Supplemental Travel Demand Modeling Technical Report

GORDIE HOWE INTERNATIONAL BRIDGE

Michigan Department of Transportation

April 2018

This document has been prepared by WSP for the Michigan Department of Transportation in April 2018.

Table of Contents

List of Figures

List of Tables

List of Appendices

Disclaimer

Notwithstanding the following, the parties understand that the output of the traffic model and the model itself, produced under this Agreement (Technical studies for noise assessment and air quality analysis as part of the National Environmental Policy Act Re-evaluation of the Gordie Howe International Bridge) is intended for use only by the Gordie Howe International Bridge project sponsor (Michigan Department of Transportation) to help determine potential average traffic, air quality and noise impacts for the environmental re-evaluation. The forecast results are estimates only and are not intended to and do not provide any information for use in determining revenue values. More specifically, these results are not an investment grade model and should not be relied on by anyone for financing purposes of any kind.

The modeling and forecasting undertaken here use existing demographic, travel and use data, existing and planned land use patterns and other information from governments, residents and businesses and apply recognized analytical tools to forecast possible future demands and needs. It must be recognized and accepted that such modeling and forecasting are not precise. Input data can and often do vary widely and circumstances change with time. Changes in macro and local economic conditions and, given the location(s) under consideration here, variations in international relations and agreements, can and often do materially alter inputs and outputs such that future, actual conditions may materially vary from those forecasts using current data and methods. Accordingly, the work product produced under this Agreement should be used for general planning purposes only. Under no circumstances should the model output or forecasts be represented or relied upon as sufficiently accurate predictors of future use patterns and/or demand such that any financing decisions, public, private or otherwise, may, can or should be based thereon.

This Report is dated as of April 30, 2018. This Report may contain forward-looking statements. Any statements that are not statements of historical fact should be considered forward-looking statements. In addition, forward- looking statements by their nature address matters that are, to different degrees, uncertain; including material and immaterial statements about future economic performance. The forward-looking statements are subject to risks and uncertainties, and actual results and future events could differ substantially and the realization of any of them could have an effect on those parties who use or rely on such forward-looking statements. The use of or reliance on opinion, analysis or information in this Report including forward-looking statements is at the sole risk of the user. WSP has no responsibility to the user as WSP is not aware of the user's purpose, intent and/or application for the use. Further, WSP disclaims any obligation to update this Report or any statements herein including forward-looking statements.

1.0 Introduction

This Supplemental Travel Demand Modeling Report has been prepared in support of the technical studies for the Traffic Analysis Report, Noise Assessment and Air Quality analysis as part of the National Environmental Policy Act (NEPA) Re-evaluation of the Gordie Howe International Bridge (GHIB), previously known as the Detroit River International Crossing (DRIC) and the New International Trade Crossing in the cities of Detroit, Michigan and Windsor, Ontario.

The GHIB project has been in the planning and development phase since early 2000. The Final Environmental Impact Statement (FEIS) was completed in 2008. The Record of Decision (ROD) was received in 2009 authorizing the project to proceed. An Investment Grade Traffic and Toll Revenue Study was completed by Michigan Department of Transportation (MDOT) in 2010.

This document provides an overview of the travel demand modeling work completed as part of the re-evaluation, which includes updating the base year to 2015, and the forecast years to 2025 and 2040, validation of the model to the base year, and a review of the model outputs for 2040.

