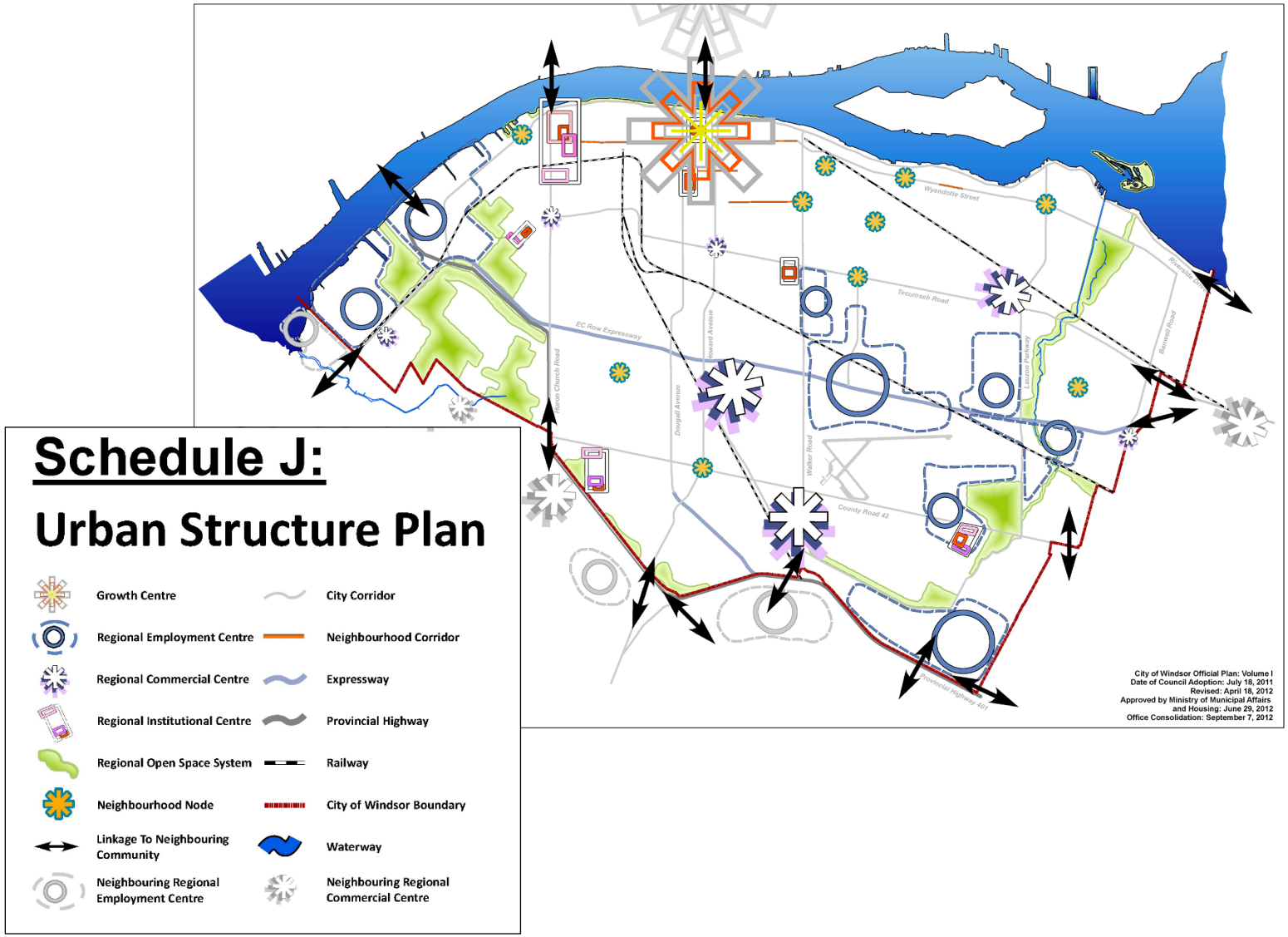
Included in the City's Urban Structure Plan includes the following Regional Commercial Centres:

- Walker Square and Walker Crossings and surrounding commercial businesses along Walker Road between Division Road and Provincial Road;
- Devonshire Mall at EC Row Expressway and Howard Avenue; and
- Tecumseh Mall and surrounding big-box retailers at Tecumseh Road and Lauzon Parkway.

Business parks and institutional areas, too, are key generators of truck traffic bringing consumer-based goods and supporting service provision, and are also important areas to consider in truck route network development.

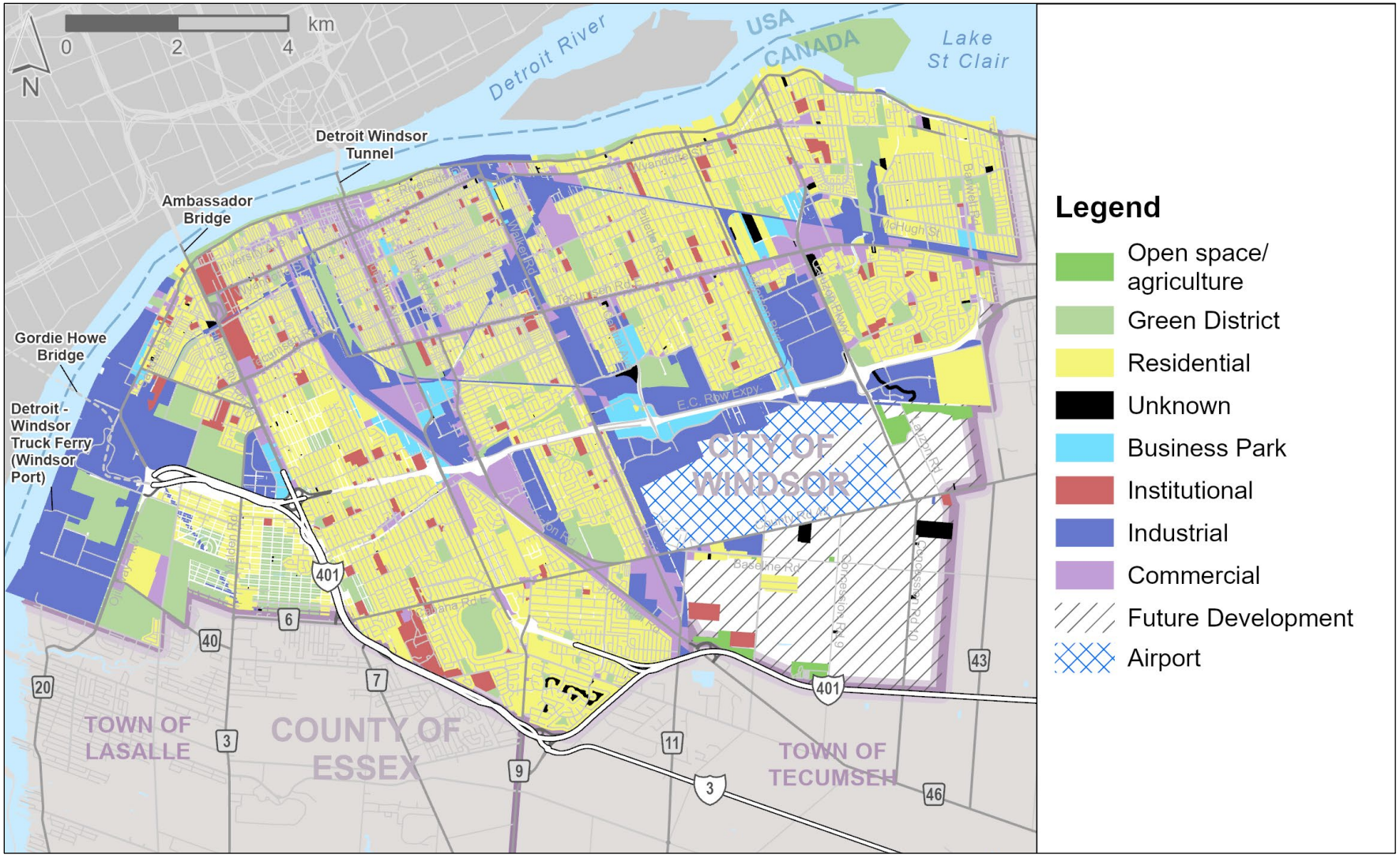
As part of the Windsor-Essex Hospitals System, a new hospital is planned southeast of County Road 42 and the Concession Road 9 in the South Sandwich Planning District of Windsor. Construction is expected to commence in 2026 and will be an important consideration in balancing truck access to the future employment area and mitigating potential negative impacts of heavy truck traffic on hospital patients, staff and visitors.

Exhibit 3.1: City of Windsor Official Plan – Urban Structure Plan



Source: City of Windsor Official Plan, Schedule J – Urban Structure Plan (2012), legend expanded.

Exhibit 3.2: City of Windsor Land Use Map



Map data source: City of Windsor (land parcel data retrieved July 2023 from Windsor's Open Data Catalogue)

3.2.2. Major Industries

Major generators of goods movement are distributed across various employment areas across the city. The auto manufacturing industry represents the primary sector for truck traffic, while other manufacturing and services also play key roles.

Of particular note, Windsor's position as Canada's automotive capital is further supported by the new Stellantis-LG Energy Solution electric vehicle (EV) lithium-ion battery plant, now called NextStar Energy. Anticipated to generate 2,500 jobs when it opens in 2024[10], the new manufacturing facility is currently under construction southwest of the EC Row Expressway and Banwell Road.

The top employers in Windsor and vicinity by approximate number of employees[11] with significant impact on truck traffic and goods movement are as follows, and are also shown in Exhibit 3.3:

1. Stellantis – automotive assembly, 4,600 employees;
2. NextStar Energy – electric vehicle battery plant, 2,500 employees (future);
3. Caesars Windsor – casino, 2,100 employees (i.e. not generating goods, but requiring consumer-based goods and service provision);
4. Ford Motor Company – auto engine manufacturing, 1,900 employees;
5. AP Plasman Corp. (Build a Mold) – plastics product manufacturing, 950 employees;
6. Integram Windsor Seating – auto parts manufacturing, 900 employees;
7. Valiant TMS – intelligent machinery manufacturing, 900 employees;
8. TRQSS Inc – auto part manufacturing, 800 employees;
9. Anchor Danly – steel fabricator, 800 employees;
10. Vistaprint – printing services, 760 employees (Municipality of Lakeshore);
11. NARMCO Group – auto parts manufacturing, 600 employees; and

[10] CBC News (2023). *New deal for Windsor EV battery plant worth $15B in tax breaks, Ontario minister says.* <https://www.cbc.ca/news/canada/windsor/deal-struck-battery-plant-windsor-stellantis-lg-solution-1.6861649> Accessed September 2023.

[11] Invest Windsor Essex (2022). *Top Employers.* < https://www.investwindsoressex.com/en/site-selection-and-data/top-employers.aspx> Accessed September 2023.

12. Catalent Inc. – pharma manufacturing, 500 employees.

While not listed among the above top employers, Southwestern Sales Corporation Ltd., located at the East Windsor Dock in the East Riverside neighbourhood, provides bulk aggregates and shipping services, and is a major generator of heavy truck traffic.

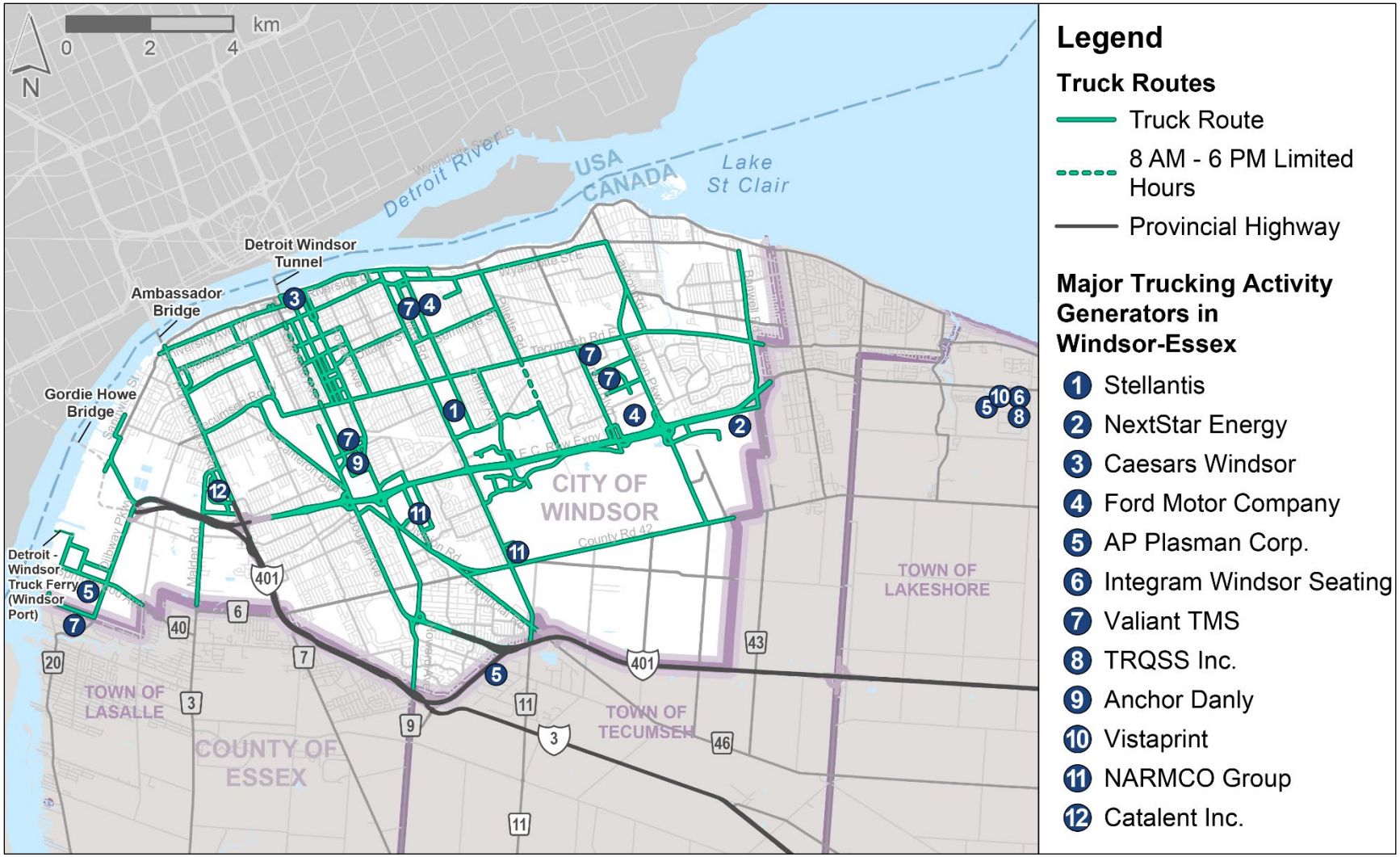
Construction is also underway of the new Windsor Amazon Fulfillment Centre, a 300,000 square foot facility located at Central Avenue and Plymouth Drive. The facility is expected open in 2024 and create 300 permanent full- and part-time jobs[12].

Immediately south of the City of Windsor boundary between Highways 3 and 401, the Oldcastle business park in the Town of Tecumseh is a significant industrial/ employment zone and is home to busy commercial truck stops/service centres.

A few kilometres east of Windsor, the Patillo/Advance planning area in the Municipality of Lakeshore is also a major industrial/employment zone connected to the truck route network in Windsor via County Road 22/EC Row Expressway.

[12] CBC News (2023). *Windsor's Amazon delivery station expected to open in about 1 year and bring 300 jobs.* <https://www.cbc.ca/news/canada/windsor/windsor-amazone-station-1.6944981> Accessed February 2024.

Exhibit 3.3: Largest Employers by Number of Employees (with relevance to truck traffic) in Windsor and Vicinity



3.3. Business Improvement Areas

The City has the following nine Business Improvement Areas (BIAs), which can be seen in Exhibit 3.4[13]:

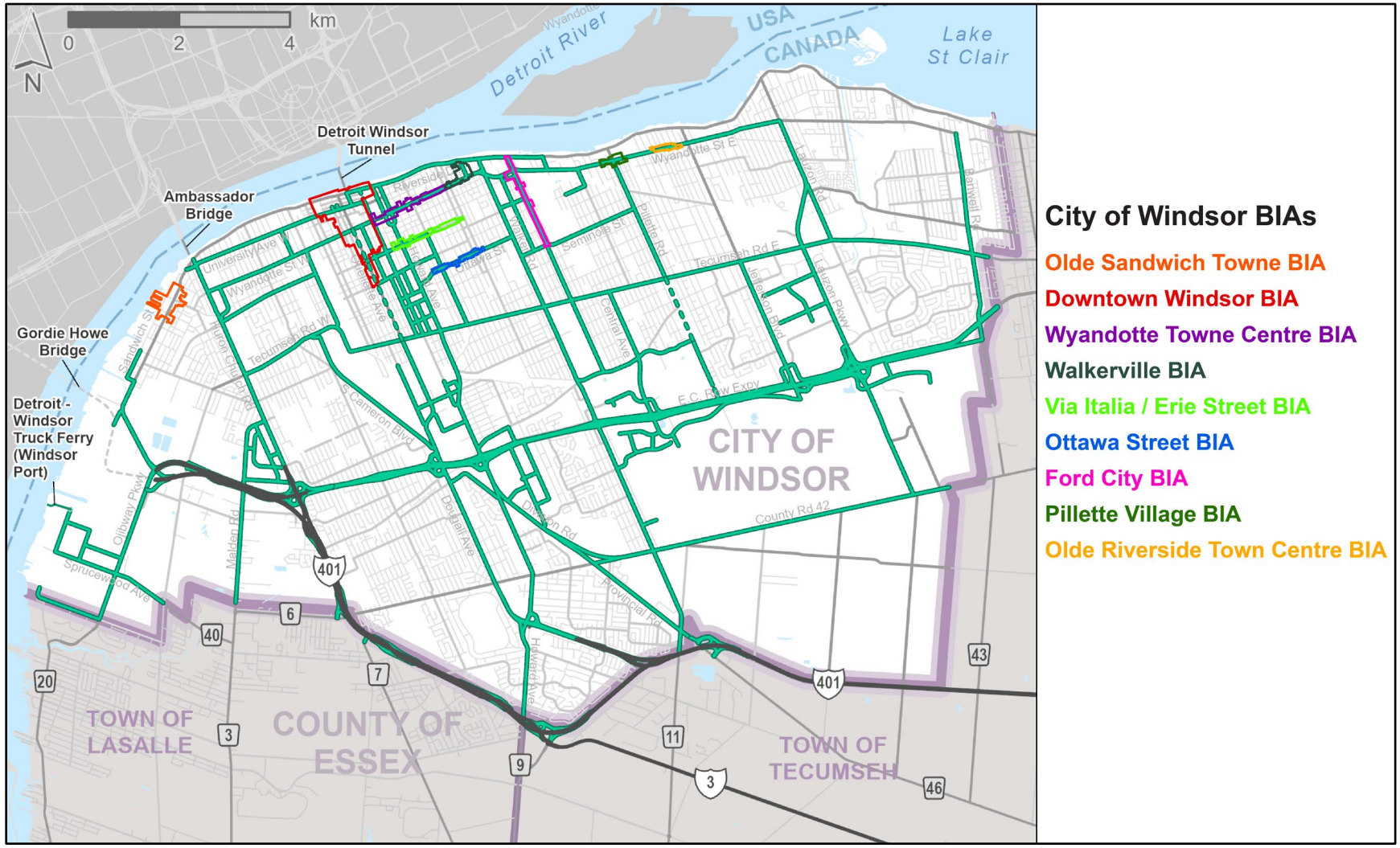
- Downtown Windsor BIA;
- Ford City BIA;
- Olde Riverside Town Centre BIA;
- Olde Sandwich Towne BIA;
- Ottawa Street BIA;
- Pillette Village BIA;
- Via Italia/Erie Street BIA;
- Walkerville BIA; and
- Wyandotte Town Centre BIA.

These often, but not always, correspond to the Neighbourhood Nodes shown earlier in Exhibit 3.1.

As part of the first round of engagement, Business Community Meeting 1 was held with representatives from various BIAs in Windsor. Key issues, considerations and opportunities that were identified by stakeholders are outlined in Section 8.1.

[13] Detailed maps of the areas represented by each BIA can also be found at the following: City of Windsor. *Business Improvement Areas in the City of Windsor.* <www.citywindsor.ca/residents/planning/development-incentives/Documents/BIA%20MAPS.pdf> Accessed September 2023.

Exhibit 3.4: Business Improvement Area Locations Relative to Current Truck Route Network



4. Overview of the City of Windsor Transportation Network

As important background to truck route network development, this section describes the transportation network in the City of Windsor in terms of the following:

- International border crossings for trucks;
- Road network characteristics; and
- Other transportation modes and related networks.

4.1. International Border Crossings for Trucks

As the City of Windsor serves as the gateway of the busiest international trade corridor in North America[14], its truck route network should be understood in terms of serving both local needs and facilitating broader geographic connectivity.

International border crossings for trucks travelling between Windsor and Detroit include the following ports of entry across the Detroit River; these can be seen in Exhibit 2.1 (shown previously) relative to the existing truck route network:

- Ambassador Bridge;
- Detroit-Windsor Tunnel;
- Detroit-Windsor Truck Ferry (until September 2023); and
- the future Gordie Howe International Bridge.

The Michigan Central Railway Tunnel (Detroit River Rail Tunnel) also moves freight internationally across the Detroit River and is described in Section 4.3.1.

4.1.1. Ambassador Bridge

The Ambassador Bridge served 2,566,476 international directional truck trips in 2023, or over 7,000 trips summed across both directions on average per day—the busiest for trucks among all Ontario-US international border crossings (the next

[14] Government of Ontario (2005). *Windsor-Detroit Gateway.* <https://news.ontario.ca/en/backgrounder/4839/windsor-detroit-gateway> Accessed September 2023.

busiest being the Blue Water Bridge at 1,621,461 truck trips in 2023)[15]. The Ambassador Bridge carries $323 million worth of commercial goods each day[16].

In Windsor, the bridge connects via Huron Church Road, a municipal Windsor Class 1 Arterial roadway, to Highway 401 (Rt. Honourable Herb Gray Parkway) and to the municipally owned EC Row Expressway. In Detroit, the bridge links to Interstates 75 and 96, as well as the arterial road network.

Cyclists, pedestrians and transit vehicles are prohibited from crossing the bridge and the transport of hazardous materials across the bridge is prohibited. The bridge is privately owned and operated by the Detroit International Bridge Company.

4.1.2. Detroit-Windsor Tunnel

Located east of the Ambassador Bridge, the Detroit-Windsor Tunnel connects the downtowns of both Windsor and Detroit. In Windsor, the tunnel is connected to the arterial road network via Wyandotte Street East. In Detroit, the tunnel provides direct access to the Michigan state trunkline highway M-10, as well as Interstate-375 expressway.

Given its convenient downtown connections, the Detroit-Windsor Tunnel served more passenger car trips in 2023—3.68 million—than the Ambassador bridge at 3.59 million.

However, in terms of goods movement, the Detroit-Windsor Tunnel served a total of just 18,743 truck trips in 2023—a small portion compared to past truck traffic volumes, for example, in 2006 the tunnel served a total of 127,433 truck trips[17]. Height restrictions on large trucks, as well as limited major access and egress roadways on both sides of the crossing, reduce the tunnel's use considerably by heavy trucks, and the crossing is mainly used by cars and light trucks. The auto manufacturing industry has in past made use of specially designed tunnel-specific trailers with lower heights and shorter trailers.

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[15] Bridge and Tunnel Operators Association (2003). *Traffic Data* <https://www.bridgeandtunneloperators.org/index.php/traffic> Accessed January 2024.

[16] Ambassador Bridge (2023). Ambassador Bridge ("Did You Know" facts) <https://www.ambassadorbridge.com> Accessed September 2023.

[17] Bridge and Tunnel Operators Association (2003). *Traffic Data* <https://www.bridgeandtunneloperators.org/index.php/traffic> Accessed January 2024.

As with the Ambassador Bridge, cyclists and pedestrians are prohibited, as is the transport of hazardous materials. Transit Windsor operates a public bus service ("Tunnel Bus") between Windsor and Detroit through the tunnel.

4.1.3. Detroit-Windsor Ferry

Until September 2023 when it ceased operations, the Detroit-Windsor Truck Ferry provided an alternate option for trucks crossing the Detroit River, and was the primary crossing for hazardous materials or dangerous goods. Located in the Ojibway neighbourhood at the western periphery of Windsor, the crossing connected the port/industrial areas of both Windsor and Detroit.

Until the Gordie Howe International Bridge begins operation, the nearest Canada-US crossing for trucks carrying hazardous materials is the Blue Water Bridge crossing in Sarnia, Ontario.

4.1.4. Gordie Howe International Bridge

The future Gordie Howe International Bridge, currently under construction, is expected to significantly increase truck crossing capacity and improve overall transborder connectivity when it opens in 2025, when it will become the largest Canadian-US port of entry.

The future bridge is anticipated to redirect a significant proportion of trucks and passenger vehicles who currently use the Ambassador Bridge and Detroit-Windsor Tunnel crossings, relieving some pressure from municipal roads that currently serve to connect international cross-border traffic, in particular Huron Church Road.

Crossing at industrial areas at both sides of the Detroit River, the new bridge will connect to the EC Row Expressway and Highway 401 via the Ojibway Parkway in the Brighton Beach neighbourhood of Windsor[18]. The bridge itself will have three travel lanes in each direction, and will include a multi-use path to accommodate cyclists and pedestrians. Hazardous goods will be allowed across the bridge.

[18] The Gordie Howe International Bridge will not include a direct connection for trucks to and from Sandwich Street. Outbound trips will use the designated truck route along Sandwich Street to connect to Ojibway Parkway to access the port of entry via the Herb Gray Expressway (and the reverse for outbound trips).

The bridge project is also undertaking the Community Benefits Plan, with key neighbourhood infrastructure strategies underway. This includes investment into the City-led Ojibway Parkway Wildlife Crossing Class Environmental Assessment for a new safe passage crossing between Black Oak Heritage Park and Ojibway Park, as well as $1 million to reconstruct and Sandwich Street between Rosedale Avenue and McKee Avenue.

The bridge will be publicly owned by both the Government Canada and State of Michigan, and is being delivered by the Windsor-Detroit Bridge Authority (a Canadian Crown corporation) through a private-sector partnership with Bridging North America.

4.2. Road Network Characteristics

4.2.1. Truck and Traffic Volumes

Understanding the mobility patterns and truck traffic volumes in Windsor allows corridors that currently play a critical role in serving truck trip connectivity to be identified.

Exhibit 4.1 and Exhibit 4.2 show the weekday heavy truck and total truck volumes along busier municipal roads in Windsor, respectively.

Exhibit 4.3 shows the weekday volumes for all vehicular traffic[19].

