



Region of Waterloo

Municipal Class Environmental Assessment

East Boundary Road Corridor Protection Study

City of Cambridge

TRANSPORTATION REPORT

October 2015

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EXECUTIVE SUMMARY

The Region of Waterloo is undertaking the East Boundary Road Corridor Protection Study. The study follows the Environmental Assessment process and its purpose is to identify whether a new Regional road corridor should be constructed on the east side of Cambridge and, if so, where that corridor should be located. Various policies over the years have identified a high capacity road on the east side of Cambridge, and an east side road is consistent with current Regional policies including the Regional Official Plan and the Regional Transportation Master Plan. The Community Plan for the area approved by the City of Cambridge also includes the East Boundary Road.

There are three main north-south road corridors in Cambridge: Water Street/Hespeler Road, Franklin Boulevard and Townline Road. The two former corridors both traverse Cambridge from its southern extent to north of Highway 401, and each carry about 40,000 vehicles per day in their busiest sections. Townline Road does not extend as far south but does cross Highway 401, and carries more than 20,000 vehicles per day in its busiest section. While Townline Road generally operates well, both Water Street/Hespeler Road and Franklin Boulevard experience operational problems regularly.

Population and employment growth in southeast Cambridge is projected to be more than 10,000 people and 4,000 jobs in the long term. This growth will put increased pressure on the north-south transportation links described above. While the improvements to public transit outlined in the RTMP are expected to accommodate much of this growth, traffic congestion on north-south screenlines is expected to worsen. This will cause delays for commuters, goods movement, transit vehicles and emergency vehicles.

A number of non-structural and other infrastructure-intensive alternatives have been examined in place of constructing a new road corridor. As noted above, public transit improvements will make a significant difference but are not expected to eliminate all problems. Improvements to other corridors, including Water Street/Hespeler Road and Franklin Boulevard, are already planned but further improvements would be impractical or cause negative community impacts. Finally, the Cheese Factory Road/Elgin Street/Conestoga Boulevard corridor is too discontinuous and residential in character to be a practical alternative.

Various alignments of the East Boundary Road have been tested to determine preferred alignments for accommodating regional and inter-regional traffic. The four routes were presented to the public at Public Consultation Centre 1 and are shown in Figure 1 below. Route A, the alignment currently in the ROP largely along Shellard Side Road, is the longest alignment and the furthest to the east, and is projected to carry the least traffic and provide the least relief to other Regional roads in Cambridge, notably Franklin Boulevard. Routes B and D are closer to Cambridge, are shorter, would carry the most traffic and would provide the most relief to other

Regional roads. Route B is also notable as being the further west and being able to provide the most direct access to planned residential developments in southeast Cambridge.

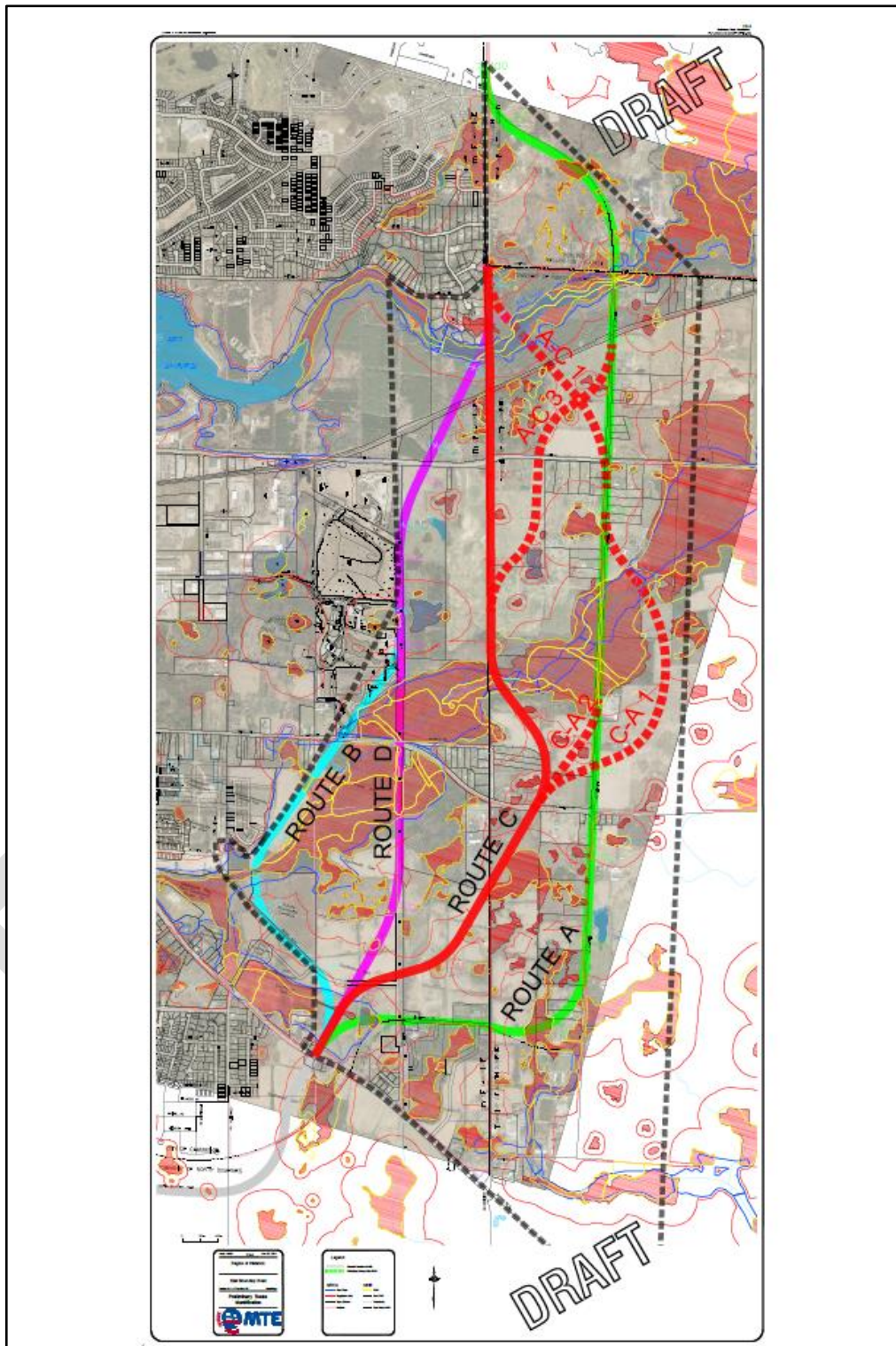


Figure 1: East Boundary Road routes.

Based on the contents of this report, the following scores are recommended for the transportation section of the criteria evaluation. Alternatives are ranked based on ○ being the least preferred and ● being the most preferred.

An evaluation of the protection requirements for the crossing of the CP railway between Clyde Road and Avenue Road suggests that the minimum acceptable protection would be crossing signals and gates. However, the likely classification of the East Boundary Road as a Community Connector, the potential for the daily number of trains using the railway to increase, and the estimates of cross-product over 200,000 for Alignments B and D, suggest that a grade separated crossing may also be appropriate. Therefore, it is recommended that a grade separated crossing be considered when determining the preferred East Boundary Road alignment.

Following determination of the preliminary preferred alignment from the criteria evaluation based on the above scores and evaluation in other portions of the Environmental Assessment, next steps include determining detailed turning movement forecasts and appropriate intersection control types.

Table 1: Transportation evaluation results.

Evaluation Criteria	Route Alternative			
	A	B	C	D
Traffic	- East Boundary Road carries 5,712 total traffic (lowest total amount). - Dundas Street carries 10,456 total traffic (7.3% less than Do Nothing). - Franklin Boulevard carries 18,324 total traffic (9.0% less than Do Nothing). - Water Street carries 19,164 total traffic (1.2% less than Do Nothing).	- East Boundary Road carries 8,520 total traffic (second highest total amount). - Dundas Street carries 10,113 total traffic (10.4% less than Do Nothing). - Franklin Boulevard carries 17,175 total traffic (14.8% less than Do Nothing). - Water Street carries 19,016 total traffic (2.0% less than Do Nothing).	- East Boundary Road carries 7,131 total traffic (second lowest total amount). - Dundas Street carries 10,216 total traffic (9.5% less than Do Nothing). - Franklin Boulevard carries 17,780 total traffic (11.7% less than Do Nothing). - Water Street carries 19,053 total traffic (1.8% less than Do Nothing).	- East Boundary Road carries 8,588 total traffic (highest total amount). - Dundas Street carries 9,782 total traffic (13.3% less than Do Nothing). - Franklin Boulevard carries 17,260 total traffic (14.3% less than Do Nothing). - Water Street carries 18,954 total traffic (2.3% less than Do Nothing).
	○	●	①	●
Active Transportation	Total length is 7,400 metres (24% longer than Route D).	Total length is 6,280 metres (5% longer than Route D).	Total length is 6,400 metres (7% longer than Route D).	Total length is 5,975 metres (shortest overall length).
	○	●	●	●
Public Transit	Longest total length, furthest away from existing and planned developments, little potentially developable lands to service.	Second shortest total length and close proximity to existing and planned developments.	Total length slightly longer than Route B, location is also further away from existing and planned developments, proximity to potentially developable lands but protected countryside along one side.	Shortest total length, further away from existing and planned developments, but close to potentially developable lands.
	○	●	①	●
Access to Developments	Furthest away from all existing and planned developments and very little access to potentially developable areas.	Closest to existing, planned and potential developments.	Would not provide access to existing or planned developments, could provide access to some potentially developable areas.	Further away from existing developments than Route B, but provides access to one planned development and a large amount of potentially developable lands.
	②	●	①	●
Overall	②	●	①	●

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1. INTRODUCTION

The Regional Transportation Master Plan (RTMP, 2010) identifies the East Boundary Road (EBR) for long-term road network improvements. The Regional Official Policies Plan (ROPP, 1995) and the Regional Official Plan (ROP, 2009) also identify this corridor.

The Region's draft 2015 Transportation Capital Program includes total funding of \$490,000 in 2015 to continue the East Boundary Corridor Protection Study (project 7299). This study will establish the alignment of the future EBR. It will follow the Class Environmental Assessment (EA) process (Schedule "C") for municipal road projects.

1.1. CAMBRIDGE AND INTER-REGIONAL TRANSPORTATION

Cambridge is located in the southeastern portion of the Region of Waterloo and is between Highways 401 and 403, as shown in Figure 2. There is significant inter-regional transportation demand between the Region of Waterloo, the Cities of Brantford and Hamilton, and Brant County. Both Highway 8 to Hamilton and Highway 24 to Brantford traverse Cambridge and pass through the downtown. Truck traffic is a particular concern because of narrow rights-of-way and proximity to residential areas and schools.

1.2. HISTORY OF EAST BOUNDARY ROAD

The initial concept was for a Highway 8 bypass and was first developed in 1966. It was part of a City of Galt plan for a ring road around the perimeter of the City. Responsibility for the boundary roads plan shifted to the Region of Waterloo (ROW) in 1988. The EBR was subsequently identified in the following Regional transportation planning policies:

- Cambridge Area Transportation Study (CATS) (1996)
- Regional Transportation Master Plan (RTMP) (1999)
- Cambridge Area Route Selection Study (CARSS) (2002)
- Detailed Transportation Network Review (DTNR) (2004)
- Regional Official Policies Plan (ROPP) (2004)
- Regional Transportation Master Plan (RTMP) (2010)
- Regional Official Plan (ROP) (2011)
- Cambridge Official Plan (2012)
- County of Wellington Official Plan (1999, revised 2015)

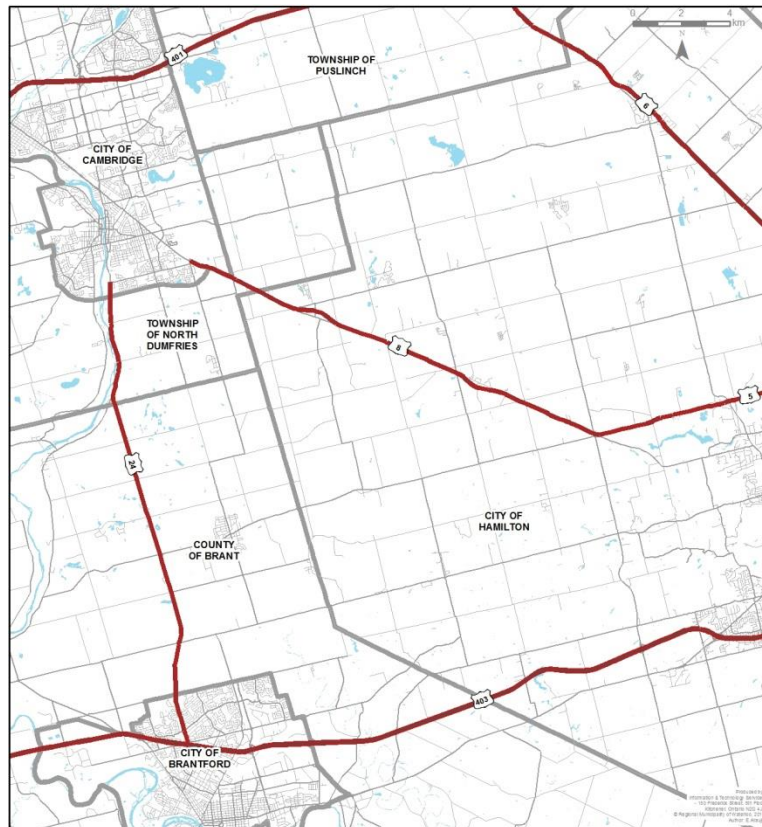


Figure 2: Cambridge and inter-regional transportation network

1.2.1. Cambridge Area Transportation Study (CATS)

CATS studied overall transportation needs in Cambridge. Among other findings, the study identified traffic capacity deficiencies in Galt, conflicts with heavy truck traffic, and north-south capacity deficiency within the commercial and industrial corridors south of Highway 401. The study revised the ring road concept and the new plan included an arterial corridor around the east, west, and south sides of the City of Cambridge, recommending the construction of the South Boundary Road and widening/realignment of Shellard Side Road to connect with a widened Townline Road. These routes would be along the alignment currently identified for the EBR.

1.2.2. Regional Transportation Master Plan (RTMP)

While the 1999 RTMP did not specifically identify heavy truck traffic concerns in Galt, the findings with respect to north-south and east-west capacity deficiencies in Cambridge were consistent with CATS. The recommendations were also very similar: construct an arterial road alignment following the South Boundary Road between Water Street and Dundas Street, and an East Side Arterial along a widened Shellard Side Road to a widened Townline Road.

1.2.3. *Cambridge Area Route Selection Study (CARSS)*

The Region initiated a Class EA Study in the City of Cambridge in 2000, called the Cambridge Area Routes Selection Study (CARSS). Corridors considered during this study included:

- East Side Arterial Corridor near Townline Road and Shellard Road
- West Side Arterial Corridor extending west from Highway 24 at the southerly edge of Cambridge across the Grand River and north to Highway 401 near Highway 8
- East-West Arterial Corridor extending from Townline Road and Highway 401 west through the City of Cambridge and across the Grand River to the West Side Arterial (now formed in part by Can-Amara Parkway)
- South Boundary Road extending from Water Street (Highway 24) through to Dundas Street (Highway 8)

1.2.4. *Detailed Transportation Network Review (DTNR)*

The DTNR recommendations included the deletion of the West Side Arterial and any new bridge crossings of the Grand River from the Regional Official Policies Plan. The study also endorsed a list of transportation network improvements including the EBR to relieve traffic congestion on Hespeler Road and Franklin Boulevard.

1.2.5. *Regional Transportation Master Plan (2010 Update)*

The 2010 update to the RTMP identified PM peak hour north-south capacity deficiencies along Hespeler Road and Franklin Boulevard in multiple sections, and also identified daily capacity deficiencies along Hespeler Road. In addition to significant investments in public transit and the conversion of Franklin Boulevard to a roundabout corridor to increase operating efficiency, the RTMP also recommended construction of the South Boundary Road and EBR. The RTMP identified a number of infrastructure improvements for north-south travel within Cambridge. These included:

- widening of Townline Road in the 0-5 and 10-20 year horizons
- increasing capacity along Franklin Boulevard in the 0-5 year horizon
- identifying the need for a new East Boundary Road beyond 20 years

1.2.6. *Regional Official Policies Plan (ROPP) and Regional Official Plan (ROP)*

Schedule A of the ROP identifies a 50-metre allowance for a future East-South Arterial from Highway 24 to Can-Amara Parkway following the Shellard Side Road alignment. This East-South Arterial includes the South Boundary Road and the East Boundary Corridor. Map 9 of the ROPP and Map 5b of the ROP show this corridor graphically. Figure 3 shows the relevant portions of these maps.

With the EBR being identified as part of Cambridge's transportation network for an extended period of time, the entire south part of Cambridge was planned and approved with the EBR assumed as a transportation improvement in the area for the future.

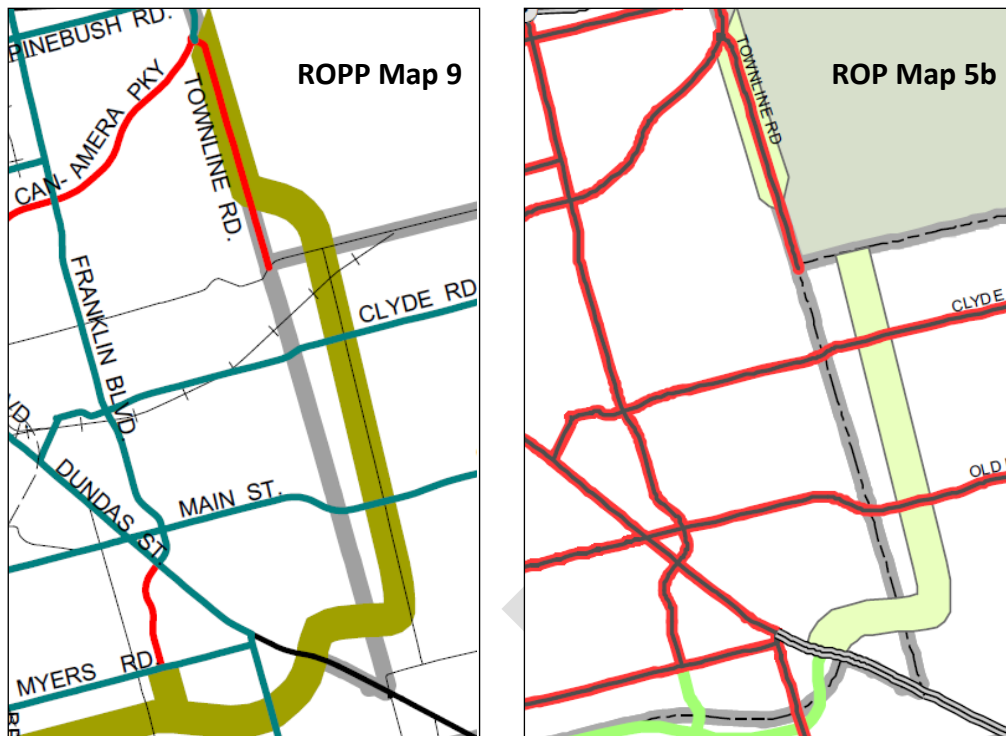


Figure 3: East Boundary Corridor in ROPP and ROP

1.2.7. *City of Cambridge Official Plan*

The Cambridge Official Plan identifies the alignment of the EBR shown in the ROPP and ROP as a “future conceptual transportation study area” from the RTMP in Map 7A. This continues planning for this area identified in previous studies such as the Southeast Galt Community Plan (1999).

1.2.8. *County of Wellington Official Plan*

The County of Wellington Official Plan identifies a proposed major roadway roughly aligning with the portion of the East Boundary Road shown to pass through the County in the ROPP in Schedule A7 (Puslinch), as shown in Figure 4 below. Wellington OP policies would govern such an alignment. Part 12 (Transportation) of the OP has a few policies relevant to this alignment:

- Section 12.1 (General) notes that the “County will co-operate with surrounding jurisdictions to develop a transportation system that recognizes the mobility of people within this area and their need for effective inter-regional transportation systems.” Similar language is also found within Section 2.5 (Our Neighbours).
- Section 12.5.2 (Major Roadways) provides general policies discussing the management of County roads, and would likely be the governing policies in the event that the EBR alignment passed through the County and became a County road for some of its length. These policies provide for access restrictions, also noting that an OP amendment would be required for a new major road.

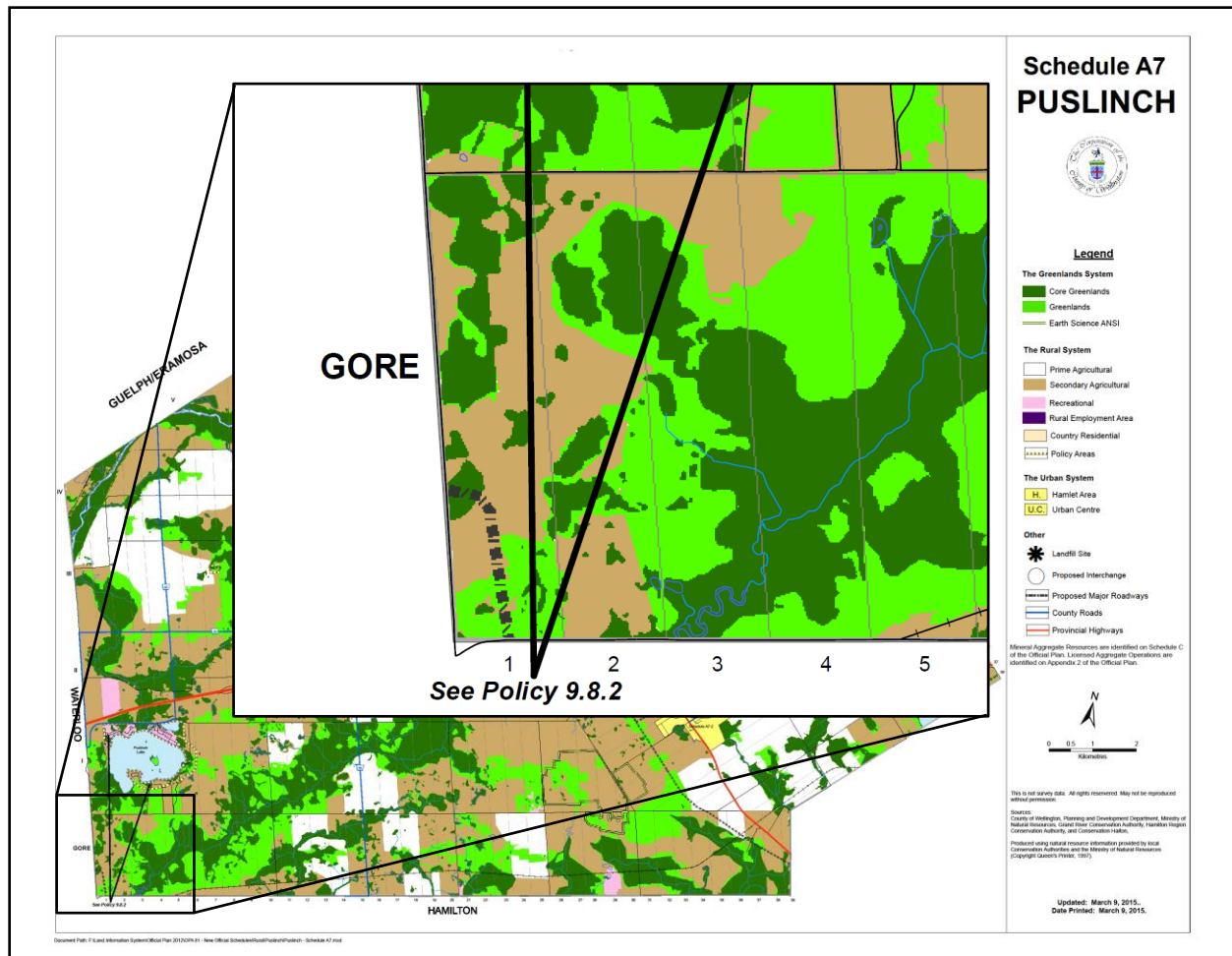


Figure 4: Wellington County Official Plan Schedule A7

It should be noted that other constraints identified in the Wellington County OP would also need to be investigated. The alignment shown in Figure 4 would pass through some areas identified as Secondary Agricultural, Greenlands and Core Greenlands. Section 4.3.2 (Secondary Agricultural Areas) denotes such lands as having agricultural capability and for which agriculture will continue to be the dominant use, but permitting other uses. Section 5.4 (Core Greenlands) identifies such lands as including provincially significant wetlands, all other wetlands, habitats for endangered or threatened species, fish habitats and hazardous lands. Similar designations of a less severe nature are attached to the Greenlands areas covered by Section 5.5. These issues would have to be reviewed during any study of the alignment of the road.

