Canada-United States-Ontario-Michigan
Border Transportation Partnership

Practical Alternatives Evaluation Working Paper

Air Quality Impact Assessment

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PREFACE

The Detroit River International Crossing (DRIC) Environmental Assessment Study is being conducted by a partnership of the federal, state and provincial governments in Canada and the United States in accordance with the requirements of the Canadian Environmental Assessment Act (CEAA), the Ontario Environmental Assessment Act (OEAA), and the U.S. National Environmental Policy Act (NEPA). In 2006, the Canadian and U.S. Study Teams completed an assessment of illustrative crossing, plaza and access road alternatives. This assessment is documented in two reports: *Generation and Assessment of Illustrative Alternatives Report - Draft November 2006)* (Canadian side) and *Evaluation of Illustrative Alternatives Report (December 2006)* (U.S. side). The results of this assessment led to the identification of an Area of Continued Analysis (ACA) as shown in Exhibit 1.

Within the ACA, practical alternatives were developed for the crossings, plazas and access routes alternatives. The evaluation of practical crossing, plaza and access road alternatives is based on the following seven factors:

- Changes to Air Quality
- Protection of Community and Neighbourhood Characteristics
- Consistency with Existing and Planned Land Use
- Protection of Cultural Resources
- Protection of the Natural Environment
- Improvements to Regional Mobility
- Cost and Constructability

This report pertains to the *Changes to Air Quality* factor and is one of several reports that will be used in support of the evaluation of practical alternatives and the selection of the technically and environmentally preferred alternative. This report will form a part of the environmental assessment documentation for this study.

Additional documentation pertaining to the evaluation of practical alternatives is available for viewing/downloading at the study website (www.partnershipborderstudy.com).

Practical Alternatives Evaluation Working Paper

Air Quality Impact Assessment

Table of Contents

List of Figures

List of Tables

Note: * means table appears AFTER the stated report page number

List of Appendices

1.0 INTRODUCTION

Changes to Air Quality is one of the seven factors being used to assess the potential effects of the various transportation improvement alternatives currently being studied by the Detroit River International Crossing (DRIC) study team.

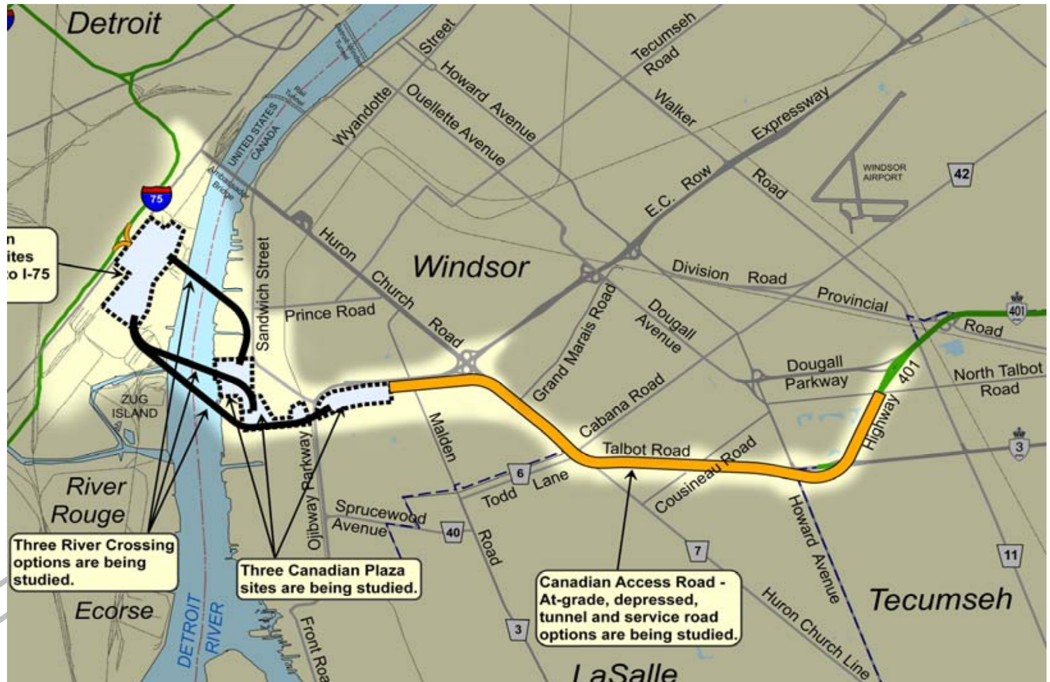
Due to the proximity to the Canada-U.S. border and the resulting high rate of traffic through the City of Windsor, vehicular emissions and their effect on existing air quality are of concern in the Windsor-Essex area In addition. The City of Windsor also has a relatively high fraction of diesel powered transport trucks that are used to move goods into and out of Canada. Diesel exhaust is highly visible and odourous, and there is increasing evidence that there are health effects associated with it. Thus, a primary objective of the Air Quality Assessment is to have a transportation solution that not only improves transportation in the Windsor-Essex area, but also improves the overall air quality in the local area, if possible.

This report outlines the methodology and tools used to conduct the Air Quality Assessment, and presents the results and evaluation of the each of the alternatives studied.

1.1 Practical Alternatives Under Assessment

Five Practical Alternatives for the Access Road were presented in the public in March 2006 at the second round of DRIC Public Information Open Houses (PIOH). These represent the best route alternatives developed from the Illustrative Alternatives with input from the public. The Alternatives are all located within the Area of Continued Analysis (ACA) as is shown in Figure 1.1.

FIGURE 1.1 KEY PLAN OF THE AREA OF CONTINUED ANALYSIS



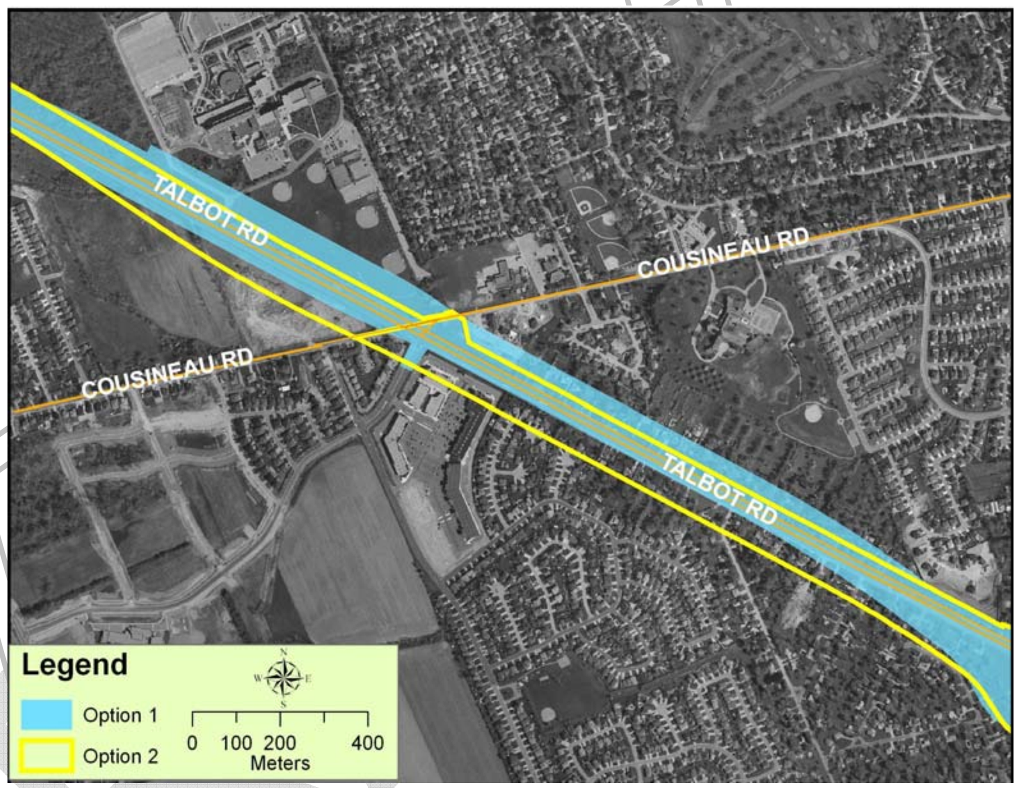
The five Practical Alternatives for the Access Road are as follows:

- **Alternative 1A** – At grade freeway with one-way local access service roads located along each side;
- **Alternative 1B** – Depressed (below) grade freeway with one-way local access service drives located at grade along each side;
- **Alternative 2A** – At grade freeway with two-way local access service roads located along the approximate existing Huron Church Road / Highway 3 corridor;
- **Alternative 2B** – Depressed grade freeway with two-way local access service roads located at grade along the approximate Huron Church Road / Highway 3 corridor; and
- **Alternative 3** – Tunnelled freeway with two-way local access service roads located at-grade along the approximate Huron Church Road / Highway 3 corridor.

In addition to these five alternatives, Alternatives 1A – 2B have two different alignment options (Option 1 & Option 2) between St.Clair College and Howard

Avenue. Option 1 & Option 2 were included in the assessment. The Right of Way (ROW) for each of these alignment options are shown below in Figure 1.2.

FIGURE 1.2 RIGHT OF WAY FOR OPTION 1 AND OPTION 2 ALIGNMENTS



Also, four separate ventilation options were studied for Alternative 3. These are as follows:

- **VB1A** – use of two separate ventilation buildings to circulate and remove air from the tunnel. One vent building located approximately 1/3rd of the distance from the south tunnel entrance/exit at the present Highway 401 terminus at Highway 3; the second vent building located approximately 1/3rd of the distance from the north tunnel entrance and exit, which is half way between Malden Rd. and Huron Church Road.

- **VB1B** – use of two separate ventilation buildings at the main tunnel entrance/exits to circulate and remove air from the tunnel. One vent building located approximately at the present Highway 401 terminus at

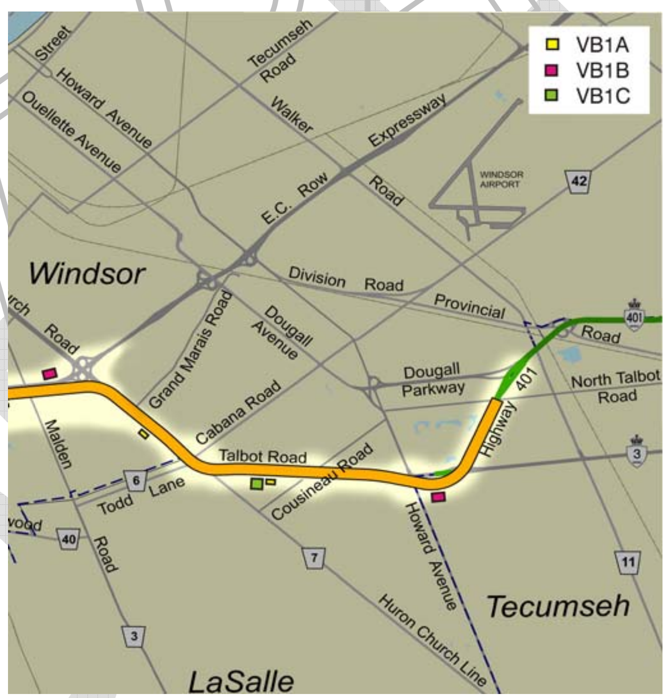
Highway 3; the second vent building located approximately half way between Malden Rd. and Huron Church Road.

- **VB1C** – use of a single ventilation building at the approximate half way point of the tunnel to circulate and remove air from the tunnel. One vent building located in the vicinity of Todd Lane/Cabana Rd.

- **Jet Fans** – use of multiple jet fans located in the tunnel interior to continuously circulate the tunnel air; assumes no vent buildings required.

The locations of the three vent building options are shown on Figure 1.3 below.

FIGURE 1.3 TUNNEL VENTILATION BUILDING OPTIONS



Four Plaza Alternatives and three river Crossing Alternatives were also examined, in various combinations. Each Plaza Alternative typically had several potential Crossing Alternatives, as follows:

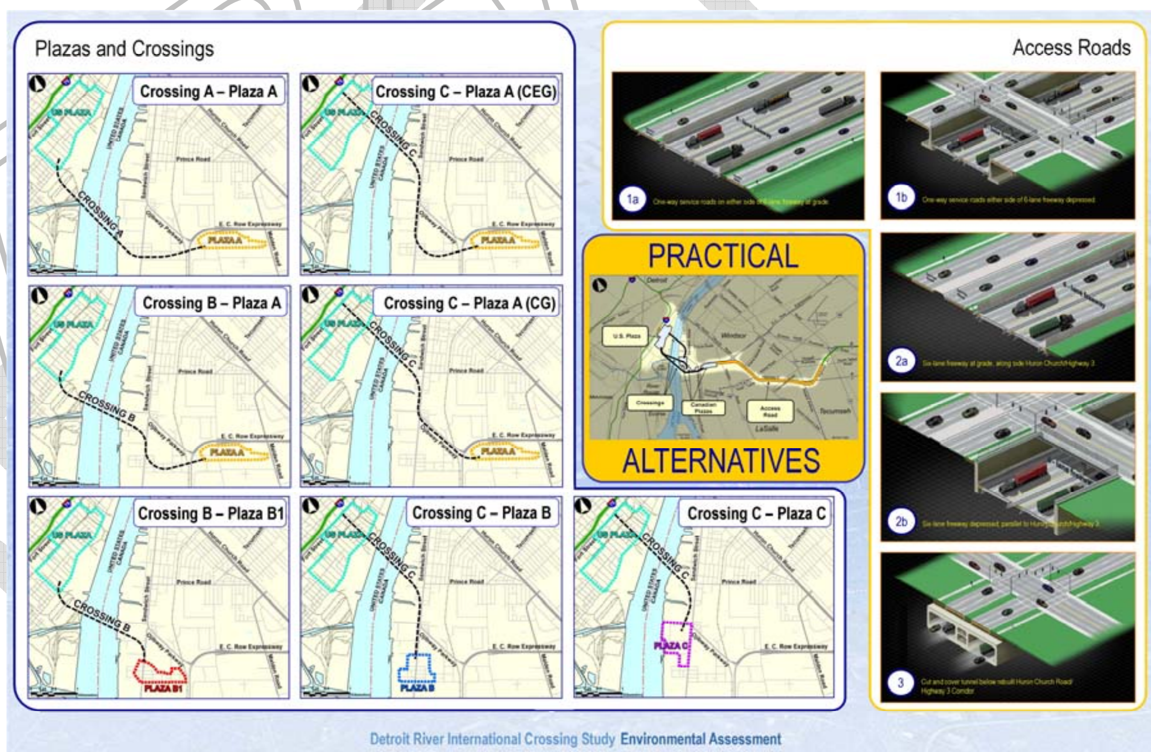
- Plaza A
    - to Crossing A
    - to Crossing B
    - to Crossing C

- Plaza B
    - o to Crossing C

- Plaza B1
    - o to Crossing B
- Plaza C
    - o to Crossing C

The details of each of Access Road, Plaza and Crossing Alternatives are presented in Figure 1.4 below.

FIGURE 1.4 SUMMARY OF PRACTICAL ALTERNATIVES



Potential air quality effects of the five Practical Alternatives for connecting routes, four Tunnel Ventilation Alternatives and seven combinations of Plaza/Crossing Alternatives were assessed using a combination of existing air monitoring data in combination with air dispersion modelling. Air dispersion modelling must be used to assess the impacts of future changes, such as implementation of the alternatives, in addition to changes in fuels, vehicle technologies and traffic volumes. The model being used is specifically designed to assess impacts from roads and highways. The model incorporates the differences between moving vehicles, and queued vehicles that are idling, as well as differences in roads that are "at grade", depressed and bridges.

Two indicator pollutants were selected for this phase of the analysis to represent one gaseous compound and one particulate compound. These are Particulate Matter less than 2.5 microns ($PM_{2.5}$) and Nitrogen Oxides (NO_x). Changes in the total predicted concentrations of these two air pollutants were compared for each alternative, as well as to existing conditions and a future "do nothing" condition.

1.2 Area of Investigation

Since air quality does not respect local boundaries, a relatively broad area was included in the Air Quality Assessment. This comprised an approximate 10 km x 10 km area in West Windsor, from just south of the present Highway 401 terminus at Highway 3, 10 km north and 10 km west to the Detroit River. This is approximately the area depicted in Figure 1.1 that was presented earlier.

Potential air quality effects from roadways decrease with increasing distance from the roadway. Therefore the greatest effects will occur immediately adjacent to the roadway. For assessment of the potential affects on air quality of the Access Road Alternatives and Crossing Alternatives, an area located within 250 m on either side of the Right of Way (ROW) of each proposed Alternative was studied. Similar to the connecting route alternatives, the Plaza Alternatives were assessed within 250 m of the proposed facility property lines.

2.0 EXISTING ENVIRONMENTAL CONDITIONS

Assessment of the existing environmental conditions in the Windsor area is an important first step in the analysis of the various alternatives being studied. The existing conditions represent the benchmark to which future changes must be added (such as future traffic growth without implementation of any project related Alternatives). This forms the baseline conditions, and is also known as the No Build Alternative. All future changes related to the project are added to the existing conditions and evaluated against the baseline condition.

2.1 Climate and Meteorological Data

Characterization of the existing climate and meteorological conditions in the vicinity of the Huron Church Road / Highway 3 corridor is important because these are the main forces driving contaminant transport (dispersion) in the atmosphere. The direction and speed of the wind dictates the location and distance from the source that the pollutants may travel. The factors that influence the contaminant mixing in the atmosphere are described below.

The Windsor-Essex area has a middle latitude humid continental climate affected by Lake Erie and Lake St.Clair. The region is characterized by pronounced seasonal differences of weather and by a highly variable day-to-day weather pattern. Some periods in summer are essentially humid tropical (high temperatures, high humidity, afternoon thunderstorms, etc.). Some periods in winter are effectively polar (very cold, clear, dry). Precipitation occurs throughout the year.

The surface meteorological data used in the air dispersion modelling was obtained from the Windsor Airport meteorological station (2000 – 2004) which is approximately 5 – 7 km from the Huron Church Road / Highway 3 corridor. It is well exposed and represents the general wind flow pattern in the vicinity of the corridor since the area is generally flat. The upper air measurements used are from the closest upper air station (Pontiac, MI), which is located approximately 30 km to the northwest of the DRIC study area. In order to be considered representative, the wind and temperature data should be obtained from within 100 km of the study area, and the upper air data (which is a regional parameter) should be within 300 km. The stations used for this study are well within these parameters.

2.1.1 Near-Surface Temperature

Temperature and precipitation normals for the Windsor Airport (1971-2000) are presented in Table 2.1. "Normals" is the term commonly used for values of climatic elements averaged over a fixed standard period of years (usually 30 years).

Temperature near the surface of the earth controls the buoyant component of turbulence (vertical motion). Heat from the earth's surface heats the air near the ground causing it to rise. This mechanism reaches a maximum in early afternoon and is at a minimum near sunrise. This affects the dispersion of air pollutants through the influence of "thermal mixing" as the air mass rises.

Table 2.1 indicates that the mean (averaged over 30 years) daily minimum temperature is –8.1°C in January and daily maximum temperature is 28°C in July at the Windsor Airport site. The annual mean temperature is 9.4°C.

TABLE 2.1 - WINDSOR AIRPORT CLIMATE NORMALS (1971-2000)

Temperature	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Year**
Daily Average (°C)	-4.5	-3.2	2	8.2	14.9	20	23	21.6	17	11	4.6	-1.5	9.4
Standard Deviation	2.9	2.7	2.1	1.6	2.1	1.3	1.1	1.2	1.3	1.7	1.7	2.7	0.8
Daily Maximum (°C)	-0.9	0.6	6.4	13	20.5	25	28	26.6	23	16	8.3	1.9	14
Daily Minimum (°C)	-8.1	-7	-2.4	3	9.3	15	17	16.6	12	6.2	0.9	-4.8	4.9
Precipitation													
Rainfall (mm)	29	33	55.6	81	80.7	90	82	79.7	96	64	67	47	805.2
Snowfall (cm)	35	28	20.6	4.3	0	0	0	0	0	0.7	8.3	30	126.6
Precipitation (mm)	58	57	75	85	80.8	90	82	79.7	96	65	76	75	918.3
Days with Rainfall													
>= 0.2 mm	5.7	5.6	9.4	12	11.8	11	10	10	11	11	11	7.9	115.7
Days With Snowfall													
>= 0.2 cm	13	9.1	6.7	2.3	0.03	0	0	0	0	0.3	3.8	10	45
Days with Precipitation													
>= 0.2 mm	15	12	13.9	13	11.8	11	10	10	11	11	13	15	146.7
Wind													
Days with Winds >= 52 km/hr	1.9	1.4	2.5	1.8	1.1	0.9	0.7	0.3	0.4	0.5	1.2	1.2	14
Days with Winds >= 63 km/hr	0.6	0.4	0.7	0.7	0.5	0.3	0.4	0.2	0.1	0.2	0.3	0.3	4.7

Source: Environment Canada website, http://www.climate.weatheroffice.ec.gc.ca/climate_normals/index_e.html

The meteorological file used in the air dispersion modeling for this project requires hourly temperatures for each day in the year.

2.1.2 Precipitation

Precipitation acts as an atmospheric cleansing mechanism, as contaminants in the air are generally washed out by precipitation. More precipitation produces more washout. For this study, the role of precipitation in the removal of pollutants from the air was not considered, thereby generally providing conservatively high ground level concentrations.

As shown in Table 2.1 above, the Windsor area normally receives a total of 918.3 mm of precipitation per year, including 805.2 mm of rainfall and 126.6 cm of snowfall. The maximum mean monthly rainfall is 96.2 mm, which occurs in September.

2.1.3 Atmospheric Stability

Normally, temperature decreases with increasing height above sea level. The relationship of the actual vertical temperature to the near-surface temperature determines the atmosphere's ability to resist or enhance vertical motion. The amount of vertical motion is a measure of the stability of the atmosphere.

The atmosphere can have three general stability states - unstable, neutral and stable. The stability scale normally used for air quality simulations varies from very unstable (A) through neutral (D) to very stable (F). The stability class distribution for the Windsor Airport station for the period 2000-2004 is presented in Table 2.2. At this station, neutral stability conditions {D (neutral) + C (near neutral)} occur approximately 68% of the time and stable conditions (E, F) about 28% of the time. Stable conditions can produce higher concentrations of contaminants because of reduced turbulent mixing.

TABLE 2.2 - STABILITY CLASS DISTRIBUTION - WINDSOR AIRPORT (2000-2004)

Stability Class	% Frequency						Descriptor
	2000-2004	2000	2001	2002	2003	2004	
A	0.5	0.4	0.8	0.6	0.4	0.4	Unstable
B	4.2	3.6	4.6	4.4	4.4	3.9	
C	10.1	10.6	10.3	9.8	9.9	9.9	Neutral
D	57.0	56.0	56.2	57.1	57.0	58.6	
E	13.3	13.6	14.0	13.2	12.8	13.1	Stable
F	14.9	15.8	14.2	15.0	15.5	14.1	

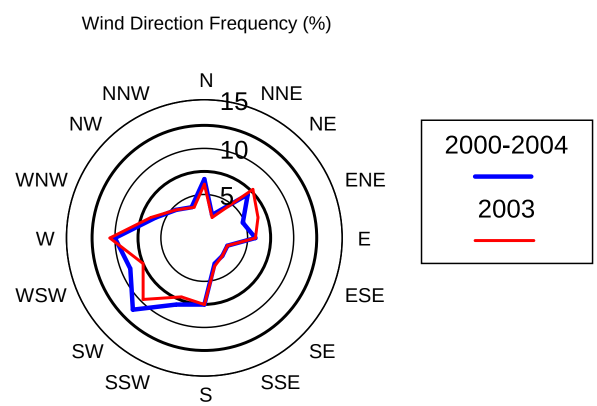
The meteorological file used in the air dispersion modeling for this project requires hourly stability classes for each day in the year.

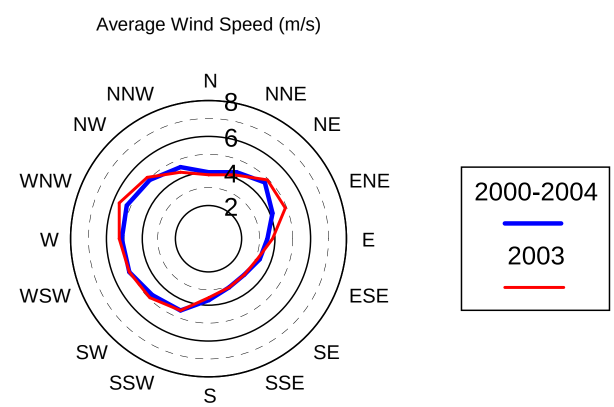
2.1.4 Wind Direction

Wind direction is reported as the direction from which the wind blows and is based on surface (10 meter) observations. In general terms, if the wind does not blow toward a receptor, there will be no impact from an upwind emission source. The wind blows in all directions with varying frequencies. Certain directions occur more frequently than others. These are known as the prevailing wind directions.

Figure 2.1 presents a wind rose for the Windsor Airport for the years 2000-2004. The prevailing wind is from the southwest, primarily during the summer months, with winds blowing from the west through southwest directions (i.e. from Southeast Michigan) approximately 32% of the time.

FIGURE 2.1 - WIND ROSE - WINDSOR AIRPORT (2000-2004)





Percentage of Calms
2000-2004 3.6 %
2003 4.3%

2.1.5 Wind Speed

Contaminant concentrations decrease with increasing wind speed as a result of atmospheric mixing. The wind speed used in the air quality modelling is based on surface observations from the Windsor Airport. Wind speed increases with height as surface friction is reduced. Variation of wind speed with height is built into the dispersion model used in this assessment. When wind speeds are high, there is good dispersion of gases and particles, but more potential for resuspension of surface dust. When wind speeds are near zero, the primary mechanism of pollutant transport away from a source is via diffusion, which can lead to very high pollutant concentrations near the ground. Calms were recorded 4.3% of the time at the Windsor Airport meteorological station (Figure 2.1) during 2003 compared with 3.6% for the 2000 – 2004 period.

The meteorological file used in the air dispersion modeling for this project requires hourly wind speed and directions for each day in the year.

2.1.6 Mixing Height

Another very important parameter in the dispersion of contaminants from a source is the "mixing height". This is the vertical extent through which the plume can be mixed. With a higher mixing height, there is a larger volume of air available within which the pollutants can mix, which results in lower concentrations. With a lower mixing height, the plume may become trapped resulting in higher concentrations.

The concept of mixing height is founded on the principle that heat transferred to the atmosphere at the earth's surface results in convection, vigorous vertical mixing and the establishment of a dry-adiabatic lapse rate [Holzworth 1967]. For annual and 24 hour average concentrations, the mixing height does not have much effect on the modelled ground level concentrations [Young & Radonjic 1993]. For 1 hour average concentrations, however, mixing height is very important. The use of variable mixing heights, that are as close to the actual conditions as possible, improves the ability of the model to accurately predict downwind concentrations. For the sources that are close to the ground, the mixing heights do not play a major role.

The closest station having the upper air data necessary for this study is the Pontiac, Michigan. The mixing height data for each day in the 5-year meteorological period (2000-2004) was developed using the Holzworth methodology. The surface values and the mean monthly minimum (morning) and maximum (afternoon) mixing heights were then pre-processed through the U.S. EPA meteorological pre-processor (PCRAMMET) [U.S. EPA 1998] which combines surface and upper air measurements to create the hourly mixing heights which are required by the dispersion model. Missing data was filled in by interpolation. There were no significant blocks of data missing from this meteorological data set.

2.2 Assessment Criteria

Environment Canada and the Ontario Ministry of the Environment (MOE) have set air quality objectives, and air quality standards and criteria, respectively for various air pollutants.

Ontario Regulation 419 (O.Reg.419) of the *Ontario Environmental Protection Act* (EPA) defines maximum concentration levels for various air contaminants at a Point of Impingement (POI), arising from an industrial facility or similar operation. The POI is generally defined as the off property location where the maximum concentration resulting from a facility emission occurs. However, if there is a child care facility, health care facility, senior's home or educational facility on the property in question these locations become the designated POI location.

Facility property boundaries are most often used as the POI. With the exception of the ventilation buildings assessed for Alternative 3, the emissions in this assessment are from open, public sources, and thus are not subject to MOE POI standards and criteria. The ventilation buildings will be assessed against the POI criteria during the analysis of the Technically and Environmentally Preferred Alternative in order to determine the necessary property footprint based on the design.

In addition, Section 14 of the *Ontario Environmental Protection Act* (*EPA*) prohibits a facility or operation to cause an adverse effect. The definition of "adverse effect" in the *EPA* includes:

1. impairment of the quality of the natural environment for any use that can be made of it; and,
2. loss of enjoyment of normal use of property.

O.Reg.419 also sets desirable Ambient Air Quality Criteria (AAQCs) for various pollutants. The AAQCs are used to assess air quality and potential changes to it. The Standards Development Branch of the MOE publishes a set of guideline limits in *Summary of O.Reg.419 Standards and Point of Impingement Guidelines & Ambient Air Quality Criteria (AAQCs)* [MOE, 2005].

Federal Air Quality Objectives encompass three levels of air quality objectives: maximum desirable level (MDL), maximum acceptable level (MAL) and maximum tolerable level (MTL). The MAL is intended to provide adequate protection against effects on soil, water, vegetation, materials, visibility, personal comfort and well-being. The MAL is considered to be a realistic objective. When the MAL is exceeded, control action by a regulatory agency is indicated. Table 2.3 summarizes the applicable available criteria from the MOE and Environment Canada.

TABLE 2.3 AIR QUALITY CRITERIA FOR $PM_{2.5}$ AND NO_X

Contaminant	Averaging Time	MOE AAQC µg/m³ (ppb)	Federal AQ Objective or Maximum Acceptable Level (MAL) (µg/m³)
NO_x (as NO_2)	1 h	400 (200)	-
	24 h	200 (100)	-
	Annual	-	100[1]
$PM_{2.5}$	24 h	-	30 *

Notes NO_x – nitrogen oxides – sum of nitrogen dioxide (NO_2) and nitric oxide (NO)
$PM_{2.5}$ includes all particulate matter with an aerodynamic diameter less than 2.5 µm – considered respirable
[1] MAL is for NO_2
- Indicates no criterion available
* comes into force in 2010

Emissions of NO_x and $PM_{2.5}$ from the vehicles traveling on the freeway and the local service roads, other local arterial roadways, local industry and transboundary pollution from the southeastern United States have the greatest potential to impact local air quality. NO_x is the sum of nitrogen dioxide (NO_2) plus nitric oxide (NO). At present, there is no annual AAQC for NO_x, but there is a MAL for NO_2. The assessment was conservatively completed assuming that 100% of the NO_x is NO_2. Typically, NO_2 comprises approximately 60% of total NO_x. With respect to $PM_{2.5}$, the MOE does not currently have an AAQC for $PM_{2.5}$. Instead, they have adopted the Canada Wide Standard (CWS) for $PM_{2.5}$, which is a Federal air quality objective that comes into force in 2010. Unlike the POI criteria in Ontario Regulation 419, it is not a legally enforceable standard that can be applied to specific sources. However, non-attainment of the CWS may indicate that regional action is required to reduce emissions.

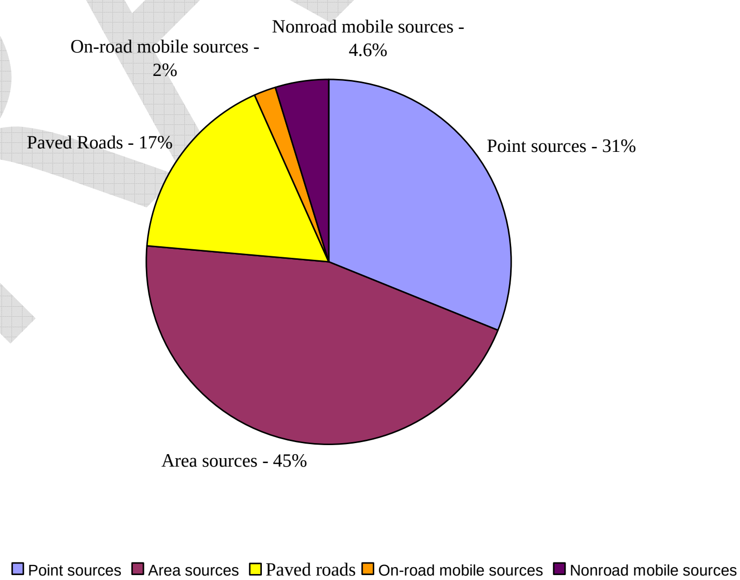
2.3 Existing Air Pollutant Concentrations

The Ontario Ministry of the Environment (MOE) measures air contaminants at various locations throughout Ontario, and reports on the state of Ontario's air quality on an annual basis. These reports are known as "Air Quality in Ontario" reports.

The existing air quality is greatly influenced by local and long range (cross-border) contaminants generated in upwind urban and industrial areas. The predominant wind directions in Windsor are from the west to southwest, which bring contaminants from the heavily industrialized areas of Detroit, nearby communities and beyond. Air quality impacts in the area are dominated by the substances that combine to produce smog or acid rain. This includes both NO_x and $PM_{2.5}$.

Figure 2.2 presents a breakdown of $PM_{2.5}$ emissions in Southwestern Ontario in 2005.

FIGURE 2.2 - $PM_{2.5}$ EMISSIONS IN SOUTHWESTERN ONTARIO (2000)



2.3.1 Ambient Monitoring Data

The MOE has historically operated a number of ambient air monitoring stations in Windsor. However, in recent years the number of fully operational stations has been reduced to two. These stations are located at:

1) 467 University Ave. (Station #060204 C);
2) College / South St. (Station #060211R);

To assess the existing air pollutant concentrations in the area, monitoring data from these two stations were obtained from the MOE [MOE 2000 - 2005]. The MOE AAQCs are based on NO_2 measurements rather than total NOx, thus the NO_2 data has been presented. Tables 2.4 and 2.5 present a summary of the measurements for NO_2 and $PM_{2.5}$ respectively.

TABLE 2.4 – FIVE YEAR SUMMARY OF MOE MONITORING RESULTS – NO_2

Station ID	Station Location	Averaging Period	Nitrogen Dioxide (µg/m³)					
			AAQC	Year				
				2001	2002	2003	2004	2005
#060211-R	College / South St.	Mean	-	39	37	INS+	33	32
		90th Percentile	-	66	62	69	62	62
		1-Hour Maximum	400	130	175	182	176	133
		24-Hour Maximum	200	83	116	92	79	109
#060204-C	467 University Ave.	Mean	-	36	36	INS	34	32
		90th Percentile	-	62	60	73	68	62
		1-Hour Maximum	400	163	130	150	182	124
		24-Hour Maximum	200	77	86	94	90	100

+ INS = Insufficient data available to compute a representative average

TABLE 2.5 - FIVE YEAR SUMMARY OF MOE MONITORING RESULTS – $PM_{2.5}$

Station ID	Station Location	Averaging Period	$PM_{2.5}$ ($\mu g/m^3$)					
			AAQC	Year				
				2001	2002	2003	2004	2005
#060211-R	College / South St.	Mean	-	-	11.8	9.6	9.5	10.5
		90th Percentile	-	-	26	20	21	24
		1-Hour Maximum	-	-	74	64	56	74
		24-Hour Maximum	30**	-	56	41	38	52
		No. of Times above Benchmark	-	-	18	7	9	9
#060204-C	467 University Ave.	Mean	-	9.4	9.8	8.5	8.6	10.4
		90th Percentile	-	20	21	19	19	24
		1-Hour Maximum	-	72	75	64	54	72
		24-Hour Maximum	30**	40	56	43	39	48
		No. of Times above Benchmark	-	7	10	5	8	12

** Canada Wide Standard, NOT AAQC

2.3.1.2 Existing Air Pollutant Concentrations in the Huron Church Rd/Hwy 3 Corridor

As part of the Environmental Assessment process, the DRIC team has established two ambient air monitoring stations in the study ACA, along the existing Huron Church/Talbot Rd. corridor. The purpose of the monitoring program is to collect data on the total pollutant concentrations that are routinely observed in the corridor, rather than specifically determine the fraction that originates from the roadway. This information will firmly establish the baseline air contaminant concentrations in the vicinity of the route. The monitoring program commenced in September 2006 and will continue until the end of September 2007.

The data are being used to:

- Establish current conditions within the corridor;
- Assist in determining background air concentrations of the pollutants being measured; and
- Benchmark the air dispersion modelling.

Table 2.6 presents a summary of the $PM_{2.5}$ and NO_x measurements collected from the two DRIC stations from October 1st, 2006 through December 31st, 2006.

TABLE 2.6 SUMMARY OF DRIC 1ST QUARTER MONITORING RESULTS

Pollutant	Averaging Time	Ontario Public Health Laboratory (OPHL)	St. Clair College (SCC)
NOx (1-hr)	Max	319	345
	Min	0	0
	Average	36	23
	90th percentile	71	47
NOx (24-hr)	Max	144	149
	Min	2	1
	Average	36	23
	90th percentile	57	39
PM2.5 (24-hr)	Max	48	42
	Min	8	8
	Average	21	20
	90th percentile	32	29

Note that the values collected at the DRIC monitoring stations are somewhat higher than those collected at the MOE monitoring stations. This is expected since the DRIC monitoring stations are located within the corridor, whereas the MOE stations are not. Thus the MOE stations are not influenced by the same volumes of traffic.

2.3.2 Contribution from Upwind / Background Sources

Air dispersion models provide an estimate of the air pollutant concentrations resulting from emission sources that are specifically included in the model set-up and inputs. Concentrations resulting from other, upwind sources are not included, but must be considered when assessing total expected air pollutant concentrations against relevant standards and guidelines. This is typically done by adding a "background component" to all model predicted results. The Ontario Ministry of the Environment (MOE) generally advocates the use of 90th percentile air pollutant concentrations, obtained from ambient air monitoring stations, for this purpose, as this is typically representative of background concentrations. The 90th percentile concentrations are then added to all model results.

Data on the existing air pollutant concentrations in the Windsor area were obtained from the two Ontario Ministry of the Environment (MOE) air monitoring stations located on College Street and on University Avenue. It is important to note that these stations are impacted by vehicle emissions from local roadways (University Avenue in particular) which results in somewhat higher concentrations than would be seen if only background sources were captured. If these stations were located within the Huron Church Road / Highway 3 corridor, they would not reflect upwind background conditions, and corridor vehicle emissions would be "double counted" since they are being modelled. However, the MOE two stations are far enough away from the corridor to effectively remove "double counting" of the emissions.

The 24-hour 90th percentile $PM_{2.5}$ and NO_x concentrations measured at these stations in the past four years were conservatively selected as the interim background concentrations, which were added to all model predicted results.

As can be seen in Tables 2.4 and 2.5 above, the average 90th percentile measured concentrations at the MOE stations are 69 and 73 ug/m^3, and 23 and 21 ug/m^3 for 1-hour NO_x and $PM_{2.5}$, respectively. The interim (first quarter) data from the two DRIC air monitoring stations were used in conjunction with the MOE monitoring data to select the background concentrations. As discussed above, since the DRIC monitors are located so close to the roadway (i.e. within the corridor), it is not appropriate to use the 90th percentile values from these stations as a measure of comparison for upwind, background sources. The DRIC monitors are primarily being affected by emissions from the corridor, and thus use of the 90th percentile values would effectively "double count" the emissions. Thus, the average measured concentrations were used. As shown in Table 2.6, the average measured concentrations at the DRIC stations for the first quarter of monitoring data (Oct 1 – Dec 31st, 2006) are 20 µg/m^3 and 30 µg/m^3 for $PM_{2.5}$ and NOx respectively. Thus, a value of 70 µg/m^3 was selected as the background NO_x concentration (based primarily on the MOE data, and a value of 20 µg/m^3 was selected as the background $PM_{2.5}$ concentration, based primarily on the DRIC monitoring data.

Table 2.7 presents a summary of the selected background concentrations.

TABLE 2.7 SUMMARY OF BACKGROUND CONCENTRATIONS USED IN DRIC AQ ASSESSMENT

Pollutant	Averaging Time		
	1-hour	24-hour	Annual
NO_x	70 µg/m^3	70 µg/m^3	-
$PM_{2.5}$	-	20 µg/m^3	9 µg/m^3

3.0 AIR DISPERSION MODELLING

Atmospheric dispersion modelling is an essential step in the air quality assessment process as it is the only way to evaluate the impact of future changes in air pollutant emission sources. With respect to the Detroit River International Crossing project, these changes include implementation of alternatives, changes in fuels, vehicle technologies and traffic volumes.

Dispersion modelling is used to predict atmospheric concentrations of pollutants at specific receptors downwind of the source of pollutants over specific averaging times (i.e. annual, daily, hourly). The process involves using a computer model to mimic the way pollutants are emitted from sources, and how the atmosphere disperses them. The model takes emissions from a source, estimates how high into the atmosphere they will go, how widely they will spread and how far they will travel based on hourly meteorological data. The model then outputs the pattern of concentrations that will occur at receptors located downwind of the source for various averaging times.

In general, the maximum air pollutant concentrations (rather than average concentrations) that are predicted to occur over specific time periods at each receptor are typically used to assess the impact of worst case meteorological conditions. This usually occurs during periods with light wind speeds, when atmospheric dispersion is poor.

3.1 Assessment Methodology

A large amount of data was required to complete the Air Quality Assessment in support of the evaluation of Practical Alternatives. This included data on existing air pollutant concentrations in the Windsor area, existing and future traffic volumes on the Huron Church Rd./Highway 3 corridor for each connecting route Alternative and Future No-Build scenarios, meteorological conditions in the Windsor area, and geographic information such as the location co-ordinates of roadways and sensitive receptors.

The necessary data was obtained from various sources, including other DRIC team members (i.e. traffic consultant, survey/mapping consultant), Environment Canada and the Ontario Ministry of the Environment (MOE).

The analysis was completed using the following approach:

1. Characterize Existing Environmental Conditions
    a. Acquire Meteorological Data

   b. Compile data on existing $PM_{2.5}$ and NO_x concentration
   c. Determine background concentrations

2. Acquire data on current and future car and truck traffic volumes
   a. Input to model - traffic data for existing and future conditions, including access road, plaza and crossing alternatives

3. Calculate pollutant emission factors for the highway corridor for existing and future conditions
   a. Input to model - vehicle emissions for each road considered in the assessment, for both $PM_{2.5}$ and NO_x

4. Use air dispersion modelling (CAL3QHCR) with meteorological data from Windsor Airport to determine future air pollutant concentrations in the vicinity of the corridor (essentially all of west Windsor) and at sensitive receptor locations (such as schools)

For the analysis of practical alternatives, an air dispersion model was set up for each of the alternative connecting routes, plazas, and crossings. The selected dispersion model was the CAL3QHCR model, which is specifically designed for roads and highways, and is approved for use in Ontario by the MOE. The model calculates emissions from moving vehicles differently from those that are queued and idling at intersections and customs plazas. The model also differentiates between "at grade", depressed and bridge sources.

The evaluation of Practical Alternative 3 required the assessment of tunnel ventilation buildings and emissions from the tunnel entrance and exit portals. The CAL3QHCR model is not appropriate for these emission sources, and thus another model was required. SENES evaluated the both the AERMOD and ISCST3 models for this purpose. While both models are appropriate to use in this assessment, the ISCST3 model was preferred since the same meteorological data file could be used for both models. Use of the AERMOD dispersion model would have required a different meteorological data file, which potentially could have introduced some inconsistencies since the outputs from both the CAL3QHCR and AERMOD/ISCST3 models were being combined. In order to avoid this potential problem, the ISCST3 air dispersion model was selected.

3.2 Model Inputs and Set-up

Air dispersion models typically require the following inputs: hourly meteorological data, receptor locations, source characteristics, and emission rates.

3.2.1 Meteorological Data

In order to simulate how air pollutants will disperse as they move away from a source, air dispersion models use hourly meteorological data over a five year period to simulate the possible meteorological conditions that are routinely experienced in a specific area. The data typically includes mixing height, temperature, cloud cover, cloud opacity, wind speed and wind direction. These were described in detail in Section 2.1.

For the assessment of Practical Alternatives, one set of model runs were conducted at the sensitive receptor locations using meteorological data from 2000 through 2004. Due to the large number of model combinations assessed and the required run times (>22 hours per year of meteorological data for the connecting routes alone) one maximum year was selected for use in all subsequent analyses, rather than five years. This was done by modeling a test case with the five years of meteorological data, and comparing the results.

The model results indicated that the meteorological data from 2003 resulted in the highest atmospheric concentrations for both contaminants evaluated (NO_x and $PM_{2.5}$). Thus, the analysis for all alternatives was completed using this single year of data. The 2003 windrose overlain on the 5-year wind rose (2000-2004) was presented in Figure 2.1. As can be seen in the figure, the 2003 windrose is similar to the 5-year average, except that the 2003 wind speeds are lower in the quadrants from WSW to SSW, and slightly higher in the ENE quadrant. This is consistent with the model results (i.e. slightly higher predicted concentrations) since lower wind speeds results in poorer dispersion conditions.

3.2.2 Receptors

A gridded network of receptors was created along the corridor at 100 m intervals that covered an area of 500 meters from the roadway on each side. In order to ensure that the worst-case effects were captured in the model results, several grids with different receptor spacing were used within this area. The first two rows of receptors were placed at 50 m intervals from the ROW, followed by 100 m intervals up to 500 m away. Another grid with 500 m x 500 m spacing was then overlaid to cover the rest of the modelling domain, which was essentially all of west Windsor. Any receptors that fell within the ROW were removed to prevent erroneous model results, as the models do not accurately predict air pollutant concentrations at locations on a source (i.e. on the roadway). Sensitive receptors (schools, churches, parks, etc.) were also identified and included in the model runs. A total of 2484 receptors were used in each model run completed for the analysis.

3.2.3 Source Characteristics and Emissions

Each emission source included in an air dispersion model is described and input separately. Source characteristics required for input to the CAL3QHCR model include road segment identification with geographic coordinates, segment width, traffic volumes for free-flowing and idling traffic, and emission factors, which represent vehicle emissions in grams per vehicle kilometer travelled. Additional information on signal timing and intersection capacity was required for road segments where vehicles queue, such as intersections. The Universal Transverse Mercator (UTM) (geographic) coordinates of all road segments and intersections were determined from digital orthographic aerial photographs combined with AutoCAD drawings of the proposed connecting route, plaza and crossing alternatives. All elements were combined in a Geographic Information System (GIS) for data maintenance. Over 700 free-flowing roadway sources (i.e. Highway 401, sections of Huron Church Road, etc.) and almost 150 queue sources (i.e. signalized intersections where vehicles wait for a green light) were included in each model run for the assessment of the connecting route alternatives.

3.2.3.1 Roadway Segments Considered in the Assessment

The dispersion modeling analysis considered a large number of existing roads and roadway segments, in addition to new, or modified roads that will be constructed through implementation of the alternatives. These are as follows:

Roads North of EC Row Expressway

Huron Church Road and all major intersecting roads along Huron Church were considered from the EC Row Expressway up to Riverside Drive. This includes the existing Ambassador Plaza, and local roads in the immediate vicinity of the Plaza. The roads that were included in the assessment are listed below:

- Riverside Dr.
- University Ave.
- Wyandotte St.
- Patricia Rd. / Union St. / Sunset Ave.
- College Ave.
- Millen St.
- Girardot St.
- Tecumseh Rd.
- Dorchester Rd.
- Prince / Totten Rd.
- Malden Rd.
- Industrial Dr.

In addition, all traffic on the Canadian side of the Ambassador Bridge and through the Ambassador Plaza was included in the assessment.

Roads South of EC Row Expressway

Huron Church Road, Talbot Road/Highway 3 and all major intersections south of EC Row Expressway along the Huron Church / Highway 3 corridor were also included in the analysis. These are as follows:

- Spring Garden Rd./ Labelle St.
- Lambton St./ Grand Marais Rd.
- Pulford St.
- Reddock Ave
- Todd Ln / Cabana Rd.
- Huron Line
- Geraedt's Rd.
- Cousineau Rd. / Sandwich Pkwy West
- Montgomery Dr.
- Surrey Dr.
- Grosvenor Rd.
- Howard Ave.
- Outer Dr.
- 6th Concession
- Roseland Dr.
- Eastbourne Ave.
- North Talbot Rd.
- Tuson Way

Roads in the Vicinity of Ojibway Parkway

The EC Row Expressway and Ojibway Parkway also formed part of the road network included in the assessment. A number of local roads in the vicinity of these major arteries were also assessed. They are as follows:

- EC Row Expressway
- Ojibway Parkway

- Malden Rd.
- Matchette Rd.
- Broadway St. (E & W)
- Chappus St.
- GN Booth Dr.
- Sandwich St.
- Prospect Ave.
- Beech St.
- Russel St.
- Armanda St.
- South St.
- Chippewa St.
- Brock St.

In order to represent each roadway in the air dispersion model, the geographic co-ordinates of the first and last point of each roadway segment (which were often comprised of several links) for each traffic flow direction had to be coded into the model input files. This was done using ArcView GIS in combination with digital orthographic aerial photography and geo-referenced AutoCAD drawings of each alternative to manually select the start and end points of each of the over 700 roadway links included in the modeling. It is important to note that the roadway links for each connecting route alternative differed, due to variations in route alignments, locations of service roads, etc. Thus the co-ordinates for each connecting route alternative had to be coded manually for essentially all of the segments included in the models.

A map showing the network of existing roadways included in the analysis is shown in Figure 3.1.

FIGURE 3.1 - MODELLED ROAD NETWORK – EXISTING ROADWAYS

3.2.3.2 Traffic Volumes

Annual Average Daily Traffic (AADT) volumes for the roadways outlined above was provided by IBI Group, the DRIC team traffic consultant for existing, baseline conditions (2006) and the future no build cases for 2015, 2025 & 2035. Traffic data was also provided for each connecting route, plaza and crossing alternative in each of these years, which reflects the anticipated changes resulting from implementation of the alternatives.

A selection of traffic volumes from the main routes considered in this assessment is presented below in Table 3.1 to illustrate the relative magnitude of the volumes. The full record of traffic data used in the assessment is presented in Appendix A. These data form the basis of the emission calculations used in the dispersion modeling analysis.

TABLE 3.1 SUMMARY OF TRAFFIC VOLUMES ON MAIN ROADS

LOCATION	SECTION	SCENARIO	24-HOUR AADT							
			2006		2015		2025		2035	
			CARS	TRUCKS	CARS	TRUCKS	CARS	TRUCKS	CARS	TRUCKS
Huron Church Rd / Talbot Road	North of ECR (Malden)	No Build	46619	10495	51466	15109	50865	19582	50178	23384
		Alternatives	0	0	58313	3352	60655	3876	63147	4592
	Grand Marais	No Build	38142	10685	40771	15164	43485	18702	44116	22369
		Alternatives	0	0	16732	245	18689	323	19884	351
	Todd/Cabbana	No Build	33454	8049	35160	11484	37285	13728	38494	16010
		Alternatives	0	0	15378	203	17269	227	18615	246
	Howard	No Build	24217	6349	24229	9039	23549	11054	23159	13246
		Alternatives	0	0	15282	21	16601	49	16979	73
Hwy 401 Mainline	Todd/Cabbana to Grand Marais	Alternatives	0	0	39481	11976	45994	16720	49632	20509

Daily profiles of car and truck traffic on different roadway types (i.e. highway, major arterial, local roads) were also provided, which were used to convert the AADTs into hourly volumes. These hourly volumes of domestic and international cars and trucks on each roadway segment were used to estimate emissions of $PM_{2.5}$ and NO_x from each source. Separate weekday and weekend traffic patterns were provided to SENES by IBI and used to represent actual expected traffic conditions. Idling traffic volumes and queue lengths were calculated by the CAL3QHCR air dispersion model based on the number of vehicles that approach an intersection, the signal timing and the capacity of each intersection. The vehicles approaching an intersection queue were conservatively assumed to be same as the free-flowing traffic volume.

3.2.3.3 Vehicle Emissions Estimates

Emissions from vehicles traveling on public roadways account for a significant portion of the smog producing air pollutants in North America. Although tailpipe emissions are the major source of gaseous pollutants (such as NOx) from these sources, they are not the major source of particulate emissions. In most cases, tailpipe emissions are a small fraction (<5%) of the total particulate emissions from roadways during free-flow traffic conditions. As cars and trucks travel over the surface of a roadway, there are many sources that contribute to overall particulate emissions. These include road abrasion and degradation, tire & brake wear, and soil/mud/debris that is deposited on the surface, in addition to tailpipe emissions. This is collectively known as surface resuspended particulate. When vehicles queue and idle, the particulate emissions are 100% from the tailpipe, as there are no emissions from the roadway surface if the vehicles are not moving. Idling cars emit approximately 4X more particulate than free-flowing cars, whereas idling diesel trucks emit over 25X more particulate than free-flowing diesel trucks. However, they generally queue for shorter periods of time than they are free-flowing, unless the roadways are completely congested. However, the inclusion of queuing in the analysis is an important consideration.

Emission factors were developed separately for vehicle exhaust and surface roadway emissions (i.e. road dust) using Environment Canada's MOBILE 6.2C model and USEPA emission factor methodologies (i.e.AP-42). Separate emission factors were developed for cars and trucks, and incorporate:

- regulatory changes in fuels and engine technologies;
- differences in Canadian and U.S. fuels and vehicles; and
- Canadian and U.S. fleet turnover rates.

Recent and on-going improvements in emission control technologies and fuels will combine to substantially reduce the emissions from transportation sources. As of June 2006, the maximum amount of sulphur in on-road diesel fuel was reduced from 500 mg/kg to 15 mg/kg. These reductions were necessary for Canadian sulphur levels in on-road fuels to be consistent with U.S. levels, and to ensure that advanced emission control technologies on newer engines would be effective. In January 2007, additional engine standards for heavy-duty vehicles came into effect. These standards reduce NOx and particulate matter emissions by 60% and 90% respectively over existing levels, and require the incorporation of additional emission control technologies on these newer engines to effect these reductions.

Since the assessment spans a large area with a number of different types of roads, the development of the emission factors considered appropriate vehicle speeds for each road type. Different emission factors were applied to each road based on the current or future assumed posted speed limits. The assessment also spans a long period of time, over which several regulated changes to fuel characteristics and vehicle engine technologies will occur. Although the effect of fuel changes on emissions occurs immediately following the implementation of the changes, technological changes require several years before the effects of the changes are fully observed. As such, the historical vehicle fleet turnover rates from the Detroit and Windsor areas were used to reflect the impacts of technological changes on vehicle emissions.

Table 3.2 presents a summary of the emission factors used in this assessment. Cars and trucks entering Canada from the U.S. were assumed to have U.S. vehicle and fuel characteristics, whereas cars and trucks exiting Canada were assumed to have Canadian vehicle and fuel characteristics. These assumptions are expected to adequately represent the fleet characteristics and emissions in the Windsor area, particularly on a daily basis, as some vehicles will both exit and enter on the same day. The complete database of emission factors, fleet turnover information and other assumptions used in the MOBILE6.2C model can be found in Appendix B. Sample calculations are presented in Appendix C.

TABLE 3.2 SUMMARY OF EMISSION FACTORS USED IN THE ASSESSMENT

Pollutant	Speed (km/h)	Surface Emissions (g/VKT)	Tailpipe Emission Factors (g/VKT)											
			Canadian Cars			Canadian Trucks			U.S. Cars			U.S. Trucks		
			2015	2025	2035	2015	2025	2035	2015	2025	2035	2015	2025	2035
NO_x	Idle*		1.32	0.63	0.58	113.68	115.42	115.42	1.20	0.59	0.52	111.9	115.65	115.65
	25		0.44	0.20	0.18	2.35	0.46	0.34	0.40	0.19	0.16	1.9	0.50	0.34
	50		0.40	0.18	0.17	2.02	0.39	0.29	0.36	0.17	0.15	1.7	0.43	0.29
	75		0.49	0.21	0.19	2.91	0.57	0.43	0.44	0.20	0.17	2.4	0.63	0.43
	100		0.49	0.21	0.19	2.91	0.57	0.43	0.44	0.20	0.17	2.4	0.63	0.43
$PM_{2.5}$	Idle*	0	0.0086	0.0066	0.0065	1.0684	0.3140	0.1554	0.0086	0.0067	0.0065	1.1543	0.4342	0.1557
	25	0.233*	0.0021	0.0016	0.0016	0.0129	0.0062	0.0058	0.0021	0.0016	0.0016	0.0119	0.0063	0.0058
	50		0.0021	0.0016	0.0016	0.0129	0.0062	0.0058	0.0021	0.0016	0.0016	0.0119	0.0063	0.0058
	75		0.0021	0.0016	0.0016	0.0129	0.0062	0.0058	0.0021	0.0016	0.0016	0.0119	0.0063	0.0058
	100		0.0021	0.0016	0.0016	0.0129	0.0062	0.0058	0.0021	0.0016	0.0016	0.0119	0.0063	0.0058

* $PM_{2.5}$ surface emissions based on typical freeway link

In regards to traffic movements, the following additional assumptions were made:

- Vehicles on Highway 401 will be moving in a free-flowing state;
- Vehicles on service roads (and north of EC Row) will generally move in free-flow, but will queue at signalized intersections;
- Inbound vehicles at the customs plaza will queue at booths; and
- Outbound vehicles at the customs plaza will not queue.