4.2.2. Physical Road Network Characteristics

Physical road characteristics of City of Windsor roads are shown in the following map exhibits:

- Exhibit 4.4 shows number of lanes; and

[19] To prepare these and other traffic count plots in this document, Arcadis processed data for analysis from traffic classification counts conducted by the City of Windsor for individual intersections using the latest count data available per location (i.e. 2020 to 2023) for a representative weekday. (Depending on the specific timing of individual count data, some volumes may be affected by COVID-19 pandemic restrictions in place at the time.) The traffic count data spanned 7:00 to 10:00 a.m., 11:00 a.m. to 2:00 p.m. and 3:00 to 6:00 p.m. Counts were interpolated for the 10:00 to 11 a.m. and 2:00 to 3:00 p.m. gaps to provide a total of 11 hours of count data. The locations of intersections for which count data were available are indicated in the traffic count map plots by small dots.

- Exhibit 4.5 shows roadway width.

Roads with a greater number of lines and wider roadway widths have more capacity to carry higher truck and other vehicle volumes. In some cases, available roadway lanes may be dedicated to on-street parking provision.

EC Row Expressway, Huron Church Road, Tecumseh Rod, Lauzon Road, Division Road are among the most significant arteries in the City of Windsor based on roadway widths and potential vehicular capacities.

4.2.3. Operational Road Network Characteristics

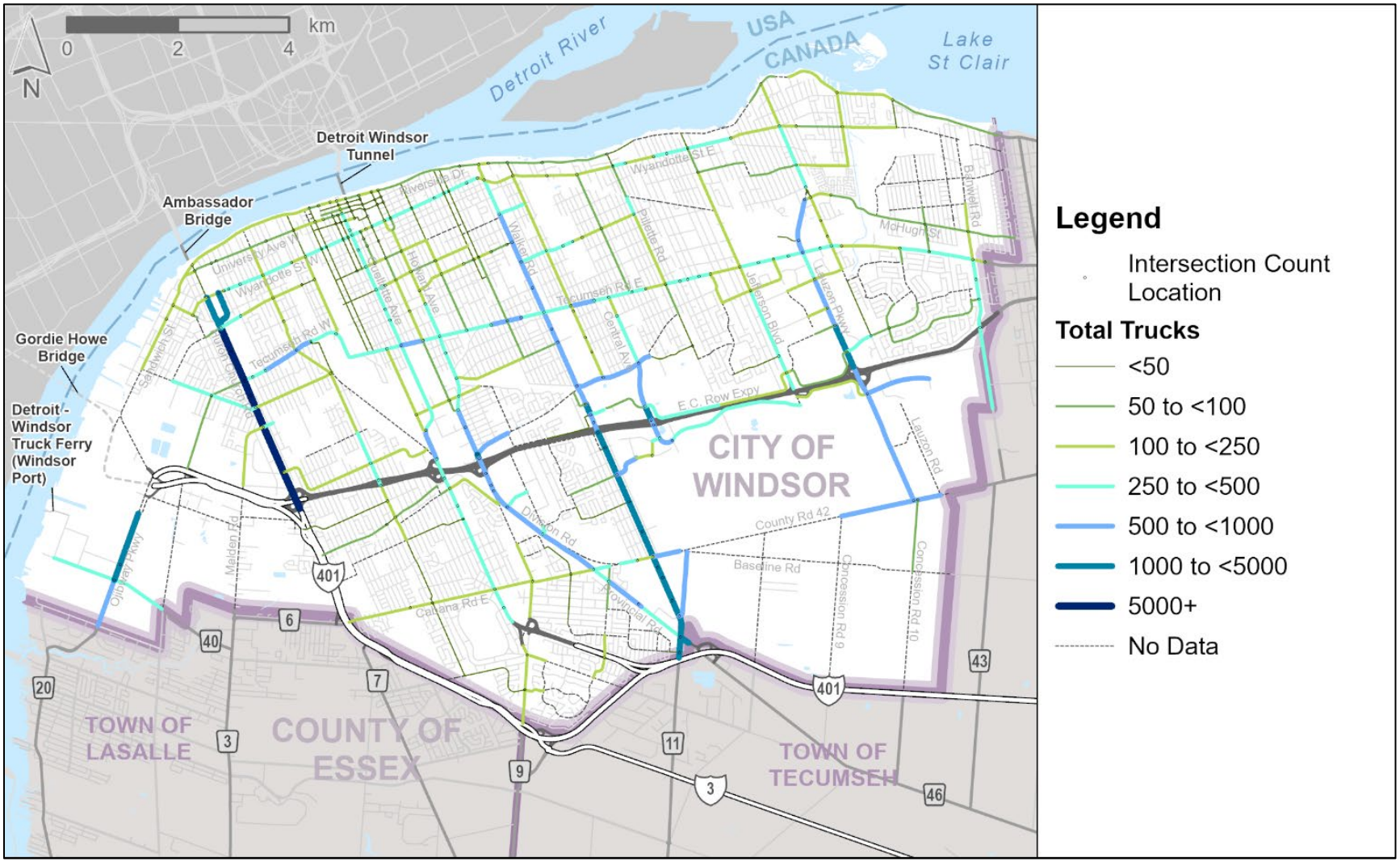
Operational road characteristics of City of Windsor roads are shown as follows:

- Exhibit 4.6 shows posted speeds; and
- Exhibit 4.7 shows the locations of signalized intersections.

Roads with higher speed limits can allow for more efficient travel and can be more attractive for truck travel. A large majority of the municipal road network in the City of Windsor has a 50 km/h. Exceptions include the following:

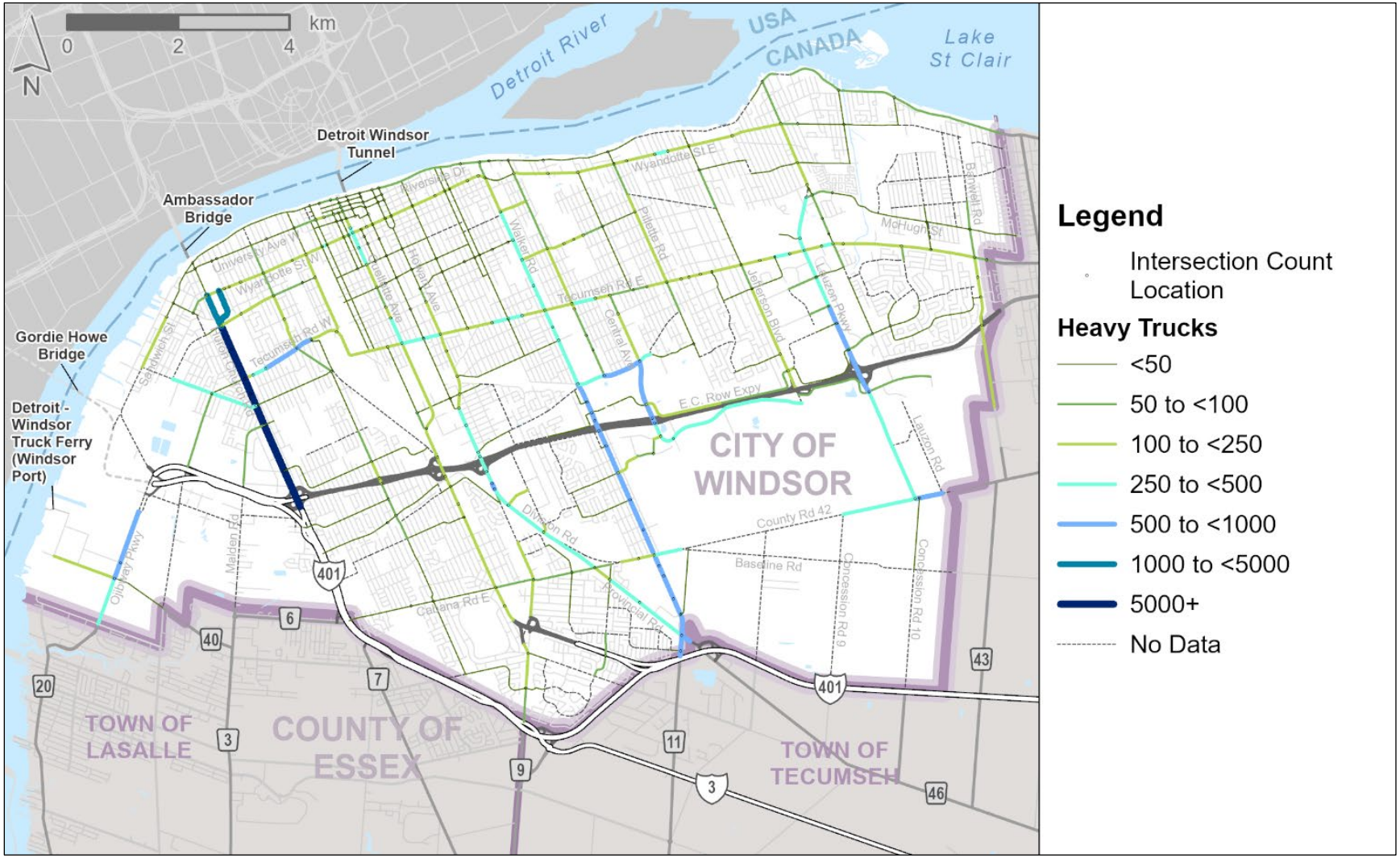
- **100 km/h:** EC Row Expressway;
- **80 km/h:** Dougall Parkway from Highway 401 to Dougall Avenue;
- **70 km/h:** Ojibway Parkway in the west and Lauzon Parkway in the east (excluding northern portion); and
- **60 km/h:** selected arterial roads.

Exhibit 4.1: Current Weekday (11-hour) Truck Volumes in the City of Windsor



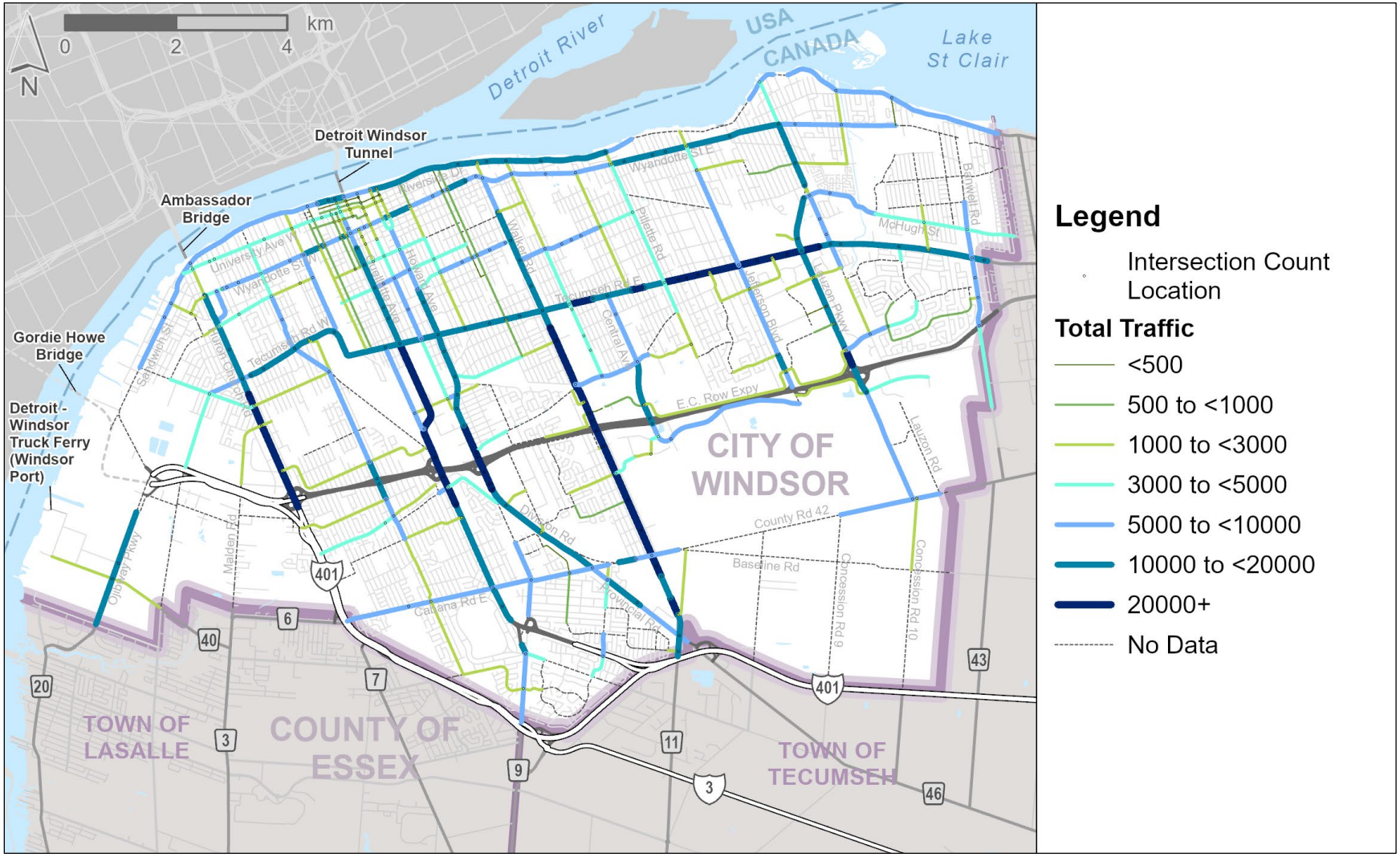
Note: Figures are 7 a.m.-6 p.m. weekday totals based on the most recent weekday counts per site (2020 to 2023).

Exhibit 4.2: Current Weekday (11-hour) Heavy Truck Volumes in the City of Windsor



Note: Figures are 7 a.m.–6 p.m. weekday totals based on the most recent weekday counts per site (2020 to 2023).

Exhibit 4.3: Weekday Total Traffic Volumes in the City of Windsor, 2020-2023



Note: Figures are 7 a.m.–6 p.m. weekday totals based on the most recent weekday counts per site (2020 to 2023).

Exhibit 4.4: Number of Lanes – City of Windsor Roads

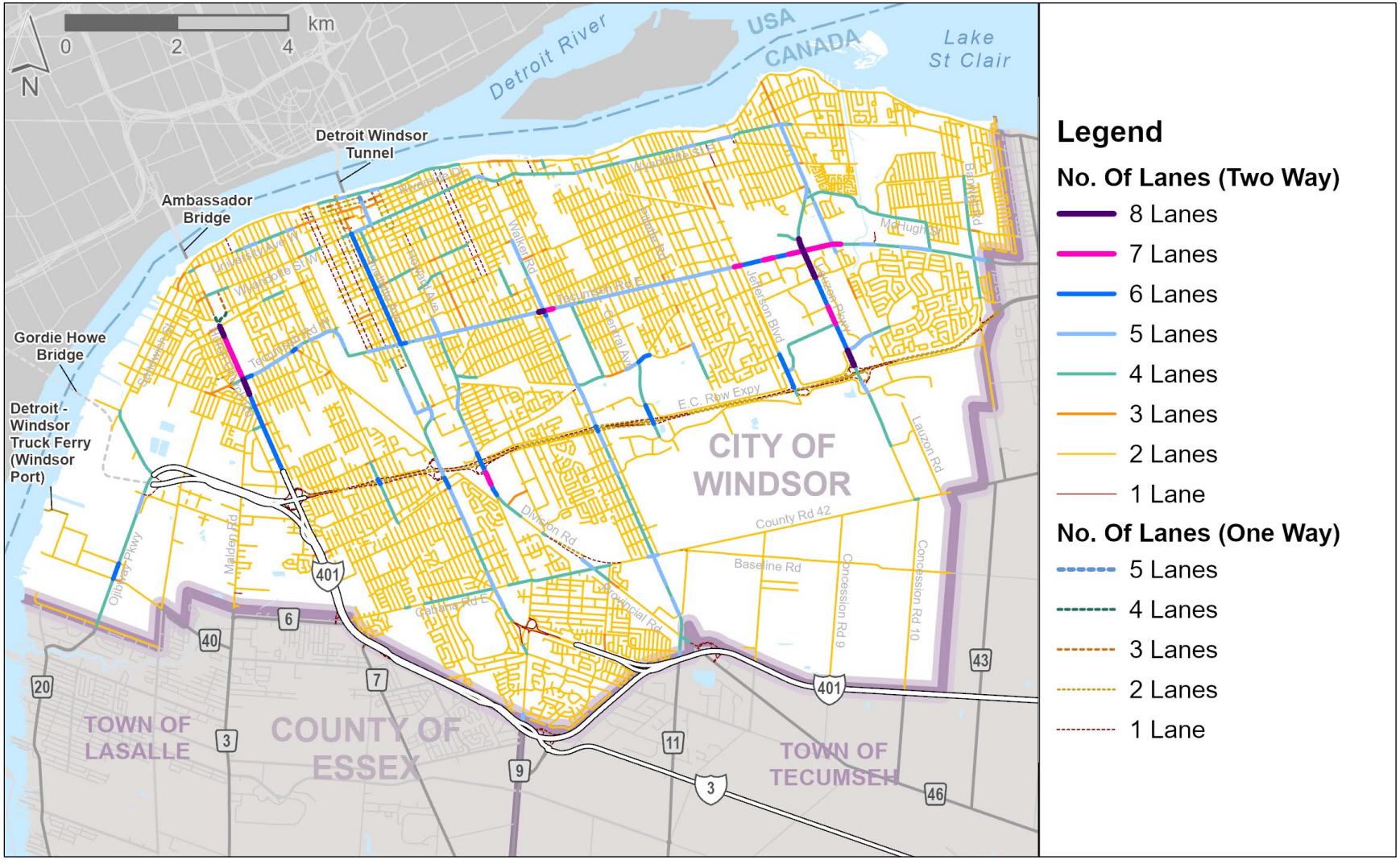


Exhibit 4.5: Roadway Width – City of Windsor Roads

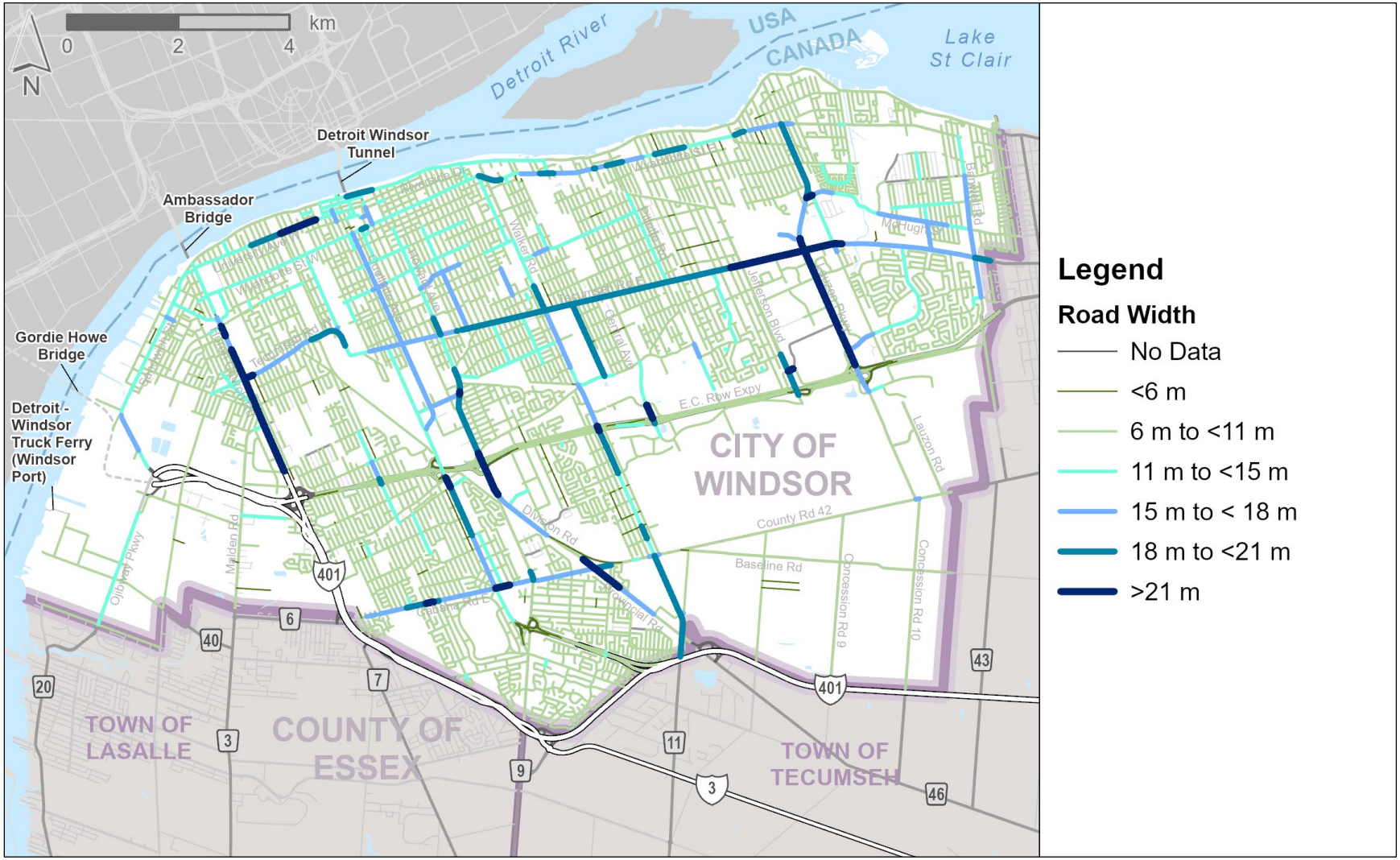


Exhibit 4.6: Posted Speeds – City of Windsor Roads

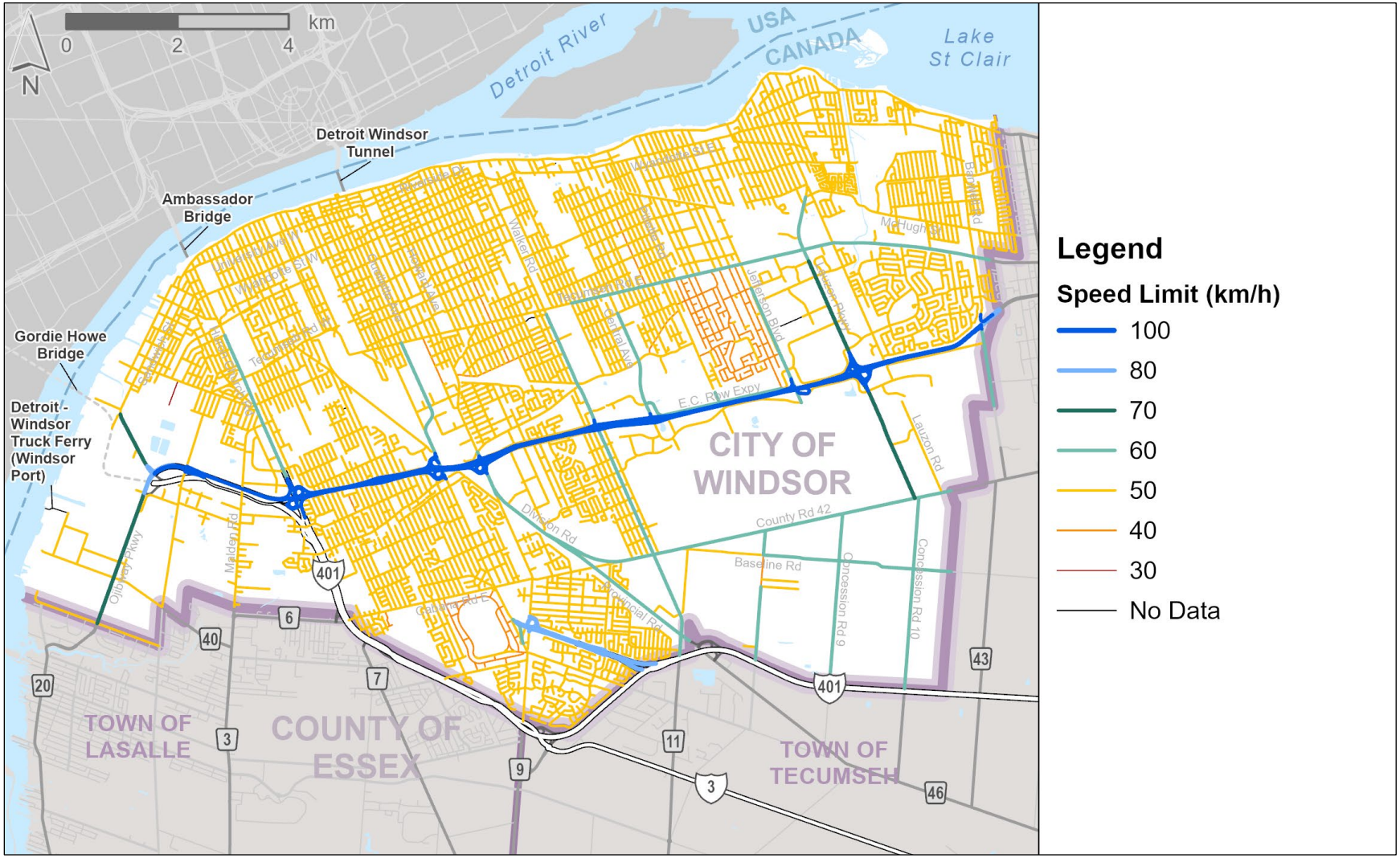
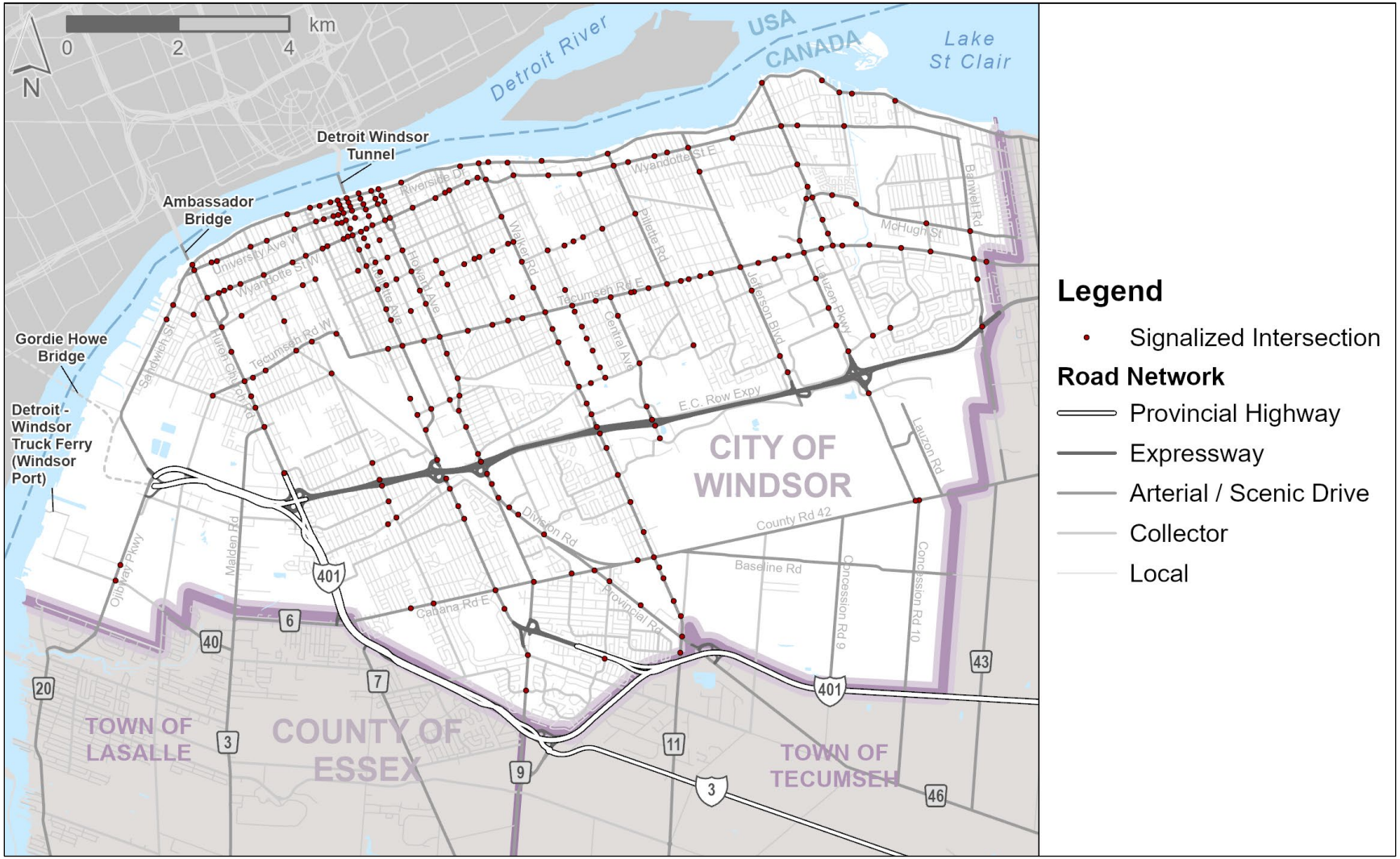


Exhibit 4.7: Signalized Intersections – City of Windsor Roadways



4.2.4. Functional Road Classifications

The City's functional road classification system helps guide transportation and land access decision-making. It designates roads into different classes based on the type of service the road provides, i.e. the degree to which the roadway facilitates the movement of traffic (e.g. suitable for higher traffic volumes and speeds) vs. the degree to which the roadway facilitates access to nearby land uses.