Schedule B7 (Well Head Protection Areas) of the County OP shows that the alignment would pass through areas of the Paris and Galt Moraine Policy Area and Well Head Protection Area 3. While the policies in Section 4.9.7 do not preclude roadways within the Paris and Galt Moraine policy areas, the importance of natural environmental protection and agricultural land uses is clearly established. While there are a significant number of policies governing land uses in Well Head Protection Areas (WHPAs), there are no policies strictly governing roads. It should be

noted that WHPA 3 is the lowest category of potential risk in the County OP, and protection of the WHPA would in any event need to be studied as part of the ongoing natural environmental inventories being undertaken by others during this study.

1.3. DESCRIPTION OF EAST BOUNDARY CORRIDOR STUDY AREA

The study area for the East Boundary Road Corridor Protection Study extends from Dundas Street (Highway 8) to Avenue Road. The western limit is Franklin Boulevard and the eastern limit is 500 metres east of Shellard Road. Figure 5 shows the study area boundary.

Both the ROPP and the ROP show that East Boundary Corridor improvements may extend to Can-Amara Parkway.

1.4. OVERVIEW OF OTHER RELEVANT TRANSPORTATION STUDIES

1.4.1. *MTO Highway 401 to Highway 24 By-Pass*

The Ministry of Transportation of Ontario (MTO) has initiated an EA for Highway 24 between the City of Brantford and Highway 401. As one alternative, the MTO will be considering a by-pass around the City of Cambridge. This would connect Highway 24 to Highway 401. This project is currently “on hold.” Communicating regularly with MTO is part of the East Boundary Road process to avoid duplication of efforts.

1.4.2. *South Boundary Road*

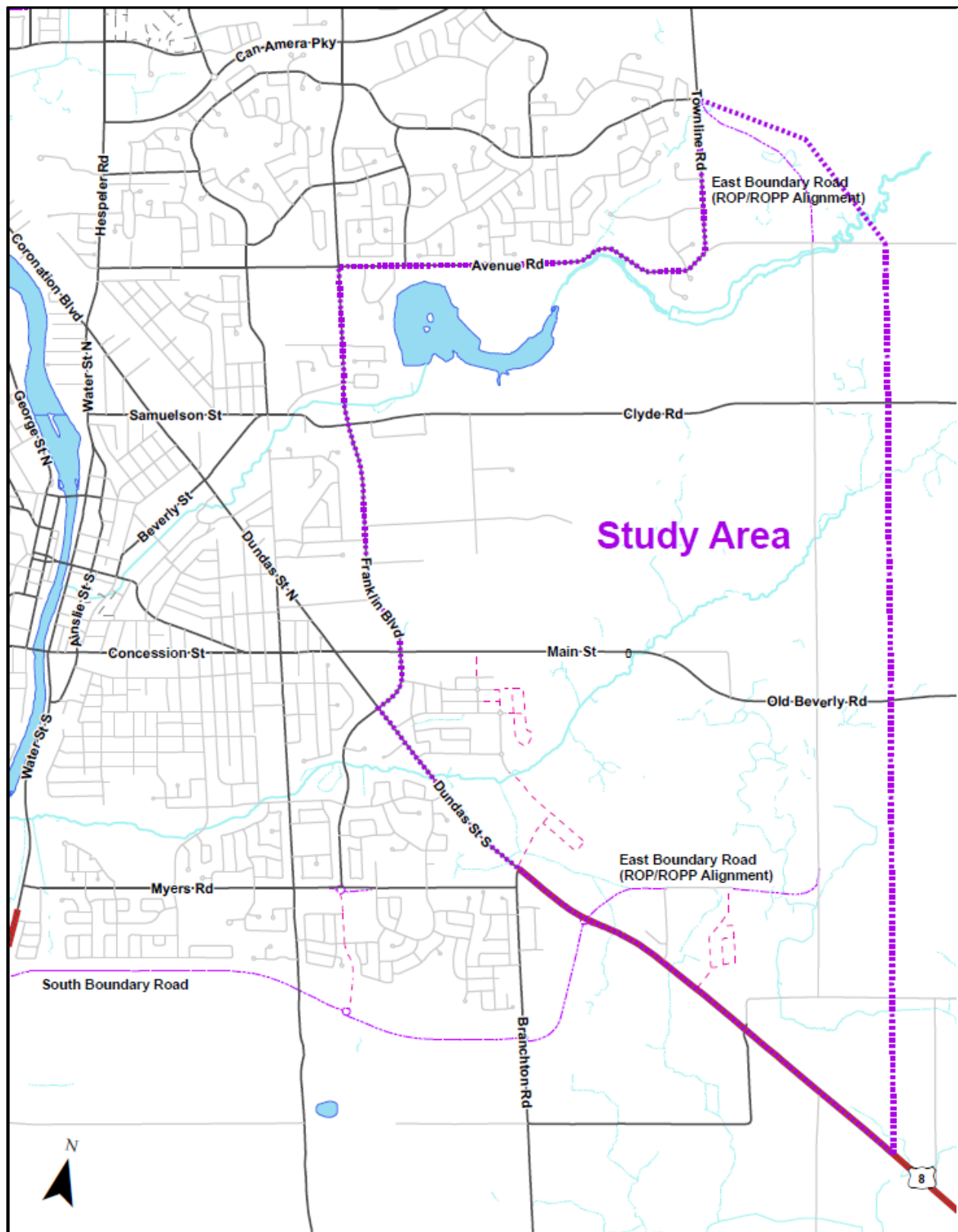
The EA for the South Boundary Corridor and Franklin Boulevard Extension is complete. The ROW will begin construction of the first phase in 2017. This will connect Water Street to the Franklin Boulevard Extension at the south end of Cambridge.

1.4.3. *Franklin Boulevard*

The EA for Franklin Boulevard is complete. The ROW will reconstruct Franklin Boulevard starting in 2015. This will increase vehicle capacity through access control and roundabout installations.

1.4.4. *Hespeler Road*

The Rapid Transit EA identified Hespeler Road for improvements. These will improve transit service along the Hespeler Road corridor as part of implementing aBRT for 2015.

**Figure 5: Study Area**

1.5. REPORT OVERVIEW

Chapter 2 provides a brief primer on transportation analysis principles and methods.

Chapter 3 and Chapter 4 of this report review the existing and future traffic conditions for north-south travel in Cambridge. This evaluation reviews and confirms the need for long-term improvements for north-south travel in Cambridge. It also informs the problem statement.

Chapter 5, evaluates network alternatives. Each of these aims to solve the problem statement described in Section 4.4. The alternatives range from “Do Nothing” through non-structural improvements and several infrastructure intensive alternatives.

Chapter 6 builds on the finding in Chapter 5 that a new East Boundary Road is the preferred network alternative. This chapter evaluates several alignment alternatives against the transportation evaluation considerations that have been developed.

Chapters 7 and 9 provide conclusions and recommendations for selecting the preliminary preferred alignment, and Chapter 10 provides some next steps in the study.

2. TRANSPORTATION ANALYSIS PRIMER

Throughout this report, analysis will be performed and conclusions drawn about the operation of roads and intersections within the study area. This analysis makes use of industry standard performance measures. Summary tables for various scenarios, alternatives, or time horizons include these measures

- level of service (LOS) and delay
- volume to capacity ratio (v/c)
- queueing, or back of queue (BOQ), values

A description of each performance measurement is provided in the following few sections. Unfamiliar readers can reference these descriptions when interpreting analysis summary tables.

2.1. VOLUME TO CAPACITY RATIO (v/c)

In traffic analysis, “volume” represents the number of vehicles used in the analysis. Volumes are typically reported for one hour intervals i.e., 500 vehicles per hour (500 vph).

Capacity is the theoretical maximum number of vehicles that can travel on a given facility. Capacity can be calculated for an entire road or for an individual movement through an intersection. Capacities depend on a large number of factors including:

- the road itself
- the vehicle being used
- the drivers

The volume to capacity ratio represents how “full” a road or movement through an intersection is.

A v/c between 0.00 and 0.49 means that vehicles use less than half the capacity of the road. This is generally associated with good operating conditions. As the v/c approaches 1.00 traffic conditions worsen and at v/c = 1.00 the theoretical maximum number of vehicles is reached and operations are generally very poor.

When forecasting volumes, it is possible that an analysis will show a v/c of greater than 1.00. This indicates that more vehicles are expected than it is possible to serve.

A v/c greater than 1.00 is associated with very bad operations and extended traffic delays. When this happens, a road is often said to be “failing.”

2.2.LEVEL OF SERVICE (LOS) AND DELAY

Level of service attempts to describe the user experience on a transportation facility. The most common application of LOS is to driver experience.

Table 2 describes LOS for both signalized and unsignalized (i.e., stop controlled) intersections. As is shown in this table, each LOS is associated with a particular amount of delay. This value represents the delay each individual driver would experience on average.

As a qualitative measure, LOS cannot be calculated directly. As such, an industry standard relationship is used to compare delay and driver experience. Delay is a quantitative measurement commonly calculated in traffic analysis. Delay translates into a qualitative statement about the experience of driving on that road using the thresholds identified in Table 2.

Table 2: Vehicle Level of Service Definitions

LOS	Signalized Intersections		Unsignalized Intersections	
	Description	Delay	Description	Delay
A	Very seldom does a vehicle wait longer than one red light. The approach appears open, turns are easily made, and drivers have freedom of operation.	≤10 sec	Little or no traffic delay occurs. Approaches appear open, turning movements are easily made, and drivers have freedom of operation.	≤10 sec
B	An occasional green light is fully used and many greens approach full use. Many drivers begin to feel somewhat restricted within groups of vehicles approaching the intersection.	≤20 sec	Short traffic delays occur. Many drivers begin to feel somewhat restricted in terms of freedom of operation.	≤15 sec
C	Intersection operation is stable but often has fully used greens. Drivers feel more restricted and occasionally may wait more than one red light. Queues may develop behind turning vehicles.	≤35 sec	Average traffic delays occur. Operations are generally stable, but drivers emerging from the minor street may have trouble completing their movement. This may occasionally impact on the stability of flow on the major street.	≤25 sec
D	Drivers experience increasing restriction and instability of traffic flow. There are substantial delays to vehicles during short peaks within the peak hour, but there is enough time with lower demand to permit occasional clearing of queues and prevent excessive backups.	≤55 sec	Long traffic delays occur. Drivers emerging from minor streets experience significant restriction and frustration. Drivers on the major street will experience congestion and delay.	≤35 sec
E	The capacity of the road is reached. There are long queues of vehicles waiting upstream of the intersection and delays to vehicles may extend to several signal cycles.	≤80 sec	Very long traffic delays occur. Operations approach the capacity of the intersection.	≤50 sec
F	Vehicle demand exceeds the available capacity and delays extending through the peak hour are experienced.	>80 sec	Vehicle demand exceeds the available capacity. Very long traffic delays occur frequently.	>50 sec

2.3.QUEUEING

Queue values are the length of the 95th percentile queue or, back of the 95th percentile queue (BOQ). The 95th percentile queue usually represents a practical maximum queue length and

can assist in the design of roadway features such as turning lanes. Summary tables may give queue values with one of the three notes in Table 3. Analysis tables will repeat these notes, when needed, for ease of reference.

Acceptable queue lengths vary from location to location and depend more on the context of any given queue than on the length itself. For example, a 200 metre long queue at an off ramp on a four lane provincial highway may be frustrating but it is not likely to have severe impacts on other drivers. Conversely, the same 200 metre queue at an intersection in a busy downtown setting may back up through other intersections block driveways or turning vehicles and may cause cascading congestion issues that impact many other drivers throughout the area.

Because of the context sensitive nature of queue assessment interpretation may require more professional judgement than an assessment based on v/c or LOS. Issues one must consider include impacts to the broader network, operation of transit vehicles, and land access.

Table 3: Notes on Queueing Values

Note	Description
m	The length of the queue is metered by an upstream intersection. Due to operational restrictions at another intersection, the queue at this location is shorter than would otherwise be expected.
#	The 95th percentile volume, on which the 95th percentile queue is based, is greater than the available capacity. The queue length reported is the maximum after two signal cycles and should be adequate for design purposes.
~	This notation indicates that the 50th percentile volume is over capacity. Effectively this means that the average volume arriving will result in a queue that continuously lengthens until the volume arriving becomes consistently lower than the average peak volume. This situation represents a cascading congestion problem likely to have severe impacts on traffic operations.

2.4.SCREENLINES

Screenlines are commonly-used analysis tools to measure aggregate travel demand across an imaginary line or in/out of a cordoned area. Screenlines are often aligned with natural or artificial barriers in the environment such as rivers or railways. Comparing estimated demand from a tool such as a demand forecasting model against count data or surveys can be useful to calibrate a model, but screenlines are also useful for summarizing travel demand over large areas. The modelling in this study makes extensive use of screenlines.

3. EXISTING CONDITIONS

3.1. DESCRIPTION OF EXISTING NORTH-SOUTH CORRIDORS

Within Cambridge, there are three existing north-south corridors:

- Hespeler Road / Water Street (Highway 24)
- Franklin Boulevard
- Townline Road / Shellard Road

King Street / Coronation Boulevard / Dundas Street is another major corridor that serves north-south and, to some extent, east-west travel. Conestoga Boulevard, Cheese Factory Road, and Elgin Street form a continuous north-south corridor. However, the existing roads are discontinuous, and do not currently serve as a viable north-south travel alternative.

3.1.1. *Hespeler Road / Water Street (Highway 24)*

Through Cambridge the name, cross-section, and 2010 AADT of Highway 24 vary and are generally as follows:

- South Boundary Road to Ainslie Street North – Water Street, AADT = 11,000 to 20,000 vehicles, 2-lane cross-section
- Ainslie Street North to Dundas Street – Water Street, AADT = 30,000 to 38, 000 vehicles, 4-lane cross-section
- Dundas Street to Dunbar Road – Hespeler Road, AADT = 32,000 to 35, 000 vehicles, 4-lane cross-section
- Dunbar Road to Highway 401 – Hespeler Road, AADT = 31,000 to 41, 000 vehicles, 6-lane cross-section

Exhibit 10 shows the number of lanes along this corridor for each road segment. Exhibit 5 shows 2011 AADT for this corridor.

3.1.2. *Franklin Boulevard*

Once construction is complete in 2016, Franklin Boulevard will extend from South Boundary Road over Highway 401 and into Hespeler. Currently Franklin Boulevard has the following characteristics:

- Myers Road to Dundas Street – AADT = 9,000 to 18,000 vehicles, 2-lane cross-section
- Dundas Street to Highway 401 – AADT = 20,000 to 41,000 vehicles, 4-lane cross-section

Exhibit 11 shows the number of lanes along this corridor for each road segment. Exhibit 6 shows 2011 AADT for this corridor.

Construction on this section will begin in 2014 to install 11 new roundabouts and other access management measures. This will improve the vehicle capacity of the road.

3.1.3. *Townline Road / Shellard Road*

Shellard Road extends from Morrison Road to Gore Road. About 750 metres west along Gore Road, Townline Road begins. Townline Road continues from there across Highway 401.

The corridor has a 2-lane cross-section until the intersection of Townline Road and Saginaw Parkway, where a 4-lane cross-section begins and continues north of Highway 401. Exhibit 12 shows the number of lanes along this corridor for each road segment.

Peak volumes occur on Townline Road near Highway 401 with an AADT of approximately 24,000 vehicles. Exhibit 7 shows 2011 AADT for this corridor.

3.1.4. *King Street / Coronation Boulevard / Dundas Street (Highway 8)*

This corridor extends from the southeast corner of Cambridge to the northwest. With the exception of a short stretch of 2-lane and 3-lane cross-section between Main Street and Beverly Street, this corridor has a 4-lane cross-section from Branchton Road to Preston.

Exhibit 13 shows the number of lanes along this corridor for each road segment. Exhibit 8 shows 2011 AADT for this corridor.

3.1.5. *Conestoga Boulevard / Elgin Street / Cheese Factory Road*

This corridor consists of City of Cambridge roads. Two major gaps in this corridor exist, one at Can-Amara Parkway and the other at the CP Rail crossing just south of Samuelson Street. The entire corridor has a 2-lane cross-section. Exhibit 14 shows the number of lanes along this corridor for each road segment.

3.2. EXISTING LAND USE

The study area spans primarily residential, industrial, and open space lands. Figure 6 shows the land use in the study area and adjacent areas of Cambridge and North Dumfries.

Nine traffic analysis zones are adjacent to the study area and will have a direct impact on north-south travel in the corridor. Figure 7 shows these zones.

Exhibit 1 shows the population and employment estimates for these nine traffic zones.

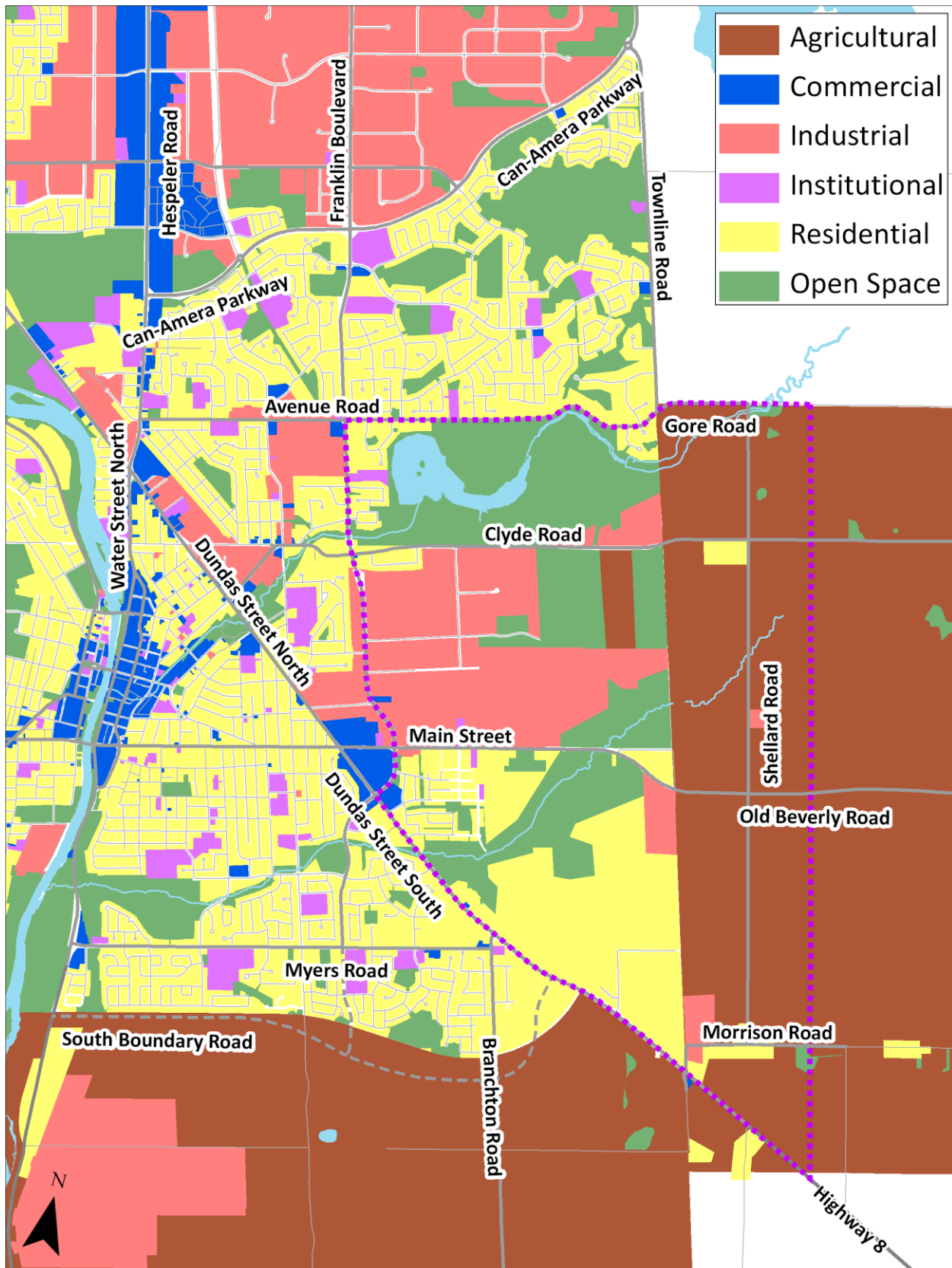


Figure 6: Existing Land Use

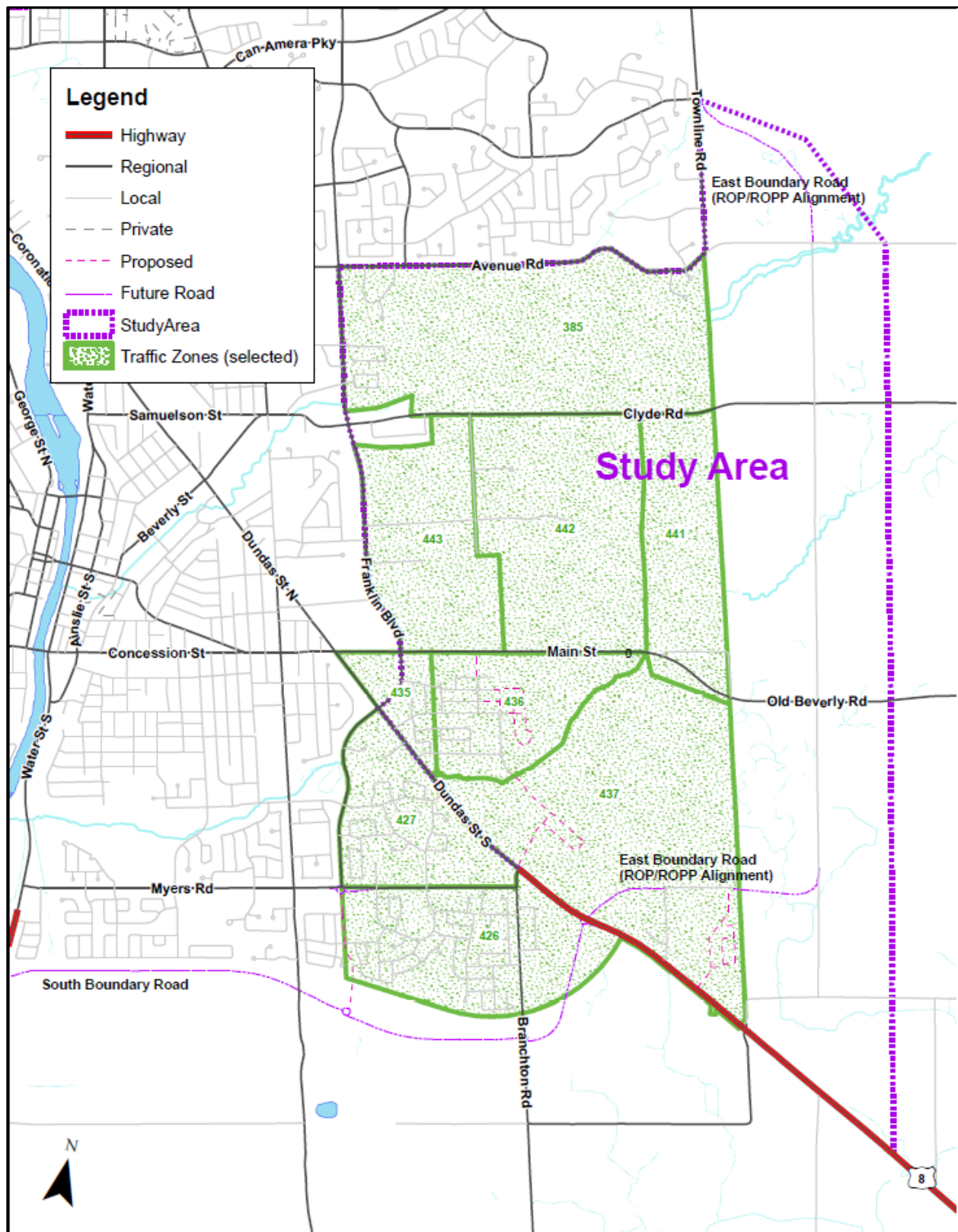


Figure 7: Traffic Analysis Zones

3.3. EXISTING TRAFFIC VOLUMES AND LEVELS OF SERVICE

3.3.1. *Corridor Based Description of Existing Conditions*

AADT

Exhibits 5 to 8 provide AADT values along the four regional corridors. The two primary corridors are Hespeler and Franklin. Each of these carries in excess of 40,000 vehicles per day. Volume in these corridors is concentrated near Can-Amara Parkway and Highway 401.