3.2.3.4 Customs / Inspections Plazas

The traffic conditions at the customs plazas were modeled using the same queuing algorithm that was used for the intersections. Volumes of cars and trucks entering Canada from the U.S. as well those leaving Canada were provided to SENES by IBI for the years 2015, 2025, and 2035.

The amount of queuing at the plazas was estimated using the hourly traffic volume and the number of booths that are open during each hour, in addition to the average duration of each vehicle at a booth. The number of booths open in each hour was assumed to be a function of the traffic volume entering the plaza. Queues of cars and trucks form at car and truck booths respectively, and thus were modelled separately. Design information regarding plaza operations and vehicle timings were provided by Stantec.

With respect to plaza queuing, the following assumptions were used:

- Each truck requires 60 seconds at the customs booths
- Each car requires 45 seconds at the customs booths
- There is always queuing (idling) at the booth due to the one vehicle in the booth being inspected.
- Number of open booths assumed to be slightly less than capacity, such that some minimal queuing (2 or 3 cars or trucks) is always occurring at open booths.
- During periods where the capacity of the plaza is exceeded, longer queues form back towards the plaza entrance.

Groups of queue links were set up for each plaza car and truck lane based on an equal hourly distribution of free flow traffic through each booth that is open during a given hour. The groups extended back away from the booths to accommodate longer and longer queue lengths, as necessary. Each queue link was then manually “turned on” or “off” by calculating the number of vehicles queued at the open booths.

Based on the methodology and assumptions outlined above, and the inbound traffic volumes through the plaza provided by IBI, the maximum number of plaza booths open at any given time was 17 truck booths and 9 car booths at any of the new Customs/Inspection Plaza Alternatives.

The same methodology was applied to the Ambassador Plaza for the future no-build scenarios and all of the connecting route alternatives. Using this approach, the queue lengths at the Ambassador often extended all the way back and onto the Ambassador Bridge and Huron Church Road for the future no-build scenarios, which is what would be expected.

3.2.3.5 Tunnel Ventilation Buildings and Portal Emissions

The tunnel ventilation buildings are not a roadway source, and thus require the use of a different model. As described above, the ISCST3 model, which is used for assessing the impact of stationary emission sources such as industrial stacks, was used to model emissions from the tunnel entrance / exit portals and ventilation buildings. The conceptual design of the tunnel is based on the premise that emissions should not escape from the portals (i.e. exhaust flow is always greater than supply flow, such that air is continually drawn into the tunnel through the ramps and portals). However, there is a "piston effect" as cars drive out of the tunnel, which will result in some emissions from these areas. A total of 5% of the emissions were assumed to escape from the tunnel at these portal locations.

Based on the tunnel configuration, there are 10 locations where emissions may exit the tunnel. These are entrance/exit portals at on and off ramps, as well as two main entrance and egress locations (one at the approximate present terminus of Highway 401 [which is combined with an entrance portal] and one immediately west of the intersection of Huron Church Rd and EC Row Expressway). The main entrance and egress locations were assumed to be comprised of two separate tunnel "tubes". The 5% of the emissions that were assumed to escape from the portals were assumed to be evenly apportioned over these 10 locations. For the "Jet Fans" option, 100% of tunnel emissions were assumed to be emitted from these openings, and the emissions were evenly apportioned over the 10 locations.

As outlined earlier, there are three options for tunnel ventilation buildings (VBIA, VBIB, VBIC). Each of these has a slightly different conceptual design and thus each option was modelled to assess whether there are any differences in the potential affects to air quality. Mitigation options were not considered in this phase of the assessment.

The basic assumptions were as follows:

- The ventilation systems collect 95% of the total emissions from the tunnel
    - All collected emissions were discharged from the vent stacks
    - Vent building height is 18 m

- Stack height is 45 m (from the ground surface)
- Options VBIA & VBIA have two ventilation buildings
    - Emissions were apportioned equally between the two buildings
- Option VBIC has one ventilation building

The locations of each of the ventilation building options were presented earlier in Figure 1.3.

The ISCST3 model input files were completed and run for each of the tunnel ventilation scenarios. The hourly predicted concentrations from the vent buildings and portals were then added to the hourly predicted concentrations from the surface roadway sources (i.e. re-build Huron Church Road / Highway 3 corridor from the CAL3QHCR model) plus ambient background background concentrations to determine the total model predicted concentrations.

3.2.4 Model combinations

The work undertaken for this project required an assessment of local impacts, as well as an assessment of end-to-end solutions. The length of the model run times (i.e. computer time) and the number of possible combinations of connecting route, plaza and crossing alternatives would require an extraordinary amount of time effort to model each possible end-to-end combination. In addition, separate model runs are required for each pollutant ($PM_{2.5}$ and NO_x).

In order to complete all of the necessary model runs, the models were run in blocks of roadway/facility type. For each pollutant, separate runs were set up for each connecting route alternative, each plaza/crossing combination, and separate connections to the plazas from Highway 401. In addition, there are two alignment alternatives (Option 1 & Option 2) for four of the connecting routes, and four tunnel ventilation options. Also, all model runs had to be completed for three horizon years (2015, 2025 & 2035).

These model runs were completed on the same receptor network, and the results were output as hourly and/or daily values for the entire year of meteorology, at each receptor. The model results for each necessary combination of blocks were then added together to provide the hourly or daily maximum concentrations. A computer program was developed using the Linux operating system to overlay the necessary files. The combinations considered in this assessment are outlined below.

Connecting Routes

- Future No-Build, Alternatives 1A (Opt 1 & 2) , 1B (Opt 1 & 2), 2A (Opt 1 & 2), 2B (Opt 1 & 2), 3 (VB1A), 3 (VB1B), 3 (VB1C), 3 (jet fans) = 13 connecting route alternatives x 2 pollutants x 3 years = 78 model runs

Plazas & Crossings

- Alternatives PA-A, PA-B, PA-C, PB-C, PB1-B, PB1-C, PC-C = 8 combinations x 2 pollutants x 3 years = 48 model runs

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Connections to Plazas

- Alternatives 1A – PA, 1A – PB/C, 1B-PA, 1B-PB/C, 2A/2B-PA, 2A/2B-PB/C, 3-PA, 3-PB/C = 8 alternatives x 2 pollutants x 3 years = 48 model runs

It should be noted that Huron Church Road north of EC Row Expressway and the Ambassador Bridge/Plaza were included in each model run for all of the connecting route alternatives.

As can be seen above, a total of 174 model runs were completed to evaluate the potential impacts of the proposed alternatives on air quality. If all end-to-end combinations were assessed, rather than the approach described above, almost double the number of model runs would have been required.

A model input file was prepared for each necessary run, as outlined above and run using one year of meteorological data (2003). The models were run on the Linux operating system, which offers more flexibility and memory in terms of processor use, file storage and manipulation of large data files. Data and file storage and management were significant issues in the completion of this project, since over 200 GB of numerical data were generated through the model runs alone.

Once the model runs were complete, the data was post-processed by adding the necessary data component results together (i.e. connecting route + connection to plazas + plaza/crossing) to form complete end-to-end results. The summed results were then imported into a GIS system for each combination such that the data could be interpreted in different areas along the connecting route, at various distances away from the ROW of each alternative.

4.0 Overview of Model Results

As discussed earlier, air dispersion models calculate air pollutant concentrations at the receptor locations specified by the user in the model inputs. For this project two gridded networks of receptors were used along the roadway, as well as specific sensitive receptor locations. This chapter presents the results of the air dispersion modeling that was undertaken for each alternative.

The results from the No Build Alternative represent the predicted air quality conditions that will occur if no transportation improvements are undertaken in the corridor. Thus, all results have been presented in relation to this condition, such that the expected change in air quality (i.e. air pollutant concentrations) is apparent. Both worst case (maximum 24-hour) conditions and typical (annual average) conditions were evaluated.

For each pollutant and averaging time being evaluated, the magnitude of the maximum model predicted concentrations for each alternative and year are presented as percentages of the predicted concentrations for the No Build Alternative. Differences of less than +/- 10% (nominally 2 - 3 ug/m^3 for $PM_{2.5}$ and 15 – 30 ug/m^3 for NO_x) were deemed to be within model tolerances and thus were considered to represent "no change" over No Build. Since the route alignments are Right of Way differed for many of the Alternatives, the results have been presented at defined distance intervals of 50 m, 100 m and 250 m from the ROW for comparative purposes. In many cases, this occurred at different model receptors for different Alternatives, since a receptor that was located 50 m from the ROW for one Alternative could have been within the ROW of another one.

In addition, where the concentrations exceed Federal or Provincial standards, objectives or guidelines, the change in the number of times the concentration was predicted to exceed (i.e. number of exceedances) was also reported, relative to the No Build Alternative. These measures were used to assess the potential impacts of any predicted changes to air quality.

Achievement of the Canada Wide Standard (CWS) is based on no more than 8 24-hour periods with concentrations greater than 30 ug/m^3. Thus, only results with greater than 8 exceedances were deemed to be in exceedance of the standard. In addition, the 8 day threshold was used to assess the significance of any changes in the number days predicted to be greater than 30 ug/m3 in comparison to No Build (i.e. if an Alternative had 9 exceedances less (or more) than No Build, this difference was deemed to be significant, regardless of the total number of exceedance days). In addition, any exceedance of the annual criterion of 15 ug/m^3 was deemed to be significant for the purpose of this assessment.

The results are presented separately for the Access Road alternatives, Customs/Inspection Plazas and Crossings.

4.1 Access Road Alternatives

Tables 4.1 through 4.10 present the results of the air dispersion modelling for each of the connecting route alternatives. In order to compare microscale differences between the different alternatives, the results of each access road alternative will be presented and discussed in relation to specific areas along the route, starting east of the present Highway 401 terminus and ending at three potential river crossing locations. These are as follows:

- Highway 401/Highway 3 to Howard Avenue
- Howard Avenue to Cousineau Road
- Cousineau Road to Lennon Drain
- Lennon Drain to Pulford Street
- Pulford Street to Malden Road

All Access Road Alternatives commence at the existing Highway 401 terminus, and end at Malden Road south of EC Row Expressway.

The results are presented at increasing distances/offsets at 50 m, 100 m and 250 m from the ROW to provide an indication about how quickly the concentrations will decrease as you move away from the roadway.

The results presented below generally follow the expected trends based on the changes in the emission factors and increases in traffic volumes over time. The concentrations generally decrease as the distance from the roadway increases; the $PM_{2.5}$ concentrations increase with time, as traffic volumes are predicted to increase from 2015 through 2035, and NOx concentrations decrease over time as the emission factors are going to be significantly reduced in the future, such that emissions are lower than 2015, regardless of predicted traffic growth.

It should be noted that the roadway and ramp alignments are essentially identical between Highway 401 and Howard Avenue for all non-tunnel alternatives. As a result, the maximum predicted concentrations and the changes in relation to No

Build are the same for these Alternatives, and thus any variations in the model predicted concentrations are likely due to slight differences in the forecasted traffic volumes for each alternative, in addition to some residual effect of emissions that occur in the previous segment. Therefore, the results will only be discussed in Section 4.1.1 for Alternative 1A. However, the results are applicable to Alternatives 1B, 2A and 2B for this area. The presence of the tunnel entrance and exit portals influences the concentrations in this area. The resulting differences will be discussed in Section 4.1.5 for Alternative 3 (tunneled access road).

As outlined previously, four separate tunnel ventilation options were examined. The results indicate that the location of the ventilation buildings does not have a significant affect; the locations of the entrance and exit portals have a higher impact on the results. The results of the "Jet Fans" tunnel ventilation option indicated that this option produced unacceptably high $PM_{2.5}$ and NO_x concentrations, and thus will not be discussed in detail in this report. Thus, the results will be discussed in the context of only one of the ventilation options (VB1A).

4.1.1 Alternative 1A

As discussed previously, access road Alternative 1A is an at grade freeway with one-way service roads located on either side. The freeway is depressed where local arterial roads cross over it, such that these bridges are at-grade, rather than elevated.

The dispersion modeling results for Alternative 1A are presented in Tables 4.1 and 4.2 for $PM_{2.5}$ and NO_x respectively. The maximum predicted NOx concentrations are below the MOE AAQCs for both averaging periods (1-hour and 24-hour) at all locations along Alternative 1A.

4.1.1.1 Highway 401/Highway 3 to Howard Avenue

This segment represents the continuation of the existing Highway 401 alignment from Highway 3 to Howard Avenue. The emissions in segment are dominated by the freeway mainline and the on/off ramps for all alternatives. There is little difference between the non-tunnel Alternatives in this segment, as the ramp configurations do not change for any of the alternatives.

As can be see in the tables, the maximum predicted concentrations of $PM_{2.5}$ are the same or less than the No Build option at 50 m away from the Right of Way, but are slightly higher than No Build at 100 and 250 m away. However, these differences are less than 10% and thus are considered to be the same as the No Build Alternative.

The annual average (rather than maximum) $PM_{2.5}$ concentrations in this area are predicted to be the same or less than No Build at all distances from the ROW; but once again these differences are less than 10%. There are slight reductions in the number of days predicted to exceed the CWS at 50 m away from the ROW in 2025 and 2035. However, these differences are less than 8 days, and thus are not considered to be different than the No Build Alternative. There is no change in the number of days predicted to be greater than the CWS at 100 m and 250 m away from the right of way in all horizon years.

As mentioned previously, all predicted NOx concentrations are below the relevant MOE AAQCs, and are below the No Build concentrations.

Overall, these results indicate a slight improvement in air quality in the area over the No Build Alternative (i.e. reduced NOx, lesser exceedances), but are generally very similar to No Build.

4.1.1.2 Howard Avenue to Cousineau Road

This segment covers the area along the route between Cousineau Road and Howard Avenue. In this phase of the assessment, two separate alignment options (Option 1 and Option 2) were studied along the access road between Howard Avenue and St.Clair College. The first route alignment (Option 1), realigns the existing Talbot Road / Highway 3 corridor slightly to the northeast. This realignment begins at approximately at Howard Avenue and continues approximately to the entrance to St.Clair College.

The Option 2 alignment utilizes the existing Talbot Road / Highway 3 corridor as local access service roads without any realignment and aligns the freeway to the southeast.

The model results for each Option that was studied, for all horizon years are found in Tables 4.1 and 4.2, presented earlier.

The Tables illustrate that at 50 m from the ROW, the maximum predicted $PM_{2.5}$ concentrations are lower than the No Build Alternative in all horizon years, but are marginally higher at 100 and 250 m away. However, with the exception of

2035, the differences in these results are less than 10%, and thus are not considered to be different than No-Build. Also, the number of days predicted to be greater than the CWS is less than No Build at 50 m away in 2035, and generally the same as No Build at 100 and 250 m away. Annual average (typical) concentrations are considered to be the same as No Build up to 250 m from the ROW.

The NOx results are somewhat different, as all predicted concentrations at all distances are less than No Build.

With respect to the differing alignments, there is no difference in the maximum predicted $PM_{2.5}$ concentrations between Option 1 and Option 2 alignments. However, the Option 2 alignment results in an even greater reduction in the number of days predicted to exceed the CWS at 50 m from the ROW. Thus, the Option 2 alignment would be slightly preferred.

Overall, these results indicate a slight improvement in air quality in the area over the No Build Alternative (i.e. reduced NOx, lesser exceedances), but are generally very similar to No Build.

4.1.1.3 Cousineau Road to Lennon Drain

This segment represents the area between the Lennon Drain and Cousineau Road, and encompasses the St.Clair College area. For many Alternatives this includes freeway on and off ramps in addition to increased daytime/weekday traffic as staff and students enter the facility. As discussed earlier, two roadway alignment options were studied for part of this area.

For this Alternative, the results in this area are generally similar to those seen between Howard Avenue and Cousineau Road. With two exceptions, the maximum predicted $PM_{2.5}$ concentrations for this alternative are the same or marginally higher than the No Build Alternative at up to 250 m from the ROW. The concentrations are marginally higher than No-Build at 100 m from the ROW in 2015 and 2025.

Maximum predicted 1-hour NOx concentrations are less than the No Build Alternative at all horizon years at 50, 100 and 250 m from the ROW.

The differing Option 1 and Option 2 alignments result in similar maximum predicted $PM_{2.5}$ concentrations, but the Option 2 alignment results in an even greater reduction in the number of days predicted to exceed the CWS at 50 m from the ROW. Also, maximum predicted NOx concentrations are distinctly lower with the Option 2 alignment.

These results indicate a slight improvement in overall air quality in the area; however, in general there is not a large difference between Alternative 1A and the No Build Alternative.

4.1.1.4 Lennon Drain to Pulford Street

This area encompasses the access road from approximately Todd Lane/Cabana Road up to Pulford Street. The maximum predicted $PM_{2.5}$ concentrations in this area are lower than the No Build Alternative at 50 m from the ROW, and are the same as No Build at 100 and 250 m away. There are no differences in the annual average concentrations at these distances in all years. However, at 50 m from the ROW there are significant reductions over No Build in the number of days predicted to exceed the CWS.

Maximum predicted NOx concentrations are below than the relevant MOE AAQCs, and are less than the No Build Alternative at all distances and horizon years studied.

These results indicate a noticeable improvement in overall air quality in the area through the implementation of Alternative 1A.

4.1.1.5 Pulford Street to Malden Road

Due to its size and differences in the sources, this area was split into two separate sections for the AQ assessment. These are:

- Pulford St. – Labelle St. The air quality in this area is potentially affected by the new freeway and service roads.
- Labelle St. – Malden Rd. The air quality in this area is potentially affected by the presence of EC Row Expressway and the numerous on/off ramps to it and those between EC Row and the new freeway.

Thus, the results have been presented separately for each of the sections.

In addition, two different roadway alignments were studied to capture potential differences in air quality due to the differing alignments for Plaza A versus Plaza B/C Alternatives.

4.1.1.5.1 Pulford Street – Labelle Street

There are no differences in the maximum and annual average predicted $PM_{2.5}$ concentrations in this segment versus the No Build Alternative. All concentrations are within 10% of the No Build value and thus there is not considered to be any change. Also, the number of days predicted to be greater than the CWS are the same or slightly higher than the No Build Alternative in this area. This is the case for both alignments that were considered.

At 50 m from the ROW, the maximum predicted NOx concentrations for this Alternative are less than the No Build Alternative. However, the Plaza B alignment results in reduced 1 hour maximum NOx concentrations at all three distance intervals studied. Also, in comparison to the Plaza A alignment, the Plaza B alignment results in fewer days that are predicted to exceed the CWS. Thus, in this area the Plaza B/C access road alignment is slightly preferred.

These results indicate a slight improvement in overall air quality in the area; however, in general there is very little difference between Alternative 1A and the No Build Alternative.

4.1.1.5.2 Labelle Street – Malden Rd.

The results in this area are similar to those seen in the Labelle / Pulford area. In general, there is no difference in the maximum predicted and annual average $PM_{2.5}$ concentrations in relation to No Build. However, there is a significant reduction in the number of days predicted to exceed the CWS at 50 m from the ROW. This is true for both the Plaza A and Plaza B/C alignments.

Predicted maximum 1 hour NOx concentrations are less than the No Build Alternative at 50 and 100 m from the ROW for the Plaza B/C alignment, whereas the 24-hour maximum concentrations were less than No Build only at 50 m from the ROW. For the Plaza A alignment, the maximum predicted 1 hour NOx concentrations were less than the No Build Alternative at all three distance intervals in all horizon years, and the maximum 24-hour concentrations were less than No Build at both the 50 and 100 m distance intervals.

Also, in comparison to the Plaza B/C alignment, the Plaza A alignment results in fewer days that are predicted to exceed the CWS. Thus, in this area the Plaza A access road alignment is slightly preferred.

These results indicate a slight improvement in overall air quality in the area; however, in general there is very little difference between Alternative 1A and the No Build Alternative.

4.1.2 Alternative 1B

Access road Alternative 1B is very similar to Alternative 1A. One way service roads are located on either side of a below grade freeway. There are differences in the location of some of the on/off ramps between 1A and 1B, which results in some differing AQ effects in these areas.

The dispersion modeling results for Alternative 1B are presented in Tables 4.3 and 4.4 for $PM_{2.5}$ and NO_x respectively. The maximum predicted NOx concentrations are below the MOE AAQCs for both averaging periods (1-hour and 24-hour) at all locations along Alternative 1B.

4.1.2.1 Howard Avenue to Cousineau Road

As mentioned previously, this segment covers the area along the route between Cousineau Road and Howard Avenue. The model results for each Option that was studied, for all horizon years are found in Tables 4.3 and 4.4, presented earlier.

The Tables illustrate that for the Option 1 alignment, at 50 m from the ROW the maximum predicted $PM_{2.5}$ concentrations are lower than the No Build Alternative in all horizon years, but the same as No Build at 100 and 250 m away. However, these differences are only considered to be different than No-Build in 2035 since these are the only changes greater than 10%. Also, the number of days predicted to be greater than the CWS is less than No Build at 50 m away in all years, and the same as No Build at 100 and 250 m away. Annual average (typical) concentrations are considered to be the same as No Build up to 250 m from the ROW.

The maximum predicted 1-hour NO_x concentrations presented in Table 4.4 are less than the No Build Alternative at all distances in all years, with one exception. The change in concentration is less than 10% in 2015 at 250 m from the ROW, and thus it is considered to be the same as No Build. The maximum predicted 24-hour concentrations are less than No Build at up to 100 m from the ROW in all years studied.

In this area, there is a slight difference between the maximum predicted $PM_{2.5}$ concentrations for the Option 1 and Option 2 alignments. The Option 2 alignment results in marginally lower concentrations and a greater reduction in the number of days predicted to exceed the CWS at 50 m from the ROW for all years studied. Also, the 1-hour NOx concentrations are also marginally lower with the Option 2 alignment in 2015 and 2025.

4.1.2.2 Cousineau Road to Lennon Drain

For this Alternative, the results presented in Tables 4.3 and 4.4 show that with one exception, the maximum predicted $PM_{2.5}$ concentrations are the same as the No Build Alternative at all distance intervals for all years. In the year 2035, the concentrations are different than No Build at 50 m from the ROW for both the Option 1 and Option 2 alignments. During this period, the Option 2 alignment results in a slight reduction in the number of days predicted to exceed the CWS.

Maximum predicted 1-hour NOx concentrations are less than the No Build Alternative at all horizon years at 50, 100 and 250 m from the ROW for both alignment Options. The maximum predicted 24-hour average concentrations with Option 1 are lower than No Build at 50 and 100 m away from the ROW in years 2025 and 2035, and additionally in 2015 with Option 2. Also, the maximum predicted 1-hour NO_x concentrations are distinctly lower with the Option 2 alignment.

4.1.2.3 Lennon Drain to Pulford Street

This area encompasses the access road from approximately Todd Lane/Cabana Road up to Pulford Street. In 2015 and 2025, the maximum predicted $PM_{2.5}$ concentrations are lower than No Build at up to 100 m from the ROW. In 2035, the concentrations in this area are different than the No Build Alternative only at 50 m from the ROW and are the same as No Build at 100 and 250 m away. There are no differences in the annual average concentrations at these distances in all years. However, at 50 m from the ROW there are significant reductions over No Build in the number of days predicted to exceed the CWS.

Maximum predicted 1-hour NOx concentrations are below than the relevant MOE AAQCs, and are generally less than the No Build Alternative at all distances and horizon years studied. The maximum predicted 24-hour concentrations are less than No Build at distances up to 100 m from the ROW in 2015 and 2025, and up to 250 m away in 2035.

4.1.2.4 Pulford Street to Malden Road

As outlined earlier, this area was split into two separate sections for the AQ assessment. The results for each are discussed in the following sections.

4.1.2.4.1 Pulford Street – Labelle Street

The Plaza A alignment results in no differences in the maximum and annual average predicted $PM_{2.5}$ concentrations in this segment versus the No Build Alternative. All concentrations are within 10% of the No Build value and thus there is not considered to be any change. However, the Plaza B/C alignment shows reduced concentrations in comparison to No Build at 50 and 100 m away from the ROW, depending on the horizon year. Also, for this alignment, the number of days predicted to be greater than the CWS are much lower in 2035 at 50 m from the ROW than the No Build Alternative.

At 50 m from the ROW, the maximum predicted 1-hour and 24-hour NO_x concentrations for the Plaza A alignment are less than the No Build Alternative in all years. In 2025 and 2035, the maximum predicted 1-hour concentrations are less than No Build at 100 m from the ROW. However, the Plaza B alignment results in reduced 1-hour maximum NOx concentrations at all three distance intervals in all years studied, and maximum 24-hour concentrations that are less than No Build at 100 m from the ROW.

4.1.2.4.2 Labelle Street – Malden Rd.

The results in this area show that, in general, there is no difference in the maximum predicted and annual average $PM_{2.5}$ concentrations in comparison to the No Build Alternative. This is true for both the Plaza A and Plaza B/C alignments. However, in 2035 the Plaza B/C alignment results in a significant reduction in the number of days predicted to exceed the CWS at 50 m from the ROW.

For the Plaza A alignment, the predicted maximum 1-hour NOx concentrations are less than the No Build Alternative at all distances from the ROW, in all years. The 24-hour maximum concentrations are less than No Build up to 100 m from the ROW in 2025 and 2035. For the Plaza B/C alignment, the maximum predicted 1-hour NOx concentrations are less than No Build at 50, 100 and 250 m from the ROW in 2015, 2025 and 2035, respectively. The maximum 24-hour NO_x concentrations for the Plaza B/C alignment are less than the No Build Alternative only at 50 m from the ROW in 2025 and 2035.

These results indicate a slight improvement in overall air quality in the area in terms of NO_X concentrations; however, in general there is little difference between Alternative 1B and the No Build Alternative.

4.1.3 Alternative 2A

The Alternative 2 configurations (i.e. 2A and 2B) are somewhat different than the Alternative 1 configurations in that there are two-way service roads are aligned on one side of the freeway along the approximate existing Huron Church Road / Highway 3 Right of Way. Similar to Alternative 1A, Alternative 2A is an at-grade freeway, but is depressed where local arterial roads cross over it, such that these bridges are at-grade.

Tables 4.5 and 4.6 below present the corresponding data for this access road alternative. The maximum predicted NOx concentrations are below the MOE AAQCs for both averaging periods (1-hour and 24-hour) at all locations along Alternative 2A.

4.1.3.1 Howard Avenue to Cousineau Road

The Tables illustrate that for the Option 1 alignment there is generally no difference between Alternative 2A and the No Build Alternative. This is because the differences in the maximum predicted $PM_{2.5}$ concentrations are less than 10 % between the Alternative and No Build. This is true at all distances, and all horizon years. However, at 50 m from the ROW the number of days predicted to be greater than the CWS is less than No Build in 2025 and 2035, and the same as No Build at 100 and 250 m away. Annual average (typical) concentrations are considered to be the same as No Build up to 250 m from the ROW.

The Option 2 alignment results in a reduction in the predicted maximum $PM_{2.5}$ concentrations, and a further reduction in the number of days predicted to be greater than the CWS. These differences are significant at 50 m from the ROW in all years.

The maximum predicted 1-hour NO_x concentrations are less than No Build at all distances, in all years, for both the Option 1 and Option 2 alignments. Predicted maximum 24-hour NO_x concentrations are less than No Build at 100 m from the ROW for all horizon years. Also, the Option 2 alignment results in marginally lower predicted maximum 1-hour concentrations than the Option 1 alignment.

4.1.3.2 Cousineau Road to Lennon Drain

For this Alternative, the results presented in Tables 4.5 and 4.6 show that for the Option 1 alignment there is no difference in the maximum predicted $PM_{2.5}$ concentrations between the Alternative and No Build at all distances and all horizon years. In addition, the number of days predicted to be above the CWS is only different than No Build at 50 m from the ROW in 2035. However, the Option 2 alignment results in marginally lower predicted maximum concentrations at 50 m from the ROW, and a reduction in the number of days predicted to exceed the CWS in 2025 and 2035.

Maximum predicted 1-hour NOx concentrations are less than the No Build Alternative for both alignment Options at all horizon years at up to 250 m from the ROW. Additionally, for the Option 2 alignment, the maximum predicted 24-hour average concentrations are lower than No Build at 50 and 100 m away from the ROW in for all three years included in the study.

4.1.3.3 Lennon Drain to Pulford Street

In this area, the maximum predicted $PM_{2.5}$ concentrations are lower than No Build at 50 m from the ROW in all horizon years. In addition, at 50 m from the ROW there are significant reductions in the number of days predicted to exceed the CWS. However, there are no differences in the annual average concentrations at these distances in all years.

Maximum predicted 1-hour NOx concentrations are below than the relevant MOE AAQCs, and are less than the No Build Alternative at distances up to 250 m from the ROW in all horizon years studied. Additionally, the maximum predicted 24-hour concentrations are less than No Build up to 100 m from the ROW in all years.

4.1.3.4 Pulford Street to Malden Road

As outlined earlier, this area was split into two separate sections for the AQ assessment. The results for each are discussed in the following sections.

4.1.3.4.1 Pulford Street – Labelle Street

The results in Tables 4.5 and 4.6 show that there are generally no differences between the Plaza A and Plaza B/C alignments. The predicted maximum $PM_{2.5}$ concentrations are less than the No Build Alternative at 50 m from the ROW in all horizon years for both alignments. The differences in all other predicted maximum concentrations are within 10% of the No Build value and thus there is not considered to be any change. Also, both alignments show significant reductions in the number of days predicted to be greater than the CWS at 50 m from the ROW in all three years examined.

The Plaza A alignment results in lower maximum predicted 1-hour NO_x concentrations in comparison to No Build at 50 m from the ROW in 2015, and extending out to 100 m in 2025 and 2035. However, the Plaza B/C alignment results in further reductions in the 1-hour predicted maximum NO_x concentrations at all three distance intervals studied, as well as reductions in the 24-hour maximum concentrations up to 100 m from the ROW.

4.1.3.4.2 Labelle Street – Malden Rd.

The results in this area show that, at 50 m from the ROW the maximum predicted $PM_{2.5}$ concentrations are less than the No Build Alternative for both the Plaza A and Plaza B/C alignments for all horizon years. However, there is generally no difference in the annual average $PM_{2.5}$ concentrations in comparison to the No Build Alternative. Also, both alignments result in a significant reduction in the number of days predicted to exceed the CWS at 50 m from the ROW in all years, and up to 100 m from the ROW in 2035. The predicted concentrations and number of days greater than the CWS are similar for both alignments.

For the Plaza A alignment, the predicted maximum 1-hour NO_x concentrations are less than the No Build Alternative at up to 250 m from the ROW in 2015, and up to 100 m from the ROW in 2025 and 2035. However, with the exception of 2015 the Plaza B/C alignment shows reductions in the 1-hour NO_x concentrations at up to 250 m for all horizon years. For both alignments, the maximum predicted 24-hour concentrations are similar to one another, and are less than No Build at 50 m from the ROW in all three years studied.

4.1.4 Alternative 2B

The alignment of Alternative 2B is almost identical to that of Alternative 2A. The primary difference is that 2B is depressed (below grade) along the entire route from approximately Howard Avenue through to approximately Spring Garden Road.

The air dispersion modeling results for Alternative 2B are presented in Tables 4.7 and 4.8. The Tables show that all maximum predicted NOx concentrations are less than the relevant MOE criteria. Similar to the previous Alternatives, the results are discussed by geographical area in the following sections.

4.1.4.1 Howard Avenue to Cousineau Road

Tables 4.7 and 4.8 show that for both the Option 1 and Option 2 alignments, the maximum predicted $PM_{2.5}$ concentrations and the number of days predicted to exceed the CWS are less than the No Build Alternative at 50 m from the ROW in all horizon years. The annual average (typical) concentrations are considered to be the same as No Build up to 250 m from the ROW. Also, the results are generally similar for each Option.

The 1-hour predicted maximum NO_x concentrations are less than No Build at all distances for all years, for both the Option 1 and Option 2 alignments. For both Options, the predicted maximum 24-hour NO_x concentrations are less than No Build at up to 100 m from the ROW for all horizon years, and are generally similar. Also, the Option 2 alignment results in marginally lower predicted maximum 1-hour concentrations than the Option 1 alignment.

4.1.4.2 Cousineau Road to Lennon Drain

For this Alternative, the results presented in Tables 4.7 and 4.8 show that for the Option 1 alignment the maximum predicted $PM_{2.5}$ concentrations are less than the No Build Alternative at 50 m from the ROW in all horizon years. This is also the case for the Option 2 alignment in 2025 and 2035. In addition, the number of days predicted to be above the CWS is less than No Build at 50 m from the ROW in 2025 and 2035 for both Options. There are no differences in the annual average concentrations at these distances in all years.

Maximum predicted 1-hour NOx concentrations are less than the No Build Alternative for both alignment Options in all horizon years at 50, 100 and 250 m from the ROW. The maximum predicted 24-hour concentrations are less than No Build at up to 100 m from the ROW in all years. The concentrations for both averaging periods are generally similar for each Option.

4.1.4.3 Lennon Drain to Pulford Street

In this area, the maximum predicted $PM_{2.5}$ concentrations are lower than No Build at 50 m from the ROW in all horizon years. In addition, at 50 m from the ROW there are significant reductions in the number of days predicted to exceed the CWS in 2015 and 2025; these reductions extend up to 100 m from the ROW in 2035. However, there are no differences in the annual average concentrations at these distances in all years.

The maximum predicted 1-hour NO_x concentrations are less than the No Build Alternative at all distances and horizon years. The maximum predicted 24-hour concentrations are less than No Build at distances up to 100 m from the ROW in 2015 and 2025, extending up to 250 m in 2035.

4.1.4.4 Pulford Street to Malden Road

4.1.4.4.1 Pulford Street – Labelle Street

The results in Tables 4.7 and 4.8 show that there are generally no differences between the Plaza A and Plaza B/C alignments. There are no differences in the predicted maximum and annual average $PM_{2.5}$ concentrations between Alternative 2B and No Build in this area, as all predicted maximum concentrations are within 10% of the No Build value. However, both alignments show significant reductions in the number of days predicted to be greater than the CWS at 50 m from the ROW in all three years examined.

In 2015, the Plaza A alignment results in lower predicted maximum 1-hour NOx concentrations in comparison to No Build at 50 m from the ROW. This extends up to 100 m from the ROW in 2025 and 2035. The Plaza B/C alignment results in further reductions in the maximum predicted 1-hour NO_x concentrations in all years and at all distance intervals examined. Additionally, maximum predicted

24-hour NOx concentrations are less than the No Build Alternative at 100 m from the ROW in all years.

4.1.4.4.2 Labelle Street – Malden Rd.

The results in this area quite similar to the previous area (i.e. Pulford to Labelle) and show that in comparison to No Build there are generally no differences in the maximum predicted and annual average $PM_{2.5}$ concentrations for Alternative 2B. Also, the results are similar for both the Plaza A and Plaza B/C alignments. However, both alignments show significant reductions in the number of days predicted to be greater than the CWS at 50 m from the ROW in 2015 and 2025, and up to 100 m from the ROW in 2035.

As seen in Table 4.8, with one exception the Plaza A alignment results in lower predicted maximum 1-hour NO_x concentrations in comparison to the No Build Alternative in all years and at all distance intervals examined. In 2025 at 250 m from the ROW the change in concentration is less than 10% and thus is not considered to be different than No Build. This is similar to the results for the Plaza B/C alignment. For both alignments, the maximum predicted 24-hour concentrations are similar to one another, and are less than No Build at 50 m from the ROW in all three years studied.

4.1.5 Alternative 3

As discussed previously, access road Alternative 3 is a tunneled freeway with two-way service roads located at grade above the tunnel, along the approximate existing Huron Church Road / Highway 3 Right of Way. A number of entrance and egress portals are located at specific points along the access road to allow traffic to move from the service roads into the tunnel, and vice versa. Also, there are two main portals where the freeway sections enter/exit the ground. These are located approximately at Howard Avenue as well as at the E.C. Row Expressway.

The dispersion modeling results for Alternative 3 (based on ventilation option VB1A) are presented in Tables 4.9 and 4.10 for $PM_{2.5}$ and NO_x respectively. The maximum predicted NOx concentrations are below the MOE AAQCs for both averaging periods (1-hour and 24-hour) at all locations along Alternative 3.

4.1.5.1 Highway 401/Highway 3 to Howard Avenue

As discussed previously, this segment represents the continuation of the existing Highway 401 alignment from Highway 3 to Howard Avenue. The emissions in segment are generally dominated by the freeway mainline and the on/off ramps for all alternatives, and there is little difference in the results between the non-tunnel Alternatives in this segment. All Alternative 3 options are somewhat different than the other Alternatives in that there are mainline entrance and egress points from the tunnel, which result in emissions from these portals. However, the effect of these portals is only significant for the Alternative 3 – Jet Fans option. With any of the Alternative 3 – Vent Building options, the effect of these portals are seen only in very close proximity to the roadway, and do not affect areas outside of the ROW. As a result, this area is discussed separately for Alternative 3.

As can be see in the tables, the maximum predicted $PM_{2.5}$ concentrations are the same or greater than the No Build option at all distance intervals and all horizon years. However, the changes in concentration are less than 10% at 50 and 100 m away from the Right of Way, and thus are considered to be the same as No Build. The changes are greater than 10% at 250 m from the ROW, which shows the effect of the ventilation buildings which are located further to the west along the access road.

With one exception, the annual average (rather than maximum) $PM_{2.5}$ concentrations in this area are predicted to be the same as No Build at all distances from the ROW. There are no differences in the number of days predicted to exceed the CWS.

As mentioned previously, all predicted NOx concentrations are below the relevant MOE AAQCs. In 2015, the maximum predicted 1-hour NOx concentrations are the same as No Build at 50 m away from the ROW, but are greater than No Build at 100 and 250 m away from the ROW. In 2025, the concentrations are less than No Build at up to 100 m from the ROW, which increases to 250 m from the ROW in 2035.

4.1.5.2 Howard Avenue to Cousineau Road

This segment covers the area along the route between Cousineau Road and Howard Avenue. In all previous Alternatives, two separate alignment options (Option 1 and Option 2) were studied along the access road between Howard

Avenue and St.Clair College. Only one alignment has been proposed for Alternative 3, and thus results for this area will not have Option 1 and Option 2.

The Tables illustrate that with one exception, the maximum predicted $PM_{2.5}$ concentrations are lower than the No Build Alternative at all distance intervals. The only exception is in 2035 at 250 m from the ROW, where the change in comparison to No Build is less than 10%. Also, the number of days predicted to be greater than the CWS is less than No Build at 50 m from the ROW in all years. Annual average (typical) concentrations are also less than No Build at 50 m from the ROW in 2015, and up to 100 m from the ROW in 2025 and 2035. However, the change in annual average concentrations is less than 10% at 250 m from the ROW, and thus is considered to be the same as No Build. Thus, the effect is localized to within 100 m of the ROW.

The NOx results are somewhat different. With two exceptions, the maximum predicted 1-hour concentrations are less than No Build at all distances and in all years. The exceptions are at 250 m from the ROW in 2015 and 2025. In 2015, the predicted concentration is greater than No Build, and in 2025 the change is less than 10%, and thus is not considered to be different. The maximum predicted 24-hour concentrations are less than No Build at up to 100 m from the ROW in all three years.

4.1.5.3 Cousineau Road to Lennon Drain

This segment represents the area between the Lennon Drain and Cousineau Road, and encompasses the St.Clair College area. For Alternative 3 this includes tunnel on and off ramps (entrance and exit portals) to allow freeway access for staff and students of the College.

Table 4.9 shows that in 2015 only the maximum predicted $PM_{2.5}$ concentration at 50 m from the ROW is different (lower) than No Build. Maximum predicted concentrations at 100 and 250 m away, as well as annual average concentrations at all distance intervals are the same as No Build. In 2025 and 2035, the maximum predicted 24-hour concentrations are less than No Build at all distance intervals, and the annual average concentrations are less than No Build at distances up to 100 m from the ROW. Also, the number of days predicted to be greater than the CWS are less than the No Build Alternative at 50 m from the ROW in 2025 and 2035.

Table 4.10 shows that with one exception, the maximum predicted 1-hour NOx concentrations are less than the No Build Alternative in all horizon years at all three distance intervals examined. The change is less than 10% at 50 m from the ROW in 2015, and thus it is considered to be the same as No Build. Maximum predicted 24-hour NOx concentrations are less than No Build at 100 m from the ROW in 2025 and 2035, but the same as No Build at 50 m and 250 m away. This is likely related to the effect of the tunnel ventilation buildings.

4.1.5.4 Lennon Drain to Pulford Street

The maximum predicted $PM_{2.5}$ concentrations in this area are lower than the No Build Alternative at up to 100 m from the ROW, in all years included in the study. In 2025 and 2035, the effect extends out to 250 m. Also, at 50 m from the ROW there are significant reductions over No Build in the number of days predicted to exceed the CWS. This extends out to 100 m from the ROW in 2035. The annual average concentrations are less than the No Build Alternative at up to 100 m away from the ROW. There are no differences in the annual average concentrations at 250 m away from the ROW in all years.

Maximum predicted 1-hour NOx concentrations are below than the relevant MOE AAQCs, and are less than the No Build Alternative at all distances and horizon years studied. The maximum predicted 24-hour NOx concentrations are less than No Build at distances up to 100 m from the ROW in 2015 and 2025, and extends out to 250 m in 2035.

4.1.5.5 Pulford Street to Malden Road

This area was split into two separate sections for the AQ assessment, with separate discussions for different Plaza alignments, as discussed previously.

4.1.5.5.1 Pulford Street – Labelle Street

Table 4.9 shows that for the Plaza A alignment, the maximum predicted $PM_{2.5}$ concentrations in this area are different (less) than the No Build Alternative at all distance intervals and all years studied. The annual average $PM_{2.5}$ concentrations for this alignment are also different than No Build at 50, 250 and 100 m from the ROW in 2105, 2025 and 2035, respectively. Also, the number of days predicted to be greater than the CWS are significantly less than the No Build Alternative in this area at 50 m from the ROW in all years, and extends out to 100 m from the ROW in 2035. However, there is no difference in the annual average concentrations and number of days above the CWS at 250 m away. The results for Plaza B/C alignment are very similar to those of the Plaza A alignment.

Table 4.10 shows that with one exception the maximum predicted 1-hour NO_x concentrations for this Alternative are less than the No Build Alternative in all years and at all distance intervals examined. The maximum predicted 24-hour concentrations are less than No Build at 50 m from the ROW. There is essentially no difference in the results between the Plaza A alignment and the Plaza B/C alignment.

4.1.5.5.2 Labelle Street – Malden Rd.

The model results in this area indicate that in general there are no differences in the maximum predicted and annual average $PM_{2.5}$ concentrations in comparison to the No Build Alternative. In 2025 and 2035, the maximum predicted $PM_{2.5}$ concentrations are greater than No Build for the Plaza B/C alignment at 250 m and 100 m from the ROW respectively.

For the Plaza A alignment there is a significant reduction in the number of days predicted to exceed the CWS at 50 and 100 m from the ROW in 2025 and 2035 respectively. The Plaza B alignment results in a reduction in the number of these days at 50 m from the ROW in all years.

Predicted maximum 1 hour NOx concentrations are less than the No Build Alternative at up to 100 m from the ROW for the Plaza A alignment in all years, whereas this is the case for the Plaza B/C alignment only in 2025 and 2035. For both plaza alignments studied, the maximum predicted 24-hour concentrations are less than No Build at 50 m from the ROW in all years included in the study.

4.2 Customs / Inspection Plaza Alternatives

As discussed previously, three separate alternatives were studied for Customs / Inspection Plaza alternatives. These are Plaza A, Plaza B / B1 and Plaza C. Tables 4.11 and 4.12 present the results of the air dispersion modelling ($PM_{2.5}$ and NO_x) for each of these Alternatives. In order to compare the location specific differences between the different alternatives, the results of each plaza alternative will be presented and discussed in relation to specific areas in the vicinity of each facility.

The plaza results show that the maximum predicted concentrations of $PM_{2.5}$ and NO_x are generally much higher in comparison to the access road alternatives. This is due to the longer idling time near the plazas as vehicles queue in line at the booths. Although the traffic data is similar for all Plaza alternatives, the footprints of the plaza properties, alignment of the plazas and proximity of nearby roads plays an important role in the maximum predicted concentrations, which is reflected in the differences in the resulting data.

4.2.1 Plaza A

The Plaza A Alternative is located adjacent to E.C. Row Expressway in the vicinity of Spring Garden Road / Armanda Street, and is the farthest from the Detroit River of any of the Alternatives under consideration. Plaza A provides potential access to all of the Crossing Alternatives (A, B or C) that are included in the study.

As can be seen in the Table 4.11, the maximum predicted $PM_{2.5}$ concentrations increase significantly within 100 m of the Plaza A boundary, in comparison to the No Build Alternative. The increase is a maximum of 250% at 50 m away from the property line of the facility, and is 136% at 250 m from the boundary in 2035. In addition, the number of days exceeding the CWS are also predicted to increase significantly at distances up to 100 m from the plaza boundary in 2035. The annual average concentrations also increase in comparison to No Build, but remain below the 15 ug/m^3 criterion at 100 m away in 2035.

Similar to the $PM_{2.5}$ results, the maximum predicted 1-hour NOx concentrations shown in Table 4.12 also increase significantly within 250 m of the plaza boundary. The maximum predicted concentrations exceed the MOE 1-hour NO_x criterion on occasion in the immediate vicinity of Plaza A, and are more than 8X higher than the predicted No Build concentrations at 50 m away in 2025 and 2035, and more than 4 X higher at 250 m away in 2035. However, the change in number of times that the MOE AAQC is predicted to be exceeded is not significant (i.e. < 8 hours) beyond 50 m away.

Based on the results presented above, air quality is predicted to be generally poorer within approximately 100 m of the Plaza A boundary.

4.2.2 Plaza B

The Plaza B alternatives are located in an industrial area immediately north of Broadway Street, west of Ojibway Parkway, near the Detroit River.

Plazas B and B1 are only slight variants of one another, and thus will be discussed in the same section. Due to the required elevation of the Crossing Alternatives and maximum grade allowances on the approach to the crossing, Plaza B could not provide access to Crossing B. Thus, the Plaza B1 variant was created to permit access to Crossing Alternative B.

4.2.2.1 Plaza B1

Plaza B1 is located immediately to the west of Ojibway Parkway, and leads to Crossing Alternative B. The results shown in the Tables indicate a general worsening of air quality in the immediate vicinity of the Plaza. In addition, the nearby concentrations are affected by traffic on the E.C. Row interchange.

Within 250 m of the property boundary, the maximum predicted $PM_{2.5}$ concentrations increase significantly in comparison to the No Build Alternative. This increase ranges from 2.8 to 3.8 X higher relative to No Build at 50 m away, and approximately 1.3 to 1.4 X at 250 m away. In addition, the change in the number of days predicted to exceed the CWS is significant within 250 m of the plaza boundary in 2025 and 2035. Annual average $PM_{2.5}$ concentrations are also higher compared to No Build, but are below the 15 ug/m3 criterion beyond 50 m away in 2015 and 2025, and beyond 100 m in 2035.

Table 4.12 presented the maximum predicted 1-hour NOx concentrations. The Table shows that the predicted concentrations are significantly greater than No Build within 250 m of the Plaza boundary. At worst, the maximum predicted concentrations are approximately 8 X higher than the predicted No Build concentrations at 50 m away in 2025, and approximately 3 X higher at 250 m away in 2035. Although the maximum predicted concentrations exceed the MOE 1-hour NOx criterion on occasion in the immediate vicinity of Plaza B1, the change in number of times is not significant (i.e. < 8 hours) at any of the distance intervals and in any of the horizon years studied.

Based on the results presented above, a general worsening of air quality is expected within approximately 250 m of the Plaza B1 boundary. However, the highest impacts will likely occur within 50 - 100 m of the boundary.

4.2.2.2 Plaza B

Plaza B is located adjacent to Plaza B1, slightly farther to the west and closer to the Detroit River. Only Crossing Alternative C can be accessed from this Plaza Alternative.

Table 4.11 shows that the maximum predicted $PM_{2.5}$ concentrations are significantly higher than the No Build Alternative within 250 m of the Plaza B property boundary. This increase is almost 3 X higher compared to No Build at 50 m away, and is approximately 1.5 X at 250 m away in 2035. Also, the number of days predicted to exceed the CWS increases significantly over the No Build Alternative within 250 m of the plaza boundary in 2035. In addition, annual average $PM_{2.5}$ concentrations are higher compared to No Build, but are below the 15 ug/m^3 criterion beyond 50 m from the Plaza B boundary in all three horizon years.

The maximum predicted 1-hour NOx concentrations shown in Table 4.12 are also significantly higher in comparison to the No Build Alternative within 250 m of the plaza boundary. This is true in all years that were examined. The maximum predicted concentrations exceed the MOE 1-hour NOx criterion on occasion at distances up to 100 m from the Plaza in all years, but the change in number of exceedances is only significant at 50 m away in 2025 and 2035. The change in the predicted maximum concentrations are approximately 10 X in comparison to No Build at 50 m away in 2025 and 2035, and approximately 3.5 X at 250 m away in 2035.

These results indicate that air quality is predicted to decrease within approximately 250 m from the Plaza B property boundary by 2035. The highest impacts will likely occur within 50 - 100 m of the boundary.

4.2.3 Plaza C

The Plaza C Alternative is located in an industrial area in the vicinity of the Brighton Beach Generating Station, on the approximate footprint of the transformer station. Plaza C provides access to Crossing Alternative C only.

Similar to the $PM_{2.5}$ results for the other Plaza alternatives, the maximum predicted $PM_{2.5}$ concentrations increase significantly over No Build at distances up to 250 m from the Plaza C boundary. This change relative to the No Build Alternative is a maximum of 2X at 50 m away in 2015, and is approximately 2.1 – 2.2 X at 250 m away in 2025 and 2035. Also, the change in the number of times that the CWS is predicted to be exceeded (relative to No Build) is significant at distances up to 250 m away in 2035. The annual average $PM_{2.5}$ concentration exceeds the 15 ug/m3 criterion at 50 m from the boundary in all horizon years.

The predicted maximum 1-hour NO_x concentration at 50 m from the Plaza C property boundary ranges from 123% to 222%. At 250 m away, this range is from 116% to 176%. Although these increases are significant at all distances relative to No Build (i.e. > 10% change), the MOE AAQC is not exceeded at any distance interval, in any of the horizon years.

As can be seen above, the overall magnitude of the changes in maximum NO_x and $PM_{2.5}$ concentrations is generally less for the Plaza C Alternative than for any of the other Plaza Alternatives evaluated. This is due to the Plaza alignment and arrangement of roadways within the property. There is a larger buffer between the traveled portion of the roadways within Plaza C and the property boundary. As a result, the emissions have dispersed more by the time they reach the property boundary.

These results indicate a marginal worsening of air quality within approximately 250 m from the Plaza C property boundary. However, the most significant affects will likely occur within 50 – 100 m away.

4.3 Crossing Alternatives

As outlined earlier in the report, three separate bridge crossing alternatives were studied and evaluated as part of this project. These are:

- Crossing A
- Crossing B
- Crossing C

Also, there is a connecting roadway between the exit of each plaza and the entrance to the Crossings.

The air dispersion modeling results for all Crossing Alternatives are presented in Tables 4.13 through 4.14. In order to compare the location specific differences between the different alternatives, the results of each crossing alternative will be presented and discussed in relation to specific areas in the vicinity of each bridge and connecting roadway.

The results for the crossings indicate that the maximum predicted concentrations of $PM_{2.5}$ and NO_x are generally similar to those of the access road alternatives. However, for some Plaza / Crossing combinations there is some "spillover" of idle emissions from the Plaza, due to the proximity of the Plaza to the Crossing. This is the case for the Plaza B / Crossing B and Plaza C / Crossing C combinations.

4.3.1 Crossing A

Crossing Alternative A can be accessed from Plaza A only, and is located in the vicinity of Wright and Water Streets. It has the longest span of the three Alternatives studied, at 1.1 km.

As can be seen in the Table 4.13, the change in the maximum predicted $PM_{2.5}$ concentrations at 50 m from the crossing / connecting roadway is 150% in comparison to the No Build Alternative in 2015. This drops to 127% at 250 m away. In 2035, the increases are 172%, 150% and 135% at 50, 100 and 250 m, respectively. In addition, the number of days predicted to be in excess of the CWS increase significantly at distances up to 100 m from the ROW in all three horizon years.

The annual average concentrations are predicted to marginally increase in the vicinity of the crossing, and will exceed the criterion within 50 m in 2025 and 2035.

The changes in the maximum predicted 1-hour NOx concentrations shown in Table 4.14 are at maximum a two-fold increase over No Build, which occurs at 50 m away from the Crossing / connecting roadway in 2015. The increases are less than this at all other distances and all horizon years. Also, there are no exceedances of the MOE 1-hour NO_x criterion in the vicinity of the crossing and connecting roadway.

Based on these results, a marginal decrease in air quality is predicted to occur at distance up to 100 m away from Crossing A and the associated connecting roadway.

4.3.2 Crossing B

Crossing Alternative B can be accessed from Plaza A or Plaza B1. Crossing B is located adjacent to the Brighton Beach Power Station and has a span of approximately 800 m.

Table 4.13 shows that for the Plaza A / Crossing B combination, the change in the maximum predicted $PM_{2.5}$ concentrations in comparison to the No Build Alternative ranges from 150 – 172% at 50 m away, 135 – 150% at 100 m and 127 - 135% at 250 m. Also, the number of days predicted to be in excess of the CWS is significantly higher than No Build at distances up to 100 m from the ROW in all horizon years.

The results for the Plaza B1 / Crossing B combination are somewhat different, due to the “spillover” effect mentioned previously. For this combination, the biggest change in the maximum predicted $PM_{2.5}$ concentrations at 50, 100 and 250 m from the crossing / connecting roadway is 212%, 188 % and 148 % respectively, in comparison to the No Build Alternative. This occurs in 2035. The number of days predicted to be in excess of the CWS is marginally higher for this combination, with significant increases at distances up to 100 m from the ROW in all years, and up to 250 m in 2035. These differences occur because Plaza B1 is located relatively close to Crossing B, and the emissions from the Plaza and the connecting roadway / crossing combine.

The annual average concentrations are the same as No Build at all distance intervals in 2015, but are higher than No Build at 50 m from the ROW in 2025 and 2035 for both Plaza / Crossing combinations.

The changes in the maximum predicted 1-hour NOx concentrations shown in Table 4.14 are greater than 10% at up to 250 m from the ROW in all horizon years. These changes are as much as 174% of the No Build at 50 m away, and up to 147 % at 250 m for the Plaza A / Crossing B1 combination. However, there are no predicted exceedances of the MOE 1-hour NO_x criterion in the vicinity of the crossing and connecting roadway. For the Plaza B1 / Crossing B combination, the increases range from 175% to 219% at 50 m away, with significant differences in the maximum predicted 1-hour NOx concentrations at distances up to 250 m from the Crossing / connecting roadway. Once again, there are no exceedances of the NOx criterion at any of the distance intervals studied, in any of the three horizon years.

Based on the above, air quality is predicted to decrease within 100 m of Crossing B and or the associated connecting roadway.

4.3.3 Crossing C

Crossing Alternative C can be accessed from Plaza A, Plaza B or Plaza C. It is located near Stirling Marine Fuels, and has the shortest span of the three Crossing Alternatives, at approximately 700 m.

Table 4.13 shows that for the Plaza A / Crossing C combination, the change in the maximum predicted $PM_{2.5}$ concentrations is as much as 172% at 50 m away from the crossing / connecting roadway in comparison to the No Build Alternative in all horizon years. The increase in concentrations is a maximum of 135% at 250 m away. Also, the number of days predicted to be in excess of the CWS is significantly higher than No Build at distances up to 100 m from the ROW in all years studied.

The Plaza B / Crossing C combination results are similar to the previous combination. The highest increase in the maximum predicted $PM_{2.5}$ concentrations is 193% at 50 m away, and 162% at 250 m away from the Crossing / connecting roadway. The number of days predicted to be in excess of the CWS is higher than No Build at distances up to 100 m from the ROW in all years.

For both of these combinations, the annual average concentrations are the same as No Build at all distance intervals and all years, with one exception. In 2035, the concentration is greater than the criterion of 15 ug/m^3 at 50 m from the ROW.