Exhibit 4.8 shows the functional road classification system applied to the City road as indicated in the City's Official Plan (2012). The functional road classification system includes the following categories (described with typical road characteristics):

- **Provincial Highway:** corridors under the control and responsibility of the Ministry of Transportation of Ontario (MTO);
- **Expressway:** controlled-access highways with a minimum right-of-way (ROW) width of 100 metres;
- **Class I Arterial Road:** designed to carry high volumes of traffic, minimum ROW width of 46 metres, direct property access prohibited, and cycling facilities permitted;
- **Class II Arterial Road:** designed to carry high volumes of traffic, minimum ROW width of 42 metres, direct property access discouraged, and cycling facilities permitted;
- **Class I Collector Road:** designed to carry moderate volumes of traffic, minimum ROW width of 28 metres, direct property access permitted with some controls, and cycling facilities permitted;
- **Class II Collector Road:** designed to carry moderate volumes of traffic, minimum ROW width of 26 metres, direct property access permitted with some controls, and cycling facilities permitted;
- **Scenic Drive:** designed to carry low to moderate volumes of traffic, minimum ROW width of 24 metres, direct property access permitted with some controls, cycling facilities permitted, and streetscape design guided by urban design policies of the OP; and
- **Local Road (Residential or Commercial-Industrial):** designed to carry low volumes of traffic, minimum ROW width of 20 metres, direct property access permitted, and cycling facilities permitted.

When comparing the existing truck route network to functional road classification, truck routes primarily utilize expressway, arterial and collector roads, which

typically have more suitable physical characteristics to accommodate trucks. The remaining roadway classifications—Scenic Drive, Local (Commercial-Industrial) and Local (Residential)—are also utilized in some instances.

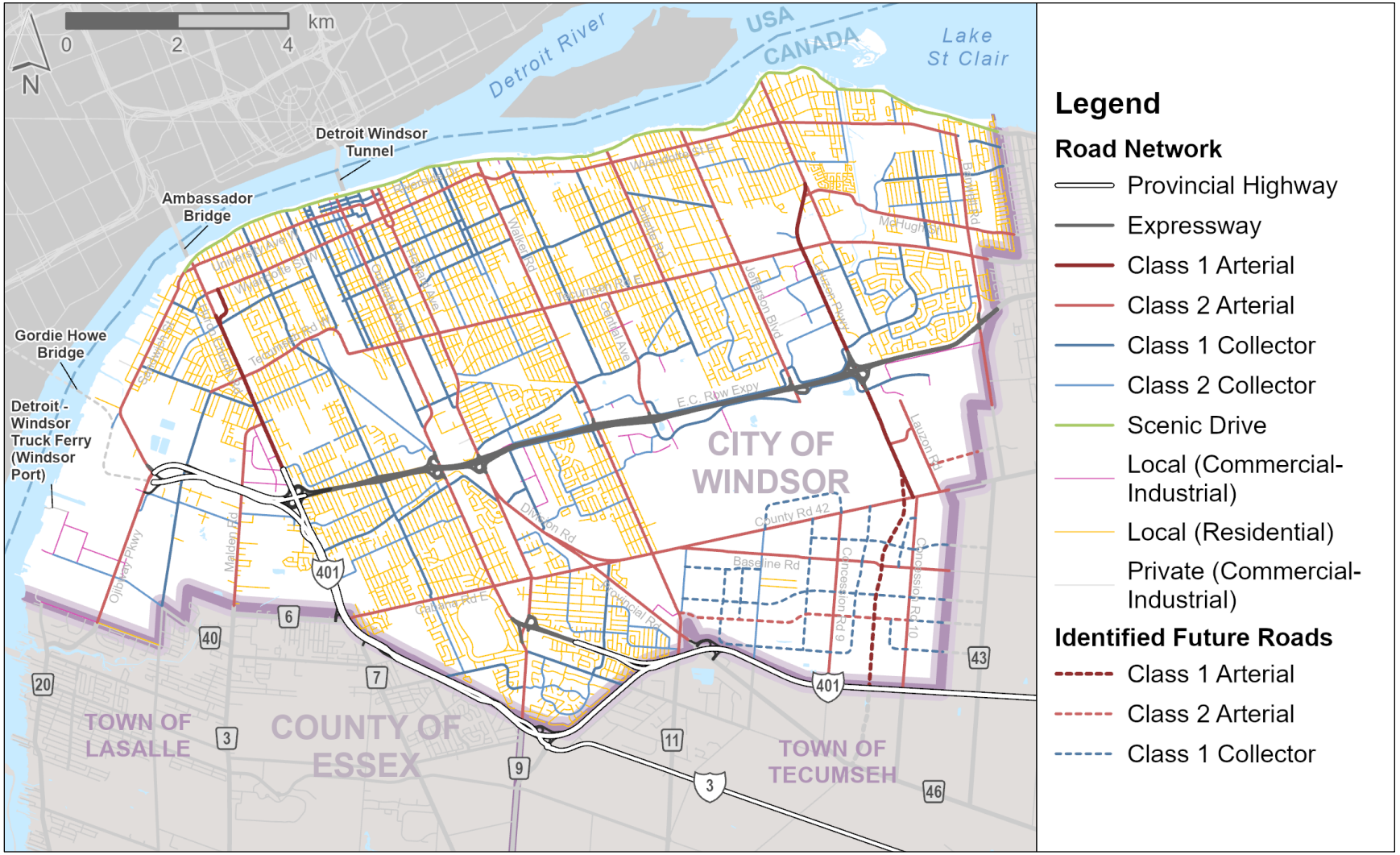
Road classification is an important consideration in the criteria used to inform truck route network development outlined in Section 7.

4.2.5. Emergency Detour Route Designations

In addition to the provincial highways that run through the City of Windsor, the Province's Emergency Detour Routes (EDRs) direct traffic from the provincial highway network in the event of incidents and closures to designated municipal roadways. A map of EDRs in Windsor and area is shown in Exhibit 4.9.

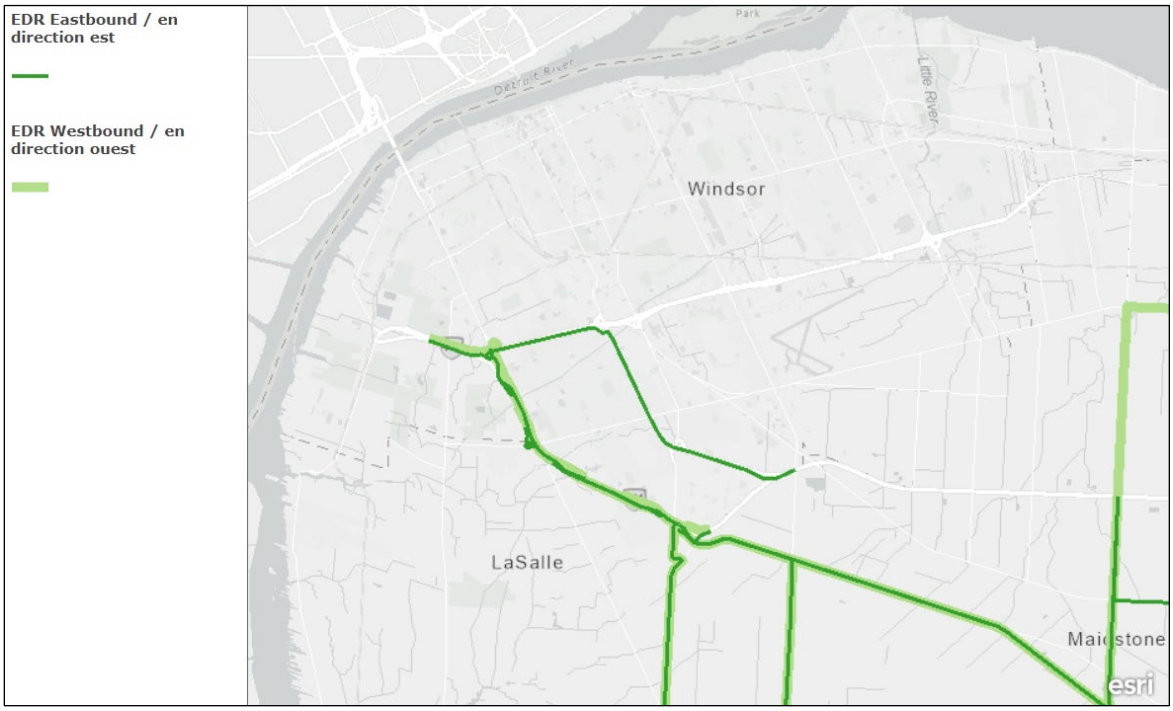
Provincial Highway 3 is identified as both the eastbound and westbound EDR in the vicinity of Highway 401 in Windsor. However, the municipal roads EC Row Expressway, Dougall Avenue and Dougall Parkway are also identified as eastbound-only EDRs in Windsor.

Exhibit 4.8: City of Windsor Functional Road Classification



Note: The future road network is identified as per Sandwich South Master Servicing Plan (2023), Figure 18 - Ultimate Road Network

Exhibit 4.9: Emergency Detour Routes in Windsor and Vicinity



MTO icorridor. <https://icorridor-mto-on-ca.hub.arcgis.com> Accessed September 2023.

4.2.6. County of Essex Road Connectivity

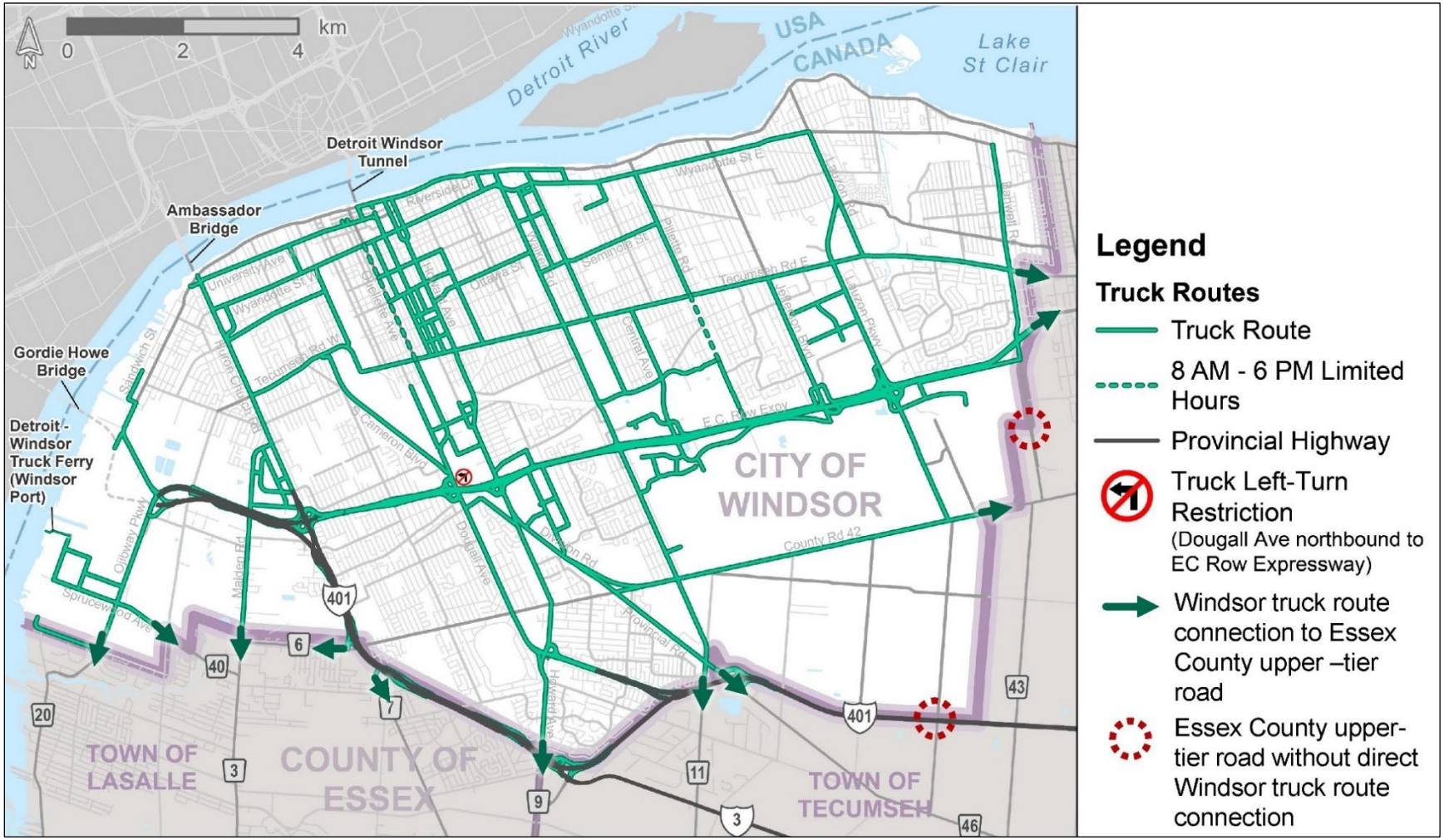
Exhibit 4.10 shows the locations along the City of Windsor boundary of connections between the City of Windsor's road network and upper-tier roads in the County of Essex, which are the focus routes for truck travel in the County[20]. Two upper-tier roads in the County of Essex currently do not have a direct Windsor truck route network connection at the City boundary:

- Concession Road 10 (County Road 17), at the southeast Windsor boundary; and
- Banwell Road (County Road 43), a seasonal load-limited highway at the east Windsor boundary.

Neither the Town of Tecumseh nor the Town of Lasalle, both bordering the City of Windsor, currently have heavy truck prohibitions on their local municipal roads.

[20] Both Essex County roads and Essex County Connecting Links (local municipal roads with financial support from the County, given their role in moving County traffic) are considered "upper-tier roads" in this report.

Exhibit 4.10: County of Essex Upper-Tier Road Connectivity to the Windsor Truck Route Network Road Network



4.2.7. Road Safety Review

The City of Windsor *2019 Road Safety Review Report* (2021) considered all vehicular traffic collisions together – it did not analyze traffic collisions involving heavy vehicles separately from other vehicle types. Only collisions on municipal roadways within City boundaries are analyzed.

City-wide in 2019, there were 6 vehicular collisions involving fatalities, 1,362 collisions involving non-fatal injuries and 3,168 involving property damage only.

Fatalities and major injuries together totalled 37 collisions. This included 2 pedestrians, 4 cyclists, 3 motorcyclists, and the remaining fatalities injured were motor vehicle drivers or passengers. Among the most common driver actions in these collisions, for 27 collisions (46%), the driver was noted to be “driving properly”, in 7 (12%), the driver was noted to have “lost control”, and in 5 (8%), to have “failed to yield right-of-way”.

4.2.8. Road Network Improvement Plans

A number of Provincial and municipal road network improvements are underway or planned. Information about these plans is provided in Sections 5.1 and 5.2.

4.3. Other Transportation Modes and Networks

Truck traffic interactions with different modes of transportation must also be taken into consideration in truck route network development. The existing transportation network in the City of Windsor consists of the following components, each of which is described below:

- Rail network;
- Marine travel;
- Air travel;
- Active transportation network; and
- Passenger transit network.

4.3.1. Rail

Freight Rail

Active rail lines that operate through the City of Windsor are shown in Exhibit 4.11. **Canadian National (CN)** and **Canadian Pacific Kansas City (CPKC)**—both federal Class I railways operate a network of freight rail in Windsor. The CPKC rail corridor connects freight trains to Detroit via the Michigan Central Railway Tunnel. **Essex Morterm Holdings Ltd (ETL),** a short line railway, also operates in the City of Windsor.

Exhibit 4.11 also shows the locations of rail yards (where freight is transferred to/from rail cars only) and transload facilities (where freight is transferred between rail and truck modes).

The transload facilities include the Morterm Limited facility in the west limits of Windsor. It primarily facilitates the mode transfer of steel and metal products, forest products, and grain products[21].

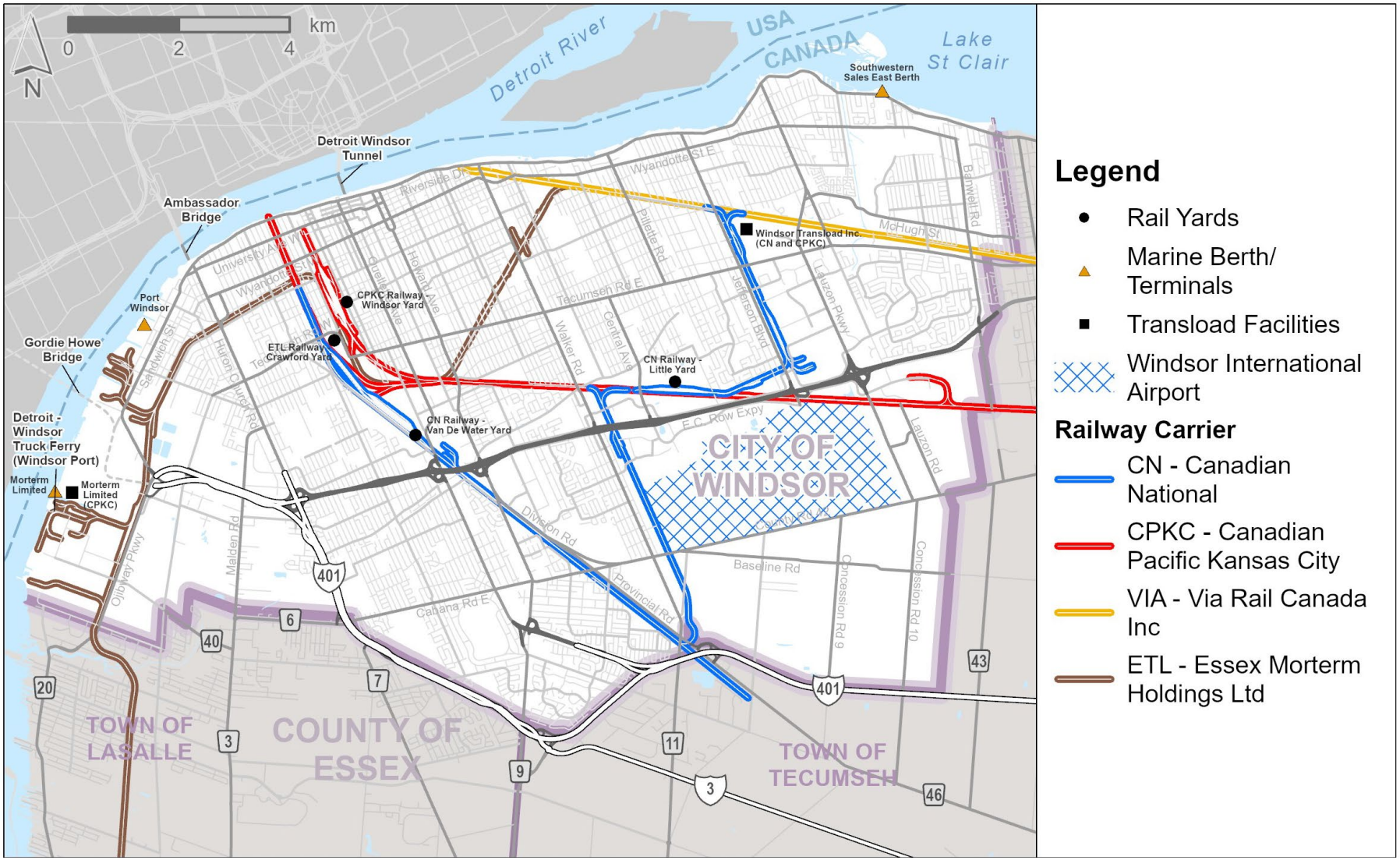
The Windsor Transload Inc. is located toward the east end of Windsor northeast of Jefferson Boulevard and Tecumseh Road East. The only road access for trucks to the busy yard from the closest truck route on Tecumseh Road East is via Jefferson Boulevard and Coronation Avenue, a distance of over 500 m via residential roads.

The **Michigan Central Railway Tunnel**, also known as the Detroit River Rail Tunnel, is a railroad tunnel connecting the downtowns of Windsor and Detroit. The tunnel is over a century old and is co-owned by CPKC (formerly Canadian Pacific Railway and Kansas City Southern Railway) and OMERS-Borealis Transportation Infrastructure and operated by the Detroit River Tunnel Company. The age of the tunnel means that it was not designed to be large enough to accommodate modern double-stack rail cars. In 2022, U.S. rail company Amtrack and CP Railway agreed to the future use of the tunnel for passenger trains, with a potential Chicago-to-Toronto connection[22].

[21] Morterm Limited (2024). <https://www.morterm.com/transloading-1> Accessed January 2024

[22] Windsor Star (2022). *Cross-border rail tunnel passenger service moves step closer.* <https://windsorstar.com/news/local-news/passenger-service-through-rail-tunnel-moves-step-closer> Accessed August 2023.

Exhibit 4.11: Rail, Air and Marine Transportation in City of Windsor



Passenger Rail

VIA Rail Canada Inc., a federal corporation and Class I railway, also operates service to and from Windsor, connecting passengers to communities across the Quebec City-Windsor Corridor and beyond. The Windsor VIA rail station is located at the west end of the VIA Rail line, with access from Riverside Drive.

4.3.2. Marine

The Port of Windsor is a major international and economically significant commercial port that supports the movement of goods as part of the greater Great Lakes St. Lawrence Seaway system. The Port comprises 13 terminals, as follows:

- **Aggregate:** GIP Aggregates Inc, LafargeHolcim, Miller Aggregates Southwest, Southwest Sales Inc. East, and Southwest Sales Inc. West;
- **Cement, Fuel and Grain:** ADM Agri-Industries, Canada Building Materials, Leigh Hanson, and Sterling Fuels Limited;
- **General Cargo:** Canadian Maritime Transport (Detroit Windsor Truck Ferry), and Morterm Limited;
- **Recreation:** Dieppe Cruiseship Terminal; and
- **Salt:** Windsor Salt Ltd.

The general locations of these terminals is shown in Exhibit 4.11 (i.e. individual terminals are not all individually labelled). Most of the terminals are located in the west Windsor port area, with the exception of Southwestern Sales Inc. East, located just over two kilometres from the City's eastern boundary.

A large-scale cargo terminal infrastructure expansion and shoreline protection project is currently underway at the Port of Windsor. The project, with expected completion by 2026, will further support the logistics supply chain and help reduce congestion along Highway 401 by shifting more goods movement to freight rail and marine modes[23]. The expansion includes a new steel warehouse for the automotive industry, as well as a multi-modal platform that enables short-sea shipping of containers and expanded capacity for goods movement (i.e. roll-on and roll-off operations).

[23] Daily Commercial News (2023). *Massive multi-modal hub in the works for Port of Windsor.* <https://canada.constructconnect.com/dcn/news/infrastructure/2023/06/massive-multi-modal-hub-in-the-works-for-port-of-windsor> Accessed August 2023.

4.3.3. Air

Windsor International Airport is located in the South Sandwich area of the city, as could be seen previously in Exhibit 4.11. It is an important commercial airport with scheduled passenger services. It is classified as an airport of entry by Nav Canada, with Canada Border Services Agency officers on site.

In 2013, the City of Windsor invested in the construction of a multi-modal cargo terminal at the airport—a FedEx Ship Centre at 3485 Wheelton Drive—helping to solidify Windsor as a hub for logistics and international trade[24].

4.3.4. Active Transportation

Active transportation (AT) is a term that refers to all forms of human-powered or power-assisted travel. Most commonly, this means walking and cycling, but can also refer to any travel with the use of mobility aids, and any other form of rolling such as e-scooters, e-bicycles, skateboards, and rollerblades. The safety of those using active transportation modes is of particular concern in truck route network development, given their high vulnerability to serious injury or fatality in the event of a collision with a motor vehicle.

The City provides dedicated infrastructure to support the safe movement of pedestrians and cyclists. Exhibit 4.12 shows the locations of buffered bike lanes, bike lanes, sharrow cycling routes, signed cycling routes, and multi-use trails in the current Windsor network. Sidewalks and pedestrian pathways are also part of the active transportation network (not shown in the exhibit). The exhibit shows the locations of selected planned future cycling infrastructure.

Cyclist volumes along selected municipal roadways are shown in Exhibit 4.13. As expected, cycling volumes are highest in the downtown area, in particular between the University of Windsor and east of the downtown, where Wyandotte Street serving as the most frequently used on-road east-west connection, followed by University Avenue and Riverside Drive. Other more frequently used on-road cycling connections include Sandwich Street near the Port of Windsor, Walker Road north of the EC Row Expressway, and Edgar Street/Little River Road between Parkview Avenue and Riverdale Avenue.