Townline Road near Highway 401 carries over 24,000 vehicles a day. Coronation Boulevard near Concession Road carries 27,000 vehicles a day.

2011 MODEL VOLUMES

Exhibits 15 to 19 provide peak hour volumes estimated by the 2011 travel-forecasting model.

These volumes demonstrate the expected northbound AM, southbound PM directionality of north-south travel in Cambridge. Peak volumes on Hespeler, Franklin, and Townline corridors occur near Can-Amara Parkway and Highway 401.

Exhibits 20 to 24 show the V/C along each of the five north-south corridors. These exhibits show that the Hespeler and Franklin corridors have v/c ratios consistent with experiencing operational problems in the peak direction.

The Elgin corridor shows localized high v/c ratios, and the Dundas corridor also has some locations between Concession Road and Elgin Street with high v/c ratios. Townline generally operates without difficulty.

3.3.2. *Screenline Based Description of Existing Conditions*

Four screenlines capture north-south travel in Cambridge. Figure 8 shows the location of these screenlines. Exhibit 2 lists each of the significant facilities that cross these screenlines.

Tables 4 and 5 show capacity, volume, and V/C values from the 2011 model for each screenline. This screenline analysis shows that the two more northern screenlines are at or are approaching capacity.

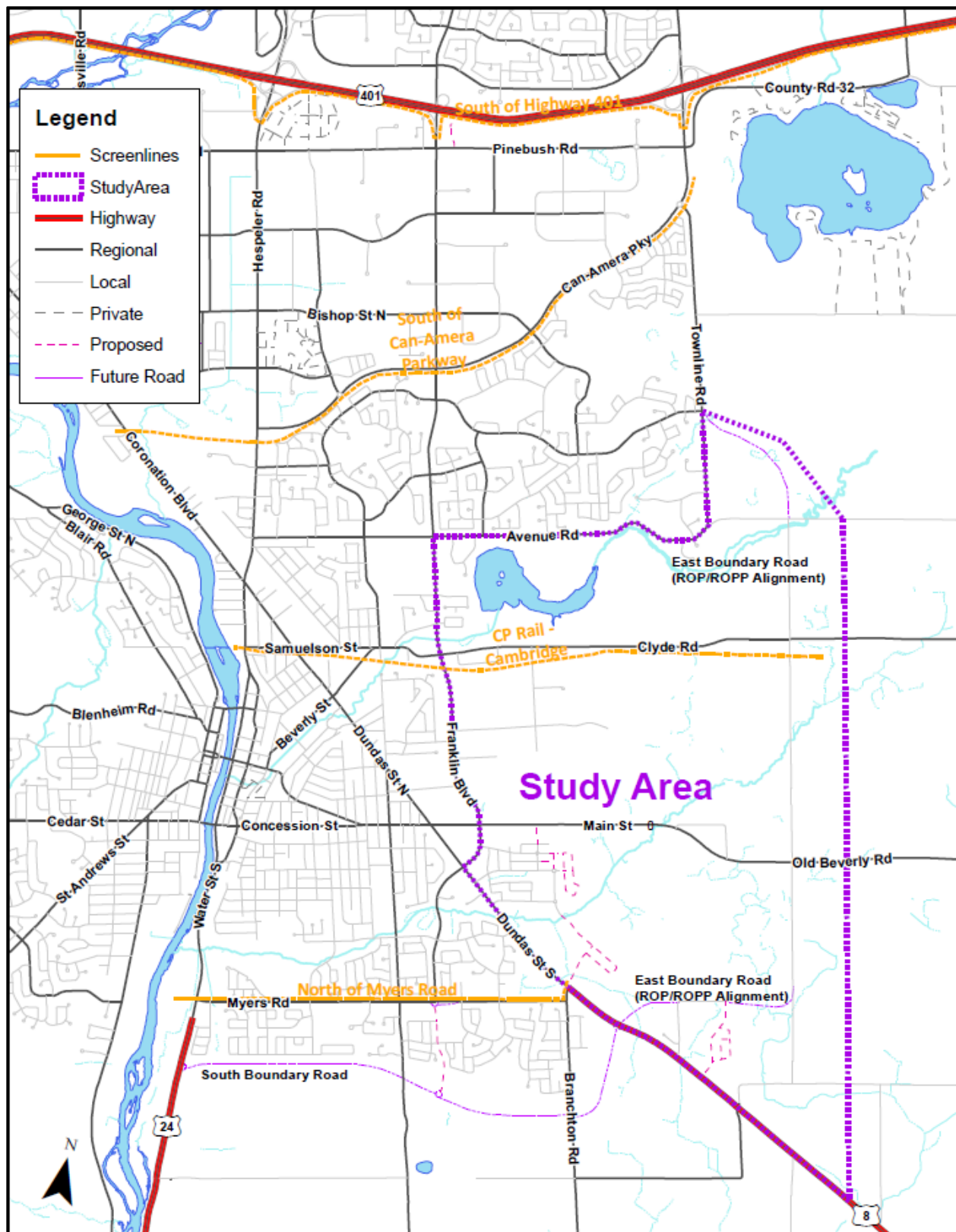


Figure 8: Screenlines

Table 4: 2011 AM Screenline Volumes

Screenline Name	Directional Lanes	Directional Capacity	Volume		V/C	
			SB	NB	SB	NB
North of Myers Road	7	5,000	1,055	1,969	0.21	0.39
CP Rail - Cambridge	8	6,550	2,221	4,448	0.34	0.68
South of Can-Amera Parkway	9	7,000	2,453	6,199	0.35	0.89
South of Highway 401	9	6,950	5,836	3,358	0.84	0.48

Table 5: 2011 PM Screenline Volumes

Screenline Name	Directional Lanes	Directional Capacity	Volume		V/C	
			SB	NB	SB	NB
North of Myers Road	7	5,000	1,970	1,327	0.39	0.27
CP Rail - Cambridge	8	6,550	4,996	2,804	0.76	0.43
South of Can-Amera Parkway	9	7,000	7,612	2,996	1.09	0.43
South of Highway 401	9	6,950	4,480	6,337	0.64	0.91

3.4. PUBLIC TRANSIT

Figure 9 shows the Grand River Transit routes that are operating within the study area. Given the nature of the area on the edge of the City, there are routes serving existing developments but no service in the outlying areas.

The main transit route serving a similar demand pattern to the EBR is Route 53 (Franklin Boulevard), which operates between Main Street and Bishop Street mostly along Franklin Boulevard. However, with only one bus every 30 minutes, this transit route cannot be expected to accommodate significant demand that would remove the need for improvements in the corridor.

The other significant current/planned transit service providing long-distance north-south travel in Cambridge is the recently started ION Bus Rapid Transit (BRT) service travelling along Ainslie/Water Street and Hespeler Road. While significant resources are being invested in this new service and efforts are being made to attract new users, this service will take some time to reach maturity and in any event is far away from the proposed EBR location.

Therefore, existing public transit has little effect on the amount of traffic travelling north/south parallel to the proposed corridor.

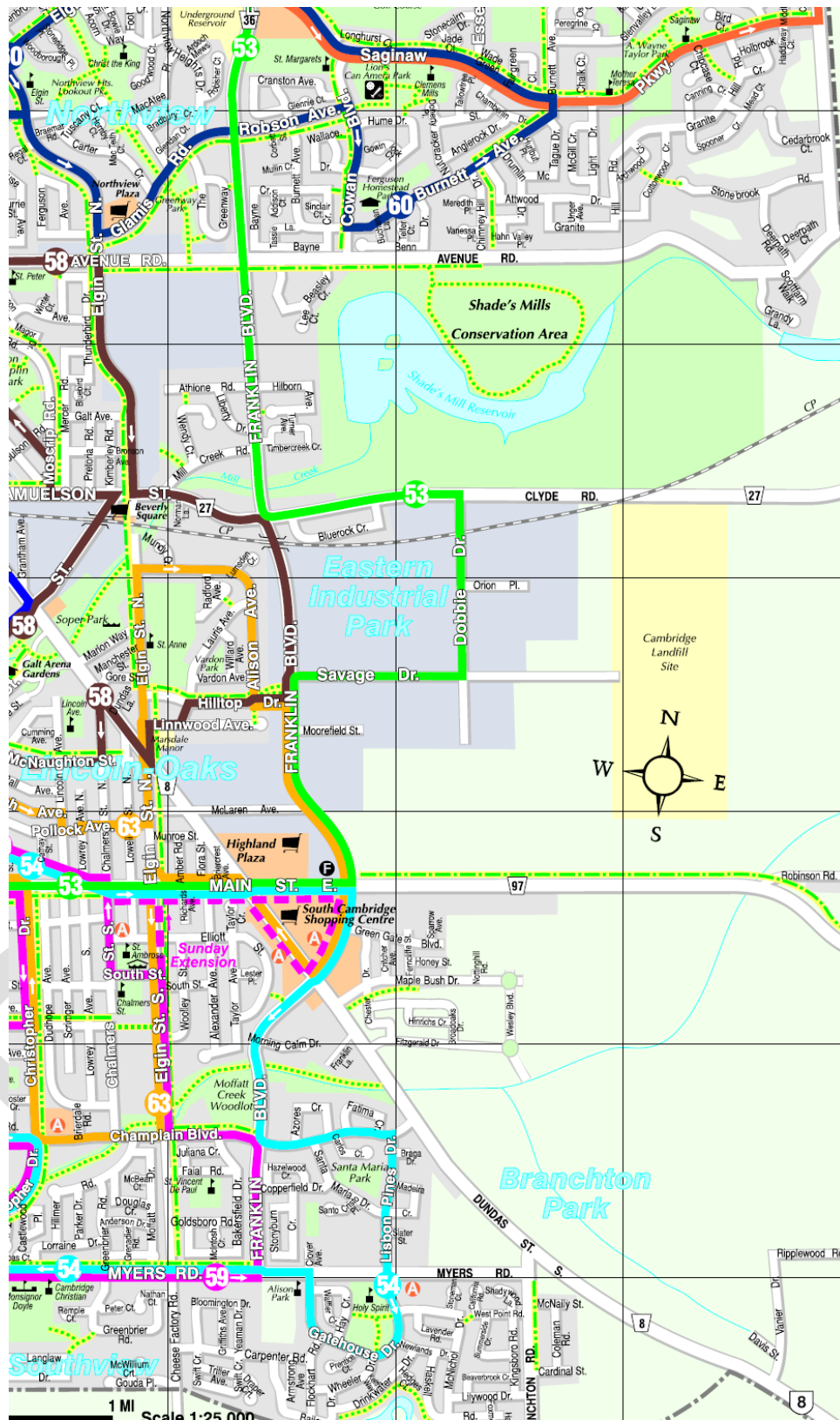


Figure 9: Transit Routes in Study Area

3.5. COMMERCIAL VEHICLE TRAFFIC

The three main Regional road corridors that serve similar demand patterns to the EBR (i.e. Hespeler Road/Water Street, Franklin Boulevard and Dundas Street) all carry significant numbers of commercial vehicles. Looking at all available traffic count data, the commercial vehicle percentages were determined and are reproduced in Table 6. With AADT on Hespeler Road about 40,000, the 5% of total traffic equates to about 2,000 trucks daily. Similarly for Franklin Boulevard with the same AADT, the roughly 7% of total traffic equates to almost 3,000 trucks daily. These represent a significant value to the local economy, and delays in these corridors carry real economic costs.

Table 6: Commercial Vehicle Percentages

Corridor	AM Peak Hour		PM Peak Hour		8-Hour Total	
	Trucks	Heavies	Trucks	Heavies	Trucks	Heavies
Hespeler/Water	2.7%	3.7%	1.2%	1.8%	2.2%	3.0%
Franklin	3.5%	3.6%	2.0%	2.0%	3.3%	3.7%
Dundas	1.8%	3.0%	0.8%	1.3%	1.5%	2.3%

3.6. RAIL TRAFFIC

The Canadian Pacific (CP) railway running generally parallel to Samuelson Street and Clyde Road carries freight rail traffic, but passenger service was discontinued some time ago. Crossings of Regional roads within the Cambridge City limits are generally grade separated, such as at Hespeler Road, Dundas Street, Beverly Street, and Franklin Boulevard, while crossings of Cambridge local roads are generally at-grade, such as Bond Street and Dobbie Drive. The Clyde Road, Shellard Side Road and Gore Road crossings are also at-grade.

The Region and the City of Cambridge are currently collaborating on a business case and feasibility study for the extension of GO Train service along the Milton Line to Cambridge. If this initiative is successful, trains would use this line and would increase the number of trains in the morning and afternoon peak periods.

4. FUTURE TRAFFIC CONDITIONS

4.1. FUTURE DEVELOPMENT

4.1.1. 2031 Horizon

The RTMP used a land use forecast for 2031 to determine transportation demand over the next 20 years. This forecast includes growth in the nine traffic analysis zones highlighted in Figure 7. Exhibit 1 shows growth in each zone. The total growth from 2011 to 2031 is:

- 11,092 additional residents
- 2,155 additional jobs

4.1.2. Mature State

Exhibit 1 shows growth assumed in the study area for the mature state. The mature state is defined more fully within the RTMP document, but corresponds to a future point where all currently designated lands are developed in accordance with current policies. These assumptions include the following growth on top of 2031 forecasts:

- 1,956 additional residents
- 1,944 additional jobs

When compared to 2011 land use estimates, this translates to:

- 13,048 additional residents
- 4,098 additional jobs

4.2. STUDY AREA TRANSPORTATION INFRASTRUCTURE IMPROVEMENTS

4.2.1. 2031 Horizon Model

The RTMP identifies several projects that directly contribute to north-south transportation capacity between 2011 and 2031. Other assessments have also identified transportation projects. Improvements include:

- Franklin Boulevard reconstruction between Myers Road and Highway 401
- Townline Road widening to four lanes between Can-Amara Parkway and Avenue Road (note that widening between Can-Amara Parkway and Saginaw Parkway has already been completed)
- Franklin Boulevard extension to South Boundary Road
- Hespeler Road improvements for aBRT

- Speedsville Road is widened to four lanes from Eagle Street to north of Highway 401

Exhibit 3 highlights how these changes affect each screenline. Exhibits 25 to 29 show the resulting road widths and capacity.

4.2.2. *Mature State Model*

The mature state network includes the following changes from 2031 that are generally associated with a full BRT along the Hespeler Road/Water Street corridor included in the Mature State model:

- Water Street is widened to four lanes between Myers Road and Ainslie Street
- Water Street from Ainslie Street to Dundas Street is only two lanes, not four as existing
- Beverly Street is widened to 4 lanes between Dundas Street and Samuelson Street
- Speedsville Road is not widened to four lanes from Eagle Street to north of Highway 401
- Hespeler Road from Dunbar Road to north of Highway 401 is only four lanes, not six as existing
- Franklin Boulevard capacity immediately north of Pinebush Road is 1100, not 750 as existing

Exhibit 4 highlights how these changes affect each screenline. Exhibits 40 to 44 show the resulting road widths and capacity.

4.3. FUTURE TRAFFIC VOLUMES AND LEVELS OF SERVICE

4.3.1. *Corridor Based Description of Future Conditions*

2031 HORIZON

Exhibits 30 to 34 give the corridor volumes forecast in the 2031 model. Exhibits 35 to 39 show the V/C for each corridor in the 2031 model.

As expected, volumes grow over the next 20 years. The peak direction flows continue to experience operational problems.

However, if the transit system develops as planned, it will capture much of the travel growth. In most cases, this reduction will return traffic volumes to near the level of 2011 traffic. The RTMP uses this scenario. Exhibits 30 to 39 demonstrate this scenario with 2031 RTMP PM peak hour values.

All corridors still demonstrate a modest increase in traffic and a corresponding reduction in the level of service. Additional north-south capacity between Samuelson Street / Clyde Road and Highway 401, or equivalent measures, may alleviate the forecast problems.

MATURE STATE

Exhibits 45 to 49 give the corridor volumes forecast in the Mature State model. Exhibits 50 to 54 show the V/C for each corridor in the Mature State model.

In the Mature State scenario, two major forces are evident:

- The large reduction in capacity on the Hespeler corridor results in a minor reduction in traffic on some sections of this corridor (other section remain stable or grow)
- The large increase in north-south travel, combined with the limited capacity on the Hespeler corridor, cause a very large increase in v/c ratio in all other corridors (with the exception of the Elgin corridor as it does not provide a continuous north-south connection)

In this model, traffic congestion affects the peak direction of all four continuous corridors. This congestion continues to be focused between Highway 401 and Can-Amara Parkway, suggesting the need for significant new north-south capacity between Concession Street / Main Street and Highway 401.

4.3.2. *Screenline Based Description of Future Conditions*

2031 HORIZON

Table 7 provides screenline volume, capacity, and V/C in the 2031 horizon assuming the improvements proposed in the RTMP. Screenlines highlighted in red are near capacity.

Improvements to north-south travel may be required based on the screenline assessment using RTMP assumptions. An improvement equivalent to one travel lane in each direction crossing Can-Amara Parkway would likely be sufficient to correct this screenline.

Table 7: 2031 RTMP PM Peak Hour Screenline Volumes

Screenline Name	Directional Lanes	Directional Capacity	Volume		V/C	
			SB	NB	SB	NB
North of Myers Road	8	6,450	2,877	1,907	0.45	0.30
CP Rail - Cambridge	8	6,950	5,886	3,068	0.85	0.44
South of Can-Amara Parkway	9	7,400	8,343	3,239	1.13	0.44
South of Highway 401	10	7,900	5,333	7,361	0.68	0.93

MATURE STATE

Table **Error! Reference source not found.**8 provides screenline volume, capacity, and V/C for the Mature State. Three of the four screenlines are over capacity in the PM peak hour. New capacity is needed to address the screenline problems identified. Near the CP Rail and Highway 401 screenlines, one additional lane of capacity is likely sufficient. However, near Can-Amara Parkway, three additional lanes of capacity may be required in the peak direction.

Table 8: Mature State PM Screenline Volumes

Screenline Name	Directional Lanes	Directional Capacity	Volume		V/C	
			SB	NB	SB	NB
North of Myers Road	9	7,200	4,024	2,007	0.56	0.28
CP Rail - Cambridge	8	6,850	7,027	3,245	1.03	0.47
South of Can-Amara Parkway	9	7,400	10,565	3,190	1.43	0.43
South of Highway 401	8	6,750	6,481	7,461	0.93	1.11

4.4. PROBLEM STATEMENT

The following problem statement will guide the transportation evaluation of alternatives in the remainder of this report:

Regional transportation studies dating back to the 1960s have all identified a future need for an arterial road connection on the east side of Cambridge between the south end of the City to Highway 401. This arterial road has commonly been referred to as the “East Boundary Road.” Recent transportation demand modelling results have confirmed that an arterial road on the east side of Cambridge is needed to alleviate forecasted north-south roadway capacity deficiencies along Hespeler Road and Franklin Boulevard, improve access to the Regional road network for residents of the Southeast Galt Community area, and provide an alternative for goods movement to avoid traffic congestion in downtown Cambridge. Such a road could also accommodate alternative transportation, including dedicated walking and cycling facilities and public transit.

A route for an “East Boundary Road” needs to be confirmed to facilitate any proposed developments in the area to proceed and to protect the land for this future roadway. With the recent approval of the South Boundary Road between Highway 24 and Dundas Street south of Myers Road, and the upgrades to Townline Road south of Highway 401 completed, a route between Dundas Street in the south, to Townline Road in the north, must be identified for this Regional road.

5. TRANSPORTATION NETWORK ALTERNATIVES

The EA process requires explicit evaluation of both “alternatives to” (Phase 2) and “alternative methods” (Phase 3) of the undertaking. In other words, when determining how to address the problem or opportunity, various strategic alternatives must initially be evaluated in Phase 2. Once an overall approach has been chosen, then various alternative ways of implementing that approach must also be evaluated in Phase 3. The purpose of these multiple layers of evaluation is to determine the optimal solution that addresses the identified problem with a minimum disturbance to the surrounding environment.

The master planning process undertaken by the RTMP is intended to identify the overall problems facing the community and identify alternatives to on a broad system level. As noted earlier, the RTMP identified constructing the EBR as the preferred way to address long-term north-south transportation capacity deficiency in Cambridge. However, it is instructive to review these alternatives to confirm the RTMP findings.

5.1. ALTERNATIVE 1: DO NOTHING

The EA process explicitly requires consideration of the “Do Nothing” alternative, which represents the effect on the surrounding environment of choosing to not address the problem or opportunity. The 2031 and mature state transportation analysis presented in Section 4.3 describes the implications of the Do Nothing alternative on the other north-south roads in Cambridge. In practical terms, traffic conditions represented by those findings would result in delays to commuters, goods movement and potentially emergency vehicles. In turn, delays to goods movement would have a negative impact on the economy in Cambridge, particularly the manufacturing base along Franklin Boulevard that depends on timely shipments of parts and completed goods.

5.2. ALTERNATIVE 2: NON-STRUCTURAL IMPROVEMENTS

This alternative refers generally to using alternative modes to accommodate travel demands: public transit, cycling and walking. The RTMP considered these improvements as part of the overall system planning process, and included significant growth in PM peak hour mode share to about 20% overall for Cambridge by 2031 for these three modes. However, even with these improvements, the existing capacity deficiencies would not be addressed, and these would worsen significantly in the mature state. While non-structural improvements are a critical component of addressing long-term transportation needs in Cambridge, alone they are not sufficient to address all long-term needs.

5.3. ALTERNATIVE 3: IMPROVEMENTS TO FRANKLIN BOULEVARD

The Franklin Boulevard EA examined two main alternatives to addressing the long-term capacity deficiency along Franklin Boulevard: widening the road to six lanes or converting it to a roundabout corridor coupled with strong access controls. While widening the road to six lanes would have addressed the forecast capacity deficiencies, there was concern about poor traffic operations at the improved signalized intersections. Also, the widening would not address the other problems being experienced in the corridor, such as the lack of active transportation facilities and poor collision history. That study ultimately concluded that the roundabout corridor alternative was preferred, and construction will start in 2017.

The approved design for the road includes a centre median for access control, boulevard multi-use trails for active transportation on both sides, two travel lanes in each direction and two-/three-lane roundabouts at almost all intersections. Improving Franklin Boulevard to increase its capacity still further would require widening of the roadway. To retain the access control concept including the centre median, widening of the road would have to be done to the outsides. The designated road allowance specified in the ROP for Franklin Boulevard is between 30 and 36 metres, and it is unlikely that a six-lane roadway with a centre median and boulevard active transportation facilities on both sides could be accommodated within that allowance. Additionally, larger roundabouts at the intersections would require more private property to be acquired beyond the road allowance specified in the ROP. The cost of the current design for Franklin Boulevard is specified at \$50M in the draft 2015 TCP, and a wider road would cost significantly more. Finally, a new Environmental Assessment study would need to be completed prior to such a widening. Consequently, this alternative seems infeasible.