The results for the Plaza C / Crossing C combination indicate that the biggest change in the maximum predicted $PM_{2.5}$ concentrations at 50, 100 and 250 m from the crossing / connecting roadway is approximately 167%, 161% and 133 % respectively, in comparison to the No Build Alternative. These occur by 2035. Also, the number of days predicted to be greater than the CWS is significantly lower for this combination than the other two, with significant increases at distances up to 100 m from the ROW in 2025 and 2035. However, the annual average concentration is only marginally higher than No Build, and does not exceed the criterion at any of the distance intervals, in any of the horizon years.

The changes in the maximum predicted 1-hour NOx concentrations shown in Table 4.14 are greater than 10% at all distances and in all horizon years for the three combinations that are possible with Crossing C. At 50 m away, these changes range from a minimum of 119% to a maximum of 192%. At 250 m away the changes range from 117% to 197%. However, the MOE 1-hour NO_x

criterion is not exceeded in the vicinity of the crossing and connecting roadway for any combination.

Based on these results, a decrease in air quality is expected within 100 m of the connecting roadway of Crossing C with either Plaza A, Plaza B, or Plaza C.

Table 4.1 Alternative 1A - Highest Maximum $PM_{2.5}$ Concentrations in Comparison to No Build

Highest $PM_{2.5}$ Concentration Relative to No Build at Intervals from Right of Way (ug/m^3)

	Distance from ROW (m)	Malden Rd to Labelle						Labelle to Pulford					
		Plaza A Alignment			Plaza B / C Alignment			Plaza A Alignment			Plaza B / C Alignment		
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 1A - 2015	50	106%	93%	-12	94%	100%	-12	97%	100%	6	97%	100%	-5
	100	97%	92%	-3	100%	92%	-1	97%	100%	0	97%	100%	-2
	250	100%	100%	0	96%	100%	0	96%	100%	0	96%	100%	0
Alternative 1A - 2025	50	92%	93%	-20	95%	93%	-7	95%	100%	18	93%	100%	10
	100	100%	100%	-1	103%	100%	3	103%	108%	11	103%	100%	-1
	250	96%	100%	0	93%	100%	0	104%	100%	0	104%	92%	0
Alternative 1A - 2035	50	88%	100%	-52	93%	94%	-31	95%	>100%	-1	93%	94%	-4
	100	100%	100%	-13	103%	100%	-7	103%	100%	7	103%	93%	7
	250	97%	100%	-3	93%	100%	-3	104%	100%	0	104%	100%	0

	Distance from ROW (m)	Pulford North of Lennon Drain			North of Lennon Drain to Cousineau Rd						Cousineau Rd to Howard Ave						Howard Ave to Highway 401		
					Option 1 Alignment			Option 2 Alignment			Option 1 Alignment			Option 2 Alignment					
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 1A - 2015	50	89%	100%	-11	103%	100%	-1	100%	100%	-3	94%	100%	-4	94%	100%	-3	100%	92%	0
	100	90%	100%	-1	111%	100%	2	104%	100%	1	100%	100%	0	104%	100%	0	104%	91%	0
	250	100%	100%	0	100%	100%	0	104%	91%	0	100%	110%	0	100%	110%	0	109%	100%	0
Alternative 1A - 2025	50	85%	100%	-22	103%	100%	0	100%	100%	-10	97%	100%	-5	100%	100%	-12	97%	100%	-1
	100	97%	100%	-3	107%	100%	7	107%	100%	3	103%	100%	0	103%	100%	3	108%	100%	0
	250	100%	100%	0	104%	100%	0	108%	100%	0	104%	100%	0	104%	100%	0	109%	100%	0
Alternative 1A - 2035	50	90%	100%	-21	105%	100%	0	103%	93%	-19	93%	100%	-19	93%	100%	-29	97%	92%	-5
	100	100%	100%	-3	113%	100%	15	109%	100%	6	100%	100%	-1	110%	108%	4	104%	100%	0
	250	108%	109%	0	104%	100%	0	111%	100%	0	117%	100%	0	117%	100%	1	108%	100%	0

Table 4.2 Alternative 1A - Highest Maximum NOx Concentrations in Comparison to No Build

Highest NOx Concentration at Intervals from Right of Way (ug/m^3)

	Distance from ROW (m)	Malden Rd to Labelle				Labelle to Pulford				Pulford to North of Lennon Drain		North of Lennon Drain to Cousineau Rd				Cousineau Rd to Howard Ave				Howard Ave to Highway 40	
		Plaza A Alignment		Plaza B/C Alignment		Plaza A Alignment		Plaza B/C Alignment				Option 1 Alignment		Option 2 Alignment		Option 1 Alignment		Option 2 Alignment			
		1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour
Alternative 1A - 2015	50	63%	82%	84%	89%	81%	86%	74%	89%	57%	82%	89%	95%	58%	92%	75%	89%	65%	86%	84%	90%
	100	73%	98%	90%	101%	96%	91%	81%	92%	66%	85%	79%	87%	55%	87%	72%	88%	69%	88%	80%	98%
	250	89%	86%	95%	93%	112%	99%	83%	95%	70%	95%	84%	98%	56%	94%	91%	98%	78%	96%	94%	99%
Alternative 1A - 2025	50	77%	87%	82%	90%	71%	85%	72%	89%	43%	76%	78%	91%	61%	91%	63%	84%	58%	84%	67%	84%
	100	83%	90%	89%	94%	79%	92%	76%	93%	54%	81%	73%	83%	59%	83%	61%	86%	58%	85%	68%	91%
	250	89%	94%	92%	95%	93%	96%	83%	95%	69%	94%	77%	94%	61%	92%	83%	95%	76%	94%	83%	97%
Alternative 1A - 2035	50	59%	85%	69%	95%	84%	84%	69%	91%	36%	70%	65%	87%	55%	86%	58%	81%	53%	80%	64%	83%
	100	69%	89%	78%	93%	85%	93%	69%	90%	42%	76%	66%	80%	54%	80%	57%	84%	55%	83%	64%	90%
	250	82%	91%	86%	94%	107%	99%	81%	95%	57%	90%	66%	91%	58%	91%	77%	95%	73%	94%	80%	96%

Table 4.3 Alternative 1B - Highest Maximum PM2.5 Concentrations in Comparison to No Build

	Distance from ROW (m)	Highest $PM_{2.5}$ Concentration at Intervals from Right of Way (µg/m³)																													
		Malden Rd to Labelle						Labelle to Pulford						Pulford North of Lennon Drain			North of Lennon Drain to Cousineau Rd						Cousineau Rd to Howard Ave						Howard Ave to Highway 401		
		Plaza A Alignment			Plaza B / C Alignment			Plaza A Alignment			Plaza B / C Alignment						Option 1 Alignment			Option 2 Alignment			Option 1 Alignment			Option 2 Alignment					
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 1B - 2015	**50**	94%	93%	-9	97%	100%	-7	94%	100%	3	89%	93%	-5	86%	92%	-16	91%	100%	-5	91%	100%	-5	91%	100%	-4	85%	100%	-7	100%	92%	0
	100	100%	92%	-1	103%	100%	-1	94%	100%	-3	87%	100%	-3	87%	100%	-1	104%	100%	0	100%	100%	0	100%	100%	0	96%	100%	0	104%	91%	0
	250	100%	109%	0	100%	100%	0	104%	100%	0	92%	100%	0	100%	100%	0	96%	100%	0	100%	91%	0	100%	110%	0	100%	110%	0	109%	100%	0
Alternative 1B - 2025	**50**	103%	100%	7	97%	100%	-2	93%	100%	-7	85%	93%	-7	79%	93%	-33	91%	100%	-12	91%	92%	-15	92%	100%	-9	86%	100%	-18	97%	100%	-1
	100	103%	108%	7	103%	100%	2	97%	108%	6	91%	92%	-4	87%	92%	-5	100%	100%	2	97%	92%	0	100%	100%	0	97%	100%	0	108%	100%	0
	250	96%	100%	0	100%	100%	0	108%	100%	0	100%	92%	0	96%	100%	0	96%	100%	2	104%	100%	0	100%	100%	0	100%	100%	0	113%	100%	0
Alternative 1B - 2035	**50**	102%	100%	-4	98%	94%	-23	95%	>100%	2	84%	88%	-22	80%	93%	-42	89%	107%	-27	89%	93%	-33	85%	100%	-39	83%	100%	-41	97%	92%	-5
	100	103%	100%	6	100%	100%	-5	94%	100%	10	89%	93%	-6	94%	100%	-8	97%	100%	2	100%	100%	0	100%	100%	-1	100%	108%	-1	104%	100%	0
	250	100%	108%	-1	97%	100%	-3	107%	100%	0	96%	92%	0	100%	100%	0	100%	100%	0	104%	100%	0	113%	100%	0	113%	100%	0	108%	100%	0

Table 4.4 Alternative 1B - Highest Maximum NOx Concentrations in Comparison to No Build

	Distance from ROW (m)	Highest NOx Concentration at Intervals from Right of Way (µg/m³)																					
		Malden Rd to Labelle				Labelle to Pulford				Pulford to North of Lennon Drain		North of Lennon Drain to Cousineau Rd				Cousineau Rd to Howard Ave				Howard Ave to Highway 401	
		Plaza A Alignment		Plaza B/C Alignment		Plaza A Alignment		Plaza B/C Alignment				Option 1 Alignment		Option 2 Alignment		Option 1 Alignment		Option 2 Alignment			
		1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour
Alternative 1B - 2015	**50**	78%	88%	88%	91%	80%	85%	73%	85%	50%	77%	83%	91%	55%	88%	73%	86%	63%	84%	79%	92%
	100	82%	102%	94%	102%	93%	90%	70%	87%	61%	83%	77%	84%	53%	84%	68%	87%	63%	87%	77%	98%
	250	89%	93%	95%	93%	106%	96%	84%	94%	70%	95%	81%	96%	56%	93%	91%	96%	77%	95%	92%	100%
Alternative 1B - 2025	**50**	69%	87%	76%	90%	86%	89%	70%	86%	39%	75%	74%	88%	59%	88%	61%	82%	56%	82%	66%	84%
	100	79%	90%	83%	93%	90%	94%	69%	89%	53%	80%	69%	82%	57%	82%	59%	85%	58%	85%	68%	91%
	250	86%	93%	91%	95%	103%	99%	86%	95%	67%	94%	75%	92%	61%	92%	81%	95%	76%	95%	82%	96%
Alternative 1B - 2035	**50**	64%	85%	70%	88%	83%	84%	68%	81%	34%	69%	63%	86%	53%	86%	57%	80%	52%	79%	63%	83%
	100	75%	90%	79%	93%	84%	93%	64%	88%	41%	76%	62%	80%	53%	80%	56%	83%	55%	82%	64%	90%
	250	83%	93%	84%	94%	106%	99%	81%	94%	55%	90%	64%	91%	57%	91%	75%	94%	73%	94%	80%	96%

Table 4.5 Alternative 2A - Highest Maximum PM2.5 Concentrations in Comparison to No Build

		Highest $PM_{2.5}$ Concentration at Intervals from Right of Way ($\mu g/m^3$)																													
	Distance from ROW (m)	Malden Rd to Labelle						Labelle to Pulford						Pulford North of Lennon Drain			North of Lennon Drain to Cousineau Rd						Cousineau Rd to Howard Ave						Howard Ave to Highway 401		
		Plaza A Alignment			Plaza B / C Alignment			Plaza A Alignment			Plaza B / C Alignment						Option 1 Alignment			Option 2 Alignment			Option 1 Alignment			Option 2 Alignment					
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 2A - 2015	50	88%	92%	-17	88%	92%	-16	89%	93%	-15	89%	93%	-14	80%	92%	-17	97%	100%	-4	88%	100%	-5	91%	100%	-6	82%	100%	-8	100%	100%	0
	100	94%	88%	-3	95%	88%	-3	94%	108%	-3	97%	100%	-2	83%	92%	-1	104%	100%	0	96%	100%	0	96%	100%	0	93%	100%	0	100%	100%	0
	250	95%	99%	0	95%	99%	0	96%	100%	0	96%	100%	0	96%	100%	0	100%	100%	0	96%	91%	0	96%	110%	0	96%	110%	0	109%	100%	0
Alternative 2A - 2025	50	87%	91%	-23	87%	92%	-26	85%	93%	-22	85%	93%	-25	82%	93%	-29	100%	100%	-7	91%	92%	-14	92%	100%	-12	86%	100%	-18	97%	100%	-1
	100	99%	93%	-4	101%	94%	-4	100%	108%	10	100%	100%	1	94%	92%	-5	103%	100%	0	97%	92%	0	100%	100%	0	93%	100%	0	108%	100%	0
	250	95%	93%	0	95%	94%	0	104%	92%	0	100%	100%	0	104%	100%	0	104%	100%	0	100%	100%	0	100%	100%	0	100%	100%	0	109%	100%	0
Alternative 2A - 2035	50	85%	91%	-42	85%	91%	-44	86%	94%	-31	86%	94%	-33	88%	93%	-37	100%	100%	-15	89%	93%	-33	93%	100%	-21	80%	93%	-44	100%	92%	-5
	100	100%	91%	-17	101%	91%	-17	94%	107%	-10	100%	100%	1	100%	100%	-5	103%	108%	1	94%	100%	-3	103%	100%	-2	97%	100%	-3	104%	92%	0
	250	95%	98%	-3	96%	98%	-3	100%	100%	0	104%	100%	0	104%	109%	0	107%	109%	0	100%	100%	0	113%	100%	0	113%	100%	0	113%	100%	0

Table 4.6 Alternative 2A - Highest Maximum NOx Concentrations in Comparison to No Build

		Highest NOx Concentration at Intervals from Right of Way ($\mu g/m^3$)																			
	Distance from ROW (m)	Malden Rd to Labelle				Labelle to Pulford				Pulford to North of Lennon Drain		North of Lennon Drain to Cousineau Rd				Cousineau Rd to Howard Ave				Howard Ave to Highway 40	
		Plaza A Alignment		Plaza B/C Alignment		Plaza A Alignment		Plaza B/C Alignment				Option 1 Alignment		Option 2 Alignment		Option 1 Alignment		Option 2 Alignment			
		1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour
Alternative 2A - 2015	50	65%	83%	68%	81%	86%	85%	74%	85%	45%	75%	59%	92%	53%	88%	73%	87%	64%	84%	80%	92%
	100	82%	100%	75%	97%	98%	96%	70%	88%	53%	82%	54%	86%	52%	84%	74%	88%	69%	87%	77%	98%
	250	89%	93%	93%	92%	100%	95%	87%	94%	65%	94%	60%	95%	58%	94%	85%	98%	85%	96%	89%	99%
Alternative 2A - 2025	50	68%	87%	66%	87%	81%	85%	70%	86%	38%	74%	62%	91%	58%	88%	65%	86%	60%	82%	65%	85%
	100	83%	93%	76%	93%	87%	95%	70%	90%	50%	80%	60%	83%	56%	82%	69%	89%	58%	85%	68%	91%
	250	97%	96%	90%	95%	98%	96%	86%	95%	63%	92%	63%	94%	62%	92%	88%	97%	78%	94%	82%	97%
Alternative 2A - 2035	50	65%	85%	63%	85%	76%	80%	66%	81%	33%	69%	54%	87%	51%	85%	59%	82%	56%	80%	66%	86%
	100	78%	92%	71%	92%	79%	89%	64%	89%	40%	76%	53%	80%	52%	78%	62%	85%	55%	83%	65%	90%
	250	93%	95%	86%	94%	99%	96%	83%	95%	53%	90%	58%	92%	57%	91%	82%	96%	75%	94%	80%	96%

Table 4.7 Alternative 2B - Highest Maximum PM2.5 Concentrations in Comparison to No Build

		Highest $PM_{2.5}$ Concentration at Intervals from Right of Way (ug/m^3)																													
	Distance from ROW (m)	Malden Rd to Labelle						Labelle to Pulford						Pulford North of Lennon Drain			North of Lennon Drain to Cousineau Rd						Cousineau Rd to Howard Ave						Howard Ave to Highway 401		
		Plaza A Alignment			Plaza B / C Alignment			Plaza A Alignment			Plaza B / C Alignment						Option 1 Alignment			Option 2 Alignment			Option 1 Alignment			Option 2 Alignment					
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 2B - 2015	50	96%	93%	-15	96%	94%	-15	97%	93%	-13	97%	93%	-13	74%	92%	-17	88%	100%	-5	91%	100%	-4	85%	100%	-8	85%	100%	-8	104%	100%	0
	100	89%	86%	-3	90%	87%	-3	94%	100%	-3	90%	100%	-3	83%	92%	-1	96%	100%	0	96%	100%	0	93%	100%	0	96%	100%	0	104%	100%	0
	250	94%	98%	0	95%	98%	0	96%	100%	0	96%	100%	0	96%	100%	0	96%	100%	0	100%	91%	0	96%	110%	0	100%	110%	0	114%	100%	0
Alternative 2B - 2025	50	97%	93%	-20	97%	93%	-22	95%	93%	-19	95%	93%	-21	79%	93%	-33	86%	100%	-12	86%	92%	-15	89%	100%	-16	86%	100%	-17	97%	100%	-1
	100	93%	92%	-5	94%	92%	-5	100%	100%	7	94%	100%	-2	90%	92%	-5	90%	100%	-1	93%	92%	0	93%	100%	-1	93%	100%	0	108%	100%	0
	250	94%	93%	0	94%	93%	0	104%	92%	0	104%	100%	0	104%	100%	0	96%	100%	0	100%	100%	0	100%	100%	0	100%	100%	0	109%	100%	0
Alternative 2B - 2035	50	97%	93%	-36	97%	93%	-38	98%	94%	-25	98%	94%	-27	73%	87%	-49	87%	93%	-31	84%	93%	-35	85%	100%	-39	80%	93%	-44	100%	92%	-5
	100	92%	88%	-21	94%	89%	-19	97%	100%	6	91%	93%	-6	91%	92%	-10	94%	100%	-4	91%	100%	-4	97%	100%	-3	97%	100%	-3	104%	92%	0
	250	93%	97%	-3	94%	98%	-3	104%	92%	0	104%	100%	0	100%	100%	0	100%	100%	0	100%	100%	0	113%	100%	0	113%	100%	0	113%	100%	0

Table 4.8 Alternative 2B - Highest Maximum NOx Concentrations in Comparison to No Build

		Highest NOx Concentration at Intervals from Right of Way (ug/m^3)																			
	Distance from ROW (m)	Malden Rd to Labelle				Labelle to Pulford				Pulford to North of Lennon Drain		North of Lennon Drain to Cousineau Rd				Cousineau Rd to Howard Ave				Howard Ave to Highway 401	
		Plaza A Alignment		Plaza B/C Alignment		Plaza A Alignment		Plaza B/C Alignment				Option 1 Alignment		Option 2 Alignment		Option 1 Alignment		Option 2 Alignment			
		1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour
Alternative 2B - 2015	50	65%	83%	64%	81%	86%	84%	74%	84%	43%	75%	56%	88%	54%	88%	65%	85%	63%	83%	80%	92%
	100	82%	100%	75%	97%	98%	87%	70%	87%	52%	82%	51%	83%	53%	84%	69%	88%	63%	85%	77%	99%
	250	88%	93%	91%	92%	101%	95%	87%	94%	59%	93%	58%	94%	58%	94%	85%	98%	77%	95%	90%	99%
Alternative 2B - 2025	50	67%	87%	66%	87%	81%	85%	70%	85%	37%	75%	58%	88%	57%	86%	63%	84%	58%	82%	64%	85%
	100	78%	90%	74%	90%	86%	92%	70%	90%	47%	80%	56%	81%	54%	78%	66%	86%	57%	85%	67%	91%
	250	91%	93%	88%	94%	100%	96%	85%	95%	62%	92%	61%	92%	59%	88%	86%	94%	77%	94%	81%	96%
Alternative 2B - 2035	50	64%	85%	62%	85%	73%	80%	65%	81%	33%	71%	53%	85%	51%	85%	59%	82%	54%	79%	66%	84%
	100	75%	90%	71%	90%	77%	89%	64%	89%	41%	76%	52%	78%	52%	78%	62%	85%	54%	82%	64%	90%
	250	88%	94%	85%	94%	97%	95%	83%	95%	53%	90%	57%	91%	57%	91%	83%	97%	75%	94%	79%	96%

Table 4.9 Alternative 3 - Highest Maximum PM2.5 Concentrations in Comparison to No Build

	Distance from ROW (m)	Highest $PM_{2.5}$ Concentration at Intervals from Right of Way ($\mu g/m^3$)																	
		Malden Rd to Labelle						Labelle to Pulford						Pulford North of Lennon Drain			North of Lennon Drain to Cousineau Rd			Cousineau Rd to Howard Ave			Howard Ave to Highway 401		
		Plaza A Alignment			Plaza B / C Alignment			Plaza A Alignment			Plaza B / C Alignment														
		24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS	24 Hour	Annual	> CWS
Alternative 3 - 2015	50	94%	93%	-6	94%	93%	-10	75%	79%	-18	78%	86%	-18	63%	77%	-17	84%	92%	-5	67%	83%	-8	104%	100%	0
	100	100%	92%	-2	103%	92%	-1	81%	92%	-3	84%	92%	-3	73%	83%	-1	93%	91%	0	79%	91%	0	104%	100%	0
	250	104%	100%	0	104%	100%	0	88%	91%	0	92%	91%	0	92%	91%	0	92%	91%	0	88%	100%	0	114%	110%	0
Alternative 3 - 2025	50	100%	93%	-12	97%	93%	-13	70%	80%	-40	73%	87%	-40	56%	71%	-38	80%	85%	-17	64%	77%	-20	100%	100%	0
	100	103%	100%	-1	109%	100%	5	81%	85%	-4	81%	92%	-4	71%	77%	-5	87%	83%	-1	73%	83%	-1	108%	100%	0
	250	104%	100%	0	111%	100%	1	88%	83%	0	92%	92%	0	88%	91%	0	88%	91%	0	85%	91%	0	113%	100%	0
Alternative 3 - 2035	50	95%	94%	-44	100%	94%	-25	67%	75%	-74	70%	81%	-72	56%	67%	-58	79%	79%	-39	58%	71%	-50	100%	100%	1
	100	103%	93%	-16	115%	100%	-3	77%	79%	-15	77%	86%	-15	72%	77%	-10	84%	83%	-5	74%	83%	-4	107%	100%	1
	250	100%	100%	-2	107%	100%	-1	89%	92%	0	93%	92%	0	85%	91%	0	89%	91%	0	92%	91%	0	113%	100%	0

Table 4.10 Alternative 3 - Highest Maximum NOx Concentrations in Comparison to No Build

	Distance from ROW (m)	Highest NOx Concentration at Intervals from Right of Way ($\mu g/m^3$)															
		Malden Rd to Labelle				Labelle to Pulford				Pulford to North of Lennon Drain		North of Lennon Drain to Cousineau Rd		Cousineau Rd to Howard Ave		Howard Ave to Highway 401	
		Plaza A Alignment		Plaza B/C Alignment		Plaza A Alignment		Plaza B/C Alignment									
		1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour	1 Hour	24 Hour
Alternative 3 - 2015	50	86%	84%	91%	87%	87%	90%	87%	90%	49%	71%	92%	110%	82%	80%	101%	97%
	100	88%	100%	92%	101%	88%	95%	88%	95%	64%	79%	86%	98%	90%	85%	111%	102%
	250	98%	92%	99%	94%	94%	98%	94%	98%	82%	93%	85%	95%	115%	94%	122%	103%
Alternative 3 - 2025	50	84%	89%	83%	90%	74%	87%	74%	87%	40%	73%	77%	96%	64%	80%	75%	88%
	100	90%	94%	87%	94%	75%	93%	75%	93%	54%	78%	73%	88%	68%	84%	78%	95%
	250	97%	96%	96%	95%	88%	96%	88%	96%	69%	92%	78%	95%	93%	94%	95%	99%
Alternative 3 - 2035	50	72%	88%	70%	89%	70%	83%	70%	83%	35%	68%	66%	93%	59%	78%	71%	86%
	100	76%	93%	73%	93%	68%	90%	68%	90%	43%	74%	66%	84%	64%	82%	73%	93%
	250	89%	95%	85%	95%	87%	96%	87%	96%	57%	90%	69%	92%	87%	94%	89%	97%

Table 4.11 - PLAZA ALTERNATIVES - Highest Maximum $PM_{2.5}$ Concentrations in Comparison to No Build

Year	Distance from Property Boundary (m)	Plaza A			Plaza B			Plaza B1			Plaza C		
		24 Hour	Annual	>CWS	24 Hour	Annual	>CWS	24 Hour	Annual	>CWS	24 Hour	Annual	>CWS
2015	50	217%	200%	134	250%	164%	127	283%	200%	148	200%	136%	84
	100	167%	140%	15	190%	120%	20	209%	140%	54	195%	140%	39
	250	129%	120%	0	138%	110%	0	130%	110%	0	162%	120%	2
2025	50	236%	200%	156	284%	182%	167	374%	220%	177	212%	155%	110
	100	173%	150%	36	209%	130%	35	239%	150%	77	205%	140%	59
	250	136%	130%	1	141%	110%	3	143%	110%	8	173%	120%	6
2035	50	250%	209%	168	288%	200%	175	383%	240%	193	223%	164%	129
	100	186%	150%	56	218%	140%	48	250%	160%	87	223%	150%	77
	250	136%	130%	3	150%	110%	8	140%	120%	11	182%	130%	17

Table 4.12 - PLAZA ALTERNATIVES - Highest Maximum NO_x Concentrations in Comparison to No Build

Year	Distance from Property Boundary (m)	Plaza A		Plaza B		Plaza B1		Plaza C	
		1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances
2015	50	344%	8	621%	6	522%	2	123%	0
	100	194%	0	463%	2	368%	1	128%	0
	250	107%	0	252%	0	223%	0	116%	0
2025	50	805%	14	929%	18	790%	7	213%	0
	100	458%	1	705%	7	590%	1	208%	0
	250	393%	0	287%	0	310%	0	173%	0
2035	50	886%	16	1096%	17	691%	6	222%	0
	100	533%	1	758%	6	655%	3	216%	0
	250	448%	0	356%	0	306%	0	176%	0

Table 4.13 - CROSSING ALTERNATIVES - Highest Maximum $PM_{2.5}$ Concentrations in Comparison to No Build

Year	Distance from ROW (m)	Crossing A From Plaza A			Crossing B From Plaza A			Crossing B From Plaza B1			Crossing C From Plaza A			Crossing C From Plaza B			Crossing C From Plaza C		
		24 Hour	Annual	Exceedances	24 Hour	Annual	Exceedances	24 Hour	Annual	Exceedances	24 Hour	Annual	Exceedances	24 Hour	Annual	Exceedances	24 Hour	Annual	Exceedances
2015	50	150%	136%	49	150%	136%	49	188%	136%	60	150%	136%	49	161%	127%	50	142%	100%	15
	100	135%	130%	14	135%	130%	14	170%	130%	20	135%	130%	14	136%	120%	20	139%	109%	1
	250	127%	120%	0	127%	120%	0	136%	110%	0	127%	120%	0	129%	110%	0	119%	100%	0
2025	50	171%	145%	83	171%	145%	83	204%	145%	87	171%	145%	83	182%	136%	78	158%	118%	35
	100	148%	130%	33	148%	130%	33	183%	130%	42	148%	130%	33	182%	130%	43	152%	130%	17
	250	130%	120%	4	130%	120%	4	139%	120%	3	130%	120%	4	157%	120%	2	124%	120%	0
2035	50	172%	155%	89	172%	155%	89	212%	155%	103	172%	155%	89	193%	145%	86	167%	127%	44
	100	150%	127%	44	150%	127%	44	188%	140%	57	150%	127%	44	195%	140%	55	161%	130%	21
	250	135%	120%	5	135%	120%	5	148%	120%	8	135%	120%	5	162%	120%	6	133%	120%	0

Table 4.14 - CROSSING ALTERNATIVES - Highest Maximum NO_x Concentrations in Comparison to No Build

Year	Distance from ROW (m)	Crossing A From Plaza A		Crossing B From Plaza A		Crossing B From Plaza B1		Crossing C From Plaza A		Crossing C From Plaza B		Crossing C From Plaza C	
		1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances	1-Hour	Exceedances
2015	50	197%	0	161%	0	174%	0	176%	0	148%	0	119%	0
	100	141%	0	141%	0	145%	0	161%	0	139%	0	149%	0
	250	128%	0	128%	0	114%	0	140%	0	117%	0	121%	0
2025	50	149%	0	145%	0	177%	0	175%	0	165%	0	125%	0
	100	130%	0	138%	0	167%	0	165%	0	161%	0	133%	0
	250	124%	0	130%	0	158%	0	158%	0	124%	0	117%	0
2035	50	170%	0	174%	0	219%	0	192%	0	155%	0	151%	0
	100	157%	0	168%	0	178%	0	192%	0	146%	0	156%	0
	250	147%	0	147%	0	153%	0	197%	0	142%	0	139%	0

5.0 EVALUATION OF ALTERNATIVES

The previous chapter presented the air dispersion modeling results for each Access Road, Plaza, and Crossing Alternative studied, and examined the potential changes to air quality in comparison to the No Build Alternative (i.e. doing nothing at all). This section of the report presents the comparative evaluation of the different options and discusses the potential benefits and effects in comparison to one another. Once again, this is done separately for the Access Road, Plaza and Crossing Alternatives.

5.1 Access Road Alternatives

In order to evaluate the potential benefit and effects of each Access Road Alternative and compare to one another, the maximum predicted $PM_{2.5}$ and NO_x concentrations at each distance interval were averaged along the entire route between Grand Marais Road and Howard Avenue. In this manner, the average change in the concentrations compared to No Build could be assessed. These results are presented in Table 5.1 for both $PM_{2.5}$ and NO_x.

The key finding is that implementation of almost any of the Alternatives results in improved air quality on average in comparison to the No-Build option. Some Alternatives and alignments result in more dramatic improvements than others. In general, depressed Alternatives (1B & 2B) result in lower concentrations and fewer exceedances of criteria on average than at-grade Alternatives (1A & 2A). A tunneled Alternative with a vent building (Alternative 3) results in the greatest reduction in $PM_{2.5}$ concentrations, but the lowest reduction in NO_x concentrations. As mentioned previously, the Jet Fans tunnel ventilation option typically resulted in unacceptable concentrations of $PM_{2.5}$ and NO_x, and frequently exceeded the relevant criteria by a significant amount, and thus was not considered further in this assessment.

Table 5.1 shows that all alternatives result in lower concentrations and number of exceedances on average in comparison with the No Build scenario. The depressed options consistently result in slightly lower $PM_{2.5}$ and NO_x concentrations. Also, the reduction in number of exceedances of the $PM_{2.5}$ criterion is greater for the depressed options than for the at-grade alternatives. These results are discussed in further detail in the following sections.

5.1.1 Comparison of At Grade, Below Grade & Cut & Cover Tunnel Alternatives

As discussed earlier, this segment encompasses various different types of roadway links, and thus was split into two separate sub-segments. Overall, this segment has the highest concentrations of NO_x and $PM_{2.5}$ in the future, and thus has the poorest air quality.

5.1.1.1 At Grade versus Below Grade Alternatives

The effect of depressing the roadway is discussed and examined in this section, through the comparison of Alternative 1A to 1B, and of 2A to 2B. As can be seen in Table 5.1, comparing the relative $PM_{2.5}$ concentrations between 1A and 1B, Alternative 1B (depressed) results in marginally lower concentrations (relative to No Build) at 50 m from the roadway. The difference is greater than 10% in 2035, and thus is considered to be significant. Similarly, Alternative 1B results in a greater reduction in the number of days predicted to be greater than the CWS. However, this effect is limited to approximately 50 m of the ROW. At 100 m from the ROW there is no difference between Alternative 1A and 1B, and no difference between implementation of either Alternative 1A or 1B and No Build.

A similar trend is seen in the comparison of Alternative 2A versus 2B. The $PM_{2.5}$ concentrations at 50 m away are marginally lower in 2015 and 2025, and significantly lower in 2035 for the depressed roadway. Also, there is a greater reduction in the number of days predicted to exceed the CWS at 50 m away from the roadway. This reduction is significant in 2035, but is once again limited to between 50 and 100 m from the ROW.

The annual average concentrations do not exceed the criterion on average for any of the alternatives examined, in any of the horizon years.

In terms of NOx concentrations, there are no predicted exceedances of the MOE 1-hour NOx criterion for any of Alternatives 1A, 1B, 2A, or 2B at any of the distance intervals studied. As mentioned previously, implementation of any of these alternatives result in significant (i.e. > 10%) decreases in the maximum predicted concentrations, relative to No build. The depressed options (Alternative 1B and 2B) show marginal decreases in the relative NO_x concentrations in comparison to the at-grade options. However, these decreases are not significant (i.e.< 10 %) between Alternative 1A and 1B or 2A and 2B.

5.1.1.2 At Grade versus Tunnel Alternatives

In this section of the report, the effect of tunneling the roadway is examined in comparison to an at grade roadway. This will be done via a comparison of the results along the route between Alternative 1A and 3, as well as 2A to 3.

Comparing the results presented in Table 5.1 for Alternatives 1A and 3 show that a tunneled alternative would result in significant reductions in the maximum $PM_{2.5}$ concentrations at 50 m from the ROW in all horizon years examined. This is true for comparisons of Alternative 3 to both Alternative 1A and 2A. Also, in comparison to Alternative 1A there is a significant reduction (i.e. >8) in the number of days predicted to exceed the CWS at 50 m away for a tunneled access road in comparison to an at-grade roadway in 2025. This difference becomes significant at 100 m away in 2035. However, these differences are less when Alternative 3 is compared to Alternative 2A, and is only significant at 50 m away in 2025 and 2035.

The annual average concentrations do not exceed the criterion on average for any of the alternatives examined, in any of the horizon years.

With respect to the maximum predicted 1-hour NOx concentrations, there are no predicted exceedances of the MOE 1-hour NOx criterion for any of the at-grade or tunneled Alternatives examined. Comparing the relative magnitude of the maximum predicted concentrations between 1A and 3 shows that there is no difference at any of the distance intervals, in any of the horizon years. However, a comparison between Alternative 2A and 3 indicates that a tunneled alternative increases the maximum predicted concentrations over an at-grade access road with 2-way service roads at 50 m from the ROW. However, this difference is significant only in the year 2015. The increases in all other years are marginal.

Based on these results, the effect of tunneling the roadway (either positive or negative) does not extend beyond a maximum of 100 m away in comparison to at grade Alternatives.

5.1.1.3 Below Grade versus Tunnel Alternatives

This evaluation examines differences between below grade (depressed) alternatives and the tunneled alternative. This will be done through a comparison of Alternative 1B to 3 and Alternative 2B to 3.

The results presented in Table 5.1 show that there are significant differences (i.e. > 10%) in the relative maximum $PM_{2.5}$ concentrations between the depressed alternatives (1B and 2B) in comparison to the tunneled alternative (3). Also, when compared to both Alternatives 1B and 2B, a tunneled alternative would result in reductions in the number of days predicted to exceed the CWS. However, the reductions are only significant (i.e. > 8) at 50 m from the ROW in 2035. The differences in all previous years and at other distance intervals are marginal.

The NO_x results are similar to what was found when the at-grade alternatives were compared to a tunneled alternative. There are no predicted exceedances of the MOE 1-hour NOx criterion for any of the depressed or tunneled Alternatives. In comparing the relative magnitude of the maximum predicted NO_x concentrations between 1B and 3 shows that there is no difference at any of the distance intervals, in any of the horizon years[1]. However, a comparison between Alternative 2B and 3 indicates that a tunneled alternative increases the maximum predicted concentrations over an at-grade access road with 2-way service roads at 50 m from the ROW. However, this difference is significant only in the year 2015. The increases in all other years are marginal.

Based on the above comparisons, the effect of tunneling the roadway (either positive or negative) is limited to within 50 - 100 m from the roadway in comparison to below grade (depressed) Alternatives.

5.1.2 Service Road Configurations

As part of the assessment, two separate configurations of freeway service roads were studied. These included one-way service roads on either side of the freeway, and two way service roads located approximately on the existing Highway 3 / Huron Church Road alignment. The differences between these configurations will be evaluated through comparisons between Alternatives 1A and 2A, as well as 1B and 2B.

Comparison of the $PM_{2.5}$ data between the at-grade alternatives shows that the two way service road configurations (Alternative 2) results in marginally lower maximum $PM_{2.5}$ concentrations, in comparison to the one-way service road configurations (Alternative 1). The difference is significant (> 10%) for the

[1] Note that there is a significant difference between the NO_x concentrations of the 1B Option 2 route alignment in comparison to Alternative 3 at 50 m away.

Option 2 alignment in 2015. Also, the two-way service road alignments result in reductions in the number of days predicted to be greater than the CWS. These differences are significant at 50 m from the ROW in 2035.

The comparison between the $PM_{2.5}$ results for the below grade options shows a slightly different trend. For these options, although there is a marginal reduction in the maximum $PM_{2.5}$ concentrations between the one and two-way service roads, and slight reductions in the number of days predicted to exceed the CWS, none of these differences are significant. This is true at all distance intervals and all horizon years studied. However, the two-way service road configuration does result in a reduction in the maximum predicted 1-hour NOx concentrations at 50 m away from the roadway in 2015 for both the at grade and below grade options. The reductions are marginal in 2025 and 2035.

Thus, the results indicate that the two-way service road configurations result in lower maximum $PM_{2.5}$ and NO_x concentrations, and fewer days that are predicted to exceed the CWS. However, this effect is limited to less than 100 m away from the ROW, and is more pronounced for at-grade alternatives than below grade alternatives.

5.1.3 Route Alignments Between St.Clair College & Howard Avenue

As outlined previously, two separate route alignment options were studied in the area between St.Clair College and Howard Avenue. The first route alignment (Option 1), realigns the existing Talbot Road / Highway 3 corridor slightly to the northeast. This realignment begins at approximately at Howard Avenue and continues approximately to the entrance to St.Clair College.

The Option 2 alignment utilizes the existing Talbot Road / Highway 3 corridor as local access service roads without any realignment and aligns the freeway to the southeast.

In order to evaluate whether there are any differences between the two alignments, the Option 1 and Option 2 results will be compared to one another for each alternative. This will be done separately for the at-grade and below grade alternatives.

5.1.3.1 At Grade Alternatives

The $PM_{2.5}$ results from Alternative 1A show that the maximum predicted concentrations are similar for both Option 1 and Option 2 at 50 m away in all horizon years. The number of days predicted to exceed the CWS is reduced for the Option 2 alignment at 50 m away by 2025. However, this difference is not significant until 2035. This same trend is seen in the results for Alternative 2A.

The Option 2 alignment also results in reduced maximum predicted 1-hour NOx concentrations. However, these reductions are only significant for Alternative 1A at 50 m from the ROW in 2015.

5.1.3.2 Below Grade Alternatives

Similar to the results for the at-grade alternatives, the Option 2 alignment results in slightly lower maximum $PM_{2.5}$ concentrations than the Option 1 alignment for the below grade alternatives. However, none of these differences are significant at any distance interval, in any of the years examined. This is also true for the change in the number of predicted CWS exceedance days.

The NO_x results for the below grade alternatives exhibit the identical trend seen for the at-grade alternatives. The Option 2 alignment results in reduced maximum predicted 1-hour NOx concentrations. However, these reductions are only significant for Alternative 1B at 50 m from the ROW in 2015.

The results outlined above indicate that in comparison to the Option 1 route alignment, the Option 2 alignment results in reduced $PM_{2.5}$ concentrations for at-grade alternatives, and reduced NO_x concentrations for both at-grade or depressed options. However the differences between the Options are limited to distances less than 100 m away from the ROW.

5.2 Evaluation of Plaza Alternatives

The dispersion model results presented previously for each of the four plaza alternatives were used to complete a comparative evaluation of the different plaza options. This evaluation is presented in Table 5.2.

The property footprints and layouts for each Plaza Alternative are slightly different, and thus the results will also differ somewhat.

5.2.1 $PM_{2.5}$ Concentrations

As can be seen in Table 5.2, the maximum predicted $PM_{2.5}$ concentrations at 50 m away from the property boundary increase by a factor of 2X to more than 3X the No Build concentrations in each of the horizon years for all four plaza options. The changes at all distance intervals from the boundary were shown earlier in Table 4.11, and are significant at 250 m for all Plaza Alternatives and all horizon years. Similarly, all of the Plaza Alternatives result in a significant increase the number of days predicted to exceed the CWS at 100 m away, in comparison to No Build.

All of the plaza alternatives have a significant impact on the air quality in the immediate vicinity of the properties. In 2015 and 2025, this distance is approximately 100 m from the property boundary, but increases to 250 m from the boundary in 2035 for Plaza B, B1 and C.

The largest difference of any alternatives (i.e. highest increase) is seen in the vicinity of Plaza B1 in 2035. Plaza B1 also has the largest increase in number of days predicted to exceed the CWS within 100 m of the Plaza boundary.

The lowest concentrations and lowest change in the number of days predicted to exceed the CWS is seen in the vicinity of Plaza C. This is likely due to the arrangement of the roadways within the property footprint, which results in an additional buffer between the emission sources (i.e. cars and trucks) and the property boundary.

5.2.2 NO_X Concentrations

All of the plaza alternatives have a significant impact on the air quality in the immediate vicinity of the property boundaries. The maximum predicted 1-hour NO_X concentrations at 50 m away from the property boundary increase by as much as a factor of 6X in 2015, 9X in 2025 and almost 11X in 2035, in comparison to the No Build concentrations for all four plaza options. The increases in concentration are significant at distances up to 250 m from the property boundary, for all Plaza Alternatives, and all horizon years.

Plaza A and B also show significant increases in the number of hours when the MOE AAQC for NOx is predicted to be exceeded at 50 m away in 2025. The NOx criterion is not exceeded at Plaza B1 or Plaza C at any of the distance intervals in any of the horizon years.

Plaza B results in the highest increase in maximum predicted concentrations and the largest increase in the number of exceedances of the NO_x criterion at distances up to 100 m from the property boundary in 2025 and 2035.

The lowest concentrations and lowest change in the number of days predicted to exceed the NO_x criterion is seen in the vicinity of Plaza C. As mentioned previously, this is likely due to an additional buffer between the vehicles and the property boundary, because of the facility layout.

5.3 Evaluation of Crossing Alternatives

The potential effects of the Crossing Alternatives are quite different from those of the Plaza Alternatives, and thus have been presented separately. The evaluation is also presented in Table 5.2. Values that pertain to the referenced crossing, rather than the plaza, are shown in brackets below the plaza value.

The results from the Crossing Alternatives / Connecting Roadways are similar to those seen for the Access Road Alternatives. However, the Crossings and connecting roads are elevated, and thus the emissions behave a little differently than ground level sources.

5.3.1 $PM_{2.5}$ Concentrations

As can be seen in Table 5.2, the maximum predicted $PM_{2.5}$ concentrations at 50 m away from the ROW of the Crossings and connecting roadways increase by a factor of 1.5 - 2X the No Build concentrations in each of the horizon years for the three crossing options. Table 4.13 presented the changes at all distance intervals from the boundary, and are significant at 250 m for all Crossing Alternatives and all horizon years. All of the Crossing Alternatives result in a significant increase the number of days predicted to exceed the CWS at 100 m away, in comparison to No Build.

Crossing B combined with Plaza B1 results in the largest difference of any of the alternatives (i.e. highest increase) in 2035. This is likely due to the "spillover effect" of emissions from Plaza B1, as this effect is not seen when Crossing B is combined with Plaza A. This crossing alternative also has the largest increase in number of days predicted to exceed the CWS within 50 - 100 m of the ROW.

The lowest concentrations and lowest change in the number of days predicted to exceed the CWS is seen in the vicinity of Crossing C, when combined with Plaza C. The difference in the maximum predicted concentrations, and number of days predicted to be in excess of the CWS is significantly lower than all other Plaza/Crossing combinations.

Based on the above evaluation, the impact of the Crossings / Connecting Roadway is limited to approximately 100 m from the ROW.

5.3.2 NO_X Concentrations

The maximum predicted 1-hour NO_X concentrations increase by more than a factor of 2X in comparison to the No Build concentrations at 50 m away from the ROW by 2035. The increases in concentration are significant (> 10%) at distances up to 250 m away, for all Alternatives, and all horizon years. Similar to the results of the Access Road Alternatives, there are no exceedances of the MOE 1-hour NOx criterion in the vicinity of the Crossings / Connecting Roadway.

The largest increase in the maximum predicted concentrations is seen in the vicinity of Crossing B from Plaza B1, at all distance intervals studied in all years. Conversely, the lowest increases in concentrations are seen in the vicinity of Crossing C from Plaza C.

Table 5.1 Access Road Evaluation Table

PRACTICAL ALTERNATIVES EVALUATION	Factor: Changes in Air Quality

Performance Measure	Criteria/Indicator	Measurement/Units	Alternative 1A Option 1	Alternative 1A Option 2	Alternative 1B Option 1	Alternative 1B Option 2	Alternative 2A Option 1	Alternative 2A Option 2	Alternative 2B Option 1	Alternative 2B Option 2	Alternative 3	Comments
Effect on changes in concentration of particulate matter	Change in concentration of $PM_{2.5}$ versus Do Nothing	Subjective assessment at identified receptors versus Do Nothing										While tunnel generally results in the lowest PM2.5 concentrations at sensitive receptors such as schools and residences, local air quality is strongly influenced by background sources and transboundary flow. Thus, all Alternatives result in similar AQ conditions at these locations.
	Change in the number of 24 hr periods where concentrations of $PM_{2.5}$ is > 30 µg/m^3 versus do nothing in 2015	Distance from ROW	-6	-6	-9	-10	-9	-10	-10	-10	-10	All alternatives result in an improvement in concentrations in comparison to "Do Nothing". Depressed alternatives result in slightly lower PM2.5 concentrations in comparison to at-grade alternatives. Tunnel alternatives results in lowest PM2.5 concentrations of all Alternatives. All Alternatives result in similar air quality conditions at 100 m from the roadway. Option 1 and Option 2 Alignments result in similar maximum concentrations and number of relative exceedances.
		Distance from ROW	1	-1	-1	-1	-1	-1	-1	-1	-1	
		Distance from ROW	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	95%	94%	89%	87%	89%	83%	82%	83%	71%	
	Change in the number of 24 hr periods where concentrations of $PM_{2.5}$ is > 30 µg/m^3 versus Do Nothing in 2025	Distance from ROW 50 m	-9	-15	-18	-22	-16	-21	-21	-22	-25	All alternatives result in an improvement in concentrations in comparison to "Do Nothing". Depressed alternatives result in slightly lower PM2.5 concentrations in comparison to at-grade alternatives. Tunnel alternatives results in lowest PM2.5 concentrations of all Alternatives. all Alternatives result in similar air quality conditions at 100 m from the roadway. Option 1 and Option 2 Alignments result in similar maximum concentrations and number of relative exceedances.
		Distance from ROW 100 m	2	1	-1	1	-2	-2	-3	-2	-3	
		Distance from ROW 250 m	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	95%	95%	88%	86%	91%	87%	85%	84%	67%	
	Change in the number of 24 hr periods where concentrations of $PM_{2.5}$ is > 30 µg/m^3 versus Do Nothing in 2035	Distance from ROW	-14	-23	-36	-39	-25	-38	-40	-43	-49	All alternatives result in an improvement in concentrations in comparison to "Do Nothing". Depressed alternatives result in slightly lower PM2.5 concentrations in comparison to at-grade alternatives. Tunnel alternatives results in lowest PM2.5 concentrations of all Alternatives. all Alternatives result in similar air quality conditions at 100 m from the roadway. Option 1 and Option 2 Alignments result in similar maximum concentrations and number of relative exceedances.
		Distance from ROW	4	3	-3	-3	-2	-4	-6	-6	-7	
		Distance from ROW	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	96%	95%	85%	84%	93%	86%	82%	79%	64%	
	Does the average annual concentration of $PM_{2.5}$ exceed 15 µg/m^3 in 2015	Yes/No	N	N	N	N	N	N	N	N	N	The annual average concentrations do not exceed 15 ug/m3 along the route, on average.
	Does the average annual concentration of $PM_{2.5}$ exceed 15 µg/m^3 in 2025	Yes/No	N	N	N	N	N	N	N	N	N	
	Does the average annual concentration of $PM_{2.5}$ exceed 15 µg/m^3 in 2035	Yes/No	N	N	N	N	N	N	N	N	N	
	Summary of effect on concentration of particulate matter	Subjective assessment										While tunnel is slightly preferred within the first 50 m from the Right of Way, all Alternatives result in similar AQ conditions at 100 m and beyond from the right of way.
Effect on changes in concentration of gaseous pollutants	Change in concentration of NOx versus Do Nothing	Subjective Assessment based on changes at identified receptors versus Do Nothing										Local air quality is strongly influenced by background sources and transboundary flow. Thus, all Alternatives result in similar AQ conditions at sensitive receptor locations such as schools, etc that are located greater than 250 m from the Right of Way.
	Change in the number of 24 hr periods where concentrations of NOx >400 µg/m^3 versus Do Nothing in 2015	Distance from ROW 50 m	0	0	0	0	0	0	0	0	0	All predicted maximum concentrations are below the relevant criteria and guidelines at 50 m from the roadway. All alternatives result in an improvement in concentrations in comparison to "Do Nothing". Depressed alternatives result in slightly lower NOx concentrations in comparison to at-grade alternatives. Option 2 Alignments result in slightly lower NOx concentrations than Option 1 Alignments, on average. Tunnel alternatives results in highest Nox concentrations on average along the corridor.
		Distance from ROW 100 m	0	0	0	0	0	0	0	0	0	
		Distance from ROW 250 m	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	74%	60%	69%	56%	59%	54%	55%	54%	74%	
	Change in the number of 24 hr periods where concentrations of NOx > 400 µg/m^3 versus Do Nothing in 2025	Distance from ROW	0	0	0	0	0	0	0	0	0	All predicted maximum concentrations are below the relevant criteria and guidelines at 50 m from the roadway. All alternatives result in an improvement in concentrations in comparison to "Do Nothing". Depressed alternatives result in slightly lower NOx concentrations in comparison to at-grade alternatives. Option 2 Alignments result in slightly lower NOx concentrations than Option 1 Alignments, on average. Tunnel alternatives results in highest Nox concentrations on average along the corridor.
		Distance from ROW	0	0	0	0	0	0	0	0	0	
		Distance from ROW	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	61%	54%	58%	51%	55%	52%	52%	50%	60%	
	Change in the number of 24 hr periods where concentrations of NOx > 400 µg/m^3 versus Do Nothing in 2035	Distance from ROW 50 m	0	0	0	0	0	0	0	0	0	All predicted maximum concentrations are below the relevant criteria and guidelines at 50 m from the roadway. All alternatives result in similar concentrations and reductions in comparison to "Do Nothing" in 2035.
		Distance from ROW 100 m	0	0	0	0	0	0	0	0	0	
		Distance from ROW 250 m	0	0	0	0	0	0	0	0	0	
		Maximum concentration relative to Do Nothing (at 50 m)	53%	48%	51%	46%	49%	47%	48%	46%	53%	
	Summary of effect on concentration of gaseous pollutants	Subjective Assessment										Although all concentrations below the relevant standards and guidelines, the tunnel alternative results in the highest NOx concentrations and thus is least preferred for NOx concentrations. All Alternatives result in similar AQ conditions at 100 m and beyond from the right of way.
Overall Assessment												Implementation of any Alternative results in a net AQ benefit over "Do Nothing". While tunnel is slightly preferred within the first 50 m from the Right of Way for PM2.5 concentrations, it is least preferred for NOx concentrations. Thus the influence of Nox and PM2.5 cancel each other out, and there is no difference in overall AQ effects between Alt 3 (tunnel) and other alternatives. Also, effects between depressed and at-grade alternatives are similar overall, and thus there is no difference in AQ between any of the alternatives.