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[24] CTV News (2013). *Cargo hub coming to Windsor airport as part of $19.9M initiative.* <https://windsor.ctvnews.ca/cargo-hub-coming-to-windsor-airport-as-part-of-19-9m-initiative-1.1480444> Accessed August 2023.

Pedestrian volumes along municipal roadways are shown in Exhibit 4.14. As expected given the higher densities of development, pedestrian volumes are highest along downtown roadways. Higher volumes of pedestrian activity are also observed along Wyandotte Street at the University of Windsor, Tecumseh Road and McDougall Street (notable generators include Jackson Park, Honourable WC Kennedy Collegiate, Catholic Central High School/St. Michael's Catholic Adult High School, and a commercial plaza), Chrysler Centre (Stellantis Windsor assembly plant), Sandwich Street, among others.

4.3.5. Passenger Transit

Municipal passenger transit routes, as well as location of bus stops, are shown in Exhibit 4.15. Transit Windsor operates a system of primary routes, secondary routes, local routes, express routes and regional routes throughout the City of Windsor, and extending into the County of Essex and City of Detroit.

Exhibit 4.12: City of Windsor Active Transportation Network

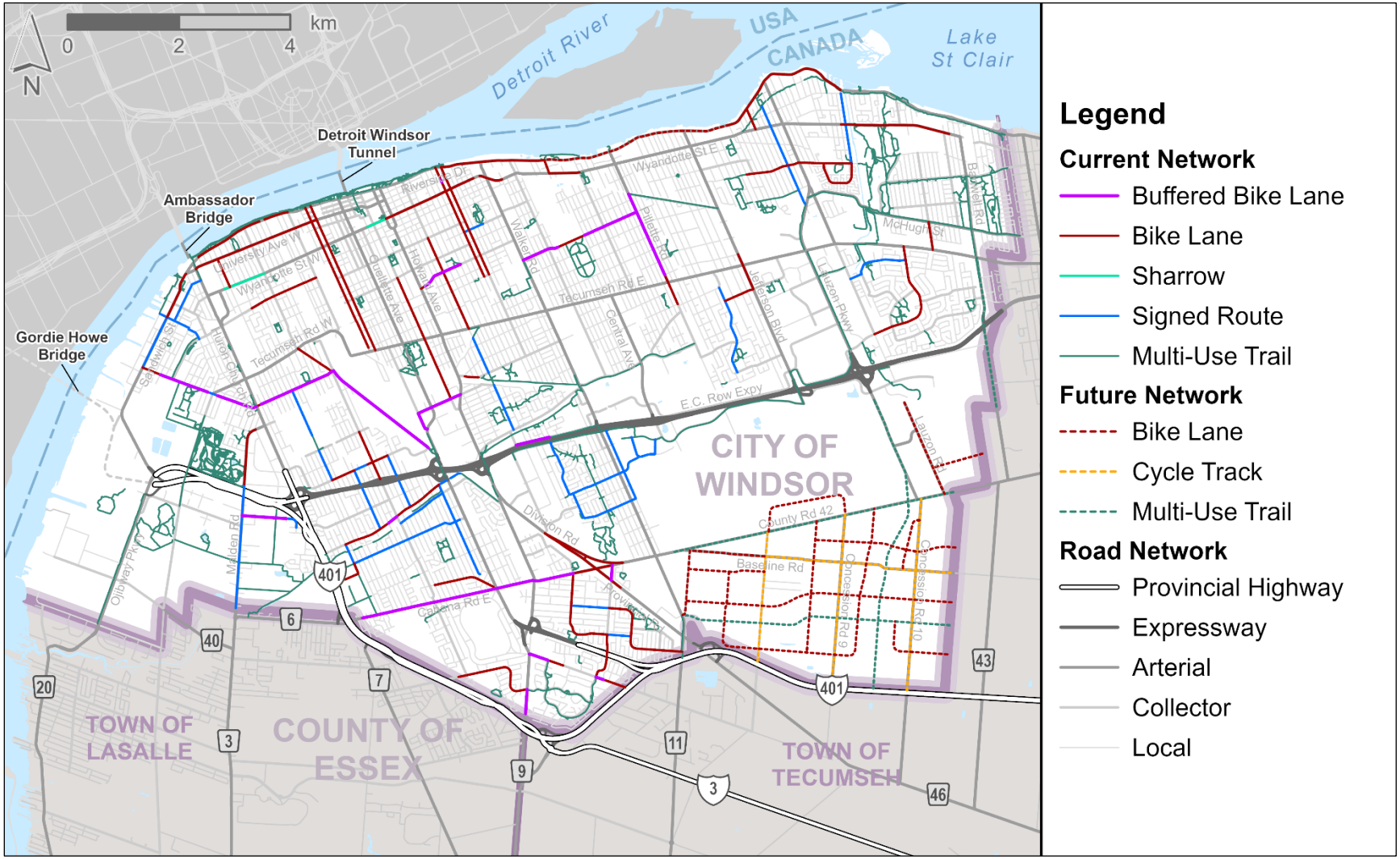
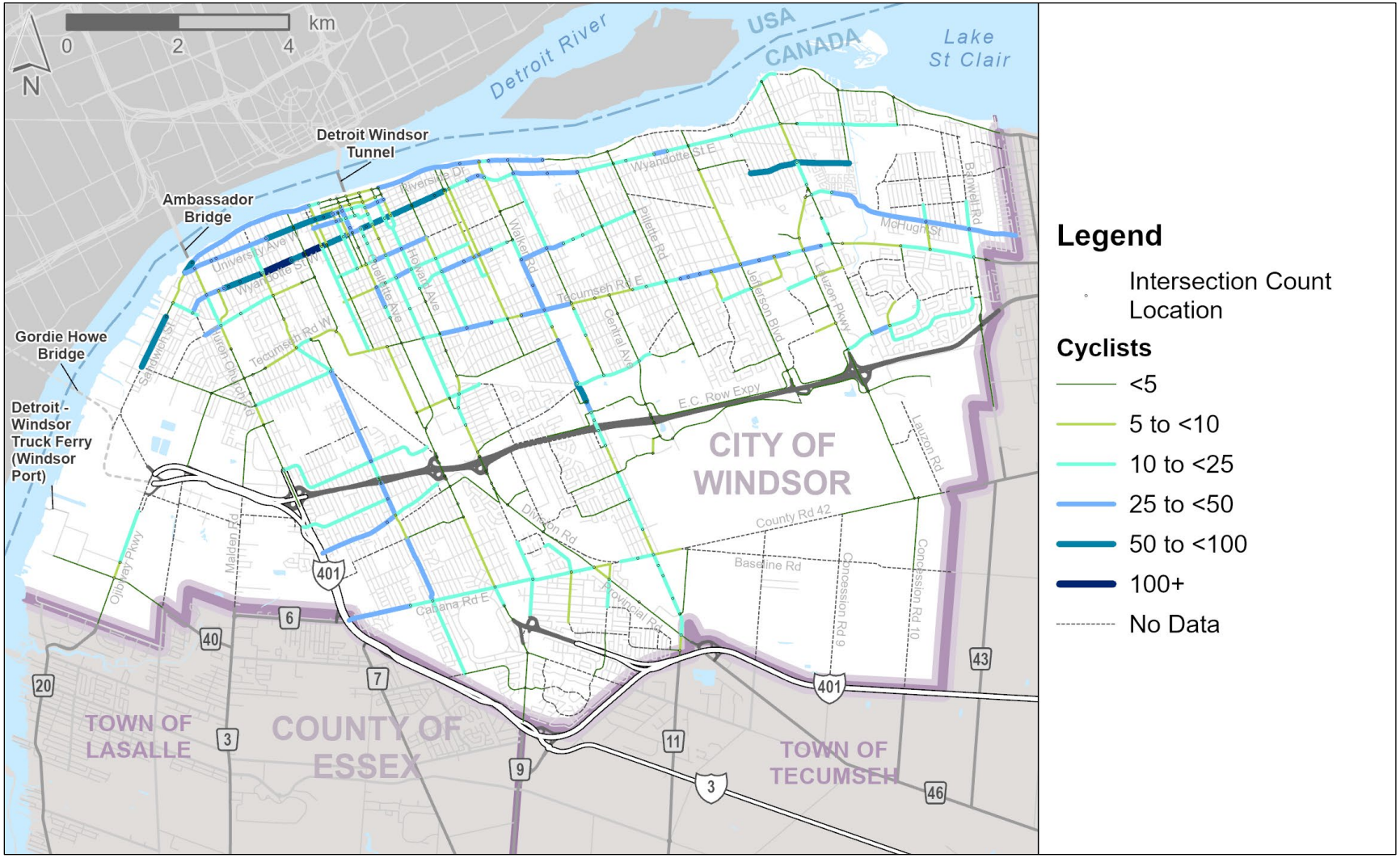
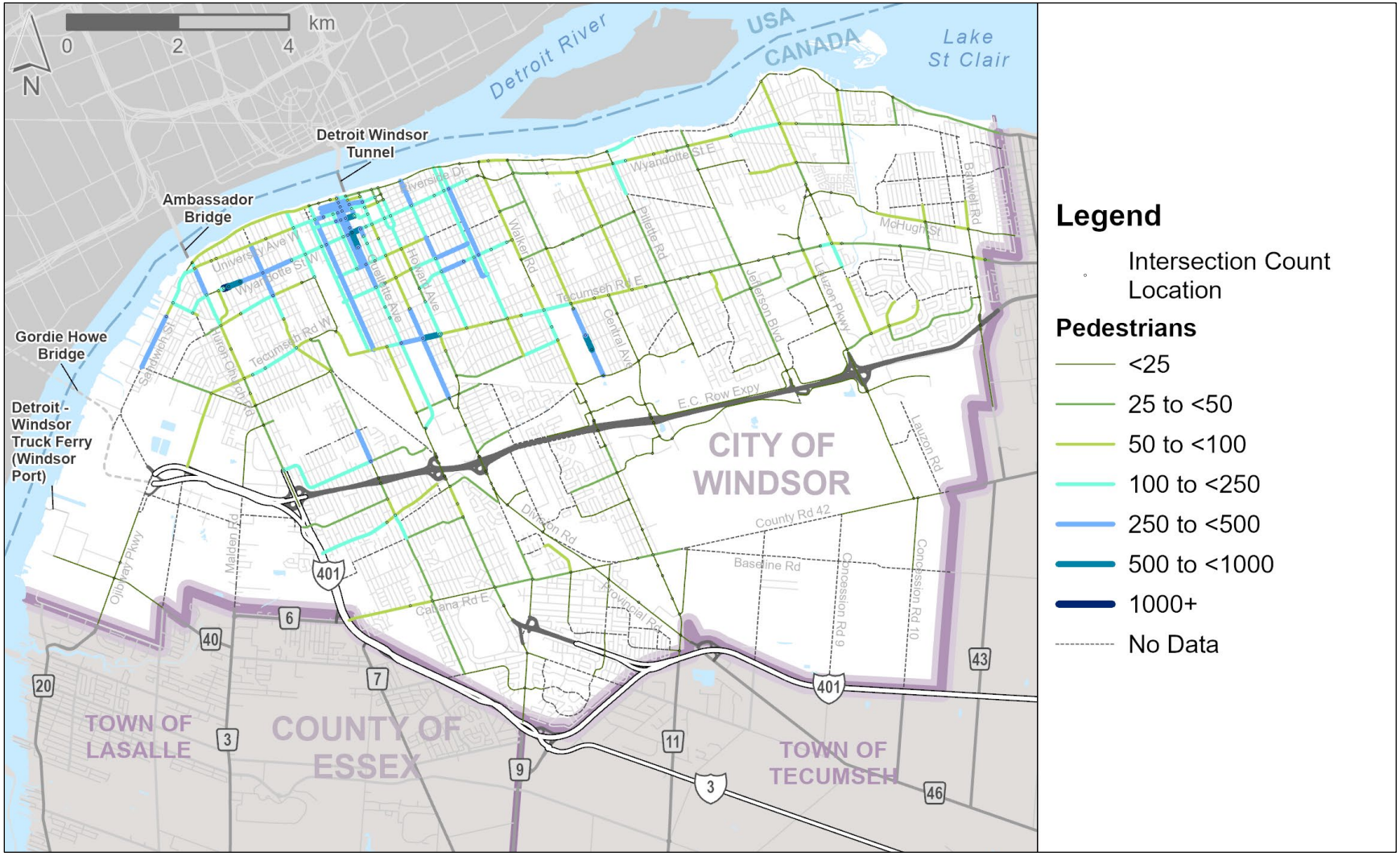


Exhibit 4.13: Cyclist Volumes – City of Windsor Roadways



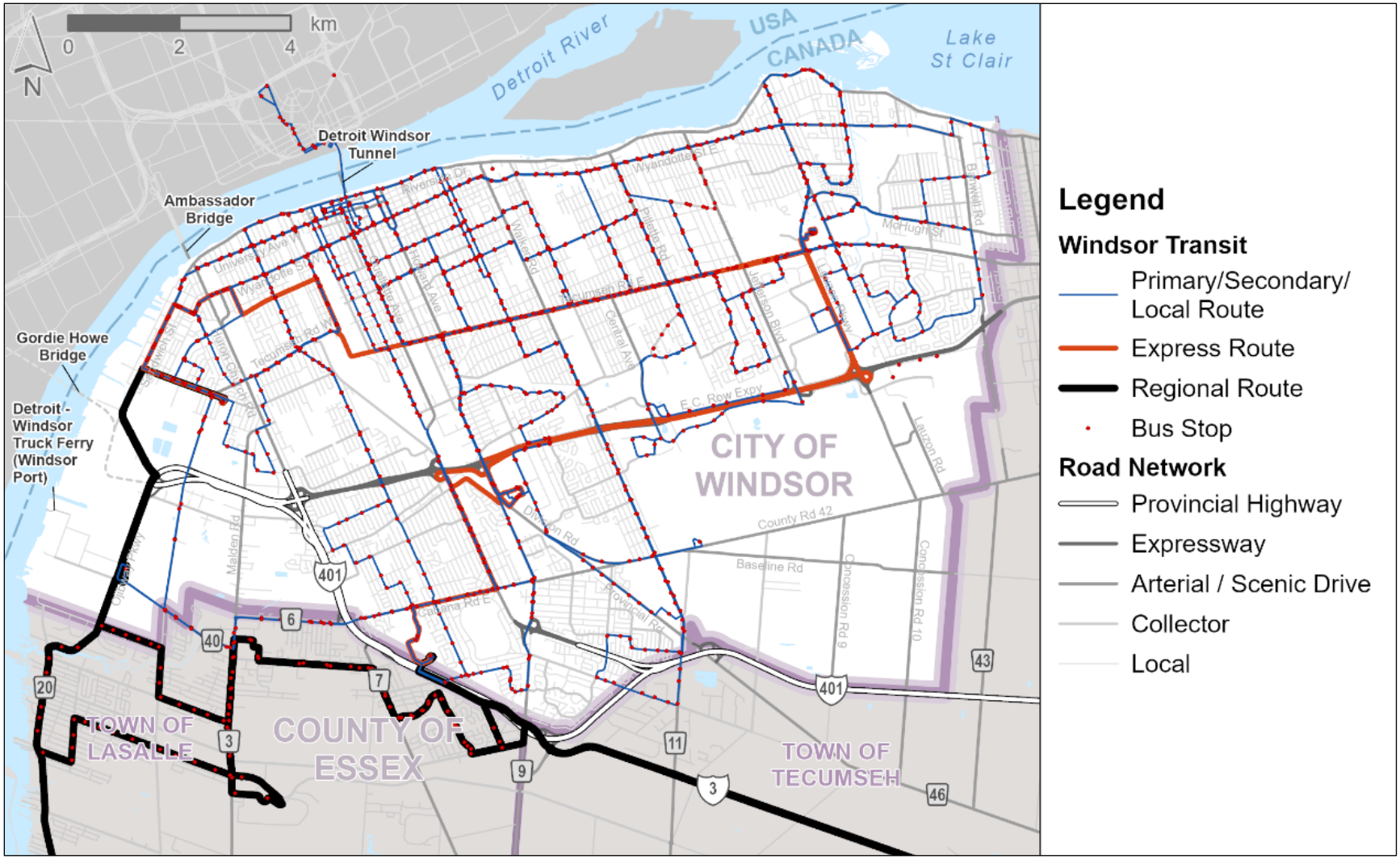
Note: Figures are 7 a.m.–6 p.m. weekday totals based on the most recent weekday counts per site (2020 to 2023)

Exhibit 4.14: Pedestrian Volumes – City of Windsor Roadways



Note: Figures are 7 a.m.–6 p.m. weekday totals based on the most recent weekday counts per site (2020 to 2023)

Exhibit 4.15: Transit Windsor Network

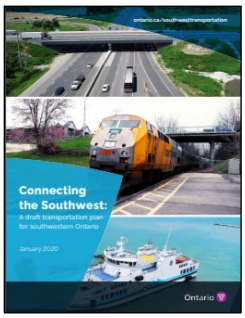


5. Policy and Planning Context

A coordinated approach to the truck route network review is required to better ensure alignment with relevant policies and plans of the Province, the City and the region. This section provides an overview of these policies and plans.

5.1. Provincial Plans and Policies

5.1.1. Provincial Policy Statement (2020)



The Provincial Policy Statement (PPS), issued under the Provincial *Planning Act, 1990,* provides strategic policy direction to municipalities related to land use planning and development. It includes policies for managing growth, managing natural resources, transportation, environmental protection, and public health and safety. All municipal plans and projects including the City's Truck Route Study recommendations must conform to the policy directions outlined in the PPS.

The PPS directs that goods movement be part of efficient, safe, coordinated multimodal transportation systems planned for the long term for the movement of both people and goods. Following are selected policies that relate to the City's truck route network:

- Transportation Systems:
  - 1.6.7.1 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 should be made of existing and planned infrastructure, including through the use of transportation demand management strategies, where feasible.
  - 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.
- Transportation Corridors:
  - 1.6.8.2 Major goods movement facilities and corridors shall be protected for the long term.

- Long-Term Economic Prosperity:
  - 1.7.1 g) providing for an efficient, cost-effective, reliable multimodal transportation system that is integrated with adjacent systems and those of other jurisdictions, and is appropriate to address projected needs to support the movement of goods and people.

5.1.2. Connecting the Southwest (2020)

In January 2020, the MTO released *Connecting the Southwest*: *a draft Transportation Plan for Southwestern Ontario*, which outlines a vision, and the following five goals to improve transportation in southwestern Ontario:

- Getting people moving and connecting communities;
- Supporting a competitive open for business environment;
- Improving safety;
- Providing more choice and convenience; and
- Preparing for the future.

The draft plan also notes ongoing or near-term actions under each goal. (The Province is currently building on this draft plan in preparing a long-term transportation strategy for the region.)

The following selected near-term actions in particular support goods movement:

- Update Long-Combination Vehicle (LCV) Program conditions to reduce congestion due to truck traffic, cut red tape and increase efficiencies for businesses [...] (Action 19);
- In cooperation with municipalities, Ontario will review the rules around reduced load periods for the agriculture, agribusiness and trucking industry to help cut red tape and support businesses, while protecting road infrastructure [...] (Action 20);
- Reduce wait times at the border by building a new overpass structure in Windsor over Ojibway Parkway to connect Highway 401 to the future new International Crossing Canada Customs inspection plaza [...] (Action 21); and
- Explore opportunities to address the shortage of truck parking for commercial vehicle operators. Commercial drivers need rest stops or areas designed to park large vehicles safely. [...] (Action 22).

In addition to these actions, the Plan also highlights improved cross-border wait time information via a new system of ground mounted, overhead and portable

message signs on Highway 401 approaching Windsor for cars and trucks crossing at the Ambassador Bridge and the Detroit-Windsor Tunnel[25].

5.1.3. Windsor-Essex (Herb Gray) Parkway Construction

The Province began planning for the extension of Highway 401 to the future Gordie Howe International Bridge immediately upon the selection of the new international crossing location. A preferred route was selected in 2008 and was initially named the Windsor-Essex Parkway, but renamed the Rt. Honourable Herb Gray Parkway in 2012. This 11-km provincial freeway is a long-term transportation solution to improve the movement of goods and people through the Windsor-Detroit borders. The route was opened in 2015 as far as the planned international bridge approach and plaza.

5.1.4. Long Combination Vehicle (LCV) Program (2022)

> An LCV is a combination of a tractor and two full-length semi-trailers [...] used for commercial goods movement, with an overall length greater than 25 metres and a maximum length of 40 metres. LCVs can help reduce congestion, help transport carriers limit costs and save time, improve road safety, and reduce greenhouse gas emissions (MTO, Long Combination Vehicle Program, 2022).

The Ministry of Transportation of Ontario's (MTO's) Long Combination Vehicle Program[26] was developed to enhance highway safety through stricter standards and controls for participating LCV carriers, drivers and vehicles. The program allows for the operation of LCVs[27] along Ontario's Primary LCV Network, which

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[25] The City of Windsor is currently working with the MTO on improved cross-border wait time information. Implementation was anticipated to be completed in 2023 or 2024. The system will feature Bluetooth technology to inform drivers of border crossing wait times at the Highway401-402 junction, as well as closer to the crossings in Windsor.

[26] The LCV program is a private-sector initiative led by the Ontario Trucking Association and Private Motor Truck Council of Canada, and developed by MTO. The program coordinates with the governments of Quebec, Nova Scotia and New Brunswick to allow the free movement of Long Combination Vehicles across the jurisdictions.

[27] The program currently allows 3 types of LCV configurations:

- an A-train comprised of two 12.2 to 16.2-m long trailers;

represents those highways authorized for LCV travel, and consists of selected divided, multi-lane, controlled access highways as well as ramps connecting between them[28]. This network is shown in Exhibit 5.1, which also indicates the locations of approved rest/emergency stops for LCVs.

Municipal roadways may be included in the Primary LCV Network for access to and egress from a specified origin and destination, as approved by local road authorities. LCVs are allowed to travel along the Primary Network to and from approved origins/destinations, located within 5 km of the designated highway.

LCV Route Design Guidelines

Because of their extended length, LCVs require more space to manoeuvre through turns. As a result, the use of local roads has often required operational and infrastructural upgrades to ensure that the LCV can move safely through these roads and intersections. Upgrades can also be required at MTO interchanges. The costs of these upgrades must be borne by the LCV proponent.[29]

The associated disruptions have led some municipalities to incorporate LCV needs in the planning and design of roads that might be used in the future to access industrial sites, to avoid costly and potentially disruptive retrofits. Until recently, general planning and design guidance was available through sources like a 2010 Ontario Trucking Association discussion paper[30] and MTO's 2015 *Freight-Supportive Guidelines*.[31]

In 2021, MTO issued a detailed guide for LCV route design. The guide recognizes that "low-speed offtracking" of LCVs can occur as they manoeuvre through intersections and around ramps, but focuses on design, operational and

- a B-train comprised of a single 11.5 to 14.65-m lead trailer and a single 11.5 to 16.2-m second trailer and
- a Twin Stinger-Steer Auto Carrier comprised of two trailers up to 14.65 m.

[28] An internal MTO LCV Route Review Committee reviews all route requests, and highways may be considered for inclusion to the Primary LCV Network through an application from an interested proponent, and include evidence of acceptable rest/emergency stop locations along the route.

[29] MTO (Updated 2022). *Long Combination Vehicle Program Conditions*. <https://www.ontario.ca/page/long-combination-vehicle-program-conditions> Accessed September 2023.

[30] Ontario Trucking Association (2010). *Accommodating Commercial Vehicles in Roundabouts: Discussion Paper*

[31] MTO (2015). *Freight-Supportive Guidelines*.

intersection control treatments to keep the offtracking within the paved area. The guide also considers the design of roundabouts.

The guide further notes the need to "balance the needs of multiple road users" at intersections, noting that the need for large, paved areas to safely allow offtracking will increase pedestrian walk times. It notes that channelized islands could be alternatives where there is insufficient space for an additional paved area: the island also provides a pedestrian (and cyclist) refuge[32].

The guide is tied to MTO's *Design Supplement for TAC Geometric Design Guide (GDG) for Canadian Roads*, which is the Ministry's official guidance for the design of its highways.[33] Accordingly, although it speaks to MTO highways and interchanges the guide also impacts how municipal access roads and intersections are designed for LCVs and, in turn, can inform the current or potential suitability of truck route segments that can support LCVs.

Approved City of Windsor LCV Routes under MTO's LCV Program

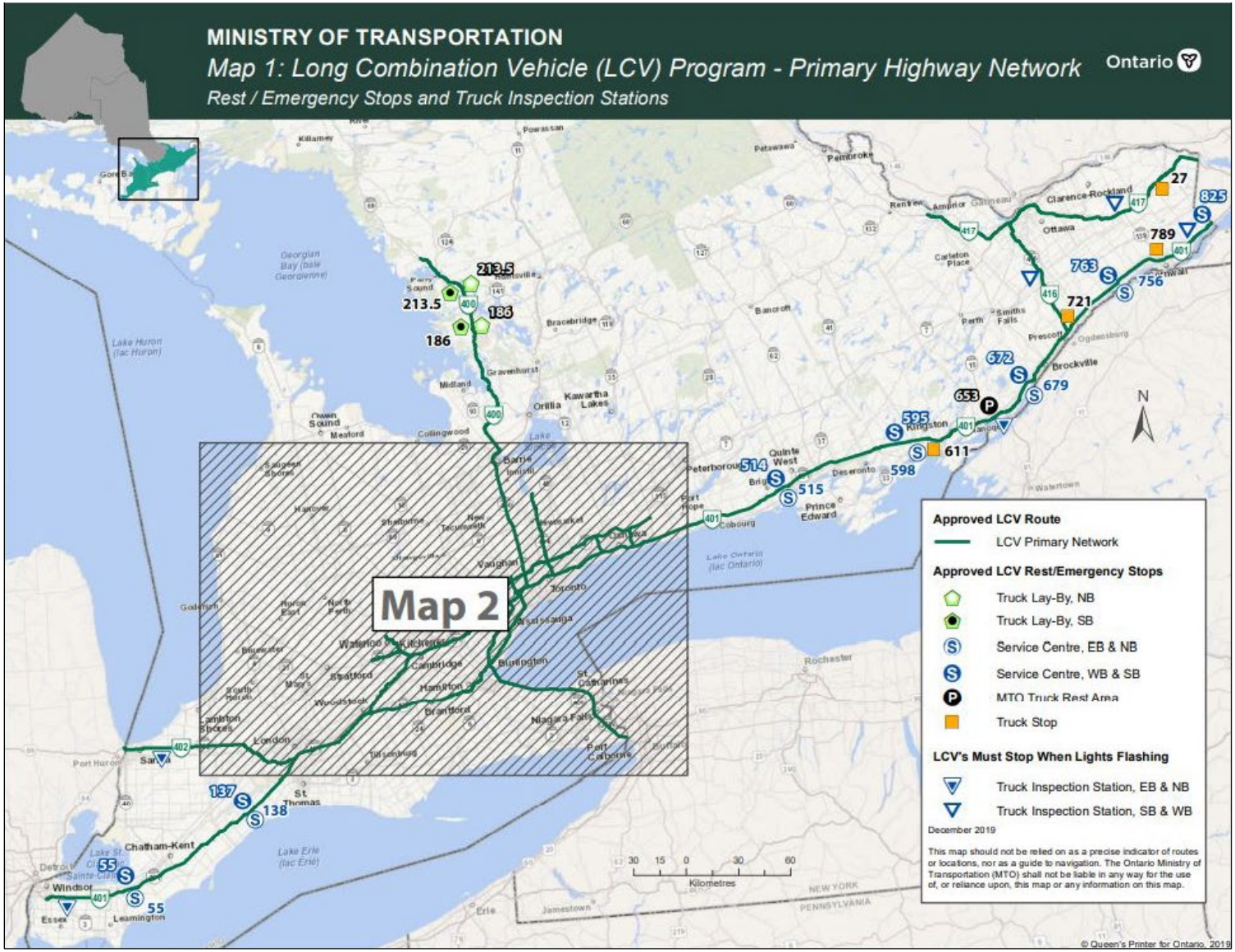
Coinciding with provincial support to increase the prevalence of LCVs as an efficient and safe way to move commercial goods, the City of Windsor has recently approved the following LCV origin/destinations and routing:

- 1885 Brunet Drive to and from Huron Church Road via Malden Road; and
- 1790 Provincial Road to and from Highway 401 via Provincial Road / County Road 46.