5.4. ALTERNATIVE 4: IMPROVEMENTS TO WATER STREET / HESPELER ROAD

As noted earlier, the Water Street/Hespeler Road corridor is the other north-south corridor showing future capacity deficiencies. The road is already six lanes wide between Eagle Street/Pinebush Road and Dunbar Road, south of which the road is four lanes wide. Two of these travel lanes have been removed in the mature state models to account for the extension of dedicated transit right-of-way to Cambridge. As shown in Exhibit 35, most of the forecast capacity deficiencies in this corridor would occur in the four-lane section between Dunbar Road and Ainslie Street. For some sections of this corridor, such as the section shown in Figure 10 below, adding additional lanes would require significant acquisitions of private property. While this would not necessarily render the alternative technically infeasible, the impacts to the social environment would be severe.



Figure 10: Water Street north of Dando Avenue (looking north)

5.5. ALTERNATIVE 5: IMPROVEMENTS TO ELGIN STREET CORRIDOR

Cheese Factory Road, Elgin Street and Conestoga Boulevard are City of Cambridge roads that are roughly parallel to Hespeler Road and Franklin Boulevard between the southern limit of Cambridge and Highway 401. As Cheese Factory Road continues into the Township of North Dumfries, this corridor can be viewed as being capable of providing a similar north-south corridor function as the East Boundary Road.

However, this corridor would be unsuitable for this purpose. As noted in Section 3.1.5, the corridor is discontinuous in two places: at Can-Amara Parkway and again at the CP Rail grade separation south of Samuelson Street. Figure 11 and Figure 12 show the discontinuities and the context of each area. South of the Can-Amara Parkway and Conestoga Boulevard intersection, the corridor becomes a City trail before intersecting with Elgin Street at a T-intersection. Elgin Street continues west/south as a residential collector road and only becomes a more suitable arterial-type roadway south of Avenue Road. Converting Elgin Street through this area into a facility capable of accommodating regional traffic would impose severe disruption to this residential area.

South of Samuelson Street, the corridor again becomes discontinuous where Elgin Street meets the CP Rail grade separation. The current structure is only wide enough to accommodate pedestrians and cyclists, and the trail also crosses a creek immediately south of the railway. Further south, Elgin Street again becomes a residential collector road with private residences fronting the street. Again, accommodating regional traffic along this portion of the road would impose severe disruption to the residential area, environmental disturbance to the creek, and entail significant expansion of the railway grade separation.



Figure 11: View of Elgin Street corridor from Can-Am Parkway and Conestoga Boulevard intersection



Figure 12: North/south sides of Elgin Street CP Rail grade separation

Finally, it is also worth noting that the corridor ends at Pinebush Road just south of Highway 401. Were this corridor to begin accommodating inter-regional traffic, this traffic would have to turn onto Pinebush Road to join or cross the highway at the existing Hespeler Road, Franklin

Boulevard or Townline Road interchanges. This would add much more traffic to an already-busy Hespeler Road interchange, and also likely require widening of Pinebush Road to the east.

Consequently, the Cheese Factory Road/Elgin Street/Conestoga Boulevard corridor would not be a suitable alternative for addressing the identified problem.

5.6. ALTERNATIVE 6: CONSTRUCT NEW EAST BOUNDARY ROAD

The above sections outline the alternatives that were considered in place of constructing a new north-south corridor along the east side of Cambridge. Constructing this corridor would be more consistent with current Regional policies and would more effectively address the identified problem.

6. EAST BOUNDARY ROAD ALIGNMENT ALTERNATIVES

The East Boundary Road Corridor Protection Study is examining potential alignments of the roadway in an effort to reduce impacts to the natural and social environments. Since the Regional demand model assigns traffic to routes based on length, speed and traffic congestion along a route, it can also evaluate whether a proposed route will be more or less likely to accommodate traffic. This was used to review the different proposed corridor alignments for the transportation evaluation.

Four corridor alternatives, and various subalternatives, were presented to the public at the first Public Consultation Centre, and are shown in Figure 13. For the purposes of the transportation evaluation, the four main alternatives were compared, as well as the “Do Nothing” alternative, as follows:

- Route A (Shellard Side Road / ROP alignment)
- Route B (Southeast Galt Community alignment)
- Route C (Cambridge / North Dumfries boundary alignment)
- Route D (Hydro corridor alignment)

At the southern limit of the East Boundary Road, all of the alternatives would connect to the planned intersection of the South Boundary Road and Dundas Street. At the northern limit, Routes B, C and D would connect to Townline Road (widened to four lanes by 2031) at Avenue Road. Route A would follow the ROP alignment and connect to Townline Road around Saginaw Parkway, with a portion of the alignment travelling through the Township of Puslinch in Wellington County. The various subalternatives shown (e.g. A-C 1, etc.) were not evaluated, but are anticipated to perform within the range of the main alternatives identified above.

6.1. ASSIGNMENT RESULTS: DISCUSSION

Forecasts from the Regional transportation demand model for the 2031 PM peak hour are presented in Appendix B, and summarized in Figure 14 to Figure 17. Some general observations are as follows:

1. The East Boundary Road is projected to carry significant traffic.
2. The East Boundary Road would provide significant relief to Dundas Street and Franklin Boulevard, but less significant relief to Water Street/Hespeler Road.
3. Routes B and D would carry the most traffic and provide the most relief to other Regional roads.
4. Route A would carry the least traffic and provide the least relief to other Regional roads.
5. Route B would provide more access to developments in Southeastern Cambridge.

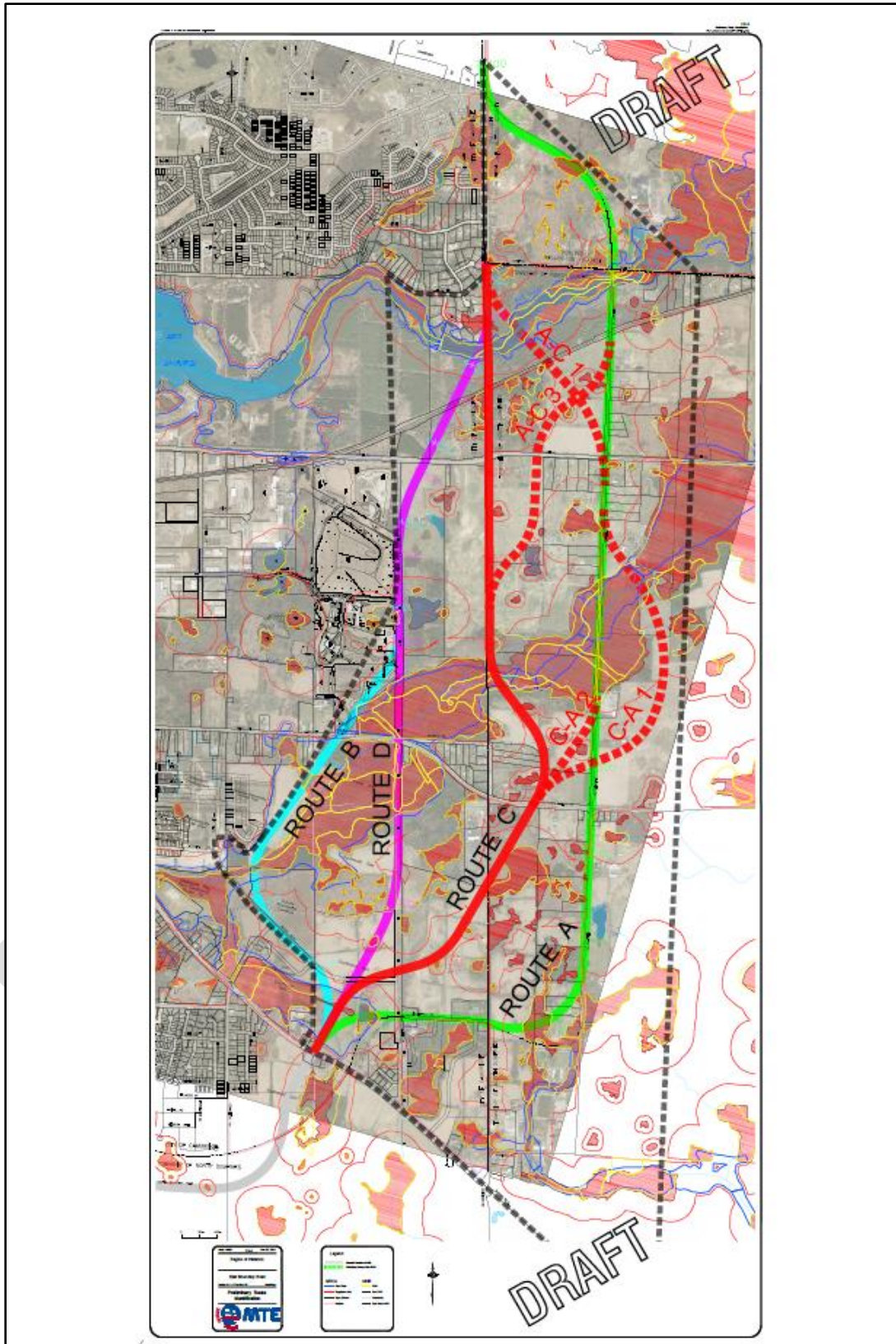


Figure 13: Preliminary EBR Corridor Alignments (PCC 1)

East Boundary Road

Alignment Alternative	Traffic							
	NB/WB	v/c	% Less than Do Nothing	SB/EB	v/c	% Less than Do Nothing	Total	% Less than Do Nothing
Total (all sections)								
A	938	N/A	N/A	4,774	N/A	N/A	5,712	N/A
B	1,562	N/A	N/A	6,957	N/A	N/A	8,520	N/A
C	1,327	N/A	N/A	5,804	N/A	N/A	7,131	N/A
D	1,726	N/A	N/A	6,862	N/A	N/A	8,588	N/A
North of Dundas Street								
A	82	0.04	N/A	85	0.04	N/A	167	N/A
B	135	0.06	N/A	305	0.14	N/A	440	N/A
C	158	0.07	N/A	159	0.07	N/A	317	N/A
D	191	0.09	N/A	297	0.14	N/A	488	N/A
South of Main Street								
A	126	0.06	N/A	179	0.08	N/A	305	N/A
B	197	0.09	N/A	598	0.27	N/A	795	N/A
C	181	0.08	N/A	340	0.15	N/A	521	N/A
D	211	0.10	N/A	483	0.22	N/A	694	N/A
North of Main Street								
A	147	0.07	N/A	800	0.36	N/A	946	N/A
B	246	0.11	N/A	1,138	0.52	N/A	1,384	N/A
C	198	0.09	N/A	985	0.45	N/A	1,184	N/A
D	261	0.12	N/A	1,147	0.52	N/A	1,408	N/A
South of Clyde Road								
A	147	0.07	N/A	808	0.37	N/A	955	N/A
B	246	0.11	N/A	1,138	0.52	N/A	1,384	N/A
C	194	0.09	N/A	996	0.45	N/A	1,190	N/A
D	261	0.12	N/A	1,147	0.52	N/A	1,408	N/A
Clyde Road to Avenue Road								
A	168	0.08	N/A	852	0.39	N/A	1,020	N/A
B	286	0.13	N/A	1,172	0.53	N/A	1,458	N/A
C	226	0.10	N/A	1,003	0.46	N/A	1,229	N/A
D	307	0.14	N/A	1,174	0.53	N/A	1,481	N/A
North of Avenue Road								
A	167	0.08	N/A	849	0.39	N/A	1,016	N/A
B	286	0.16	N/A	1,177	0.65	N/A	1,463	N/A
C	225	0.13	N/A	1,004	0.56	N/A	1,229	N/A
D	307	0.17	N/A	1,179	0.65	N/A	1,486	N/A
Can-Amara Parkway to Saginaw Parkway								
A	102	0.06	N/A	1,201	0.67	N/A	1,302	N/A
B	165	0.09	N/A	1,429	0.79	N/A	1,594	N/A
C	144	0.08	N/A	1,317	0.73	N/A	1,460	N/A
D	189	0.10	N/A	1,436	0.80	N/A	1,624	N/A

Figure 14: East Boundary Road 2031 PM Peak Hour Forecast Traffic

Dundas Street

Alignment Alternative	Traffic							
	NB/WB	v/c	% Less than Do Nothing	SB/EB	v/c	% Less than Do Nothing	Total	% Less than Do Nothing
Total (all sections)								
Do Nothing	4,718	N/A		6,565	N/A		11,283	
A	4,543	N/A	-3.7%	5,913	N/A	-9.9%	10,456	-7.3%
B	4,703	N/A	-0.3%	5,410	N/A	-17.6%	10,113	-10.4%
C	4,549	N/A	-3.6%	5,667	N/A	-13.7%	10,216	-9.5%
D	4,411	N/A	-6.5%	5,371	N/A	-18.2%	9,782	-13.3%
East of EBR/SBR								
Do Nothing	682	0.62		716	0.65		1,398	
A	637	0.58	-6.5%	657	0.60	-8.3%	1,294	-7.4%
B	673	0.61	-1.2%	724	0.66	1.2%	1,398	0.0%
C	673	0.61	-1.3%	700	0.64	-2.3%	1,373	-1.8%
D	673	0.61	-1.2%	728	0.66	1.6%	1,401	0.3%
EBR/SBR to Branchton Road								
Do Nothing	650	0.59		697	0.63		1,346	
A	631	0.57	-2.9%	640	0.58	-8.1%	1,271	-5.6%
B	753	0.68	15.9%	619	0.56	-11.1%	1,372	1.9%
C	612	0.56	-5.9%	639	0.58	-8.3%	1,250	-7.1%
D	597	0.54	-8.2%	568	0.52	-18.5%	1,164	-13.5%
Branchton Road to Champlain Boulevard								
Do Nothing	795	0.88		1,032	1.15		1,827	
A	741	0.82	-6.7%	986	1.10	-4.5%	1,727	-5.5%
B	747	0.83	-6.0%	822	0.91	-20.4%	1,570	-14.1%
C	738	0.82	-7.1%	909	1.01	-12.0%	1,647	-9.9%
D	702	0.78	-11.6%	807	0.90	-21.8%	1,510	-17.4%
Champlain Boulevard to Franklin Boulevard								
Do Nothing	804	0.45		1,326	0.74		2,130	
A	744	0.41	-7.4%	1,198	0.67	-9.7%	1,942	-8.8%
B	721	0.40	-10.3%	1,019	0.57	-23.2%	1,740	-18.3%
C	734	0.41	-8.7%	1,108	0.62	-16.4%	1,842	-13.5%
D	693	0.39	-13.8%	993	0.55	-25.1%	1,686	-20.8%
Franklin Boulevard to Main Street								
Do Nothing	675	0.38		1,041	0.58		1,717	
A	670	0.38	-0.8%	906	0.50	-13.0%	1,576	-8.2%
B	657	0.37	-2.7%	793	0.44	-23.9%	1,450	-15.6%
C	666	0.37	-1.4%	834	0.46	-20.0%	1,499	-12.7%
D	642	0.36	-4.9%	825	0.46	-20.7%	1,467	-14.5%
West of Main Street								
Do Nothing	512	0.68		783	1.04		1,295	
A	520	0.69	1.6%	676	0.90	-13.6%	1,196	-7.6%
B	550	0.73	7.4%	625	0.83	-20.1%	1,175	-9.3%
C	525	0.70	2.4%	653	0.87	-16.6%	1,177	-9.1%
D	519	0.69	1.4%	640	0.85	-18.3%	1,159	-10.5%
East of Beverly Street								
Do Nothing	600	0.80		970	1.29		1,570	
A	599	0.80	-0.2%	850	1.13	-12.4%	1,449	-7.8%
B	602	0.80	0.3%	808	1.08	-16.7%	1,410	-10.2%
C	602	0.80	0.2%	826	1.10	-14.9%	1,427	-9.1%
D	584	0.78	-2.7%	810	1.08	-16.5%	1,394	-11.2%

Figure 15: Dundas Street 2031 PM Peak Hour Forecast Traffic

Franklin Boulevard

Alignment Alternative	Traffic							
	NB/WB	v/c	% Less than Do Nothing	SB/EB	v/c	% Less than Do Nothing	Total	% Less than Do Nothing
Total (all sections)								
Do Nothing	5,410	N/A		14,738	N/A		20,148	
A	4,889	N/A	-9.6%	13,435	N/A	-8.8%	18,324	-9.0%
B	4,482	N/A	-17.2%	12,693	N/A	-13.9%	17,175	-14.8%
C	4,650	N/A	-14.0%	13,131	N/A	-10.9%	17,780	-11.7%
D	4,454	N/A	-17.7%	12,806	N/A	-13.1%	17,260	-14.3%
SBR to Myers Road								
Do Nothing	147	0.13		257	0.23		404	
A	113	0.10	-23.2%	241	0.22	-6.4%	353	-12.5%
B	102	0.09	-30.8%	252	0.23	-2.0%	354	-12.5%
C	105	0.10	-28.7%	255	0.23	-0.8%	360	-10.9%
D	99	0.09	-32.4%	257	0.23	-0.1%	356	-11.9%
Myers Road to Champlain Boulevard								
Do Nothing	287	0.13		651	0.30		938	
A	253	0.12	-12.2%	634	0.29	-2.6%	886	-5.6%
B	240	0.11	-16.5%	611	0.28	-6.2%	851	-9.3%
C	241	0.11	-16.2%	639	0.29	-1.8%	880	-6.2%
D	232	0.11	-19.5%	665	0.30	2.2%	897	-4.4%
South of Dundas Street								
Do Nothing	386	0.18		1,113	0.51		1,499	
A	349	0.16	-9.6%	1,102	0.50	-1.0%	1,451	-3.2%
B	329	0.15	-14.7%	1,059	0.48	-4.9%	1,388	-7.4%
C	327	0.15	-15.2%	1,095	0.50	-1.6%	1,422	-5.1%
D	317	0.15	-17.9%	1,124	0.51	1.0%	1,441	-3.9%
South of Main Street								
Do Nothing	649	0.30		1,793	0.82		2,442	
A	553	0.25	-14.9%	1,628	0.74	-9.2%	2,181	-10.7%
B	480	0.22	-26.0%	1,473	0.67	-17.8%	1,954	-20.0%
C	503	0.23	-22.5%	1,574	0.72	-12.2%	2,078	-14.9%
D	471	0.22	-27.4%	1,484	0.68	-17.3%	1,955	-20.0%
Savage Drive to Clyde Road								
Do Nothing	1,036	0.47		2,278	1.04		3,314	
A	906	0.41	-12.5%	1,906	0.87	-16.4%	2,812	-15.2%
B	803	0.37	-22.5%	1,694	0.77	-25.7%	2,497	-24.7%
C	855	0.39	-17.4%	1,795	0.82	-21.2%	2,650	-20.0%
D	808	0.37	-22.0%	1,678	0.77	-26.3%	2,486	-25.0%
South of Avenue Road								
Do Nothing	1,159	0.53		2,523	1.15		3,682	
A	1,037	0.47	-10.5%	2,088	0.95	-17.2%	3,125	-15.1%
B	932	0.43	-19.6%	1,906	0.87	-24.5%	2,838	-22.9%
C	985	0.45	-15.1%	2,009	0.92	-20.4%	2,993	-18.7%
D	935	0.43	-19.4%	1,901	0.87	-24.6%	2,836	-23.0%
Saginaw Parkway/Elgin Street to Can-Amara Parkway								
Do Nothing	1,015	0.47		3,438	1.57		4,453	
A	956	0.44	-5.8%	3,257	1.49	-5.3%	4,213	-5.4%
B	895	0.41	-11.8%	3,154	1.44	-8.3%	4,049	-9.1%
C	922	0.42	-9.2%	3,205	1.46	-6.8%	4,127	-7.3%
D	894	0.41	-11.9%	3,140	1.43	-8.7%	4,033	-9.4%
Can-Amara Parkway to Bishop Street								
Do Nothing	730	0.33		2,685	1.22		3,415	
A	724	0.33	-0.9%	2,579	1.17	-3.9%	3,303	-3.3%
B	700	0.32	-4.1%	2,545	1.16	-5.2%	3,245	-5.0%
C	712	0.33	-2.5%	2,559	1.17	-4.7%	3,270	-4.2%
D	699	0.32	-4.3%	2,557	1.16	-4.8%	3,256	-4.7%

Figure 16: Franklin Boulevard 2031 PM Peak Hour Forecast Traffic

Water Street/Hespeler Road

Alignment Alternative	Traffic							
	NB/WB	v/c	% Less than Do Nothing	SB/EB	v/c	% Less than Do Nothing	Total	% Less than Do Nothing
Total (all sections)								
Do Nothing	7,845	N/A		11,552	N/A		19,397	
A	7,937	N/A	1.2%	11,227	N/A	-2.8%	19,164	-1.2%
B	7,961	N/A	1.5%	11,055	N/A	-4.3%	19,016	-2.0%
C	7,930	N/A	1.1%	11,123	N/A	-3.7%	19,053	-1.8%
D	7,938	N/A	1.2%	11,017	N/A	-4.6%	18,954	-2.3%
South of SBR								
Do Nothing	707	0.64		895	0.81		1,602	
A	708	0.64	0.1%	903	0.82	0.9%	1,611	0.6%
B	708	0.64	0.2%	918	0.83	2.6%	1,626	1.5%
C	708	0.64	0.2%	912	0.83	1.9%	1,620	1.1%
D	709	0.64	0.2%	913	0.83	2.1%	1,622	1.3%
South of Myers Road								
Do Nothing	552	0.74		670	0.89		1,222	
A	553	0.74	0.2%	633	0.84	-5.5%	1,186	-3.0%
B	557	0.74	0.8%	602	0.80	-10.2%	1,159	-5.2%
C	551	0.74	-0.1%	614	0.82	-8.4%	1,165	-4.6%
D	552	0.74	0.0%	595	0.79	-11.2%	1,147	-6.1%
South of Ainslie Street								
Do Nothing	584	0.90		791	1.22		1,375	
A	584	0.90	0.1%	753	1.16	-4.8%	1,337	-2.7%
B	587	0.90	0.6%	729	1.12	-7.8%	1,317	-4.2%
C	582	0.90	-0.2%	739	1.14	-6.6%	1,321	-3.9%
D	583	0.90	-0.1%	723	1.11	-8.6%	1,306	-5.0%
South of Samuelson Street								
Do Nothing	981	0.66		1,926	1.29		2,907	
A	972	0.66	-0.9%	1,910	1.28	-0.9%	2,882	-0.9%
B	973	0.66	-0.8%	1,879	1.26	-2.4%	2,853	-1.9%
C	971	0.66	-1.0%	1,899	1.28	-1.4%	2,870	-1.3%
D	975	0.66	-0.6%	1,884	1.27	-2.2%	2,859	-1.7%
South of Coronation Boulevard/Dundas Street								
Do Nothing	949	0.64		1,811	1.22		2,760	
A	944	0.64	-0.4%	1,795	1.21	-0.9%	2,740	-0.7%
B	945	0.64	-0.4%	1,774	1.19	-2.1%	2,719	-1.5%
C	944	0.64	-0.5%	1,788	1.20	-1.3%	2,732	-1.0%
D	947	0.64	-0.2%	1,774	1.19	-2.0%	2,721	-1.4%
South of Avenue Road								
Do Nothing	1,088	0.74		1,705	1.15		2,793	
A	1,083	0.73	-0.4%	1,650	1.11	-3.2%	2,734	-2.1%
B	1,075	0.73	-1.3%	1,628	1.10	-4.5%	2,702	-3.3%
C	1,075	0.73	-1.3%	1,639	1.10	-3.9%	2,713	-2.9%
D	1,075	0.73	-1.2%	1,631	1.10	-4.4%	2,706	-3.1%
South of Can-Amara Parkway								
Do Nothing	772	0.53		2,344	1.58		3,116	
A	765	0.52	-0.9%	2,209	1.49	-5.8%	2,973	-4.6%
B	761	0.52	-1.4%	2,149	1.45	-8.3%	2,911	-6.6%
C	759	0.52	-1.7%	2,181	1.47	-6.9%	2,940	-5.6%
D	759	0.52	-1.7%	2,150	1.45	-8.3%	2,909	-6.6%
South of Pinebush Road/Eagle Street								
Do Nothing	2,212	0.99		1,410	0.63		3,622	
A	2,327	1.04	5.2%	1,375	0.61	-2.5%	3,702	2.2%
B	2,354	1.05	6.4%	1,376	0.61	-2.4%	3,730	3.0%
C	2,340	1.04	5.8%	1,351	0.60	-4.2%	3,692	1.9%
D	2,339	1.04	5.7%	1,346	0.60	-4.5%	3,685	1.7%

Figure 17: Water Street/Hespeler Road 2031 PM Peak Hour Forecast Traffic

The East Boundary Road would carry significant traffic by 2031, meaning that the road would be well used. While projected traffic is generally modest near the southern limit at Dundas Street, traffic volumes would be much higher close to Highway 401, and the road would be operating at 70-80% of its theoretical one-way design capacity for a four-lane roadway. In the PM peak hour, most traffic would be travelling southbound.