1. Do Nothing defined as no transportation improvements other than those already
2. Year 2015 reflects effects upon opening of facility
3. Provinicial guideline for acceptable maximum 24-hr average PM2.5 concentration is <30µg/m3
4. Year 2025 reflects effects 10 years post construction
5. Year 2035 reflects effects at 30 year planning horizon
6. Federal objective for acceptable average annual concentration of PM2.5 is < 15µg/m3

Table 5.2 Plaza and Crossings Evaluation Table

PRACTICAL ALTERNATIVE EVALUATION	Factor: Changes in Air Quality								
			Plaza A			Plaza B	Plaza B1	Plaza C	
Performance Measure	Criteria/Indicator	Measurement/Units	From Crossing A	From Crossing B	From Crossing C	From Crossing C	From Crossing B	From Crossing C	Comments
			A-G	B-G	C-G	C-E	B-F	C-D	
Effect on changes in concentration of particulate matter	Change in concentration of $PM_{2.5}$ versus Do Nothing	Subjective assessment at identified receptors versus Do Nothing							In Armanda St. area, future No Build results in the lowest concentrations of all Alternatives, and Plaza A results in marginally higher PM2.5 concentrations than Plaza B. Implementation of any Plaza Alternative results in increased concentrations over No Build. Crossing Alternatives have no impact on this area. In Sandwich, future No Build results in the lowest concentrations of all Alternatives, but there is essentially no difference between No Build and Plaza A/Plaza B/Plaza C Alternatives. Thus, Plaza alternatives have no impact in Sandwich. Crossing C results in the highest concentrations in Sandwich relative to all other Alternatives, but the increase is marginal.
	Change in the number of 24 hr periods where in concentrations of $PM_{2.5}$ is > 30 $\mu g/m^3$ versus do nothing in 2015	Number expressed in terms of distance intervals/offsets from ROW 50m	134 (49)	134 (49)	134 (49)	127 (50)	148 (60)	84 (15)	Implementation of any of the Alternatives has a negative impact on Air Quality within 100 m of the Plaza boundary. Significant increases in maximum concentrations are predicted to occur within 100 m of the Plaza boundary versus No Build for all Plaza/Crossing combinations. Maximum concentrations are approximately 2X higher than No Build within 50 m of the Plaza boundary. Plaza B1/Crossing B has the highest increases relative to No Build. Plaza C / Crossing C has the lowest increase in concentrations in the vicinity of the Plazas (because of buffer, and distance away from other major roads such as EC Row and Ojibway, which also influence Air Quality in the vicinity of the Plaza A and B).
		100m	15 (14)	15 (14)	15 (14)	20 (20)	54 (22)	39 (1)	
		250	0 (0)	0 (0)	0 (0)	0 (0)	0 (1)	2 (0)	
		Maximum concentration relative to Do Nothing at 50m	217%(150%)	217%(150%)	217%(150%)	250% (161%)	282%(161%)	200%(142%)	
	Change in the number of 24 hr periods where in concentrations of $PM_{2.5}$ is > 30 $\mu g/m^3$ versus Do Nothing in 2025	Number expressed in terms of distance intervals/offsets from ROW 50m	156 (83)	156 (83)	156 (83)	167 (78)	177 (87)	110 (35)	Implementation of any of the Alternatives has a negative impact on Air Quality within 100 m of the Plaza boundary. Significant increases in maximum concentrations are predicted to occur within 100 m of the Plaza boundary versus No Build for all Plaza/Crossing combinations. Maximum concentrations are approximately 2X higher than No Build within 50 m of the Plaza boundary. Concentrations are marginally higher than 2015. Plaza B1/Crossing B has the highest increases relative to No Build. Plaza C / Crossing C has the lowest increase in concentrations in the vicinity of the Plazas (because of buffer and distance away from other major roads such as EC Row and Ojibway, which also influence Air Quality in the vicinity of the Plaza A and B).
		100m	36 (33)	36 (33)	36 (33)	35 (43)	77 (42)	59 (17)	
		250m	1 (4)	1 (4)	1 (4)	3 (2)	8 (3)	6 (0)	
		Maximum concentration relative to Do Nothing at 50m	236%(171%)	236%(171%)	236%(171%)	284%(182%)	374%(196%)	212%(158%)	
	Change in the number of 24 hr periods where in concentrations of $PM_{2.5}$ is > 30 $\mu g/m^3$ versus Do Nothing in 2035	Number expressed in terms of distance intervals/offsets from ROW 50m	168 (99)	168 (99)	168 (99)	175 (86)	193 (103)	129(44)	Implementation of any of the Alternatives has a negative impact on Air Quality within 250 m of the Plaza boundary. Significant increases in maximum concentrations are predicted to occur within 250 m of the Plaza boundary versus No Build for all Plaza/Crossing combinations. Maximum concentrations are approximately 2X higher than No Build within 50 m of the Plaza boundary. Concentrations are marginally higher than 2025. Plaza B1/Crossing B has the highest increases relative to No Build. Plaza C / Crossing C has the lowest increase in concentrations in the vicinity of the Plazas (because of buffer and distance away from other major roads such as EC Row and Ojibway, which also influence Air Quality in the vicinity of the Plaza A and B).
		100m	56 (44)	56 (44)	56 (44)	48 (55)	87 (57)	77(21)	
		250m	3 (5)	3 (5)	3 (5)	8 (6)	11 (8)	17(0)	
		Maximum concentration relative to Do Nothing at 50m	250%(172%)	250%(172%)	250%(172%)	288%(193%)	383%(211%)	223%(167%)	
	Does the average annual concentration of $PM_{2.5}$ exceeds 15 $\mu g/m^3$ in 2015	Yes/No at 50 m	Plz - Yes (50m), Crs - No (50m)	Plz - Yes (50m), Crs - No (50m)	Plz - Yes (50m), Crs - No (50m)	Plz - Yes (50m), Crs - No (50m)	Plz - Yes (50m), Crs - No (50m)	Plz - No (50m), Crs - No (50m)	Average (typical) concentrations are predicted to be greater than the Reference Level at 50 m away from the Plaza Boundary for all Alternatives in 2015. Concentrations are less than the reference level at greater than 50 m from the property boundary.
		Yes/No at 100 m	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	
		Yes/No at 250 m	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	
	Does the average annual concentration of $PM_{2.5}$ exceeds 15 $\mu g/m^3$ in 2025	Yes/No at 50 m	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - No (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - No (50m)	Average (typical) concentrations are predicted to be greater than the Reference Level at 50 m away from the Plaza Boundary for all Alternatives in 2025. Concentrations are less than the reference level at greater than 50 m from the property boundary.
		Yes/No at 100 m	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	
		Yes/No at 250 m	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	
	Does the average annual concentration of $PM_{2.5}$ exceeds 15 $\mu g/m^3$ in 2035	Yes/No at 50 m	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - Yes (50m)	Plz - Yes (50m), Crs - No (50m)	Average (typical) concentrations are predicted to be greater than the Reference Level at 50 m away from the Plaza Boundary for all Alternatives in 2035. Plaza B1 results in concentrations greater than the reference level at 100 m away from the boundary. Concentrations are less than the reference level at distances greater than 50 m from the property boundary for all other Alternatives.
		Yes/No at 100 m	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	Plz - No (100m), Crs - No (100m)	
		Yes/No at 250 m	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	Plz - No(250m), Crs - No (250m)	
	Summary of effect on concentration of particulate matter	Subjective assessment							Plaza A is least preferred over other Alternatives as there are more receptors in closer proximity to the Plaza boundary than other Alternatives, and the highest effects are seen within 50 - 100 m of the boundary. Crossing C is least preferred over other Alternatives as it has some influence on PM2.5 concentrations in Sandwich.
Effect on changes in concentration of gaseous pollutants	Change in concentration of NOx versus Do Nothing	Subjective Assessment based on changes at identified receptors versus Do Nothing							NOx concentrations in the vicinity of Armanda street are increased relative to No Build for all Plaza alternatives. Implementation of Plaza A results in higher NOx concentrations than other Plaza alternatives. Crossing Alternatives have no impact on Armanda St area. In Sandwich, future No Build results in the lowest NOx concentrations of all Alternatives. However, there is little to no difference between No Build and Plaza A/B Alternatives. Crossing A/B have little impact on NOx concentrations in Sandwich. Crossing C results in marginally higher NOx
	Change in the number of 1hr periods where concentrations of NOx >400 $\mu g/m^3$ versus Do Nothing in 2015	Number expressed in terms of distance intervals/offsets from ROW 50m	8 (0)	8 (0)	8 (0)	6(0)	2 (0)	0 (0)	Maximum predicted 1-hour NOx concentrations increase by 1 - 6X over future No Build within 50 m of the Plaza boundary for all Alternatives. There is an increase in the number of hours greater than the MOE AAQC for NOx relative to No Build at 50 m away from the Plaza boundary. Plaza A and Plaza B have the highest increases due to the combined effect of the Plaza and local roads. NOx concentrations are higher relative to No Build within 50 - 250 m of the roadway for all crossings. The impact of the crossings is limited to within 100 m of the bridge/roadway.
		100m	0 (0)	0 (0)	0 (0)	2(0)	1 (0)	0 (0)	
		250m	0 (0)	0 (0)	0 (0)	0	0 (0)	0 (0)	
		Maximum concentration relative to Do Nothing at 50m	343%(197%)	343%(161%)	343%(176%)	620%(148%)	522%(174%)	122%(119%)	
	Change in the number of 1 hr periods where concentrations of NOx > 400 $\mu g/m^3$ versus Do Nothing in 2025	Number expressed in terms of distance intervals/offsets from ROW 50m	14 (0)	14 (0)	14 (0)	18(0)	7 (0)	0 (0)	Maximum predicted 1-hour NOx concentrations increase by 2 - 9X over future No Build within 50 m of the Plaza boundary for all Alternatives. There is an increase in the number of hours greater than the MOE AAQC for NOx relative to No Build at 50 m away from the Plaza boundary. Plaza A and Plaza B have the highest increases due to the combined effect of the Plaza and local roads. NOx concentrations are higher relative to No Build within 50 - 250 m of the roadway for all crossings. The impact of the crossings is limited to within 100 m of the bridge/roadway.
		100m	1 (0)	1 (0)	1 (0)	7(0)	1 (0)	0 (0)	
		250m	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Maximum concentration relative to Do Nothing at 50m	804%(149%)	804%(145%)	804%(175%)	928%(165%)	789%(176%)	213%(125%)	
	Change in the number of 1 hr periods where concentrations of NOx > 400 $\mu g/m^3$ versus Do Nothing in 2035	Number expressed in terms of distance intervals/offsets from ROW 50m	16 (0)	16 (0)	16 (0)	17 (0)	6 (0)	0 (0)	Maximum predicted 1-hour NOx concentrations increase by 2 - 10X over future No Build within 50 m of the Plaza boundary for all Alternatives. There is an increase in the number of hours greater than the MOE AAQC for NOx relative to No Build at 50 m away from the Plaza boundary. Plaza A and Plaza B have the highest increases due to the combined effect of the Plaza and local roads. NOx concentrations are higher relative to No Build within 50 - 250 m of the roadway for all crossings. The impact of the crossings is limited to within 100 m of the bridge/roadway.
		100m	1 (0)	1 (0)	1 (0)	6 (0)	3 (0)	0 (0)	
		250m	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	
		Maximum concentration relative to Do Nothing at 50m	886%(170%)	886%(174%)	886%(192%)	1096%(155%)	690%(219%)	221%(151%)	
	Summary of effect on concentration of particulate matter	Subjective assessment							Implementation of Plaza A or Plaza B Alternatives results in increases of short term NOx concentrations in close proximity (50 m) to the Plaza boundary. This is likely due to the combined effect of the Plaza and nearby major roads such as EC Row and Ojibway Pkwy, in addition to the combined effect of Plaza B and Crossing B .
Factor Summary:									
Factor Score:									

pact 4-Neutral/No Impact 5-Low Benefit 6-Medium Benefit 7-High Benefit

6.0 IMPACT ASSESSMENT

(Each practical alternative evaluated end to end).

TO BE COMPLETED FOR END TO END ALTERNATIVES WHEN ASSESSMENT OF ALL PRACTICAL ALTERNATIVES IS COMPLETE

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APPENDICES

APPENDIX A
TRAFFIC DATA

Table A-1 Hourly Traffic profiles used in Modelling

Period Starting	Profile 1		Profile 2		Profile 3		Profile 4	
	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound	Outbound	Inbound
12:00 AM	47	27	22	22	8	9	29	20
01:00 AM	33	21	17	16	4	4	26	15
02:00 AM	33	19	14	15	3	3	24	14
03:00 AM	32	19	14	12	2	2	26	11
04:00 AM	41	18	18	12	2	3	34	12
05:00 AM	65	19	37	16	8	8	54	14
06:00 AM	135	28	92	29	29	21	114	24
07:00 AM	157	30	124	46	50	43	152	34
08:00 AM	175	38	149	53	81	88	139	53
09:00 AM	141	43	103	44	57	68	102	52
10:00 AM	114	48	82	46	67	68	100	56
11:00 AM	111	57	85	56	81	80	99	63
12:00 PM	112	58	87	58	81	79	100	64
01:00 PM	114	61	85	59	82	74	96	65
02:00 PM	117	69	95	68	89	84	102	74
03:00 PM	108	88	104	94	102	95	111	89
04:00 PM	100	100	100	100	100	100	100	100
05:00 PM	113	96	99	100	99	102	94	110
06:00 PM	116	82	92	75	91	96	98	98
07:00 PM	86	65	71	58	73	71	78	79
08:00 PM	94	67	63	59	61	58	74	65
09:00 PM	84	57	53	50	50	40	64	51
10:00 PM	75	48	50	42	27	29	52	44
11:00 PM	62	38	37	36	18	18	39	35

Profile 1: Huron Church North of E.C. Row in Base Cases

Profile 2: Huron Church South of E.C. Row in Base Cases and Freeway in Alternatives 1-3

Profile 3: All other Streets in Base Cases and Alternatives 1-3

Profile 4: Huron Church North of E.C. Row and E.C. Row in Alternatives 1-3

Profiles have been standardized to modelled p.m. peak hour 4:00 to 5:00 p.m.

Table A-1 Contd.

Profile 1	Profile 2	Profile 3	Profile 4
0.021	0.015	0.007	0.016
0.016	0.011	0.003	0.013
0.015	0.010	0.002	0.012
0.015	0.009	0.002	0.012
0.017	0.010	0.002	0.014
0.024	0.018	0.006	0.022
0.047	0.042	0.020	0.044
0.054	0.060	0.037	0.059
0.061	0.071	0.068	0.061
0.053	0.052	0.050	0.049
0.047	0.045	0.054	0.050
0.048	0.049	0.064	0.051
0.049	0.051	0.064	0.052
0.050	0.050	0.062	0.051
0.054	0.057	0.069	0.056
0.057	0.070	0.078	0.064
0.058	0.070	0.080	0.063
0.061	0.069	0.080	0.065
0.057	0.058	0.074	0.062
0.044	0.045	0.057	0.050
0.047	0.043	0.047	0.044
0.041	0.036	0.036	0.037
0.036	0.032	0.022	0.030
0.029	0.025	0.014	0.023

Table A-2 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1A - Year 2015

LOCATION	SECTION		Alternative 1A 2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6720	5292	179	85	3	1	0	3
	University	Wyandotte					3015	3508	91	119	55	244	47	3
	Wyandotte	AMB Off Ramp					2228	2903	0	0	34	174	0	0
	AMB Off Ramp	College					8505	6127	234	96	6342	1	2395	0
	College St	Girardot St	1791	824	1486	1710	18099	16524	543	480	6474	4536	203	2515
	Girardot St	Tecumseh Rd	1719	789	1325	1545	17739	17038	629	558	5654	3842	181	2350
	Tecumseh Rd	Dorchester St	1788	1072	1668	1709	21099	20908	769	701	5407	3450	183	2172
	Dorchester St	Prince Rd/Totten St	1891	1128	1608	1770	21746	22719	677	642	4927	3158	153	1983
	Prince Rd/Totten St	Malden Rd	2033	1334	1827	1951	24315	25966	759	741	4841	3202	174	1950
	Malden Rd	Industrial Rd	1668	1133	1473	1575	19089	20887	575	581	5025	3362	7	1881
	Industrial Rd	EC Row N. Ramp Terminal	1821	1192	1607	1726	21649	23194	656	661	4828	3102	0	1910
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1342	1491	1172	2010	15483	29452	441	749	4275	3003	0	1734
	S. of EC Row S. Ramp Terminal		1715	1187	1531	1500	20217	22131	557	479	3942	2688	0	1538
S Service Rd	N. of Lambton St		n/a	591	n/a	613	n/a	9712	n/a	159	n/a	612	n/a	0
	Lambton St	Todd Ln/Cabana Rd	n/a	562	n/a	513	n/a	9006	n/a	123	n/a	301	n/a	0
	Todd Ln/Cabana Rd	St Clair College	n/a	876	n/a	945	n/a	15950	n/a	71	n/a	0	n/a	0
	St Clair College	Cousineau Dr	n/a	349	n/a	753	n/a	7675	n/a	90	n/a	1433	n/a	89
	Cousineau Dr	Howard Ave	n/a	349	n/a	369	n/a	5737	n/a	90	n/a	356	n/a	104
	E. of Howard Ave		n/a	767	n/a	697	n/a	11822	n/a	238	n/a	0	n/a	0
N Service Rd	N. of Labelle St		1715	n/a	1527	n/a	20908	n/a	472	n/a	3865	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1549	n/a	1501	n/a	22254	n/a	307	n/a	1717	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	935	n/a	657	n/a	11288	n/a	153	n/a	984	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	863	n/a	700	n/a	11286	n/a	163	n/a	865	n/a	0	n/a
	Todd Ln/Cabana Rd	St Clair College	292	n/a	539	n/a	6976	n/a	0	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	1030	n/a	872	n/a	11656	n/a	74	n/a	2721	n/a	0	n/a
	Cousineau Dr	Howard Ave	339	n/a	574	n/a	6689	n/a	179	n/a	548	n/a	0	n/a
	E. of Howard Ave		632	n/a	998	n/a	13344	n/a	286	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	665	409	570	790	9927	9984	136	134	27	14	91	422
	GN Booth Dr	Sandwich St	650	420	576	763	9862	9851	135	133	27	15	92	433
	Sandwich St	Prospect Ave	615	390	540	729	9356	9615	74	78	49	37	0	0
	N. of Prospect Ave		608	379	539	715	9293	9398	74	76	49	36	0	0
CROSSING ROADS			**WB**	**EB**	**WB**	**EB**								
Wyandotte	W of HuronChurch						4850	4479	0	0	359	433	0	0
	E of HuronChurch						2855	4105	21	142	716	937	43	0
University	W of HuronChurch						1266	1188	0	0	0	0	0	0
	E of HuronChurch						1944	1963	119	91	70	21	3	47
Riverside	W of HuronChurch						3428	3580	0	0	0	0	0	0
	E of HuronChurch						6538	5669	0	0	174	34	0	0
AMB Off Ramp	E of HuronChurch						0	1363	0	56	0	6339	0	2395
AMB On Ramp	E of HuronChurch						303	0	12	0	5917	0	174	0
Patricia	AMB	Wyandotte					541	1360	22	54	3371	3416	171	267
College St	E. of HC Road		300	349	479	384	6352	5557	158	125	3	536	0	142
	W. of HC Road		79	38	141	62	1639	758	0	0	222	51	0	0
Girardot St	E. of HC Road		51	86	87	45	962	1169	0	0	165	0	0	0
	W. of HC Road		81	153	191	126	2258	2224	38	22	50	30	0	0
Tecumseh Rd	E. of HC Road		312	324	394	462	5496	6181	132	145	200	357	0	153
	W. of HC Road		242	468	524	390	6468	6877	0	0	146	118	0	0
Dorchester St	E. of HC Road		75	84	131	93	1438	1556	0	0	247	0	0	0
	W. of HC Road		76	46	86	52	1371	789	23	9	24	10	0	0
Prince Rd/Totten S	E. of HC Road		139	130	115	205	1999	2784	0	0	76	124	0	0
	W. of HC Road		233	288	315	340	4709	5101	0	0	75	75	0	0
Malden Rd	E. of HC Road		84	55	85	76	1173	927	0	0	203	199	0	0
	W. of HC Road		429	534	464	470	6973	7418	371	367	390	86	151	542
Industrial Rd	E. of HC Road		248	145	197	251	3397	3178	56	58	156	174	7	16
	W. of HC Road		290	93	167	275	3912	2779	159	193	0	0	0	198
EC Row N. Ramp T	E. of HC Road (W-N/S Off Ramp & N-W On Ramp)		924	110	872	123	12487	1842	314	0	1377	199	0	0
	W. of HC Road (S-W On Ramp)		36	n/a	30	n/a	414	n/a	14	n/a	49	n/a	133	n/a
EC Row S. Ramp T	E. of HC Road (N-E On Ramp)		n/a	450	n/a	447	n/a	7295	n/a	113	n/a	0	n/a	0
	W. of HC Road (S-E On Ramp & E-N/S Off Ramp)		364	137	630	208	7589	2479	257	83	499	338	279	0
Labelle St	E. of N. Service Rd		208	42	65	39	1878	715	0	0	196	0	0	0
Grand Marais Rd R	E. of N. Service Rd		415	80	205	140	4640	1680	0	0	256	197	0	0
Fazio Dr	W. of S. Service Rd		140	115	270	175	3421	2355	58	28	71	28	0	0
Pulford St	E. of N. Service Rd		48	54	18	61	419	1011	0	0	74	0	0	0
Todd Ln/Cabana R	E. of N. Service Rd		552	351	541	518	8882	7537	0	0	87	49	0	0
	between N. and S. Service Rd		503	902	634	769	9971	12816	0	106	0	536	0	0
	between S. Service Rd and Huron Church Line		706	986	860	775	13430	13675	85	100	190	426	0	0
	W. of Huron Church Line		468	481	520	571	8682	8725	0	0	4	4	0	0
St Clair College	E. of N. Service Rd		132	798	226	159	2873	8387	0	0	95	268	0	0
	between N. and S. Service Rd		80	257	180	72	2255	2389	0	0	0	183	0	0
Cousineau Dr	E. of N. Service Rd		283	217	362	289	4042	3492	0	0	1338	916	0	0
	between N. and S. Service Rd		343	408	558	404	5520	6599	4	106	2044	0	0	0
	W. of S. Service Rd		334	460	797	313	8457	5507	17	114	1272	791	0	0
Howard Ave	E. of N. Service Rd		390	418	490	599	7588	8318	127	160	2	4	0	0
	between N. and S. Service Rd		651	384	755	437	11288	7067	199	147	116	1	0	0
	W. of S. Service Rd		591	743	778	789	11047	13167	243	277	69	32	0	0
EC Row Expressw	E. of Ojibway Pwy		720	412	880	520	12917	7927	311	246	17	0	58	0
	W. of Ojibway Pwy		919	737	1430	620	16503	10907	224	248	3710	0	97	0
	E. of Huron Church Rd		2138	2124	2204	2834	31717	37465	673	793	2222	3542	377	1227
	At Malden Rd		1360	1447	1485	1965	21261	25093	402	475	1062	3032	497	889
	W. of Matchette		940	412	980	520	13990	7927	338	246	872	0	418	0
GN Booth Dr	W. of Ojibway Pwy		27	10	13	44	346	450	6	7	4	4	0	0
Sandwich St	W. of Ojibway Pwy		74	69	101	97	1360	1261	148	91	25	35	0	0
Prospect Ave	W. of Ojibway Pwy		29	33	9	21	332	427	6	4	4	6	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-2 Contd.

LOCATION	SECTION FROM	SECTION TO	Alternative 1A 2015 AM PEAK HOUR NB	AM PEAK HOUR SB	PM PEAK HOUR NB	PM PEAK HOUR SB	24 Hour AADT Local Cars NB / WB	Local Cars SB / EB	Local Trucks NB / WB	Local Trucks SB / EB	International Cars NB / WB	International Cars SB / EB	International Trucks NB / WB	International Trucks SB / EB
HIGHWAY 401 Mainline			2015 NB	SB	NB	SB								
S. of Hwy 3 merge/split			1110	930	1260	1520	11333	10718	322	248	3131	3025	5185	7538
N. of Howard Ave			1050	958	1226	1509	10240	10473	316	255	3577	3490	4893	7259
At Grand Marais Rd			739	1041	1159	1847	8788	12349	292	305	3361	4476	3713	7787
E. of Malden Rd			460	515	380	1010	1749	5353	57	213	1572	2430	4123	5509
To/From Canadian Plaza			790	450	440	1570	0	3	2	4	4148	8568	5884	9432
HIGHWAY 401 Ramps			2015 AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split														
401 NB Off Ramp			518		710		8251	0	182	0	1114	0	423	0
401 NB On Ramp			496		652		8951	0	173	0	0	0	0	0
401 SB Off Ramp				619		574	0	9303	0	188	0	0	0	0
401 SB On Ramp				566		591	0	7278	0	186	0	1702	0	408
At St. Clair College														
401 NB Off Ramp			560		379		6964	0	0	0	0	0	0	0
401 NB On Ramp			249		312		3605	0	20	0	693	0	0	0
401 SB Off Ramp				433		619	0	6876	0	77	0	1227	0	108
401 SB On Ramp				350		281	0	5001	0	18	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			279		779		6939	0	242	0	1712	0	0	0
401 SB On Ramp				526		837	0	8072	0	187	0	1668	0	1117
At Malden Rd														
401 NB On Ramp			240		190		2447	0	406	0	262	0	61	0
401 SB Off Ramp				240		290	0	2705	0	571	0	864	0	0
Hwy 401 to EC Row Expressway														
401 SB Off Ramp				625		1070	0	9377	0	221	0	2943	0	802
Ojibway Pkwy IC														
401 NB Off Ramp			330		270		4197	0	463	0	0	0	0	0
401 NB On Ramp			200		40		0	0	0	0	1210	0	293	0
401 SB Off Ramp				20		130	0	122	0	8	0	961	0	0
401 SB On Ramp				950		930	0	14542	0	417	0	0	0	0
EC Row Expressway to Hwy 401														
401 NB On Ramp			220		100		0	0	0	0	1309	0	774	0
Highway 401 Mainline Vol	**FROM**	**TO**	**NB**	**SB**	**NB**	**SB**								
	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11333		322		3131		5185	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	554		574		3119		125		2475		4170	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1050		1226		10240		316		3577		4893	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	490		847		5820		235		2491		3105	
	St. Clair/401 NB On Ramp	HC Rd/401 NB Off Ramp	739		1159		8788		292		3361		3713	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	460		380		1749		57		1572		4123	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	700		570		4197		463		1834		4185	
	Ojibway Pkway/401 NB Off Ramp	Ojibway Pkway/401 NB On Ramp	370		300		0		0		1834		4185	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	570		340		0		0		3044		4477	
	EC ROW to 401 NB On Ramp	Canadian Plaza	790		440		0		0		4148		5884	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		3		4		8568		9432
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		3		4		7916		8799
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		16044		572		6781		8136
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		755		1300		5089		361		4119		9345
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		515		1010		3207		92		3163		7772
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1041		1847		12349		305		4476		7787
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		608		1228		6632		205		3057		6240
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		958		1509		10473		255		3490		7259
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		339		935		5098		121		1950		3811
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10718		248		3025		7538
Grand Marais Rd	**E. of connecting ramp**		310	230	280	255	4528	3803	0	0	241	462	0	0
	W. of connecting ramp		145	400	290	330	3656	5871	3	36	0	551	0	0
Broadway Street	**W. of Ojibway Pkwy**		20	20	20	20	329	352	0	0	1	0	0	0
			NB	**SB**	**NB**	**SB**								
Huron Church Line	**S. of Todd Lane**		662	386	509	636	7829	7592	197	167	843	877	227	277
Millen[1]	Felix	HC	8	5	4	25	104	251	2	4	1	3	0	0
Malden	Chappus	401 S. Ramp	694	589	540	708	8976	10514	254	259	567	612	0	0
	401 S. Ramp	401 N. Ramp	734	389	620	498	9899	7169	278	179	612	428	0	0
	N. of 401 N. Ramp		534	429	470	538	7359	7824	206	195	450	463	0	0
Matchette	Chappus	EC Row S. Ramp	522	380	441	567	8409	7804	0	0	105	103	0	0
	EC Row S. Ramp	EC Row N. Ramp	167	435	129	630	2487	8793	0	0	134	92	0	0
	EC Row N. Ramp	Carmichael	284	136	259	255	4678	3199	0	0	115	85	0	0
Montgomery	Surrey	Talbot	4	14	7	6	91	166	1	2	0	8	0	3
Surrey	Montgomery	Talbot	5	3	4	2	73	41	1	1	0	2	0	1
Grosvenor	Montgomery	Talbot	11	3	4	6	119	71	2	1	0	6	0	1

Table A-3 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1A - Year 2025

LOCATION	SECTION		Alternative 1A 2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6730	5355	188	91	3	1	0	41
	University	Wyandotte					2976	3574	91	123	64	236	55	41
	Wyandotte	AMB Off Ramp					2201	2973	0	0	43	166	0	0
	AMB Off Ramp	College					8368	6194	239	102	7092	1	2821	0
	College St	Girardot St	1809	849	1561	1778	18434	16577	576	499	6873	4953	264	2826
	Girardot St	Tecumseh Rd	1722	825	1407	1627	18123	17435	682	591	6059	4282	238	2664
	Tecumseh Rd	Dorchester St	1758	1093	1767	1786	21472	21113	833	733	5720	3811	238	2420
	Dorchester St	Prince Rd/Totten St	1843	1151	1716	1845	22182	22974	737	668	5191	3496	204	2222
	Prince Rd/Totten St	Malden Rd	2011	1397	1932	2050	24797	26746	824	786	5109	3544	230	2050
	Malden Rd	Industrial Rd	1664	1154	1479	1716	18818	21670	611	631	5220	3782	8	2024
	Industrial Rd	EC Row N. Ramp Terminal	1844	1183	1677	1885	22088	23972	711	692	5117	3429	0	2011
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1354	1579	1196	2235	15555	31912	465	803	4460	3350	0	1832
	S. of EC Row S. Ramp Terminal		1931	1217	1720	1700	22465	23981	651	505	4558	2895	0	1547
S Service Rd	N. of Lambton St		n/a	739	n/a	679	n/a	11499	n/a	174	n/a	707	n/a	0
	Lambton St	Todd Ln/Cabana Rd	n/a	708	n/a	601	n/a	10949	n/a	133	n/a	408	n/a	0
	Todd Ln/Cabana Rd	St Clair College	n/a	944	n/a	997	n/a	16998	n/a	86	n/a	0	n/a	0
	St Clair College	Cousineau Dr	n/a	390	n/a	775	n/a	8086	n/a	89	n/a	1543	n/a	115
	Cousineau Dr	Howard Ave	n/a	352	n/a	369	n/a	5739	n/a	80	n/a	376	n/a	118
	E. of Howard Ave		n/a	857	n/a	727	n/a	12772	n/a	251	n/a	0	n/a	0
N Service Rd	N. of Labelle St		1931	n/a	1720	n/a	23331	n/a	544	n/a	4421	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1756	n/a	1712	n/a	25324	n/a	345	n/a	1940	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	959	n/a	794	n/a	12577	n/a	166	n/a	1045	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	971	n/a	843	n/a	13152	n/a	185	n/a	994	n/a	0	n/a
	Todd Ln/Cabana Rd	St Clair College	302	n/a	552	n/a	7167	n/a	0	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	1058	n/a	889	n/a	11596	n/a	79	n/a	3000	n/a	0	n/a
	Cousineau Dr	Howard Ave	338	n/a	594	n/a	6917	n/a	199	n/a	484	n/a	0	n/a
	E. of Howard Ave		646	n/a	1112	n/a	14417	n/a	315	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	700	440	620	820	10618	10442	137	132	27	21	112	531
	GN Booth Dr	Sandwich St	685	443	626	793	10553	10241	137	130	27	21	113	535
	Sandwich St	Prospect Ave	646	405	582	753	9968	9956	73	73	47	40	0	0
	N. of Prospect Ave		639	394	581	740	9906	9748	72	72	47	39	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4769	4457	0	0	370	437	0	0
	E of HuronChurch						2820	4180	19	147	743	927	51	0
University	W of HuronChurch						1376	1275	0	0	0	0	0	0
	E of HuronChurch						2053	2040	123	91	70	21	41	55
Riverside	W of HuronChurch						3579	3715	0	0	0	0	0	0
	E of HuronChurch						6759	5759	0	0	166	43	0	0
AMB Off Ramp	E of HuronChurch						0	1286	0	54	0	7089	0	2821
AMB On Ramp	E of HuronChurch						240	0	6	0	6270	0	223	0
Patricia	AMB	Wyandotte					422	1283	12	53	3486	3339	215	305
College St	E. of HC Road		307	353	483	399	6436	5615	164	129	3	574	0	212
	W. of HC Road		84	52	165	66	1666	921	0	0	400	42	0	0
Girardot St	E. of HC Road		54	84	87	46	970	1159	0	0	177	0	0	0
	W. of HC Road		82	149	184	121	2218	2155	36	21	43	27	0	0
Tecumseh Rd	E. of HC Road		317	319	385	468	5461	6130	126	145	201	374	0	195
	W. of HC Road		245	487	508	387	6306	6991	0	0	189	123	0	0
Dorchester St	E. of HC Road		76	85	134	95	1453	1582	0	0	264	0	0	0
	W. of HC Road		76	46	86	52	1375	790	23	9	22	9	0	0
Prince Rd/Totten St	E. of HC Road		148	126	123	143	2135	2253	0	0	79	101	0	0
	W. of HC Road		237	314	398	359	5419	5468	0	0	97	77	0	0
Malden Rd	E. of HC Road		102	63	99	96	1358	1086	0	0	274	273	0	0
	W. of HC Road		442	557	488	496	7338	7745	385	378	294	15	195	721
Industrial Rd	E. of HC Road		270	152	213	272	3710	3431	50	58	157	163	8	21
	W. of HC Road		296	104	183	298	4090	3017	173	204	0	0	0	246
EC Row N. Ramp Terminal	E. of HC Road (W-N/S Off Ramp & N-W On Ramp)		1029	111	987	125	14136	1853	358	0	1469	214	0	0
	W. of HC Road (S-W On Ramp)		32	n/a	31	n/a	378	n/a	11	n/a	44	n/a	151	n/a
EC Row S. Ramp Terminal	E. of HC Road (N-E On Ramp)		n/a	668	n/a	612	n/a	10387	n/a	160	n/a	0	n/a	0
	W. of HC Road (S-E On Ramp & E-N/S Off Ramp)		425	154	661	214	8157	2649	288	85	619	351	384	0
Labelle St	E. of N. Service Rd		218	43	51	43	1819	758	0	0	199	0	0	0
Grand Marais Rd Ramp	E. of N. Service Rd		456	88	225	154	5154	1852	0	0	248	213	0	0
Fazio Dr	W. of S. Service Rd		154	126	297	224	3774	2859	62	35	71	31	0	0
Pulford St	E. of N. Service Rd		47	59	17	66	402	1099	0	0	75	0	0	0
Todd Ln/Cabana Rd	E. of N. Service Rd		566	355	604	474	9555	7187	0	0	81	60	0	0
	between N. and S. Service Rd		509	991	710	871	10668	14245	0	119	0	635	0	0
	between S. Service Rd and Huron Church Line		833	1090	999	887	15681	15339	91	114	259	496	0	0
	W. of Huron Church Line		462	513	535	590	8753	9142	0	0	5	3	0	0
St Clair College	E. of N. Service Rd		137	821	248	165	3100	8643	0	0	100	275	0	0
	between N. and S. Service Rd		88	282	198	73	2480	2578	0	0	0	193	0	0
Cousineau Dr	E. of N. Service Rd		281	228	348	259	3905	3314	0	0	1337	951	0	0
	between N. and S. Service Rd		298	402	651	453	5473	6958	4	127	2402	0	0	0
	W. of S. Service Rd		300	472	939	383	9032	6291	19	125	1566	676	0	0
Howard Ave	E. of N. Service Rd		449	447	528	723	8438	9593	140	190	3	5	0	0
	between N. and S. Service Rd		726	421	812	489	12310	7827	213	165	145	2	0	0
	W. of S. Service Rd		666	866	843	878	12164	14999	259	318	81	38	0	0
EC Row Expressway	E. of Ojibway Pwy		1030	450	1101	580	16904	8566	399	258	250	132	147	50
	W. of Ojibway Pwy		1255	795	1676	700	20084	12038	252	266	5276	0	127	0
	E. of Huron Church Rd		2733	2528	2647	3299	38826	43586	819	935	2946	4393	549	1704
	At Malden Rd		1847	1589	1816	2240	26762	27744	498	529	1652	3619	719	1173
	W. of Matchette		1311	450	1218	580	17929	8566	423	258	1385	132	610	50
GN Booth Dr	W. of Ojibway Pwy		27	10	13	44	347	450	6	6	4	4	0	0
Sandwich St	W. of Ojibway Pwy		79	79	107	103	1453	1386	151	97	25	35	0	0
Prospect Ave	W. of Ojibway Pwy		29	33	9	21	333	428	5	4	3	6	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-3 Contd.

LOCATION	SECTION FROM	SECTION TO	Alternative 1A 2025 AM PEAK HOUR NB	AM PEAK HOUR SB	PM PEAK HOUR NB	PM PEAK HOUR SB	24 Hour AADT Local Cars NB / WB	Local Cars SB / EB	Local Trucks NB / WB	Local Trucks SB / EB	International Cars NB / WB	International Cars SB / EB	International Trucks NB / WB	International Trucks SB / EB
HIGHWAY 401 Mainline			**2025**											
			NB	**SB**	**NB**	**SB**								
S. of Hwy 3 merge/split			1360	1180	1560	1860	14104	13161	414	298	3568	3385	6618	10121
N. of Howard Ave			1360	1136	1356	1841	11366	11823	363	290	4199	4060	6674	10160
At Grand Marais Rd			1063	1238	1270	2168	9883	13605	340	339	4031	5132	5272	10795
E. of Malden Rd			634	837	423	1205	1906	6731	61	239	1847	2982	5617	8783
To/From Canadian Plaza			1050	560	520	1800	0	4	3	4	5057	9228	7644	12306
HIGHWAY 401 Ramps			**2025**											
			AM PEAK HOUR		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			527		826		9034	0	199	0	1343	0	590	0
401 NB On Ramp			511		664		9156	0	172	0	0	0	0	0
401 SB Off Ramp				640		597	0	9643	0	198	0	0	0	0
401 SB On Ramp				657		614	0	7754	0	194	0	2082	0	570
At St. Clair College														
401 NB Off Ramp			563		404		7216	0	0	0	0	0	0	0
401 NB On Ramp			266		318		3658	0	22	0	777	0	0	0
401 SB Off Ramp				462		652	0	7229	0	75	0	1333	0	134
401 SB On Ramp				360		325	0	5426	0	23	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			429		847		7959	0	289	0	2082	0	0	0
401 SB On Ramp				401		963	0	7881	0	176	0	1748	0	1154
At Malden Rd														
401 NB On Ramp			275		235		2808	0	384	0	425	0	151	0
401 SB Off Ramp				275		360	0	3457	0	541	0	951	0	0
Hwy 401 to EC Row Expressway														
401 SB Off Ramp				700		1200	0	10255	0	248	0	3455	0	1018
Ojibway Pkwy IC														
401 NB Off Ramp			370		295		4714	0	446	0	0	0	0	0
401 NB On Ramp			230		40		0	0	0	0	1331	0	357	0
401 SB Off Ramp				20		140	0	202	0	18	0	922	0	0
401 SB On Ramp				1272		1105	0	18372	0	536	0	0	0	0
EC Row Expressway to Hwy 401														
401 NB On Ramp			281		117		0	0	0	0	1554	0	967	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1360		1560		14104		414		3568		6618	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	849		692		4087		170		3022		6067	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1360		1356		11366		363		4199		6674	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	797		952		6835		283		3101		4685	
	St. Clair/401 NB On Ramp	HC Rd/401 NB Off Ramp	1063		1270		9883		340		4031		5272	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	634		423		1906		61		1847		5617	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	909		658		4714		446		2272		5768	
	Ojibway Pkway/401 NB Off	Ojibway Pkway/401 NB On Ramp	539		363		0		0		2272		5768	
	Ojibway Pkway/401 NB On	EC ROW to 401 NB On Ramp	769		403		0		0		3603		6125	
	EC ROW to 401 NB On Ram	Canadian Plaza	1050		520		0		0		5057		7644	
	Canadian Plaza	Ojibway/401 SB Off Ramp		560		1800		4		4		9228		12306
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		540		1660		4		3		8578		11568
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1812		2765		18221		637		8291		12140
	401 to EC ROW SB Off Ram	Malden/401 SB Off Ramp		1112		1565		5859		357		4978		13079
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		837		1205		3616		104		3880		11078
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1238		2168		13605		339		5132		10795
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		776		1516		7649		239		3643		8991
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1136		1841		11823		290		4060		10160
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		496		1244		6566		156		2533		6006
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1180		1860		13161		298		3385		10121
Grand Marais Rd	**E. of connecting ramp**		340	253	308	280	5017	4186	0	0	240	501	0	0
	W. of connecting ramp		159	440	319	362	4018	6458	3	40	0	597	0	0
Broadway Street	**W. of Ojibway Pkwy**		20	20	20	20	329	352	0	0	1	0	0	0
			NB	**SB**	**NB**	**SB**								
Huron Church Line	**S. of Todd Lane**		766	550	645	802	9386	9973	233	220	1039	1162	326	465
Millen[1]	Felix	HC	8	5	4	25	104	251	2	4	1	3	0	0
Malden	Chappus	401 S. Ramp	742	627	586	783	9601	11445	269	286	643	637	0	0
	401 S. Ramp	401 N. Ramp	787	397	676	513	10637	7375	295	185	695	416	0	0
	N. of 401 N. Ramp		557	442	496	568	7675	8188	212	206	496	461	0	0
Matchette	Chappus	EC Row S. Ramp	586	500	530	640	9736	9270	0	0	116	209	0	0
	EC Row S. Ramp	EC Row N. Ramp	186	545	129	699	2667	10155	0	0	129	190	0	0
	EC Row N. Ramp	Carmichael	310	133	267	239	4984	2984	0	0	114	137	0	0
Montgomery	Surrey	Talbot	4	15	8	7	100	181	1	2	0	9	0	4
Surrey	Montgomery	Talbot	5	3	4	2	73	41	1	0	0	2	0	1
Grosvenor	Montgomery	Talbot	11	3	4	6	119	71	1	1	0	6	0	1

Table A-4 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1A - Year 2035

LOCATION	SECTION		Alternative 1A 2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6681	5506	199	95	3	1	0	81
	University	Wyandotte					2848	3663	92	125	69	237	62	81
	Wyandotte	AMB Off Ramp					2062	3072	0	0	47	168	0	0
	AMB Off Ramp	College					7913	6352	238	107	7713	1	3781	0
	College St	Girardot St	1846	887	1546	1845	18212	16345	580	514	7061	5277	306	3756
	Girardot St	Tecumseh Rd	1743	853	1449	1695	18263	17708	712	614	6376	4624	287	3524
	Tecumseh Rd	Dorchester St	1782	1143	1806	1846	21568	21530	867	768	6028	3842	287	3124
	Dorchester St	Prince Rd/Totten St	1904	1184	1737	1903	22344	23275	763	691	5483	3517	244	2844
	Prince Rd/Totten St	Malden Rd	2068	1458	1974	2175	25100	27702	860	830	5462	3268	278	2696
	Malden Rd	Industrial Rd	1728	1194	1509	1841	19140	23044	648	684	5492	3421	10	2762
	Industrial Rd	EC Row N. Ramp Terminal	1915	1277	1704	2060	22486	25804	740	759	5337	3536	0	2728
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1450	1725	1225	2448	16155	34765	488	890	4690	3428	0	2489
	S. of EC Row S. Ramp Terminal		2046	1344	1886	1883	24303	26445	722	568	4907	3037	0	2010
S Service Rd	N. of Lambton St		n/a	830	n/a	826	n/a	13352	n/a	204	n/a	867	n/a	0
	Lambton St	Todd Ln/Cabana Rd	n/a	788	n/a	739	n/a	12677	n/a	155	n/a	530	n/a	0
	Todd Ln/Cabana Rd	St Clair College	n/a	1006	n/a	1082	n/a	18273	n/a	98	n/a	0	n/a	0
	St Clair College	Cousineau Dr	n/a	418	n/a	846	n/a	8674	n/a	91	n/a	1745	n/a	143
	Cousineau Dr	Howard Ave	n/a	359	n/a	394	n/a	5944	n/a	77	n/a	426	n/a	136
	E. of Howard Ave		n/a	922	n/a	793	n/a	13828	n/a	278	n/a	0	n/a	0
N Service Rd	N. of Labelle St		2046	n/a	1886	n/a	25012	n/a	618	n/a	4799	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1864	n/a	1877	n/a	27023	n/a	408	n/a	2258	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	1058	n/a	813	n/a	13112	n/a	201	n/a	1256	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	1076	n/a	868	n/a	13747	n/a	223	n/a	1227	n/a	0	n/a
	Todd Ln/Cabana Rd	St Clair College	322	n/a	564	n/a	7428	n/a	0	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	1085	n/a	941	n/a	11970	n/a	87	n/a	3222	n/a	0	n/a
	Cousineau Dr	Howard Ave	368	n/a	614	n/a	7331	n/a	246	n/a	434	n/a	0	n/a
	E. of Howard Ave		705	n/a	1144	n/a	15128	n/a	344	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	735	470	680	860	11387	10979	144	129	25	19	140	648
	GN Booth Dr	Sandwich St	720	473	686	833	11322	10778	143	127	26	19	141	652
	Sandwich St	Prospect Ave	679	425	633	793	10666	10473	74	72	50	44	0	0
	N. of Prospect Ave		672	415	632	780	10603	10274	74	71	49	43	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4604	4465	0	0	381	446	0	0
	E of HuronChurch						2776	4327	17	154	771	942	58	0
University	W of HuronChurch						1547	1310	0	0	0	0	0	0
	E of HuronChurch						2225	2085	125	92	68	22	81	62
Riverside	W of HuronChurch						3717	4039	0	0	0	0	0	0
	E of HuronChurch						7009	5930	0	0	169	47	0	0
AMB Off Ramp	E of HuronChurch						0	931	0	43	0	7710	0	3781
AMB On Ramp	E of HuronChurch						265	0	7	0	6598	0	273	0
Patricia	AMB	Wyandotte					469	928	14	41	3573	3465	233	394
College St	E. of HC Road		319	351	490	406	6584	5577	171	131	3	582	0	296
	W. of HC Road		90	52	187	79	1746	1039	0	0	529	39	0	0
Girardot St	E. of HC Road		59	83	84	48	973	1167	0	0	182	0	0	0
	W. of HC Road		85	146	180	120	2213	2122	36	22	42	27	0	0
Tecumseh Rd	E. of HC Road		332	329	420	509	5868	6355	135	146	206	450	0	342
	W. of HC Road		252	505	527	395	6315	7254	0	0	362	99	0	0
Dorchester St	E. of HC Road		78	86	135	96	1466	1600	0	0	274	0	0	0
	W. of HC Road		76	46	86	52	1375	790	22	9	22	9	0	0
Prince Rd/Totten St	E. of HC Road		154	126	129	207	2228	2764	0	0	83	124	0	0
	W. of HC Road		241	329	338	365	4992	5628	0	0	62	83	0	0
Malden Rd	E. of HC Road		117	71	113	111	1546	1009	0	0	313	503	0	0
	W. of HC Road		469	573	506	527	7608	7977	399	391	380	44	234	890
Industrial Rd	E. of HC Road		305	161	225	285	3605	3587	46	57	702	191	8	27
	W. of HC Road		307	114	198	303	4307	3085	183	210	0	0	0	308
EC Row N. Ramp Terminal	E. of HC Road (W-N/S Off Ramp & N-W On Ramp)		1060	113	1020	140	14587	1944	376	2	1534	267	0	0
	W. of HC Road (S-W On Ramp)		34	n/a	33	n/a	387	n/a	11	n/a	45	n/a	182	n/a
EC Row S. Ramp Terminal	E. of HC Road (N-E On Ramp)		n/a	700	n/a	756	n/a	11821	n/a	230	n/a	0	n/a	0
	W. of HC Road (S-E On Ramp & E-N/S Off Ramp)		446	169	698	228	8584	2930	312	86	541	301	585	0
Labelle St	E. of N. Service Rd		229	47	53	44	1900	803	0	0	212	0	0	0
Grand Marais Rd Ramp	E. of N. Service Rd		498	96	246	168	5666	2026	0	0	245	228	0	0
Fazio Dr	W. of S. Service Rd		216	178	324	242	4549	3403	74	39	79	39	0	0
Pulford St	E. of N. Service Rd		47	65	17	72	401	1205	0	0	76	0	0	0
Todd Ln/Cabana Rd	E. of N. Service Rd		617	406	696	540	10749	8206	0	0	86	65	0	0
	between N. and S. Service Rd		552	1125	816	964	11958	15840	0	146	0	777	0	0
	between S. Service Rd and Huron Church Line		930	1238	1167	992	17887	17167	103	140	333	626	0	0
	W. of Huron Church Line		506	534	557	628	9340	9633	0	0	7	5	0	0
St Clair College	E. of N. Service Rd		142	844	265	170	3287	8894	0	0	101	276	0	0
	between N. and S. Service Rd		96	306	216	74	2706	2761	0	0	0	201	0	0
Cousineau Dr	E. of N. Service Rd		287	242	372	257	4052	3386	0	0	1456	993	0	0
	between N. and S. Service Rd		361	458	740	499	6330	7763	7	160	2824	0	0	0
	W. of S. Service Rd		364	539	1051	438	10109	7212	25	153	1974	738	0	0
Howard Ave	E. of N. Service Rd		493	482	559	768	9092	10245	151	202	3	6	0	0
	between N. and S. Service Rd		794	451	863	543	13254	8541	226	182	150	2	0	0
	W. of S. Service Rd		733	953	900	980	13154	16611	281	354	82	49	0	0
EC Row Expressway	E. of Ojibway Pwy		1335	480	1300	640	20974	9441	499	250	191	84	140	18
	W. of Ojibway Pwy		1585	835	1910	780	24225	13029	311	285	6091	0	150	0
	E. of Huron Church Rd		3237	2884	2812	3676	43009	48627	905	1071	3558	5208	688	2127
	At Malden Rd		2324	1907	1965	2450	30637	31372	566	596	2197	4367	917	1336
	W. of Matchette		1676	480	1433	640	21519	9441	512	250	1921	84	832	18
GN Booth Dr	W. of Ojibway Pwy		27	10	13	44	347	450	6	6	4	4	0	0
Sandwich St	W. of Ojibway Pwy		82	89	121	107	1594	1496	157	102	25	33	0	0
Prospect Ave	W. of Ojibway Pwy		29	33	9	21	333	427	5	4	3	6	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-5 Contd.

LOCATION	SECTION		2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			**2015**											
			NB	**SB**	**NB**	**SB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
S. of Hwy 3 merge/split			1110	930	1260	1520	11418	10688	322	249	3100	3035	5113	7557
N. of Howard Ave			1139	1028	1231	1459	10555	10684	328	261	3688	3447	5093	7309
At Grand Marais Rd			1459	1408	1379	2172	14236	17149	346	371	3844	4960	4124	7942
E. of Malden Rd			460	515	380	1010	1882	3207	55	88	1578	3163	3899	7772
To/From Canadian Plaza			790	450	440	1570	0	3	2	4	4203	8626	5784	9346
HIGHWAY 401 Ramps			**2015**											
			AM PEAK HOUR		**PM PEAK HOUR**									
Hwy 3 merge/split							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*518*		*710*		8295	0	179	0	1071	0	422	0
401 NB On Ramp			*496*		*652*		8952	0	172	0	0	0	0	0
401 SB Off Ramp				*619*		*574*	0	9307	0	184	0	0	0	0
401 SB On Ramp				*566*		*591*	0	7308	0	188	0	1668	0	402
At St. Clair College							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*560*		*379*		6937	0	27	0	0	0	0	0
401 NB On Ramp			*249*		*283*		3578	0	31	0	460	0	0	0
401 SB Off Ramp				*383*		*604*	0	6415	0	79	0	1154	0	163
401 SB On Ramp				*350*		*341*	0	5471	0	27	0	0	0	0
At Pulford St							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			631		244		5206	0	71	0	641	0	0	0
401 SB Off Ramp				347		450	0	5445	0	70	0	723	0	0
At Huron Church Rd							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			999		999		12483	0	292	0	2264	0	0	0
401 SB On Ramp				893		1162	0	13008	0	267	0	2012	0	1276
At Malden Rd							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			*240*		190		2447	0	406	0	262	0	61	0
401 SB Off Ramp				*240*		290	0	2705	0	571	0	864	0	0
Hwy 401 to EC Row Expressway							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 SB Off Ramp				*625*		1070	0	9455	0	227	0	2861	0	820
Ojibway Pkwy IC							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*330*		270		4329	0	461	0	0	0	0	0
401 NB On Ramp			*200*		40		0	0	0	0	1222	0	274	0
401 SB Off Ramp				*20*		130	0	126	0	10	0	956	0	0
401 SB On Ramp				*950*		930	0	14537	0	422	0	0	0	0
EC Row Expressway to Hwy 401							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			*220*		*100*		0	0	0	0	1309	0	774	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11418		322		3100		5113	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	643		579		3301		132		2615		4541	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1139		1231		10555		328		3688		5093	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	579		852		6027		243		2650		3387	
	St. Clair/401 NB On Ramp	Pulford/401 NB On Ramp	828		1135		9052		295		3309		3866	
	Pulford/401 NB On Ramp	HC Rd/401 NB Off Ramp	1459		1379		14236		346		3844		4124	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	460		380		1882		55		1578		3899	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	700		570		4329		461		1839		3961	
	Ojibway Pkway/401 NB Off	Ojibway Pkway/401 NB On Ramp	370		300		0		0		1839		3961	
	Ojibway Pkway/401 NB On	EC ROW to 401 NB On Ramp	570		340		0		0		3061		4235	
	EC ROW to 401 NB On Ra	Canadian Plaza	790		440		0		0		4203		5784	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		3		4		8626		9346
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		3		4		7971		8719
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		16044		572		6781		8136
	401 to EC ROW SB Off Ra	Malden/401 SB Off Ramp		755		1300		5089		361		4119		9345
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		515		1010		3207		88		3163		7772
	HC Rd/401 SB On Ramp	Pulford/401 SB Off Ramp		1408		2172		17149		371		4960		7942
	Pulford/401 SB Off Ramp	St Clair/401 SB Off Ramp		1061		1722		11594		304		4266		8067
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		678		1118		6723		204		2874		6049
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1028		1459		10684		261		3447		7309
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		409		885		5307		127		1912		3855
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10688		249		3035		7557
Malden	Chappus	401 S. Ramp	585	589	540	738	7966	10186	345	490	655	804	0	0
	401 S. Ramp	401 N. Ramp	625	389	620	528	8856	7008	383	341	718	567	0	0
	N. of 401 N. Ramp		425	429	470	568	6410	7630	276	370	510	613	0	0
Matchette	Chappus	EC Row S. Ramp	522	380	441	567	8363	7730	0	0	149	203	0	0
	EC Row S. Ramp	EC Row N. Ramp	167	436	129	630	2477	8734	0	0	144	182	0	0
	EC Row N. Ramp	Carmichael	287	136	264	255	4744	3150	0	0	117	153	0	0

Table A-4 Contd.