[32] *Long Combination Vehicles Best Practices for Design*, Ontario Ministry of Transportation, September 2021.

[33] *Design Supplement for TAC Geometric Design Guide (GDG) for Canadian Roads*, draft, Ontario Ministry of Transportation, June 2023.

Exhibit 5.1: Ontario Long Combination Vehicle Program Primary Highway Network

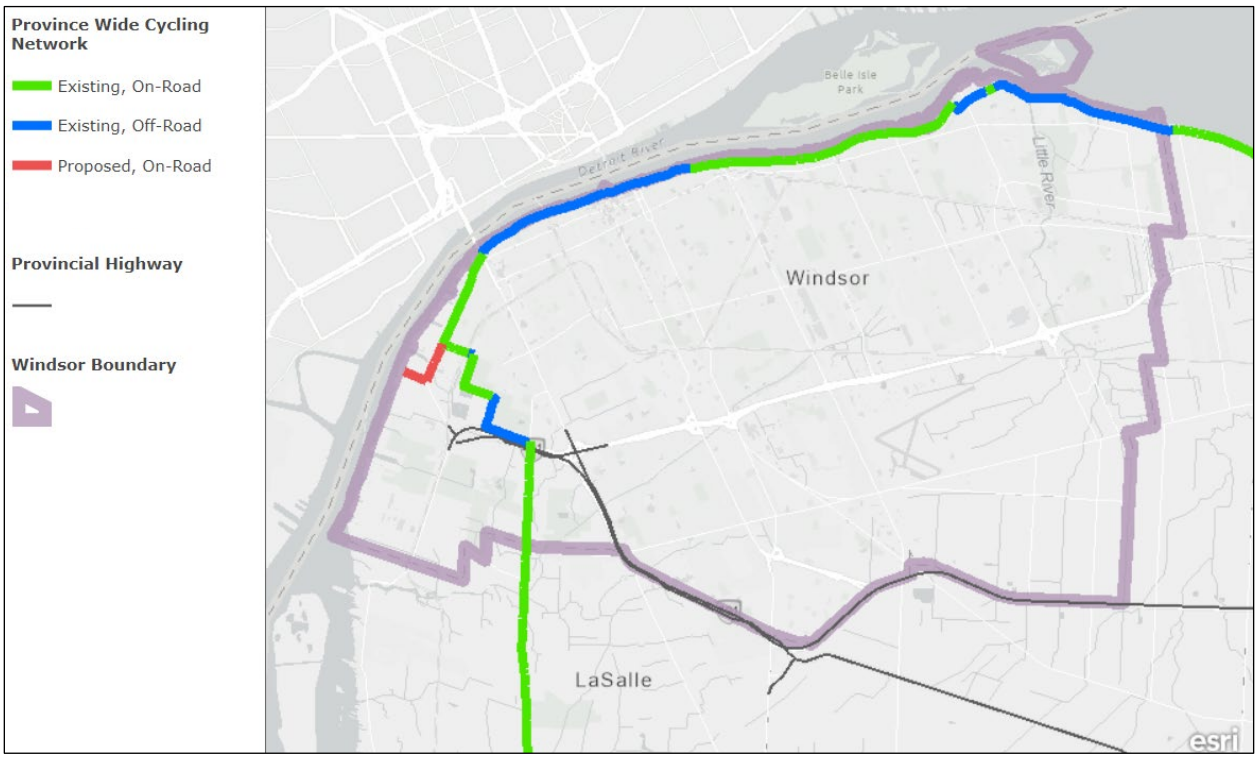


Source: Long Combination Vehicle Program Conditions (MTO, 2022). Image resolution as in source.

5.1.5. Province-Wide Cycling Network

The Government of Ontario's Province-Wide Cycling Network runs through the City of Windsor, as shown in Exhibit 5.2. Riverside Drive is an important off-road cycling route east of Huron Church Road, providing connections outside of Windsor along Lake St. Clair and north toward Sarnia. On-road connections west of Huron Church Road utilize Sandwich Street, Prince Road, Carmichael Road and Malden Road, ultimately providing connections south through La Salle and toward Lake Erie.

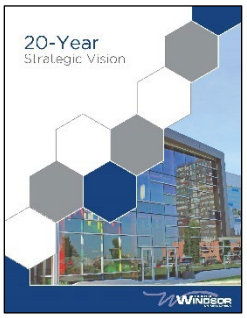
Exhibit 5.2: Province-Wide Cycling Network – City of Windsor



Source: MTO icorridor. <https://icorridor-mto-on-ca.hub.arcgis.com> Accessed July 2023

5.2. City of Windsor Plans and Policies

5.2.1. 20-Year Strategic Vision (2016)



The *20-Year Strategic Vision* (2016) outlines a framework to help Council and the City direct decision-making related to programs, services and infrastructure, as well as provide the community the opportunity to share input on the future of Windsor. The Vision is supported by the following three main goals:

- **More jobs in Windsor:** Through a diversified economy, and by supporting entrepreneurship and small business, Windsor will have jobs.
- **Addressing Windsor's reputation:** Through celebrating all successes, emphasizing its fiscal sustainability, and encouraging favourable conversation about the city, Windsor will be a positive place.
- **Improving quality of life in Windsor:** By strengthening the city as a whole through supporting its neighbourhoods and districts, encouraging convenient transit and transportation options, and excellent service delivery, Windsor will provide a high quality of life for all.

The document also identifies strengths that the City will build on over the 20-year horizon and beyond, as following:

- Strategic Location:
  - Canada-USA border and transportation hub
  - Proximity to markets
  - Favourable climate and beautiful natural riverfront setting
  - Biodiversity
- People:
  - Diverse population
  - And skilled and hard-working labour force
- Fiscal Sustainability:
  - Sound, stable financial position to make decisions
- Quality of Life:
  - Great place to go to school, raise a family and retire

5.2.2. City of Windsor Official Plan (2012)

City Vision

The City of Windsor Official Plan (office consolidation 2012, amended 2022) outlines a long-term vision and development strategy for the municipality over a 20-year period. As the chief overarching planning document, it outlines the City's social, economic and environmental goals, objectives and policies to direct land use, new development and growth.

The vision was carried forward from the *City of Windsor Community Strategic Plan (2007)*, and adopted by the Official Plan to help guide the City's future, as follows:

> **Windsor is a quality city full of history and potential, with a diverse culture, a durable economy, and a healthy environment where citizens share a strong sense of belonging and a collective pride of place.**

Functional Road Classification

The functional road classification system for the road network in the City of Windsor was described in Section 4.2.4, with a map of the road network shown in Exhibit 4.8.

Transportation System Policies Relevant for the Truck Route Network

The following selected Official Plan policies related to the transportation system are of relevance to the Windsor Truck Route Study:

- 3.2.3.1 Transportation System: Windsor will work toward achieving a sustainable transportation system where all modes of transportation can play a more balanced role. The creation of mixed use and employment centres will allow businesses and services to be closer to homes and allow greater opportunities for walking, cycling and transit.
- 7.2.1.1 Establish System: To establish a safe and efficient transportation system that facilitates the movement of people and goods and is appropriate to address projected needs.
- 7.2.1.2 Efficient Use: To make efficient use of existing and planned transportation infrastructure.
- 7.2.1.3 Integrated Transportation System: To provide for the integration, coordination and extension of the transportation system within, to and from Windsor.
- 7.2.1.4 Interconnected Transportation System: To provide a system with functional connectivity and interconnectedness.

- 7.2.1.11 Minimize Conflicts: To minimize conflicts within the transportation system.
- 7.2.1.15 Roads: To establish and maintain a safe and efficient road network.
- 7.2.1.17 International Gateway: To uphold and advance Windsor's role as Canada's foremost international gateway.
- 7.2.1.19 Viable Port Facilities: To ensure accessible and viable port facilities.
- 7.2.1.23 Natural Features: To direct the transportation systems, where possible, away from Natural Heritage Features and Areas.

The following Official Plan policies are related specifically to trucking activity:

- 7.2.1.8 Truck Routes: To establish safe and efficient truck routes within and through Windsor.
- 7.2.2.9 Truck Route System: Council shall establish and manage a truck route system to minimize the intrusion of trucks into sensitive areas while providing acceptable access to business and industries.
- 7.2.2.10 Truck Access: Council recognizes that while truck access is necessary for some properties, the adverse effects of truck traffic shall be minimized by:
  - a) Discouraging truck traffic in residential and pedestrian oriented areas;
  - (b) Directing land uses which generate substantial truck traffic to appropriate areas in accordance with the Land Use chapter of this Plan;
  - (c) Ensuring the proper design of roads intended to carry truck traffic; and
  - (d) Implementing other measures as may be appropriate and necessary.
- 7.2.2.11 Hazardous Goods: Council shall restrict the movement of hazardous goods to transportation routes which avoid high risk areas and provide safe and direct access to their intended destination.

Economic Development

The following Official Plan policy are related to the City's economic development priorities:

- 3.2.2.1 Employment Centres: Windsor's economy will be stimulated by active employment centres that serve the larger Census Metropolitan Area. These centres will cluster appropriate large scale employment, shopping and entertainment uses together to create exciting areas for employment and investment. With convenient access to major transportation routes, these centres will be transit friendly and poise to take advantage of Windsor' role as an international gateway.

The Official Plan's *Urban Structure Plan* identifies a hierarchy of nodes based on their scale and variety of land uses, as well as their local and regional importance. This plan was discussed previously in Section 3.2.1.

5.2.3. Walk Wheel Windsor – Active Transportation Master Plan (2019)

Walk Wheel Windsor is the City's master plan for active transportation, guiding municipal progress and investment in active transportation over a 20-year horizon. The Active Transportation Master Plan identifies a vision, goals and targets to improve active travel, and establishes strategies and corresponding actions related to the following themes: connecting communities, places for people, innovation and integration, culture shift, and quality of life. Sidewalk improvements along local and major streets, as well as a proposed bicycle network (including both on-street and off-street facilities) are recommended to prioritize investment over the short-, medium- and long-term.

The City's recommended active transportation network was also discussed in Section 4.3.4.

The following strategy and actions from *Walk Wheel Windsor*, relate to Complete Streets (below):

- Strategy 2A: Develop Complete Streets
  - Action 2A.1: Develop and Adopt a Complete Streets Policy and Design Guidelines
  - Action 2A.2: Follow Complete Street Design Principles in All New Development and Road Projects

5.2.4. Vision Zero Action Plan (2023)

The City of Windsor's Vision Zero Action Plan was approved by Council in January 2024.

The plan identifies eleven strategic priorities organized under four themes: driver behaviour, road user types, locations and infrastructure, and process improvements.

The plan outlines 42 initiatives, the first of which is to develop and implement a Complete Streets policy, described below.

The only initiative related specifically to trucks is Initiative 42: develop safety-related vehicle design criteria for future city vehicle fleet purchases.

The plan also outlines targets measurable against a 2015-2019 baseline, e.g. reducing fatalities and major injuries involving drivers speeding or losing control from 11.0 per year in 2015-2019 to zero in 15 years.

5.2.5. Complete Streets Policy (ongoing)

A Windsor Complete Streets Policy is currently under development.

> "Complete Streets are streets that are safe for all users, regardless of age, ability, income, race, ethnicity, or mode of travel. By using a Complete Streets approach to designing road networks, we can create spaces that allow all users to thrive — not only motorists" (*Complete Streets for Canada).*

The lead agency for this initiative is the Transportation Planning department, and the initiative would address the following strategic priorities:

- 1A: Vehicle Speeds;
- 1D: Failing to Yield at Intersections
- 2A: Vulnerable Road Users
- 3A: High Injury Corridors
- 3B: Signalized Intersections
- 3C: Pedestrians Crossing Mid-block
- 4B: Design Standards and Best Practices

Developing and implementing a Complete Streets Policy will support Vision Zero goals by:

- Identifying target speeds for all street types and implementing features that discourage drivers from travelling faster than the target speed.
- Ensuring that all users are accommodated in the right-of-way appropriately, comfortably and safely.

The Complete Streets Policy is intended to be a City-wide policy, but high-injury corridors could be prioritized for implementation.

5.2.6. County Road 42 Secondary Plan (2018)

The County Road 42 Secondary Plan is guides future development including a full range and mix of housing and employment uses, establish the road network for the study area, and provide for the development of a new regional hospital.

Schedule F of the secondary plan, shown as Exhibit 5.3, outlines the transportation plan for the area, including the locations of roads by classification: Class I Arterials (future Lauzon Parkway extension), Class II Arterials, and Class I Collectors, as well as multi-use trails and bicycle lanes.

5.2.7. Sandwich South Master Servicing Plan (2023)

The Sandwich South Master Servicing Plan was approved by Council in May 2023 to help meet the future growth needs of the City through a coordinated approach to providing municipal infrastructure in the Sandwich South annex lands previously annexed by the City in 2003 from the Town of Tecumseh.

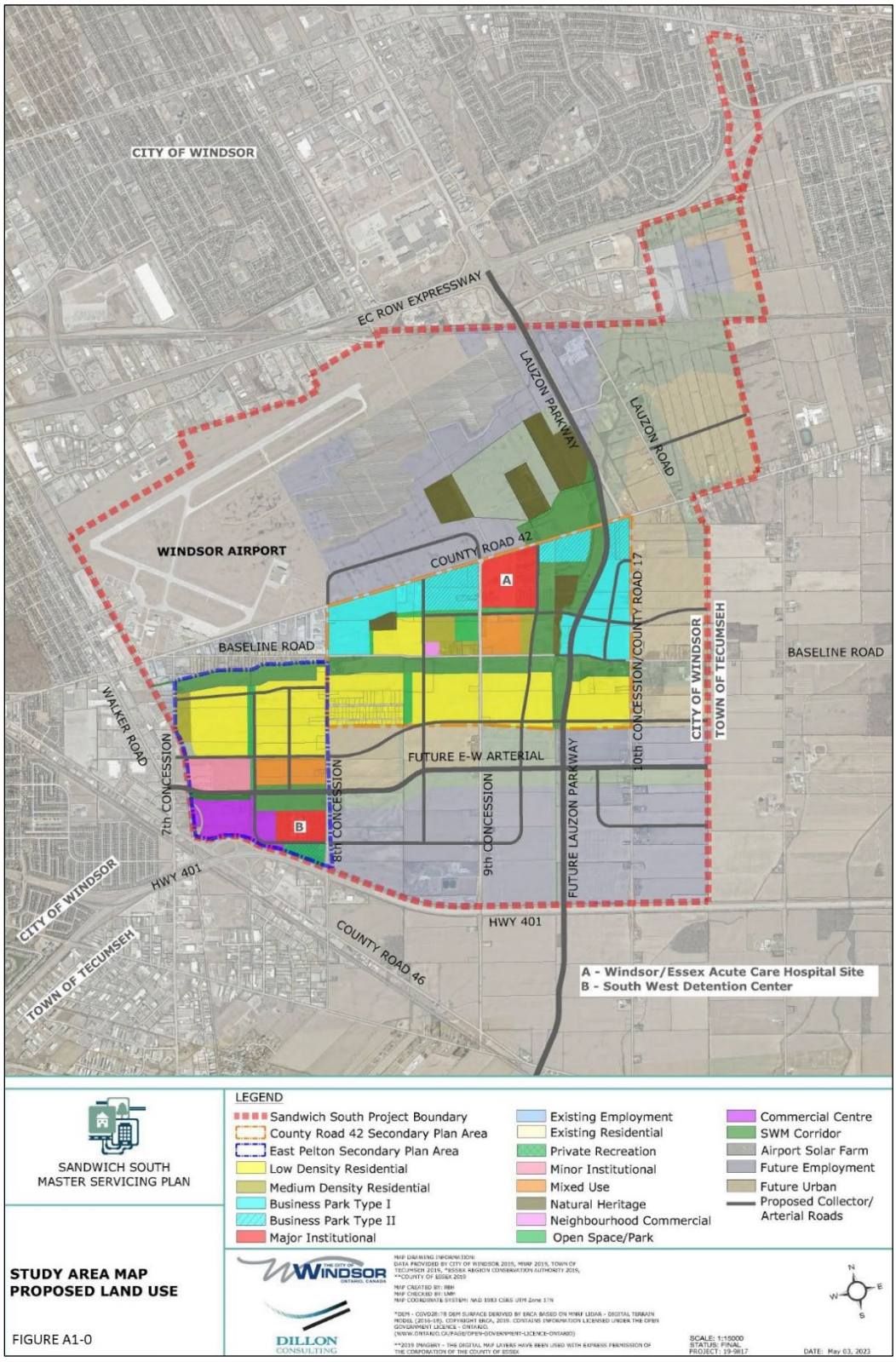
The study area for the Master Servicing Plan comprises the lands that are part of the *County Road 42 Secondary Plan, 2018* (undertaken in response to the future development of a new regional hospital, and was approved by Council as Official Plan Amendment 120) and the *East Pelton Secondary Plan Area, 2009* (approved by Council as Official Plan Amendment 74, and subsequent land use changes approved as Official Plan Amendment 94 in 2016).

Proposed land uses for the Sandwich South area are shown in Exhibit 5.4. The area's ultimate road network is shown in Exhibit 5.5, and the proposed active transportation network is shown in Exhibit 5.6.

Exhibit 5.3: County Road 42 Secondary Plan - Transportation Plan

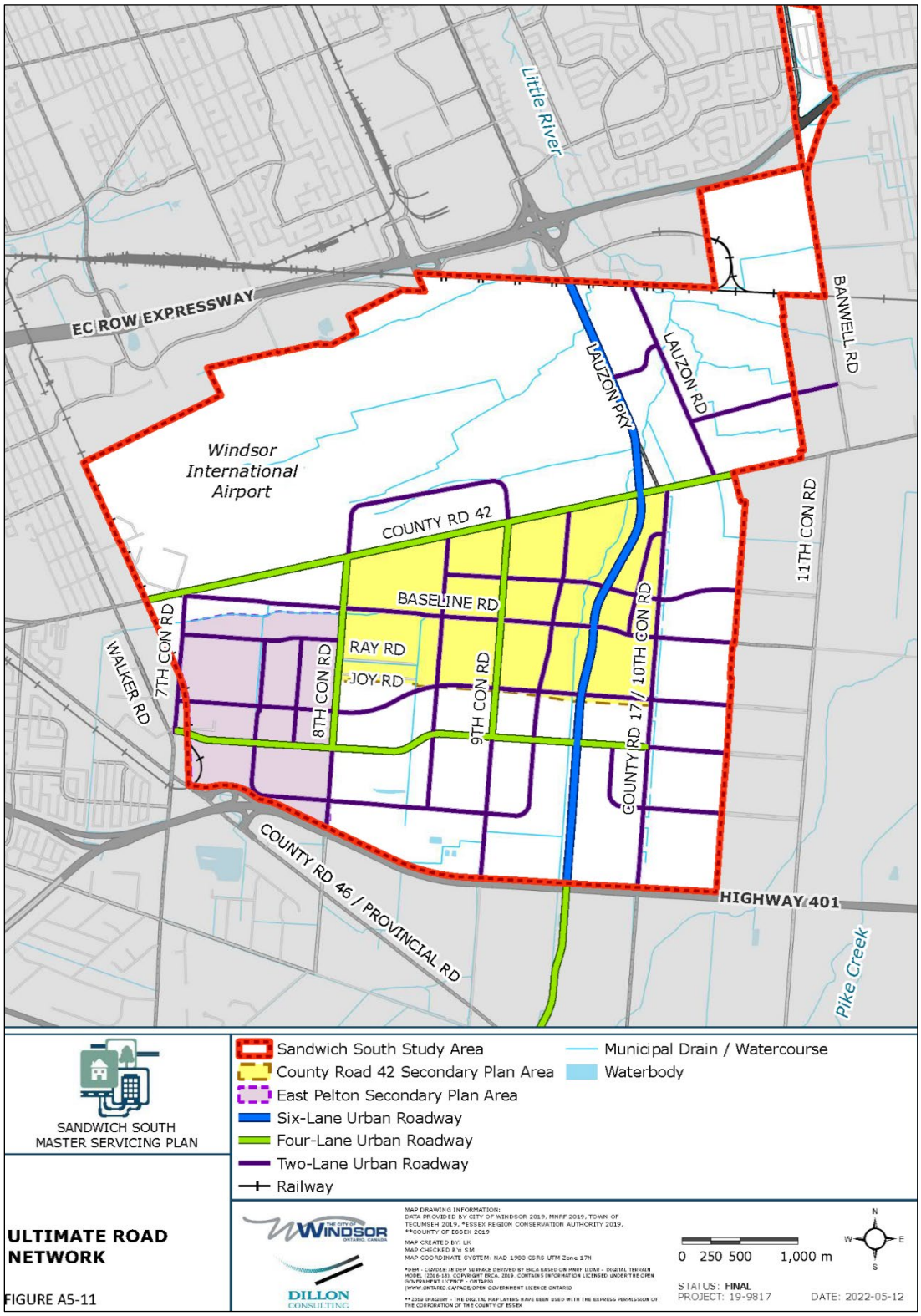
Source: City of Windsor (2018). County Road 42 Secondary Plan, Schedule F: Transportation Plan

Exhibit 5.4: Sandwich South Master Servicing Plan Proposed Land Use



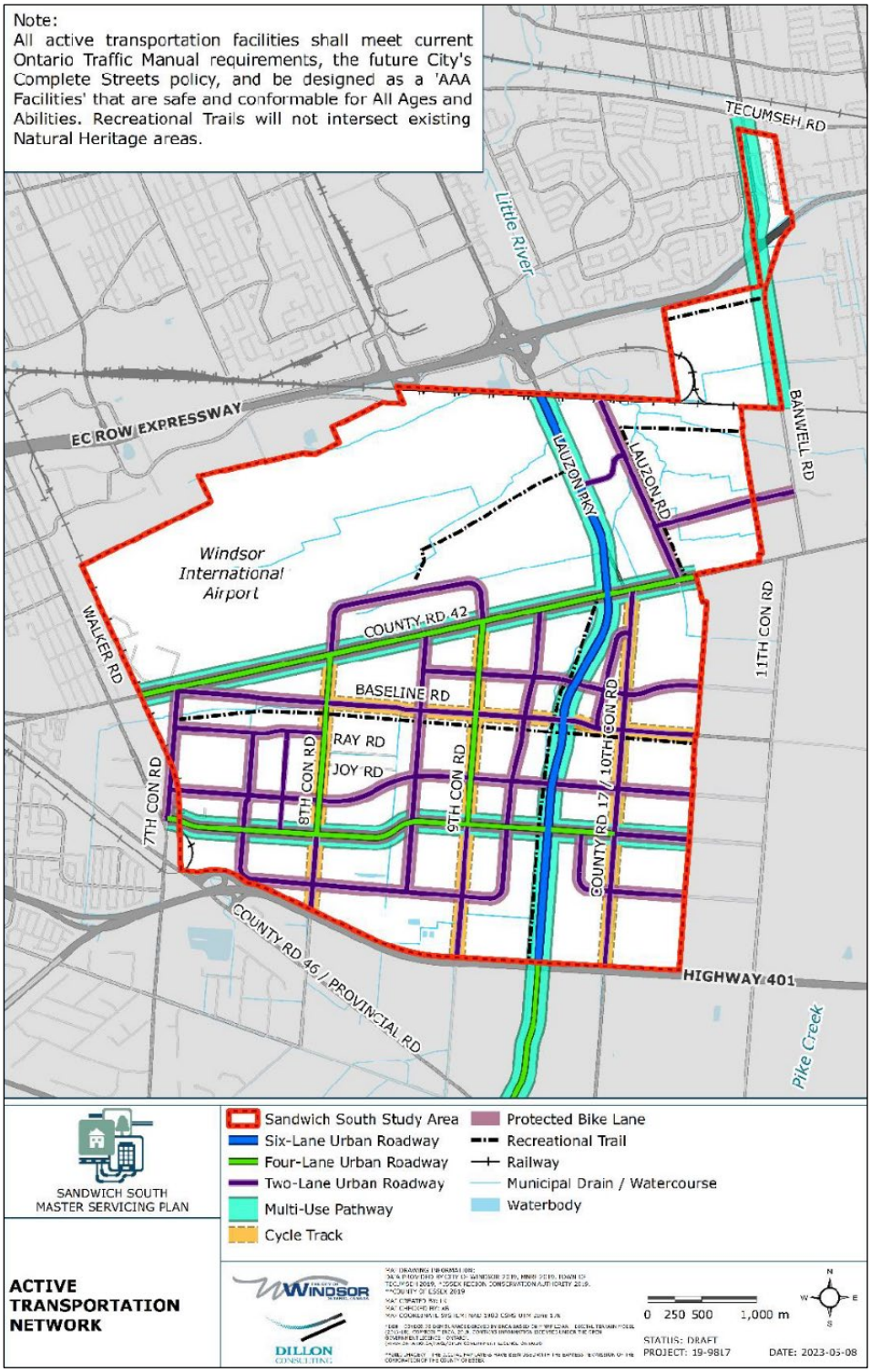
Source: Sandwich South Master Servicing Plan (2023), Figure A1-0

Exhibit 5.5: Sandwich South Master Servicing Plan Proposed Road Network



Source: Sandwich South Master Servicing Plan (2023), Figure A5-11, cropped

Exhibit 5.6: Sandwich South Master Servicing Plan Proposed Active Transportation Network



Source: Sandwich South Master Servicing Plan (2023), Appendix E – Sandwich South Transportation Report, Figure 19, cropped

5.2.8. Environmental Assessments

Banwell Road Environmental Assessment (2016)

In 2016, the City of Windsor completed a Schedule C Municipal Class Environmental Assessment for Banwell Road from Tecumseh Road East to the CPKC rail corridor/City of Windsor boundary. Recommendations of the EA include the following roadway improvements, to be completed in phases over a 20-year timeframe:

- Widen Banwell Road from two to four lanes, and protect for future widening to six lanes from the CPKC rail corridor to the EC Row Expressway interchange;
- Construct an interchange at the Banwell Road and EC Row Expressway intersection;
- Reserve property for a future grade separation at the CPKC rail corridor;
- Construct a multi-use trail along one side of Banwell Road;
- Construct a sidewalk along one side of Banwell Road, except for the overpass over EC Row Expressway; and
- Construct a roundabout at Banwell Road and Wildwood Drive/Mulberry Drive (now complete).