All alignments would provide significant relief to Dundas Street (South Boundary Road to Beverly Street), ranging from about 7% to about 13% less traffic overall, and more in the peak direction. Route D would provide the most relief for Dundas Street, while Route A would provide the least.

Similarly, all alignments would provide significant relief to Franklin Boulevard (South Boundary Road to Bishop Street), ranging from 9% to about 15% less traffic overall, and more in the peak direction. Route B would provide slightly more relief than alignment D, while Route A would provide the least. Also, relief for Franklin Boulevard would be more significant than for Dundas Street, both because it carries more traffic and because it is parallel to the East Boundary Road.

All alignments would provide minor relief to Water Street/Hespeler Road, ranging from about 1% to 2% less traffic overall, and more in the peak direction. It is worth noting that relief would be most pronounced outside of downtown Cambridge (i.e. south of Ainslie Street and north of Avenue Road). This is likely because travellers outside of the downtown area have more feasible routes available to them to reach their final destinations. Similar to above, Routes B and D would provide the most relief to Water Street/Hespeler Road, while Route A would provide the least.

Routes B and D would carry the highest traffic volumes and provide the most relief to other Regional roads. Route D is projected to carry higher traffic because it is the shortest alignment, providing the shortest travel times between other Regional roads. While Route B is also a relatively short route, the higher projected traffic volumes are also partly caused by its better accessibility, as it is the only alignment that could be connected to the residential developments around Green Gate Boulevard and Maple Bush Drive.

Conversely, Route A is projected to carry the least traffic volume, and provide the least relief to other Regional roads, of the tested alignments. The ROP alignment is significantly longer than the other routes and further away from major traffic generators.

6.2.ALIGNMENT CONSIDERATIONS: ACTIVE TRANSPORTATION

As a Regional road, the East Boundary Road would be designed as a multi-modal corridor able to accommodate multiple types of users. The road is intended to carry large volumes of car and truck traffic at high speeds, so active transportation would likely be provided a separated facility such as a boulevard multi-use trail.

Active transportation users travel much slower than vehicles, and as such the length of the corridor is much more relevant to their overall experience with the corridor. For this reason,

Route D, the shortest alternative, is more likely to accommodate higher numbers of utilitarian users than Route A, which is the longest. Table 9 below shows the total lengths of each route alternative (Highway 8/Dundas Street to Townline Road around Saginaw Parkway) and the increase in length over Route D.

Table 9: Lengths of East Boundary Corridor Route Alternatives

Route Alternative	Length (m)	% more than D
A	7,400	24%
B	6,280	5%
C	6,400	7%
D	5,975	

6.3.ALIGNMENT CONSIDERATIONS: PUBLIC TRANSIT ROUTING

As noted above, the East Boundary Road would be designed as a multi-modal transportation corridor, including potentially as a public transit route. Proximity to potential and planned developments, and overall length of the route, will determine how useful the road could be for public transit. Figure 18 below shows the different East Boundary Road alignments, planned developments, Provincially Significant Wetlands, and the Regional rural and protected countryside as defined in the ROP. Any area shown in white is a potential future development site. Route B, with its short total length and closest location to planned developments, could provide an excellent high-speed transit connection. Conversely, Route A is long, distant from planned developments, has protected countryside on both sides for much of its length, and therefore would be a poor routing choice for public transit. Route D is further from planned developments than Route B, but would have similar access to potentially developable area. Route C also has access to some potentially developable area, but less than B and D, and also would have protected countryside along one side for much of its length.

6.4.ALIGNMENT CONSIDERATIONS: ACCESS TO PLANNED DEVELOPMENTS

The East Boundary Road would be planned as a protected access roadway, meaning that the majority of nearby developments would not have direct accesses to it, and private driveways would generally be forbidden. Therefore, the degree of access provided to the road is governed more by how close it passes to nearby developments. As shown in Figure 18 below, Route A would provide the poorest connectivity to planned developments in southeast Cambridge, as the majority of the route would be far away from those developments. Conversely, Route B would provide the best access as it would pass through many of those developments. Routes C and D would provide good access for some developments, but would pass through fewer developments than Route B.

6.5.OVERALL EVALUATION

The overall evaluation is summarized in Table 10 below. From a transportation perspective and considering all evaluation criteria, Route B is the preferred route. Alternatives are ranked based on ○ being the least preferred and ● being the most preferred.

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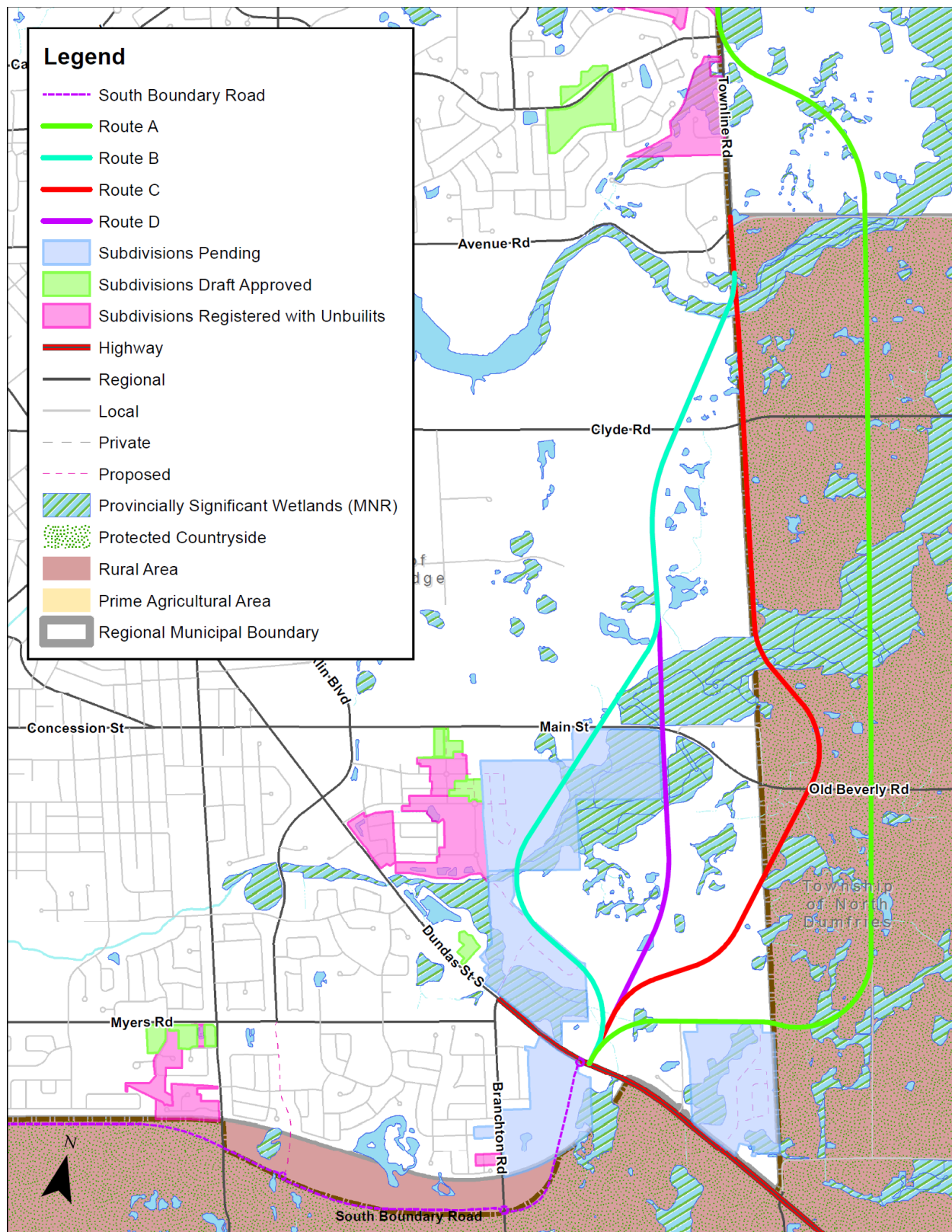


Figure 18: EBR Routes and Planned Developments

Table 10: Overall Transportation Evaluation Results

Evaluation Criteria	Route Alternative			
	A	B	C	D
Traffic	- East Boundary Road carries 5,712 total traffic (lowest total amount). - Dundas Street carries 10,456 total traffic (7.3% less than Do Nothing). - Franklin Boulevard carries 18,324 total traffic (9.0% less than Do Nothing). - Water Street carries 19,164 total traffic (1.2% less than Do Nothing).	- East Boundary Road carries 8,520 total traffic (second highest total amount). - Dundas Street carries 10,113 total traffic (10.4% less than Do Nothing). - Franklin Boulevard carries 17,175 total traffic (14.8% less than Do Nothing). - Water Street carries 19,016 total traffic (2.0% less than Do Nothing).	- East Boundary Road carries 7,131 total traffic (second lowest total amount). - Dundas Street carries 10,216 total traffic (9.5% less than Do Nothing). - Franklin Boulevard carries 17,780 total traffic (11.7% less than Do Nothing). - Water Street carries 19,053 total traffic (1.8% less than Do Nothing).	- East Boundary Road carries 8,588 total traffic (highest total amount). - Dundas Street carries 9,782 total traffic (13.3% less than Do Nothing). - Franklin Boulevard carries 17,260 total traffic (14.3% less than Do Nothing). - Water Street carries 18,954 total traffic (2.3% less than Do Nothing).
	○	●	①	●
Active Transportation	Total length is 7,400 metres (24% longer than Route D).	Total length is 6,280 metres (5% longer than Route D).	Total length is 6,400 metres (7% longer than Route D).	Total length is 5,975 metres (shortest overall length).
	○	●	●	●
Public Transit	Longest total length, furthest away from existing and planned developments, little potentially developable lands to service.	Second shortest total length and close proximity to existing and planned developments.	Total length slightly longer than Route B, location is also further away from existing and planned developments, proximity to potentially developable lands but protected countryside along one side.	Shortest total length, further away from existing and planned developments, but close to potentially developable lands.
	○	●	①	●
Access to Developments	Furthest away from all existing and planned developments and very little access to potentially developable areas.	Closest to existing, planned and potential developments.	Would not provide access to existing or planned developments, could provide access to some potentially developable areas.	Further away from existing developments than Route B, but provides access to one planned development and a large amount of potentially developable lands.
	②	●	①	●
Overall	②	●	①	●

7. FUTURE TRAFFIC CONTROL

This section of the report is still to be developed. Turning movement forecasts will be determined after the preferred corridor alignment has been selected, and traffic controls will be determined to accommodate those movements. Additionally, preliminary recommendations of crossing protection at the intersection with the CP railway will be determined.

7.1. TURNING MOVEMENT FORECASTS

To be developed.

7.2. INTERSECTION TRAFFIC CONTROLS

To be developed.

7.3. CROSSING PROTECTION AT THE CP RAILWAY

The EBR crosses the main CP railway in the section between Avenue Road and Clyde Road. Correspondence with CPR staff indicates that there are currently 14 trains per day at this location with a maximum train speed of 60 miles per hour (about 100 kilometres per hour).

Guidelines for crossing protection at road/railway crossing locations recommend an escalating series of protective measures, from warning signs, to the addition of flashing lights, to descending barriers, and finally to full grade separation of the crossing. These measures are considered as the volume of trains and road vehicles increases, the operating speeds of trains and cars increases, and by the class of roadway crossing the railway. One measure that is frequently used is the cross-product (i.e. trains per day X road vehicles per day), with measures proposed as shown in Table 11 below.

Table 11: Road/Railway Crossing Protection

Cross-Product	Crossing Protection	Notes
> 1,000	Crossing signals	
> 50,000	Crossing signals with gates	Train speeds exceeding 50 mph
> 200,000	Grade separation	Preferred if over a major arterial

Based on an assumed ratio of 10% of PM peak hour traffic to AADT, forecast 2031 daily traffic for the different EBR alignments at their crossing locations can be estimated from the forecast peak hour traffic in Figure 14 as shown in Table 12 below.

Table 12: 2031 AADTs and Cross-Products at Crossing Location

EBR Alignment	2031 AADT	Cross-Products (14 trains)
A	10,200	143,000
B	14,580	204,000
C	12,290	172,000
D	14,810	207,000

Estimates of the 2031 cross-products for the various alignments would range from a low of about 143,000 (Alignment A) to a high of 207,000 (Alignment D). Given the operating speeds of trains on the railway and forecast cross-products in excess of 50,000 for any of the alignment alternatives, crossing signals with gates would be the minimum acceptable protection.

Although the Region does not designate its roadways as “arterials”, “collectors” and so on, it should be noted that the EBR would likely be classified as a Community Connector under the Region’s Context Sensitive Corridor Design Guidelines. This designation is most similar to a “major arterial” in use in many other jurisdictions. Furthermore, discussions involving the Region, the City of Cambridge and Metrolinx around extending GO Train service along the Milton Line, which uses this section of railway, have the potential to increase the number of trains per day. This would increase the cross-product estimates noted in Table 12 above.

Therefore, for the purposes of determining the preferred EBR alignment, it is recommended that a grade separation be considered.

8. CONCLUSIONS

Population and employment growth in southeast Cambridge is projected to be more than 10,000 people and 4,000 jobs in the long term. This growth will put increased pressure on the north-south transportation links described above. While the improvements to public transit outlined in the RTMP are expected to accommodate much of this growth, traffic congestion on north-south screenlines is expected to worsen. This will cause delays for commuters, goods movement and emergency vehicles.

A number of non-structural and other infrastructure-intensive alternatives have been examined in place of constructing a new road corridor. As noted above, public transit improvements will make a significant difference but are not expected to eliminate all problems. Improvements to other corridors, including Water Street/Hespeler Road and Franklin Boulevard, are already planned but further improvements would be impractical or cause severe impacts. Finally, the Cheese Factory Road/Elgin Street/Conestoga Boulevard corridor is too discontinuous and residential in character to be a practical alternative.

Various alignments of the East Boundary Road have been tested to determine preferred alignments for accommodating regional and inter-regional traffic. The four routes were presented to the public at Public Consultation Centre 1. Route A, the alignment currently in the ROP largely along Shellard Side Road, is the longest alignment and the further to the east, and is projected to carry the least traffic and provide the least relief to other Regional roads in Cambridge, notably Franklin Boulevard. Routes B and D are closer to Cambridge, are shorter, would carry the most traffic and would provide the most relief to other Regional roads. Route B is also notable as being the further west and being able to provide the most direct access to planned residential developments in southeast Cambridge.

9. RECOMMENDATIONS

Based on the contents of this report, the evaluation scores as presented in Table 10 are recommended to be carried forward to be compared against the other criteria categories.

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10. NEXT STEPS

Based on the recommendations in this report and other works associated with the Environmental Assessment, the preliminary preferred alignment will be chosen according to the criteria evaluation. After the preliminary preferred alignment has been selected, the following transportation analysis can proceed:

1. Turning movement forecasts can be developed at locations where the EBR intersects with an existing or planned road
2. Based on the forecasts, traffic control warrants will be completed. The results of these could be as follows:
 - a. If no control is warranted, side street stop control may be appropriate.
 - b. If traffic controls are warranted, a roundabout screening will be completed to compare traffic signals to modern roundabouts.
 - c. If roundabouts “screen in” at any location, a more detailed intersection control study (ICS) will be completed to determine the appropriate traffic control.
 - d. In the event that forecast turning movements are extremely high, other traffic control (e.g. grade separation, interchanges) may be recommended.
3. In comparing the various traffic control types, estimates of future delays and collision potential will also be completed.

Appendix A: Exhibits

LAND USE BY TRAFFIC ANALYSIS ZONE

Exhibit 1: Traffic Analysis Zone Land Use Assumptions

TAZ	2011 Total Population	2011 Total Employment	2031 Total Population	2031 Total Employment	Mature State Total Population	Mature State Total Employment
385	744	94	932	80	1,215	68
426	3,667	396	4,245	427	4,334	283
427	2,605	97	3,599	162	3,954	209
435	333	570	742	624	748	602
436	436	46	3,087	200	3,446	235
437	159	51	5,528	998	6,349	1,510
441	80	5	986	178	1,027	217
442	19	1,096	19	1,187	20	1,743
443	12	1,669	9	2,324	11	3,256
Total	8,056	4,025	19,148	6,180	21,104	8,123
<i>Growth from 2011</i>			11,092	2,155	13,048	4,098
<i>Growth from 2031</i>					1,956	1,944

SCREENLINE FACILITIES

Exhibit 2: 2011 Model Screenline Facilities

Screenline Name	Directional Lanes	Directional Capacity
<i>North of Myers Road</i>		
Water Street	1	750
Christopher Drive	1	300
Elgin Street	1	300
Franklin Boulevard	1	750
Dundas Street	2	1,800
Shellard Side Road	1	1,100
<i>Total</i>	7	5,000
<i>CP Rail - Cambridge</i>		
Water Street	2	1,500
Dundas Street	2	1,500
Beverly Street	1	650
Franklin Boulevard	2	1,800
Shellard Side Road	1	1,100
<i>Total</i>	8	6,550
<i>South of Can-Amara Parkway</i>		
Coronation Boulevard	2	1,500
Hespeler Road	2	1,500
Franklin Boulevard	2	1,800
Burnett Avenue	1	400
Townline Rd	2	1,800
<i>Total</i>	9	7,000
<i>South of Highway 401</i>		
Speedsville Road	1	550
Hespeler Road	3	2,700
Smart Centre Ramp	1	400
Franklin Boulevard	2	1,500
Townline Road	2	1,800
<i>Total</i>	9	6,950

Exhibit 3: 2031 Model Screenline Facilities

Screenline Name	Directional Lanes	Directional Capacity
<i>North of Myers Road</i>		
Water Street	1	750
Christopher Drive	1	300
Elgin Street	1	300
Franklin Boulevard	2	2,200
Dundas Street	2	1,800
Shellard Side Road	1	1,100
<i>Total</i>	8	6,450
<i>CP Rail - Cambridge</i>		
Water Street	2	1,500
Dundas Street	2	1,500
Beverly Street	1	650
Franklin Boulevard	2	2,200
Shellard Side Road	1	1,100
<i>Total</i>	8	6,950
<i>South of Can-Amera Parkway</i>		
Coronation Boulevard	2	1,500
Hespeler Road	2	1,500
Franklin Boulevard	2	2,200
Burnett Avenue	1	400
Townline Rd	2	1,800
<i>Total</i>	9	7,400
<i>South of Highway 401</i>		
Speedsville Road	2	1,500
Hespeler Road	3	2,700
Smart Centre Ramp	1	400
Franklin Boulevard	2	1,500
Townline Road	2	1,800
<i>Total</i>	10	7,900

Exhibit 4: Mature State Model Screenline Facilities

Screenline Name	Directional Lanes	Directional Capacity
<i>North of Myers Road</i>		
Water Street	2	1,500
Christopher Drive	1	300
Elgin Street	1	300
Franklin Boulevard	2	2,200
Dundas Street	2	1,800
Shellard Side Road	1	1,100
<i>Total</i>	9	7,200
<i>CP Rail - Cambridge</i>		
Water Street	1	750
Dundas Street	2	1,500
Beverly Street	2	1,300
Franklin Boulevard	2	2,200
Shellard Side Road	1	1,100
<i>Total</i>	8	6,850
<i>South of Can-Amera Parkway</i>		
Coronation Boulevard	2	1,500
Hespeler Road	2	1,500
Franklin Boulevard	2	2,200
Burnett Avenue	1	400
Townline Rd	2	1,800
<i>Total</i>	9	7,400
<i>South of Highway 401</i>		
Speedsville Road	1	550
Hespeler Road	2	1,800
Smart Centre Ramp	1	400
Franklin Boulevard	2	2,200
Townline Road	2	1,800
<i>Total</i>	8	6,750

2011 AADT

2011 AADT		
Hespeler / Water		
401 EB Ramp	41328	
Eagle / Pinebush	36551	
	32814	
Langs / Sheldon	31302	
	32640	
	32640	
Bishop	32776	
	34293	
Dunbar	32572	
Can-Amera	34428	
Munch	32212	
	32019	
	31827	
Avenue	33995	
Dundas / Coronation	33833	
	30476	
Samuelson	29897	Ainslie
Ainslie	11277	26724
	15202	19414
Park Hill	11849	11884
	11849	12259
	11730	12477
Dickson	11331	12207
Main	13458	10191
	12904	10938
Wellington		12104
		8847
Concession	12687	6725
Ainslie	19351	
	19351	
	19351	
	19351	
Myers	20085	
South Boundary		

Exhibit 5: Hespeler / Water Corridor – 2011 AADT

2011 AADT	
Franklin	
401 EB Ramp	25622
Pinebush	33542
Sheldon	34062
	33386
	29460
Bishop	27987
Can-Amera	40795
Elgin	32378
	32378
	33957
Avenue	37797
	28019
Clyde	32547
	28461
	30991
	28377
Main	22305
	19772
Franklin	17886
	14719
	9447
Myers	
South Boundary	

Exhibit 6: Franklin Corridor - 2011 AADT

2011 AADT	
Townline / Shellard	
401 EB Ramp	24162
Pinebush	21479
Can-Amera	13847
Avenue / Gore	6244
Clyde	
Main	
Morrison	

Exhibit 7: Townline / Shellard Corridor - 2011 AADT

2011 AADT	
King / Coronation / Dundas	
Bishop	19408
Concession	15028
	26940
	27761
	21555
	23790
	23790
Hespeler / Water	16072
	21344
Samuelson	17427
	19286
	21272
Beverly	17836
	16989
	16142
	12857
Elgin	10724
	11602
Main	12022
Franklin	12645
Champlain	11101
Branchton	
South Boundary	
Morrison	

Exhibit 8: King / Coronation / Dundas Corridor - 2011 AADT

City of Cambridge Roads – Not Compiled by Region

Exhibit 9: Conestoga / Elgin / Cheese Factory Corridor - 2011 AADT

2011 ROAD WIDTH AND CAPACITY

2011 Lanes				2011 Capacity			
Hespeler / Water				Hespeler / Water			
401 EB Ramp	3	3		401 EB Ramp	2700	2700	
Eagle / Pinebush	3	3		Eagle / Pinebush	2250	2250	
	3	3			2250	2250	
Langs / Sheldon	3	3		Langs / Sheldon	2250	2250	
	3	3			2250	2250	
	3	3			2250	2250	
Bishop	3	3		Bishop	2250	2250	
	3	3			2250	2250	
Dunbar	2	2		Dunbar	1500	1500	
	2	2			1500	1500	
Can-Amera	2	2		Can-Amera	1500	1500	
	2	2			1500	1500	
Munch	2	2		Munch	1500	1500	
	2	2			1500	1500	
	2	2			1500	1500	
Avenue	2	2		Avenue	1500	1500	
	2	2			1500	1500	
Dundas / Coronation	2	2		Dundas / Coronation	1500	1500	
	2	2			1500	1500	
Samuelson	2	2	Ainslie	Samuelson	1500	1500	Ainslie
	2	2			1500	1500	
Ainslie	2	0	1 2	Ainslie	1300	0	650 1300
			1 2				650 1300
Park Hill	1	1	1 1	Park Hill	650	650	650 650
	1	1	1 1		650	650	650 650
	1	1	1 1		650	650	650 650
Dickson	1	1	1 1	Dickson	650	650	650 650
	1	1	1 1		650	650	650 650
Main	1	1	1 1	Main	650	650	650 650
	2	1	1 1		1300	650	650 650
Wellington			1 1	Wellington			650 650
			1 1				650 650
Concession	1	1	1 1	Concession	650	650	650 650
	1	1	1 1		650	650	650 650
Ainslie	1	1		Ainslie	650	650	
	1	1			750	750	
	1	1			750	750	
	1	1			750	750	
Myers	1	1		Myers	1100	1100	
South Boundary	1	1		South Boundary	1100	1100	