LOCATION	SECTION		Alternative 1A 2035 AM PEAK HOUR		Alternative 1A 2035 PM PEAK HOUR		24 Hour AADT Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			**2035 NB**	**SB**	**NB**	**SB**								
S. of Hwy 3 merge/split			1540	1340	1720	2120	15464	14400	474	334	3825	3724	7924	12508
N. of Howard Ave			1486	1285	1560	2068	12463	12507	411	312	4686	4508	8122	12725
At Grand Marais Rd			1183	1390	1463	2362	10894	14073	394	357	4549	5585	6568	13340
E. of Malden Rd			779	960	477	1365	1969	6847	67	239	2183	3534	7009	11131
To/From Canadian Plaza			1260	650	580	1970	1	5	3	4	5721	9960	9109	14199
HIGHWAY 401 Ramps			**2035 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			564		869		9353	0	208	0	1518	0	782	0
401 NB On Ramp			529		695		9544	0	184	0	0	0	0	0
401 SB Off Ramp				670		635	0	10166	0	217	0	0	0	0
401 SB On Ramp				732		678	0	8354	0	209	0	2528	0	739
At St. Clair College														
401 NB Off Ramp			576		453		7753	0	0	0	0	0	0	0
401 NB On Ramp			273		356		3965	0	25	0	860	0	0	0
401 SB Off Ramp				483		648	0	7289	0	74	0	1386	0	163
401 SB On Ramp				378		354	0	5797	0	27	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			404		986		8930	0	342	0	2224	0	0	0
401 SB On Ramp				430		997	0	8128	0	187	0	1754	0	1429
At Malden Rd														
401 NB On Ramp			300		260		2986	0	436	0	516	0	209	0
401 SB Off Ramp				300		400	0	3858	0	536	0	1059	0	0
Hwy 401 to EC Row Expressway														
401 SB Off Ramp				970		1325	0	12115	0	304	0	4414	0	1311
Ojibway Pkwy IC														
401 NB Off Ramp			410		330		4956	0	503	0	0	0	0	0
401 NB On Ramp			250		40		0	0	0	0	1396	0	410	0
401 SB Off Ramp				20		160	0	295	0	28	0	974	0	0
401 SB On Ramp				1600		1280	0	22247	0	658	0	0	0	0
EC Row Expressway to Hwy 401														
401 NB On Ramp			341		133		0	0	0	0	1865	0	1164	0
Highway 401 Mainline Vol	**FROM**	**TO**	**NB**	**SB**	**NB**	**SB**								
	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1540		1720		15464		474		3825		7924	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	957		865		4872		211		3465		7486	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1486		1560		12463		411		4686		8122	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	910		1107		7633		328		3538		5861	
	St. Clair/401 NB On Ramp	HC Rd/401 NB Off Ramp	1183		1463		10894		394		4549		6568	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	779		477		1969		67		2183		7009	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	1079		737		4956		503		2698		7218	
	Ojibway Pkway/401 NB Off Ram	Ojibway Pkway/401 NB On Ramp	669		407		0		0		2698		7218	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	919		447		0		0		4095		7628	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1260		580		0		0		5721		9109	
	Canadian Plaza	Ojibway/401 SB Off Ramp		650		1970		5		4		9960		14199
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		630		1810		5		3		9245		13349
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		2230		3090		19725		681		9840		16288
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1260		1765		6163		354		5724		16865
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		960		1365		3767		98		4513		14505
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1390		2362		14073		357		5585		13340
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		907		1714		8128		259		4069		11353
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1285		2068		12507		312		4508		12725
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		615		1433		7279		176		2918		7844
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1340		2120		14400		334		3724		12508
Grand Marais Rd	**E. of connecting ramp**		372	276	336	306	5514	4580	0	0	235	537	0	0
	W. of connecting ramp		174	480	348	396	4388	7049	3	47	0	654	0	0
Broadway Street	**W. of Ojibway Pkwy**		20	20	20	20	329	352	0	0	1	0	0	0
			NB	**SB**	**NB**	**SB**								
Huron Church Line	**S. of Todd Lane**		909	616	718	953	10527	11295	263	251	1324	1477	443	678
Millen [1]	Felix	HC	8	5	4	25	104	251	2	4	1	3	0	0
Malden	Chappus	401 S. Ramp	523	669	627	826	8502	12153	232	312	534	652	0	0
	401 S. Ramp	401 N. Ramp	573	419	727	526	9648	7676	261	198	595	414	0	0
	N. of 401 N. Ramp		323	469	527	586	6413	8572	168	221	365	462	0	0
Matchette	Chappus	EC Row S. Ramp	622	610	564	599	10420	9722	0	0	44	259	0	0
	EC Row S. Ramp	EC Row N. Ramp	204	648	136	656	2981	10374	0	0	34	400	0	0
	EC Row N. Ramp	Carmichael	342	138	266	254	5343	2969	0	0	36	322	0	0
Montgomery	Surrey	Talbot	4	16	9	7	108	189	1	2	0	10	0	5
Surrey	Montgomery	Talbot	5	3	4	2	73	41	1	0	0	2	0	1
Grosvenor	Montgomery	Talbot	11	3	4	6	119	70	1	1	0	6	0	1

Table A-5 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1B - Year 2015

LOCATION	SECTION		2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6735	5369	173	84	3	1	0	3
	University	Wyandotte					3090	3626	91	118	58	242	20	3
	Wyandotte	AMB Off Ramp					2285	3005	0	0	37	172	0	0
	AMB Off Ramp	College					8617	6228	229	94	6211	1	2391	0
	College St	Girardot St	1791	824	1486	1710	18255	16675	543	487	6361	4419	205	2512
	Girardot St	Tecumseh Rd	1719	789	1325	1545	17763	17139	636	571	5615	3744	182	2347
	Tecumseh Rd	Dorchester St	1788	1072	1668	1709	21118	21024	778	716	5388	3342	186	2185
	Dorchester St	Prince Rd/Totten St	1891	1128	1608	1770	21714	22815	693	656	4945	3065	159	1997
	Prince Rd/Totten St	Malden Rd	2033	1334	1827	1951	24278	26074	777	757	4852	3020	180	1940
	Malden Rd	Industrial Rd	1668	1133	1473	1575	19251	21200	577	580	4904	3155	7	1837
	Industrial Rd	EC Row N. Ramp Termina	1821	1192	1607	1726	21772	23501	662	652	4735	2918	0	1845
	EC Row N. Ramp Termina	EC Row S. Ramp Termina	1342	1491	1172	2010	15712	30308	416	646	4099	2573	0	1516
	S. of EC Row S. Ramp Terminal		1715	1187	1531	1500	20499	23057	528	389	3776	2217	0	1283
S Service Rd	N. of Bethlehem Ave		n/a	1187	n/a	1501	n/a	19685	n/a	343	n/a	2215	n/a	1249
	Bethlehem Ave	Lambton St	n/a	294	n/a	304	n/a	4783	n/a	124	n/a	313	n/a	0
	Lambton St	Pulford St	n/a	350	n/a	224	n/a	4812	n/a	29	n/a	222	n/a	0
	Pulford St	Todd Ln/Cabana Rd	n/a	662	n/a	684	n/a	11759	n/a	94	n/a	0	n/a	0
	Todd Ln/Cabana Rd	Huron Church Line	n/a	643	n/a	792	n/a	12007	n/a	112	n/a	385	n/a	0
	Huron Church Line	St Clair College	n/a	876	n/a	1006	n/a	16439	n/a	97	n/a	0	n/a	0
	St Clair College	Cousineau Dr	n/a	349	n/a	753	n/a	7717	n/a	104	n/a	1359	n/a	154
	Cousineau Dr	Howard Ave	n/a	349	n/a	369	n/a	5460	n/a	105	n/a	534	n/a	184
	E. of Howard Ave		n/a	767	n/a	697	n/a	11823	n/a	237	n/a	0	n/a	0
N Service Rd	N. of Labelle St		1715	n/a	1531	n/a	21702	n/a	443	n/a	3356	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1449	n/a	1436	n/a	21787	n/a	235	n/a	1276	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	255	n/a	407	n/a	5040	n/a	8	n/a	376	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	233	n/a	422	n/a	5484	n/a	12	n/a	0	n/a	0	n/a
	Todd Ln/Cabana Rd	Huron Church Line	727	n/a	678	n/a	10740	n/a	124	n/a	449	n/a	0	n/a
	Huron Church Line	St Clair College	292	n/a	568	n/a	7197	n/a	32	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	1030	n/a	872	n/a	12769	n/a	123	n/a	1825	n/a	0	n/a
	Cousineau Dr	Howard Ave	339	n/a	574	n/a	6898	n/a	111	n/a	451	n/a	0	n/a
	E. of Howard Ave		632	n/a	998	n/a	13346	n/a	283	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	665	409	570	790	9926	9978	137	137	27	14	91	427
	GN Booth Dr	Sandwich St	650	420	576	763	9861	9845	136	135	27	15	91	438
	Sandwich St	Prospect Ave	615	390	540	729	9354	9613	75	78	50	37	0	0
	N. of Prospect Ave		608	379	539	715	9292	9397	75	77	49	36	0	0

CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4808	4435	0	0	359	435	0	0
	E of HuronChurch						2813	4048	21	135	722	937	18	0
University	W of HuronChurch						1254	1192	0	0	0	0	0	0
	E of HuronChurch						1947	1986	118	91	70	21	3	20
Riverside	W of HuronChurch						3390	3487	0	0	0	0	0	0
	E of HuronChurch						6598	5633	0	0	173	37	0	0
AMB Off Ramp	E of HuronChurch						0	931	0	43	0	7710	0	3781
AMB On Ramp	E of HuronChurch						309	0	11	0	5792	0	174	0
Patricia	AMB	Wyandotte					552	1458	21	57	3367	3412	171	267
College St	E. of HC Road		300	349	479	384	6343	5558	168	124	3	535	0	144
	W. of HC Road		79	38	141	62	1670	752	0	0	197	54	0	0
Girardot St	E. of HC Road		51	86	87	45	1017	1029	0	0	116	130	0	0
	W. of HC Road		81	153	191	126	2258	2216	41	25	48	33	0	0
Tecumseh Rd	E. of HC Road		312	324	394	462	5489	6174	139	148	201	359	0	156
	W. of HC Road		242	468	524	390	6420	6866	0	0	184	127	0	0
Dorchester St	E. of HC Road		75	84	131	93	1520	1350	0	0	173	183	0	0
	W. of HC Road		76	46	86	52	1370	786	26	10	24	11	0	0
Prince Rd/Totten St	E. of HC Road		139	130	115	205	1998	2777	0	0	77	130	0	0
	W. of HC Road		233	288	315	340	4701	5101	0	0	81	76	0	0
Malden Rd	E. of HC Road		84	55	85	76	1172	923	0	0	205	203	0	0
	W. of HC Road		429	534	464	470	6798	7406	386	398	553	38	154	576
Industrial Rd	E. of HC Road		248	145	197	251	3425	3181	49	57	139	172	6	16
	W. of HC Road		290	93	167	275	3914	2791	158	192	0	0	0	183
EC Row N. Ramp Terminal	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		924	110	872	123	13014	1881	270	0	1050	162	0	0
	W. of HC Road (N-W On Ramp)		36	n/a	30	n/a	420	n/a	14	n/a	51	n/a	122	n/a
EC Row S. Ramp Terminal	E. of HC Road (S-E On Ramp)		n/a	450	n/a	447	n/a	7341	n/a	66	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		364	137	630	208	7642	2447	263	81	451	376	280	0
Labelle St/Bethlehem Ave	E. of N. Service Rd		248	132	125	110	2670	1934	0	0	234	182	0	0
	between N. and S. Service Rd		70	220	90	170	1403	3105	0	0	0	97	0	0
	W. of S. Service Rd		100	250	105	150	1803	3251	0	0	2	4	0	0
Grand Marais Rd/Lambton Rd	E. of N. Service Rd		295	200	225	175	3919	3026	0	0	264	244	0	0
	between N. and S. Service Rd		99	200	180	160	2426	2777	3	24	0	140	0	0
	W. of S. Service Rd		45	170	155	75	1647	1912	29	17	38	32	0	0
Pulford St	E. of N. Service Rd		143	154	50	65	1306	1733	0	0	159	216	0	0
	between N. and S. Service Rd		115	120	40	40	1393	1073	0	0	0	161	0	0
	W. of S. Service Rd		110	80	20	30	1143	855	24	7	11	14	0	0
Todd Ln/Cabana Rd	E. of N. Service Rd		552	351	541	484	8177	6567	0	0	544	610	0	0
	between N. and S. Service Rd		463	427	604	535	9351	7180	0	0	0	894	0	0
	W. of S. Service Rd		466	411	670	775	9920	9948	0	0	13	10	0	0
Huron Church Line	between N. and S. Service Rd		50	475	90	200	1178	4863	41	77	0	303	0	0
	W. of S. Service Rd		250	525	620	340	7017	6398	93	98	341	345	0	0
St Clair College	E. of N. Service Rd		132	798	226	159	2874	8398	0	0	94	257	0	0
	between N. and S. Service Rd		80	257	180	72	2255	2418	0	0	0	169	0	0
Cousineau Dr	E. of N. Service Rd		283	217	362	289	4440	3623	0	0	956	793	0	0
	between N. and S. Service Rd		343	408	558	404	6207	6705	0	0	1400	0	0	0
	W. of S. Service Rd		334	460	797	313	9797	6318	0	0	0	0	0	0
Howard Ave	E. of N. Service Rd		390	418	490	599	7585	8325	133	155	0	3	0	0
	betweem N. and S. Service Rd		651	384	755	437	11382	7054	211	160	44	1	0	0
	W. of S. Service Rd		591	743	778	789	11110	13141	250	308	21	29	0	0
EC Row Expressway	E. of Ojibway Pwy		720	412	880	520	12916	7790	311	383	18	0	60	0
	W. of Ojibway Pwy		919	737	1430	620	16318	10907	214	248	3903	0	103	0
	E. of Huron Church Rd		2138	2124	2209	2834	31755	37865	679	775	2215	3256	393	1170
	At Malden Rd		1360	1447	1490	1965	20864	24508	447	539	1305	3374	545	1040
	W. of Matchette		940	412	980	520	15444	7790	364	383	20	0	66	0
GN Booth Dr	W. of Ojibway Pwy		27	10	13	44	346	448	7	8	4	5	0	0
Sandwich St	W. of Ojibway Pwy		74	69	101	97	1361	1261	148	91	24	35	0	0
Prospect Ave	W. of Ojibway Pwy		29	33	9	21	331	426	7	4	4	7	0	0

Table A-5 Contd.

LOCATION	SECTION		2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			2015											
			NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
S. of Hwy 3 merge/split			1110	930	1260	1520	11418	10688	322	249	3100	3035	5113	7557
N. of Howard Ave			1139	1028	1231	1459	10555	10684	328	261	3688	3447	5093	7309
At Grand Marais Rd			1459	1408	1379	2172	14236	17149	346	371	3844	4960	4124	7942
E. of Malden Rd			460	515	380	1010	1882	3207	55	88	1578	3163	3899	7772
To/From Canadian Plaza			790	450	440	1570	0	3	2	4	4203	8626	5784	9346
HIGHWAY 401 Ramps			2015											
			AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*518*		*710*		8295	0	179	0	1071	0	422	0
401 NB On Ramp			*496*		*652*		8952	0	172	0	0	0	0	0
401 SB Off Ramp				*619*		*574*	0	9307	0	184	0	0	0	0
401 SB On Ramp				*566*		*591*	0	7308	0	188	0	1668	0	402
At St. Clair College							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*560*		*379*		6937	0	27	0	0	0	0	0
401 NB On Ramp			*249*		*283*		3578	0	31	0	460	0	0	0
401 SB Off Ramp				*383*		*604*	0	6415	0	79	0	1154	0	163
401 SB On Ramp				*350*		*341*	0	5471	0	27	0	0	0	0
At Pulford St							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			631		244		5206	0	71	0	641	0	0	0
401 SB Off Ramp				347		450	0	5445	0	70	0	723	0	0
At Huron Church Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			999		999		12483	0	292	0	2264	0	0	0
401 SB On Ramp				893		1162	0	13008	0	267	0	2012	0	1276
At Malden Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			*240*		190		2447	0	406	0	262	0	61	0
401 SB Off Ramp				*240*		290	0	2705	0	571	0	864	0	0
Hwy 401 to EC Row Expressway							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 SB Off Ramp				*625*		1070	0	9455	0	227	0	2861	0	820
Ojibway Pkwy IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*330*		270		4329	0	461	0	0	0	0	0
401 NB On Ramp			*200*		40		0	0	0	0	1222	0	274	0
401 SB Off Ramp				*20*		130	0	126	0	10	0	956	0	0
401 SB On Ramp				*950*		930	0	14537	0	422	0	0	0	0
EC Row Expressway to Hwy 401							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			*220*		*100*		0	0	0	0	1309	0	774	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11418		322		3100		5113	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	643		579		3301		132		2615		4541	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1139		1231		10555		328		3688		5093	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	579		852		6027		243		2650		3387	
	St. Clair/401 NB On Ramp	Pulford/401 NB On Ramp	828		1135		9052		295		3309		3866	
	Pulford/401 NB On Ramp	HC Rd/401 NB Off Ramp	1459		1379		14236		346		3844		4124	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	460		380		1882		55		1578		3899	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	700		570		4329		461		1839		3961	
	Ojibway Pkway/401 NB Off	Ojibway Pkway/401 NB On Ramp	370		300		0		0		1839		3961	
	Ojibway Pkway/401 NB On	EC ROW to 401 NB On Ramp	570		340		0		0		3061		4235	
	EC ROW to 401 NB On Rar	Canadian Plaza	790		440		0		0		4203		5784	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		3		4		8626		9346
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		3		4		7971		8719
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		16044		572		6781		8136
	401 to EC ROW SB Off Rar	Malden/401 SB Off Ramp		755		1300		5089		361		4119		9345
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		515		1010		3207		88		3163		7772
	HC Rd/401 SB On Ramp	Pulford/401 SB Off Ramp		1408		2172		17149		371		4960		7942
	Pulford/401 SB Off Ramp	St Clair/401 SB Off Ramp		1061		1722		11594		304		4266		8067
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		678		1118		6723		204		2874		6049
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1028		1459		10684		261		3447		7309
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		409		885		5307		127		1912		3855
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10688		249		3035		7557
Malden	Chappus	401 S. Ramp	585	589	540	738	7966	10186	345	490	655	804	0	0
	401 S. Ramp	401 N. Ramp	625	389	620	528	8856	7008	383	341	718	567	0	0
	N. of 401 N. Ramp		425	429	470	568	6410	7630	276	370	510	613	0	0
Matchette	Chappus	EC Row S. Ramp	522	380	441	567	8363	7730	0	0	149	203	0	0
	EC Row S. Ramp	EC Row N. Ramp	167	436	129	630	2477	8734	0	0	144	182	0	0
	EC Row N. Ramp	Carmichael	287	136	264	255	4744	3150	0	0	117	153	0	0

Table A-6 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1B - Year 2025

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6800	5480	184	89	3	1	0	41
	University	Wyandotte					3052	3697	91	121	67	233	23	41
	Wyandotte	AMB Off Ramp					2234	3061	0	0	46	163	0	0
	AMB Off Ramp	College					8494	6347	234	100	6673	1	2947	0
	College St	Girardot St	1809	849	1561	1778	18669	16795	572	497	6714	4695	263	2978
	Girardot St	Tecumseh Rd	1722	825	1407	1627	18255	17710	683	597	5954	4048	237	2803
	Tecumseh Rd	Dorchester St	1758	1093	1767	1786	21600	21412	834	741	5636	3507	240	2539
	Dorchester St	Prince Rd/Totten St	1843	1151	1716	1845	22280	23208	743	678	5128	3231	207	2353
	Prince Rd/Totten St	Malden Rd	2011	1397	1932	2050	24902	27007	831	798	5032	3187	233	2165
	Malden Rd	Industrial Rd	1664	1154	1479	1716	19169	22115	608	631	4976	3389	8	2120
	Industrial Rd	EC Row N. Ramp Terminal	1844	1183	1677	1885	22450	24431	704	687	4868	3056	0	2066
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1354	1579	1196	2235	15806	32888	438	713	4242	2742	0	1746
	S. of EC Row S. Ramp Terminal		1931	1217	1720	1700	22807	24956	615	428	4386	2287	0	1444
S Service Rd	N. of Bethlehem Ave		n/a	1217	n/a	1665	n/a	21124	n/a	380	n/a	2245	n/a	1374
	Bethlehem Ave	Lambton St	n/a	323	n/a	319	n/a	5139	n/a	137	n/a	333	n/a	0
	Lambton St	Pulford St	n/a	385	n/a	254	n/a	5418	n/a	18	n/a	206	n/a	0
	Pulford St	Todd Ln/Cabana Rd	n/a	818	n/a	715	n/a	13482	n/a	64	n/a	0	n/a	0
	Todd Ln/Cabana Rd	Huron Church Line	n/a	707	n/a	901	n/a	13405	n/a	121	n/a	468	n/a	0
	Huron Church Line	St Clair College	n/a	944	n/a	1069	n/a	17578	n/a	115	n/a	0	n/a	0
	St Clair College	Cousineau Dr	n/a	390	n/a	775	n/a	8111	n/a	108	n/a	1463	n/a	221
	Cousineau Dr	Howard Ave	n/a	352	n/a	369	n/a	5422	n/a	99	n/a	568	n/a	233
	E. of Howard Ave		n/a	857	n/a	727	n/a	12772	n/a	252	n/a	0	n/a	0
N Service Rd	N. of Labelle St		1901	n/a	1720	n/a	23981	n/a	514	n/a	3821	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1616	n/a	1616	n/a	24437	n/a	282	n/a	1408	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	280	n/a	424	n/a	5372	n/a	8	n/a	374	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	255	n/a	472	n/a	6082	n/a	12	n/a	11	n/a	0	n/a
	Todd Ln/Cabana Rd	Huron Church Line	780	n/a	720	n/a	11396	n/a	139	n/a	515	n/a	0	n/a
	Huron Church Line	St Clair College	321	n/a	605	n/a	7722	n/a	56	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	1058	n/a	889	n/a	12982	n/a	136	n/a	1934	n/a	0	n/a
	Cousineau Dr	Howard Ave	338	n/a	594	n/a	6978	n/a	112	n/a	513	n/a	0	n/a
	E. of Howard Ave		646	n/a	1112	n/a	14432	n/a	300	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	700	440	620	820	10615	10438	140	134	26	21	114	534
	GN Booth Dr	Sandwich St	685	443	626	793	10549	10237	139	132	27	21	115	538
	Sandwich St	Prospect Ave	646	405	582	753	9965	9953	74	74	48	42	0	0
	N. of Prospect Ave		639	394	581	740	9903	9744	74	73	48	41	0	0
CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4729	4420	0	0	370	438	0	0
	E of HuronChurch						2772	4133	18	142	750	926	22	0
University	W of HuronChurch						1365	1272	0	0	0	0	0	0
	E of HuronChurch						2079	2079	121	91	70	21	41	23
Riverside	W of HuronChurch						3552	3655	0	0	0	0	0	0
	E of HuronChurch						6817	5737	0	0	164	46	0	0
AMB Off Ramp	E of HuronChurch						0	931	0	43	0	7710	0	3781
AMB On Ramp	E of HuronChurch						246	#REF!	6	#REF!	6082	#REF!	223	#REF!
Patricia	AMB	Wyandotte					435	1328	13	54	3485	3362	216	305
College St	E. of HC Road		307	353	483	399	6437	5640	163	127	3	568	0	191
	W. of HC Road		84	52	165	66	1677	904	0	0	391	51	0	0
Girardot St	E. of HC Road		54	84	87	46	1032	1014	0	0	122	135	0	0
	W. of HC Road		82	149	184	121	2208	2148	42	25	47	30	0	0
Tecumseh Rd	E. of HC Road		317	319	385	468	5448	6099	137	145	201	389	0	212
	W. of HC Road		245	487	508	387	6271	6983	0	0	217	132	0	0
Dorchester St	E. of HC Road		76	85	134	95	1544	1361	0	0	182	196	0	0
	W. of HC Road		76	46	86	52	1369	787	26	10	24	10	0	0
Prince Rd/Totten St	E. of HC Road		148	126	123	143	2133	2247	0	0	80	106	0	0
	W. of HC Road		237	314	398	359	5414	5466	0	0	101	79	0	0
Malden Rd	E. of HC Road		102	63	99	96	1355	1081	0	0	276	277	0	0
	W. of HC Road		442	557	488	496	7049	7669	401	393	570	46	203	766
Industrial Rd	E. of HC Road		270	152	213	272	3722	3440	48	57	148	156	8	21
	W. of HC Road		296	104	183	298	4094	3044	168	204	0	0	0	211
EC Row N. Ramp Terminal	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		1029	111	987	125	14906	1894	311	0	1028	174	0	0
	W. of HC Road (N-W On Ramp)		32	n/a	31	n/a	380	n/a	11	n/a	46	n/a	146	n/a
EC Row S. Ramp Terminal	E. of HC Road (S-E On Ramp)		n/a	668	n/a	612	n/a	10444	n/a	103	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		425	154	661	214	8237	2636	296	85	550	362	383	0
Labelle St/Bethlehem Ave	E. of N. Service Rd		262	142	137	126	2867	2132	0	0	246	207	0	0
	between N. and S. Service Rd		44	242	98	192	1232	3459	0	0	0	106	0	0
	W. of S. Service Rd		77	375	115	165	1676	4354	0	0	2	6	0	0
Grand Marais Rd/Lambton Rd	E. of N. Service Rd		324	220	247	192	4348	3339	0	0	245	256	0	0
	between N. and S. Service Rd		108	220	198	175	2661	3047	2	29	0	153	0	0
	W. of S. Service Rd		49	192	170	82	1801	2141	34	20	42	33	0	0
Pulford St	E. of N. Service Rd		156	169	55	71	1422	1890	0	0	178	245	0	0
	between N. and S. Service Rd		126	132	44	44	1528	1170	0	0	0	185	0	0
	W. of S. Service Rd		121	88	22	32	1258	934	26	8	11	14	0	0
Todd Ln/Cabana Rd	E. of N. Service Rd		566	355	604	518	8855	6797	0	0	535	685	0	0
	between N. and S. Service Rd		465	468	665	695	9884	8599	0	0	0	1229	0	0
	W. of S. Service Rd		569	457	788	887	11859	11282	0	0	15	11	0	0
Huron Church Line	between N. and S. Service Rd		55	522	105	220	1352	5299	39	89	0	357	0	0
	W. of S. Service Rd		275	577	691	368	7790	6936	103	114	379	400	0	0
St Clair College	E. of N. Service Rd		137	821	248	165	3101	8647	0	0	98	268	0	0
	between N. and S. Service Rd		88	282	198	73	2480	2599	0	0	0	191	0	0
Cousineau Dr	E. of N. Service Rd		281	228	348	259	4303	3409	0	0	951	860	0	0
	between N. and S. Service Rd		298	402	651	453	6334	7082	0	3	1590	0	0	0
	W. of S. Service Rd		300	472	939	383	10685	7010	0	11	0	0	0	0
Howard Ave	E. of N. Service Rd		449	447	528	723	8436	9599	144	187	0	4	0	0
	betweem N. and S. Service Rd		726	421	812	489	12433	7815	221	177	57	1	0	0
	W. of S. Service Rd		666	866	843	878	12241	14977	262	342	27	37	0	0
EC Row Expressway	E. of Ojibway Pwy		1030	450	1101	580	16912	8373	407	400	227	160	152	69
	W. of Ojibway Pwy		1255	795	1676	700	19953	12035	255	270	5399	0	134	0
	E. of Huron Church Rd		2722	2564	2647	3299	38796	44381	827	929	2908	4048	571	1646
	At Malden Rd		1836	1655	1816	2240	25905	27562	552	614	2055	4070	785	1404
	W. of Matchette		1300	450	1218	580	19940	8373	472	400	252	160	168	69
GN Booth Dr	W. of Ojibway Pwy		27	10	13	44	346	448	7	8	4	5	0	0
Sandwich St	W. of Ojibway Pwy		79	79	107	103	1455	1387	151	97	24	34	0	0
Prospect Ave	W. of Ojibway Pwy		29	33	9	21	331	426	7	5	4	6	0	0

Table A-6 Contd.

LOCATION	SECTION		2025 AM PEAK HOUR		2025 PM PEAK HOUR		24 Hour AADT Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
S. of Hwy 3 merge/split			1360	1180	1560	1860	14332	13093	407	298	3472	3388	6446	10216
N. of Howard Ave			1368	1214	1358	1841	11602	12224	371	298	4114	4103	6554	10446
At Grand Marais Rd			1767	1736	1583	2507	16248	19562	405	419	4489	5657	5502	10899
E. of Malden Rd			645	742	423	1205	2103	3616	61	92	1856	3880	5393	11078
To/From Canadian Plaza			1050	560	520	1800	1	5	3	4	5116	9409	7501	12024
HIGHWAY 401 Ramps			2025 AM PEAK HOUR		2025 PM PEAK HOUR									
Hwy 3 merge/split							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*549*		*826*		9165	0	198	0	1339	0	601	0
401 NB On Ramp			*533*		*664*		9286	0	176	0	0	0	0	0
401 SB Off Ramp				*668*		*597*	0	9875	0	189	0	0	0	0
401 SB On Ramp				*685*		*614*	0	7935	0	200	0	2115	0	581
At St. Clair College							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*563*		*414*		7267	0	42	0	0	0	0	0
401 NB On Ramp			*247*		*275*		3470	0	33	0	476	0	0	0
401 SB Off Ramp				*402*		*606*	0	6448	0	81	0	1245	0	219
401 SB On Ramp				*352*		*390*	0	5872	0	33	0	0	0	0
At Pulford St							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			715		364		6615	0	95	0	796	0	0	0
401 SB Off Ramp				472		450	0	6381	0	77	0	768	0	0
At Huron Church Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			1122		1160		14226	0	346	0	2622	0	0	0
401 SB On Ramp				994		1302	0	14697	0	302	0	2027	0	1442
At Malden Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			*275*		235		2808	0	384	0	425	0	151	0
401 SB Off Ramp				*275*		360	0	3457	0	541	0	951	0	0
Hwy 401 to EC Row Expressway							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 SB Off Ramp				*795*		1200	0	10963	0	274	0	3445	0	1100
Ojibway Pkwy IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			*370*		295		4911	0	445	0	0	0	0	0
401 NB On Ramp			*230*		40		0	0	0	0	1345	0	344	0
401 SB Off Ramp				*20*		140	0	155	0	14	0	964	0	0
401 SB On Ramp				*1272*		1105	0	18366	0	542	0	0	0	0
EC Row Expressway to Hwy 401							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB On Ramp			*270*		*117*		0	0	0	0	1554	0	967	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1360		1560		14332		407		3472		6446	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	835		694		4295		175		2911		5832	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1368		1358		11602		371		4114		6554	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	805		944		6788		281		3106		4709	
	St. Clair/401 NB On Ramp	Pulford/401 NB On Ramp	1052		1219		9831		331		3739		5056	
	Pulford/401 NB On Ramp	HC Rd/401 NB Off Ramp	1767		1583		16248		405		4489		5502	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	645		423		2103		61		1856		5393	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	920		658		4911		445		2281		5544	
	Ojibway Pkwy/401 NB Off Ramp	Ojibway Pkwy/401 NB On Ramp	550		363		0		0		2281		5544	
	Ojibway Pkwy/401 NB OnRamp	EC ROW to 401 NB On Ramp	780		403		0		0		3626		5889	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1050		520		0		0		5116		7501	
	Canadian Plaza	Ojibway/401 SB Off Ramp		560		1800		5		4		9409		12024
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		540		1660		4		4		8745		11307
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1812		2765		18221		637		8291		12140
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1017		1565		5859		357		4978		13079
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		742		1205		3616		92		3880		11078
	HC Rd/401 SB On Ramp	Pulford/401 SB Off Ramp		1736		2507		19562		419		5657		10899
	Pulford/401 SB Off Ramp	St Clair/401 SB Off Ramp		1264		2057		12845		340		4934		11295
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		862		1451		8008		241		3539		8974
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1214		1841		12224		298		4103		10446
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		546		1244		6822		162		2561		6192
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1180		1860		13093		298		3388		10216
Malden	Chappus	401 S. Ramp	650	632	510	695	7948	10336	341	449	795	742	0	0
	401 S. Ramp	401 N. Ramp	695	402	600	425	8938	6456	381	279	874	457	0	0
	N. of 401 N. Ramp		465	447	420	480	6129	7230	261	313	593	515	0	0
Matchette	Chappus	EC Row S. Ramp	522	468	530	640	9114	8967	0	0	147	301	0	0
	EC Row S. Ramp	EC Row N. Ramp	167	523	129	699	2499	9937	0	0	121	270	0	0
	EC Row N. Ramp	Carmichael	316	136	267	239	5032	2977	0	0	120	192	0	0

Table A-7 24-Hour Annual Average Daily Traffic (AADT) for Alternative 1B - Year 2035

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6718	5664	203	94	3	1	0	81
	University	Wyandotte					2886	3812	92	124	68	237	62	81
	Wyandotte	AMB Off Ramp					2085	3201	0	0	46	169	0	0
	AMB Off Ramp	College					7999	6549	244	106	7545	1	3755	0
	College St	Girardot St	*1846*	*887*	*1546*	*1845*	18469	16494	574	523	6880	5152	303	3764
	Girardot St	Tecumseh Rd	*1743*	*853*	*1449*	*1695*	18403	17853	712	625	6238	4516	284	3530
	Tecumseh Rd	Dorchester St	*1782*	*1143*	*1806*	*1846*	21703	21695	867	781	5937	3720	289	3103
	Dorchester St	Prince Rd/Totten St	*1904*	*1184*	*1737*	*1903*	22442	23399	768	705	5418	3417	247	2837
	Prince Rd/Totten St	Malden Rd	*2068*	*1458*	*1974*	*2175*	25203	27845	865	847	5387	3091	281	2646
	Malden Rd	Industrial Rd	*1728*	*1194*	*1509*	*1841*	19460	23370	645	683	5267	3219	10	2695
	Industrial Rd	EC Row N. Ramp Terminal	*1915*	*1277*	*1704*	*2060*	22816	26119	734	752	5107	3366	0	2631
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	*1450*	*1725*	*1225*	*2448*	16270	35653	459	783	4568	3017	0	2217
	S. of EC Row S. Ramp Terminal		*2046*	*1344*	*1886*	*1883*	24465	27343	684	474	4856	2621	0	1717
S Service Rd	N. of Bethlehem Ave		n/a	1344	n/a	1837	n/a	23078	n/a	420	n/a	2547	n/a	1629
	Bethlehem Ave	Lambton St	n/a	352	n/a	355	n/a	5636	n/a	161	n/a	377	n/a	0
	Lambton St	Pulford St	n/a	420	n/a	311	n/a	6187	n/a	23	n/a	230	n/a	0
	Pulford St	Todd Ln/Cabana Rd	n/a	908	n/a	875	n/a	15648	n/a	75	n/a	0	n/a	0
	Todd Ln/Cabana Rd	Huron Church Line	n/a	771	n/a	1048	n/a	15091	n/a	134	n/a	575	n/a	0
	Huron Church Line	St Clair College	n/a	1006	n/a	1132	n/a	18666	n/a	127	n/a	0	n/a	0
	St Clair College	Cousineau Dr	*n/a*	*418*	*n/a*	*846*	n/a	8636	n/a	109	n/a	1699	n/a	292
	Cousineau Dr	Howard Ave	*n/a*	*359*	*n/a*	*394*	n/a	5540	n/a	95	n/a	668	n/a	293
	E. of Howard Ave		*n/a*	*922*	*n/a*	*793*	n/a	13825	n/a	281	n/a	0	n/a	0
N Service Rd	N. of Labelle St		2046	n/a	1876	n/a	25730	n/a	569	n/a	4241	n/a	0	n/a
	Labelle St	Grand Marais Rd Ramp	1744	n/a	1762	n/a	26402	n/a	326	n/a	1568	n/a	0	n/a
	Grand Marais Rd Ramp	Pulford St	306	n/a	442	n/a	5700	n/a	8	n/a	391	n/a	0	n/a
	Pulford St	Todd Ln/Cabana Rd	278	n/a	529	n/a	6766	n/a	13	n/a	0	n/a	0	n/a
	Todd Ln/Cabana Rd	Huron Church Line	844	n/a	744	n/a	11954	n/a	151	n/a	597	n/a	0	n/a
	Huron Church Line	St Clair College	350	n/a	628	n/a	8105	n/a	100	n/a	0	n/a	0	n/a
	St Clair College	Cousineau Dr	*1085*	*n/a*	*941*	*n/a*	13535	n/a	131	n/a	2005	n/a	0	n/a
	Cousineau Dr	Howard Ave	*368*	*n/a*	*614*	*n/a*	7336	n/a	102	n/a	545	n/a	0	n/a
	E. of Howard Ave		*705*	*n/a*	*1144*	*n/a*	15156	n/a	316	n/a	0	n/a	0	n/a
Ojibway Pwy	EC Row Expressway	GN Booth Dr	*735*	*470*	*680*	*860*	11383	10973	146	131	26	19	142	654
	GN Booth Dr	Sandwich St	*720*	*473*	*686*	*833*	11317	10772	146	129	26	19	143	658
	Sandwich St	Prospect Ave	*679*	*425*	*633*	*793*	10661	10469	76	73	52	47	0	0
	N. of Prospect Ave		*672*	*415*	*632*	*780*	10599	10270	75	71	51	46	0	0
CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4627	4439	0	0	381	446	0	0
	E of HuronChurch						2803	4299	17	157	770	942	58	0
University	W of HuronChurch						1511	1306	0	0	0	0	0	0
	E of HuronChurch						2207	2097	124	92	68	22	81	62
Riverside	W of HuronChurch						3642	3993	0	0	0	0	0	0
	E of HuronChurch						7055	5911	0	0	170	46	0	0
AMB Off Ramp	E of HuronChurch						0	931	0	43	0	7710	0	3781
AMB On Ramp	E of HuronChurch						222	0	6	0	6416	0	273	0
Patricia	AMB	Wyandotte					389	969	12	42	3571	3469	234	394
College St	E. of HC Road		*319*	*351*	*490*	*406*	6583	5598	172	130	4	579	0	273
	W. of HC Road		*90*	*52*	*187*	*79*	1730	1027	0	0	542	48	0	0
Girardot St	E. of HC Road		*59*	*83*	*84*	*48*	1037	1025	0	0	125	130	0	0
	W. of HC Road		*85*	*146*	*180*	*120*	2202	2109	42	26	47	33	0	0
Tecumseh Rd	E. of HC Road		*332*	*329*	*420*	*509*	5868	6315	140	146	202	468	0	366
	W. of HC Road		*252*	*505*	*527*	*395*	6321	7251	0	0	357	104	0	0
Dorchester St	E. of HC Road		*78*	*86*	*135*	*96*	1561	1382	0	0	187	191	0	0
	W. of HC Road		*76*	*46*	*86*	*52*	1368	785	26	11	24	11	0	0
Prince Rd/Totten St	E. of HC Road		*154*	*126*	*129*	*207*	2228	2764	0	0	83	125	0	0
	W. of HC Road		*241*	*329*	*338*	*365*	4985	5626	0	0	68	85	0	0
Malden Rd	E. of HC Road		*117*	*71*	*113*	*111*	1545	990	0	0	313	519	0	0
	W. of HC Road		*469*	*573*	*506*	*527*	7378	7922	405	408	599	52	251	932
Industrial Rd	E. of HC Road		*305*	*161*	*225*	*285*	3613	3596	45	56	697	185	7	27
	W. of HC Road		*307*	*114*	*198*	*303*	4310	3115	179	210	0	0	0	269
EC Row N. Ramp Terminal	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		*1060*	*113*	*1020*	*140*	15527	1966	327	6	998	242	0	0
	W. of HC Road (N-W On Ramp)		*34*	*n/a*	*33*	*n/a*	389	n/a	11	n/a	48	n/a	176	n/a
EC Row S. Ramp Terminal	E. of HC Road (S-E On Ramp)		*n/a*	*700*	*n/a*	*756*	n/a	11928	n/a	124	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		*446*	*169*	*698*	*228*	8650	2901	325	91	465	322	607	0
Labelle St/Bethlehem Ave	E. of N. Service Rd		277	167	150	132	3077	2391	0	0	259	226	0	0
	between N. and S. Service Rd		72	276	108	204	1573	3822	0	0	0	112	0	0
	W. of S. Service Rd		108	220	126	180	2053	3279	0	0	2	4	0	0
Grand Marais Rd/Lambton	E. of N. Service Rd		354	240	270	210	4753	3657	0	0	257	272	0	0
	between N. and S. Service Rd		118	240	216	192	2905	3323	2	34	0	170	0	0
	W. of S. Service Rd		54	214	186	90	1973	2362	37	25	46	41	0	0
Pulford St	E. of N. Service Rd		171	184	60	78	1550	2076	0	0	199	254	0	0
	between N. and S. Service Rd		138	144	48	48	1672	1282	0	0	0	201	0	0
	W. of S. Service Rd		132	96	24	36	1372	1023	28	10	13	18	0	0
Todd Ln/Cabana Rd	E. of N. Service Rd		617	406	696	588	10025	7623	0	0	561	872	0	0
	between N. and S. Service Rd		504	555	746	772	10926	9600	0	0	0	1623	0	0
	W. of S. Service Rd		642	548	925	992	13683	12906	0	0	18	12	0	0
Huron Church Line	between N. and S. Service Rd		60	570	110	240	1426	5740	53	96	0	416	0	0
	W. of S. Service Rd		300	630	756	386	8500	7407	120	122	422	455	0	0
St Clair College	E. of N. Service Rd		*142*	*844*	*265*	*170*	3288	8903	0	0	99	265	0	0
	between N. and S. Service Rd		*96*	*306*	*216*	*74*	2706	2790	0	0	0	199	0	0
Cousineau Dr	E. of N. Service Rd		*287*	*242*	*372*	*257*	4478	3440	0	0	1038	941	0	0
	between N. and S. Service Rd		*361*	*458*	*740*	*499*	7335	7920	0	3	1872	0	0	0
	W. of S. Service Rd		*364*	*539*	*1051*	*438*	12218	8015	0	8	0	0	0	0
Howard Ave	E. of N. Service Rd		*493*	*482*	*559*	*768*	9089	10255	157	196	0	4	0	0
	betweem N. and S. Service Rd		*794*	*451*	*863*	*543*	13368	8531	238	192	72	1	0	0
	W. of S. Service Rd		*733*	*953*	*900*	*980*	13228	16593	284	375	34	46	0	0
EC Row Expressway	E. of Ojibway Pwy		*1335*	*480*	*1300*	*640*	20977	9262	509	404	173	100	145	25
	W. of Ojibway Pwy		*1585*	*835*	*1910*	*780*	23810	13024	324	290	6487	0	163	0
	E. of Huron Church Rd		3239	2837	2955	3666	44205	48832	932	1039	3586	4703	738	2009
	At Malden Rd		2326	1860	2108	2450	30617	30207	642	678	2860	4783	1049	1550
	W. of Matchette		1676	480	1433	640	24688	9262	591	404	190	100	160	25
GN Booth Dr	W. of Ojibway Pwy		*27*	*10*	*13*	*44*	345	448	7	8	5	5	0	0
Sandwich St	W. of Ojibway Pwy		*82*	*89*	*121*	*107*	1598	1499	156	102	21	29	0	0
Prospect Ave	W. of Ojibway Pwy		*29*	*33*	*9*	*21*	331	425	7	5	4	7	0	0

Table A-7 Contd.

LOCATION	SECTION FROM	SECTION TO	2035 AM PEAK HOUR NB	2035 AM PEAK HOUR SB	2035 PM PEAK HOUR NB	2035 PM PEAK HOUR SB	24 Hour AADT Local Cars NB / WB	Local Cars SB / EB	Local Trucks NB / WB	Local Trucks SB / EB	International Cars NB / WB	International Cars SB / EB	International Trucks NB / WB	International Trucks SB / EB
HIGHWAY 401 Mainline			**2035 NB**	**SB**	**NB**	**SB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
S. of Hwy 3 merge/split			*1540*	*1340*	*1720*	*2120*	15756	14266	470	335	3700	3704	7704	12730
N. of Howard Ave			*1516*	*1305*	*1580*	*2073*	12902	12639	438	311	4634	4475	8070	12876
At Grand Marais Rd			1983	1872	1758	2805	17705	20616	450	434	4996	6262	6769	13294
E. of Malden Rd			779	960	477	1365	2232	3767	66	93	2087	4513	6818	14505
To/From Canadian Plaza			1260	650	580	1970	1	5	3	4	5779	10031	8965	14092
HIGHWAY 401 Ramps			**2035 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*564*		869		9359	0	201	0	1519	0	782	0
401 NB On Ramp			*529*		695		9541	0	186	0	0	0	0	0
401 SB Off Ramp				*670*		635	0	10185	0	198	0	0	0	0
401 SB On Ramp				*732*		678	0	8406	0	211	0	2468	0	728
At St. Clair College							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*576*		453		7681	0	72	0	0	0	0	0
401 NB On Ramp			*245*		292		3608	0	32	0	484	0	0	0
401 SB Off Ramp				*415*		584	0	6278	0	77	0	1309	0	280
401 SB On Ramp				*378*		404	0	6186	0	37	0	0	0	0
At Pulford St							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			798		339		6735	0	106	0	896	0	0	0
401 SB Off Ramp				530		552	0	7380	0	87	0	997	0	0
At Huron Church Rd							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			1204		1281		15456	0	383	0	2902	0	0	0
401 SB On Ramp				912		1440	0	14711	0	296	0	2235	0	1603
At Malden Rd							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			*300*		260		2986	0	436	0	516	0	209	0
401 SB Off Ramp				*300*		400	0	3858	0	536	0	1059	0	0
Hwy 401 to EC Row Expressway							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 SB Off Ramp				*970*		1325	0	12269	0	312	0	4261	0	1337
Ojibway Pkwy IC							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			*410*		330		5218	0	503	0	0	0	0	0
401 NB On Ramp			*250*		40		0	0	0	0	1413	0	392	0
401 SB Off Ramp				*20*		160	0	282	0	22	0	990	0	0
401 SB On Ramp				*1600*		1280	0	22242	0	664	0	0	0	0
EC Row Expressway to Hwy 401							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB On Ramp			*341*		133		0	0	0	0	1865	0	1164	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1540		1720		15756		470		3700		7704	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	987		885		5315		235		3408		7441	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1516		1580		12902		438		4634		8070	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	940		1127		7760		332		3636		6053	
	St. Clair/401 NB On Ramp	Pulford/401 NB On Ramp	1185		1419		11030		378		4243		6321	
	Pulford/401 NB On Ramp	HC Rd/401 NB Off Ramp	1983		1758		17705		450		4996		6769	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	779		477		2232		66		2087		6818	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	1079		737		5218		503		2603		7027	
	Ojibway Pkway/401 NB Off Ramp	Ojibway Pkway/401 NB On Ramp	669		407		0		0		2603		7027	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	919		447		0		0		4016		7419	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1260		580		0		0		5779		8965	
	Canadian Plaza	Ojibway/401 SB Off Ramp		650		1970		5		4		10031		14092
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		630		1810		5		3		9312		13249
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		2230		3090		19725		681		9840		16288
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1260		1765		6163		354		5724		16865
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		960		1365		3767		93		4513		14505
	HC Rd/401 SB On Ramp	Pulford/401 SB Off Ramp		1872		2805		20616		434		6262		13294
	Pulford/401 SB Off Ramp	St Clair/401 SB Off Ramp		1342		2253		12884		346		5298		13733
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		927		1669		8255		251		3913		11172
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1305		2073		12639		311		4475		12876
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		635		1438		7400		177		2904		7984
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1340		2120		14266		335		3704		12730
Malden	Chappus	401 S. Ramp	666	679	540	725	8232	10979	365	456	851	772	0	0
	401 S. Ramp	401 N. Ramp	716	429	640	425	9326	6705	410	275	941	460	0	0
	N. of 401 N. Ramp		465	479	440	485	6252	7560	274	311	622	522	0	0
Matchette	Chappus	EC Row S. Ramp	522	551	564	705	9486	10131	0	0	56	359	0	0
	EC Row S. Ramp	EC Row N. Ramp	167	606	136	764	2641	10945	0	0	34	507	0	0
	EC Row N. Ramp	Carmichael	347	136	301	254	5681	2975	0	0	39	343	0	0

Table A-8 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2A - Year 2015

LOCATION	SECTION		Alternative 2A 2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6763	5390	173	85	3	1	0	3
	University	Wyandotte					3111	3651	90	119	65	198	20	3
	Wyandotte	AMB Off Ramp					2211	3045	0	0	44	131	0	0
	AMB Off Ramp	College					8806	6251	231	96	6173	1	2162	0
	College St	Girardot St	1797	834	1389	1656	17474	16649	522	486	6193	4360	192	2209
	Girardot St	Tecumseh Rd	1720	817	1275	1536	17362	17487	621	567	5517	3775	176	2114
	Tecumseh Rd	Dorchester St	1789	1119	1632	1717	20829	21671	768	720	5325	3452	181	1987
	Dorchester St	Prince Rd/Totten St	1831	1163	1593	1799	21353	23522	685	653	4826	3173	156	1799
	Prince Rd/Totten St	Malden Rd	1934	1384	1806	1952	23703	26772	763	750	4676	3162	177	1660
	Malden Rd	Industrial Rd	1588	1142	1466	1623	18911	21704	573	566	4737	3352	7	1601
	Industrial Rd	EC Row N. Ramp Terminal	1703	1199	1551	1743	20829	23841	635	632	4457	3024	0	1593
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1190	1453	1223	2080	15536	30518	425	631	3900	2716	0	1307
	EC Row S. Ramp Terminal	Highway 401 Offramp	1612	1082	1638	1555	23080	22647	449	380	2181	2159	0	1032
	Highway 401 Offramp	Spring Gdn Rd/Labelle St	1055	412	406	430	10669	6674	78	97	654	564	0	0
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd Ramp	878	384	342	465	9076	6728	111	134	413	516	0	0
	Lambton St/Grand Marais Rd	Pulford St	675	374	354	396	7863	6452	136	37	209	240	0	0
	Pulford St	Todd Ln/Cabana Rd	648	422	359	417	8033	7308	152	50	0	37	0	0
	Todd Ln/Cabana Rd	Huron Church Line	768	627	628	894	10252	12558	126	153	697	461	0	54
Talbot Rd	Huron Church Line	St Clair College	403	503	418	376	5522	6832	8	0	884	850	0	0
	St Clair College	Cousineau Dr	858	303	464	429	8455	6404	10	0	1430	0	0	0
	Cousineau Dr	Howard Ave	723	322	485	298	9730	5472	21	0	81	0	0	0
	Howard Ave	Highway 3 split	982	789	862	711	14885	12943	291	278	0	25	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	665	409	570	790	9922	10623	136	139	32	15	90	430
	GN Booth Dr	Sandwich St	650	411	576	765	9857	10411	136	136	32	15	91	432
	Sandwich St	Prospect Ave	615	381	541	738	9360	9610	75	78	52	35	0	0
	N. of Prospect Ave		608	370	540	725	9298	9402	74	76	52	34	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4834	4441	0	0	358	431	0	0
	E of HuronChurch						2850	4074	21	137	726	867	18	0
University	W of HuronChurch						1267	1128	0	0	0	0	0	0
	E of HuronChurch						1950	2014	119	90	67	21	3	20
Riverside	W of HuronChurch						3367	3642	0	0	0	0	0	0
	E of HuronChurch						6608	5719	0	0	132	45	0	0
AMB Off Ramp	E of HuronChurch						0	1643	0	60	0	6170	3	2162
AMB On Ramp	E of HuronChurch						317	0	12	0	5799	0	174	0
Patricia	AMB	Wyandotte					567	1642	22	58	3342	3241	171	231
College St	E. of HC Road		312	355	483	387	6465	5630	175	132	3	532	0	150
	W. of HC Road		75	35	135	64	1566	746	0	0	210	59	0	0
Girardot St	E. of HC Road		51	86	86	45	1060	1052	0	0	68	109	0	0
	W. of HC Road		81	153	191	126	2178	2149	36	29	114	91	9	4
Tecumseh Rd	E. of HC Road		315	316	409	462	5638	6115	134	150	211	357	0	137
	W. of HC Road		241	465	505	385	6296	6802	0	0	147	125	0	0
Dorchester St	E. of HC Road		75	84	132	93	1605	1382	0	0	102	155	0	0
	W. of HC Road		76	46	86	52	1321	762	23	10	64	34	8	1
Prince Rd/Totten St	E. of HC Road		144	108	115	206	2040	2591	0	0	73	121	0	0
	W. of HC Road		235	299	322	337	4778	5165	0	0	82	73	0	0
Malden Rd	E. of HC Road		84	55	85	74	1175	931	0	0	201	183	0	0
	W. of HC Road		373	403	479	432	6483	6223	368	337	484	36	168	431
Industrial Rd	E. of HC Road		244	142	202	257	3437	3215	46	55	146	164	6	16
	W. of HC Road		290	92	148	275	3764	2787	147	191	0	0	0	179
EC Row N. Ramp Termina	E-N/S Ramp		843	n/a	870	n/a	12487	n/a	266	n/a	987	n/a	0	n/a
	N-W Ramp		n/a	29	n/a	63	n/a	731	n/a	0	n/a	37	n/a	0
	S-W Ramp		40	n/a	130	n/a	913	n/a	28	n/a	92	n/a	528	n/a
EC Row S. Ramp Termina	W-N/S Ramp		n/a	148	n/a	188	n/a	2461	n/a	47	n/a	297	n/a	0
	S/N-E Ramp		n/a	941	n/a	1083	n/a	15627	n/a	296	n/a	762	n/a	224
Spring Gdn Rd	W. of HC Road		115	210	150	170	2320	3114	0	0	2	4	0	0
Labelle St	E. of HC Road		293	144	167	66	3338	1722	0	0	268	144	0	0
Lambton St/Grand Marais	E. of HC Road		420	225	234	285	5171	4240	0	0	95	198	0	0
Pulford St	E. of HC Road		203	128	207	91	3090	1739	0	0	211	186	0	0
Cabana Rd	E. of HC Road		550	324	467	444	7381	6096	0	0	646	518	0	0
	between HC Road and Hwy 401 NB Ramps		1308	1175	928	1124	19803	17449	39	127	0	1440	0	66
Todd Lane	between Hwy 401 NB and SB Ramps		773	849	586	1122	12020	14962	24	113	0	1413	0	48
	W. of Hwy 401 SB Ramps		675	527	613	664	11358	9885	0	0	12	10	0	0
Huron Church Line	W. of HC Road		251	454	614	306	7091	5657	97	80	234	294	22	0
St Clair College	E. of Talbot Road		150	805	234	267	2984	9148	0	0	160	451	0	0
Cousineau Dr	E. of Talbot Road		268	295	387	300	5464	4248	0	0	0	985	0	0
	W. of Talbot Road		246	408	589	365	7233	6365	0	0	0	0	0	0
Howard Ave	E. of Talbot Rd		403	551	532	718	7723	10360	128	195	283	2	0	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		707	315	1015	526	13285	7183	208	150	951	0	0	0
	W. of Hwy 401 SB On-Ramp		520	790	976	886	12302	14210	247	290	11	192	0	0
E.C. Row Expressway	E. of Huron Church Rd		2154	2268	2167	2873	31509	39193	678	807	2214	3455	390	1241
	At Malden Rd		1380	1475	1490	1978	20975	25038	452	548	1325	3220	545	1052
	W. of Matchette		960	412	980	520	15597	7773	364	401	23	0	66	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-8 Contd.

LOCATION	SECTION FROM	SECTION TO	Alternative 2A 2015 AM PEAK HOUR NB / WB	AM PEAK HOUR SB / EB	PM PEAK HOUR NB / WB	PM PEAK HOUR SB / EB	24 Hour AADT Local Cars NB / WB	Local Cars SB / EB	Local Trucks NB / WB	Local Trucks SB / EB	International Cars NB / WB	International Cars SB / EB	International Trucks NB / WB	International Trucks SB / EB
HIGHWAY 401 Mainline			**2015 AM PEAK HOUR NB**	**SB**	**PM PEAK HOUR NB**	**SB**								
S. of Hwy 3 merge/split			1110	930	1260	1520	11368	10615	328	247	3123	3047	5139	7655
N. of Howard Ave			703	987	1336	1739	10196	12593	329	261	3213	3711	3997	6748
At Grand Marais Rd			977	1210	1677	2225	14531	16280	371	352	3805	4866	3667	7586
E. of Malden Rd			440	465	380	1010	1781	3389	56	260	1583	3109	3854	6724
To/From Canadian Plaza			790	450	440	1570	0	4	2	3	4208	8509	5773	9512
HIGHWAY 401 Ramps			**2015 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			886		628		9792	0	203	0	972	0	499	0
401 NB On Ramp			514		706		9534	0	193	0	9	0	0	0
401 SB Off Ramp				664		587	0	9770	0	182	0	0	0	0
401 SB On Ramp				633		618	0	7899	0	198	0	1822	0	431
Howard Ave														
401 NB Off Ramp				126		278	0	2588	0	34	0	525	0	0
At Todd Lane/Cabana Rd														
401 NB Off Ramp			521		395		6800	0	75	0	0	0	0	0
401 NB On Ramp			795		736		10190	0	115	0	1153	0	0	0
401 SB Off Ramp				793		909	0	11959	0	130	0	1245	0	77
401 SB On Ramp				570		423	0	7872	0	25	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			537		1297		12787	0	321	0	2136	0	0	0
401 SB On Ramp				745		1215	0	12540	0	253	0	1894	0	1025
At Malden Rd														
401 NB On Ramp			240		190		2469	0	395	0	255	0	56	0
401 SB Off Ramp				240		290	0	2712	0	564	0	868	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				675		1070	0	9934	0	232	0	2770	0	845
Ojibway Pkwy IC														
401 NB Off Ramp			330		270		4249	0	451	0	0	0	0	0
401 NB On Ramp			200		40		0	0	0	0	1221	0	274	0
401 SB Off Ramp				20		130	0	122	0	15	0	955	0	0
401 SB On Ramp				950		930	0	14528	0	431	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			240		100		0	0	0	0	1387	0	791	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11368		328		3123		5139	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	189		630		2888		129		2068		2646	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	703		1336		10196		329		3213		3997	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	182		941		5483		237		2332		2458	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	977		1677		14531		371		3805		3667	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	440		380		1781		56		1583		3854	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	680		570		4249		451		1838		3910	
	Ojibway Pkway/401 NB Off Ran	Ojibway Pkway/401 NB On Ramp	350		300		0		0		1838		3910	
	Ojibway Pkway/401 NB OnRam	EC ROW to 401 NB On Ramp	550		340		0		0		3059		4184	
	EC ROW to 401 NB On Ramp	Canadian Plaza	790		440		0		0		4208		5773	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		4		3		8509		9512
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		4		2		7859		8877
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		15975		574		6705		8355
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		705		1300		4689		358		4135		9294
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		465		1010		2827		84		3174		7681
	HC Rd/401 SB On Ramp	Todd/401 SB Off Ramp		1210		2225		16280		352		4866		7586
	Todd/401 SB Off Ramp	Todd/401 SB On Ramp		417		1316		6555		175		2996		5155
	Todd/401 SB On Ramp	Howard/401 SB Off Ramp		987		1739		12593		261		3711		6748
	Howard/401 SB Off Ramp	Hwy 3/401 SB Off Ramp		861		1461		10107		226		**3176**		6611
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		197		874		4265		91		**1649**		3143
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10615		247		**3047**		7655
			AM PEAK HOUR WB	**EB**	**PM PEAK HOUR WB**	**EB**								
Grand Marais Rd	E. of connecting ramp		305	205	167	205	3730	3436	0	0	68	**153**	0	0
	W. of connecting ramp		110	205	160	90	2283	2301	34	21	37	**38**	0	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	560	540	540	660	7820	9202	336	442	634	**742**	0	0
	401 S. Ramp	401 N. Ramp	600	340	620	450	8710	6031	373	293	697	499	0	0
	N. of 401 N. Ramp		400	380	470	490	6261	6651	267	322	490	546	0	0
Matchette	Chappus	EC Row S. Ramp	518	330	423	530	7601	7389	0	0	90	93	0	0
	EC Row S. Ramp	EC Row N. Ramp	164	367	125	623	2243	8524	0	0	86	85	0	0
	EC Row N. Ramp	Carmichael	318	101	252	240	4564	2871	0	0	79	67	0	0

Table A-9 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2A - Year 2025

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6879	5510	180	92	3	1	0	41
	University	Wyandotte					3138	3726	88	124	67	191	56	41
	Wyandotte	AMB Off Ramp					2188	3074	0	0	45	128	0	0
	AMB Off Ramp	College					8649	6379	229	103	6543	1	2797	0
	College St	Girardot St	1812	878	1461	1778	17875	17283	550	519	6510	4605	245	2918
	Girardot St	Tecumseh Rd	1703	849	1348	1627	17721	18123	662	603	5770	3971	226	2741
	Tecumseh Rd	Dorchester St	1772	1123	1711	1806	21215	22028	818	751	5543	3513	230	2420
	Dorchester St	Prince Rd/Totten St	1853	1201	1676	1895	22001	24262	734	690	5064	3277	200	2247
	Prince Rd/Totten St	Malden Rd	1952	1453	1905	2090	24456	28088	820	807	4895	3216	228	2022
	Malden Rd	Industrial Rd	1607	1157	1550	1778	19557	22795	629	615	4986	3431	9	1979
	Industrial Rd	EC Row N. Ramp Terminal	1744	1255	1710	1866	22312	25206	711	686	4773	3036	0	1963
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1200	1653	1352	2350	16550	34662	480	730	4187	2860	0	1700
	EC Row S. Ramp Terminal	Highway 401 Offramp	1777	1250	1848	1802	25613	26275	527	460	2559	2338	0	1316
	Highway 401 Offramp	Spring Gdn Rd/Labelle St	1110	562	434	450	11292	8073	89	137	688	666	0	0
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd Ramp	927	535	372	465	9687	7975	134	190	431	596	0	0
	Lambton St/Grand Marais Rd	Pulford St	720	475	354	445	8242	7776	152	50	183	246	0	0
	Pulford St	Todd Ln/Cabana Rd	679	512	403	472	8646	8568	165	62	0	56	0	0
	Todd Ln/Cabana Rd	Huron Church Line	839	737	768	954	11835	14051	155	158	801	470	0	66
Talbot Rd	Huron Church Line	St Clair College	440	501	444	403	5765	7109	13	0	1087	787	0	0
	St Clair College	Cousineau Dr	881	319	516	484	8799	7016	12	0	1628	0	0	0
	Cousineau Dr	Howard Ave	736	358	552	341	10300	6162	46	3	138	0	0	0
	Howard Ave	Highway 3 split	1028	900	964	786	16103	14544	320	315	0	41	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	700	440	620	820	10615	10841	139	134	27	21	113	531
	GN Booth Dr	Sandwich St	685	442	626	795	10550	10636	139	132	27	21	114	533
	Sandwich St	Prospect Ave	646	403	582	760	9966	9995	74	74	48	41	0	0
	N. of Prospect Ave		639	392	581	747	9904	9787	73	72	48	40	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4742	4425	0	0	370	436	0	0
	E of HuronChurch						2809	4146	18	141	749	860	51	0
University	W of HuronChurch						1358	1254	0	0	0	0	0	0
	E of HuronChurch						2083	2192	124	88	63	21	41	56
Riverside	W of HuronChurch						3547	3769	0	0	0	0	0	0
	E of HuronChurch						6822	5807	0	0	128	46	0	0
AMB Off Ramp	E of HuronChurch						0	1407	0	54	0	6540	41	2797
AMB On Ramp	E of HuronChurch						276	0	7	0	6098	0	223	0
Patricia	AMB	Wyandotte					490	1407	14	51	3456	3338	193	305
College St	E. of HC Road		321	356	487	404	6567	5748	178	133	3	534	0	193
	W. of HC Road		84	43	163	67	1466	857	0	0	546	43	0	0
Girardot St	E. of HC Road		54	84	84	48	1065	1057	0	0	66	110	0	0
	W. of HC Road		82	149	183	122	2131	2092	33	27	108	83	11	4
Tecumseh Rd	E. of HC Road		318	310	381	468	5430	5973	128	147	200	400	0	245
	W. of HC Road		237	460	494	379	6273	6703	0	0	62	130	0	0
Dorchester St	E. of HC Road		77	85	134	95	1638	1406	0	0	101	156	0	0
	W. of HC Road		76	46	86	52	1323	764	22	10	63	31	10	2
Prince Rd/Totten St	E. of HC Road		154	101	123	210	2177	2562	0	0	83	121	0	0
	W. of HC Road		241	315	335	344	4937	5354	0	0	87	73	0	0
Malden Rd	E. of HC Road		102	63	105	94	1422	1098	0	0	259	250	0	0
	W. of HC Road		398	413	486	421	6763	6083	368	315	461	90	206	562
Industrial Rd	E. of HC Road		267	151	213	296	3702	3605	47	56	146	180	8	21
	W. of HC Road		299	103	185	297	4136	3003	171	199	0	0	0	250
EC Row N. Ramp Termina	E-N/S Ramp		993	n/a	1002	n/a	14751	n/a	313	n/a	1035	n/a	0	n/a
	N-W Ramp		n/a	30	n/a	76	n/a	846	n/a	0	n/a	43	n/a	0
	S-W Ramp		40	n/a	137	n/a	882	n/a	31	n/a	91	n/a	638	n/a
EC Row S. Ramp Terminal	W-N/S Ramp		n/a	154	n/a	194	n/a	2478	n/a	63	n/a	369	n/a	0
	S/N-E Ramp		n/a	1134	n/a	1194	n/a	17986	n/a	362	n/a	704	n/a	344
Spring Gdn Rd	W. of HC Road		115	210	150	170	2320	3114	0	0	2	4	0	0
Labelle St	E. of HC Road		330	174	168	56	3589	1905	0	0	294	154	0	0
Lambton St/Grand Marais I	E. of HC Road		420	275	234	285	5182	4700	0	0	88	200	0	0
Pulford St	E. of HC Road		186	122	184	48	2788	1379	0	0	186	138	0	0
Cabana Rd	E. of HC Road		611	369	475	520	7859	7079	0	0	674	574	0	0
	between HC Road and Hwy 401 NB Ramps		1444	1271	1033	1206	21920	18772	56	136	0	1574	0	82
Todd Lane	between Hwy 401 NB and SB Ramps		801	976	659	1186	12884	16383	33	123	0	1528	0	63
	W. of Hwy 401 SB Ramps		689	533	694	682	12168	10089	0	0	14	10	0	0
Huron Church Line	W. of HC Road		324	508	671	444	8180	7131	100	102	278	378	29	0
St Clair College	E. of Talbot Road		150	785	246	281	3141	9151	0	0	112	396	0	0
Cousineau Dr	E. of Talbot Road		250	290	431	339	5707	4478	0	0	0	1034	0	0
	W. of Talbot Road		265	448	679	402	8163	6968	4	31	0	0	0	0
Howard Ave	E. of Talbot Rd		453	607	552	778	8327	11296	138	218	289	2	10	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		747	350	1116	570	14389	7858	223	168	1019	1	15	0
	W. of Hwy 401 SB On-Ramp		550	914	1075	981	13377	16078	261	331	15	219	0	0
E.C. Row Expressway	E. of Huron Church Rd		2769	2559	2604	3237	38745	43645	822	917	2922	4191	575	1644
	At Malden Rd		1846	1579	1815	2237	25989	26982	552	588	2030	4004	810	1315
	W. of Matchette		1310	450	1217	580	20264	8624	472	404	23	0	96	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-9 Contd.