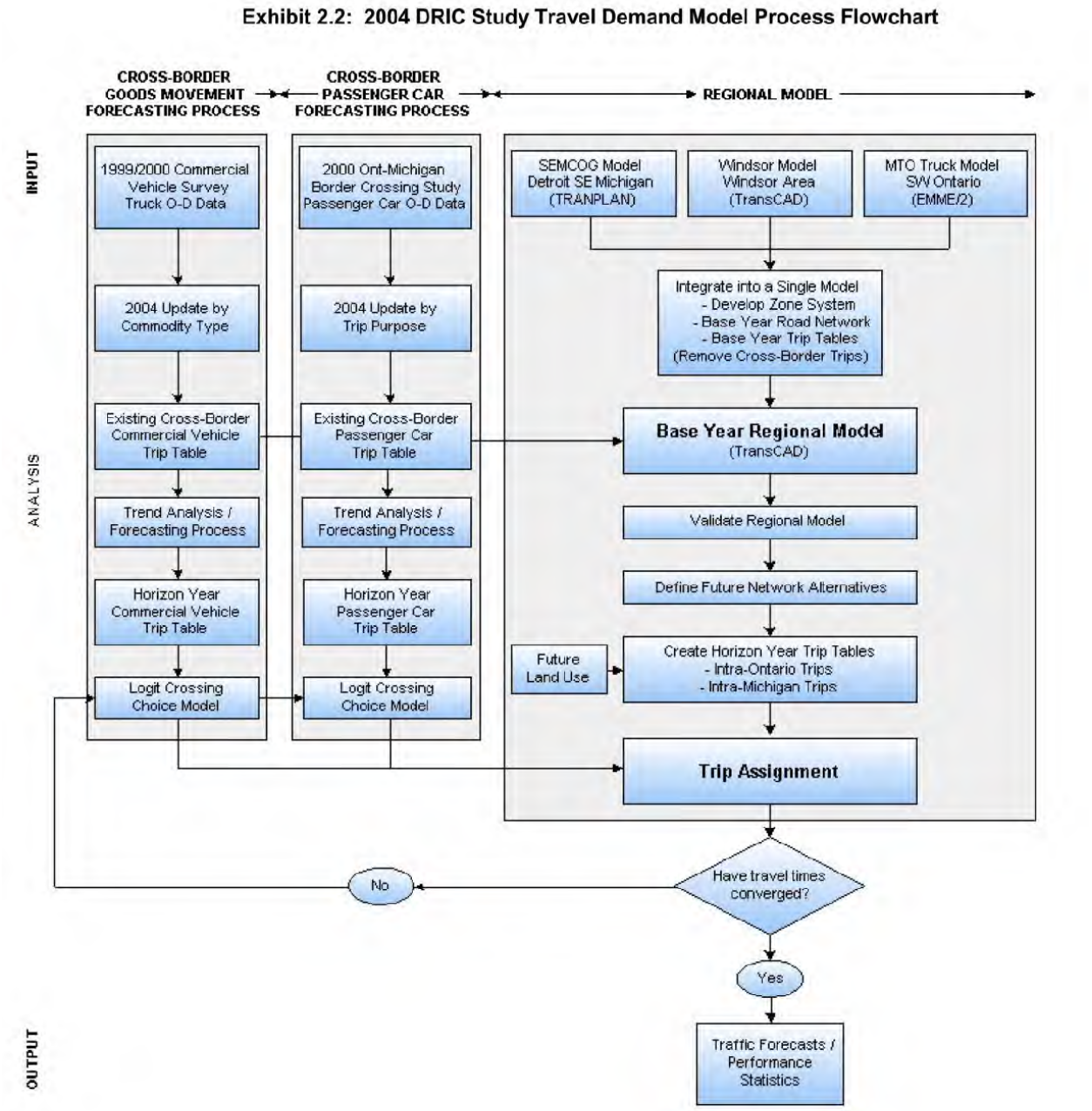
2.0 Travel Demand Modeling Overview

As part of the initial Planning Needs and Feasibility (P/N&F) study in early 2000s, a travel demand model was developed combining the networks and background trip tables from three pre-existing travel demand models – the Southeast Michigan Council of Government's (SEMCOG) E4 model, Windsor Area Long Range Transportation Study (WALTS) model and the Ontario Ministry of Transportation's (MTO) Truck model that primarily focused on Ontario, but also covered North America. The SEMCOG 2030 Regional Development Forecast for Southeast Michigan and its 2030 Regional Transportation Plan formed the basis of model development for this study; as part of the DRIC Draft EIS (DEIS), the SEMCOG 2030 Regional Development Forecasts were extrapolated to 2035 using the 2025-through-2030 trends. Over the course of the DEIS, these inputs were further revised to incorporate the SEMCOG's 2035 Forecasts. The framework of this initial model formed the basis for most of the subsequent studies.

The P/N&F and DEIS models incorporated domestic trip tables from the local models in combination with modified international crossing trip tables for international traffic. The international crossing trip tables were modified to account for impacts of population and employment changes in addition to regional growth shifts and patterns that took into account historical trends, spatial patterns, factors influencing travel behavior, including extreme events such as 9/11 and SARS. The model produced traffic for three peak periods – AM, midday and PM – for the base year of 2004 and forecast years for 2015 and 2035.