Exhibit 10: Hespeler / Water Corridor - 2011 Road Width and Capacity

2011 Lanes		2011 Capacity	
Franklin		Franklin	
401 EB Ramp		401 EB Ramp	
2	2	1500	1500
Pinebush		Pinebush	
2	2	1800	1800
Sheldon		Sheldon	
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
Bishop		Bishop	
2	2	1800	1800
Can-Amera		Can-Amera	
2	2	1800	1800
Elgin		Elgin	
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
Avenue		Avenue	
2	2	1800	1800
2	2	1800	1800
Clyde		Clyde	
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
Main		Main	
2	2	1800	1800
2	2	1800	1800
Franklin		Franklin	
1	1	750	750
1	1	750	750
1	1	750	750
Myers		Myers	
2	2	1800	1800
South Boundary		South Boundary	

Exhibit 11: Franklin Corridor - 2011 Road Width and Capacity

2011 Lanes		2011 Capacity	
Townline / Shellard		Townline / Shellard	
401 EB Ramp		401 EB Ramp	
2	2	1800	1800
Pinebush		Pinebush	
2	2	1800	1800
2	2	1800	1800
Can-Amera		Can-Amera	
2	2	1800	1800
1	1	900	900
1	1	900	900
Avenue / Gore		Avenue / Gore	
1	1	1100	1100
Clyde		Clyde	
1	1	1100	1100
Main		Main	
1	1	1100	1100
Morrison		Morrison	

Exhibit 12: Townline / Shellard Corridor - 2011 Road Width and Capacity

2011 Lanes		2011 Capacity	
Coronation / Dundas		Coronation / Dundas	
Bishop		Bishop	
2	2	1300	1300
Concession		Concession	
2	2	1300	1300
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
Hespeler / Water		Hespeler / Water	
2	2	1500	1500
2	2	1500	1500
Samuelson		Samuelson	
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
Beverly		Beverly	
1	1	750	750
1	1	750	750
1	1	750	750
1	1	750	750
Elgin		Elgin	
2	1	1800	900
2	2	1800	1800
Main		Main	
2	2	1800	1800
Franklin		Franklin	
2	2	1800	1800
Champlain		Champlain	
2	2	1800	1800
Branchton		Branchton	
1	1	1100	1100
South Boundary		South Boundary	
1	1	1100	1100
1	1	1100	1100
Morrison		Morrison	
1	1	1100	1100

Exhibit 13: King / Coronation / Dundas Corridor - 2011 Road Width and Capacity

2011 Lanes		2011 Capacity	
Conestoga / Elgin / Cheese Factory		Conestoga / Elgin / Cheese Factory	
Smartcentre		Smartcentre	
1	1	400	400
Pinebush		Pinebush	
1	1	650	650
1	1	650	650
Sheldon		Sheldon	
1	1	650	650
1	1	650	650
Bishop		Bishop	
1	1	650	650
Dunbar		Dunbar	
1	1	650	650
Can-Amera		Can-Amera	
****GAP****		****GAP****	
1	1	400	400
Munch		Munch	
1	1	400	400
Avenue		Avenue	
1	1	400	400
1	1	400	400
1	1	400	400
Samuelson		Samuelson	
****GAP****		****GAP****	
Alison		Alison	
1	1	300	300
Gore		Gore	
1	1	300	300
Dundas		Dundas	
1	1	300	300
Pollock		Pollock	
1	1	300	300
Main		Main	
1	1	300	300
1	1	300	300
1	1	300	300
1	1	300	300
Champlain		Champlain	
1	1	300	300
1	1	300	300
Myers		Myers	
1	1	400	400
South Boundary		South Boundary	

Exhibit 14: Conestoga / Elgin / Cheese Factory Corridor - 2011 Road Width and Capacity

2011 MODEL VOLUMES

2011 AM Volume					2011 PM Volume				
Hespeler / Water					Hespeler / Water				
401 EB Ramp	1821	1119			401 EB Ramp	1322	2413		
Eagle / Pinebush	1657	896			Eagle / Pinebush	1349	1975		
	1286	1177				1664	1540		
Langs / Sheldon	1140	1246			Langs / Sheldon	1643	1242		
	1022	1326				1758	1148		
	861	1509				2001	1016		
Bishop	893	1312			Bishop	1562	1046		
	512	1615				1860	585		
Dunbar	514	1482			Dunbar	1602	686		
	441	1591				1719	603		
Can-Amera	651	1954			Can-Amera	2215	785		
Munch	615	1619			Munch	1827	732		
	642	1583				1782	763		
	675	1587				1729	825		
Avenue	1076	1602			Avenue	1682	1170		
Dundas / Coronation	853	1415			Dundas / Coronation	1765	930		
	853	1415				1765	930		
Samuelson	867	1438	Ainslie		Samuelson	1844	960	Ainslie	
Ainslie	716	0	150	1438	Ainslie	1452	0	392	960
			150	1438				392	960
Park Hill	613	12	160	572	Park Hill	591	236	391	634
	371	110	178	587		636	189	480	462
	371	110	178	587		636	189	480	462
Dickson	371	109	178	568	Dickson	636	106	480	442
Main	430	204	257	574	Main	688	133	477	525
	430	204	257	574		688	133	477	525
Wellington			261	571	Wellington			414	730
			57	844				683	325
Concession	305	230	58	521	Concession	493	226	239	321
Ainslie	362	751			Ainslie	731	547		
	362	751				731	547		
	362	751				731	547		
	362	751				731	547		
Myers	346	708			Myers	655	501		
South Boundary	346	708			South Boundary	655	501		

Exhibit 15: Hespeler / Water Corridor - 2011 Model Volumes

2011 AM Volume		2011 PM Volume	
Franklin		Franklin	
401 EB Ramp		401 EB Ramp	
2108	1074	1306	1532
Pinebush		Pinebush	
1414	1145	1435	1087
Sheldon		Sheldon	
1154	1678	1742	977
1154	1678	1742	977
980	1753	1849	737
Bishop		Bishop	
853	1993	2172	635
Can-Amera		Can-Amera	
919	2305	2764	860
Elgin		Elgin	
631	1974	1938	769
631	1974	1938	769
866	1488	1701	846
Avenue		Avenue	
881	1501	1625	925
845	1409	1519	866
Clyde		Clyde	
805	1247	1374	804
616	1444	1558	584
505	1270	1339	496
430	1269	1335	424
Main		Main	
499	535	1062	382
333	546	1083	150
Franklin		Franklin	
121	743	673	167
102	647	579	144
98	459	373	121
Myers		Myers	
1179	1109	1240	1141
South Boundary		South Boundary	

Exhibit 16: Franklin Corridor - 2011 Model Volumes

2011 AM Volume		2011 PM Volume	
Townline / Shellard		Townline / Shellard	
401 EB Ramp		401 EB Ramp	
1007	641	1114	1243
Pinebush		Pinebush	
556	920	1465	727
556	920	1465	727
Can-Amera		Can-Amera	
91	566	943	69
91	566	943	69
57	372	494	87
Avenue / Gore		Avenue / Gore	
56	370	459	99
Clyde		Clyde	
42	338	431	90
Main		Main	
15	76	12	52
Morrison		Morrison	

Exhibit 17: Townline / Shellard Corridor - 2011 Model Volumes

2011 AM Volume			2011 PM Volume		
Coronation / Dundas			Coronation / Dundas		
Bishop			Bishop		
	498	542		885	755
Concession			Concession		
	720	1006		1275	1084
	720	1006		1275	1084
	732	926		1164	1108
	681	1031		1285	1041
	620	1222		1551	1030
	620	1222		1551	1030
Hespeler / Water			Hespeler / Water		
	655	1221		1091	892
	315	1467		1257	674
Samuelson			Samuelson		
	250	1135		1031	555
	250	1135		1030	555
	250	1135		1030	555
Beverly			Beverly		
	235	770		825	499
	235	770		825	499
	224	499		761	425
	224	499		761	425
Elgin			Elgin		
	179	529		510	453
	145	604		598	395
Main			Main		
	249	1054		799	567
Franklin			Franklin		
	451	846		1172	514
Champlain			Champlain		
	414	549		661	468
Branchton			Branchton		
	378	453		514	463
South Boundary			South Boundary		
	378	453		514	463
	370	440		502	440
Morrison			Morrison		
	377	502		499	478

Exhibit 18: King / Coronation / Dundas Corridor - 2011 Model Volumes

2011 AM Volume			2011 PM Volume		
Conestoga / Elgin / Cheese Factory			Conestoga / Elgin / Cheese Factory		
Smartcentre			Smartcentre		
	74	489		654	96
Pinebush			Pinebush		
	275	141		339	273
	186	213		428	177
Sheldon			Sheldon		
	207	251		458	160
	41	401		654	13
Bishop			Bishop		
	31	321		623	6
Dunbar			Dunbar		
	63	473		766	23
Can-Amera			Can-Amera		
****GAP****			****GAP****		
	158	103		179	200
Munch			Munch		
	45	85		103	33
Avenue			Avenue		
	124	78		261	87
	124	78		261	87
	124	78		261	87
Samuelson			Samuelson		
****GAP****			****GAP****		
Alison			Alison		
	0	0		0	0
Gore			Gore		
	52	300		35	213
Dundas			Dundas		
	238	381		421	289
Pollock			Pollock		
	169	262		294	218
Main			Main		
	186	359		357	228
	186	359		357	228
	186	359		357	228
	142	169		211	153
Champlain			Champlain		
	109	81		115	99
	109	81		115	99
Myers			Myers		
	2	10		5	5
South Boundary			South Boundary		

Exhibit 19: Conestoga / Elgin / Cheese Factory Corridor - 2011 Model Volumes

2011 MODEL V/C

2011 AM V/C				2011 PM V/C			
Hespeler / Water				Hespeler / Water			
401 EB Ramp	0.67	0.41		0.49	0.89		
Eagle / Pinebush	0.74	0.4		0.6	0.88		
	0.57	0.52		0.74	0.68		
Langs / Sheldon	0.51	0.55		0.73	0.55		
	0.45	0.59		0.78	0.51		
	0.38	0.67		0.89	0.45		
Bishop	0.4	0.58		0.69	0.46		
	0.23	0.72		0.83	0.26		
Dunbar	0.34	0.99		1.07	0.46		
	0.29	1.06		1.15	0.4		
Can-Amera	0.43	1.3		1.48	0.52		
Munch	0.41	1.08		1.22	0.49		
	0.43	1.06		1.19	0.51		
	0.45	1.06		1.15	0.55		
Avenue	0.72	1.07		1.12	0.78		
Dundas / Coronation	0.57	0.94		1.18	0.62		
	0.57	0.94		1.18	0.62		
Samuelson	0.58	0.96		1.23	0.64		
Ainslie	0.55			1.12			
		0.23	1.11		0.6	0.74	
		0.23	1.11		0.6	0.74	
Park Hill	0.94	0.02	0.25	0.88	0.91	0.36	0.6
	0.57	0.17	0.27	0.9	0.98	0.29	0.74
	0.57	0.17	0.27	0.9	0.98	0.29	0.74
Dickson	0.57	0.17	0.27	0.87	0.98	0.16	0.74
Main	0.66	0.31	0.4	0.88	1.06	0.2	0.73
	0.33	0.31	0.4	0.88	0.53	0.2	0.73
Wellington			0.4	0.88			0.64
			0.09	1.3			1.05
Concession	0.47	0.35	0.09	0.8	0.76	0.35	0.37
Ainslie	0.56	1.16			1.12	0.84	
	0.48	1			0.97	0.73	
	0.48	1			0.97	0.73	
	0.48	1			0.97	0.73	
Myers	0.31	0.64			0.6	0.46	
South Boundary	0.31	0.64			0.6	0.46	

Exhibit 20: Hespeler / Water Corridor - 2011 Model V/C

2011 AM V/C		2011 PM V/C	
Franklin		Franklin	
401 EB Ramp	1.41 0.72	401 EB Ramp	0.87 1.02
Pinebush	0.79 0.64	Pinebush	0.8 0.6
Sheldon	0.64 0.93	Sheldon	0.97 0.54
	0.64 0.93		0.97 0.54
	0.54 0.97		1.03 0.41
Bishop	0.47 1.11	Bishop	1.21 0.35
Can-Amera	0.51 1.28	Can-Amera	1.54 0.48
Elgin	0.35 1.1	Elgin	1.08 0.43
	0.35 1.1		1.08 0.43
	0.48 0.83		0.95 0.47
Avenue	0.49 0.83	Avenue	0.9 0.51
	0.47 0.78		0.84 0.48
Clyde	0.45 0.69	Clyde	0.76 0.45
	0.34 0.8		0.87 0.32
	0.28 0.71		0.74 0.28
	0.24 0.71		0.74 0.24
Main	0.28 0.3	Main	0.59 0.21
	0.19 0.3		0.6 0.08
Franklin	0.16 0.99	Franklin	0.9 0.22
	0.14 0.86		0.77 0.19
	0.13 0.61		0.5 0.16
Myers	0.66 0.62	Myers	0.69 0.63
South Boundary		South Boundary	

Exhibit 21: Franklin Corridor - 2011 Model V/C

2011 AM V/C		2011 PM V/C	
Townline / Shellard		Townline / Shellard	
401 EB Ramp	0.56 0.36	401 EB Ramp	0.62 0.69
Pinebush	0.31 0.51	Pinebush	0.81 0.4
	0.31 0.51		0.81 0.4
Can-Amera	0.05 0.31	Can-Amera	0.52 0.04
	0.1 0.63		1.05 0.08
	0.06 0.41		0.55 0.1
Avenue / Gore	0.05 0.34	Avenue / Gore	0.42 0.09
Clyde	0.04 0.31	Clyde	0.39 0.08
Main	0.01 0.07	Main	0.01 0.05
Morrison		Morrison	

Exhibit 22: Townline / Shellard Corridor - 2011 Model V/C

2011 AM V/C			2011 PM V/C		
Coronation / Dundas			Coronation / Dundas		
Bishop			Bishop		
	0.38	0.42		0.68	0.58
Concession			Concession		
	0.55	0.77		0.98	0.83
	0.48	0.67		0.85	0.72
	0.49	0.62		0.78	0.74
	0.45	0.69		0.86	0.69
	0.41	0.81		1.03	0.69
	0.41	0.81		1.03	0.69
Hespeler / Water			Hespeler / Water		
	0.44	0.81		0.73	0.59
	0.21	0.98		0.84	0.45
Samuelson			Samuelson		
	0.17	0.76		0.69	0.37
	0.17	0.76		0.69	0.37
	0.17	0.76		0.69	0.37
Beverly			Beverly		
	0.31	1.03		1.1	0.67
	0.31	1.03		1.1	0.67
	0.3	0.67		1.01	0.57
	0.3	0.67		1.01	0.57
Elgin			Elgin		
	0.1	0.59		0.28	0.5
	0.08	0.34		0.33	0.22
Main			Main		
	0.14	0.59		0.44	0.32
Franklin			Franklin		
	0.25	0.47		0.65	0.29
Champlain			Champlain		
	0.23	0.31		0.37	0.26
Branchton			Branchton		
	0.34	0.41		0.47	0.42
South Boundary			South Boundary		
	0.34	0.41		0.47	0.42
	0.34	0.4		0.46	0.4
Morrison			Morrison		
	0.34	0.46		0.45	0.43

Exhibit 23: King / Coronation / Dundas Corridor - 2011 Model V/C

2011 AM V/C		2011 PM V/C	
Conestoga / Elgin / Cheese Factory		Conestoga / Elgin / Cheese Factory	
Smartcentre		Smartcentre	
	0.19 1.22		1.64 0.24
Pinebush		Pinebush	
	0.42 0.22		0.52 0.42
	0.29 0.33		0.66 0.27
Sheldon		Sheldon	
	0.32 0.39		0.7 0.25
	0.06 0.62		1.01 0.02
Bishop		Bishop	
	0.05 0.49		0.96 0.01
Dunbar		Dunbar	
	0.1 0.73		1.18 0.04
Can-Amera		Can-Amera	
****GAP****		****GAP****	
	0.4 0.26		0.45 0.5
Munch		Munch	
	0.11 0.21		0.26 0.08
Avenue		Avenue	
	0.31 0.2		0.65 0.22
	0.31 0.2		0.65 0.22
	0.31 0.2		0.65 0.22
Samuelson		Samuelson	
****GAP****		****GAP****	
Alison		Alison	
	0 0		0 0
Gore		Gore	
	0.17 1		0.12 0.71
Dundas		Dundas	
	0.79 1.27		1.4 0.96
Pollock		Pollock	
	0.56 0.87		0.98 0.73
Main		Main	
	0.62 1.2		1.19 0.76
	0.62 1.2		1.19 0.76
	0.62 1.2		1.19 0.76
	0.47 0.56		0.7 0.51
Champlain		Champlain	
	0.36 0.27		0.38 0.33
	0.36 0.27		0.38 0.33
Myers		Myers	
	0.01 0.03		0.01 0.01
South Boundary		South Boundary	

Exhibit 24: Conestoga / Elgin / Cheese Factory Corridor - 2011 Model V/C

2031 ROAD WIDTH AND CAPACITY

2031 Lanes					2031 Capacity				
Hespeler / Water					Hespeler / Water				
401 EB Ramp	3	3			401 EB Ramp	2700	2700		
Eagle / Pinebush	3	3			Eagle / Pinebush	2250	2250		
	3	3				2250	2250		
Langs / Sheldon	3	3			Langs / Sheldon	2250	2250		
	3	3				2250	2250		
	3	3				2250	2250		
Bishop	3	3			Bishop	2250	2250		
	3	3				2250	2250		
Dunbar	2	2			Dunbar	1500	1500		
	2	2				1500	1500		
Can-Amera	2	2			Can-Amera	1500	1500		
	2	2				1500	1500		
Munch	2	2			Munch	1500	1500		
	2	2				1500	1500		
	2	2				1500	1500		
Avenue	2	2			Avenue	1500	1500		
	2	2				1500	1500		
Dundas / Coronation	2	2			Dundas / Coronation	1500	1500		
	2	2				1500	1500		
Samuelson	2	2	Ainslie		Samuelson	1500	1500	Ainslie	
	2	2				1500	1500		
Ainslie	2	0	1	2	Ainslie	1300	0	650	1300
	0	0	1	2		0	0	650	1300
Park Hill	1	1	1	1	Park Hill	650	650	650	650
	1	1	1	1		650	650	650	650
	1	1	1	1		650	650	650	650
Dickson	1	1	1	1	Dickson	650	650	650	650
	1	1	1	1		650	650	650	650
Main	1	1	1	1	Main	650	650	650	650
	2	1	1	1		1300	650	650	650
Wellington			1	1	Wellington			650	650
			1	1				650	650
Concession	1	1	1	1	Concession	650	650	650	650
	1	1				650	650		
Ainslie	1	1			Ainslie	650	650		
	1	1				750	750		
	1	1				750	750		
	1	1				750	750		
Myers	1	1			Myers	1100	1100		
	1	1				1100	1100		
South Boundary	1	1			South Boundary	1100	1100		

Exhibit 25: Hespeler / Water Corridor - 2031 Road Width and Capacity

2031 Lanes		2031 Capacity	
Franklin		Franklin	
401 EB Ramp		401 EB Ramp	
2	2	1500	1500
Pinebush		Pinebush	
2	2	2200	2200
Sheldon		Sheldon	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Bishop		Bishop	
2	2	2200	2200
Can-Amera		Can-Amera	
2	2	2200	2200
Elgin		Elgin	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Avenue		Avenue	
2	2	2200	2200
2	2	2200	2200
Clyde		Clyde	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Main		Main	
2	2	2200	2200
2	2	2200	2200
Franklin		Franklin	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Myers		Myers	
1	1	1100	1100
South Boundary		South Boundary	

Exhibit 26: Franklin Corridor - 2031 Road Width and Capacity

2031 Lanes		2031 Capacity	
Townline / Shellard		Townline / Shellard	
401 EB Ramp		401 EB Ramp	
2	2	1800	1800
Pinebush		Pinebush	
2	2	1800	1800
2	2	1800	1800
Can-Amera		Can-Amera	
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
Avenue / Gore		Avenue / Gore	
1	1	1100	1100
Clyde		Clyde	
1	1	1100	1100
Main		Main	
1	1	1100	1100
Morrison		Morrison	

Exhibit 27: Townline / Shellard Corridor - 2031 Road Width and Capacity

2031 Lanes		2031 Capacity	
King / Coronation / Dundas		King / Coronation / Dundas	
Bishop		Bishop	
2	2	1300	1300
Concession		Concession	
2	2	1300	1300
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
Hespeler / Water		Hespeler / Water	
2	2	1500	1500
2	2	1500	1500
Samuelson		Samuelson	
2	2	1500	1500
2	2	1500	1500
2	2	1500	1500
Beverly		Beverly	
1	1	750	750
1	1	750	750
1	1	750	750
1	1	750	750
Elgin		Elgin	
2	1	1800	900
2	2	1800	1800
Main		Main	
2	2	1800	1800
Franklin		Franklin	
2	2	1800	1800
Champlain		Champlain	
2	2	1800	1800
Branchton		Branchton	
1	1	1100	1100
South Boundary		South Boundary	
1	1	1100	1100
1	1	1100	1100
Morrison		Morrison	
1	1	1100	1100

Exhibit 28: King / Coronation / Dundas Corridor - 2031 Road Width and Capacity

2031 Lanes			2031 Capacity		
Conestoga / Elgin / Cheese Factory			Conestoga / Elgin / Cheese Factory		
Smartcentre			Smartcentre		
	1	1		400	400
Pinebush			Pinebush		
	1	1		650	650
	1	1		650	650
Sheldon			Sheldon		
	1	1		650	650
	1	1		650	650
Bishop			Bishop		
	1	1		650	650
Dunbar			Dunbar		
	1	1		650	650
Can-Amera			Can-Amera		
*****GAP*****			*****GAP*****		
	1	1		400	400
Munch			Munch		
	1	1		400	400
Avenue			Avenue		
	1	1		400	400
	1	1		400	400
	1	1		400	400
Samuelson			Samuelson		
*****GAP*****			*****GAP*****		
Alison			Alison		
	1	1		300	300
Gore			Gore		
	1	1		300	300
Dundas			Dundas		
	1	1		300	300
Pollock			Pollock		
	1	1		300	300
Main			Main		
	1	1		300	300
	1	1		300	300
	1	1		300	300
	1	1		300	300
Champlain			Champlain		
	1	1		300	300
	1	1		300	300
Myers			Myers		
	1	1		400	400
South Boundary			South Boundary		

Exhibit 29: Conestoga / Elgin / Cheese Factory Corridor – 2031 Road Width and Capacity