LOCATION	SECTION FROM	SECTION TO	2025 AM PEAK HOUR NB / WB	2025 AM PEAK HOUR SB / EB	2025 PM PEAK HOUR NB / WB	2025 PM PEAK HOUR SB / EB	24 Hour AADT Local Cars NB / WB	Local Cars SB / EB	Local Trucks NB / WB	Local Trucks SB / EB	International Cars NB / WB	International Cars SB / EB	International Trucks NB / WB	International Trucks SB / EB
HIGHWAY 401 Mainline			**2025 AM PEAK HOUR NB**	**SB**	**2025 PM PEAK HOUR NB**	**SB**								
S. of Hwy 3 merge/split			1360	1180	1560	1860	14218	12940	422	298	3520	3423	6511	10381
N. of Howard Ave			1008	1220	1546	2105	12049	14451	400	303	3864	4416	5668	9719
At Grand Marais Rd			1292	1550	1902	2645	16706	19084	437	407	4489	5716	5051	10824
E. of Malden Rd			645	787	423	1205	2001	4411	62	284	1896	3861	5472	10242
To/From Canadian Plaza			1050	560	520	1800	1	6	3	2	5114	9382	7501	12070
HIGHWAY 401 Ramps			**2025 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			931		709		10486	0	220	0	1173	0	686	0
401 NB On Ramp			533		695		9542	0	194	0	12	0	0	0
401 SB Off Ramp				668		607	0	9950	0	193	0	0	0	0
401 SB On Ramp				728		683	0	8453	0	207	0	2452	0	704
Howard Ave														
401 NB Off Ramp				139		305	0	2797	0	38	0	613	0	9
At Todd Lane/Cabana Rd														
401 NB Off Ramp			560		487		7883	0	90	0	0	0	0	0
401 NB On Ramp			844		843		11246	0	135	0	1322	0	0	0
401 SB Off Ramp				945		941	0	13130	0	146	0	1461	0	110
401 SB On Ramp				615		401	0	8041	0	36	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			647		1479		14695	0	381	0	2458	0	0	0
401 SB On Ramp				763		1440	0	13805	0	282	0	2112	0	1422
At Malden Rd														
401 NB On Ramp			275		235		2798	0	419	0	447	0	85	0
401 SB Off Ramp				275		360	0	3650	0	426	0	877	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				750		1200	0	10506	0	265	0	3518	0	1159
Ojibway Pkwy IC														
401 NB Off Ramp			370		295		4799	0	481	0	0	0	0	0
401 NB On Ramp			230		40		0	0	0	0	1346	0	343	0
401 SB Off Ramp				20		140	0	1393	0	37	0	0	0	0
401 SB On Ramp				1272		1105	0	4868	0	345	0	12578	0	0
EC Row Expressway IC														
401 NB On Ramp			270		117		0	0	0	0	1498	0	1039	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1360		1560		14218		422		3520		6511	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	475		851		4528		202		2766		4580	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	1008		1546		12049		400		3864		5668	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	448		1059		6532		287		2889		3861	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	1292		1902		16706		437		4489		5051	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	645		423		2001		62		1896		5472	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	920		658		4799		481		2343		5557	
	Ojibway Pkway/401 NB Off Ran	Ojibway Pkway/401 NB On Ramp	550		363		0		0		2343		5557	
	Ojibway Pkway/401 NB OnRam	EC ROW to 401 NB On Ramp	780		403		0		0		3689		5900	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1050		520		0		0		5114		7501	
	Canadian Plaza	Ojibway/401 SB Off Ramp		560		1800		6		2		9382		12070
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		540		1660		6		2		8721		11348
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1812		2765		17983		635		8434		12223
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1062		1565		5846		376		5064		13553
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		787		1205		3431		97		4025		11755
	HC Rd/401 SB On Ramp	Todd/401 SB Off Ramp		1550		2645		19084		407		5716		10824
	Todd/401 SB Off Ramp	Todd/401 SB On Ramp		605		1704		8095		219		3842		8061
	Todd/401 SB On Ramp	Howard/401 SB Off Ramp		1220		2105		14451		303		4416		9719
	Howard/401 SB Off Ramp	Hwy 3/401 SB Off Ramp		1081		1800		11771		265		3798		9540
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		413		1193		6164		134		2297		5419
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1180		1860		12940		298		3423		10381
			AM PEAK HOUR WB	**EB**	**PM PEAK HOUR WB**	**EB**								
Grand Marais Rd	E. of connecting ramp		305	230	224	205	4229	3669	0	0	69	152	0	0
	W. of connecting ramp		135	205	160	90	2492	2306	45	22	44	35	0	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	590	580	510	701	7624	9939	325	435	729	726	0	0
	401 S. Ramp	401 N. Ramp	635	350	600	431	8614	6053	366	266	807	445	0	0
	N. of 401 N. Ramp		407	395	420	486	5805	6829	246	300	533	502	0	0
Matchette	Chappus	EC Row S. Ramp	509	464	496	608	8169	9160	0	0	95	188	0	0
	EC Row S. Ramp	EC Row N. Ramp	157	491	126	695	2210	10162	0	0	80	172	0	0
	EC Row N. Ramp	Carmichael	316	114	266	237	4671	2900	0	0	81	119	0	0

Table A-10 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2A - Year 2035

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	**Riverside**	**University**					6841	5716	194	96	3	1	0	80
	University	**Wyandotte**					3085	3887	88	127	77	186	62	80
	Wyandotte	**AMB Off Ramp**					2237	3286	0	0	55	128	0	0
	AMB Off Ramp	**College**					8264	6614	233	108	7649	1	3551	0
	College St	**Girardot St**	1854	907	1500	1835	18116	16775	568	526	6811	5142	295	3625
	Girardot St	**Tecumseh Rd**	1784	879	1380	1764	18031	18277	690	633	6165	4689	271	3498
	Tecumseh Rd	**Dorchester St**	1835	1203	1740	1987	21405	22845	848	812	5878	4339	275	3082
	Dorchester St	**Prince Rd/Totten St**	1914	1273	1697	2083	22173	25058	758	751	5347	4113	239	2888
	Prince Rd/Totten St	**Malden Rd**	2007	1521	1942	2328	24722	29055	851	877	5231	4139	274	2590
	Malden Rd	**Industrial Rd**	1652	1211	1576	2009	19807	23638	658	673	5197	4387	10	2592
	Industrial Rd	**EC Row N. Ramp Terminal**	1777	1302	1682	2116	22107	26382	716	751	4838	3849	0	2513
	EC Row N. Ramp Terminal	**EC Row S. Ramp Terminal**	1231	1752	1342	2482	16462	35843	481	792	4297	3423	0	2087
	EC Row S. Ramp Terminal	**Highway 401 Offramp**	1878	1351	1952	1950	26863	28114	566	507	2834	2624	0	1586
	Highway 401 Offramp	**Spring Gdn Rd/Labelle St**	1123	609	474	472	11642	8637	96	148	750	704	0	0
	Spring Gdn Rd/Labelle St	**Lambton St/Grand Marais Rd Ramp**	934	580	401	531	9868	8846	142	210	506	664	0	0
	Lambton St/Grand Marais Rd	**Pulford St**	729	510	402	443	8470	8099	133	55	344	226	0	0
	Pulford St	**Todd Ln/Cabana Rd**	718	554	432	522	9190	9374	178	69	0	51	0	0
	Todd Ln/Cabana Rd	**Huron Church Line**	952	846	868	1107	13388	16198	175	199	913	547	8	81
Talbot Rd	**Huron Church Line**	**St Clair College**	465	545	476	431	5966	7815	14	0	1266	734	0	0
	St Clair College	**Cousineau Dr**	905	302	551	482	9054	6843	13	0	1791	0	0	0
	Cousineau Dr	**Howard Ave**	751	324	588	375	10685	6137	68	4	157	0	0	0
	Howard Ave	**Highway 3 split**	1058	981	1103	856	17511	15829	358	349	0	57	0	0
Ojibway Pwy	**EC Row Expressway**	**GN Booth Dr**	735	470	680	860	11381	11654	146	134	27	20	143	652
	GN Booth Dr	**Sandwich St**	720	472	686	835	11316	11442	146	132	27	19	144	654
	Sandwich St	**Prospect Ave**	679	424	632	800	10653	10523	76	72	51	44	0	0
	N. of Prospect Ave		672	413	631	787	10590	10315	75	71	51	43	0	0
CROSSING ROADS			**WB**	**EB**	**WB**	**EB**								
Wyandotte	**W of HuronChurch**						4556	4436	0	0	381	446	0	0
	E of HuronChurch						2767	4279	17	152	785	866	57	0
University	**W of HuronChurch**						1504	1357	0	0	0	0	0	0
	E of HuronChurch						2193	2195	127	88	57	22	80	62
Riverside	**W of HuronChurch**						3634	3914	0	0	0	0	0	0
	E of HuronChurch						7125	5981	0	0	129	56	0	0
AMB Off Ramp	**E of HuronChurch**						0	1096	0	44	0	7646	80	3551
AMB On Ramp	**E of HuronChurch**						214	0	5	0	6435	0	273	0
Patricia	**AMB**	**Wyandotte**					375	1095	12	42	3544	3434	263	395
College St	**E. of HC Road**		333	359	482	423	6613	5752	182	139	3	636	0	253
	W. of HC Road		90	50	184	71	1670	946	0	0	570	44	0	0
Girardot St	**E. of HC Road**		59	84	83	49	1071	1067	0	0	82	108	0	0
	W. of HC Road		85	146	180	121	2156	2059	33	25	88	83	14	5
Tecumseh Rd	**E. of HC Road**		331	321	437	511	5994	6325	138	147	218	393	0	396
	W. of HC Road		248	492	517	391	6561	7108	0	0	68	112	0	0
Dorchester St	**E. of HC Road**		78	86	135	97	1626	1428	0	0	119	158	0	0
	W. of HC Road		76	46	86	52	1332	763	22	9	55	32	13	2
Prince Rd/Totten St	**E. of HC Road**		160	101	129	208	2265	2560	0	0	93	109	0	0
	W. of HC Road		240	321	354	353	5081	5466	0	0	92	80	0	0
Malden Rd	**E. of HC Road**		117	70	113	111	1536	1195	0	0	323	347	0	0
	W. of HC Road		429	431	485	432	6860	6247	378	324	603	45	246	701
Industrial Rd	**E. of HC Road**		300	160	232	305	4094	3789	50	59	163	155	10	27
	W. of HC Road		306	113	198	304	4301	3096	180	222	0	0	0	279
EC Row N. Ramp Termina	**E-N/S Ramp**		1060	n/a	1009	n/a	15484	n/a	339	n/a	964	n/a	0	n/a
	N-W Ramp		n/a	32	n/a	86	n/a	923	n/a	8	n/a	56	n/a	0
	S-W Ramp		41	n/a	140	n/a	848	n/a	28	n/a	97	n/a	719	n/a
EC Row S. Ramp Termina	**W-N/S Ramp**		n/a	170	n/a	175	n/a	2475	n/a	72	n/a	313	n/a	0
	S/N-E Ramp		n/a	1218	n/a	1317	n/a	19144	n/a	408	n/a	1181	n/a	480
Spring Gdn Rd	**W. of HC Road**		120	210	150	170	2365	3114	0	0	2	4	0	0
Labelle St	**E. of HC Road**		349	189	176	49	3780	1987	0	0	311	153	0	0
Lambton St/Grand Marais	**E. of HC Road**		420	285	234	351	5188	5305	0	0	83	238	0	0
Pulford St	**E. of HC Road**		187	117	189	51	2777	1362	0	0	226	132	0	0
Cabana Rd	**E. of HC Road**		650	437	529	588	8553	8024	0	0	723	778	0	0
	between HC Road and Hwy 401 NB Ramps		1567	1415	1132	1350	23872	20643	69	167	0	2098	0	101
Todd Lane	**between Hwy 401 NB and SB Ramps**		880	1064	671	1290	13704	17541	40	147	0	1984	0	76
	W. of Hwy 401 SB Ramps		723	538	670	705	12278	10327	0	0	14	11	0	0
Huron Church Line	**W. of HC Road**		395	601	803	528	9820	8436	129	117	353	464	38	5
St Clair College	**E. of Talbot Road**		124	807	261	286	3145	9460	0	0	70	342	0	0
Cousineau Dr	**E. of Talbot Road**		258	312	515	340	6502	4608	0	0	0	1120	0	0
	W. of Talbot Road		284	490	737	439	8828	7603	4	47	0	0	0	0
Howard Ave	**E. of Talbot Rd**		499	650	543	839	8664	12148	149	234	288	3	11	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		858	376	1212	590	15994	8255	255	178	1085	1	18	0
	W. of Hwy 401 SB On-Ramp		654	999	1180	1085	15057	17650	299	364	22	264	0	0
E.C. Row Expressway	**E. of Huron Church Rd**		3313	2955	2733	3551	42939	48782	909	1047	3516	4839	709	2001
	At Malden Rd		2326	1907	1950	2409	29372	30979	615	673	2797	4237	984	1518
	W. of Matchette		1676	480	1433	640	24849	9435	598	375	24	0	130	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-10 Contd.

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline														
			NB	SB	NB	SB								
S. of Hwy 3 merge/split			1540	1340	1720	2120	15594	14171	475	334	3761	3747	7841	12804
N. of Howard Ave			1178	1403	1619	2343	12613	15452	425	329	4139	4911	6853	12270
At Grand Marais Rd			1514	1772	2020	2927	17838	20461	467	442	4916	6417	6182	13419
E. of Malden Rd			779	960	477	1365	2145	4649	64	273	2124	4456	6880	12995
To/From Canadian Plaza			1260	650	580	1970	1	6	3	3	5775	9910	8967	14272
HIGHWAY 401 Ramps			2035 AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split														
401 NB Off Ramp			958		842		11374	0	239	0	1494	0	967	0
401 NB On Ramp			570		709		9879	0	207	0	17	0	0	0
401 SB Off Ramp				698		647	0	10497	0	204	0	0	0	0
401 SB On Ramp				819		753	0	9417	0	230	0	2732	0	784
Howard Ave														
401 NB Off Ramp				153		330	0	2996	0	40	0	709	0	10
At Todd Lane/Cabana Rd														
401 NB Off Ramp			529		497		7772	0	105	0	0	0	0	0
401 NB On Ramp			865		898		11743	0	145	0	1420	0	9	0
401 SB Off Ramp				1035		1017	0	14285	0	158	0	1590	0	120
401 SB On Ramp				666		433	0	8698	0	39	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			735		1543		15534	0	405	0	2650	0	0	0
401 SB On Ramp				812		1562	0	14852	0	303	0	2292	0	1540
At Malden Rd														
401 NB On Ramp			300		260		3186	0	372	0	447	0	139	0
401 SB Off Ramp				300		400	0	4024	0	470	0	966	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				970		1325	0	12365	0	312	0	4140	0	1364
Ojibway Pkwy IC														
401 NB Off Ramp			410		330		5331	0	436	0	0	0	0	0
401 NB On Ramp			250		40		0	0	0	0	1412	0	395	0
401 SB Off Ramp				20		160	0	257	0	23	0	1010	0	0
401 SB On Ramp				1600		1280	0	22229	0	676	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			341		133		0	0	0	0	1760	0	1266	0
Highway 401 Mainline Vol	FROM	TO	NB	SB	NB	SB								
	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1540		1720		15594		475		3761		7841	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	608		910		5060		225		2888		5566	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	1178		1619		12613		425		4139		6853	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	649		1122		7038		311		3270		5087	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	1514		2020		17838		467		4916		6182	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	779		477		2145		64		2124		6880	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	1079		737		5331		436		2571		7019	
	Ojibway Pkway/401 NB Off Ran	Ojibway Pkway/401 NB On Ramp	669		407		0		0		2571		7019	
	Ojibway Pkway/401 NB OnRam	EC ROW to 401 NB On Ramp	919		447		0		0		3983		7414	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1260		580		0		0		5775		8967	
	Canadian Plaza	Ojibway/401 SB Off Ramp		650		1970		6		3		9910		14272
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		630		1810		5		3		9198		13418
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		2230		3090		19721		683		9742		16417
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1260		1765		6060		356		5788		16929
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		960		1365		3417		95		4636		14862
	HC Rd/401 SB On Ramp	Todd/401 SB Off Ramp		1772		2927		20461		442		6417		13419
	Todd/401 SB Off Ramp	Todd/401 SB On Ramp		737		1910		8634		239		4325		10333
	Todd/401 SB On Ramp	Howard/401 SB Off Ramp		1403		2343		15452		329		4911		12270
	Howard/401 SB Off Ramp	Hwy 3/401 SB Off Ramp		1250		2013		12614		288		4207		12024
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		552		1366		7020		155		2646		7169
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1340		2120		14171		334		3747		12804
			AM PEAK HOUR		PM PEAK HOUR									
			WB	EB	WB	EB								
Grand Marais Rd	E. of connecting ramp		305	235	224	271	4234	4229	0	0	65	187	0	0
	W. of connecting ramp		140	205	160	9	2536	1615	46	10	45	30	0	0
	FROM	TO	NB	SB	NB	SB								
Malden	Chappus	401 S. Ramp	630	620	530	725	7963	10505	341	416	797	746	0	0
	401 S. Ramp	401 N. Ramp	680	370	630	425	9063	6215	384	246	884	439	0	0
	N. of 401 N. Ramp		431	420	430	485	5992	7073	252	280	573	500	0	0
Matchette	Chappus	EC Row S. Ramp	613	566	506	582	9127	9882	0	0	72	183	0	0
	EC Row S. Ramp	EC Row N. Ramp	189	599	134	654	2600	10825	0	0	45	158	0	0
	EC Row N. Ramp	Carmichael	364	124	253	256	5002	3150	0	0	46	121	0	0

Table A-11 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2B - Year 2015

LOCATION	SECTION		Alternative 2A 2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6763	5390	173	85	3	1	0	3
	University	Wyandotte					3111	3651	90	119	65	198	20	3
	Wyandotte	AMB Off Ramp					2211	3045	0	0	44	131	0	0
	AMB Off Ramp	College					8806	6251	231	96	6173	1	2162	0
	College St	Girardot St	1797	834	1389	1656	17474	16649	522	486	6193	4360	192	2209
	Girardot St	Tecumseh Rd	1720	817	1275	1536	17362	17487	621	567	5517	3775	176	2114
	Tecumseh Rd	Dorchester St	1789	1119	1632	1717	20829	21671	768	720	5325	3452	181	1987
	Dorchester St	Prince Rd/Totten St	1831	1163	1593	1799	21353	23522	685	653	4826	3173	156	1799
	Prince Rd/Totten St	Malden Rd	1934	1384	1806	1952	23703	26772	763	750	4676	3162	177	1660
	Malden Rd	Industrial Rd	1588	1142	1466	1623	18911	21704	573	566	4737	3352	7	1601
	Industrial Rd	EC Row N. Ramp Terminal	1703	1199	1551	1743	20829	23841	635	632	4457	3024	0	1593
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1190	1453	1223	2080	15536	30518	425	631	3900	2716	0	1307
	EC Row S. Ramp Terminal	Highway 401 Offramp	1612	1082	1638	1555	23080	22647	449	380	2181	2159	0	1032
	Highway 401 Offramp	Spring Gdn Rd/Labelle St	1055	412	406	430	10669	6674	78	97	654	564	0	0
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd Ramp	878	384	342	465	9076	6728	111	134	413	516	0	0
	Lambton St/Grand Marais Rd	Pulford St	675	374	354	396	7863	6452	136	37	209	240	0	0
	Pulford St	Todd Ln/Cabana Rd	648	422	359	417	8033	7308	152	50	0	37	0	0
	Todd Ln/Cabana Rd	Huron Church Line	768	627	628	894	10252	12558	126	153	697	461	0	54
Talbot Rd	Huron Church Line	St Clair College	403	503	418	376	5522	6832	8	0	884	850	0	0
	St Clair College	Cousineau Dr	858	303	464	429	8455	6404	10	0	1430	0	0	0
	Cousineau Dr	Howard Ave	723	322	485	298	9730	5472	21	0	81	0	0	0
	Howard Ave	Highway 3 split	982	789	862	711	14885	12943	291	278	0	25	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	665	409	570	790	9922	10623	136	139	32	15	90	430
	GN Booth Dr	Sandwich St	650	411	576	765	9857	10411	136	136	32	15	91	432
	Sandwich St	Prospect Ave	615	381	541	738	9360	9610	75	78	52	35	0	0
	N. of Prospect Ave		608	370	540	725	9298	9402	74	76	52	34	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4834	4441	0	0	358	431	0	0
	E of HuronChurch						2850	4074	21	137	726	867	18	0
University	W of HuronChurch						1267	1128	0	0	0	0	0	0
	E of HuronChurch						1950	2014	119	90	67	21	3	20
Riverside	W of HuronChurch						3367	3642	0	0	0	0	0	0
	E of HuronChurch						6608	5719	0	0	132	45	0	0
AMB Off Ramp	E of HuronChurch						0	1643	0	60	0	6170	3	2162
AMB On Ramp	E of HuronChurch						317	0	12	0	5799	0	174	0
Patricia	AMB	Wyandotte					567	1642	22	58	3342	3241	171	231
College St	E. of HC Road		312	355	483	387	6465	5630	175	132	3	532	0	150
	W. of HC Road		75	35	135	64	1566	746	0	0	210	59	0	0
Girardot St	E. of HC Road		51	86	86	45	1060	1052	0	0	68	109	0	0
	W. of HC Road		81	153	191	126	2178	2149	36	29	114	91	9	4
Tecumseh Rd	E. of HC Road		315	316	409	462	5638	6115	134	150	211	357	0	137
	W. of HC Road		241	465	505	385	6296	6802	0	0	147	125	0	0
Dorchester St	E. of HC Road		75	84	132	93	1605	1382	0	0	102	155	0	0
	W. of HC Road		76	46	86	52	1321	762	23	10	64	34	8	1
Prince Rd/Totten St	E. of HC Road		144	108	115	206	2040	2591	0	0	73	121	0	0
	W. of HC Road		235	299	322	337	4778	5165	0	0	82	73	0	0
Malden Rd	E. of HC Road		84	55	85	74	1175	931	0	0	201	183	0	0
	W. of HC Road		373	403	479	432	6483	6223	368	337	484	36	168	431
Industrial Rd	E. of HC Road		244	142	202	257	3437	3215	46	55	146	164	6	16
	W. of HC Road		290	92	148	275	3764	2787	147	191	0	0	0	179
EC Row N. Ramp Terminal	E-N/S Ramp		843	n/a	870	n/a	12487	n/a	266	n/a	987	n/a	0	n/a
	N-W Ramp		n/a	29	n/a	63	n/a	731	n/a	0	n/a	37	n/a	0
	S-W Ramp		40	n/a	130	n/a	913	n/a	28	n/a	92	n/a	528	n/a
EC Row S. Ramp Terminal	W-N/S Ramp		n/a	148	n/a	188	n/a	2461	n/a	47	n/a	297	n/a	0
	S/N-E Ramp		n/a	941	n/a	1083	n/a	15627	n/a	296	n/a	762	n/a	224
Spring Gdn Rd	W. of HC Road		115	210	150	170	2320	3114	0	0	2	4	0	0
Labelle St	E. of HC Road		293	144	167	66	3338	1722	0	0	268	144	0	0
Lambton St/Grand Marais Rd	E. of HC Road		305	205	224	205	4221	3436	0	0	75	153	0	0
	W. of HC Road		110	205	160	90	2283	2301	34	21	37	38	0	0
Pulford St	E. of HC Road		203	128	207	91	3090	1739	0	0	211	186	0	0
Cabana Rd	E. of HC Road		550	324	467	444	7381	6096	0	0	646	518	0	0
	between HC Road and Hwy 401 NB Ramps		1308	1175	928	1124	19803	17449	39	127	0	1440	0	66
Todd Lane	between Hwy 401 NB and SB Ramps		773	849	586	1122	12020	14962	24	113	0	1413	0	48
	W. of Hwy 401 SB Ramps		675	527	613	664	11358	9885	0	0	12	10	0	0
Huron Church Line	W. of HC Road		251	454	614	306	7091	5657	97	80	234	294	22	0
St Clair College	E. of Talbot Road		150	805	234	267	2984	9148	0	0	160	451	0	0
Cousineau Dr	E. of Talbot Road		268	295	387	300	5464	4248	0	0	0	985	0	0
	W. of Talbot Road		246	408	589	365	7233	6365	0	0	0	0	0	0
Howard Ave	E. of Talbot Rd		403	551	532	718	7723	10360	128	195	283	2	0	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		707	315	1015	526	13285	7183	208	150	951	0	0	0
	W. of Hwy 401 SB On-Ramp		520	790	976	886	12302	14210	247	290	11	192	0	0
E.C. Row Expressway	**E. of Huron Church Rd**		**2154**	**2268**	**2167**	**2873**	**31509**	**39193**	**678**	**807**	**2214**	**3455**	**390**	**1241**
	At Malden Rd		**1380**	**1475**	**1490**	**1978**	**20975**	**25038**	**452**	**548**	**1325**	**3220**	**545**	**1052**
	W. of Matchette		**960**	**412**	**980**	**520**	**15597**	**7773**	**364**	**401**	**23**	**0**	**66**	**0**

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-11 Contd.

LOCATION	SECTION		Alternative 2A 2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	**TO**	NB / WB	SB / EB	NB / WB	SB / EB	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
HC Road	**Riverside**	**University**					6763	5390	173	85	3	1	0	3
	University	**Wyandotte**					3111	3651	90	119	65	198	20	3
	Wyandotte	**AMB Off Ramp**					2211	3045	0	0	44	131	0	0
	AMB Off Ramp	**College**					8806	6251	231	96	6173	1	2162	0
	College St	**Girardot St**	1797	834	1389	1656	17474	16649	522	486	6193	4360	192	2209
HIGHWAY 401 Mainline			**NB**	**SB**	**NB**	**SB**								
S. of Hwy 3 merge/split			1110	930	1260	1520	11368	10615	328	247	3123	3047	5139	7655
N. of Howard Ave			703	987	1336	1739	10196	12593	329	261	3213	3711	3997	6748
At Grand Marais Rd			977	1210	1677	2225	14531	16280	371	352	3805	4866	3667	7586
E. of Malden Rd			440	465	380	1010	1781	3389	56	260	1583	3109	3854	6724
To/From Canadian Plaza			790	450	440	1570	0	4	2	3	4208	8509	5773	9512
HIGHWAY 401 Ramps			**2015 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			886		628		9792	0	203	0	972	0	499	0
401 NB On Ramp			514		706		9534	0	193	0	9	0	0	0
401 SB Off Ramp				664		587	0	9770	0	182	0	0	0	0
401 SB On Ramp				633		618	0	7899	0	198	0	1822	0	431
Howard Ave														
401 SB Off Ramp				126		278	0	2588	0	34	0	525	0	0
At Todd Lane/Cabana Rd														
401 NB Off Ramp			521		395		6800	0	75	0	0	0	0	0
401 NB On Ramp			795		736		10190	0	115	0	1153	0	0	0
401 SB Off Ramp				793		909	0	11959	0	130	0	1245	0	77
401 SB On Ramp				570		423	0	7872	0	25	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			537		1297		12787	0	321	0	2136	0	0	0
401 SB On Ramp				745		1215	0	12540	0	253	0	1894	0	1025
At Malden Rd														
401 NB On Ramp			240		190		2469	0	395	0	255	0	56	0
401 SB Off Ramp				240		290	0	2712	0	564	0	868	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				675		1070	0	9934	0	232	0	2770	0	845
Ojibway Pkwy IC														
401 NB Off Ramp			330		270		4249	0	451	0	0	0	0	0
401 NB On Ramp			200		40		0	0	0	0	1221	0	274	0
401 SB Off Ramp				20		130	0	122	0	15	0	955	0	0
401 SB On Ramp				950		930	0	14528	0	431	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			240		100		0	0	0	0	1387	0	791	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11368		328		3123		5139	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	189		630		2888		129		2068		2646	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	703		1336		10196		329		3213		3997	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	182		941		5483		237		2332		2458	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	977		1677		14531		371		3805		3667	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	440		380		1781		56		1583		3854	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	680		570		4249		451		1838		3910	
	Ojibway Pkway/401 NB Off Ran	Ojibway Pkway/401 NB On Ramp	350		300		0		0		1838		3910	
	Ojibway Pkway/401 NB OnRam	EC ROW to 401 NB On Ramp	550		340		0		0		3059		4184	
	EC ROW to 401 NB On Ramp	Canadian Plaza	790		440		0		0		4208		5773	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		4		3		8509		9512
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		4		2		7859		8877
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		15975		574		6705		8355
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		705		1300		4689		358		4135		9294
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		465		1010		2827		84		3174		7681
	HC Rd/401 SB On Ramp	Todd/401 SB Off Ramp		1210		2225		16280		352		4866		7586
	Todd/401 SB Off Ramp	Todd/401 SB On Ramp		417		1316		6555		175		2996		5155
	Todd/401 SB On Ramp	Howard/401 SB Off Ramp		987		1739		12593		261		3711		6748
	Howard/401 SB Off Ramp	Hwy 3/401 SB Off Ramp		861		1461		10107		226		3176		6611
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		197		874		4265		91		1649		3143
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10615		247		3047		7655
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	560	535	500	660	7499	9159	324	441	616	741	0	0
	401 S. Ramp	401 N. Ramp	600	335	580	450	8390	5988	361	291	679	497	0	0
	N. of 401 N. Ramp		400	375	430	490	5940	6608	254	320	472	544	0	0
Matchette	**Chappus**	**EC Row S. Ramp**	**518**	**330**	**423**	**530**	**7601**	**7389**	**0**	**0**	**90**	**93**	**0**	**0**
	EC Row S. Ramp	EC Row N. Ramp	164	367	125	625	2243	8541	0	0	86	85	0	0
	EC Row N. Ramp	Carmichael	318	101	250	240	4546	2871	0	0	79	67	0	0

Table A-12 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2B - Year 2025

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6879	5510	180	92	3	1	0	41
	University	Wyandotte					3138	3726	88	124	67	191	56	41
	Wyandotte	AMB Off Ramp					2188	3074	0	0	45	128	0	0
	AMB Off Ramp	College					8649	6379	229	103	6543	1	2797	0
	College St	Girardot St	1812	878	1461	1778	17875	17283	550	519	6510	4605	245	2918
	Girardot St	Tecumseh Rd	1703	849	1348	1627	17721	18123	662	603	5770	3971	226	2741
	Tecumseh Rd	Dorchester St	1772	1123	1711	1806	21215	22028	818	751	5543	3513	230	2420
	Dorchester St	Prince Rd/Totten St	1853	1201	1676	1895	22001	24262	734	690	5064	3277	200	2247
	Prince Rd/Totten St	Malden Rd	1952	1453	1905	2090	24456	28088	820	807	4895	3216	228	2022
	Malden Rd	Industrial Rd	1607	1157	1550	1778	19557	22795	629	615	4986	3431	9	1979
	Industrial Rd	EC Row N. Ramp Terminal	1744	1255	1710	1866	22312	25206	711	686	4773	3036	0	1963
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1200	1653	1352	2350	16550	34662	480	730	4187	2860	0	1700
	EC Row S. Ramp Terminal	Highway 401 Offramp	1777	1250	1848	1802	25613	26275	527	460	2559	2338	0	1316
	Highway 401 Offramp	Spring Gdn Rd/Labelle St	1110	562	434	450	11292	8073	89	137	688	666	0	0
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd Ramp	927	535	372	465	9687	7975	134	190	431	596	0	0
	Lambton St/Grand Marais Rd Ra	Pulford St	720	475	354	445	8242	7776	152	50	183	246	0	0
	Pulford St	Todd Ln/Cabana Rd	679	512	403	472	8646	8568	165	62	0	56	0	0
	Todd Ln/Cabana Rd	Huron Church Line	839	737	768	954	11835	14051	155	158	801	470	0	66
Talbot Rd	Huron Church Line	St Clair College	440	501	444	403	5765	7109	13	0	1087	787	0	0
	St Clair College	Cousineau Dr	881	319	516	484	8799	7016	12	0	1628	0	0	0
	Cousineau Dr	Howard Ave	736	358	552	341	10300	6162	46	3	138	0	0	0
	Howard Ave	Highway 3 split	1028	900	964	786	16103	14544	320	315	0	41	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	700	440	620	820	10615	10841	139	134	27	21	113	531
	GN Booth Dr	Sandwich St	685	442	626	795	10550	10636	139	132	27	21	114	533
	Sandwich St	Prospect Ave	646	403	582	760	9966	9995	74	74	48	41	0	0
	N. of Prospect Ave		639	392	581	747	9904	9787	73	72	48	40	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4742	4425	0	0	370	436	0	0
	E of HuronChurch						2809	4146	18	141	749	860	51	0
University	W of HuronChurch						1358	1254	0	0	0	0	0	0
	E of HuronChurch						2083	2192	124	88	63	21	41	56
Riverside	W of HuronChurch						3547	3769	0	0	0	0	0	0
	E of HuronChurch						6822	5807	0	0	128	46	0	0
AMB Off Ramp	E of HuronChurch						0	1407	0	54	0	6540	41	2797
AMB On Ramp	E of HuronChurch						276	0	7	0	6098	0	223	0
Patricia	AMB	Wyandotte					490	1407	14	51	3456	3338	193	305
College St	E. of HC Road		321	356	487	404	6567	5748	178	133	3	534	0	193
	W. of HC Road		84	43	163	67	1466	857	0	0	546	43	0	0
Girardot St	E. of HC Road		54	84	84	48	1065	1057	0	0	66	110	0	0
	W. of HC Road		82	149	183	122	2131	2092	33	27	108	83	11	4
Tecumseh Rd	E. of HC Road		318	310	381	468	5430	5973	128	147	200	400	0	245
	W. of HC Road		237	460	494	379	6273	6703	0	0	62	130	0	0
Dorchester St	E. of HC Road		77	85	134	95	1638	1406	0	0	101	156	0	0
	W. of HC Road		76	46	86	52	1323	764	22	10	63	31	10	2
Prince Rd/Totten St	E. of HC Road		154	101	123	210	2177	2562	0	0	83	121	0	0
	W. of HC Road		241	315	335	344	4937	5354	0	0	87	73	0	0
Malden Rd	E. of HC Road		102	63	105	94	1422	1098	0	0	259	250	0	0
	W. of HC Road		398	413	486	421	6763	6083	368	315	461	90	206	562
Industrial Rd	E. of HC Road		267	151	213	296	3702	3605	47	56	146	180	8	21
	W. of HC Road		299	103	185	297	4136	3003	171	199	0	0	0	250
EC Row N. Ramp Termina	E-N/S Ramp		993	n/a	1002	n/a	14751	n/a	313	n/a	1035	n/a	0	n/a
	N-W Ramp		n/a	30	n/a	76	n/a	846	n/a	0	n/a	43	n/a	0
	S-W Ramp		40	n/a	137	n/a	882	n/a	31	n/a	91	n/a	638	n/a
EC Row S. Ramp Terminal	W-N/S Ramp		n/a	154	n/a	194	n/a	2478	n/a	63	n/a	369	n/a	0
	S/N-E Ramp		n/a	1134	n/a	1194	n/a	17986	n/a	362	n/a	704	n/a	344
Spring Gdn Rd	W. of HC Road		115	210	150	170	2320	3114	0	0	2	4	0	0
Labelle St	E. of HC Road		330	174	168	56	3589	1905	0	0	294	154	0	0
Lambton St/Grand Marais I	E. of HC Road		305	230	224	205	4229	3669	0	0	69	152	0	0
	W. of HC Road		135	205	160	90	2492	2306	45	22	44	35	0	0
Pulford St	E. of HC Road		186	122	184	48	2788	1379	0	0	186	138	0	0
Cabana Rd	E. of HC Road		611	369	475	520	7859	7079	0	0	674	574	0	0
	between HC Road and Hwy 401 NB Ramps		1444	1271	1033	1206	21920	18772	56	136	0	1574	0	82
Todd Lane	between Hwy 401 NB and SB Ramps		801	976	659	1186	12884	16383	33	123	0	1528	0	63
	W. of Hwy 401 SB Ramps		689	533	694	682	12168	10089	0	0	14	10	0	0
Huron Church Line	W. of HC Road		324	508	671	444	8180	7131	100	102	278	378	29	0
St Clair College	E. of Talbot Road		150	785	246	281	3141	9151	0	0	112	396	0	0
Cousineau Dr	E. of Talbot Road		250	290	431	339	5707	4478	0	0	0	1034	0	0
	W. of Talbot Road		265	448	679	402	8163	6968	4	31	0	0	0	0
Howard Ave	E. of Talbot Rd		453	607	552	778	8327	11296	138	218	289	2	10	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		747	350	1116	570	14389	7858	223	168	1019	1	15	0
	W. of Hwy 401 SB On-Ramp		550	914	1075	981	13377	16078	261	331	15	219	0	0
E.C. Row Expressway	E. of Huron Church Rd		2769	2559	2604	3237	38745	43645	822	917	2922	4191	575	1644
	At Malden Rd		1846	1579	1815	2237	25989	26982	552	588	2030	4004	810	1315
	W. of Matchette		1310	450	1217	580	20264	8624	472	404	23	0	96	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-12 Contd.

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline														
			NB	**SB**	**NB**	**SB**								
S. of Hwy 3 merge/split			1360	1180	1560	1860	14218	12940	422	298	3520	3423	6511	10381
N. of Howard Ave			1008	1220	1546	2105	12049	14451	400	303	3864	4416	5668	9719
At Grand Marais Rd			1292	1550	1902	2645	16706	19084	437	407	4489	5716	5051	10824
E. of Malden Rd			645	787	423	1205	2001	4411	62	284	1896	3861	5472	10242
To/From Canadian Plaza			1050	560	520	1800	1	6	3	2	5114	9382	7501	12070
HIGHWAY 401 Ramps			2025											
			AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split														
401 NB Off Ramp			931		709		10486	0	220	0	1173	0	686	0
401 NB On Ramp			533		695		9542	0	194	0	12	0	0	0
401 SB Off Ramp				668		607	0	9950	0	193	0	0	0	0
401 SB On Ramp				728		683	0	8453	0	207	0	2452	0	704
Howard Ave														
401 SB Off Ramp				139		305	0	2797	0	38	0	613	0	9
At Todd Lane/Cabana Rd														
401 NB Off Ramp			560		487		7883	0	90	0	0	0	0	0
401 NB On Ramp			844		843		11246	0	135	0	1322	0	0	0
401 SB Off Ramp				945		941	0	13130	0	146	0	1461	0	110
401 SB On Ramp				615		401	0	8041	0	36	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			647		1479		14695	0	381	0	2458	0	0	0
401 SB On Ramp				763		1440	0	13805	0	282	0	2112	0	1422
At Malden Rd														
401 NB On Ramp			275		235		2798	0	419	0	447	0	85	0
401 SB Off Ramp				275		360	0	3650	0	426	0	877	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				750		1200	0	10506	0	265	0	3518	0	1159
Ojibway Pkwy IC														
401 NB Off Ramp			370		295		4799	0	481	0	0	0	0	0
401 NB On Ramp			230		40		0	0	0	0	1346	0	343	0
401 SB Off Ramp				20		140	0	1393	0	37	0	0	0	0
401 SB On Ramp				1272		1105	0	4868	0	345	0	12578	0	0
EC Row Expressway IC														
401 NB On Ramp			270		117		0	0	0	0	1498	0	1039	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1360		1560		14218		422		3520		6511	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	475		851		4528		202		2766		4580	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	1008		1546		12049		400		3864		5668	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	448		1059		6532		287		2889		3861	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	1292		1902		16706		437		4489		5051	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	645		423		2001		62		1896		5472	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	920		658		4799		481		2343		5557	
	Ojibway Pkway/401 NB Off Ran	Ojibway Pkway/401 NB On Ramp	550		363		0		0		2343		5557	
	Ojibway Pkway/401 NB OnRam	EC ROW to 401 NB On Ramp	780		403		0		0		3689		5900	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1050		520		0		0		5114		7501	
	Canadian Plaza	Ojibway/401 SB Off Ramp		560		1800		6		2		9382		12070
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		540		1660		6		2		8721		11348
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1812		2765		17983		635		8434		12223
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1062		1565		5846		376		5064		13553
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		787		1205		3431		97		4025		11755
	HC Rd/401 SB On Ramp	Todd/401 SB Off Ramp		1550		2645		19084		407		5716		10824
	Todd/401 SB Off Ramp	Todd/401 SB On Ramp		605		1704		8095		219		3842		8061
	Todd/401 SB On Ramp	Howard/401 SB Off Ramp		1220		2105		14451		303		4416		9719
	Howard/401 SB Off Ramp	Hwy 3/401 SB Off Ramp		1081		1800		11771		265		3798		9540
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		413		1193		6164		134		2297		5419
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1180		1860		12940		298		3423		10381
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	590	580	510	700	7624	9932	325	435	729	725	0	0
	401 S. Ramp	401 N. Ramp	635	350	600	431	8614	6053	366	266	807	445	0	0
	N. of 401 N. Ramp		407	395	420	486	5805	6829	246	300	533	502	0	0
Matchette	Chappus	EC Row S. Ramp	509	464	496	608	8169	9160	0	0	95	188	0	0
	EC Row S. Ramp	EC Row N. Ramp	157	491	126	695	2210	10162	0	0	80	172	0	0
	EC Row N. Ramp	Carmichael	316	114	266	237	4671	2900	0	0	81	119	0	0

Table A-13 24-Hour Annual Average Daily Traffic (AADT) for Alternative 2B - Year 2035

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6841	5716	194	96	3	1	0	80
	University	Wyandotte					3085	3887	88	127	77	186	62	80
	Wyandotte	AMB Off Ramp					2237	3286	0	0	55	128	0	0
	AMB Off Ramp	College					8264	6614	233	108	7649	1	3551	0
	College St	Girardot St	1854	907	1500	1835	18116	16775	568	526	6811	5142	295	3625
	Girardot St	Tecumseh Rd	1784	879	1380	1764	18031	18277	690	633	6165	4689	271	3498
	Tecumseh Rd	Dorchester St	1835	1203	1740	1987	21405	22845	848	812	5878	4339	275	3082
	Dorchester St	Prince Rd/Totten St	1914	1273	1697	2083	22173	25058	758	751	5347	4113	239	2888
	Prince Rd/Totten St	Malden Rd	2007	1521	1942	2328	24722	29055	851	877	5231	4139	274	2590
	Malden Rd	Industrial Rd	1652	1211	1576	2009	19807	23638	658	673	5197	4387	10	2592
	Industrial Rd	EC Row N. Ramp Terminal	1777	1302	1682	2116	22107	26382	716	751	4838	3849	0	2513
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1231	1752	1342	2482	16462	35843	481	792	4297	3423	0	2087
	EC Row S. Ramp Terminal	Highway 401 Offramp	1878	1351	1952	1908	26863	27824	566	503	2834	2575	0	1560
	Highway 401 Offramp	Spring Gdn Rd/Labelle St	1123	609	474	472	11642	8637	96	148	750	704	0	0
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd Ramp	934	580	401	531	9868	8846	142	210	506	664	0	0
	Lambton St/Grand Marais Rd Ramp	Pulford St	729	510	402	443	8470	8099	133	55	344	226	0	0
	Pulford St	Todd Ln/Cabana Rd	718	554	432	522	9190	9374	178	69	0	51	0	0
	Todd Ln/Cabana Rd	Huron Church Line	952	846	868	1107	13388	16198	175	199	913	547	8	81
Talbot Rd	Huron Church Line	St Clair College	465	545	476	431	5966	7815	14	0	1266	734	0	0
	St Clair College	Cousineau Dr	905	302	551	482	9054	6843	13	0	1791	0	0	0
	Cousineau Dr	Howard Ave	751	324	588	375	10685	6137	68	4	157	0	0	0
	Howard Ave	Highway 3 split	1058	981	1103	856	17511	15829	358	349	0	57	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	735	470	680	860	11381	11654	146	134	27	20	143	652
	GN Booth Dr	Sandwich St	720	472	686	835	11316	11442	146	132	27	19	144	654
	Sandwich St	Prospect Ave	679	424	632	800	10653	10523	76	72	51	44	0	0
	N. of Prospect Ave		672	413	631	787	10590	10315	75	71	51	43	0	0
CROSSING ROADS			WB	EB	WB	EB								
Wyandotte	W of HuronChurch						4556	4436	0	0	381	446	0	0
	E of HuronChurch						2767	4279	17	152	785	866	57	0
University	W of HuronChurch						1504	1357	0	0	0	0	0	0
	E of HuronChurch						2193	2195	127	88	57	22	80	62
Riverside	W of HuronChurch						3634	3914	0	0	0	0	0	0
	E of HuronChurch						7125	5981	0	0	129	56	0	0
AMB Off Ramp	E of HuronChurch						0	1096	0	44	0	7646	80	3551
AMB On Ramp	E of HuronChurch						214	0	5	0	6435	0	273	0
Patricia	AMB	Wyandotte					375	1095	12	42	3544	3434	263	395
College St	E. of HC Road		333	359	482	423	6613	5752	182	139	3	636	0	253
	W. of HC Road		90	50	184	71	1670	946	0	0	570	44	0	0
Girardot St	E. of HC Road		59	84	83	49	1071	1067	0	0	82	108	0	0
	W. of HC Road		85	146	180	121	2156	2059	33	25	88	83	14	5
Tecumseh Rd	E. of HC Road		331	321	437	511	5994	6325	138	147	218	393	0	396
	W. of HC Road		248	492	517	391	6561	7108	0	0	68	112	0	0
Dorchester St	E. of HC Road		78	86	135	97	1626	1428	0	0	119	158	0	0
	W. of HC Road		76	46	86	52	1332	763	22	9	55	32	13	2
Prince Rd/Totten St	E. of HC Road		160	101	129	208	2265	2560	0	0	93	109	0	0
	W. of HC Road		240	321	354	353	5081	5466	0	0	92	80	0	0
Malden Rd	E. of HC Road		117	70	113	111	1536	1195	0	0	323	347	0	0
	W. of HC Road		429	431	485	432	6860	6247	378	324	603	45	246	701
Industrial Rd	E. of HC Road		300	160	232	305	4094	3789	50	59	163	155	10	27
	W. of HC Road		306	113	198	304	4301	3096	180	222	0	0	0	279
EC Row N. Ramp Terminal	E-N/S Ramp		1060	n/a	1009	n/a	15484	n/a	339	n/a	964	n/a	0	n/a
	N-W Ramp		n/a	32	n/a	86	n/a	923	n/a	8	n/a	56	n/a	0
	S-W Ramp		41	n/a	140	n/a	848	n/a	28	n/a	97	n/a	719	n/a
EC Row S. Ramp Terminal	W-N/S Ramp		n/a	170	n/a	175	n/a	2475	n/a	72	n/a	313	n/a	0
	S/N-E Ramp		n/a	1218	n/a	1317	n/a	19144	n/a	408	n/a	1181	n/a	480
Spring Gdn Rd	W. of HC Road		120	210	150	170	2365	3114	0	0	2	4	0	0
Labelle St	E. of HC Road		349	189	176	49	3780	1987	0	0	311	153	0	0
Lambton St/Grand Marais Rd	E. of HC Road		305	235	224	271	4234	4229	0	0	65	187	0	0
	W. of HC Road		140	205	160	90	2536	2303	46	23	45	36	0	0
Pulford St	E. of HC Road		187	117	189	51	2777	1362	0	0	226	132	0	0
Cabana Rd	E. of HC Road		650	437	529	588	8553	8024	0	0	723	778	0	0
	between HC Road and Hwy 401 NB Ramps		1567	1415	1132	1350	23872	20643	69	167	0	2098	0	101
Todd Lane	between Hwy 401 NB and SB Ramps		880	1064	671	1290	13704	17541	40	147	0	1984	0	76
	W. of Hwy 401 SB Ramps		723	538	670	705	12278	10327	0	0	14	11	0	0
Huron Church Line	W. of HC Road		395	601	803	528	9820	8436	129	117	353	464	38	5
St Clair College	E. of Talbot Road		124	807	261	286	3145	9460	0	0	70	342	0	0
Cousineau Dr	E. of Talbot Road		258	312	515	340	6502	4608	0	0	0	1120	0	0
	W. of Talbot Road		284	490	737	439	8828	7603	4	47	0	0	0	0
Howard Ave	E. of Talbot Rd		499	650	543	839	8664	12148	149	234	288	3	11	0
	betweem Talbot Road and Hwy 401 SB On-Ramp		858	376	1212	590	15994	8255	255	178	1085	1	18	0
	W. of Hwy 401 SB On-Ramp		654	999	1180	1085	15057	17650	299	364	22	264	0	0
E.C. Row Expressway	**E. of Huron Church Rd**		**3313**	**2955**	**2733**	**3551**	**42939**	**48782**	**909**	**1047**	**3516**	**4839**	**709**	**2001**
	At Malden Rd		**2326**	**1907**	**1950**	**2409**	**29372**	**30979**	**615**	**673**	**2797**	**4237**	**984**	**1518**
	W. of Matchette		**1676**	**480**	**1433**	**640**	**24849**	**9435**	**598**	**375**	**24**	**0**	**130**	**0**

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-13 Contd.