Central Box Study Area Environmental Assessment (2016)

The City of Windsor conducted a Schedule C Municipal Class Environmental Assessment to identify transportation improvements to the area known as “central box”, bounded by Eugenie Street to the north, Howard Avenue to the east, Dominion Boulevard to the west, and West Grand Boulevard/South Cameron Boulevard to the south.

The EA recommends various roadway modifications, including the following relative to truck traffic.

- The **removal of the existing northbound left-turn restriction** for trucks at the Dougall Avenue/EC Row Expressway north ramp to reduce the instances of trucks attempting U-turns at the Van de Water Rail Yard access, and to strengthen the role of Dougall Avenue and the EC Row Expressway as part of the truck route network;
- Addition of active transportation infrastructure – bike lanes, sidewalks and or/multi-use trails – along Dominion Boulevard, Eugenie Street, Ouellette Avenue, Dougall Avenue, Remington Ave, Howard Avenue, and adjoining streets.

Provincial/Division Road Environmental Assessment (2007)

In 2007, the City of Windsor completed a Class C Environmental Assessment to respond to the congestion along Provincial Road and Division Road caused by tremendous growth in nearby commercial and residential development along the Walker Road corridor.

Based on EA recommendations, the following roadway modifications have been completed or are planned for the corridor:

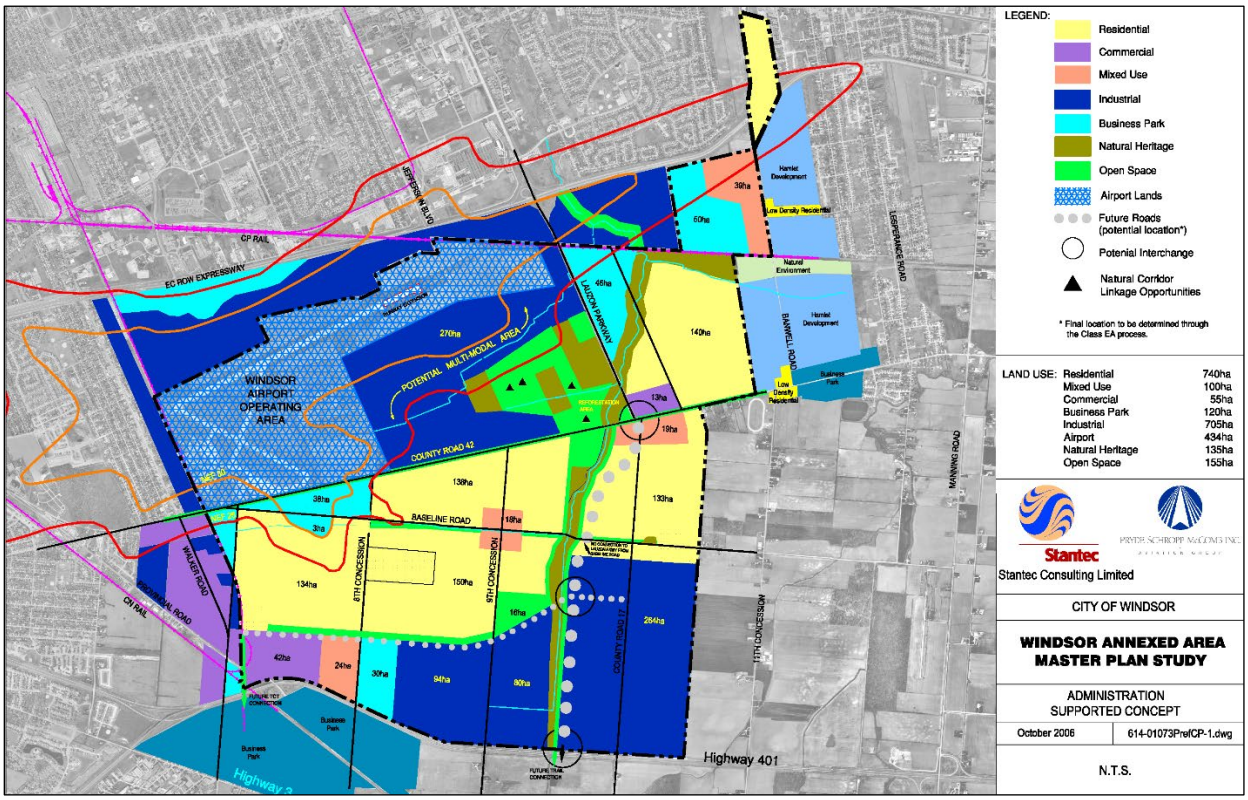
- Widening of Division Road to four through lanes between north of Sydney Avenue to Marentette Avenue (complete);
- Widening of Provincial Road from two lanes to five lanes from Cabana Road to Legacy Park Drive, as well as the installation of an off-road multi-use trail and sidewalks (complete);
- Widening of Provincial Road from Legacy Park Drive to Walker Road (budgeted for 2029); and
- Widening of Cabana Road from two to four lanes between the CN rail corridor to Barracuda Street (complete as far east as Sixth Concession Road).

5.2.9. Windsor Annexed Lands Master Planning Study (2006)

In 2006, the City of Windsor completed a planning study to determine the land needs requirements to accommodate future growth and redesignate agricultural lands to other land uses as part of the Sandwich South annex lands previously annexed by the City in 2002 from the Town of Tecumseh.

The Council adopted land use plan is shown in Exhibit 5.7.

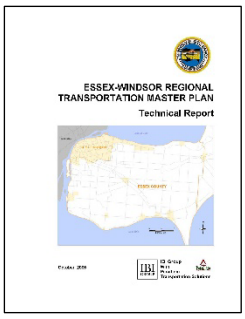
Exhibit 5.7: Windsor Annexed Lanes Master Plan Study Council Supported Concept



Source: Windsor Annexed Lands Master Planning Study Background Reports Summary (Stantec, 2006)

5.3. Regional Plans and Policies

5.3.1. Essex-Windsor Regional Transportation Master Plan (2005)



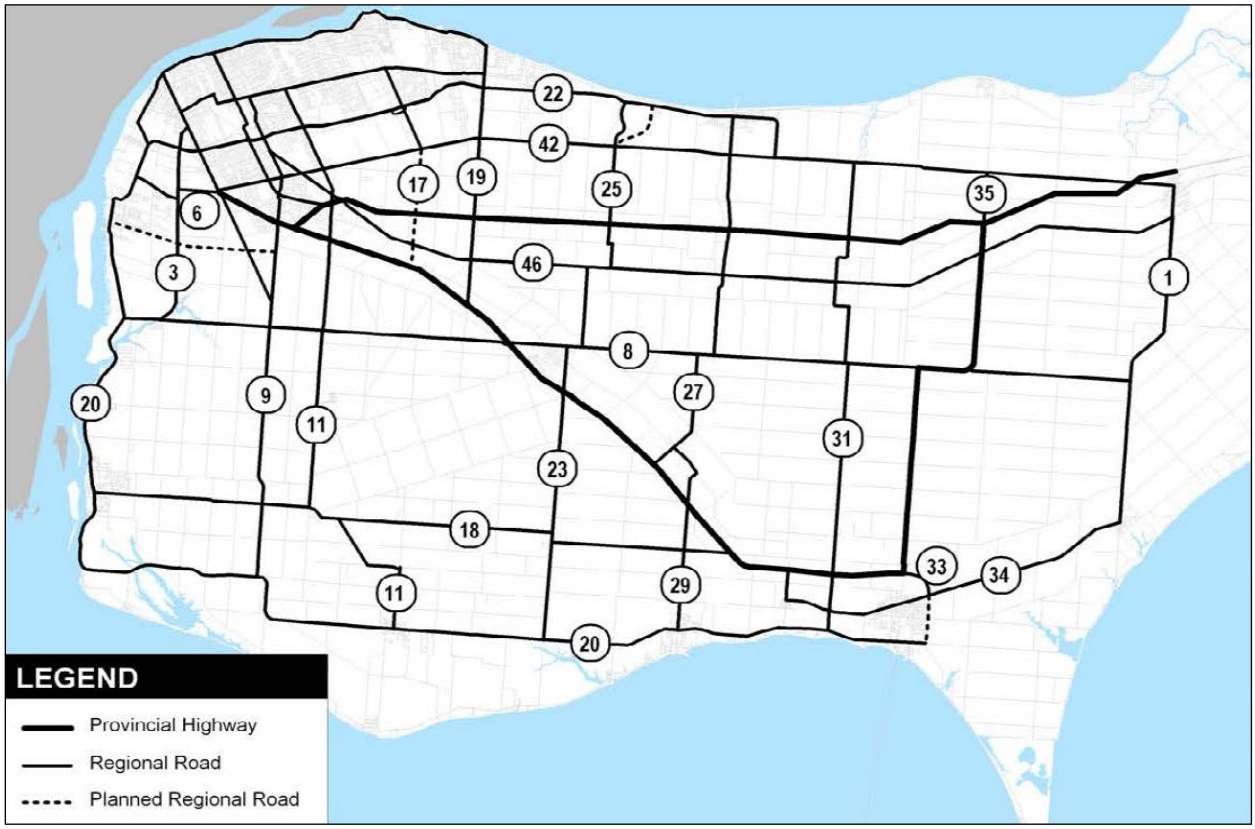
The Essex-Windsor Regional Transportation Master Plan (EWRTMP) serves as a comprehensive regional transportation policy and implementation strategy to serve regional, provincial and international travel over a 20-year timeframe. While the EWRTMP was not adopted by City of Windsor Council as an official planning document, is was adopted by County of Essex.

This master plan builds and expands on the recommendations of the Windsor Area Long Range Transportation Study (1999) to develop a full regional plan for the City of Windsor and Essex County.

As part of the master plan, a regional road system was recommended in which urban and rural roads were identified based on their service function in inter-regional connectivity, as shown in Exhibit 5.8. The regional road system was developed separate to the regional road classification hierarchy, and is used to apply and maintain consistent operational and maintenance standards between all municipalities in the region. Section 5.4 of the Regional Master Plan defines regional roads as:

> Roads, both urban and rural, that by themselves or in combination with other regional roads, provide inter-regional connectivity within the regional planning area and to adjacent municipalities. This inter-regional connectivity within the Essex-Windsor area is recommended as the prime service function criteria in designated regional roads. Roads or road sections that may serve high traffic volume but do not provide inter-regional connections would not be designated as a regional road.

Exhibit 5.8: Essex-Windsor Regional Transportation Master Plan Recommended Regional Road System



Source: Essex-Windsor Regional Transportation Master Plan (2005), Exhibit 5.7

For strong regional goods movement connectivity, the City of Windsor truck route network should connect efficiently at the city boundary to the Regional Roads and Planned Regional Roads identified in Exhibit 5.8.

5.3.2. Windsor Area Long Range Transportation Study (1999)

The Windsor Are Long Range Transportation Study (WALTS) serves as a transportation plan for the City of Windsor, Town of LaSalle, Town of Tecumseh, and Town of Lakeshore to guide priorities and decision-making in roads, cycling and walking facilities, transit, and trucking services, among other topics, to a horizon year of 2016.

The study identified the need for truck route extensions into less-developed areas to support the growth of commercial goods movement and the continuity of truck routes between the City and Essex County. The following roadways were identified as focus areas for truck route extensions, and are included in the existing truck route network for the City of Windsor: Ojibway Parkway, Malden Road, Huron Church Road/County Road 7, Howard Avenue/County Road 9, Walker Road/County Road 11, Lauzon Parkway and County Road 19 (Essex County).

The study also outlines two truck route management approaches – restrictive vs. operational (i.e. enhanced traffic management, one-way truck routes, two-tier truck routes, open system with time restrictions). Restrictive truck route management was the recommended approach, and includes the following measures:

- Vehicle Restrictions: Prohibit vehicles based on weight, height, length and width;
- Time Restrictions: Reduce impacts associated with truck routes typically at night;
- Seasonal Restrictions: Used in rural contexts where seasonal conditions cause structural limitations to the roadway;
- “No entry” Access Restrictions: Prohibit local access of trucks through identified areas; and
- Zonal truck restrictions: Limit through truck traffic in smaller areas bounded by arterial road truck routes.

5.3.3. Lauzon Parkway Improvements Environmental Assessment (2014)

The City of Windsor, in partnership with the MTO and the County of Essex, completed a Class C Environmental Assessment to identify future requirements for Lauzon Parkway and area. The recommendations are grouped into six phases over two horizons, as shown in Exhibit 5.9, and include the following:

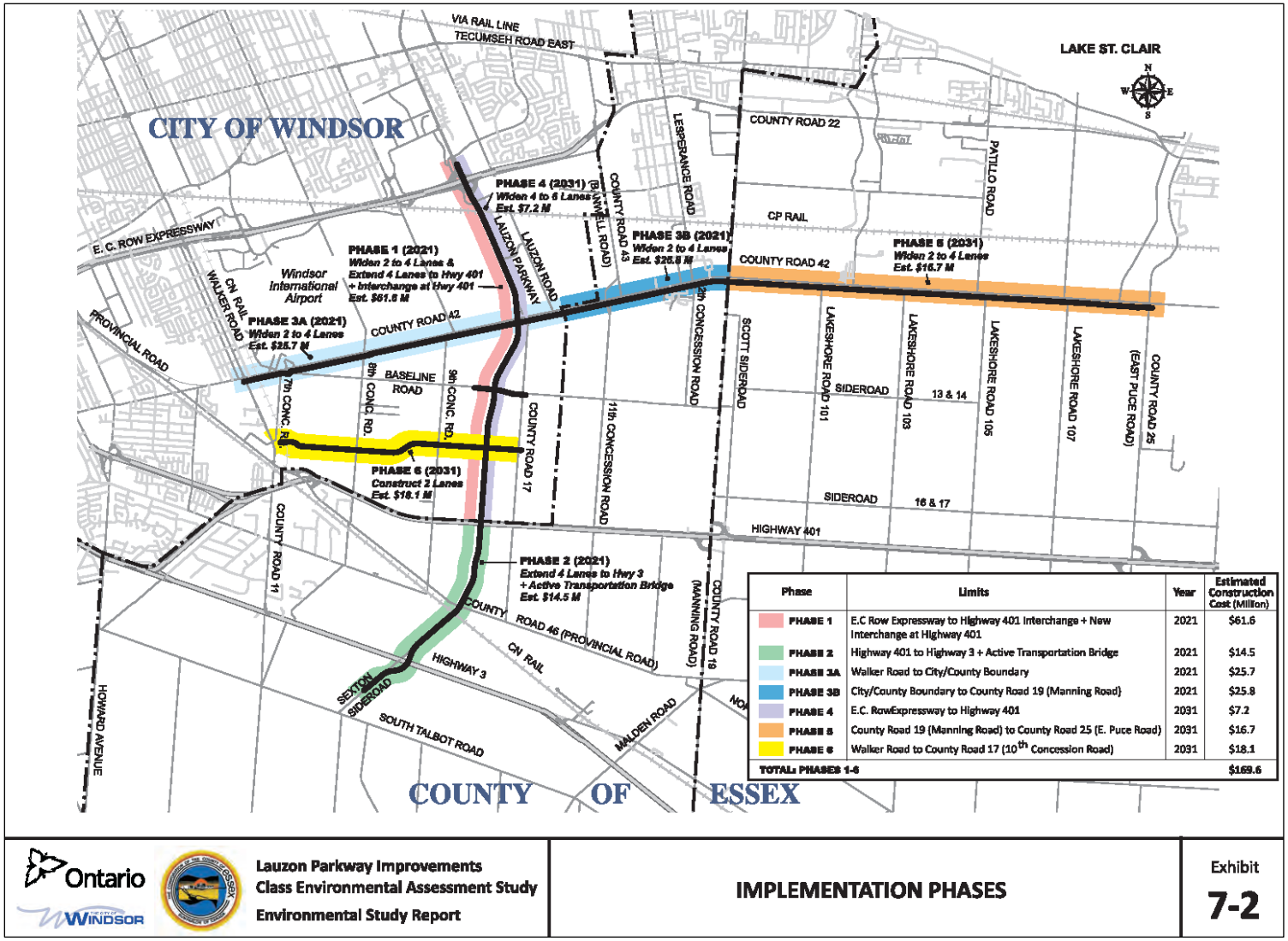
- Phase 1: Widen Lauzon Parkway from two to four lanes between EC Row Expressway and County Road 42, and extend roadway to Highway 401 with new interchange at Highway 401;
- Phase 2: Extend four-lane Lauzon Parkway from Highway 401 to Highway 3 and implement active transportation bridge over Highway 401;
- Phase 3: Widen County Road 42 from two to four lanes between Walker Road and County Road 19;
- Phase 4: Widen Lauzon Parkway from four to six lanes between EC Row Expressway and Highway 401;
- Phase 5: Widen County Road 42 from two to four lanes between County Road 19 and County Road 25;
- Phase 6: Build new two-lane east-west arterial roadway between Walker Road and County Road 17.

Phases 1 through 3 were anticipated to be built by 2021, and Phases 4 through 6 by 2031.

In June 2021, as part of the Province's Highway 3 widening project between Essex and Leamington, the Province announced support for plans to connect Lauzon Parkway to Highway 401 via a new interchange, increasing opportunities for trade and better access to the Windsor-Detroit border[34].

[34] *Ontario Newsroom* (2023). <news.ontario.ca/en/release/1003124/ontario-awards-contract-to-expand-and-widen-highway->. June 1. Accessed September 2023.

Exhibit 5.9: Lauzon Parkway EA Implementation Phases



Source: Lauzon Parkway Improvement Class Environment Study Report, Exhibit 7-2 (MRC, 2014)

5.3.4. County Road 42 Environmental Assessment (2022)

To support the influx of traffic caused by the future business park and NextStar Energy battery plant in the City of Windsor, the County of Essex is investing in the key upgrades to County roads to increase road capacity and neighbourhood connectivity. The project involves follows the recommendations to the class environmental assessment, as follows:

- Widening of County Road 42 from County Road 19 to the City of Windsor boundary from two lanes to five lanes with bike lanes, sidewalks and a multi-use trail.
- Implementation of roundabouts at County Road 42 and County Road 19, as well as at County Road 42 and new intersection with County Road 43; and
- The widening of Banwell Road (County Road 43) and its diversion west from Shields Avenue to south of County Road 42 (shown in Exhibit 5.10).

The project will be carried out over five phases, with Phase 1 commencing in 2023.

Exhibit 5.10: County Road 42 Reconstruction Phasing and the Realignment of Banwell Road

Source: County of Essex (2023), County Road 42 Reconstruction

6. Review of Best Practices in Truck Route Network Development

This section reviews and summarizes the factors and processes used by selected Canadian and American municipalities in defining or revising their truck route networks.

Although municipalities across North America have largely taken their own customized approach to this task, the key in each municipality is to establish and apply a consistent framework to define the network; this also helps with gaining acceptance of the results and, with future truck route updates as needed.

The discussion has three parts:

- Section 6.1 overviews the need for a consistent framework, and outlines the benefits of a systematic approach;
- Section 6.2 reviews the criteria and guidelines developed by selected Canadian and American municipalities; and
- Section 6.3 provides a summary of findings.

6.1. Benefits of a Systematic Approach

Many Canadian municipalities have established a truck route network and associated by-law to manage the circulation of large trucks throughout the municipality. However, there is a need to keep the truck route networks up to date to account for changing demands, new developments, safety and operational needs and community desires.

Although some municipalities have established a regular process to update their networks, others treat these updates on an ad hoc basis in isolation from the rest of the network. As a result, updates can be reactive and disruptive, with unintended impacts on truck traffic patterns that extend beyond the immediate vicinity of the change.

This points to the need for a **systematic approach** that will allow Council to address community and industry needs cohesively and consistently, and will accommodate future needs as demographic, economic and transportation conditions change.

The process and framework for updating a truck route network must also be flexible enough to anticipate new development, new infrastructure and, increasingly, new logistics practices and technologies. Without such a framework, truck route updates in effect are often triggered by residents' concerns about truck volumes, noise, vibration and safety in their neighbourhoods.

Guidance by the Ontario Trucking Association (OTA)[35] also notes that a systematic approach is key to addressing and reconciling the sometimes-conflicting needs of different stakeholder groups.

6.1.1. Balancing Varied Perspectives

Stakeholder groups in the City of Windsor include the private sector, residential communities and other citizen groups, and the City, as outlined below.

The private sector generates and moves goods or transports vehicles for service provision along the road network. For the private sector, "time equals money," and so there is a desire for a well-connected, well-defined, direct and reliable network that supports the smooth, safe and cost-efficient movement of goods. Redundancy is also a need, so that alternative routes are readily available in the event of a blockage on one route.

Residential communities and other citizen groups neither own the roads nor are involved in logistics decisions but who can be affected adversely by truck traffic. Community groups typically wish to minimize neighbourhood intrusion by trucks, along with the health impacts of truck noise, vibration and pollutants and concerns about the safety of pedestrians and cyclists. There are also concerns about maintaining neighbourhood cohesion. Minimizing truck intrusion in the vicinity of schools, seniors' homes and similar land uses and in environmentally sensitive areas is also a common desire.

The City owns the municipal road network and, with the Province, regulates its use. The need is to have a truck route network that supports or aligns with a range of public policies, including those related to the use of the transportation system, safety, the preservation of communities and sensitive areas, the promotion of economic growth, and the minimization of air pollutants and greenhouse gas

[35] Ontario Trucking Association (2011). *Local Truck Routes: A Guide for Municipal Officials*. <http://ontruck.org/wp-content/uploads/2016/04/OTA-Local-Truck-Routes-A-Guide-FINAL_public.pdf> Accessed September 2023.

(GHG) emissions. Fiscal responsibility, expressed as maintaining an affordable, reliable and safe road network at an acceptable state of good repair, is also an important need that informs asset management and future infrastructure investment decisions.

While many of these needs are complementary—safety is common to all three groups—at times there is also a need to balance competing needs (for example, if a residential neighbourhood lies along the only route that links an industrial area with the freeway network).

6.2. Best Practices from Selected Peer Jurisdictions

This section reviews the criteria used to define truck route networks in seven Canadian and US municipalities: Detroit, Hamilton, Ottawa, Oakville, Seattle, Region of Waterloo, and Regina. The municipalities reflect recent practice, have a similarly industrial base to that of Windsor, or provide other unique insights.

The summaries below outline the objectives identified for each truck route network and the criteria/indicators used to assess candidate routes.

Detroit and Hamilton are noteworthy for their use of clearly-defined criteria at the heart of a systematic, multi-level evaluation process, while the other examples offer unique features that are not necessarily criteria but can inform the City of Windsor's truck route review process.

6.2.1. City of Detroit

A 2021 pilot truck route development study reflecting a clearly defined, systematic truck route development process was conducted for Southwest Detroit, with potential for extension across the city (Giffels Webster, *Southwest Detroit Truck Route Study*, prepared for the City of Detroit, March 24, 2021).

As in Windsor, vehicle manufacturing is a primary industry in Detroit. The industry's special needs were also recognized in a separate study, noted below.

Truck Route Network Objectives

The study outlined two objectives:

- Ensure continuity and connectivity; and
- Protect population and environment.

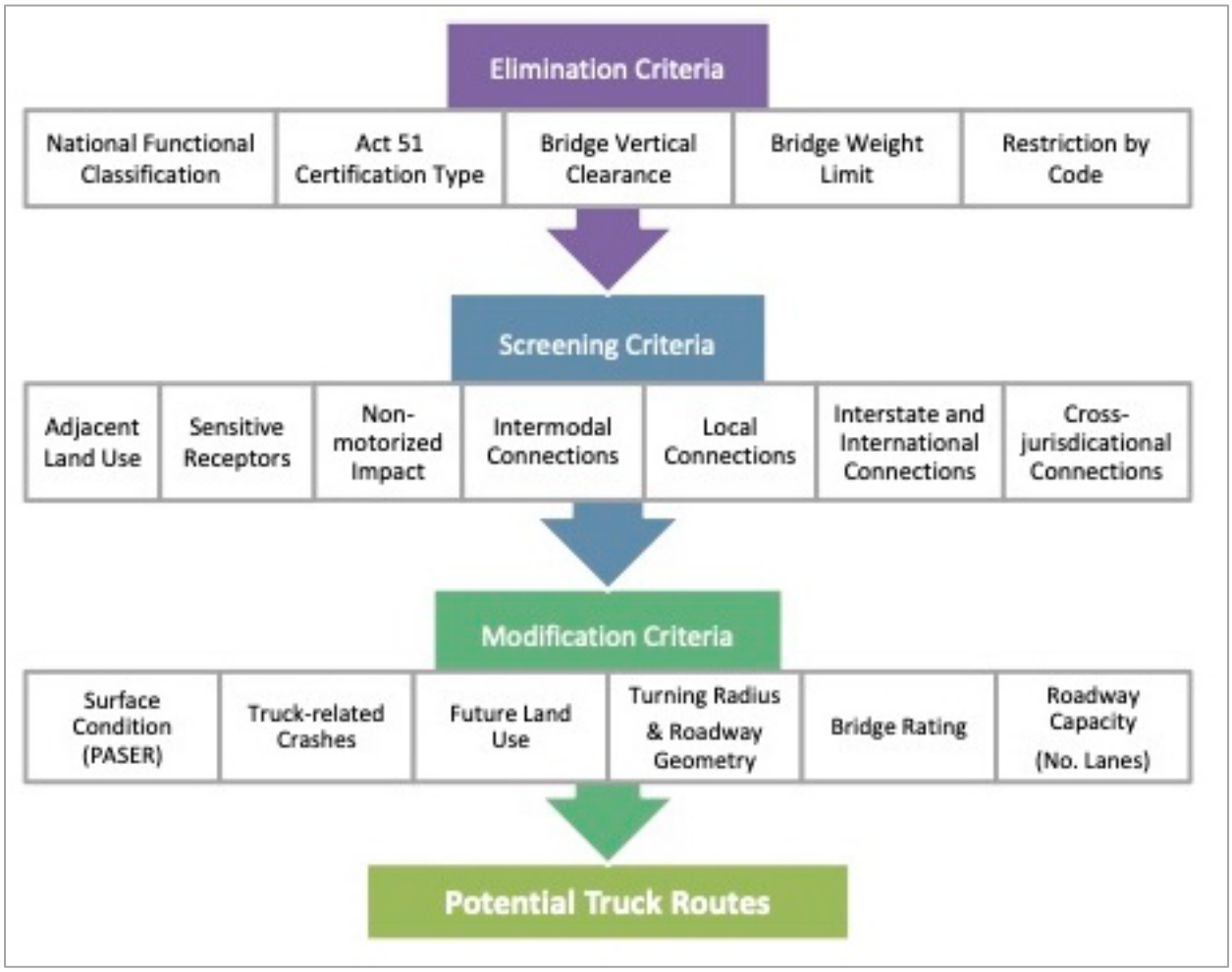
Criteria/Indicators

Three levels of criteria were used to assess the City's roads, reflecting in effect a three-step process in developing a truck route network, with different scoring methods used at each level:

- **Elimination criteria** (minimum requirements):
  - National Functional Classification
  - Act 51 Certification Type
  - Bridge vertical clearance (minimum 12'0")
  - Bridge weight limit (per state DOT specifications)
  - Restriction by definition
- **Screening criteria** (ranking least to most desirable):
  - Adjacent land use (residential, institutional, mixed-used, commercial and industrial)
  - Sensitive receptors (in proximity)
  - Non-motorized impact (trails, bike lanes and shared-use paths)
  - Intermodal connections
  - Local connections
  - Interstate and International connections
  - Cross-jurisdictional connections
- **Modification criteria** (screened segments that would require improvements to be included in the network):
  - Pavement condition (PASER rating of 4 or less)
  - Number of truck-related crashes
  - Future land use (planned land use changes)
  - Turning radius and roadway geometry (e.g. improving sub-standard curb radius and intersection geometry)
  - Bridge condition (state DOT bridge rating of poor)
  - Road capacity (number of lanes)

This framework is shown visually in Exhibit 6.1.