2031 MODEL VOLUMES

2031 AM Volume				2031 PM Volume				2031 RTMP PM Volume			
Hespeler / Water				Hespeler / Water				Hespeler / Water			
401 EB Ramp				401 EB Ramp				401 EB Ramp			
2044	985			1319	2703			1303	2540		
Eagle / Pinebush				Eagle / Pinebush				Eagle / Pinebush			
2123	855			1429	2528			1381	2308		
1520	1261			1871	1847			1751	1681		
Langs / Sheldon				Langs / Sheldon				Langs / Sheldon			
1386	1308			1817	1542			1717	1367		
1227	1390			1933	1403			1808	1248		
1022	1595			2198	1226			2039	1103		
Bishop				Bishop				Bishop			
1089	1291			1617	1270			1527	1155		
585	1666			2009	700			1824	677		
Dunbar				Dunbar				Dunbar			
608	1551			1722	792			1635	756		
470	1722			1900	640			1785	628		
Can-Amera				Can-Amera				Can-Amera			
683	2105			2322	802			2238	775		
Munch				Munch				Munch			
636	1706			1897	734			1840	718		
662	1662			1847	768			1796	749		
696	1644			1774	835			1728	816		
Avenue				Avenue				Avenue			
1050	1670			1717	1161			1675	1110		
Dundas / Coronation				Dundas / Coronation				Dundas / Coronation			
940	1560			1904	988			1821	945		
940	1560			1904	988			1821	945		
Samuelson				Samuelson				Samuelson			
952	1581			2038	1027			1933	974		
Ainslie				Ainslie				Ainslie			
783	0	168	1581	1568	0	470	1027	1500	0	433	974
0	0	168	1581	0	0	470	1027	0	0	433	974
Park Hill				Park Hill				Park Hill			
657	129	214	563	570	330	467	708	577	313	433	657
440	204	241	562	642	284	481	558	635	283	456	543
440	204	241	562	642	284	481	558	635	283	456	543
Dickson				Dickson				Dickson			
440	205	242	544	642	146	481	530	635	145	456	517
Main				Main				Main			
461	290	298	551	689	172	477	569	683	175	450	557
461	290	298	551	689	172	477	569	683	175	450	557
Wellington				Wellington				Wellington			
		299	523			413	817			381	769
		64	870			737	339			689	381
Concession				Concession				Concession			
331	302	65	484	506	272	261	287	537	273	259	357
Ainslie				Ainslie				Ainslie			
396	786			767	559			795	630		
396	786			767	559			795	630		
396	786			767	559			795	630		
396	786			767	559			795	630		
Myers				Myers				Myers			
371	663			566	495			647	585		
371	663			566	495			647	585		
South Boundary				South Boundary				South Boundary			
433	842			825	617			901	713		

Exhibit 30: Hespeler / Water Corridor - 2031 Model Volumes

2031 AM Volume	2031 PM Volume	2031 RTMP PM Volume
Franklin 401 EB Ramp 2156 1169 Pinebush 1545 1450 Sheldon 1273 2030 1273 2030 1089 2114 Bishop 958 2464 Can-Amera 1040 2841 Elgin 713 2490 713 2490 932 2033 Avenue 979 2079 941 1989 Clyde 981 1907 698 2120 607 1931 535 1936 Main 601 1070 435 1074 Franklin 151 1018 132 901 130 655 Myers 38 170 South Boundary	Franklin 401 EB Ramp 1381 1591 Pinebush 1763 1151 Sheldon 2168 985 2168 985 2284 778 Bishop 2717 668 Can-Amera 3398 991 Elgin 2513 905 2513 905 2278 968 Avenue 2241 1083 2137 1041 Clyde 2067 1001 2300 730 2045 653 2048 595 Main 1573 499 1612 285 Franklin 1047 306 932 285 622 253 Myers 216 119 South Boundary	Franklin 401 EB Ramp 1314 1503 Pinebush 1725 1169 Sheldon 2038 987 2038 987 2150 787 Bishop 2541 696 Can-Amera 3284 951 Elgin 2429 861 2429 861 2184 920 Avenue 2113 1031 2030 1007 Clyde 1933 962 2160 711 1924 644 1928 593 Main 1492 519 1535 289 Franklin 866 299 767 281 519 259 Myers 223 125 South Boundary

Exhibit 31: Franklin Corridor - 2031 Model Volumes

2031 AM Volume	2031 PM Volume	2031 RTMP PM Volume
Townline / Shellard 401 EB Ramp 1127 923 Pinebush 611 1317 611 1317 Can-Amera 96 790 96 790 77 573 Avenue / Gore 82 556 Clyde 67 516 Main 35 151 Morrison	Townline / Shellard 401 EB Ramp 1405 1362 Pinebush 1915 876 1915 876 Can-Amera 1330 49 1330 49 824 74 Avenue / Gore 736 92 Clyde 694 86 Main 167 40 Morrison	Townline / Shellard 401 EB Ramp 1473 1257 Pinebush 1897 764 1897 764 Can-Amera 1107 39 1107 39 715 70 Avenue / Gore 676 86 Clyde 638 82 Main 65 35 Morrison

Exhibit 32: Townline / Shellard Corridor - 2031 Model Volumes

2031 AM Volume	2031 PM Volume	2031 RTMP PM Volume
King / Coronation / Dundas	King / Coronation / Dundas	King / Coronation / Dundas
Bishop	Bishop	Bishop
598 649	1038 862	943 855
Concession	Concession	Concession
899 1219	1467 1300	1363 1291
899 1219	1467 1300	1363 1291
916 1114	1329 1331	1220 1321
856 1222	1460 1260	1354 1252
779 1407	1693 1206	1578 1214
779 1407	1693 1206	1578 1214
Hespeler / Water	Hespeler / Water	Hespeler / Water
770 1398	1193 1067	1116 1062
388 1648	1399 853	1301 868
Samuelson	Samuelson	Samuelson
319 1289	1121 726	1047 730
319 1287	1117 726	1046 730
319 1287	1117 726	1046 730
Beverly	Beverly	Beverly
297 920	945 621	916 663
297 920	945 621	916 663
295 715	905 628	875 648
295 715	905 628	875 648
Elgin	Elgin	Elgin
294 767	718 666	687 692
233 849	820 577	779 600
Main	Main	Main
374 1353	1109 845	1057 894
Franklin	Franklin	Franklin
658 1409	1635 785	1690 847
Champlain	Champlain	Champlain
673 1158	1262 810	1325 878
Branchton	Branchton	Branchton
665 1148	1161 863	1176 924
South Boundary	South Boundary	South Boundary
711 1178	1191 932	1214 985
477 514	529 628	678 683
Morrison	Morrison	Morrison
447 592	589 565	673 651

Exhibit 33: King / Coronation / Dundas Corridor - 2031 Model Volumes

2031 AM Volume	2031 PM Volume	2031 RTMP PM Volume
Conestoga / Elgin / Cheese Factory	Conestoga / Elgin / Cheese Factory	Conestoga / Elgin / Cheese Factory
Smartcentre	Smartcentre	Smartcentre
71 614	773 98	699 113
Pinebush	Pinebush	Pinebush
365 138	398 399	388 358
270 213	488 295	477 265
Sheldon	Sheldon	Sheldon
237 305	493 194	485 183
73 459	685 42	663 38
Bishop	Bishop	Bishop
66 390	653 31	630 28
Dunbar	Dunbar	Dunbar
170 561	871 95	816 166
Can-Amera	Can-Amera	Can-Amera
*****GAP*****	*****GAP*****	*****GAP*****
166 158	200 160	221 164
Munch	Munch	Munch
45 124	150 33	139 36
Avenue	Avenue	Avenue
128 81	345 76	300 77
128 81	345 76	300 77
128 81	345 76	300 77
Samuelson	Samuelson	Samuelson
*****GAP*****	*****GAP*****	*****GAP*****
Alison	Alison	Alison
0 0	0 0	0 0
Gore	Gore	Gore
45 286	30 203	17 202
Dundas	Dundas	Dundas
227 396	418 294	401 283
Pollock	Pollock	Pollock
141 271	290 219	277 217
Main	Main	Main
188 354	353 205	350 192
188 354	353 205	350 192
188 354	353 205	350 192
143 147	174 130	177 120
Champlain	Champlain	Champlain
105 71	88 67	99 64
105 71	88 67	99 64
Myers	Myers	Myers
3 17	18 5	21 5
South Boundary	South Boundary	South Boundary

Exhibit 34: Conestoga / Elgin / Cheese Factory Corridor – 2031 Model Volumes

2031 MODEL V/C

2031 AM V/C				2031 PM V/C				2031 RTMP PM V/C			
Hespeler / Water				Hespeler / Water				Hespeler / Water			
401 EB Ramp				401 EB Ramp				401 EB Ramp			
	0.76	0.36			0.49	1			0.48	0.94	
Eagle / Pinebush				Eagle / Pinebush				Eagle / Pinebush			
	0.94	0.38			0.64	1.12			0.61	1.03	
	0.68	0.56			0.83	0.82			0.78	0.75	
Langs / Sheldon				Langs / Sheldon				Langs / Sheldon			
	0.62	0.58			0.81	0.69			0.76	0.61	
	0.55	0.62			0.86	0.62			0.8	0.55	
	0.45	0.71			0.98	0.54			0.91	0.49	
Bishop				Bishop				Bishop			
	0.48	0.57			0.72	0.56			0.68	0.51	
	0.26	0.74			0.89	0.31			0.81	0.3	
Dunbar				Dunbar				Dunbar			
	0.41	1.03			1.15	0.53			1.09	0.5	
	0.31	1.15			1.27	0.43			1.19	0.42	
Can-Amera				Can-Amera				Can-Amera			
	0.46	1.4			1.55	0.53			1.49	0.52	
Munch				Munch				Munch			
	0.42	1.14			1.26	0.49			1.23	0.48	
	0.44	1.11			1.23	0.51			1.2	0.5	
	0.46	1.1			1.18	0.56			1.15	0.54	
Avenue				Avenue				Avenue			
	0.7	1.11			1.14	0.77			1.12	0.74	
Dundas / Coronation				Dundas / Coronation				Dundas / Coronation			
	0.63	1.04			1.27	0.66			1.21	0.63	
	0.63	1.04			1.27	0.66			1.21	0.63	
Samuelson				Samuelson				Samuelson			
	0.63	1.05			1.36	0.68			1.29	0.65	
Ainslie				Ainslie				Ainslie			
	0.6				1.21				1.15		
		0.26	1.22			0.72	0.79			0.67	0.75
		0.26	1.22			0.72	0.79			0.67	0.75
Park Hill				Park Hill				Park Hill			
	1.01	0.2			0.88	0.51			0.89	0.48	
	0.68	0.31			0.99	0.44			0.98	0.44	
	0.68	0.31			0.99	0.44			0.98	0.44	
Dickson				Dickson				Dickson			
	0.68	0.32			0.99	0.22			0.98	0.22	
Main				Main				Main			
	0.71	0.45			1.06	0.26			1.05	0.27	
	0.35	0.45			0.53	0.26			0.53	0.27	
Wellington				Wellington				Wellington			
		0.46	0.8			0.64	1.26			0.59	1.18
		0.1	1.34			1.13	0.52			1.06	0.59
Concession				Concession				Concession			
	0.51	0.46			0.78	0.42			0.83	0.42	
					0.4	0.44			0.4	0.55	
Ainslie				Ainslie				Ainslie			
	0.61	1.21			1.18	0.86			1.22	0.97	
	0.53	1.05			1.02	0.75			1.06	0.84	
	0.53	1.05			1.02	0.75			1.06	0.84	
	0.53	1.05			1.02	0.75			1.06	0.84	
Myers				Myers				Myers			
	0.34	0.6			0.51	0.45			0.59	0.53	
	0.34	0.6			0.51	0.45			0.59	0.53	
South Boundary				South Boundary				South Boundary			
	0.39	0.77			0.75	0.56			0.82	0.65	

Exhibit 35: Hespeler / Water Corridor - 2031 Model V/C

2031 AM V/C	2031 PM V/C	2031 RTMP PM V/C
Franklin 401 EB Ramp 1.44 0.78 Pinebush 0.7 0.66 Sheldon 0.58 0.92 0.58 0.92 0.5 0.96 Bishop 0.44 1.12 Can-Amera 0.47 1.29 Elgin 0.32 1.13 0.32 1.13 0.42 0.92 Avenue 0.45 0.95 0.43 0.9 Clyde 0.45 0.87 0.32 0.96 0.28 0.88 0.24 0.88 Main 0.27 0.49 0.2 0.49 Franklin 0.07 0.46 0.06 0.41 0.06 0.3 Myers 0.03 0.15 South Boundary	Franklin 401 EB Ramp 0.92 1.06 Pinebush 0.8 0.52 Sheldon 0.99 0.45 0.99 0.45 1.04 0.35 Bishop 1.24 0.3 Can-Amera 1.54 0.45 Elgin 1.14 0.41 1.14 0.41 1.04 0.44 Avenue 1.02 0.49 0.97 0.47 Clyde 0.94 0.46 1.05 0.33 0.93 0.3 0.93 0.27 Main 0.72 0.23 0.73 0.13 Franklin 0.48 0.14 0.42 0.13 0.28 0.12 Myers 0.2 0.11 South Boundary	Franklin 401 EB Ramp 0.88 1 Pinebush 0.78 0.53 Sheldon 0.93 0.45 0.93 0.45 0.98 0.36 Bishop 1.16 0.32 Can-Amera 1.49 0.43 Elgin 1.1 0.39 1.1 0.39 0.99 0.42 Avenue 0.96 0.47 0.92 0.46 Clyde 0.88 0.44 0.98 0.32 0.87 0.29 0.88 0.27 Main 0.68 0.24 0.7 0.13 Franklin 0.39 0.14 0.35 0.13 0.24 0.12 Myers 0.2 0.11 South Boundary

Exhibit 36: Franklin Corridor - 2031 Model V/C

2031 AM V/C	2031 PM V/C	2031 RTMP PM V/C
Townline / Shellard 401 EB Ramp 0.63 0.51 Pinebush 0.34 0.73 0.34 0.73 Can-Amera 0.05 0.44 0.05 0.44 0.04 0.32 Avenue / Gore 0.07 0.51 Clyde 0.06 0.47 Main 0.03 0.14 Morrison	Townline / Shellard 401 EB Ramp 0.78 0.76 Pinebush 1.06 0.49 1.06 0.49 Can-Amera 0.74 0.03 0.74 0.03 0.46 0.04 Avenue / Gore 0.67 0.08 Clyde 0.63 0.08 Main 0.15 0.04 Morrison	Townline / Shellard 401 EB Ramp 0.82 0.7 Pinebush 1.05 0.42 1.05 0.42 Can-Amera 0.62 0.02 0.62 0.02 0.4 0.04 Avenue / Gore 0.61 0.08 Clyde 0.58 0.07 Main 0.06 0.03 Morrison

Exhibit 37: Townline / Shellard Corridor - 2031 Model V/C

2031 AM V/C	2031 PM V/C	2031 RTMP PM V/C
King / Coronation / Dundas	King / Coronation / Dundas	King / Coronation / Dundas
Bishop	Bishop	Bishop
0.46 0.5	0.8 0.66	0.73 0.66
Concession	Concession	Concession
0.69 0.94	1.13 1	1.05 0.99
0.6 0.81	0.98 0.87	0.91 0.86
0.61 0.74	0.89 0.89	0.81 0.88
0.57 0.81	0.97 0.84	0.9 0.83
0.52 0.94	1.13 0.8	1.05 0.81
0.52 0.94	1.13 0.8	1.05 0.81
Hespeler / Water	Hespeler / Water	Hespeler / Water
0.51 0.93	0.8 0.71	0.74 0.71
0.26 1.1	0.93 0.57	0.87 0.58
Samuelson	Samuelson	Samuelson
0.21 0.86	0.75 0.48	0.7 0.49
0.21 0.86	0.74 0.48	0.7 0.49
0.21 0.86	0.74 0.48	0.7 0.49
Beverly	Beverly	Beverly
0.4 1.23	1.26 0.83	1.22 0.88
0.4 1.23	1.26 0.83	1.22 0.88
0.39 0.95	1.21 0.84	1.17 0.86
0.39 0.95	1.21 0.84	1.17 0.86
Elgin	Elgin	Elgin
0.16 0.85	0.4 0.74	0.38 0.77
0.13 0.47	0.46 0.32	0.43 0.33
Main	Main	Main
0.21 0.75	0.62 0.47	0.59 0.5
Franklin	Franklin	Franklin
0.37 0.78	0.91 0.44	0.94 0.47
Champlain	Champlain	Champlain
0.37 0.64	0.7 0.45	0.74 0.49
Branchton	Branchton	Branchton
0.6 1.04	1.06 0.78	1.07 0.84
South Boundary	South Boundary	South Boundary
0.65 1.07	1.08 0.85	1.1 0.9
0.43 0.47	0.48 0.57	0.62 0.62
Morrison	Morrison	Morrison
0.41 0.54	0.54 0.51	0.61 0.59

Exhibit 38: King / Coronation / Dundas Corridor - 2031 Model V/C

2031 AM V/C	2031 PM V/C	2031 RTMP PM V/C
Conestoga / Elgin / Cheese Factory	Conestoga / Elgin / Cheese Factory	Conestoga / Elgin / Cheese Factory
Smartcentre	Smartcentre	Smartcentre
0.18 1.54	1.93 0.25	1.75 0.28
Pinebush	Pinebush	Pinebush
0.56 0.21 0.42 0.33	0.61 0.61 0.75 0.45	0.6 0.55 0.73 0.41
Sheldon	Sheldon	Sheldon
0.36 0.47 0.11 0.71	0.76 0.3 1.05 0.06	0.75 0.28 1.02 0.06
Bishop	Bishop	Bishop
0.1 0.6	1 0.05	0.97 0.04
Dunbar	Dunbar	Dunbar
0.26 0.86	1.34 0.15	1.26 0.26
Can-Amera	Can-Amera	Can-Amera
****GAP****	****GAP****	****GAP****
0.42 0.4	0.5 0.4	0.55 0.41
Munch	Munch	Munch
0.11 0.31	0.38 0.08	0.35 0.09
Avenue	Avenue	Avenue
0.32 0.2 0.32 0.2 0.32 0.2	0.86 0.19 0.86 0.19 0.86 0.19	0.75 0.19 0.75 0.19 0.75 0.19
Samuelson	Samuelson	Samuelson
****GAP****	****GAP****	****GAP****
Alison	Alison	Alison
0 0	0 0	0 0
Gore	Gore	Gore
0.15 0.95	0.1 0.68	0.06 0.67
Dundas	Dundas	Dundas
0.76 1.32	1.39 0.98	1.34 0.94
Pollock	Pollock	Pollock
0.47 0.9	0.97 0.73	0.92 0.72
Main	Main	Main
0.63 1.18 0.63 1.18 0.63 1.18 0.48 0.49	1.18 0.68 1.18 0.68 1.18 0.68 0.58 0.43	1.17 0.64 1.17 0.64 1.17 0.64 0.59 0.4
Champlain	Champlain	Champlain
0.35 0.24 0.35 0.24	0.29 0.22 0.29 0.22	0.33 0.21 0.33 0.21
Myers	Myers	Myers
0.01 0.04	0.05 0.01	0.05 0.01
South Boundary	South Boundary	South Boundary

Exhibit 39: Conestoga / Elgin / Cheese Factory Corridor – 2031 Model V/C

MATURE STATE ROAD WIDTH AND CAPACITY

Mature State Lanes					Mature State Capacity				
Hespeler / Water					Hespeler / Water				
401 EB Ramp	2	2			401 EB Ramp	1800	1800		
Eagle / Pinebush	2	2			Eagle / Pinebush	1500	1500		
	2	2				1500	1500		
Langs / Sheldon	2	2			Langs / Sheldon	1500	1500		
	2	2				1500	1500		
	2	2				1500	1500		
Bishop	2	2			Bishop	1500	1500		
	2	2				1500	1500		
Dunbar	2	2			Dunbar	1500	1500		
	2	2				1500	1500		
Can-Amera	2	2			Can-Amera	1500	1500		
Munch	2	2			Munch	1500	1500		
	2	2				1500	1500		
	2	2				1500	1500		
Avenue	2	2			Avenue	1500	1500		
Dundas / Coronation	1	1			Dundas / Coronation	750	750		
	1	1				750	750		
Samuelson	1	1			Samuelson	750	750		
Ainslie	1	0	1	2	Ainslie	650	0	650	1700
			1	2				650	1700
Park Hill	1	1	1	1	Park Hill	650	650	650	650
	1	1	1	1		650	650	650	650
	1	1	1	1		650	650	650	650
Dickson	1	1	1	1	Dickson	650	650	650	650
	1	1	1	1		650	650	650	650
Main	1	1	1	1	Main	650	650	650	650
	2	1	1	1		1300	650	650	650
Wellington			1	1	Wellington			650	650
			1	1				650	850
Concession	1	1	2	2	Concession	650	650	1300	1300
Ainslie	2	2			Ainslie	1300	1300		
	2	2				1500	1500		
	2	2				1500	1500		
	2	2				1500	1500		
Myers	1	1			Myers	1100	1100		
South Boundary	1	1			South Boundary	1100	1100		

Exhibit 40: Hespeler / Water Corridor - Mature State Road Width and Capacity

Mature State Lanes		Mature State Capacity	
Franklin		Franklin	
401 EB Ramp		401 EB Ramp	
2	0	1500	0
Pinebush		Pinebush	
2	2	2200	2200
Sheldon		Sheldon	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Bishop		Bishop	
2	2	2200	2200
Can-Amera		Can-Amera	
2	2	2200	2200
Elgin		Elgin	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Avenue		Avenue	
2	2	2200	2200
2	2	2200	2200
Clyde		Clyde	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Main		Main	
2	2	2200	2200
2	2	2200	2200
Franklin		Franklin	
2	2	2200	2200
2	2	2200	2200
2	2	2200	2200
Myers		Myers	
1	1	0	0
South Boundary		South Boundary	

Exhibit 41: Franklin Corridor - Mature State Road Width and Capacity

Mature State Lanes		Mature State Capacity	
Townline / Shellard		Townline / Shellard	
401 EB Ramp		401 EB Ramp	
2	2	1800	1800
Pinebush		Pinebush	
2	2	1800	1800
2	2	1800	1800
Can-Amera		Can-Amera	
2	2	1800	1800
2	2	1800	1800
2	2	1800	1800
Avenue / Gore		Avenue / Gore	
1	1	1100	1100
Clyde		Clyde	
1	1	1100	1100
Main		Main	
1	1	1100	1100
Morrison		Morrison	

Exhibit 42: Townline / Shellard Corridor - Mature State Road Width and Capacity

Mature State Lanes			Mature State Capacity		
King / Coronation / Dundas			King / Coronation / Dundas		
Bishop					
	2	2	1300	1300	
Concession					
	2	2	1300	1300	
	2	2	1500	1500	
	2	2	1500	1500	
	2	2	1500	1500	
	2	2	1500	1500	
	2	2	1500	1500	
Hespeler / Water					
	2	2	1500	1500	
	2	2	1500	1500	
Samuelson					
	2	2	1500	1500	
	2	2	1500	1500	
	2	2	1500	1500	
Beverly					
	1	1	750	750	
	1	1	750	750	
	1	1	750	750	
	1	1	750	750	
Elgin					
	2	1	1800	900	
	2	2	1800	1800	
Main					
	2	2	1800	1800	
Franklin					
	2	2	1800	1800	
Champlain					
	2	2	1800	1800	
Branchton					
	1	1	1100	1100	
South Boundary					
	1	1	1100	1100	
	1	1	1100	1100	
Morrison					
	1	1	1100	1100	

Exhibit 43: King / Coronation / Dundas Corridor - Mature State Road Width and Capacity

Mature State Lanes		Mature State Capacity	
Conestoga / Elgin / Cheese Factory		Conestoga / Elgin / Cheese Factory	
Smartcentre		Smartcentre	
1	1	400	600
Pinebush		Pinebush	
1	1	650	650
1	1	650	650
Sheldon		Sheldon	
1	1	650	650
1	1	650	650
Bishop		Bishop	
1	1	650	650
Dunbar		Dunbar	
1	1	650	650
Can-Amera		Can-Amera	
****GAP****		****GAP****	
1	1	400	400
Munch		Munch	
1	1	400	400
Avenue		Avenue	
1	1	400	400
1	1	400	400
1	1	400	400
Samuelson		Samuelson	
****GAP****		****GAP****	
Alison		Alison	
1	1	300	300
Gore		Gore	
1	1	300	300
Dundas		Dundas	
1	1	300	400
Pollock		Pollock	
1	1	300	300
Main		Main	
1	1	300	300
1	1	300	300
1	1	300	300
1	1	300	300
Champlain		Champlain	
1	1	300	300
1	1	300	300
Myers		Myers	
1	1	300	300
South Boundary		South Boundary	

Exhibit 44: Conestoga / Elgin / Cheese Factory Corridor – Mature State Road Width and Capacity