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline														
			NB	**SB**	**NB**	**SB**								
S. of Hwy 3 merge/split			1540	1340	1720	2120	15594	14171	475	334	3761	3747	7841	12804
N. of Howard Ave			1178	1403	1619	2301	12613	15311	425	326	4139	4840	6853	12127
At Grand Marais Rd			1514	1772	2020	2885	17838	20309	467	439	4916	6342	6182	13296
E. of Malden Rd			779	960	477	1365	2145	4649	64	273	2124	4456	6880	12995
To/From Canadian Plaza			1260	650	580	1970	1	6	3	3	5775	9910	8967	14272
HIGHWAY 401 Ramps			2035											
			AM PEAK HOUR		**PM PEAK HOUR**									
Hwy 3 merge/split														
401 NB Off Ramp			958		842		11374	0	239	0	1494	0	967	0
401 NB On Ramp			570		709		9879	0	207	0	17	0	0	0
401 SB Off Ramp				698		647	0	10497	0	204	0	0	0	0
401 SB On Ramp				819		753	0	9417	0	230	0	2732	0	784
Howard Ave														
401 SB Off Ramp				153		330	0	2996	0	40	0	709	0	10
At Todd Lane/Cabana Rd														
401 NB Off Ramp			529		497		7772	0	105	0	0	0	0	0
401 NB On Ramp			865		898		11743	0	145	0	1420	0	9	0
401 SB Off Ramp				1035		1017	0	14285	0	158	0	1590	0	120
401 SB On Ramp				666		433	0	8698	0	39	0	0	0	0
At Huron Church Rd														
401 NB Off Ramp			735		1543		15534	0	405	0	2650	0	0	0
401 SB On Ramp				**812**		**1562**	**0**	**14852**	**0**	**303**	**0**	**2292**	**0**	**1540**
At Malden Rd														
401 NB On Ramp			300		260		3186	0	372	0	447	0	139	0
401 SB Off Ramp				300		400	0	4024	0	470	0	966	0	0
EC Row Expressway to Hwy 401														
401 SB Off Ramp				970		1325	0	12365	0	312	0	4140	0	1364
Ojibway Pkwy IC														
401 NB Off Ramp			410		330		5331	0	436	0	0	0	0	0
401 NB On Ramp			250		40		0	0	0	0	1412	0	395	0
401 SB Off Ramp				20		160	0	257	0	23	0	1010	0	0
401 SB On Ramp				1600		1280	0	22229	0	676	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			341		133		0	0	0	0	1760	0	1266	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1540		1720		15594		475		3761		7841	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	608		910		5060		225		2888		5566	
	Hwy 3/401 NB On Ramp	Todd/401 NB Off Ramp	1178		1619		12613		425		4139		6853	
	Todd/401 NB Off Ramp	Todd/401 NB On Ramp	649		1122		7038		311		3270		5087	
	Todd/401 NB On Ramp	HC Rd/401 NB On Ramp	1514		2020		17838		467		4916		6182	
	HC Rd/401 NB On Ramp	Malden/401 NB On Ramp	779		477		2145		64		2124		6880	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	1079		737		5331		436		2571		7019	
	Ojibway Pkway/401 NB Off Ramp	Ojibway Pkway/401 NB On Ramp	669		407		0		0		2571		7019	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	919		447		0		0		3983		7414	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1260		580		0		0		5775		8967	
	Canadian Plaza	Ojibway/401 SB Off Ramp		650		1970		6		3		9910		14272
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		630		1810		5		3		9198		13418
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		2230		3090		19721		683		9742		16417
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1260		1765		6060		356		5788		16929
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		960		1365		3417		95		4636		14862
	HC Rd/401 SB On Ramp	**Todd/401 SB Off Ramp**		**1772**		**2927**		**20461**		**442**		**6417**		**13419**
	Todd/401 SB Off Ramp	**Todd/401 SB On Ramp**		**737**		**1910**		**8634**		**239**		**4325**		**10333**
	Todd/401 SB On Ramp	**Howard/401 SB Off Ramp**		**1403**		**2343**		**15452**		**329**		**4911**		**12270**
	Howard/401 SB Off Ramp	**Hwy 3/401 SB Off Ramp**		**1250**		**2013**		**12614**		**288**		**4207**		**12024**
	Hwy 3/401 SB Off Ramp	**Hwy 3/401 SB On Ramp**		**552**		**1366**		**7020**		**155**		**2646**		**7169**
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1340		2120		14171		334		3747		12804
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	630	630	530	720	7963	10557	341	417	797	744	0	0
	401 S. Ramp	401 N. Ramp	680	380	630	420	9063	6267	384	246	884	436	0	0
	N. of 401 N. Ramp		430	430	430	480	5986	7125	252	280	572	498	0	0
Matchette	**Chappus**	**EC Row S. Ramp**	**613**	**566**	**506**	**582**	**9127**	**9882**	**0**	**0**	**72**	**183**	**0**	**0**
	EC Row S. Ramp	**EC Row N. Ramp**	**189**	**599**	**134**	**654**	**2600**	**10825**	**0**	**0**	**45**	**158**	**0**	**0**
	EC Row N. Ramp	**Carmichael**	**364**	**124**	**253**	**256**	**5002**	**3150**	**0**	**0**	**46**	**121**	**0**	**0**

Table A-14 24-Hour Annual Average Daily Traffic (AADT) for Alternative 3 - Year 2015

LOCATION	SECTION		Alternative 3 2015				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6736	5308	180	84	3	1	0	3
	University	Wyandotte					3024	3558	91	118	58	241	20	3
	Wyandotte	AMB Off Ramp					2222	2957	0	0	37	171	0	0
	AMB Off Ramp	College					8545	6153	234	95	6352	1	2392	0
	College St	Girardot St	1782	789	1381	1686	17294	16101	520	467	6189	4444	192	2437
	Girardot St	Tecumseh Rd	1675	794	1245	1557	16858	17155	609	575	5424	3869	173	2365
	Tecumseh Rd	Dorchester St	1734	1054	1585	1727	20136	20850	750	712	5219	3451	178	2173
	Dorchester St	Prince Rd/Totten St	1801	1124	1573	1781	20995	22729	677	658	4796	3168	155	2001
	Prince Rd/Totten St	Malden Rd	1907	1334	1787	1983	23361	26152	756	763	4660	3177	177	1962
	Malden Rd	Industrial Rd	1588	1051	1413	1644	18327	20673	559	560	4752	3336	7	1819
	Industrial Rd	EC Row N. Ramp Terminal	1700	1152	1513	1790	20368	23372	624	646	4486	3098	0	1866
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1180	1443	1195	2230	15128	31177	429	668	3945	2935	0	1615
	EC Row S. Ramp Terminal	Spring Gdn Rd/Labelle St	1629	1153	1531	1720	22018	24061	423	419	2198	2594	0	1381
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd	1327	379	1492	944	20998	10369	300	174	1392	745	0	0
	Lambton St/Grand Marais Rd	Pulford St	849	457	528	941	9870	11158	149	154	740	677	0	0
	Pulford St	Todd Ln/Cabana Rd	849	524	540	951	10093	12039	168	175	650	512	0	0
	Todd Ln/Cabana Rd	Huron Church Line	706	492	608	862	10200	11413	103	95	311	235	0	0
Talbot Rd	Huron Church Line	St Clair College	423	703	406	847	6786	13447	54	76	0	82	0	0
	St Clair College	Cousineau Dr	1130	389	744	508	12069	6110	125	80	2049	1326	0	153
	Cousineau Dr	Howard Ave	400	346	410	288	5810	4825	95	93	528	488	0	176
	S. of Howard Ave		679	746	940	670	13212	12253	279	252	0	0	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	634	409	570	790	9780	9982	134	135	0	14	0	425
	GN Booth Dr	Sandwich St	618	413	577	763	9717	9790	133	132	0	14	0	429
	Sandwich St	Prospect Ave	578	385	539	729	9064	9557	72	78	46	46	0	0
	N. of Prospect Ave		571	376	538	715	9002	9359	72	76	46	45	0	0
CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4817	4431	0	0	359	438	0	0
	E of HuronChurch						2818	4098	21	142	722	939	18	0
University	W of HuronChurch						1264	1185	0	0	0	0	0	0
	E of HuronChurch						1938	1976	118	91	70	21	3	20
Riverside	W of HuronChurch						3427	3539	0	0	0	0	0	0
	E of HuronChurch						6590	5621	0	0	171	37	0	0
AMB Off Ramp	E of HuronChurch						0	1379	0	56	0	6349	3	2392
AMB On Ramp	E of HuronChurch						305	0	11	0	5828	0	174	0
Patricia	AMB	Wyandotte					545	1376	22	55	3372	3417	171	267
College St	E. of HC Road		299	339	488	379	6421	5429	161	125	3	531	0	141
	W. of HC Road		79	30	139	62	1594	709	0	0	245	43	0	0
Girardot St	E. of HC Road		51	86	86	45	989	996	0	0	131	160	0	0
	W. of HC Road		81	154	191	126	2257	2224	41	25	48	33	0	0
Tecumseh Rd	E. of HC Road		309	322	381	456	5357	6111	139	146	196	357	0	154
	W. of HC Road		244	448	504	392	6265	6733	0	0	187	124	0	0
Dorchester St	E. of HC Road		76	46	86	52	1142	717	0	0	154	127	0	0
	W. of HC Road		75	84	132	93	1730	1419	32	18	34	20	0	0
Prince Rd/Totten St	E. of HC Road		138	102	115	202	1990	2507	0	0	77	117	0	0
	W. of HC Road		235	255	301	313	4607	4619	0	0	76	68	0	0
Malden Rd	E. of HC Road		84	55	85	72	1174	896	0	0	202	198	0	0
	W. of HC Road		373	403	456	391	6338	5887	362	323	455	28	150	429
Industrial Rd	E. of HC Road		247	146	207	257	3492	3232	52	59	149	177	7	17
	W. of HC Road		292	93	121	275	3570	2785	132	193	0	0	0	190
EC Row N. Ramp Terminal	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		873	50	940	123	13121	1365	274	0	1120	122	0	0
	W. of HC Road (N-W On Ramp)		32	n/a	60	n/a	526	n/a	17	n/a	57	n/a	247	n/a
EC Row S. Ramp Terminal	E. of HC Road (S-E On Ramp)		n/a	525	n/a	420	n/a	7692	n/a	66	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		360	146	630	204	7615	2560	257	74	452	295	273	0
Spring Gdn Rd/Labelle St	E. of HC Road		305	145	151	193	3548	2853	0	0	95	88	0	0
	W. of HC Road		107	223	317	276	3654	4139	0	0	5	4	0	0
Lambton St/Grand Marais Rd	E. of HC Road		332	196	216	245	4140	3605	0	0	241	219	0	0
	W. of HC Road		82	220	152	274	1953	3974	36	52	39	54	0	0
Pulford St	E. of HC Road		189	122	97	102	1922	1665	0	0	270	284	0	0
Todd Ln/Cabana Rd	E. of HC Road		525	441	703	560	10075	8720	0	0	95	46	0	0
	W. of HC Road		513	543	998	698	13128	10310	0	0	8	7	0	0
Huron Church Line	W. of HC Road		288	431	650	371	7770	6118	96	81	218	247	0	0
St Clair College	E. of Talbot Road		121	774	248	288	2984	9189	0	0	94	321	0	0
Cousineau Dr	E. of Talbot Road		411	254	528	420	6000	4676	0	0	1836	1155	0	0
	W. of Talbot Road		426	457	806	530	10717	6675	0	39	0	1625	0	0
Howard Ave	E. of Talbot Road		342	472	534	666	7519	9311	127	172	2	4	0	0
	betweem Talbot Road and Hwy 401 SB On Ramp		451	337	837	449	10470	6729	189	154	111	2	0	0
	W. of Hwy 401 SB On Ramp		397	683	754	747	9389	12226	205	284	54	56	0	0
E.C. Row Expressway	E. of Huron Church Rd		2171	1874	2247	2180	32171	30978	681	652	2331	2711	398	991
	At Malden Rd		1380	1495	1490	1964	21005	24885	443	544	1327	3432	544	1020
	W. of Matchette		960	412	980	520	15668	7785	365	388	0	0	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

LOCATION	SECTION		Alternative 3 2015 AM PEAK HOUR		PM PEAK HOUR		24 Hour AADT Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			**2015 AM PEAK HOUR**		**PM PEAK HOUR**									
			NB	**SB**	**NB**	**SB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
S. of Hwy 3 merge/split			1110	930	1260	1520	11487	10692	326	250	3070	3028	5053	7579
N. of Howard Ave			1037	990	1271	1551	10563	10877	331	262	3614	3559	4852	7406
At Grand Marais Rd			722	1213	1248	1664	9605	12163	303	322	3373	4468	3564	8132
At Malden Rd			440	465	380	1010	1730	3444	57	260	1550	2918	3999	6920
To/From Canadian Plaza			790	450	440	1570	0	3	2	4	4189	8563	5820	9439
HIGHWAY 401 Ramps			**2015 AM PEAK HOUR**		**PM PEAK HOUR**									
Hwy 3 merge/split							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			577		655		8206	0	178	0	1013	0	411	0
401 NB On Ramp			508		655		9050	0	176	0	0	0	0	0
401 SB Off Ramp				625		611	0	9642	0	193	0	0	0	0
401 SB On Ramp				551		601	0	7303	0	188	0	1632	0	394
At St. Clair College							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			555		307		6219	0	41	0	0	0	0	0
401 NB On Ramp			240		284		3471	0	34	0	516	0	0	0
401 SB Off Ramp				351		466	0	5081	0	60	0	1180	0	134
401 SB On Ramp				128		353	0	3815	0	20	0	0	0	0
At Huron Church Rd							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			282		868		7755	0	253	0	1749	0	0	0
401 SB On Ramp				748		654	0	8323	0	222	0	1696	0	1242
Malden Rd IC							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 On Ramp			240		190		2421	0	400	0	291	0	50	0
401 Off Ramp				240		290	0	2737	0	558	0	844	0	0
EC Row Expressway IC							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 SB Off Ramp				675		1070	0	9678	0	235	0	3005	0	838
Ojibway Pkwy IC							**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**	**NB / WB**	**SB / EB**
401 NB Off Ramp			330		270		4151	0	457	0	0	0	0	0
401 NB On Ramp			200		40		0	0	0	0	1209	0	281	0
401 SB Off Ramp				20		130	0	114	0	13	0	926	0	59
401 SB On Ramp				950		930	0	14532	0	427	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			240		100		0	0	0	0	1400	0	781	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1110		1260		11487		326		3070		5053	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	529		616		3317		136		2545		4108	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1037		1271		10563		331		3614		4852	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	482		964		6382		260		2772		3342	
	St. Clair/401 NB On Ramp	HC Rd/401 NB Off Ramp	722		1248		9605		303		3373		3564	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	440		380		1730		57		1550		3999	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	680		570		4151		457		1841		4049	
	Ojibway Pkway/401 NB Off Ramp	Ojibway Pkway/401 NB On Ramp	350		300		0		0		1841		4049	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	550		340		0		0		3051		4330	
	EC ROW to 401 NB On Ramp	Canadian Plaza	790		440		0		0		4189		5820	
	Canadian Plaza	Ojibway/401 SB Off Ramp		450		1570		3		4		8563		9439
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		430		1440		3		4		7912		8806
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		1380		2370		15936		574		6769		8286
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		705		1300		4775		358		3881		9532
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		465		1010		2888		86		2960		7907
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1213		1664		12163		322		4468		8132
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		862		1198		7825		245		3245		6951
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		990		1551		10877		262		3559		7406
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		365		940		5302		125		1963		3861
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		930		1520		10692		250		3028		7579
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	560	530	470	615	7234	8882	324	407	611	643	0	0
	401 S. Ramp	401 N. Ramp	600	330	550	405	8122	5685	362	262	675	419	0	0
	N. of 401 N. Ramp		400	370	400	445	5682	6310	252	290	464	463	0	0
Matchette	Chappus	EC Row S. Ramp	469	260	384	480	7421	6049	0	0	124	187	0	0
	EC Row S. Ramp	EC Row N. Ramp	149	349	139	607	2404	7847	0	0	135	191	0	0
	EC Row N. Ramp	Carmichael	372	152	293	251	5737	3232	0	0	150	163	0	0
Montgomery	Surrey	Talbot	4	14	7	6	88	171	1	2	2	3	0	2
Surrey	Montgomery	Talbot	5	5	4	21	70	210	1	3	2	8	0	1
Grosvenor	Montgomery	Talbot	11	7	5	19	122	212	2	3	4	7	0	1

Table A-15 24-Hour Annual Average Daily Traffic (AADT) for Alternative 3 - Year 2025

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6774	5399	184	90	3	1	0	41
	University	Wyandotte					3000	3621	90	122	69	236	56	41
	Wyandotte	AMB Off Ramp					2176	3010	0	0	48	166	0	0
	AMB Off Ramp	College					8426	6251	234	101	7087	1	2816	0
	College St	Girardot St	1803	848	1446	1778	17631	16549	546	493	6532	4968	246	2833
	Girardot St	Tecumseh Rd	1733	872	1337	1666	17627	18139	664	624	5889	4413	227	2782
	Tecumseh Rd	Dorchester St	1808	1163	1680	1836	20974	22098	814	779	5635	3919	229	2535
	Dorchester St	Prince Rd/Totten St	1893	1221	1665	1925	21963	24148	736	717	5181	3654	201	2354
	Prince Rd/Totten St	Malden Rd	1984	1383	1856	2150	24053	27222	810	813	4961	3616	225	2098
	Malden Rd	Industrial Rd	1607	1077	1501	1801	19004	21544	618	608	5015	3810	9	2019
	Industrial Rd	EC Row N. Ramp Terminal	1725	1103	1608	1980	21211	23946	680	665	4704	3444	0	1981
	EC Row N. Ramp Tern	EC Row S. Ramp Terminal	1190	1498	1256	2451	15562	33206	464	721	4124	3269	0	1756
	EC Row S. Ramp Tern	Spring Gdn Rd/Labelle St	1818	1191	1788	1871	25166	25543	508	455	2586	2788	0	1424
	Spring Gdn Rd/Labelle	Lambton St/Grand Marais Rd	1501	586	1745	955	24153	12203	360	196	1622	862	0	0
	Lambton St/Grand Ma	Pulford St	897	678	697	980	11525	13341	184	167	848	812	0	0
	Pulford St	Todd Ln/Cabana Rd	904	751	710	987	11793	14229	205	185	766	668	0	0
	Todd Ln/Cabana Rd	Huron Church Line	739	718	773	939	11786	14038	123	104	372	311	0	0
Talbot Rd	Huron Church Line	St Clair College	332	761	452	844	6453	13839	76	89	1	179	0	0
	St Clair College	Cousineau Dr	1149	407	796	491	12477	6120	128	78	2173	1318	0	189
	Cousineau Dr	Howard Ave	435	340	458	252	6399	4536	101	80	585	430	0	196
	S. of Howard Ave		728	844	1055	729	14581	13628	294	275	0	0	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	699	440	620	820	10717	10440	140	133	0	21	0	533
	GN Booth Dr	Sandwich St	683	439	623	793	10619	10207	139	130	0	20	0	531
	Sandwich St	Prospect Ave	643	409	579	750	9918	9959	73	74	47	46	0	0
	N. of Prospect Ave		636	403	578	735	9856	9779	72	73	47	45	0	0
CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4743	4443	0	0	370	439	0	0
	E of HuronChurch						2781	4182	18	143	754	932	51	0
University	W of HuronChurch						1375	1229	0	0	0	0	0	0
	E of HuronChurch						2063	2040	122	90	70	21	41	56
Riverside	W of HuronChurch						3594	3728	0	0	0	0	0	0
	E of HuronChurch						6812	5752	0	0	167	48	0	0
AMB Off Ramp	E of HuronChurch						0	1287	0	54	0	7084	41	2816
AMB On Ramp	E of HuronChurch						242	0	6	0	6145	0	223	0
Patricia	AMB	Wyandotte					427	1285	12	52	3480	3359	216	305
College St	E. of HC Road		307	347	493	389	6521	5512	166	129	4	554	0	195
	W. of HC Road		84	49	164	66	1627	887	0	0	424	47	0	0
Girardot St	E. of HC Road		54	84	87	47	1011	987	0	0	139	166	0	0
	W. of HC Road		82	150	183	122	2199	2159	42	26	47	32	0	0
Tecumseh Rd	E. of HC Road		315	313	375	465	5350	6031	137	145	197	384	0	204
	W. of HC Road		244	456	515	397	6315	6830	0	0	222	130	0	0
Dorchester St	E. of HC Road		76	46	86	52	1138	711	0	0	159	132	0	0
	W. of HC Road		76	85	135	94	1761	1434	34	19	36	20	0	0
Prince Rd/Totten St	E. of HC Road		147	98	123	203	2124	2482	0	0	82	115	0	0
	W. of HC Road		236	264	305	332	4646	4854	0	0	80	70	0	0
Malden Rd	E. of HC Road		102	63	99	91	1356	1050	0	0	275	268	0	0
	W. of HC Road		398	413	465	409	6562	6018	370	319	497	39	192	563
Industrial Rd	E. of HC Road		280	157	216	282	3818	3553	49	60	153	168	8	22
	W. of HC Road		292	104	175	297	3994	3037	163	204	0	0	0	208
EC Row N. Ramp T	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		982	50	1065	125	15016	1374	317	1	1165	128	0	0
	W. of HC Road (N-W On Ramp)		33	n/a	70	n/a	577	n/a	17	n/a	60	n/a	294	n/a
EC Row S. Ramp T	E. of HC Road (S-E On Ramp)		n/a	717	n/a	620	n/a	10896	n/a	103	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		377	159	661	215	7836	2684	273	77	558	371	343	0
Spring Gdn Rd/Lab	E. of HC Road		317	157	152	190	3622	2934	0	0	112	92	0	0
	W. of HC Road		116	239	347	283	3989	4325	0	0	5	5	0	0
Lambton St/Grand	E. of HC Road		377	198	240	254	4709	3704	0	0	239	215	0	0
	W. of HC Road		91	203	148	271	1999	3820	38	52	40	52	0	0
Pulford St	E. of HC Road		193	127	96	102	1931	1693	0	0	279	299	0	0
Todd Ln/Cabana Rd	E. of HC Road		492	459	720	511	9987	8450	0	0	86	63	0	0
	W. of HC Road		464	562	1017	682	12838	10322	0	0	8	6	0	0
Huron Church Line	W. of HC Road		400	476	729	530	9382	7721	116	105	271	324	0	0
St Clair College	E. of Talbot Road		121	770	262	280	3107	9102	0	0	94	304	0	0
Cousineau Dr	E. of Talbot Road		426	260	551	363	6182	4244	0	0	1977	1172	0	0
	W. of Talbot Road		470	495	893	540	11856	6974	0	113	0	1681	0	0
Howard Ave	E. of Talbot Road		383	499	553	730	8048	10052	135	198	3	5	0	0
	betweem Talbot Road and Hwy 401 SB On Ramp		497	358	884	474	11210	7126	198	161	116	2	0	0
	W. of Hwy 401 SB On Ramp		436	802	816	886	10221	14457	214	328	53	49	0	0
E.C. Row Expressw	E. of Huron Church Rd		2735	2215	2684	2722	38998	37195	822	790	3058	3567	575	1422
	At Malden Rd		1836	1657	1814	2317	25945	28015	543	613	2046	4258	774	1379
	W. of Matchette		1300	450	1217	580	20276	8617	475	412	0	0	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-15 Contd.

LOCATION	SECTION		2025				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
			2025											
HIGHWAY 401 Mainline			AM PEAK HOUR		PM PEAK HOUR									
			NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
S. of Hwy 3 merge/split			1360	1180	1560	1860	14411	13155	412	301	3441	3388	6373	10127
N. of Howard Ave			1241	1132	1425	1862	11756	11978	386	291	4032	4059	6240	10124
At Grand Marais Rd			1050	1338	1387	1900	10989	12714	355	341	4051	4902	5092	10731
At Malden Rd			645	767	423	1129	1940	4241	63	275	1854	3308	5655	10254
To/From Canadian Plaza			1050	560	520	1800	1	5	3	3	5096	9206	7555	12338
			2025											
HIGHWAY 401 Ramps			AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 NB Off Ramp			616		773		9160	0	201	0	1258	0	596	0
401 NB On Ramp			518		668		9231	0	177	0	0	0	0	0
401 SB Off Ramp				645		603	0	9747	0	182	0	0	0	0
401 SB On Ramp				649		622	0	7792	0	196	0	2039	0	561
At St. Clair College							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 NB Off Ramp			545		330		6356	0	58	0	0	0	0	0
401 NB On Ramp			354		292		4004	0	37	0	687	0	0	0
401 SB Off Ramp				374		425	0	4960	0	58	0	1145	0	168
401 SB On Ramp				168		387	0	4398	0	25	0	0	0	0
At Huron Church Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 NB Off Ramp			405		964		8942	0	303	0	2075	0	0	0
401 SB On Ramp				571		771	0	7837	0	204	0	1688	0	1124
Malden Rd IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 On Ramp			275		235		2723	0	424	0	454	0	161	0
401 Off Ramp				275		360	0	3551	0	517	0	887	0	0
EC Row Expressway IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 SB Off Ramp				770		1276	0	10804	0	265	0	3886	0	1169
Ojibway Pkwy IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WE	SB / EB
401 NB Off Ramp			370		295		4663	0	487	0	0	0	0	0
401 NB On Ramp			230		40		0	0	0	0	1330	0	355	0
401 SB Off Ramp				20		140	0	142	0	13	0	930	0	75
401 SB On Ramp				1272		1105	0	18366	0	543	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			270		117		0	0	0	0	1569	0	954	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1360		1560		14411		412		3441		6373	
	Hwy 3/ 401 NB Off Ram	Hwy 3/401 NB On Ramp	723		757		4501		190		2873		5419	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1241		1425		11756		386		4032		6240	
	St. Clair/401 NB Off Ra	St. Clair/401 NB On Ramp	696		1095		7332		307		3281		4709	
	St. Clair/401 NB On Ran	HC Rd/401 NB Off Ramp	1050		1387		10989		355		4051		5092	
	HC Rd/401 NB Off Ram	Malden/401 NB On Ramp	645		423		1940		63		1854		5655	
	Malden/401 NB On Ram	Ojibway/401 NB Off Ramp	920		658		4663		487		2308		5817	
	Ojibway Pkway/401 NB	Ojibway Pkway/401 NB On Ramp	550		363		0		0		2308		5817	
	Ojibway Pkway/401 NB	EC ROW to 401 NB On Ramp	780		403		0		0		3638		6171	
	EC ROW to 401 NB On	Canadian Plaza	1050		520		0		0		5096		7555	
	Canadian Plaza	Ojibway/401 SB Off Ramp		560		1800		5		3		9206		12338
	Ojibway/401 SB Off Ra	Ojibway/401 SB On Ramp		540		1660		4		3		8557		11597
	Ojibway/401 SB On Ran	401 to EC ROW SB Off Ramp		1812		2765		18022		637		8202		12526
	401 to EC ROW SB Off	Malden/401 SB Off Ramp		1042		1489		5683		368		4395		13722
	Malden/401 SB Off Ram	HC Rd/401 SB On Ramp		767		1129		3344		95		3394		11730
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1338		1900		12714		341		4902		10731
	St Clair/401 SB Off Ram	St Clair/401 SB On Ramp		964		1475		8444		266		3737		9521
	St Clair/401 SB On Ram	Hwy 3/401 SB Off Ramp		1132		1862		11978		291		4059		10124
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		487		1259		6636		156		2531		5970
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1180		1860		13155		301		3388		10127
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Malden	Chappus	401 S. Ramp	600	580	499	660	7519	9673	340	416	762	676	0	0
	401 S. Ramp	401 N. Ramp	645	350	589	390	8505	5779	382	247	841	401	0	0
	N. of 401 N. Ramp		415	395	409	445	5713	6556	255	281	554	456	0	0
Matchette	Chappus	EC Row S. Ramp	508	395	504	560	8771	7728	0	0	144	269	0	0
	EC Row S. Ramp	EC Row N. Ramp	158	483	149	668	2577	9359	0	0	129	265	0	0
	EC Row N. Ramp	Carmichael	382	171	331	253	6140	3359	0	0	159	207	0	0
Montgomery	Surrey	Talbot	4	15	8	7	97	188	1	2	2	4	0	3
Surrey	Montgomery	Talbot	5	5	4	22	70	217	1	3	2	8	0	1
Grosvenor	Montgomery	Talbot	11	7	5	19	122	211	2	3	4	8	0	1

Table A-16 24-Hour Annual Average Daily Traffic (AADT) for Alternative 3 - Year 2035

LOCATION	SECTION		2035				24 Hour AADT							
			AM PEAK HOUR		PM PEAK HOUR		Local Cars		Local Trucks		International Cars		International Trucks	
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HC Road	Riverside	University					6678	5604	199	95	3	1	0	81
	University	Wyandotte					2832	3759	92	125	67	241	63	81
	Wyandotte	AMB Off Ramp					2061	3152	0	0	46	176	0	0
	AMB Off Ramp	College					7911	6474	237	106	7717	1	3852	0
	College St	Girardot St	1846	897	1476	1855	17762	16404	558	517	6849	5320	293	3861
	Girardot St	Tecumseh Rd	1774	912	1384	1744	17897	18482	693	654	6255	4781	275	3762
	Tecumseh Rd	Dorchester St	1836	1203	1740	1906	21270	22372	851	812	5982	3977	278	3334
	Dorchester St	Prince Rd/Totten St	1913	1244	1727	1974	22277	24172	773	737	5498	3676	247	3066
	Prince Rd/Totten St	Malden Rd	2012	1421	1956	2197	24702	27332	862	837	5362	3272	280	2766
	Malden Rd	Industrial Rd	1652	1097	1560	1846	19459	22099	660	642	5334	3363	11	2746
	Industrial Rd	EC Row N. Ramp Terminal	1755	1135	1640	2070	21452	24453	704	695	4898	3479	0	2656
	EC Row N. Ramp Terminal	EC Row S. Ramp Terminal	1240	1582	1303	2598	15992	34770	489	774	4403	3352	0	2408
	EC Row S. Ramp Terminal	Spring Gdn Rd/Labelle St	1897	1267	1891	1974	26279	26779	547	491	2836	2906	0	1848
	Spring Gdn Rd/Labelle St	Lambton St/Grand Marais Rd	1606	627	1852	990	25464	12835	394	204	1862	889	0	0
	Lambton St/Grand Marais Rd	Pulford St	963	752	751	1021	12242	14344	203	177	994	825	0	0
	Pulford St	Todd Ln/Cabana Rd	975	831	765	1028	12527	15281	224	193	930	687	0	0
	Todd Ln/Cabana Rd	Huron Church Line	797	767	798	1027	12297	15199	135	111	458	333	0	0
Talbot Rd	Huron Church Line	St Clair College	430	821	432	872	7028	14513	89	110	3	272	0	0
	St Clair College	Cousineau Dr	1198	431	845	516	13092	6326	126	78	2294	1478	0	239
	Cousineau Dr	Howard Ave	469	339	493	267	6884	4573	100	75	640	479	0	233
	S. of Howard Ave		789	898	1114	793	15541	14634	324	305	0	0	0	0
Ojibway Pwy	EC Row Expressway	GN Booth Dr	734	470	700	830	11678	10724	149	131	0	19	0	648
	GN Booth Dr	Sandwich St	720	468	703	803	11595	10483	148	128	0	19	0	645
	Sandwich St	Prospect Ave	678	419	649	763	10793	10162	76	70	51	48	0	0
	N. of Prospect Ave		671	406	648	750	10731	9936	75	68	51	47	0	0
CROSSING ROADS			WB	EB	WB	EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
Wyandotte	W of HuronChurch						4596	4453	0	0	381	447	0	0
	E of HuronChurch						2776	4331	17	153	770	948	58	0
University	W of HuronChurch						1513	1313	0	0	0	0	0	0
	E of HuronChurch						2206	2073	125	92	65	21	81	63
Riverside	W of HuronChurch						3708	4018	0	0	0	0	0	0
	E of HuronChurch						7079	5910	0	0	177	46	0	0
AMB Off Ramp	E of HuronChurch						0	932	0	43	0	7713	81	3852
AMB On Ramp	E of HuronChurch						221	0	6	0	6520	0	273	0
Patricia	AMB	Wyandotte					387	930	12	41	3574	3467	233	394
College St	E. of HC Road		322	352	496	399	6657	5523	173	130	4	590	0	289
	W. of HC Road		90	47	185	77	1737	984	0	0	522	38	0	0
Girardot St	E. of HC Road		59	84	84	48	1017	992	0	0	142	168	0	0
	W. of HC Road		85	147	180	121	2202	2125	42	27	47	33	0	0
Tecumseh Rd	E. of HC Road		329	325	416	505	5805	6274	141	146	204	457	0	345
	W. of HC Road		253	479	541	414	6419	7211	0	0	381	110	0	0
Dorchester St	E. of HC Road		76	46	86	52	1136	708	0	0	160	134	0	0
	W. of HC Road		78	85	135	96	1779	1449	34	20	36	21	0	0
Prince Rd/Totten St	E. of HC Road		153	97	129	204	2220	2485	0	0	83	112	0	0
	W. of HC Road		240	269	316	331	4780	4880	0	0	76	73	0	0
Malden Rd	E. of HC Road		117	70	114	106	1550	964	0	0	318	498	0	0
	W. of HC Road		429	431	479	426	6891	6225	380	323	529	14	232	699
Industrial Rd	E. of HC Road		307	166	227	295	3646	3711	45	59	695	195	8	29
	W. of HC Road		309	113	189	304	4258	3117	174	210	0	0	0	267
EC Row N. Ramp Terminal	E. of HC Road (E-N/S Off Ramp & S-W On Ramp)		1049	52	1104	140	15875	1474	340	3	1188	171	0	0
	W. of HC Road (N-W On Ramp)		35	n/a	80	n/a	587	n/a	15	n/a	66	n/a	403	n/a
EC Row S. Ramp Terminal	E. of HC Road (S-E On Ramp)		n/a	758	n/a	680	n/a	11723	n/a	118	n/a	0	n/a	0
	W. of HC Road (N-E On Ramp & W-N/S Off Ramp)		390	176	698	221	8199	2878	294	76	479	362	535	0
Spring Gdn Rd/Labelle St	E. of HC Road		283	169	161	191	3170	3133	0	0	265	27	0	0
	W. of HC Road		126	214	367	296	4250	4243	0	0	5	4	0	0
Lambton St/Grand Marais Rd	E. of HC Road		425	206	254	263	5172	3873	0	0	246	200	0	0
	W. of HC Road		100	202	144	266	2047	3766	39	53	40	53	0	0
Pulford St	E. of HC Road		198	132	94	102	1943	1730	0	0	284	308	0	0
Todd Ln/Cabana Rd	E. of HC Road		518	512	797	538	10844	9168	0	0	97	60	0	0
	W. of HC Road		478	586	1051	720	13248	10838	0	0	13	7	0	0
Huron Church Line	W. of HC Road		445	571	836	617	10658	9046	131	124	293	420	0	0
St Clair College	E. of Talbot Road		121	769	268	269	3164	9013	0	0	91	293	0	0
Cousineau Dr	E. of Talbot Road		449	278	611	365	6652	4360	0	0	2223	1244	0	0
	W. of Talbot Road		517	538	987	582	13081	7324	0	120	0	2039	0	0
Howard Ave	E. of Talbot Road		420	530	598	801	8753	10898	149	213	3	6	0	0
	betweem Talbot Road and Hwy 401 SB On Ramp		542	375	947	526	12085	7704	216	178	121	2	0	0
	W. of Hwy 401 SB On Ramp		476	867	869	985	10974	15844	234	363	54	57	0	0
E.C. Row Expressway	E. of Huron Church Rd		3288	2489	3014	3034	44794	41237	944	890	3783	4209	748	1758
	At Malden Rd		2326	1907	2130	2575	30926	31214	645	689	2820	5162	1041	1553
	W. of Matchette		1676	480	1453	640	25148	9398	594	413	0	0	0	0

* - For consistency, Huron Church Rd/Talbot Rd runs North-South and all crossing roads run East-West

Table A-16 Contd.

LOCATION	SECTION		2035				24 Hour AADT: Local Cars		Local Trucks		International Cars		International Trucks	
			AM PEAK HOUR		PM PEAK HOUR									
	FROM	TO	NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
HIGHWAY 401 Mainline			NB	SB	NB	SB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
S. of Hwy 3 merge/split			1540	1340	1720	2120	15817	14374	474	339	3691	3738	7623	12511
N. of Howard Ave			1484	1319	1591	2064	12948	12870	441	318	4599	4468	7921	12619
At Grand Marais Rd			1226	1511	1596	2084	12338	13225	410	363	4649	5383	6470	13326
At Malden Rd			779	960	477	1240	2042	4467	69	281	2083	3857	7122	12816
To/From Canadian Plaza			1260	650	580	1970	1	5	3	4	5750	9967	9035	14184
HIGHWAY 401 Ramps			2035 AM PEAK HOUR		PM PEAK HOUR									
Hwy 3 merge/split							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			654		844		9709	0	215	0	1456	0	806	0
401 NB On Ramp			535		700		9620	0	191	0	0	0	0	0
401 SB Off Ramp				685		647	0	10394	0	203	0	0	0	0
401 SB On Ramp				723		690	0	8417	0	212	0	2482	0	729
At St. Clair College							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			564		353		6674	0	70	0	0	0	0	0
401 NB On Ramp			306		358		4353	0	40	0	684	0	0	0
401 SB Off Ramp				396		430	0	5025	0	58	0	1256	0	214
401 SB On Ramp				204		410	0	4861	0	32	0	0	0	0
At Huron Church Rd							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			447		1119		10257	0	357	0	2374	0	0	0
401 SB On Ramp				551		844	0	7916	0	209	0	1724	0	1440
Malden Rd IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 On Ramp			300		260		2893	0	451	0	567	0	213	0
401 Off Ramp				300		400	0	4002	0	511	0	954	0	0
EC Row Expressway IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 SB Off Ramp				970		1450	0	12479	0	320	0	4893	0	1367
Ojibway Pkwy IC							NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB	NB / WB	SB / EB
401 NB Off Ramp			410		330		4935	0	519	0	0	0	0	0
401 NB On Ramp			250		40		0	0	0	0	1396	0	406	0
401 SB Off Ramp				20		160	0	275	0	25	0	942	0	81
401 SB On Ramp				1600		1280	0	22226	0	680	0	0	0	0
EC Row Expressway IC														
401 NB On Ramp			341		133		0	0	0	0	1833	0	1186	0
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
Highway 401 Mainline Vol	S. of Hwy 3 merge/split	Hwy 3/ 401 NB Off Ramp	1540		1720		15817		474		3691		7623	
	Hwy 3/ 401 NB Off Ramp	Hwy 3/401 NB On Ramp	949		891		5381		237		3349		7173	
	Hwy 3/401 NB On Ramp	St. Clair/401 NB Off Ramp	1484		1591		12948		441		4599		7921	
	St. Clair/401 NB Off Ramp	St. Clair/401 NB On Ramp	920		1238		8261		356		3865		6258	
	St. Clair/401 NB On Ramp	HC Rd/401 NB Off Ramp	1226		1596		12338		410		4649		6470	
	HC Rd/401 NB Off Ramp	Malden/401 NB On Ramp	779		477		2042		69		2083		7122	
	Malden/401 NB On Ramp	Ojibway/401 NB Off Ramp	1079		737		4935		519		2650		7335	
	Ojibway Pkway/401 NB Off Ramp	Ojibway Pkway/401 NB On Ramp	669		407		0		0		2650		7335	
	Ojibway Pkway/401 NB OnRamp	EC ROW to 401 NB On Ramp	919		447		0		0		4046		7741	
	EC ROW to 401 NB On Ramp	Canadian Plaza	1260		580		0		0		5750		9035	
	Canadian Plaza	Ojibway/401 SB Off Ramp		650		1970		5		4		9967		14184
	Ojibway/401 SB Off Ramp	Ojibway/401 SB On Ramp		630		1810		5		4		9251		13336
	Ojibway/401 SB On Ramp	401 to EC ROW SB Off Ramp		2230		3090		19712		706		9803		16234
	401 to EC ROW SB Off Ramp	Malden/401 SB Off Ramp		1260		1640		5883		370		5089		16884
	Malden/401 SB Off Ramp	HC Rd/401 SB On Ramp		960		1240		3308		92		3986		14648
	HC Rd/401 SB On Ramp	St Clair/401 SB Off Ramp		1511		2084		13225		363		5383		13326
	St Clair/401 SB Off Ramp	St Clair/401 SB On Ramp		1115		1654		8965		288		4133		11916
	St Clair/401 SB On Ramp	Hwy 3/401 SB Off Ramp		1319		2064		12870		318		4468		12619
	Hwy 3/401 SB Off Ramp	Hwy 3/401 SB On Ramp		634		1417		7452		179		2868		7724
	Hwy 3/401 SB On Ramp	S. of Hwy 3 merge/split		1340		2120		14374		339		3738		12511
	FROM	**TO**	**NB**	**SB**	**NB**	**SB**								
	Chappus	401 S. Ramp	630	630	520	720	7792	10551	353	442	840	730	0	0
Malden	401 S. Ramp	401 N. Ramp	680	380	620	420	8881	6263	400	261	933	428	0	0
	N. of 401 N. Ramp		430	430	420	480	5840	7121	262	297	602	489	0	0
	Chappus	EC Row S. Ramp	547	520	555	650	9635	9398	0	0	60	372	0	0
Matchette	EC Row S. Ramp	EC Row N. Ramp	180	609	172	753	3051	10826	0	0	44	560	0	0
	EC Row N. Ramp	Carmichael	406	185	374	278	6820	3508	0	0	54	410	0	0
Montgomery	Surrey	Talbot	4	16	9	7	105	196	1	2	3	5	0	4
Surrey	Montgomery	Talbot	5	5	4	23	70	224	1	3	2	10	0	1
Grosvenor	Montgomery	Talbot	11	7	5	19	121	211	1	3	4	8	0	2

APPENDIX B
MOBILE 6.2 MODELLING RESULTS

M E M O R A N D U M

To: Ms. Abby Salb, SENES

From: Tom Darlington

Date: December 8, 2005

Subject: Emission Rates for Windsor/Detroit Crossing Project

Hyper Anemo℠

This memo details the models, inputs, and procedures used to estimate on-road mobile source emission rates for various vehicle types for the Windsor/Detroit Crossing project.

This memo focuses on the emission rates from all vehicle types except idle emissions from heavy-duty diesel vehicles. The idle emissions from heavy-duty diesel vehicles are described in a separate AIR memo. [1]

This memo is divided into the following sections:

- Background
- Models
- Seasons and ambient temperatures
- Vehicle speeds
- Fuel inputs
- Results

Background

Detroit and Windsor are studying the possibility of adding a second Detroit River facility to augment the current Ambassador Bridge and tunnel. Such a crossing would change emissions of vehicles on both sides of the crossing. For example, heavy-duty diesel trucks may experience reduced idle times if the crossing were added. Light duty vehicles may also experience reduced idle times and somewhat higher average speeds in the vicinity of the crossings. At the same time, cross-border traffic could increase, as the time it takes to cross the border is reduced.

A key part of the study is to estimate the impact of a new crossing on traffic flow on both sides, and the resultant impact on vehicle emissions. To estimate these emission impacts requires detailed information about emission rates at idle, and at various speeds, for all the different vehicle types, and also detailed projections of traffic flow, and the projected impact of the crossing on traffic flow in the vicinity of the crossing.

Air Improvement Resource, Inc.
47298 Sunnybrook Lane
Suite 103
Novi, Michigan 48374 USA
248•380•3140
248•380•3146 fax
www.airimprovement.com

The purpose of this memo is to describe the methods used to estimate emissions on both the U.S. and Canadian side of the crossing. SENES contracted with AIR to estimate vehicle emissions for all of the various vehicle types, for both sides of the crossing. AIR assisted EPA in the development of the MOBILE6 model, and also developed the MOBILE6.2C model for Environment Canada. These models estimate emissions for a number of different vehicle types. The emissions are estimated in units of g/mi for vehicles not at idle, and in units of g/hr for vehicles at idle.

Models Used

AIR used EPA's MOBILE6.2 model for the Detroit side, and used Environment Canada's M6C25PPM model for Windsor. The M6C25PPM model is a Canadian version of the MOBILE6 model that incorporates fuel changes and many other changes that are specific to the Canadian fleet. Both models estimate all of the pollutants needed in this evaluation, however, AIR utilized more up-to-date procedures for estimating emissions from idling heavy-duty diesel trucks.

The following pollutants were estimated:

- VOC
- CO
- NOx
- SO2
- PM2.5
- CO2
- Methane
- 1,3 butadiene
- Acrolein
- Formaldehyde
- Acetaldehyde
- Benzene

The above pollutants were estimated for a base year, 2004, and two projection years, 2013 and 2023.

Seasons and Ambient Temperatures

Emissions are estimated for the fours seasons. Average minimum and maximum temperatures for these seasons were determined for both locations using 30 years of data from the National Weather Service for the US, and from Environment Canada for Canada. The ambient temperatures for the two locations are shown in Table 1 below.

Table 1. Average Minimum and Average Maximum Temperatures (F)				
Season	Detroit		Windsor	
Winter	22.8	35.6	19.7	32.4
Spring	38.8	57.7	37.3	55.4
Summer	67.1	88.9	60.4	79.9
Autumn	43.4	60.9	46.7	60.2

Vehicle Speeds

Vehicle speed inputs were obtained from SENES. Emissions were estimated for the following speeds: Idle (2.5 mph), 15.5, 31.1, 46.6, and 62.1 mph. The same speeds were used for both sides of the border.

Fuel Inputs

Both models used default gasoline and diesel fuel sulfur levels for Canada and the U.S. Detailed gasoline inputs are also needed to compute toxics emission rates. Ontario fuel property data was obtained from Natural Resources Canada. [2] Data for Detroit was obtained from The Alliance of Automobile Manufacturers. [3] Fuel characteristics are shown in Table 2.

Table 3. Non-Sulphur Gasoline Characteristics									
City	Season	RVP (psi)	E200 (%)	E300 (%)	Arom. (%)	Olef. (%)	Benzene (%)	% with ETOH	ETOH Concen.
Detroit	Winter	14.4	53.8	82.7	26.8	6.9	1.7	25%	9.75%
	Spring	11.0	47.7	81.2	29.4	8.5	1.6	25%	9.75%
	Summer	7.6	41.6	79.6	32.0	10.0	1.5	25%	9.75%
	Fall	11.0	47.7	81.2	29.4	8.5	1.6	25%	9.75%
Windsor	Winter	14.6	53.9	84.4	25.1	9.0	0.73	100%	1.92%
	Spring	12.1	50.9	83.4	26.9	9.3	0.73	100%	1.92%
	Summer	9.7	47.9	82.4	28.8	9.7	0.73	100%	1.92%
	Fall	12.1	50.9	83.4	26.9	9.3	0.73	100%	1.92%

Gasoline and diesel sulphur levels that are contained in both models for 2003, 2013, and 2023 are shown in Table 4.

Table 4. Sulphur Levels			
Fuel	Year	Sulphur Level (ppm) - Windsor	Sulphur Level (ppm) – Detroit
Gasoline	2004	52	170-180 ppm ,depending on season
	2013	25	30
	2023	25	30
Diesel	2004	320	365
	2013	15	11
	2023	15	11

Technologies and Emission Standards

Both models used in this analysis include the effects of all currently adopted regulatory programs for light duty vehicles and light duty trucks, as follows:

Light Duty Vehicles

- National LEV program starting in 2001
- Onboard vapor recovery requirements for all gasoline cars, trucks, and SUVs
- Onboard diagnostic requirements for all vehicles
- Tier 2 exhaust emission standards
- Tier 2 evaporative emission standards

Technologies which are being used to meet the Tier 2 exhaust emission standards are closer air/fuel ratio control, increased previous metal loadings on catalysts, closer-coupled catalysts, reduced cold-start emissions, and dual oxygen sensors. Technologies being used to meet the Tier 2 evaporative standards are larger and redesigned charcoal canisters, very low permeation hoses and fuel tanks, and other technologies designed to reduced vapor generation from the fuel tanks and lines during engine operation.

Heavy-Duty Vehicles

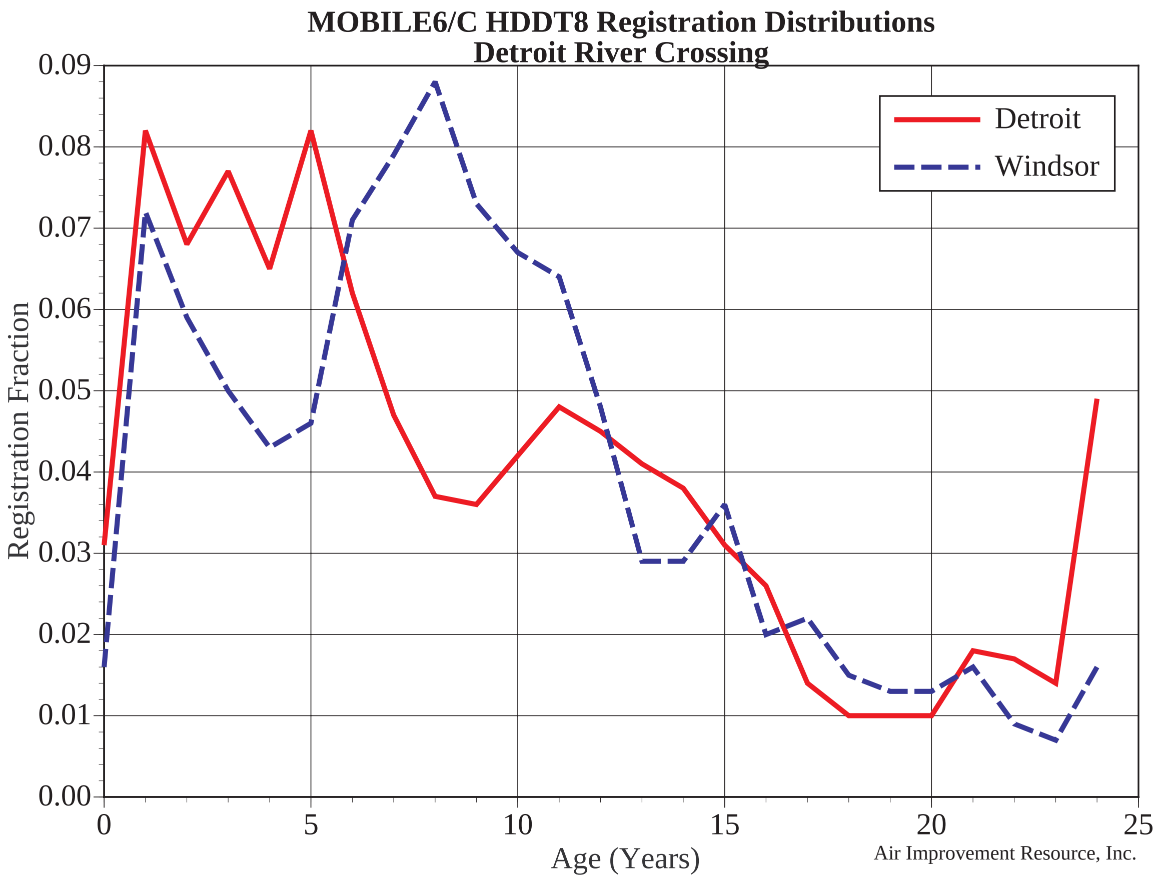
- 2004 HC+NOx standards
- 2007-2010 HC, NOx and PM standards
- 2010 NOx standards

The 2007-2010 heavy-duty standards assume the use of catalyzed PM traps to meet the 0.01 g/bhp-hr PM standard, and either engine controls like aggressive EGR, or aftertreatment (or both) needed to obtain a 50% NOx reduction. The 2010 heavy-duty NOx standards are a 90% reduction from 2006 NOx, and currently it is thought that this can only be met with aftertreament and aggressive EGR. Currently the aftertreatment choices to meet the 2010 NOx standard of 0.2 g/bhp-hr is either selective catalytic reduction (SCR), or a NOx adsorber.

EPA is planning to propose a mobile source toxics rule to apply to future light duty gasoline vehicles and trucks. That rule will probably reduce toxics from motor vehicles further, but the rule is not reflected in these emission rates because it has not been either proposed or adopted.

Heavy-Duty Fleet Turnover Comparison

The figure below shows a comparison of registration fractions versus age for both Detroit and Windsor. The Detroit fleet appears to be somewhat newer with the highest registration fractions in the 1-5 year old age group, but there also is a significantly higher fraction in the 25+ year old category for Detroit. Windsor appears to have a somewhat older fleet on average, in that the highest registrations fractions are for vehicles that are 6-9 years of age.



Results

All results are shown in spreadsheet format in two different files, “Detroit.xls”, and “Windsor.xls”.

References

[1] "Idle Emission Rates for Diesel Trucks", Memo from Tom Darlington at AIR to Dan Hrebenyk at SENES, November 9, 2005.

[2] Natural Resources Canada

[3] Alliance of Automobile Manufacturers Fuel Survey for Detroit for 2003.

M E M O R A N D U M

To: Dan Hrebenyk, SENES

From: Tom Darlington

Date: November 9, 2005

Subject: Idle Emission Rates for Diesel Trucks

This memo develops heavy duty diesel emission idle and "creep" emission rates for use in Vancouver.

Method

We are unsure of the duty cycle of heavy-duty trucks which are waiting in line at them loading terminal. Therefore, we have developed two sets of emissions rates – one is an idle emission rate, if the duty cycle is almost all idle, and the second estimate is based on a "creep" cycle, which was developed by the California Air Resources Board and West Virginia University.

The idle emission rates we recommend using in Vancouver come from a recent ARB staff report on requirements to reduce idling emissions from new and in-use trucks. The report lists idle emissions by model year for heavy-duty diesel trucks that are weighted by the fraction of time spent at low idle and high idle. The emission rates are also weighted by summer and winter fractions.

We obtained the separate winter and summer idle emission emission rates, at both low and high idle. For Vancouver, we have developed separate summer and winter emission rates, but we have used the ARB low and high idle fractions in each season. Idle emission rates were developed for three years: 2003, 2011, and 2020. Idle emission rates were developed for NOx, PM10, VOC, CO, and CO_2.

The emission rates based on the creep cycle have been developed from raw data obtained from the Coordinating Research Council's E55/57 testing program (the idle emission rates also ultimately come from this testing program). The creep cycle is a very low average speed cycle, where speed is varied between 0 and 8 mph and 0 and 3 mph, with an idle period in between.

Air Improvement Resource, Inc.
47298 Sunnybrook Lane
Suite 103
Novi, Michigan 48374 USA
248•380•3140
248•380•3146 fax
www.airimprovement.com

ARB's Idle Emission Rates

In the recent idle emissions staff report, ARB lists the idle emissions for heavy-duty diesel trucks in g/hr. [1] These emission rates are shown in Table 1.

Table 1. HDDT Idle Emissions (grams/hour)					
Calendar Year	Model Year	NOx	ROG	PM	CO_2
2010	Pre-1991	39.8	20.2	5.3	6228
	1991-2006	115.3	9.4	1.9	6228
	2007+	115.3	8.3	0.16	6228
2020	Pre-1991	39.8	20.1	5.2	6228
	1991-2006	115.3	8.9	1.8	6228
	2007+	115.3	8.3	0.16	6228

The above emission factors were developed by the ARB from recent tests conducted by West Virginia University as a part of the Coordinating Research Councils' E55/E57 testing program. [2] The above numbers include typical accessory loads for both summer and winter (summer is weighted 7/12 and winter is weighted 5/12), and also include both low and high idle operation. The low/high idle weighting factors are 61% low idle, 39% high idle.

The PM emission rates are much lower for 2007 and later trucks, due to fact that 2007 and later trucks are subject to much lower PM standards (0.01 g/bhp-hr). While the NOx standards are also lower in 2007 and 2010 (1.2 g/bhp-hr and 0.2 g/bhp-hr, respectively), ARB does not expect this technology to reduce idle NOx emissions, because idle temperatures are much lower than when the engine is under load, and the expected NOx emission control technology is expected to be less efficient at lower temperatures than at high temperatures. [1]

Idle Emissions for Vancouver

Since the climate is much different in Vancouver than in California, we recommend the use of separate winter and summer emission rates in Vancouver. The emission rates still need to utilize the ARB fractions of high and low idle operation.

We obtained the separate summer and winter high and low idle emission rates and high idle correction factors from the ARB, and these are shown in Attachments 1 and 2. We then weighted the low idle baseline with the summer high idle and winter high idle emission rates. The results are shown in Tables 2 and 3.

Table 2. Summer Vancouver Idle Emission Rates (g/hr) for HDDTs					
Model Year	PM	NOx	CO	HC	CO2
2007+	0.13	119.0	33.7	7.8	6594
2004-2006	1.35	119.0	33.7	7.8	6594
1998-2003	1.35	119.0	33.7	7.8	6594
1994-1997	1.80	119.0	37.4	9.7	6594
1991-1993	2.38	119.0	41.6	12.0	6594
1990	3.17	119.0	46.2	14.9	6594
1987-1989	3.17	41.1	46.2	14.9	6594
1984-1986	4.21	41.1	51.2	18.5	6594
1980-1983	5.60	41.1	56.9	22.9	6594
1977-1979	7.42	41.1	63.2	28.4	6594
1975-1976	9.08	41.1	68.1	33.0	6594
Pre-1975	10.68	41.1	72.3	37.4	6594

Table 3. Winter Vancouver Idle Emission Rates (g/hr) for HDDTs					
Model Year	PM	NOx	CO	HC	CO2
2007+	0.19	110.2	63.9	9.0	5714
2004-2006	1.95	110.2	63.9	9.0	5714
1998-2003	1.95	110.2	63.9	9.0	5714
1994-1997	2.59	110.2	70.9	11.1	5714
1991-1993	3.44	110.2	78.8	13.8	5714
1990	4.58	110.2	87.5	17.1	5714
1987-1989	4.58	38.0	87.5	17.1	5714
1984-1986	6.07	38.0	97.2	21.2	5714
1980-1983	8.08	38.0	107.9	26.3	5714
1977-1979	10.72	38.0	119.8	32.5	5714
1975-1976	13.11	38.0	129.1	37.9	5714
Pre-1975	15.42	38.0	137.1	42.8	5714

As shown in Table 2 and 3, the winter PM, CO, and HC emission rates are higher than the summer emission rates, and the NOx and CO_2 emission rates are lower.

Heavy-duty truck registration distributions were obtained for British Columbia from modeling we have done for Environment Canada. The registration distributions are shown in Attachment 3. These registration distributions were used with the idle emission rates in Table 2 and 3 to develop fleet idle emission rates for three years: 2003, 2011, and 2020. The final fleet idle emission rates for summer and winter for 2003, 2011 and 2020 are shown in Table 4.

Table 4. HDDT Fleet Idle Emission Rates (g/hr) for HDDTs						
Year	Season	PM	NOx	CO	HC	CO_2
2003	Summer	2.26	110	39.4	11.3	6594
	Winter	3.26	102	74.7	12.9	5714
2011	Summer	1.26	111	36.1	9.2	6594
	Winter	1.82	110	68.5	10.5	5714
2020	Summer	0.52	119	34.0	8.0	6594
	Winter	0.75	110	64.5	9.2	5714

"Creep" Emission Rates

The CRC testing referenced earlier also included a "Creep" cycle. This cycle was 0.13 miles long, with an average speed of 1.6 mph. The driving cycle is shown in Attachment 4. The cycle is intended to develop emissions for situations in which trucks wait in lines for long periods of time with idle and very slow speed operation, like at borders and toll collections, etc. Trucks were tested with normal accessory loads (compressor fan and alternator, but not a/c or heater).

AIR estimated average creep emissions in g/mi for pre-1991 and 1991 and later trucks, as shown in Table 5. These were estimated in both g/mi (first two columns), and in g/hr (second two columns).