Exhibit 6.1: Evaluation Framework – Southwest Detroit Truck Route Study



Source: Giffels Webster, *Southwest Detroit Truck Route Study*, prepared for the City of Detroit, March 24, 2021

Other Features and Considerations

In addition to the framework summarized above, the study proposed complementary measures/strategies to alleviate truck route impacts, including allowing off-hours deliveries, promoting replacement of old diesel trucks to low-carbon vehicles, education and outreach, and making major truck generators responsible for providing sweeping services to reduce dust levels on adjoining roads.

In a separate analysis, truck access to the new Stellantis Assembly Complex was addressed as a key community issue. Stellantis proposed three truck routes to link

the Complex with its third-party logistics supplier: delivery, return and emergency backup (the last reflecting the criticality of maintaining just-in-time deliveries)[36].

6.2.2. City of Hamilton

Like the City of Windsor, the City of Hamilton has a strong industrial base that is anchored by a port near its downtown and an airport. The City of Hamilton recently conducted a truck route update (IBI Group, 2022: *Hamilton Truck Route Master Plan Update: Final Report*, prepared for the City of Hamilton).

Truck Route Network Objectives

The study identified three pillars and associated goals:

- **Economic prosperity,** supported by economic aspirations, efficient connectivity and reliability goals;
- **Community liveability:** supported by safety and equity goals; and
- **Environmental and public health,** supported by environmental sustainability and public health, and adaptability goals.

These were separate from but generally follow from eight principles that were identified to guide the study.

Criteria/Indicators

The following five-step framework was used to develop the truck route network in the study:

1. Select road links for assessment (based primarily on functional road class);
2. Evaluate links using specified criteria;
3. Form a draft truck route network (using step 2 results as well as a set of principles to ensure essential truck route network connectivity);
4. Address specific issues in the network; and
5. Establish alternate truck route network configurations.

In Step 2, five criteria were used to assess candidate road segments. The criteria were quantified through several component indicators. Numerical scores were assigned to each component indicator, with the maximum possible score for each criterion being 20 and the maximum possible overall score being 100.

[36] Stellantis, *Community Benefits Update, Truck Routes,* Annual Update Meeting, December 15, 2021

1. Efficiently connected
    - Functional road class
    - Truck volumes (very high [maximum] to very low [minimum])
2. Reliability (a measure of current use)
    - Emergency detour route
    - Barrier crossing
    - Travel time index (a measure of current congestion)
    - Reduced load (road has no seasonal load restrictions)
3. Safety
    - Safety – maximum potential for safety improvement
    - Road uses (road is not on BLAST network)
    - Shared road uses - cycling
    - Pedestrian density (traffic zone population and employment per hectare)
4. Equity
    - Low-income household prevalence
    - Vulnerable age cohort (<19 and 65+) distribution (%)
5. Environment and public health
    - Adjacent zoning
    - Sensitive land uses and community facilities

In step 2 of the framework, four scenarios or perspectives were also developed to assess the implications of alternate weighting schemes for the criteria:

- Balanced (all criteria/goals weighted equally);
- Goods movement mobility-focused;
- Community resiliency-focused; and
- Public health-focused.

The above perspectives and the individual criteria weightings applied for each are illustrated in Exhibit 6.1.

Exhibit 6.2: Alternate Perspective to Evaluate Candidate Road Segments

Public Health-Focused

Goal	Weighting
Efficiently Connected	50%
Reliability	50%
Safety	150%
Equity	100%
Public Health	150%
Total	500%

Goods Movement Mobility-Focused

Goal	Weighting
Efficiently Connected	150%
Reliability	150%
Safety	100%
Equity	50%
Public Health	50%
Total	500%

Community Resiliency-Focused

Goal	Weighting
Efficiently Connected	50%
Reliability	50%
Safety	100%
Equity	150%
Public Health	150%
Total	500%

Balanced Network

Goal	Weighting
Efficiently Connected	100%
Reliability	100%
Safety	100%
Equity	100%
Public Health	100%
Total	500%

Source: City of Hamilton (2022). Hamilton Truck Route Master Plan Update: Final Report. Prepared by IBI Group.

Road segments that exceeded a minimum threshold score in Step 2 were carried forward to a draft truck route network in step 3.

Additional links were also carried forward to ensure that the network has the following key connections, using the higher scoring of alternative candidate road links where feasible:

- Access between the nearest provincial freeway and the Hamilton Port as well as the Hamilton International Airport;
- Sufficient connectivity for designated employment areas;
- Sufficient connectivity for aggregate facilities; and/or
- Direct connection with intra-city and inter-regional routes and adjacent truck route systems.

Other Features and Considerations

The truck route update study was prompted in large part by concerns with increasing volumes of heavy trucks along the City's downtown streets in accessing the port area, as well as the increasing size and weight of the trucks. The resulting network applied a four-axle limit to truck routes in a downtown zone, so that heavier trucks must now access the port area from east of the City through higher-capacity arterial and expressway routes, rather than through downtown.

6.2.3. City of Ottawa

In 2005, Ottawa developed its *Truck Route Designation Policy* (Report to City of Ottawa Transportation Committee and Council, October 26, 2005). The truck route maps are updated annually, typically reflecting minor updates.

Truck Route Network Objectives

Objectives of the original 2005 network designation outline five objectives:

- Efficient movement of trucks;
- Safe movement of trucks;
- Efficient movement of other traffic;
- Minimization of environmental disruption to citizens; and
- Minimization of structural damage to roadways and structures.

Criteria/Indicators

The City used several criteria in the development of its 2005 truck route policy:

- Continuity;
- Redundancy;
- Fluidity (avoid congestion);
- Avoid conflicts;
- Adequate capacity, geometries, grades;
- Adequate pavement;
- Adequate structural capacity;
- Minimize intrusion;
- Avoid heritage / weak structures; and
- Avoid bisecting communities.

Other Features and Considerations

Community concerns (e.g. concerns with trucks in the downtowns and near sensitive land uses in smaller communities in in southeast Ottawa) may prompt a review of the truck route network.

6.2.4. Town of Oakville

Like the City of Windsor, the Town of Oakville (a local municipality in the Region of Halton) has a vehicle manufacturing base and need for connections to highway

network and external terminals. The Town recently conducted a *Goods Movement Study* (David Kriger Consultants Inc., prepared for the Town of Oakville, 2016).

Truck Route Network Objectives

The objective of the truck route network was to manage heavy truck traffic through the community.

Criteria/Indicators

The 2016 review proposed that the Town adopt a regular review of its heavy truck route based on the following criteria, adopted from a best practice review of Canadian and American municipalities:

- Road classification and function;
- Continuity (directness, avoidance of circuitous routing);
- Connectivity (accessibility to key generators);
- Adequacy of road capacity;
- Avoidance of conflicts with vulnerable road users;
- Minimization of intrusion into sensitive areas; and
- Suitable adjacent land uses.

Other Features and Considerations

As a lower-tier municipality, the criteria apply to the Town's road network only. By definition, all Halton Region roads allow heavy trucks, so the review focused on ensuring that the major industrial generators (especially the Ford Assembly Complex) were connected to the Regional and Provincial networks with minimal intrusion through the Town's nearby residential areas.

6.2.5. City of Seattle

The City of Seattle's *Transportation Strategic Plan* (2005) involved management of truck traffic to intermodal terminals, and to international gateways (in this case, the Port of Seattle) via the city's downtown.

Truck Route Network Objectives

Transportation principles included:

- Make the best use of the streets we have to move people, goods and services;
- Increase transportation choices (including cycling and walking);
- Encourage walking and biking; and

- Promote the economy by moving freight and goods.

Criteria/Indicators

Seattle has designated a system of Major Truck Streets on selected arterials and limited-access highways to "accommodate significant freight movement through the city and to and from major freight traffic generators." Major Truck Streets "generally carry heavier loads and higher truck volumes." The system also designates first/last mile truck streets in industrial areas. This includes the Port of Seattle container terminal, for which a primary access is via downtown Seattle.

The City also has a designated network of separated and non-separated bicycle lanes.

The truck system and the bicycle network are designed for connectivity while avoiding overlap. In some cases, in the downtown this means that bicycle routes are located on non-arterial streets (which are used as Truck Streets), i.e. whereas Seattle has a clear policy to promote a safe environment for active transportation, it is the truck network rather than the bike network that was given priority on certain arterials.

Other Features and Considerations

The City uses its Major Truck Street designation to inform street design, traffic management decisions and pavement design and repair.

The City also seeks to address "site-specific obstacles to truck movement" at critical locations, for example by removing on-street parking, installing truck directional signage, revising intersection signal control and providing truck holding lanes at major terminal access points.

Other initiatives include a review of street design standards to accommodate today's larger and heavier trucks when existing heavy-use arterials are redesigned and rebuilt, and ways to better manage truck circulation such as off-hours delivery and route guidance for truckers accessing the Port of Seattle (a key truck traffic generator).

6.2.6. Region of Waterloo

The Region very recently applied a rules-based treatment to address a long-standing concern with heaving trucks passing through downtown Cambridge (one of the Region's local municipalities) on a regional road (*Cambridge Truck Diversion*

Study – Final Evaluation, Report to Region of Waterloo Planning and Works Committee, August 15, 2023). The study highlights the importance of mitigating measures (in this case noise barriers) for community acceptance of a truck route modification.

Truck Route Network Objectives

The study supports the following focus areas in the Region of Waterloo "Strategic Focus 2019-2023" plan:

- 2.3 Increase participation in active transportation (cycling and walking); and
- 2.4 Improve road safety for all road users.

Criteria/Indicators

An August 2023, resolution by the Region's Planning and Works Committee proposed the diversion of heavy trucks from downtown Cambridge onto a newly constructed bypass around the city, by banning through heavy trucks on selected downtown streets. The resolution follows ongoing requests by the City of Cambridge and downtown businesses to reduce heavy truck traffic.

No criteria were identified, although the analysis was based on origin-destination surveys to quantify truck diversions to the recommended route, and traffic counts were conducted to quantify the volumes of heavy truck traffic passing through the downtown. Stakeholders and the public were engaged.

To mitigate the additional truck volumes on the bypass, an analysis determined that noise walls are warranted along a 240-m section of the bypass with residential land uses backing onto the road and, as traffic grows in the future, at other locations and on other roads. The installation of the noise walls was also part of the resolution.

However, as of summer 2023, the Committee has deferred its decision, in part because residents want additional noise walls on the preferred alternative now, in response to which Councillors proposed another alternative. However, this other alternative exceeds the policy thresholds defined for a "suitable alternative," which requires that the selected alternative must not require trucks to make a diversion greater than 50% or 4 km longer than their current route. The diversion would result in a 230% increase in trip length, or 5 km.

Other Features and Considerations

The estimated cost of the 240-m section of noise wall is $624,000, which can be covered within existing capital budgets. However, additional noise walls could be warranted in the future, if 10-year projections of truck traffic materialize on the diverted route, at an unbudgeted cost of up to $11 million.

6.2.7. City of Regina

The City of Regina has two-tier truck route network to manage traffic flows, as reflected in *The Regina Traffic Bylaw, 1997, No. 9900*, City of Regina (Office consolidation to April 26, 2023). The network was subjected to a minor update in September 2022 (Source: *Traffic Bylaw Amendments for Trucking Provisions*, report to Executive Committee, City of Regina, September 7, 2022).

Truck Route Network Objectives

The objectives of the September 2022 truck route update were to clarify usage of the two-tier road network to improve driver understanding and ease enforcement, and to remove a road section that was subjected to frequent bridge “strikes”.

Criteria/Indicators

The City of Regina’s two-tier truck route network distinguishes between a primary network that supports heavy vehicles and long-combination vehicles (LCVs), and a secondary heavy vehicle network that is limited to heavy vehicles that have four or fewer axles and a trailer length of less than 8.6 m, i.e. single-unit vehicles vs. tractor-trailers. The heavy vehicle and LCV network is a subset of the secondary heavy vehicle network.

The City of Regina also specifies a dangerous goods network: no vehicles carrying hazardous goods are allowed during peak commuting periods other than on designated dangerous goods routes.

While the criteria used to designate the two networks are not specified, Regina’s approach provides an example of its implementation.

Other Features and Considerations

Note that LCV routes are not restricted to certain distances from expressways as they are in Ontario.

6.3. Summary of Findings

This section summarizes the above review with respect to truck route network objectives and network development processes. Additional considerations are also outlined.

6.3.1. Truck Route Network Objectives

The Hamilton and Seattle objectives promote sustainable transportation and economic prosperity, as a covering framework within which the management of truck flows and mitigation of truck impacts can be addressed, i.e. identifying both the positive and the negative impacts of truck transportation. The Hamilton objectives provide the broadest perspective, tying together economic prosperity, community liveability and environmental and public health as pillars, each supported by specific goals. These are consistent with the City, private sector and residential/community group perspectives outlined in Section 6.1.

The objectives of the Ottawa, Region of Waterloo, Oakville and Regina network plans focus on ways to better manage the movement of trucks and mitigate their impacts. In other words, the focus is mainly on controlling the negative impacts of truck movement. The Waterloo objectives focus entirely on the promotion of sustainable transportation, although the Ottawa example notes the need to promote the safe and efficient movement of trucks. The Detroit plans seeks to protect the community and the environment while also supporting truck route "continuity and connectivity."

6.3.2. Network Development Processes

The Detroit and Hamilton truck route review studies offer the most comprehensive and systematic truck route development processes. The criteria for both are **set within a multi-step evaluation framework**. Both sets make use of GIS to overlay relevant truck route considerations, to provide an **evidence-based analysis of the routes that trucks use**, while **allowing for stakeholder and other modifications**.

Both studies outline **multi-step processes** that are similar in overall approach but differ in their specific application of criteria.

6.3.3. Additional Considerations

The experience of the jurisdictions that were reviewed offer additional considerations to inform the Windsor Truck Route Study, as outlined below.

Consider the unique requirements of the vehicle manufacturing industry (Detroit). In Detroit, Stellantis is developing a major new assembly plant. As part of the planning process to address community concerns, Stellantis prepared a three-part truck route network between the plant and a key logistics supplier. The network has separate routes for each direction (which reduces the impact on any given street). It also identifies an emergency backup route, which would be deployed in the event of a blockage on the other routes. In this way, the plant can maintain its operations—a critical factor for 24/7 vehicle plants—while avoiding trucks detouring through the adjoining neighbourhoods.[37]

Continuity and redundancy are important factors (Ottawa). Ottawa's approach used a range of criteria, with specific attention given to network continuity and redundancy. Although Ottawa has not conducted a detailed review of its truck route network since 2005, the City does issue annual updates of its truck route maps with these factors in mind.

Ensure connectivity with external truck route networks (Oakville). Oakville introduced a process for reviewing and updating its heavy truck route network. Oakville is a lower-tier municipality in Halton Region, so the town's truck route network must fit into the broader regional truck route network which, by definition, includes all Regional roads. Emphasis is placed on ensuring that Oakville's major industrial generators, which notably include the Ford Assembly Complex, feed directly into higher order road and highway network while avoiding residential and environmentally sensitive areas.

Separate trucks from cyclists and pedestrians where feasible (Seattle). The Port of Seattle is a major focus of heavy truck traffic. A key access to the port is through the downtown. To help separate heavy truck and cyclist traffic, the City of Seattle has designated a Major Truck Route network comprised of selected city arterials and limited-access highways, and a bicycle network that mainly uses non-arterial streets. In other words, whereas Seattle has a clear policy to support active transportation, the determined that the way to make the system work safely for all

[37] Source: Stellantis, *Community Benefits Update, Truck Routes,* Annual Update Meeting, December 15, 2021. Note that this is a separate initiative from the *Southwest Detroit Truck Route Study*.

modes was to keep the trucks on the arterial roads and move the bicycle lanes to non-arterial streets.

Staying within outlined policy can facilitate implementation (Region of Waterloo). The Region of Waterloo recently proposed the banning of heavy trucks from a downtown Cambridge route, in response to longstanding local business concerns. An alternative route was proposed on a new suburban bypass, with noise walls proposed over a 240-metre section to mitigate the impacts of projected truck volumes on adjacent residential properties. However, some residents have proposed the extension of the noise walls along the proposed alternative, for which additional budget would be required. In response, some Councillors proposed a different route. Because this proposed route exceeds the Region's policy requirements for a "suitable" increase in route length over the existing routes, so the plan has been deferred.

Consider two-tier networks and ensure network clarity (Regina). Regina offers an example of a two-tier truck route network to keep large heavy trucks and LCVs out of certain corridors while also managing the routing of smaller heavy trucks on a secondary network. Heavy trucks that have 4 or fewer axles and a trailer length of less than 8.6 metres (single-units vehicles) can use both networks. The 2022 bylaw updates also reflect the need for clarity to improve driver understanding and compliance and simplify enforcement.

7. Truck Route Network Strategic Framework and Network Development Process

Drawing on the best practices review from the previous section, and from the policy context described in Section 5, this section proposes a framework for developing the truck route network.

The framework includes the following elements:

- **Principles:** These guide the study process. While the objectives below can be opposed to each other and may need to be weighed against each other in some cases in developing the truck route network, the principles are non-negotiable and all truck route outcomes will aim to follow the outlined principles.
- **Objectives:** These are used together with their associated criteria for each to assess individual candidate road segments for suitability for inclusion in the truck route network.

This section concludes by outlining a process for developing the City of Windsor truck route network.

7.1. Draft Truck Route Network Principles

Six principles have been identified to guide the study process and can inform truck route network objectives. A draft version of the principles was presented to the public and stakeholders during the first round of study engagement, where it generally received positive support. The truck route network principles are as follows:

Support Safety Outcomes

- Focus truck routes on higher-order road classes (e.g. arterials instead of local roads).
- Reduce opportunities for conflicts with vulnerable road users (or apply appropriate design mitigations).

Provide a Connected Truck Route Network

- Ensure truck route connectivity between the higher-order transportation network and major truck trip generators.
- Provide one or more truck route connections at each Hwy 401 interchange where feasible.

Design for Reliability and Redundancy

- Redundancy in the truck route network (back-up or detour routes) can ensure that goods can continue to move safely in the event of road closures on main truck routes.
- Ensure that the Province's designated network of Emergency Detour Routes on City roads is suitable to manage increased truck volumes in the event of highway traffic incidents.

Simplify Enforcement Requirements

- Avoid excessive travel times for goods movement.
- Clearly identify and communicate the truck route network.
- Avoid truck route "spurs" that do not allow legal truck turn-arounds.

Support Environmental and Public Health

- Reduce the negative impact of truck operations to improve environmental and public health outcomes, e.g. reduce overall vehicle-kilometres travelled.
- Avoid simply moving a truck routing issue from one place to another to create similar impacts.

Plan for Consistency and Adaptability

- Develop a clear and transparent truck route assessment framework that can be updated for future conditions.

7.2. Draft Truck Route Network Objectives and Criteria

The two key competing objectives, with their associated criteria, can be summarized as follows:

Optimize Goods Movement Efficiency and Connectivity

1. Prioritize higher functional road classes.
2. Prioritize higher-capacity roads.
3. Prioritize roads with higher truck volumes.
4. Prioritize routes without load restrictions.

Maintain Community Livability and Integrity

1. Prioritize routes that run alongside appropriate adjacent land uses.
2. Prioritize routes with lower pedestrian and cyclist volumes.
3. Prioritize routes without dedicated on-road cycling infrastructure.

A draft version of the objectives and criteria was presented to the public and stakeholders during the first round of study engagement, where it received overall strong support from members of the public. These objectives and their associated criteria are described more fully below.

Note that the above do not identify **safety** as a separate assessment criterion. Increasing safety is a common pursuit across both objectives and is a Truck Route Study principle. Increasing safety is inherent in some of the criteria above. Moreover, the truck route network development process outlined in Section 7.3 includes mitigating measures to improve safety.

Also not included in the above criteria are indicators of **equity** such as the prevalence of low-income households along a road segment or the prevalence of vulnerable age cohorts living along the corridor (younger than 18 years and older than 65 years). These correlate with the criterion of prioritizing routes that run alongside appropriate adjacent land uses. These are also difficult to measure with available data at the level of precision needed to apply to specific road segments, and are subject to change over time.

7.2.1. Objective 1: Optimize Goods Movement Efficiency and Connectivity

This objective supports the City's economic development aspirations. Corresponding criteria for assessing alternate road segments are outlined below.

1. **Prioritize higher functional road classes.** Functional road classes specify a roadway's role with respect to movement of traffic vs. access to local properties, with expressways at the high end of prioritizing traffic movement and local roads at the low end of prioritizing traffic movement. Functional road class is ideally reflected in the roadway's geometric design features, frequency of driveways along the road, etc. The highest-order road classes include expressways, followed by arterials then collectors.
2. **Prioritize higher-capacity roads.** Segments with wider roadway widths and/or a higher number of lanes can serve higher volumes of trucks. Alternatively, the wider roadway space can provide flexibility to provide roadside parking space for trucks and other vehicles, or to provide greater separation from other road users such as cyclists or pedestrians. Considerations under this criterion can include the feasibility of supporting over-dimensioned loads, if information is available.
3. **Prioritize roads with higher truck volumes.** Current and/or forecasted truck traffic volumes are a particularly effective indicator of the current demand for goods movement. The anticipated demand for truck traffic for future developments must also be considered.
4. **Prioritize routes without load restrictions**. The most reliable routes for truck traffic include those that are available year-round without additional load restrictions. Routes with load restrictions may be suitable for a secondary truck route network (e.g. for smaller vehicles/local deliveries).

The above measures together will indicate the degree to which there is interest from the perspective of optimizing goods movement efficiency in having the route be part of the truck route network. Note that a road segment's current designation as part of the existing truck route is not included among the above listed criteria.

7.2.2. Objective 2: Maintain Community Livability and Integrity

This objective aims to reduce the negative impacts of truck routes on communities and in sensitive areas. Corresponding evaluation criteria are outlined below.

1. **Prioritize routes that run alongside appropriate adjacent land uses.** To the extent possible, the truck route network should avoid residential areas, as measured by proportion of adjacent zoning (land use fronting the road segment) that is residential. In particular, sensitive land uses as measured by the incidence of hospitals, schools, long-term care, etc. adjacent to the segment should be avoided.
2. **Prioritize routes with lower pedestrian and cyclist volumes.** Windsor traffic count data including pedestrian and cyclist counts are available for a number of higher-order roads. A potential proxy for pedestrian activity along the road segment is the sum of population and employment (jobs) per hectare in small geographies like transportation analysis zones.
3. **Prioritize routes without dedicated on-road cycling infrastructure.** To the extent possible, the truck route network should avoid routes with on-road cycling infrastructure.

7.3. Truck Route Network Development Process

The truck route network development process for the City of Windsor is informed by the processes used by the City of Hamilton and for the Southwest Detroit truck route network described in Section 6.2, together with considerations for the Windsor context.

The process has the following steps, described more fully below:

- Step 1: Select candidate road segments for assessment;
- Step 2: Evaluate individual candidate road segments;
- Step 3: Create a draft truck route network;
- Step 4: Address network issues and identify mitigations; and
- Step 5: Finalize the recommended truck route network.

7.3.1. Step 1: Select Candidate Road Segments for Assessment

The Windsor truck route network will include all Provincial highways and all international road border crossings, as trucks are included on these facilities.

City-owned roads selected as candidate roads for inclusion in the truck route network will have the following characteristics:

- Have a functional road classification of Class 1 Arterial, Class 2 Arterial, Class 1 Collector, Class 2 Collector, Scenic Drive or Local (Commercial-Industrial), noting that higher-order roads will have greater weighting in the truck route development process in Step 2; Local (Residential) are included in the assessment where they are part of the City's current Truck Route Network and/or they are currently being used by significant volumes of trucks;
- Is currently in place or be a planned roadway; and
- Be free of geometric design or structural limitations that would limit truck use, such as not having a minimum clearance beneath an overpass, or bridges not being able to carry truck weights.

7.3.2. Step 2: Evaluate Individual Candidate Road Segments

Each roadway segment will be evaluated according to the objectives and criteria described in Section 7.2. A transparent scoring and weighting system will be outlined for each objective and criteria and applied to each candidate road network segment with the results shown in map form.

7.3.3. Step 3: Create a Draft Connected Truck Route Network

Informed by the segment-by-segment scoring results from Step 2 and prioritizing higher-scoring segments wherever feasible, a draft truck route network will be developed ensuring the following connectivity principles:

1. Each Provincial highway interchange has a direct truck route connection;
2. Each international border crossing has a direct truck route connection;
3. Intermodal freight terminals (marine port, airport or truck-rail transfer yards) have a direct truck route connection;
4. Each upper-tier road in Essex County suitable for heavy trucks has a truck route connection; conversely, the Windsor truck route network does not

connect to “dead-end” on any connecting roads within Essex County that are not suitable for trucks;

5. Key trucking activity origins and destinations are connected without the need for excessive detours; appropriate connectivity is provided between/among other major truck activity generators—manufacturing plants, industrial sites, commercial areas, etc. —while also providing appropriate connectivity to the transportation connections identified in connectivity principles 1 through 4.

   Factors to consider in determining the most appropriate connecting routes include the segment-by-segment evaluation results of Step 2, travel times, and route reliability[38].