MATURE STATE MODEL VOLUMES

Mature State AM Volume					Mature State PM Volume				
Hespeler / Water					Hespeler / Water				
401 EB Ramp	2653	1239			401 EB Ramp	1380	2718		
Eagle / Pinebush	2357	1015			Eagle / Pinebush	1181	2347		
	1345	1693				1998	1333		
Langs / Sheldon	1481	1577			Langs / Sheldon	1689	1359		
	1173	1754				1946	1104		
	957	2008				2274	925		
Bishop	1286	1492			Bishop	1660	1186		
	668	1966				2272	611		
Dunbar	722	1833			Dunbar	2063	683		
	468	2176				2413	400		
Can-Amera	622	2407			Can-Amera	2578	612		
Munch	606	1914			Munch	2044	643		
	641	1862				1982	681		
	747	1782				1863	836		
Avenue	1176	1697			Avenue	1710	1135		
Dundas / Coronation	771	1123			Dundas / Coronation	1180	807		
	771	1123				1180	807		
Samuelson	862	1315	Ainslie		Samuelson	1402	902	Ainslie	
Ainslie	679	0	183	1315	Ainslie	865	0	538	902
			183	1315				538	902
Park Hill	529	254	456	701	Park Hill	619	354	490	747
	529	427	371	609		627	388	590	633
	529	427	371	609		627	388	590	633
Dickson	529	556	290	627	Dickson	677	449	583	633
Main	551	546	322	627	Main	716	448	574	633
	551	546	322	627		716	448	574	633
Wellington			348	651	Wellington			476	745
			113	877				786	350
Concession	528	652	76	533	Concession	724	618	363	303
Ainslie	604	1185			Ainslie	1085	919		
	604	1185				1085	919		
	604	1185				1085	919		
	604	1185				1085	919		
Myers	566	810			Myers	721	824		
South Boundary	582	1086			South Boundary	1030	695		

Exhibit 45: Hespeler / Water Corridor - Mature State Model Volumes

Mature State AM Volume			Mature State PM Volume		
Franklin			Franklin		
401 EB Ramp			401 EB Ramp		
	2343	0		1734	0
Pinebush			Pinebush		
	2076	2150		2039	1683
Sheldon			Sheldon		
	1388	2348		2659	1260
	1388	2348		2659	1260
	1213	2441		2708	1060
Bishop			Bishop		
	1025	2921		3113	778
Can-Amera			Can-Amera		
	1143	3410		3809	1140
Elgin			Elgin		
	1051	2808		3008	1138
	1051	2808		3008	1138
	1219	2574		2626	1308
Avenue			Avenue		
	1241	2698		2824	1480
	1192	2606		2684	1435
Clyde			Clyde		
	1054	2299		2396	1173
	703	2646		2783	786
	634	2269		2499	644
	562	2262		2500	571
Main			Main		
	603	1270		1943	433
	440	1276		1963	198
Franklin			Franklin		
	172	1395		1651	194
	168	1241		1497	167
	144	899		1093	170
Myers			Myers		
	0	0		0	0
South Boundary			South Boundary		

Exhibit 46: Franklin Corridor - Mature State Model Volumes

Mature State AM Volume			Mature State PM Volume		
Townline / Shellard			Townline / Shellard		
401 EB Ramp			401 EB Ramp		
	1630	1348		1816	1854
Pinebush			Pinebush		
	696	1912		2526	1040
	696	1912		2526	1040
Can-Amera			Can-Amera		
	80	1394		1976	34
	80	1394		1976	34
	68	901		1370	64
Avenue / Gore			Avenue / Gore		
	82	840		1152	82
Clyde			Clyde		
	68	777		1084	79
Main			Main		
	28	319		388	36
Morrison			Morrison		

Exhibit 47: Townline / Shellard Corridor - Mature State Model Volumes

Mature State AM Volume			Mature State PM Volume		
King / Coronation / Dundas			King / Coronation / Dundas		
Bishop			Bishop		
	569	888		1073	787
Concession			Concession		
	801	1466		1661	1135
	801	1466		1661	1135
	823	1335		1563	1240
	753	1427		1703	1181
	693	1600		1909	1134
	693	1600		1909	1134
Hespeler / Water			Hespeler / Water		
	742	1818		1883	905
	413	2076		2018	666
Samuelson			Samuelson		
	388	1668		1701	603
	391	1495		1514	603
	391	1495		1514	603
Beverly			Beverly		
	395	1067		1097	500
	395	1067		1097	500
	403	951		1046	614
	403	951		1046	614
Elgin			Elgin		
	364	963		841	608
	328	1111		974	533
Main			Main		
	460	1674		1233	829
Franklin			Franklin		
	736	1563		1539	827
Champlain			Champlain		
	809	1263		1324	790
Branchton			Branchton		
	828	1250		1194	888
South Boundary			South Boundary		
	927	1276		1230	1157
	654	527		560	889
Morrison			Morrison		
	524	684		680	660

Exhibit 48: King / Coronation / Dundas Corridor - Mature State Model Volumes

Mature State AM Volume			Mature State PM Volume		
Conestoga / Elgin / Cheese Factory			Conestoga / Elgin / Cheese Factory		
Smartcentre			Smartcentre		
	100	0		6	4
Pinebush			Pinebush		
	452	275		494	685
	359	340		594	601
Sheldon			Sheldon		
	242	544		675	233
	72	692		873	85
Bishop			Bishop		
	51	682		860	56
Dunbar			Dunbar		
	146	711		973	322
Can-Amera			Can-Amera		
*****GAP*****			*****GAP*****		
	121	88		164	81
Munch			Munch		
	0	32		108	4
Avenue			Avenue		
	7	68		220	1
	7	68		220	1
	7	68		220	1
Samuelson			Samuelson		
*****GAP*****			*****GAP*****		
Alison			Alison		
	0	0		0	0
Gore			Gore		
	53	191		68	98
Dundas			Dundas		
	193	464		437	276
Pollock			Pollock		
	160	334		284	205
Main			Main		
	111	353		308	162
	111	353		308	162
	111	353		308	162
	82	102		138	111
Champlain			Champlain		
	72	62		86	74
	72	62		86	74
Myers			Myers		
	13	29		19	35
South Boundary			South Boundary		

Exhibit 49: Conestoga / Elgin / Cheese Factory Corridor – Mature State Model Volumes

MATURE STATE MODEL V/C



Exhibit 50: Hespeler / Water Corridor - Mature State Model V/C

Mature State AM V/C		Mature State PM V/C	
Franklin		Franklin	
401 EB Ramp	1.56	401 EB Ramp	1.16
Pinebush	0.94 0.98	Pinebush	0.93 0.77
Sheldon	0.63 1.07	Sheldon	1.21 0.57
	0.63 1.07		1.21 0.57
	0.55 1.11		1.23 0.48
Bishop	0.47 1.33	Bishop	1.42 0.35
Can-Amera	0.52 1.55	Can-Amera	1.73 0.52
Elgin	0.48 1.28	Elgin	1.37 0.52
	0.48 1.28		1.37 0.52
	0.55 1.17		1.19 0.59
Avenue	0.56 1.23	Avenue	1.28 0.67
	0.54 1.18		1.22 0.65
Clyde	0.48 1.05	Clyde	1.09 0.53
	0.32 1.2		1.27 0.36
	0.29 1.03		1.14 0.29
	0.26 1.03		1.14 0.26
Main	0.27 0.58	Main	0.88 0.2
	0.2 0.58		0.89 0.09
Franklin	0.08 0.63	Franklin	0.75 0.09
	0.08 0.56		0.68 0.08
	0.07 0.41		0.5 0.08
Myers		Myers	
South Boundary		South Boundary	

Exhibit 51: Franklin Corridor - Mature State Model V/C

Mature State AM V/C		Mature State PM V/C	
Townline / Shellard		Townline / Shellard	
401 EB Ramp	0.91 0.75	401 EB Ramp	1.01 1.03
Pinebush	0.39 1.06	Pinebush	1.4 0.58
	0.39 1.06		1.4 0.58
Can-Amera	0.04 0.77	Can-Amera	1.1 0.02
	0.04 0.77		1.1 0.02
	0.04 0.5		0.76 0.04
Avenue / Gore	0.07 0.76	Avenue / Gore	1.05 0.07
Clyde	0.06 0.71	Clyde	0.99 0.07
Main	0.03 0.29	Main	0.35 0.03
Morrison		Morrison	

Exhibit 52: Townline / Shellard Corridor - Mature State Model V/C

Mature State AM V/C		Mature State PM V/C	
King / Coronation / Dundas		King / Coronation / Dundas	
Bishop		Bishop	
	0.44 0.68		0.83 0.61
Concession		Concession	
	0.62 1.13		1.28 0.87
	0.53 0.98		1.11 0.76
	0.55 0.89		1.04 0.83
	0.5 0.95		1.14 0.79
	0.46 1.07		1.27 0.76
	0.46 1.07		1.27 0.76
Hespeler / Water		Hespeler / Water	
	0.49 1.21		1.26 0.6
	0.28 1.38		1.35 0.44
Samuelson		Samuelson	
	0.26 1.11		1.13 0.4
	0.26 1		1.01 0.4
	0.26 1		1.01 0.4
Beverly		Beverly	
	0.53 1.42		1.46 0.67
	0.53 1.42		1.46 0.67
	0.54 1.27		1.39 0.82
	0.54 1.27		1.39 0.82
Elgin		Elgin	
	0.2 1.07		0.47 0.68
	0.18 0.62		0.54 0.3
Main		Main	
	0.26 0.93		0.69 0.46
Franklin		Franklin	
	0.41 0.87		0.86 0.46
Champlain		Champlain	
	0.45 0.7		0.74 0.44
Branchton		Branchton	
	0.75 1.14		1.09 0.81
South Boundary		South Boundary	
	0.84 1.16		1.12 1.05
	0.59 0.48		0.51 0.81
Morrison		Morrison	
	0.48 0.62		0.62 0.6

Exhibit 53: King / Coronation / Dundas Corridor - Mature State Model V/C

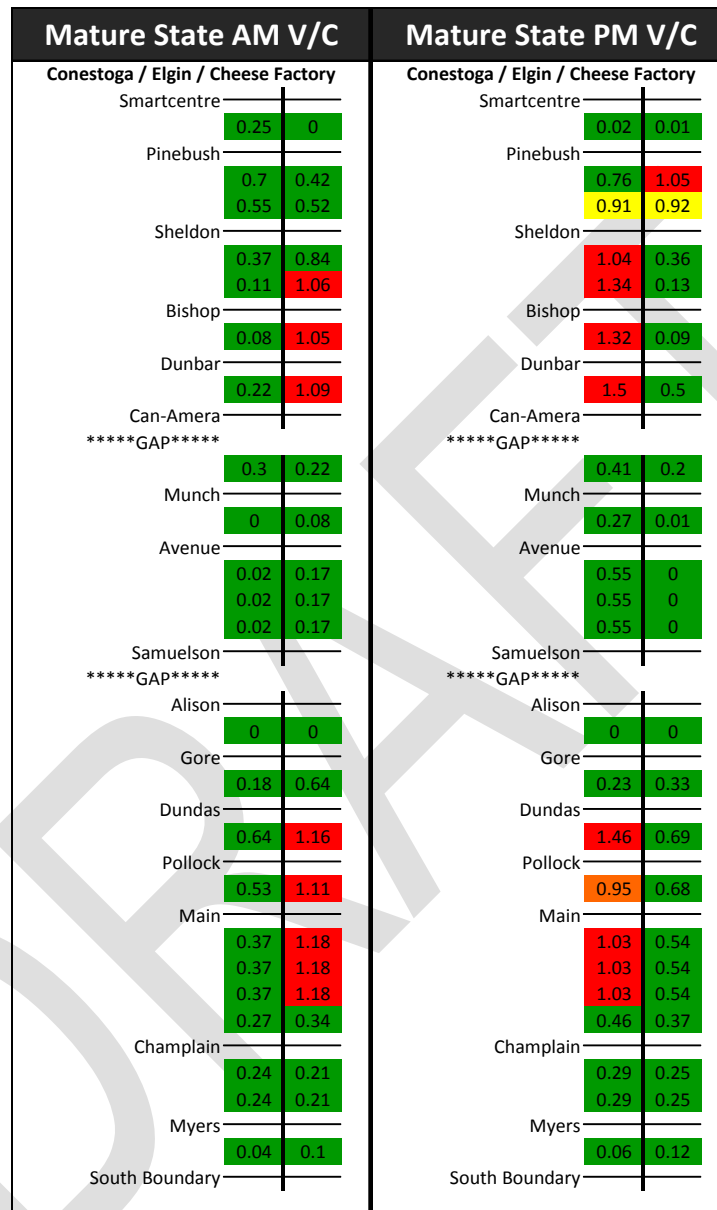
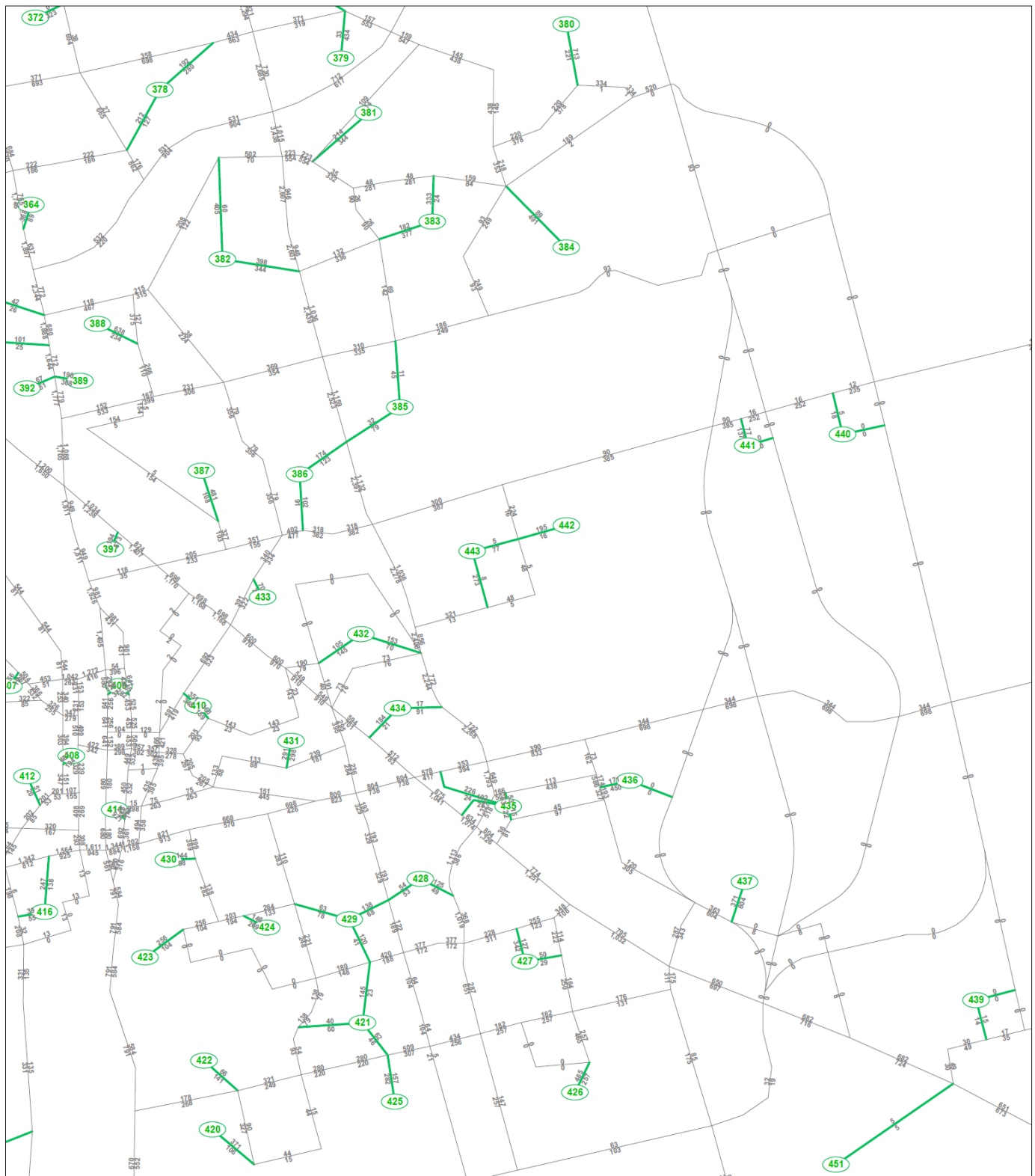


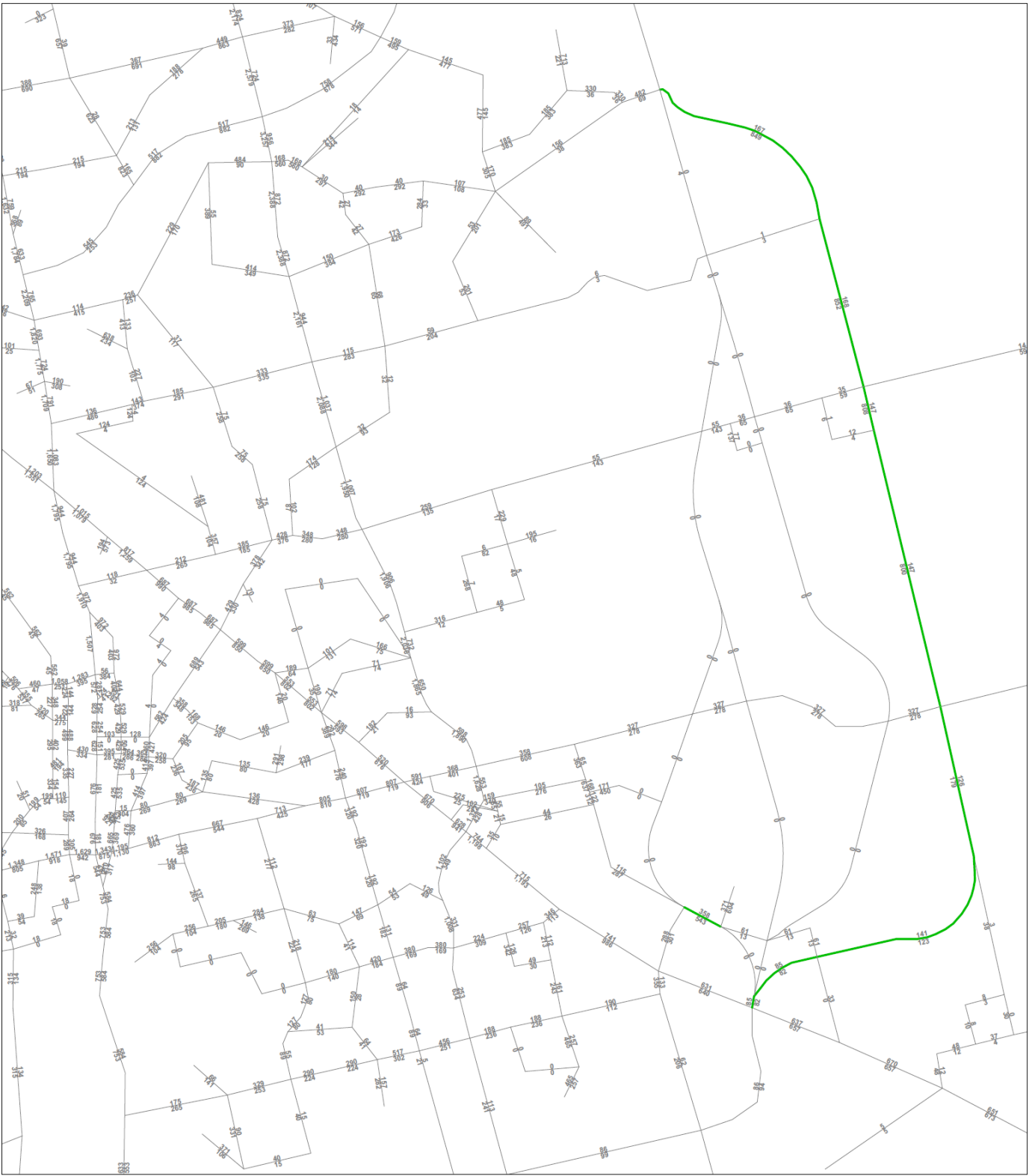
Exhibit 54: Conestoga / Elgin / Cheese Factory Corridor – Mature State Model V/C

Appendix B: 2031 PM Peak Hour Model Assignments

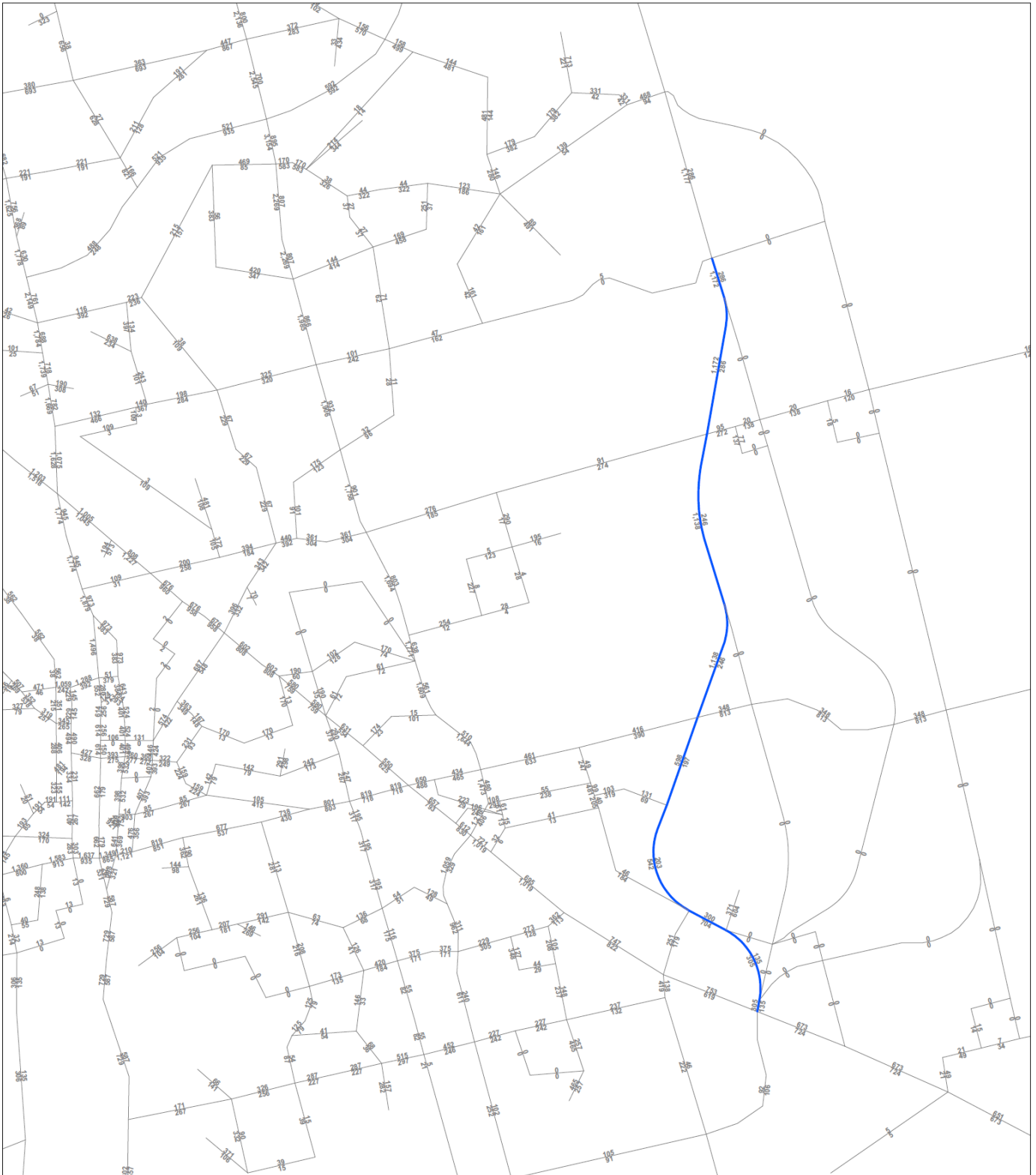
“Do Nothing” Alternative



Route A



Route B



Route C



Route D