Table 5. "Creep" Emission Rates				
	g/mi		g/hr	
Pollutant	Pre-1991	1991+	Pre-1991	1991+
NOx	38.6	71.7	62.7	116.1
HC	15.5	9.2	25.1	14.9
PM	7.2	3.5	11.7	5.7
CO	30.9	20.2	50.0	32.7

For NOx, the g/hr emission rates in Table 5 are similar to the NOx and CO emission rates in Table 4. However the creep cycle HC and PM rates appear to be higher than the rates in Table 4. This is due to the acceleration periods from idle in this cycle (see Attachment 4). Starting in model year 2007, however, PM emission rates must be reduced by 90%. Therefore, we propose the use of a 0.57 g/hr emission rate for 2007 and later heavy-duty trucks. While NOx emissions may also be reduced because of lower NOx standards, for this analysis we will assume they remain the same as 1991+ creep emission rates. We also propose the use of a 12% reduction in VOC emissions, similar to the ARB in Table 1 (13.1 g/hr).

Using estimates of HDDV VMT fractions in Attachment 3, the 2003, 2011 and 2020 fleet "creep" emissions are shown in Table 6.

Table 6. HDDT Fleet Idle Emission Rates (g/hr) for HDDTs				
Year	PM	NOx	CO	HC
2003	6.94	105	36	17
2011	5.04	116	36	16
2020	2.19	116	33	14

The HC and PM emission rates in Table 6 are somewhat higher than those in Table 5. These may be the most realistic emission rates to use for Vancouver, if the duty cycle includes idle punctuated by slow movement.

SO_2 Emission Rates

SO_2 emission rates can be estimated from the very low speed fuel consumption estimates from the creep cycle data (fuel consumption is not available from the idle emission tests). Idle SO_2 emission rates in g/hr can be estimated with the following expression:

SO_2 (g/hr) = (cycle miles/mpg) *4.44 L/gal *850 g/L * Sulphur ppm * (64/32)/(hr * 10^6)

Where:

Cycle miles = 0.13 miles
Mpg = average of 2.32 mpg
850 = typical density of diesel fuel
sulphur ppm = 365 ppm in 2003, 15 ppm in other years
64/32 = molecular weight ratio of SO_2 to S
hr = cycle time in hours, or 0.08 hrs

Using the above expression, the SO_2 emission rates in g/hr are shown in Table 6 below.

Table 6. SO_2 Emission Rates (g/hr)		
Year	Sulphur in Diesel fuel (ppm)	SO_2 Emission Rate (g/hr)
2003	365	1.93
2011	15	0.08
2020	15	0.08

EPA Guidance on PM and NOx

Finally, we note EPA's 2002 guidance recommends a NOx emission rate of 135 g/hr, and a PM emission rates that vary by model year from 3.68 g/hr for 2006 and earlier vehicles down to 0.33 g/hr for 2029 vehicles. [3] EPA does not provide CO, HC, or SO_2 emission rates. EPA developed these emission rates from a variety of sources including the CRC data, but the guidance does not explain how EPA arrived at these emission rates.

Uncertainties

The major uncertainty with the above emission rates is ARB's assumption that the NOx idle emission rates will not be lower in with lower NOx standards in the 2007 and later model years. The ARB is proposing to adopt controls that would either (1) require new engines to shut-off after a period of time, or (2) emit at below 30 g/hr. If these controls are adopted by the ARB, they could also be adopted by the EPA. If they are adopted by the EPA, it is likely that Environment Canada will implement an memorandum of understanding to require the controls in Canada as well. But even if none of this happens, it is likely that the 2007-2010 NOx emission reduction strategies will have some effect at reducing idle emissions from 2007 and later trucks. Thus, the idle NOx emission rates for 2020 in Table 4 are probably quite high.

Another uncertainty is whether the idle emission rates properly represent the duty cycle at the terminal. The creep emission rates indicate that the NOx emissions are probably appropriate, but if the duty cycle is more like the creep cycle than the idle cycle, then PM and HC emission rate will be somewhat higher.

References

1. “Staff Report: Initial Statement of reasons, Notice of Public Hearing to Consider Requirements to Reduce Idling Emissions from New and In-Use Trucks, Beginning in 2008”, September 1, 2005, California EPA, Air Resources Board.

2. “Heavy-Duty Vehicle Chassis Dynamometer Testing for Emission Inventory”, CRC Project No. E-55/59, http:crcao.com

3. “Guidance for Quantifying and Using Long Duration Truck Idling Emission Reductions in State Implementation Plans and Transportation Conformity”, EPA420-B-04-001, January 2004.

Attachment 1
Low Idle and High Idle Emission Rates

LOW IDLE BASELINE	PM	NOx	CO	HC	CO2
2007+	0.09	83.73	18.40	6.12	4366
2004-2006	0.85	83.73	18.40	6.12	4366
1998-2003	0.85	83.73	18.40	6.12	4366
1994-1997	1.13	83.73	20.44	7.59	4366
1991-1993	1.50	83.73	22.70	9.39	4366
1990	2.00	83.73	25.21	11.65	4366
1987-1989	2.00	28.91	25.21	11.65	4366
1984-1986	2.65	28.91	28.00	14.42	4366
1980-1983	3.53	28.91	31.10	17.89	4366
1977-1979	4.68	28.91	34.53	22.14	4366
1975-1976	5.72	28.91	37.21	25.79	4366
Pre-1975	6.73	28.91	39.51	29.15	4366

High Idle Summer	PM	NOx	CO	HC	CO2
2007+	0.213	174	57.6	10.5	10081
2004-2006	2.131	174	57.6	10.5	10081
1998-2003	2.131	174	57.6	10.5	10081
1994-1997	2.837	174	64.0	13.1	10081
1991-1993	3.761	174	71.0	16.2	10081
1990	5.007	174	78.9	20.1	10081
1987-1989	5.007	60	78.9	20.1	10081
1984-1986	6.639	60	87.6	24.8	10081
1980-1983	8.838	60	97.3	30.8	10081
1977-1979	11.719	60	108.1	38.1	10081
1975-1976	14.336	60	116.5	44.4	10081
Pre-1975	16.863	60	123.6	50.2	10081

High Idle Winter	PM	NOx	CO	HC	CO2
2007+	0.367	151.5	135.0	13.5	7823
2004-2006	3.666	151.5	135.0	13.5	7823
1998-2003	3.666	151.5	135.0	13.5	7823
1994-1997	4.880	151.5	149.9	16.7	7823
1991-1993	6.471	151.5	166.5	20.7	7823
1990	8.613	151.5	184.9	25.6	7823
1987-1989	8.613	52.3	184.9	25.6	7823
1984-1986	11.421	52.3	205.3	31.7	7823
1980-1983	15.203	52.3	228.1	39.4	7823
1977-1979	20.159	52.3	253.2	48.7	7823
1975-1976	24.661	52.3	272.9	56.7	7823
Pre-1975	29.008	52.3	289.7	64.1	7823

Attachment 2

Idle Correction Factors

High Idle Correction Factors

		PM	NOx	CO	HC	CO2
Summer CF	CF1	2.51	2.08	3.13	1.72	2.31
Winter CF	CF2	4.31	1.81	7.33	2.20	1.79

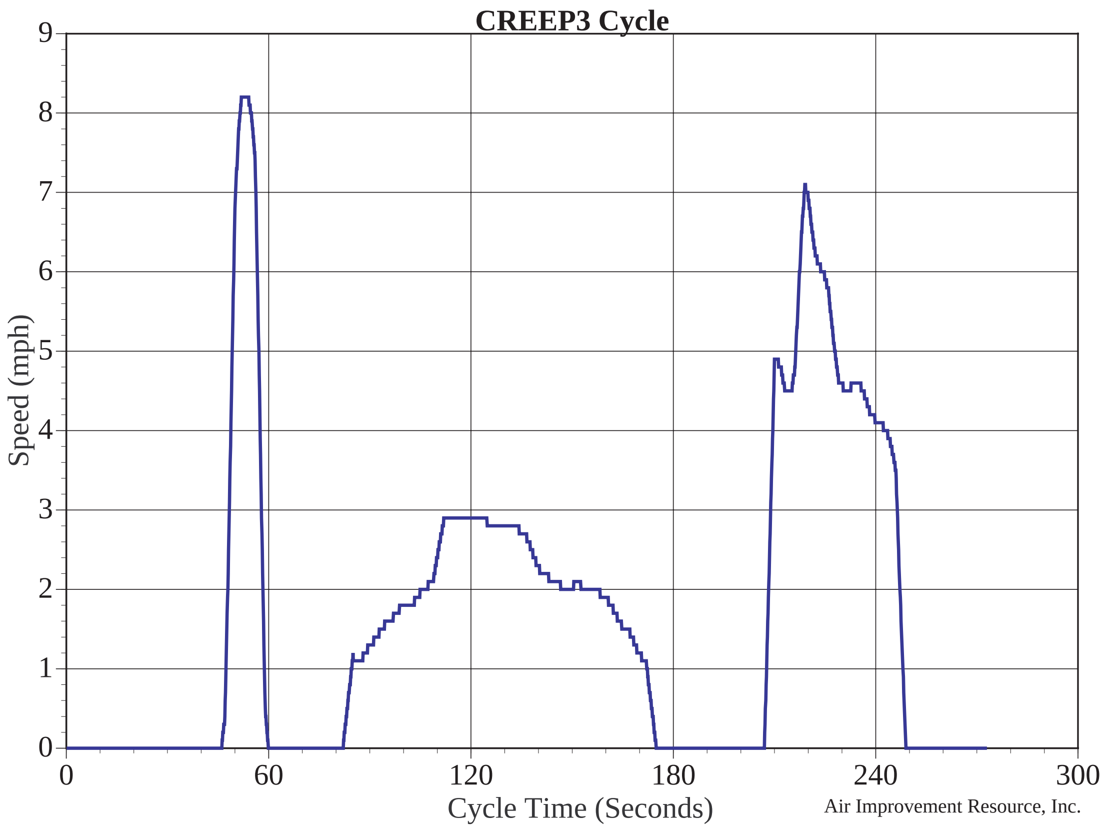
Attachment 3

British Columbia HDDT Registration Distributions

Age	Calendar Year 2000 (used for 2003)	Calendar Year 2010 (used for 2011)	Calendar Year 2020 (used for 2020)
1	0.079	0.0816	0.0835
2	0.086	0.0733	0.075
3	0.086	0.0685	0.0701
4	0.065	0.0641	0.0655
5	0.055	0.0599	0.0612
6	0.074	0.052	0.0515
7	0.066	0.0486	0.0482
8	0.044	0.0455	0.045
9	0.040	0.0426	0.0422
10	0.039	0.0397	0.0394
11	0.062	0.0372	0.0368
12	0.050	0.0348	0.0344
13	0.047	0.0325	0.0322
14	0.034	0.0305	0.0301
15	0.029	0.0284	0.0281
16	0.022	0.0267	0.0263
17	0.013	0.0249	0.0245
18	0.004	0.0233	0.023
19	0.008	0.0218	0.0215
20	0.018	0.0204	0.0201
21	0.017	0.0191	0.0188
22	0.013	0.0179	0.0176
23	0.007	0.0166	0.0164
24	0.009	0.0156	0.0154
25	0.034	0.0745	0.0734

* Only the 1997-2020 year data were used in this analysis for 2003, 2011, and 2020.

Attachment 4
CREEP Cycle Used in CRC E55/E57
(the second cycle is the same as the first, but has 4 repeats)



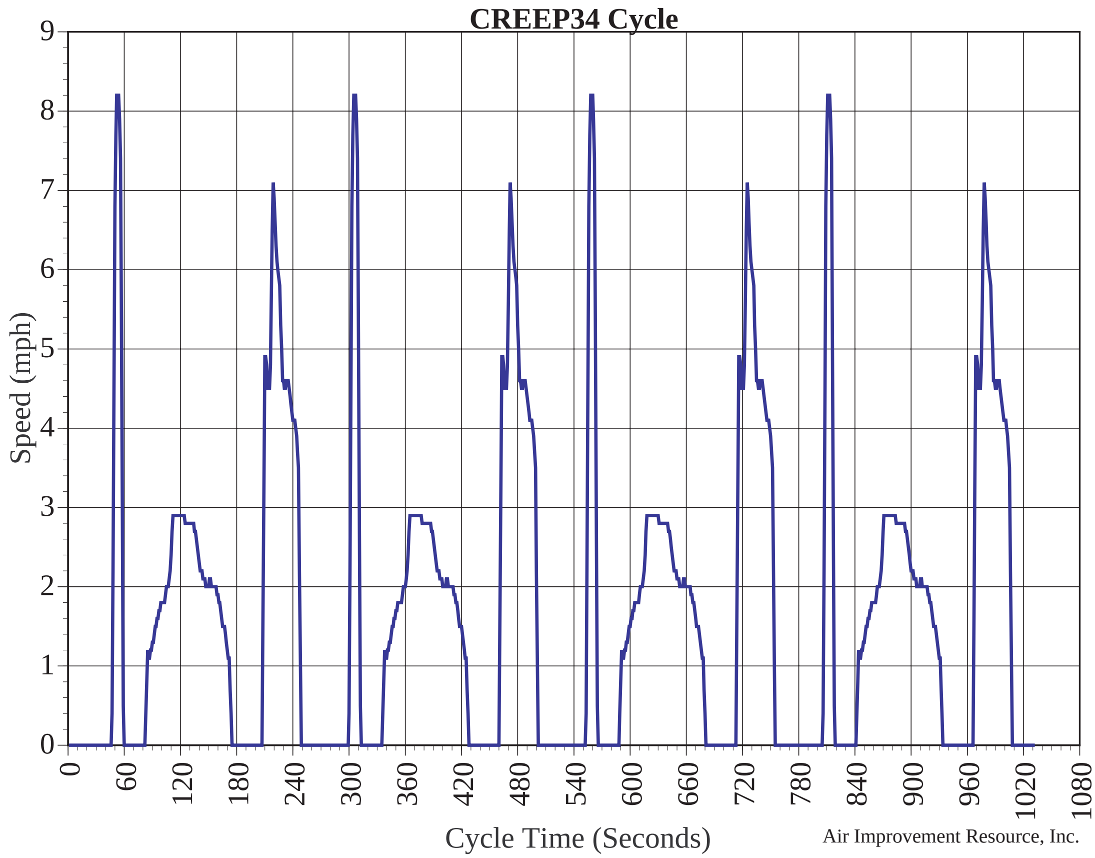

CREEP34 Cycle
Speed (mph)
0
1
2
3
4
5
6
7
8
9
0
60
120
180
240
300
360
420
480
540
600
660
720
780
840
900
960
1020
1080
Cycle Time (Seconds)
Air Improvement Resource, Inc.

Table B-1 Summary of Creep Emission Factors for Windsor and Detroit for NO_x (g/veh/hr)

Year	Windsor	Detroit
2006	106.3	103.4
2007	109.1	106.1
2015	115.0	113.8
2025	116.2	116.4
2035	116.2	116.4

Table B-2 Summary of Creep Emission Factors for Windsor and Detroit for $PM_{2.5}$ (g/veh/hr)

Year	Windsor	Detroit
2006	6.6	7.0
2007	6.3	6.6
2015	3.2	3.3
2025	1.0	1.4
2035	0.6	0.6

Table B-3 Working sheet showing Creep Emission Factor Calculation for Windsor and Detroit - Year 2015

					Creep Emission Factors			**Windsor**		Detroit	
Age	**HDDT8 Distribution**		year	Model Year	NOx EF	PM EF	PM2.5 EF	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	NOx	PM2.5
0	0.016	0.03	2015	2007+	116.1	0.57	0.5529				
1	0.071	0.08	2014	2007+	116.1	0.57	0.5529	8.2431	0.0392559	9.288	0.044232
2	0.058	0.067	2013	2007+	116.1	0.57	0.5529	6.7338	0.0320682	7.7787	0.0370443
3	0.049	0.076	2012	2007+	116.1	0.57	0.5529	5.6889	0.0270921	8.8236	0.0420204
4	0.044	0.066	2011	2007+	116.1	0.57	0.5529	5.1084	0.0243276	7.6626	0.0364914
5	0.046	0.08	2010	2007+	116.1	0.57	0.5529	5.3406	0.0254334	9.288	0.044232
6	0.072	0.06	2009	2007+	116.1	0.57	0.5529	8.3592	0.0398088	6.966	0.033174
7	0.078	0.044	2008	2007+	116.1	0.57	0.5529	9.0558	0.0431262	5.1084	0.0243276
8	0.087	0.036	2007	2007+	116.1	0.57	0.5529	10.1007	0.0481023	4.1796	0.0199044
9	0.074	0.036	2006	1991+	116.1	5.7	5.529	8.5914	0.409146	4.1796	0.199044
10	0.067	0.042	2005	1991+	116.1	5.7	5.529	7.7787	0.370443	4.8762	0.232218
11	0.064	0.048	2004	1991+	116.1	5.7	5.529	7.4304	0.353856	5.5728	0.265392
12	0.045	0.045	2003	1991+	116.1	5.7	5.529	5.2245	0.248805	5.2245	0.248805
13	0.03	0.04	2002	1991+	116.1	5.7	5.529	3.483	0.16587	4.644	0.22116
14	0.03	0.038	2001	1991+	116.1	5.7	5.529	3.483	0.16587	4.4118	0.210102
15	0.035	0.031	2000	1991+	116.1	5.7	5.529	4.0635	0.193515	3.5991	0.171399
16	0.02	0.026	1999	1991+	116.1	5.7	5.529	2.322	0.11058	3.0186	0.143754
17	0.022	0.013	1998	1991+	116.1	5.7	5.529	2.5542	0.121638	1.5093	0.071877
18	0.015	0.01	1997	1991+	116.1	5.7	5.529	1.7415	0.082935	1.161	0.05529
19	0.013	0.01	1996	1991+	116.1	5.7	5.529	1.5093	0.071877	1.161	0.05529
20	0.013	0.01	1995	1991+	116.1	5.7	5.529	1.5093	0.071877	1.161	0.05529
21	0.013	0.015	1994	1991+	116.1	5.7	5.529	1.5093	0.071877	1.7415	0.082935
22	0.009	0.015	1993	1991+	116.1	5.7	5.529	1.0449	0.049761	1.7415	0.082935
23	0.007	0.015	1992	1991+	116.1	5.7	5.529	0.8127	0.038703	1.7415	0.082935
24	0.016	0.05	1991	1991+	116.1	5.7	5.529	1.8576	0.088464	5.805	0.27645
25	0.023	0.05	1990	pre 1991	62.7	11.7	11.349	1.4421	0.261027	3.135	0.56745
	1.001	1.003						**115.0**	**3.2**	**113.8**	**3.3**

Table B-4 Working sheet showing Creep Emission Factor Calculation for Windsor and Detroit - Year 2025

					Creep Emission Factors			**Windsor**		Detroit	
Age	**HDDT8**	**Distribution**	year	Model Year	NOx EF	PM EF	PM2.5 EF	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	NOx	PM2.5
0	0.016	0.03	2025	2007+	116.1	0.57	0.5529				
1	0.071	0.08	2024	2007+	116.1	0.57	0.5529	8.2431	0.0392559	9.288	0.044232
2	0.058	0.067	2023	2007+	116.1	0.57	0.5529	6.7338	0.0320682	7.7787	0.0370443
3	0.049	0.076	2022	2007+	116.1	0.57	0.5529	5.6889	0.0270921	8.8236	0.0420204
4	0.044	0.066	2021	2007+	116.1	0.57	0.5529	5.1084	0.0243276	7.6626	0.0364914
5	0.046	0.08	2020	2007+	116.1	0.57	0.5529	5.3406	0.0254334	9.288	0.044232
6	0.072	0.06	2019	2007+	116.1	0.57	0.5529	8.3592	0.0398088	6.966	0.033174
7	0.078	0.044	2018	2007+	116.1	0.57	0.5529	9.0558	0.0431262	5.1084	0.0243276
8	0.087	0.036	2017	2007+	116.1	0.57	0.5529	10.1007	0.0481023	4.1796	0.0199044
9	0.074	0.036	2016	2007+	116.1	0.57	0.5529	8.5914	0.0409146	4.1796	0.0199044
10	0.067	0.042	2015	2007+	116.1	0.57	0.5529	7.7787	0.0370443	4.8762	0.0232218
11	0.064	0.048	2014	2007+	116.1	0.57	0.5529	7.4304	0.0353856	5.5728	0.0265392
12	0.045	0.045	2013	2007+	116.1	0.57	0.5529	5.2245	0.0248805	5.2245	0.0248805
13	0.03	0.04	2012	2007+	116.1	0.57	0.5529	3.483	0.016587	4.644	0.022116
14	0.03	0.038	2011	2007+	116.1	0.57	0.5529	3.483	0.016587	4.4118	0.0210102
15	0.035	0.031	2010	2007+	116.1	0.57	0.5529	4.0635	0.0193515	3.5991	0.0171399
16	0.02	0.026	2009	2007+	116.1	0.57	0.5529	2.322	0.011058	3.0186	0.0143754
17	0.022	0.013	2008	2007+	116.1	0.57	0.5529	2.5542	0.0121638	1.5093	0.0071877
18	0.015	0.01	2007	2007+	116.1	0.57	0.5529	1.7415	0.0082935	1.161	0.005529
19	0.013	0.01	2006	1991+	116.1	5.7	5.529	1.5093	0.071877	1.161	0.05529
20	0.013	0.01	2005	1991+	116.1	5.7	5.529	1.5093	0.071877	1.161	0.05529
21	0.013	0.015	2004	1991+	116.1	5.7	5.529	1.5093	0.071877	1.7415	0.082935
22	0.009	0.015	2003	1991+	116.1	5.7	5.529	1.0449	0.049761	1.7415	0.082935
23	0.007	0.015	2002	1991+	116.1	5.7	5.529	0.8127	0.038703	1.7415	0.082935
24	0.016	0.05	2001	1991+	116.1	5.7	5.529	1.8576	0.088464	5.805	0.27645
25	0.023	0.05	2000	1991+	116.1	5.7	5.529	2.6703	0.127167	5.805	0.27645
	1.001	1.003						**116.2**	**1.0**	**116.4**	**1.4**

Table B-5 Working sheet showing Creep Emission Factor Calculation for Windsor and Detroit - Year 2035

					Creep Emission Factors			**Windsor**		Detroit	
Age	**HDDT8 Distribution**		year	Model Year	NOx EF	PM EF	PM2.5 EF	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	NOx	PM2.5
0	0.016	0.03	2035	2007+	116.1	0.57	0.5529				
1	0.071	0.08	2034	2007+	116.1	0.57	0.5529	8.2431	0.0392559	9.288	0.044232
2	0.058	0.067	2033	2007+	116.1	0.57	0.5529	6.7338	0.0320682	7.7787	0.0370443
3	0.049	0.076	2032	2007+	116.1	0.57	0.5529	5.6889	0.0270921	8.8236	0.0420204
4	0.044	0.066	2031	2007+	116.1	0.57	0.5529	5.1084	0.0243276	7.6626	0.0364914
5	0.046	0.08	2030	2007+	116.1	0.57	0.5529	5.3406	0.0254334	9.288	0.044232
6	0.072	0.06	2029	2007+	116.1	0.57	0.5529	8.3592	0.0398088	6.966	0.033174
7	0.078	0.044	2028	2007+	116.1	0.57	0.5529	9.0558	0.0431262	5.1084	0.0243276
8	0.087	0.036	2027	2007+	116.1	0.57	0.5529	10.1007	0.0481023	4.1796	0.0199044
9	0.074	0.036	2026	2007+	116.1	0.57	0.5529	8.5914	0.0409146	4.1796	0.0199044
10	0.067	0.042	2025	2007+	116.1	0.57	0.5529	7.7787	0.0370443	4.8762	0.0232218
11	0.064	0.048	2024	2007+	116.1	0.57	0.5529	7.4304	0.0353856	5.5728	0.0265392
12	0.045	0.045	2023	2007+	116.1	0.57	0.5529	5.2245	0.0248805	5.2245	0.0248805
13	0.03	0.04	2022	2007+	116.1	0.57	0.5529	3.483	0.016587	4.644	0.022116
14	0.03	0.038	2021	2007+	116.1	0.57	0.5529	3.483	0.016587	4.4118	0.0210102
15	0.035	0.031	2020	2007+	116.1	0.57	0.5529	4.0635	0.0193515	3.5991	0.0171399
16	0.02	0.026	2019	2007+	116.1	0.57	0.5529	2.322	0.011058	3.0186	0.0143754
17	0.022	0.013	2018	2007+	116.1	0.57	0.5529	2.5542	0.0121638	1.5093	0.0071877
18	0.015	0.01	2017	2007+	116.1	0.57	0.5529	1.7415	0.0082935	1.161	0.005529
19	0.013	0.01	2016	2007+	116.1	0.57	0.5529	1.5093	0.0071877	1.161	0.005529
20	0.013	0.01	2015	2007+	116.1	0.57	0.5529	1.5093	0.0071877	1.161	0.005529
21	0.013	0.015	2014	2007+	116.1	0.57	0.5529	1.5093	0.0071877	1.7415	0.0082935
22	0.009	0.015	2013	2007+	116.1	0.57	0.5529	1.0449	0.0049761	1.7415	0.0082935
23	0.007	0.015	2012	2007+	116.1	0.57	0.5529	0.8127	0.0038703	1.7415	0.0082935
24	0.016	0.05	2011	2007+	116.1	0.57	0.5529	1.8576	0.0088464	5.805	0.027645
25	0.023	0.05	2010	2007+	116.1	0.57	0.5529	2.6703	0.0127167	5.805	0.027645
	1.001	1.003						**116.2**	**0.6**	**116.4**	**0.6**

Table B-8 Working sheet showing Idle Emission Factor Calculation for Windsor and Detroit - Year 2015

					Idle Emission Factors					**Windsor**			Detroit		
Age	**HDDT8 Distribution**		year	Model Year	NOx EF	PM EF	PM2.5 EF	CO2 EF	CO EF	Weighted	Weighted	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	CO	NOx	PM2.5	CO
0	0.016	0.03	2015	2007+	115.3	0.16	0.1552	6228	51.2965						
1	0.071	0.08	2014	2007+	115.3	0.16	0.1552	6228	51.2965	8.1863	0.0110192	3.6420515	9.224	0.012416	4.10372
2	0.058	0.067	2013	2007+	115.3	0.16	0.1552	6228	51.2965	6.6874	0.0090016	2.975197	7.7251	0.0103984	3.4368655
3	0.049	0.076	2012	2007+	115.3	0.16	0.1552	6228	51.2965	5.6497	0.0076048	2.5135285	8.7628	0.0117952	3.898534
4	0.044	0.066	2011	2007+	115.3	0.16	0.1552	6228	51.2965	5.0732	0.0068288	2.257046	7.6098	0.0102432	3.385569
5	0.046	0.08	2010	2007+	115.3	0.16	0.1552	6228	51.2965	5.3038	0.0071392	2.359639	9.224	0.012416	4.10372
6	0.072	0.06	2009	2007+	115.3	0.16	0.1552	6228	51.2965	8.3016	0.0111744	3.693348	6.918	0.009312	3.07779
7	0.078	0.044	2008	2007+	115.3	0.16	0.1552	6228	51.2965	8.9934	0.0121056	4.001127	5.0732	0.0068288	2.257046
8	0.087	0.036	2007	2007+	115.3	0.16	0.1552	6228	51.2965	10.0311	0.0135024	4.4627955	4.1508	0.0055872	1.846674
9	0.074	0.036	2006	1991+	115.3	1.9	1.843	6228	51.2965	8.5322	0.136382	3.795941	4.1508	0.066348	1.846674
10	0.067	0.042	2005	1991+	115.3	1.9	1.843	6228	51.2965	7.7251	0.123481	3.4368655	4.8426	0.077406	2.154453
11	0.064	0.048	2004	1991+	115.3	1.9	1.843	6228	51.2965	7.3792	0.117952	3.282976	5.5344	0.088464	2.462232
12	0.045	0.045	2003	1991+	115.3	1.9	1.843	6228	51.2965	5.1885	0.082935	2.3083425	5.1885	0.082935	2.3083425
13	0.03	0.04	2002	1991+	115.3	1.9	1.843	6228	51.2965	3.459	0.05529	1.538895	4.612	0.07372	2.05186
14	0.03	0.038	2001	1991+	115.3	1.9	1.843	6228	51.2965	3.459	0.05529	1.538895	4.3814	0.070034	1.949267
15	0.035	0.031	2000	1991+	115.3	1.9	1.843	6228	51.2965	4.0355	0.064505	1.7953775	3.5743	0.057133	1.5901915
16	0.02	0.026	1999	1991+	115.3	1.9	1.843	6228	51.2965	2.306	0.03686	1.02593	2.9978	0.047918	1.333709
17	0.022	0.013	1998	1991+	115.3	1.9	1.843	6228	51.2965	2.5366	0.040546	1.128523	1.4989	0.023959	0.6668545
18	0.015	0.01	1997	1991+	115.3	1.9	1.843	6228	56.97065	1.7295	0.027645	0.85455975	1.153	0.01843	0.5697065
19	0.013	0.01	1996	1991+	115.3	1.9	1.843	6228	56.97065	1.4989	0.023959	0.74061845	1.153	0.01843	0.5697065
20	0.013	0.01	1995	1991+	115.3	1.9	1.843	6228	56.97065	1.4989	0.023959	0.74061845	1.153	0.01843	0.5697065
21	0.013	0.015	1994	1991+	115.3	1.9	1.843	6228	56.97065	1.4989	0.023959	0.74061845	1.7295	0.027645	0.85455975
22	0.009	0.015	1993	1991+	115.3	1.9	1.843	6228	63.26325	1.0377	0.016587	0.56936925	1.7295	0.027645	0.94894875
23	0.007	0.015	1992	1991+	115.3	1.9	1.843	6228	63.26325	0.8071	0.012901	0.44284275	1.7295	0.027645	0.94894875
24	0.016	0.05	1991	1991+	115.3	1.9	1.843	6228	63.26325	1.8448	0.029488	1.012212	5.765	0.09215	3.1631625
25	0.023	0.05	1990	pre 1991	39.8	5.3	5.141	6228	70.2641	0.9154	0.118243	1.6160743	1.99	0.25705	3.513205
	1.001	1.003								**113.7**	**1.1**	**52.5**	**111.9**	**1.2**	**53.6**

Table B-9 Working sheet showing Idle Emission Factor Calculation for Windsor and Detroit - Year 2025

						Idle Emission Factors				Windsor				Detroit	
Age	**HDDT8 Distribution**		year	Model Year	NOx EF	PM EF	PM2.5 EF	CO2 EF	CO EF	Weighted	Weighted	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	CO	NOx	PM2.5	CO
0	0.016	0.03	2025	2007+	115.3	0.16	0.1552	6228	51.2965						
1	0.071	0.08	2024	2007+	115.3	0.16	0.1552	6228	51.2965	8.1863	0.0110192	3.6420515	9.224	0.012416	4.10372
2	0.058	0.067	2023	2007+	115.3	0.16	0.1552	6228	51.2965	6.6874	0.0090016	2.975197	7.7251	0.0103984	3.4368655
3	0.049	0.076	2022	2007+	115.3	0.16	0.1552	6228	51.2965	5.6497	0.0076048	2.5135285	8.7628	0.0117952	3.898534
4	0.044	0.066	2021	2007+	115.3	0.16	0.1552	6228	51.2965	5.0732	0.0068288	2.257046	7.6098	0.0102432	3.385569
5	0.046	0.08	2020	2007+	115.3	0.16	0.1552	6228	51.2965	5.3038	0.0071392	2.359639	9.224	0.012416	4.10372
6	0.072	0.06	2019	2007+	115.3	0.16	0.1552	6228	51.2965	8.3016	0.0111744	3.693348	6.918	0.009312	3.07779
7	0.078	0.044	2018	2007+	115.3	0.16	0.1552	6228	51.2965	8.9934	0.0121056	4.001127	5.0732	0.0068288	2.257046
8	0.087	0.036	2017	2007+	115.3	0.16	0.1552	6228	51.2965	10.0311	0.0135024	4.4627955	4.1508	0.0055872	1.846674
9	0.074	0.036	2016	2007+	115.3	0.16	0.1552	6228	51.2965	8.5322	0.0114848	3.795941	4.1508	0.0055872	1.846674
10	0.067	0.042	2015	2007+	115.3	0.16	0.1552	6228	51.2965	7.7251	0.0103984	3.4368655	4.8426	0.0065184	2.154453
11	0.064	0.048	2014	2007+	115.3	0.16	0.1552	6228	51.2965	7.3792	0.0099328	3.282976	5.5344	0.0074496	2.462232
12	0.045	0.045	2013	2007+	115.3	0.16	0.1552	6228	51.2965	5.1885	0.006984	2.3083425	5.1885	0.006984	2.3083425
13	0.03	0.04	2012	2007+	115.3	0.16	0.1552	6228	51.2965	3.459	0.004656	1.538895	4.612	0.006208	2.05186
14	0.03	0.038	2011	2007+	115.3	0.16	0.1552	6228	51.2965	3.459	0.004656	1.538895	4.3814	0.0058976	1.949267
15	0.035	0.031	2010	2007+	115.3	0.16	0.1552	6228	51.2965	4.0355	0.005432	1.7953775	3.5743	0.0048112	1.5901915
16	0.02	0.026	2009	2007+	115.3	0.16	0.1552	6228	51.2965	2.306	0.003104	1.02593	2.9978	0.0040352	1.333709
17	0.022	0.013	2008	2007+	115.3	0.16	0.1552	6228	51.2965	2.5366	0.0034144	1.128523	1.4989	0.0020176	0.6668545
18	0.015	0.01	2007	2007+	115.3	0.16	0.1552	6228	51.2965	1.7295	0.002328	0.7694475	1.153	0.001552	0.512965
19	0.013	0.01	2006	1991+	115.3	1.9	1.843	6228	51.2965	1.4989	0.023959	0.6668545	1.153	0.01843	0.512965
20	0.013	0.01	2005	1991+	115.3	1.9	1.843	6228	51.2965	1.4989	0.023959	0.6668545	1.153	0.01843	0.512965
21	0.013	0.015	2004	1991+	115.3	1.9	1.843	6228	51.2965	1.4989	0.023959	0.6668545	1.7295	0.027645	0.7694475
22	0.009	0.015	2003	1991+	115.3	1.9	1.843	6228	51.2965	1.0377	0.016587	0.4616685	1.7295	0.027645	0.7694475
23	0.007	0.015	2002	1991+	115.3	1.9	1.843	6228	51.2965	0.8071	0.012901	0.3590755	1.7295	0.027645	0.7694475
24	0.016	0.05	2001	1991+	115.3	1.9	1.843	6228	51.2965	1.8448	0.029488	0.820744	5.765	0.09215	2.564825
25	0.023	0.05	2000	1991+	115.3	1.9	1.843	6228	51.2965	2.6519	0.042389	1.1798195	5.765	0.09215	2.564825
	1.001	1.003								**115.4**	**0.3**	**51.3**	**115.6**	**0.4**	**51.5**

Table B-10 Working sheet showing Idle Emission Factor Calculation for Windsor and Detroit - Year 2035

					Idle Emission Factors					**Windsor**			**Detroit**		
Age	**HDDT8 Distribution**		year	Model Year	NOx EF	PM EF	PM2.5 EF	CO2 EF	CO EF	Weighted	Weighted	Weighted	Weighted	Weighted	Weighted
(Years)	**Windsor**	**Detroit**			**g/hr**	**g/hr**	**g/hr**	**g/hr**	**g/hr**	NOx	PM2.5	CO	NOx	PM2.5	CO
0	0.016	0.03	2035	2007+	115.3	0.16	0.1552	6228	51.2965						
1	0.071	0.08	2034	2007+	115.3	0.16	0.1552	6228	51.2965	8.1863	0.0110192	3.6420515	9.224	0.012416	4.10372
2	0.058	0.067	2033	2007+	115.3	0.16	0.1552	6228	51.2965	6.6874	0.0090016	2.975197	7.7251	0.0103984	3.4368655
3	0.049	0.076	2032	2007+	115.3	0.16	0.1552	6228	51.2965	5.6497	0.0076048	2.5135285	8.7628	0.0117952	3.898534
4	0.044	0.066	2031	2007+	115.3	0.16	0.1552	6228	51.2965	5.0732	0.0068288	2.257046	7.6098	0.0102432	3.385569
5	0.046	0.08	2030	2007+	115.3	0.16	0.1552	6228	51.2965	5.3038	0.0071392	2.359639	9.224	0.012416	4.10372
6	0.072	0.06	2029	2007+	115.3	0.16	0.1552	6228	51.2965	8.3016	0.0111744	3.693348	6.918	0.009312	3.07779
7	0.078	0.044	2028	2007+	115.3	0.16	0.1552	6228	51.2965	8.9934	0.0121056	4.001127	5.0732	0.0068288	2.257046
8	0.087	0.036	2027	2007+	115.3	0.16	0.1552	6228	51.2965	10.0311	0.0135024	4.4627955	4.1508	0.0055872	1.846674
9	0.074	0.036	2026	2007+	115.3	0.16	0.1552	6228	51.2965	8.5322	0.0114848	3.795941	4.1508	0.0055872	1.846674
10	0.067	0.042	2025	2007+	115.3	0.16	0.1552	6228	51.2965	7.7251	0.0103984	3.4368655	4.8426	0.0065184	2.154453
11	0.064	0.048	2024	2007+	115.3	0.16	0.1552	6228	51.2965	7.3792	0.0099328	3.282976	5.5344	0.0074496	2.462232
12	0.045	0.045	2023	2007+	115.3	0.16	0.1552	6228	51.2965	5.1885	0.006984	2.3083425	5.1885	0.006984	2.3083425
13	0.03	0.04	2022	2007+	115.3	0.16	0.1552	6228	51.2965	3.459	0.004656	1.538895	4.612	0.006208	2.05186
14	0.03	0.038	2021	2007+	115.3	0.16	0.1552	6228	51.2965	3.459	0.004656	1.538895	4.3814	0.0058976	1.949267
15	0.035	0.031	2020	2007+	115.3	0.16	0.1552	6228	51.2965	4.0355	0.005432	1.7953775	3.5743	0.0048112	1.5901915
16	0.02	0.026	2019	2007+	115.3	0.16	0.1552	6228	51.2965	2.306	0.003104	1.02593	2.9978	0.0040352	1.333709
17	0.022	0.013	2018	2007+	115.3	0.16	0.1552	6228	51.2965	2.5366	0.0034144	1.128523	1.4989	0.0020176	0.6668545
18	0.015	0.01	2017	2007+	115.3	0.16	0.1552	6228	51.2965	1.7295	0.002328	0.7694475	1.153	0.001552	0.512965
19	0.013	0.01	2016	2007+	115.3	0.16	0.1552	6228	51.2965	1.4989	0.0020176	0.6668545	1.153	0.001552	0.512965
20	0.013	0.01	2015	2007+	115.3	0.16	0.1552	6228	51.2965	1.4989	0.0020176	0.6668545	1.153	0.001552	0.512965
21	0.013	0.015	2014	2007+	115.3	0.16	0.1552	6228	51.2965	1.4989	0.0020176	0.6668545	1.7295	0.002328	0.7694475
22	0.009	0.015	2013	2007+	115.3	0.16	0.1552	6228	51.2965	1.0377	0.0013968	0.4616685	1.7295	0.002328	0.7694475
23	0.007	0.015	2012	2007+	115.3	0.16	0.1552	6228	51.2965	0.8071	0.0010864	0.3590755	1.7295	0.002328	0.7694475
24	0.016	0.05	2011	2007+	115.3	0.16	0.1552	6228	51.2965	1.8448	0.0024832	0.820744	5.765	0.00776	2.564825
25	0.023	0.05	2010	2007+	115.3	0.16	0.1552	6228	51.2965	2.6519	0.0035696	1.1798195	5.765	0.00776	2.564825
	1.001	1.003								**115.4**	**0.2**	**51.3**	**115.6**	**0.2**	**51.5**

APPENDIX C
SAMPLE CALCULATIONS

SAMPLE CALCULATIONS

$PM_{2.5}$ EMISSIONS

Emissions of particulate (TSP, PM_{10}, and $PM_{2.5}$) from vehicle travel on roadways results both from tailpipe emissions and recirculation of road dust.

1. Tailpipe Emissions

Tailpipe emissions from vehicle travel were calculated by applying a fleet averaged emission factor from the Mobile 6C Emissions model for each horizon year. For the public roads, traffic data on AADT levels was supplied by IBI Group. The emission factors output from Mobile 6C have been included below in the following tables. As indicates in the tables, the emission factors are dependent upon vehicle type, country of origin (of vehicle), vehicle speed and analysis year. The $PM_{2.5}$ and NOx emission factors have been highlighted, as they are the two contaminants that have been assessed at this point in time. All contaminants will be included in the final analysis.

As both cars and trucks travel on the same roadways, an average fleet tailpipe emission factor must be calculated.

(a) $VKT_{Total} = VKT_{CDN\_car} + VKT_{CDN\_truck} + VKT_{US\_car} + VKT_{US\_Truck}$

(b) Fleet Average $EF_{(g/VKT)}$ =

$$EF_{CDN\_car} * \frac{VKT_{CDN\_car}}{VKT_{Total}} + EF_{CDN\_truck} \frac{VKT_{CDN\_truck}}{VKT_{car}} + EF_{US\_car} \frac{VKT_{US\_car}}{VKT_{Total}} + EF_{US\_truck} \frac{VKT_{US\_truck}}{VKT_{Total}}$$

Table 1a - 2015 Canadian Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0161	0.0161	0.0086	1.32	0.0108	29.3	1398.5	2.70	0.0532	0.0084	0.0196	0.0058	0.0014
25	0.0040	0.0040	0.0021	0.44	0.0047	6.4	347.6	0.38	0.0108	0.0020	0.0047	0.0012	0.0003
50	0.0040	0.0040	0.0021	0.40	0.0047	5.9	347.6	0.28	0.0087	0.0014	0.0033	0.0010	0.0002
75	0.0040	0.0040	0.0021	0.49	0.0047	6.6	347.6	0.27	0.0085	0.0013	0.0031	0.0009	0.0002
100	0.0040	0.0040	0.0021	0.49	0.0047	6.6	347.6	0.27	0.0085	0.0013	0.0031	0.0009	0.0002

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 1b - 2015 CanadianTruck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	1.1015	1.1015	1.07	113.68	0.08	52.50	6228	1.02	0.0113	0.0309	0.0838	0.0065	0.0050
25	0.0191	0.0191	0.01	2.35	0.007	0.96	960	0.33	0.0036	0.0099	0.0268	0.0021	0.0016
50	0.0191	0.0191	0.01	2.02	0.007	0.49	960	0.19	0.0020	0.0056	0.0152	0.0012	0.0009
75	0.0191	0.0191	0.01	2.91	0.007	0.51	960	0.16	0.0018	0.0048	0.0131	0.0010	0.0008
100	0.0191	0.0191	0.01	2.91	0.007	0.51	960	0.16	0.0018	0.0048	0.0131	0.0010	0.0008

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 1c - 2015 American Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0158	0.0158	0.0086	1.20	0.0123	25.0	1405	2.34	0.0577	0.0080	0.0174	0.0050	0.0012
25	0.0039	0.0039	0.0021	0.40	0.0055	5.5	349	0.33	0.0118	0.0019	0.0043	0.0011	0.0003
50	0.0039	0.0039	0.0021	0.36	0.0056	5.1	349	0.25	0.0096	0.0013	0.0029	0.0008	0.0002
75	0.0039	0.0039	0.0021	0.44	0.0056	5.7	349	0.24	0.0094	0.0013	0.0028	0.0008	0.0002
100	0.0039	0.0039	0.0021	0.44	0.0056	5.7	349	0.24	0.0094	0.0013	0.0028	0.0008	0.0002

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 1d - 2015 American Truck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	1.1901	1.1901	1.1543	111.9	0.0800	53.60	6228	1.00	0.0111	0.0303	0.0822	0.0064	0.0049
25	0.0181	0.0181	0.0119	1.9	0.0066	0.83	960	0.32	0.0035	0.0097	0.0263	0.0021	0.0016
50	0.0181	0.0181	0.0119	1.7	0.0066	0.43	960	0.18	0.0020	0.0055	0.0149	0.0012	0.0009
75	0.0181	0.0181	0.0119	2.4	0.0066	0.44	960	0.16	0.0017	0.0047	0.0128	0.0010	0.0008
100	0.0181	0.0181	0.0119	2.4	0.0066	0.44	960	0.16	0.0017	0.0047	0.0128	0.0010	0.0008

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 2a - 2025 Canadian Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0141	0.0141	0.0066	0.63	0.0108	26.56	1411	2.26	0.0433	0.0069	0.0159	0.0048	0.0011
25	0.0035	0.0035	0.0016	0.20	0.0048	5.77	351	0.31	0.0087	0.0016	0.0038	0.0010	0.0003
50	0.0035	0.0035	0.0016	0.18	0.0048	5.34	351	0.23	0.0071	0.0012	0.0027	0.0008	0.0002
75	0.0035	0.0035	0.0016	0.21	0.0048	6.00	351	0.21	0.0070	0.0011	0.0025	0.0008	0.0002
100	0.0035	0.0035	0.0016	0.21	0.0048	6.00	351	0.21	0.0070	0.0011	0.0025	0.0008	0.0002

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 2b - 2025 Canadian Truck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0476	0.0476	0.3140	115.42	0.0800	51.30	6228	0.8575	0.0094	0.0259	0.0702	0.0055	0.0042
25	0.0118	0.0118	0.0062	0.46	0.0071	0.31	960	0.2740	0.0030	0.0083	0.0225	0.0018	0.0013
50	0.0118	0.0118	0.0062	0.39	0.0071	0.16	960	0.1553	0.0017	0.0047	0.0128	0.0010	0.0008
75	0.0118	0.0118	0.0062	0.57	0.0071	0.16	960	0.1336	0.0015	0.0040	0.0110	0.0009	0.0007
100	0.0118	0.0118	0.0062	0.57	0.0071	0.16	960	0.1336	0.0015	0.0040	0.0110	0.0009	0.0007

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 2c - 2025 American Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0141	0.0141	0.0067	0.59	0.0123	22.0	1417	1.88	0.0454	0.0064	0.0141	0.0040	0.0010
25	0.0035	0.0035	0.0016	0.19	0.0056	4.8	352	0.26	0.0092	0.0015	0.0035	0.0009	0.0002
50	0.0035	0.0035	0.0016	0.17	0.0057	4.5	352	0.19	0.0076	0.0011	0.0024	0.0007	0.0002
75	0.0035	0.0035	0.0016	0.20	0.0057	5.0	352	0.18	0.0075	0.0010	0.0022	0.0007	0.0002
100	0.0035	0.0035	0.0016	0.20	0.0057	5.0	352	0.18	0.0075	0.0010	0.0022	0.0007	0.0002

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 2d - 2025 American Truck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0483	0.0483	0.4342	115.65	0.0800	51.50	6228	0.86	0.0095	0.0261	0.0708	0.0055	0.0042
25	0.0120	0.0120	0.0063	0.50	0.0066	0.32	960	0.28	0.0030	0.0083	0.0226	0.0018	0.0014
50	0.0120	0.0120	0.0063	0.43	0.0066	0.16	960	0.16	0.0017	0.0047	0.0128	0.0010	0.0008
75	0.0120	0.0120	0.0063	0.63	0.0066	0.17	960	0.13	0.0015	0.0041	0.0111	0.0009	0.0007
100	0.0120	0.0120	0.0063	0.63	0.0066	0.17	960	0.13	0.0015	0.0041	0.0111	0.0009	0.0007

Bn = Benzene, Ac =Acetaldehyde, Fm = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 3a - 2035 Canadian Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0139	0.0139	0.0065	0.58	0.0108	26.4	1411	2.24	0.0425	0.0068	0.0156	0.0047	0.0011
25	0.0034	0.0034	0.0016	0.18	0.0048	5.7	351	0.30	0.0086	0.0016	0.0038	0.0010	0.0003
50	0.0034	0.0034	0.0016	0.17	0.0048	5.3	351	0.22	0.0070	0.0011	0.0026	0.0008	0.0002
75	0.0034	0.0034	0.0016	0.19	0.0048	6.0	351	0.21	0.0069	0.0011	0.0025	0.0007	0.0002
100	0.0034	0.0034	0.0016	0.19	0.0048	6.0	351	0.21	0.0069	0.0011	0.0025	0.0007	0.0002

n = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 3b - 2035 Canadian Truck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0458	0.0458	0.1554	115.42	0.0800	51.30	6228	0.85	0.0093	0.0255	0.0693	0.0054	0.0041
25	0.0114	0.0114	0.0058	0.34	0.0071	0.26	960	0.27	0.0030	0.0082	0.0222	0.0017	0.0013
50	0.0114	0.0114	0.0058	0.29	0.0071	0.13	960	0.15	0.0017	0.0046	0.0126	0.0010	0.0008
75	0.0114	0.0114	0.0058	0.43	0.0071	0.14	960	0.13	0.0015	0.0040	0.0108	0.0008	0.0006
100	0.0114	0.0114	0.0058	0.43	0.0071	0.14	960	0.13	0.0015	0.0040	0.0108	0.0008	0.0006

n = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 3c - 2035 American Car Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0139	0.0139	0.0065	0.52	0.0123	21.8	1417	1.85	0.0443	0.0062	0.0136	0.0039	0.0009
25	0.0034	0.0034	0.0016	0.16	0.0056	4.8	352	0.25	0.0090	0.0015	0.0034	0.0008	0.0002
50	0.0034	0.0034	0.0016	0.15	0.0057	4.4	352	0.19	0.0074	0.0011	0.0023	0.0006	0.0002
75	0.0034	0.0034	0.0016	0.17	0.0057	4.9	352	0.18	0.0073	0.0010	0.0022	0.0006	0.0001
100	0.0034	0.0034	0.0016	0.17	0.0057	4.9	352	0.18	0.0073	0.0010	0.0022	0.0006	0.0001

n = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

Table 3d - 2035 American Truck Tailpipe Emissions (g/VKT)

Speed (km/h)	PM	PM_{10}	$PM_{2.5}$	NOx	SOx	CO	CO_2	VOC	Bn	Ac	Fm	Bu	Acr
Idle	0.0458	0.0458	0.1557	115.65	0.0800	51.50	6228	0.85	0.0093	0.0255	0.0693	0.0054	0.0041
25	0.0114	0.0114	0.0058	0.34	0.0066	0.26	960	0.27	0.0030	0.0082	0.0222	0.0017	0.0013
50	0.0114	0.0114	0.0058	0.29	0.0066	0.13	960	0.15	0.0017	0.0046	0.0126	0.0010	0.0008
75	0.0114	0.0114	0.0058	0.43	0.0066	0.14	960	0.13	0.0015	0.0040	0.0108	0.0008	0.0006
100	0.0114	0.0114	0.0058	0.43	0.0066	0.14	960	0.13	0.0015	0.0040	0.0108	0.0008	0.0006

n = Formaldehyde, Bu = 1,3 Butadiene, Acr = Acrolein

2. Road Dust Emissions

Emissions of road dust (TSP, PM_{10}, and $PM_{2.5}$) resulting from vehicular travel on paved roads were estimated using the empirical expression (*Equation 1*) and parameters (*Tables 13.2.1-1 and 13.2.1-2*) provided in *Section 13.2.1: Paved Roads* of the U.S. EPA AP-42 document.

$$EF_{(g/VKT)} = k * \left(\frac{sL}{2}\right)^{0.65} * \left(\frac{W}{3}\right)^{1.5} - C$$

where,

EF = particle emission factor (having units matching the units of k)
k = particle size multiplier (see Table 1)
sL = road surface silt content (g/m^2) (see Table 2)
W = average weight (tons) of the vehicles traveling the road
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear (see Table 1)
VKT = vehicle kilometers travelled

Table 4 – Paved Road Parameters

Constant	TSP	PM_{10}	$PM_{2.5}$
k (g/VKT)	24	4.6	0.66
C (g/VKT)	0.1317	0.1317	0.1005

Table 5 – Silt Loading Default Values

Constant	Average Travel (No. of Vehicles)		
	<500	5,000-10,000	>5000
sL	0.6	0.06	0.03

Estimating the W

(a) To calculate W, the car and truck contributions to the total VKT must first be determined.

$$VKT_{Total} = VKT_{car} + VKT_{truck}$$

(b) the weight of each type of vehicle must be determined
Average weight of car=3.5 tons
Average weight of truck =20 tons

(c) the average weight (tons) of the vehicles traveling the road can be determined:

$$W = W_{car} * \frac{VKT_{car}}{VKT_{Total}} + W_{truck} \frac{VKT_{truck}}{VKT_{car}}$$

3. Total $PM_{2.5}$ Emissions

$$Total\_PM_{2.5}ER_{(g/s)} = \left[TailpipeEF_{(g/VKT)} + RoadDustEF_{(g/VKT)}\right] x VKT_{Total(kg/hr)} x \frac{1hr}{3600s}$$

NO_x EMISSIONS

Emissions of NO_x from vehicle travel on roadways results solely from tailpipe emissions. The NOx tailpipe emissions were estimated in the same manner as the $PM_{2.5}$ tailpipe emissions, and using the emission factors included above in Tables 1a through 3c.

(a) $VKT_{Total} = VKT_{CDN\_car} + VKT_{CDN\_truck} + VKT_{US\_car} + VKT_{US\_Truck}$

(b) Fleet Average $EF_{(g/VKT)}$ =

$$EF_{CDN\_car} * \frac{VKT_{CDN\_car}}{VKT_{Total}} + EF_{CDN\_truck} \frac{VKT_{CDN\_truck}}{VKT_{car}} + EF_{US\_car} \frac{VKT_{US\_car}}{VKT_{Total}} + EF_{US\_truck} \frac{VKT_{US\_truck}}{VKT_{Total}}$$

(c) $$NOxTailpipeER_{(g/s)} = \left[TailpipeEF_{(g/VKT)}\right] x VKT_{Total(kg/hr)}\, x \frac{1hr}{3600s}$$

QUEUEING AT THE CUSTOMS/INSPECTION PLAZAS

Key assumptions:

- Inbound vehicles at customs plaza will queue at inspection booths.
- Outbound vehicles at customs plaza will not queue.
- Queuing traffic volume is same as free-flowing traffic volume.
- There is always queuing (idling) at the booth due to the one vehicle in the booth being inspected.
- Inspection times for cars and trucks are 45 seconds and 60 seconds, respectively.

Customs Plaza Queuing Algorithm:

Groups of queue links were set up for each plaza based on an equal distribution of free flow traffic through each booth that is open during a given hour. Then each queue link was manually "turned on" or "off" by calculating the number of vehicles queued. This modeling approach represents the actual situation because not all groups of queue links actually experience queuing for a given hour.

The amount of queuing at each booth was calculated manually for each group of queue links and for each hour using the hourly free flow traffic volume and the number of booths that are open during each hour, which varies by demand.

1. For each hour, the number of booths that are open is calculated using the hourly free flow traffic volume and the inspection time for each vehicle.
2. The number of vehicles passing through each booth is then back calculated.
3. The calculated number from Step 2 is then compared with the capacity of each booth, i.e., 80 for cars and 60 for trucks. If the number is less than its capacity, then no queuing in this hour; if greater than its capacity, then queuing will occur and the difference is the number of vehicles queued at the booth during that hour.
4. Based on the results obtained from Step 3, the queue links are either "turned on" (with queuing) or "off" (no queuing).
5. If there is queuing, and the queue length per booth exceeds 4 trucks or 6 cars, an additional booth is opened, if possible.
6. If there are no more booths to open, the queue length extends far enough back to accommodate the number of vehicles waiting at the plaza. The locations depend on the physical configuration of each plaza; if the number of vehicles queued determined from Step 3 exceeds the physical length of the queue link, then the next corresponding group of queue links will be "turned on", and so on.

For example, for an hour with 1004 truck traffic, the number of booths that are needed is 1004 / 60 = 17. Then the number of trucks passing through each booth is back calculated: 1004 / 17 = 59. Since this number is less than the capacity of each booth (60 trucks per hour), there will be no queuing at each booth except for the one truck that is in the booth and being inspected.

For an hour with 443 truck traffic, the number of booths that are needed is 443 / 60 = 7. Similarly, the back-calculated number of trucks passing through each booth is 443 / 7 = 63.3. Theoretically there will be 3.3 trucks queuing at each booth, in addition to the one truck that is in the booth and being inspected. If the group of queue links right next to the booths are set up such that only 2 trucks can wait in line, then 7 of the next group of queue links will be "turned on" and on each link there will be 1.3 trucks queuing.

Summary of CAL3QHCR Model Inputs:

	Cars	Trucks
Number of queuing lanes	1	1
Light cycle time	45 seconds	60 seconds
Yellow time	0 seconds	0 seconds
Red duration time	40 seconds	55 seconds
Saturated flow volume (veh/hr/lane)	1200	1200
Signal type	2	2
Arrival rate	1	1
Maximum number of booths at each plaza	20	19