6. Truck route redundancy is provided, i.e. there is more than one possible way to travel between key trucking activity origins and destinations in the event of a traffic incident, construction, etc. requiring closure of one of the routes.

7. The network will have no “spurs” or “dead-ends”—each segment will connect to another truck route or have a feasible, legal means of turning back once on any truck route segment.

Up to three alternative network configurations may also be put forward for consideration. These may include, for example, a two-tier network (e.g. primary route plus delivery routes for smaller vehicles, e.g. 4 axles), an alternative downtown configuration, etc.

Desired LCV connectivity will also be identified at this step.

Should the draft truck route network include road segments that may be particularly problematic for trucks, such as having adjacent sensitive land uses, selected possible mitigation measures may be identified at this stage at a broad level, though identifying mitigation measures more comprehensively will be the focus of Step 4.

[38] Reliability speaks to the frequency and degree to which the road section (or corridor) is subjected to congestion. A common measure of reliability is the Travel Time Index (TTI), which is the ratio of travel time on a corridor during, for example, the commuter peak period, relative to free-flow or posted speeds. As the City of Windsor does not have travel time data available for use for this study, reliability considerations will be based on local knowledge of the transportation network, the number of signalized intersections along a potential route, etc.

The draft truck route network together with possible alternatives will be shared with the public and stakeholders at this stage.

7.3.4. Step 4: Address Network Issues and Identify Mitigations

Based on engagement feedback and other considerations, one of the draft truck route network alternatives from Step 3 will be carried forward for further refinement.

In Step 4, identified issues or concerns for the preferred network will be addressed to the extent possible through network revisions or through recommended mitigations.

For example, corridor initiatives for other modes could involve the need for trade-offs, wherein either the proposed truck lane or another existing or proposed use such as a cycling lane may be better served by shifting the truck route segment or other mode to another parallel corridor. Alternatively, the need for increased separation between vehicular traffic and cycling lanes on a shared roadway could be identified.

Mitigating measures could also include means to reduce heavy truck activity, such as limiting truck use on selected segments to only daytime or only nighttime as appropriate, limiting the size of truck that can use the route, prohibiting truck turns, etc. Intersection improvements or expanding sidewalks are other possible mitigations that may be put forward.

7.3.5. Step 5: Develop a Recommended Truck Route Network

The final step is to carry forward a single recommended truck route network, outlining any truck route network treatments identified in Step 5.

Given that the recommended truck route network will include planned roads that are not yet improved (e.g. widened) or constructed, the recommended truck route network will include two truck route phases:

- A near-term truck route network that could be implemented directly, or upon the completion of potential simple mitigations, to meet existing needs while also accounting for imminent infrastructure improvements like the Gordie Howe International Bridge; and
- A longer-term truck route network that will take shape as new routes are constructed, after planned route improvements are made such as road

widenings, after the opening of a new major trucking activity generator, or after more significant mitigating measures required for a route are put in place.

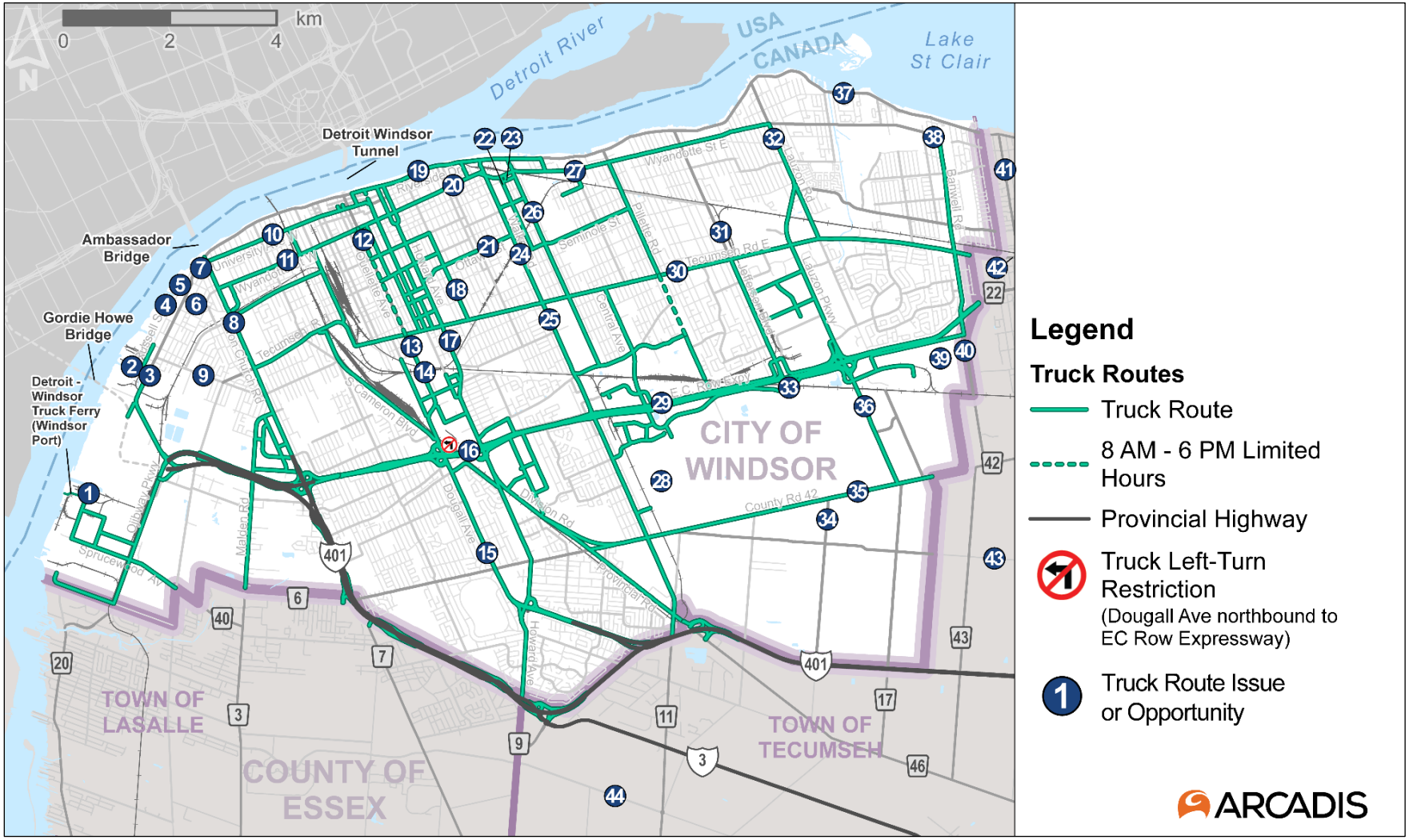
8. Summary of Needs and Opportunities

Findings from technical analysis, policy review and engagement with the public and stakeholders with respect to the movement of trucks in the City informed the summary of needs and opportunities outlined below.

8.1. Location–Specific Truck Route Network Issues and Opportunities

Stakeholders and residents identified location-specific issues and opportunities related to the truck route network through Round 1 engagement activities of the Truck Route Study. The locations of these are shown in Exhibit 8.1, and the issues or opportunities associated with these are summarized in Exhibit 8.2 using the corresponding identification (ID) numbers on the map. **The issues and opportunities identified below are the opinions expressed during engagement activities, and do not necessarily reflect the opinions of the City of Windsor or of the Windsor Truck Route Study team. It is noted that there are conflicting opinions.**

Exhibit 8.1: Map of Location-Specific Truck Route Network Engagement Inputs



Note: Map numbers correspond to Location ID column shown in Exhibit 8.2.

Exhibit 8.2: List of Location-Specific Truck Route Network Engagement Inputs

Location ID	Issues, Needs and Opportunities
1 Windsor Port	**Need:** Maintain truck route access to existing dock facilities to support building critical city-building infrastructure. This includes the planned terminal infrastructure expansion that will offer roll-on and roll-off operations between marine and commercial vehicles (Goods Movement Community).
2 Windsor Port/ Russell Street	**Issue:** Dust caused by gravel roads at facilities is an issue (Goods Movement Community). Dust, noise and vibrations caused by frequent and speeding dump trucks is a health and safety issue, particularly for cyclist (Public Opinion Survey).
3 Sandwich Street and Chappell Avenue	**Opportunity:** Traffic control signals would help manage the volume of truck traffic to and from aggregates site on Russell Street (Goods Movement Community).
4 East and West Docks	**Need:** Continue to ensure connectivity is maintained between the port and markets – do not restrict access to Windsor's port terminals (Goods Movement Community).
5 Russell Street	**Issue:** Trucks using Russell Street are an issue for residents along Russell Street (Trucks should instead use Sandwich Street) (Public Opinion Survey). **Issue:** Safety concerns for vulnerable road users travelling to school in Sandwich Towne, and the potential conflict between the frequency of trucks and school children waiting for the bus at Russell Street and Mill Street (Email – member of the public). **Opportunity:** The truck route network should extend easterly past its current end point on Russell Street (Goods Movement Community). Designating Russell Street as a truck route to access the industry along the roadway is needed, and will help limit truck traffic along Sandwich Street (Business Community).
6 Sandwich Street/ Sandwich Towne	**Issue:** Trucks are an issue on Sandwich Street or travelling through Sandwich Towne, a heritage neighbourhood for residents and tourists. Significant concerns include pollution, safety, noise and vibration (Public Opinion Survey). Cut-through truck traffic is an issue through the

Location ID	Issues, Needs and Opportunities
	neighbourhood to access the Ambassador Bridge (Business Community). **Need:** It is important to understand future conditions and mitigating impacts caused by the Gordie Howe International Bridge (e.g. vibration impacts on heritage buildings in Sandwich) (Business Community). Potential conflict between trucks and vulnerable road users caused by the future opening of the Gordie Howe International Bridge is a concern (Business Community).
7 Sandwich Street and University Avenue	**Opportunity:** The new roundabout has been successful in preventing trucks from using Sandwich Street to access the industrial yard on Russell Street (Business Community).
8 Huron Church Road/Hwy 401/ Ambassador Bridge	**Issue:** Congestion is a concern leading to the Ambassador Bridge. It is important to improve access between Highway 401 and the Ambassador Bridge (Goods Movement Community). There are delays at traffic signals along Huron Church Road between Highway 401 and the Ambassador Bridge, resulting in cut-through traffic of trucks trying to bypass the congestion (Public Opinion Survey). **Issue:** Speeding trucks are an issue along Huron Church Road between The Ambassador Bridge and Highway 401 (Public Opinion Survey). **Need:** An alternative route to access the bridge when Highway 401/Huron Church Road is congested is needed (Goods Movement Community). **Opportunity:** Intersection improvements and/or improved traffic signal timing coordination may help reduce travel delays on Huron Church Road (Public Opinion Survey). **Opportunity:** Consider dedicated truck lanes on Huron Church Road and on Highway 401 (Goods Movement Community, Public Opinion Survey). **Opportunity:** Trucks crossing the border should be required to use the Gordie Howe International Bridge to free space along Huron Church Road (Public Opinion Survey).
9 Prince Road	**Issue:** This is a non-truck route used by trucks from Huron Church Road (Public Opinion Survey).

Location ID	Issues, Needs and Opportunities
10 University Avenue	**Issue:** Increasing cycling traffic along University Avenue between the University of Windsor and the Downtown is a key consideration in truck route network planning. (Business Community).
11 Wyandotte Street West	**Issue:** Noise, congestion and safety concerns caused by big trucks are issues, particularly near the University (Public Opinion Survey).
12 Ouellette Avenue (north of Tecumseh Road)	**Issue:** Local delivery trucks cause congestion for northbound/southbound traffic on Ouellette Avenue between Elliott Street and Wyandotte Street due to streetscaping that has reduced the street to one lane in either direction (Business Community). **Opportunity:** Truck route limited hours on Ouellette Avenue should be changed from 8 am-6 pm to 8 am-8 pm (Business Community).
13 Ouellette Avenue (south of Tecumseh Road)	**Opportunity:** This roadway is a good north-south connection for truck traffic (Public Opinion Survey).
14 Ouellette Avenue Rail Overpass	**Issue:** Trucks using the overpass during construction has caused congestion (Public Opinion Survey).
15 Dougall Avenue	**Issue:** As this is an important ambulance route, Dougall Avenue should not be a 24-hour truck route, as trucks impede emergency response travel (Interactive map – resident).
16 EC Row Expressway between Dougall Avenue and Howard Avenue	**Issue:** Merging onto and off the expressway is a challenge because of slow moving trucks (Public Opinion Survey).
17 Howard Avenue	**Opportunity:** This roadway is a good north-south connection for truck traffic (Public Opinion Survey).
18 Parent Avenue	**Issue:** The volume and speed of trucks along Parent Avenue is disruptive to local residents (Public Opinion Survey).

Location ID	Issues, Needs and Opportunities
19 Riverside Drive East	**Issue:** This scenic route should not be part of the truck route network due to adjacent residential land uses and a narrow roadway width (Interactive map – resident).
20 Wyandotte Street East	**Issue:** Trucks conflict with the businesses, pedestrians and cyclists along Wyandotte Street west of Walker Road (Public Opinion Survey). Restricting trucks would improve the safety of vulnerable road users, decrease congestion and pollution, and decrease traffic speed. Restrict trucks through this residential community (Interactive map – resident). Restrict trucks from using Wyandotte Street, especially segments where Riverside Drive or Tecumseh Road can be used as alternatives (Public Opinion Survey). The area of Wyandotte Street and Devonshire Road is rapidly developing with residential uses, hotels and restaurants; an alternate route for trucks to access industry along Riverside Drive is needed. [Double-trailer trucks] also access Hiram Walker & Sons Ltd (Business Community). **Issue:** Vehicle carrier trucks (and other large transport trucks) 24/7 between Walker Road and the Ambassador Bridge are noisy and dangerous, especially for pedestrians (Public Opinion Survey). **Issue:** Cut-through truck traffic is an issue along Wyandotte Street to access the Detroit-Windsor Tunnel (Business Community).
21 Ottawa Street	**Issue:** Restrict trucks on Ottawa Street (Public Opinion Survey).
22 St Luke Road	**Issue:** Restrict trucks on St Luke Road, a primarily residential roadway that will also see a new residential development at Edna Street (Interactive map – resident). Walker Road is a more suitable truck route alternative to St Luke Road (Business Community).
23 Edna Street and Albert Road	**Issue:** The geometry of the underpass at Drouillard Road and Wyandotte Street prohibits truck turning and forces trucks to navigate on these local roads to access Champion Products (Business Community).

Location ID	Issues, Needs and Opportunities
24 Walker Road and Seminole Street	**Opportunity:** Moving the stop bars back for left-turning traffic on Seminole Street would provide enough space for trucks turning from Walker Road eastbound to Seminole Street (Goods Movement Community).
25 Walker Road	**Opportunity:** This roadway is a good north-south connection for truck traffic (Public Opinion Survey).
26 Drouillard Road	**Issue:** The absence of traffic controls/signals makes Drouillard Road an attractive route for trucks between Seminole Street and Wyandotte Street, but conflicts with the existing uses and users in the area. Removing Drouillard Road from the truck route network would support the BIA's vision of a future flex street[39] (Business Community). Drouillard Road between Riverside Drive and Richmond Street is too narrow for large trucks (Public Opinion Survey). Restrict trucks on Drouillard Road between Edna Street and Richmond Street to prioritize the walkable businesses, homes, pedestrians and cyclists along the corridor (Interactive map – resident). Truck traffic conflicts with the street's increasing cycling and pedestrian activity (Business Community). Trucks should be routed to Seminole or Walker Road instead (Public Opinion Survey). Restrict large scrap metal carriers along Drouillard Road (Business Community).
27 Wyandotte Street and George Avenue	**Opportunity:** Move stop bars back on George Avenue for left turns to Wyandotte Street. This will provide enough space for trucks turning left from Wyandotte Street southbound to George Avenue (Goods Movement Community).
28 Windsor Airport	**Opportunity:** Reducing truck restrictions to the airport will support future cargo expansion opportunities (especially as

[39] Also known as a shared street, a "flex street" prioritizes the needs and safety of pedestrians and cyclists along a roadway with the goal of creating a more inclusive and vibrant public realm. They are characterized by their adaptability in the way space is use, and can feature pedestrian-centric design and programming, as well as reduced vehicle speeds and access.

Location ID	Issues, Needs and Opportunities
	a result of the NextStar Energy plant and related production) (Goods Movement Community).
29 EC Row Expressway	**Opportunity:** The expressway is essential to goods movement, and improvements/ expansion are needed to address capacity and congestion issues, with an emphasis on improving connections south to Highway 401 (Public Opinion Survey).
30 Tecumseh Road	**Issue:** Restrict trucks on Tecumseh Road (Public Opinion Survey).
31 Jefferson Boulevard (Windsor Transload Facility)	**Issue:** There should not be high volumes of truck traffic along Jefferson Boulevard, as it is not part of the truck route network (Public Opinion Survey). Jefferson Boulevard has fewer traffic signals than parallel truck routes, which makes it more attractive for trucks (Public Information Centre). **Issue:** Public health issues, pollution and congestion caused by heavy trucks accessing the transload facility are key concerns, as well as dust generated at the unpaved facility (Public Opinion Survey).
32 Lauzon Road	**Opportunity:** Lauzon Road is a key truck route, connecting to concrete plants along Patillo Road in Tecumseh via Lesperance Road/County Road 22 (Goods Movement Community).
33 Jefferson Boulevard	**Opportunity:** Extend Jefferson Boulevard south of EC Row Expressway to connect with Highway 3, with an interchange at Highway 401. Expand the interchange at EC Row Expressway (Public Opinion Survey).
34 South Sandwich Planning District	**Need:** It is important to consider future development, including a new hospital (Goods Movement Community).
35 County Road 42	**Opportunity:** The roadway will be a critical travel corridor in the future and should be widened and well connected (Public Opinion Survey).
36 Lauzon Parkway	**Opportunity:** Widen Lauzon Parkway south of EC Row Expressway to six lanes to connect with Highway 3, with an interchange at Highway 401 (Public Opinion Survey).

Location ID	Issues, Needs and Opportunities
37 Riverside Drive East	**Need:** The gap in truck route network along Riverside Drive should be addressed so trucks aren't having to backtrack; City requires trucks existing the east dock to travel east (even if the truck is destined west) forcing trucks through school zones and along Banwell Road (Goods Movement Community).
38 Wyandotte Street and Banwell Road	**Opportunity:** To maintain truck flow, especially with all the construction expected in the south areas of Windsor, trucks should be allowed to use Wyandotte Street and Banwell Road (Goods Movement Community).
39 EC Row Expressway and Banwell Road	**Need:** Stellantis-LG Energy Solution EV battery plant must be considered in truck route network planning (Goods Movement Community).
40 Banwell Road	**Opportunity:** Widen Banwell Road south of EC Row Expressway to six lanes to connect with Highway 3, with an interchange at Highway 401 (Public Opinion Survey).
41 Lesperance Road (Town of Tecumseh):	**Issue:** The Town of Tecumseh does not support routing trucks along Lesperance Road between County Roads 22 and 42, as Banwell Road is a more suitable alternative (Municipality/ Government).
42 Tecumseh Road (Town of Tecumseh)	**Issue:** Through-truck traffic will be limited along Tecumseh Road in the Town of Tecumseh as part of a road diet. Instead, trucks should be directed north and south via Banwell Road (Municipality/ Government).
43 Baseline Road (Town of Tecumseh)	**Issue:** Shortcutting trucks along Baseline Road to access the Manning Road interchange at Highway 401 is an issue, as the roadway has load restrictions and is unsuitable for trucks (Municipality/ Government).
44 South Talbot Road (Town of Tecumseh)	**Issue:** This load-restricted roadway is used by trucks as a bypass when there are collisions or construction along Highway 3 (Municipality/ Government).

Location IDs correspond to map shown in Exhibit 8.1.
Note: This exhibit lists the opinions expressed during study engagement activities, and does not necessarily reflect the opinions of the City of Windsor or of the Windsor Truck Route Study team. It is noted that there are conflicting opinions in this list.

8.1.1. Dougall Avenue Truck Left-Turn Restriction

Another location-specific consideration for the Truck Route Study relates to the left-turn restrictions for trucks only from Dougall Avenue to EC Row Expressway. The restriction was implemented in 2008 by City Council as a response to cut-through truck traffic avoiding long traffic queues on Highway 401 toward the Ambassador Bridge by travelling along Dougall Avenue, which has largely residential adjacent land uses. In 2013, the City reported a 50% reduction in northbound truck volumes at the North EC Row Expressway ramp as a result of the left-turn restriction[40].

However, there is concern that the truck traffic cut-through issue may have been moved to other municipal roadways. The left-turn restriction appears to have pushed truck traffic to continue northerly to Tecumseh Road to access Huron Church Road, or from Tecumseh Road to Crawford Avenue then College Avenue to access the Ambassador Bridge directly.

8.2. Other Truck Route Network Issues and Opportunities

In addition to the location-based input received during engagement activities, the following varied and often competing considerations were also noted by representatives from the Business Community Meeting and the Goods Movement Community Meeting:

Truck Network Efficiency:

- Clarity or a rationale is needed for truck routes that do not seem to make sense for efficient deliveries.
- Many areas in Windsor have limited to no truck route connectivity, causing site access issues and restrictions for goods movement.
- Most existing concerns and the most important need relate to congestion on Huron Church Road and improving access between Highway 401 and the Ambassador Bridge.
- Improving access/reducing restrictions to key industrial areas and goods pick-up/drop-off locations is a priority.

[40] Windsorite (2013). *'No Truck Turns On Dougall Avenue' Signs Have Been Successful.* <https://windsorite.ca/2013/03/no-truck-turns-on-dougall-avenue-signs-have-been-successful/> Accessed September 2023.

- It is important to consider the efficient movement of goods to and from the Gordie Howe International Bridge.
- Widening roadways and line painting improvements are needed to help accommodate turning trucks.
- The Truck Route Study requires a pragmatic lens and needs to consider primary truck routes as well as alternate routes, with a focus on connecting businesses with their origin/destination.

Enforcement:

- Enforcement of the truck route network is needed at both the municipal level and provincial level.
- Education is important for a successful truck route network—businesses should communicate network changes to drivers, and the City should deploy additional signage.

Other Considerations:

- Approximately 600 trucks are unloaded at the Stellantis plant daily from routes travelling between Detroit and Brampton along Highway 401.
- Height restrictions are important to consider in planning the truck route network.
- Initiatives to support LCVs are important, including improved network efficiency and less time restrictions to the port and border.
- A well-maintained roadway with a smooth surface helps to limit truck noise.

8.2.1. Adjacent and Other Governments

Representatives from adjacent municipal governments also expressed the following issues, opportunities and considerations related to truck route network connectivity in the City of Windsor:

- None of the load-restricted roadways in the Town of Tecumseh connect directly to existing City of Windsor truck routes.
- Trucks are permitted along Riverside Drive in the Town of Tecumseh specifically to service the east dock in Windsor.
- The Town of Tecumseh is undertaking the Tecumseh Road Main Street Community Improvement Project, which involves lane reductions, the addition of on-street parking, as well as residential and retail development. Through traffic will be limited, and trucks should instead be routed to an alternative route north and south via Banwell Road (routing trucks along Riverside Drive, Lesperance Road to EC Row Expressway is supported).

- Truck parking issues do not appear to be an issue in the Town of Tecumseh.
- MTO requires the new truck route network bylaw once complete in order to support enforcement in the City of Windsor.
- As per the Highway Traffic Act regulations – Section 182 (2), Regulation 615, truck signage must be lawful and signage must be in place in order for the MTO to legally enforce the truck route network.

8.3. Complete Streets and Trucks

One area of need that is described in greater depth below is the need to incorporate goods movement in Complete Streets planning.

The Complete Streets concept promotes corridor designs and operations that provide a safe and attractive environment for all corridor travellers, especially cyclists and pedestrians. Some municipalities have adopted design guidelines and policies that are to be applied to new corridors and to retrofits of existing corridors. The City of Windsor is in the process of developing Complete Streets guidelines.

In practice, Complete Streets initiatives in many communities have focused on accommodating non-motorized travellers and transit onto urban road rights-of-way, with much less said about the treatment of goods movement vehicles, except typically in industrial areas. A 2021 survey of nine Canadian municipalities found that although goods movement is considered in the development of their Complete Streets policies and guidelines, it is done to varying degrees—especially with respect to how and whether goods movement stakeholders are consulted.[41]

Although non-motorized travellers and transit clearly have a critical need, less attention has been given to accommodating trucks and delivery vehicles than it has to other modes.[42] For example:

- Trucks and courier traffic is often assumed to have the same operational requirements and functions as passenger vehicles;
- Curb extensions, despite their other benefits, can block site access for a truck;

[41] D Kriger and M Seera, *Complete Streets and Goods Movement: The Canadian Experience*, ITE Journal, November 2021.

[42] J Green, *Complete Streets vs. Trucks*, The Dirt, newsletter of the American Society of Landscape Architects, January 21, 2015.

- Roundabouts, which are intended to improve road user safety, can be difficult for trucks to manoeuvre; and
- Many Complete Streets initiatives place a bicycle lane next to the curb, which must be crossed by drivers making deliveries from their vehicles, even if they are parked in designated loading areas.

A 2019 guide points out that, among other consequences, the failure to account for goods movement in Complete Streets often results in unresolved or new challenges. These include unanticipated navigation requirements as vehicles manoeuvre through the corridor or look for a loading space, parking challenges due to inappropriately designed spaces or an insufficient supply of spaces, and even continued conflicts with other road users (which the scheme was intended to mitigate), in addition to the associated congestion and emissions impacts. The guide addresses designs that are appropriate for the context, accommodation of large vehicle turns, conflict reduction between trucks and cyclists/pedestrians, and adequacy of loading, parking and delivery space, among other topics.[43]

Ideally, it would be possible to minimize or even avoid the use of a designated Complete Street that prioritizes cyclists as and pedestrians as a corridor for heavy truck traffic. However, there will still be a need to accommodate heavy trucks on the Complete Street through appropriate design and operational treatments and, if the criteria warrant, there must always be a route for heavy trucks. In some cases, this could mean that another nearby corridor is better suited as a Complete Street.

9. Next Steps

This document provides a range of key background and context findings to inform the development of the City of Windsor's truck route network. It also draws on best practices from other jurisdictions in truck route network development considered in putting forward a strategic framework and a step-by-step process for truck route network development.

The document also compiles a list of truck route needs, issues and opportunities as heard through public and stakeholder engagement activities conducted in Phase 1 of the study.

[43] A Conway et al., *Complete Streets Considerations for Freight and Emergency Vehicle Operations*, New York State Energy Research and Development Authority, Albany, NY, 2019.

Phase 2 of the study involves applying the truck route network development process outlined in section 7.3 of this report outlines a process to prepare a draft truck route network. This process will be applied through step 3, that of identifying draft network alternatives, the results of which will be shared through the second round of engagement for the Windsor Truck Route Study.