These models used a multi-modal, multi-class, user equilibrium assignment procedure for assigning the final OD trip tables (domestic and international trips) to the network, however, a multinomial single-logit model was used to allocate international trips between the Detroit River area and Port Huron/Sarnia area, before being combined with domestic trips for final assignment. A two-level nested logit model was also developed to model the sensitivity between the three Detroit River area crossings (the Detroit-Windsor Tunnel – DWT, the Ambassador Bridge – AMB and the proposed DRIC crossing). The nested-logit model allocates international trips first between port Huron/Sarnia area and the Detroit River area, the trips are then allocated further across the three crossings in the Detroit River area. The single-logit model was estimated based on a stated preference survey conducted along the international frontier in 2008 and updated with surveys from 2012 (commercial vehicles) and 2015 (passenger cars). The single-logit model forecasts were used for the DEIS and FEIS to support the analyses (traffic, noise, air quality, etc.) in a manner that is consistent with MDOT's approach to the NEPA process. Figure 1 provides an overview of the modeling process.

Figure 1: Travel Demand Modeling Flowchart for P/N&F and DEIS



Source: DRIC Study Travel Model Update – IBI Group Working Paper, September 2005.

Further details about the modeling procedures for both DEIS and FEIS can be found on the project website - http://www.partnershipborderstudy.com/reports_us.asp

Since the FEIS and the ROD in 2009, a study was commissioned by MDOT to develop investment grade tolling and revenue forecasts.

The Comprehensive Investment Grade Traffic and Toll Revenue (IGTAR) studies and refreshes were conducted by the CDM Smith team, they included a comprehensive review of historical databases and studies, updating traffic counts and using the latest Ontario/FHWA border crossing origin-destination surveys, stated preference surveys and independent economic assessment of local, provincial/state economic trends. They also included application of enhanced traffic assignment, route selection, and toll diversion modeling techniques; detailed forecasts of DRIC under baseline, and a risk assessment to measure and quantify the range of traffic and revenue. The annual traffic and revenue estimates for the proposed DRIC were developed taking into account multiple key variables such as border crossings travel times, corridor growth variables, traffic seasonality, border crossing choices, ramp-up and toll rate sensitivities. However, based on the results from the 2007 MDOT induced demand analysis, the process did not include consideration of induced demand due to the construction of DRIC.

As part of the 2013 Study, CDM Smith updated the base year used in their modeling analysis to 2010 and the forecast year to 2040, the networks and the domestic trip tables were also updated to reflect the changes in SEMCOG and WALTS 2040 models. The domestic trip tables in the SEMCOG region were updated to reflect the latest demographic forecasts as part of SEMCOG's 2040 Long Range Transportation Plan, the base year international trip tables were still built based on the 2008 Origin-Destination survey for passenger and commercial vehicles, but factored to the latest traffic counts collected as part of the study. The future-year international trip tables were developed based on the updated base-year trip tables and corridor growth analysis.

The 2017 update to the GHIB Comprehensive IGTAR updated regional traffic counts at specific screenlines, border crossing traffic counts were also collected on the three existing bridge crossings; these counts were supported by other border counts obtained from Bridge and Tunnel Operators, Statistics Canada, U.S. Bureau of Transportation Statistics, and Canada Border Services Agency.

In addition, results from the most recent border crossing origin-destination surveys conducted by MTO/FHWA for passenger cars (2015) and commercial vehicles (2012) were used to update the international trip table. The international crossing traffic growth was based on regression analysis of a combination of variables. Several regional socioeconomic variables were considered in a regression analysis process to forecast total frontier traffic demand. "Total Frontier" includes the Ambassador Bridge, Detroit Windsor Tunnel, Blue Water Bridge, and future Gordie Howe International Bridge. Considering passenger cars, the selected baseline regression equation includes regional population forecasts from Moody's (for the U.S.) and the Ontario Ministry of Finance (for Canada), foreign exchange rate forecasts from Moody's, a dummy variable representing the September 2001 terrorist attack, and a dummy variable representing the 1989 North American Free Trade Agreement. Considering commercial

vehicles, the selected baseline regression equation includes Ontario's foreign trade turnover forecasts (the sum of all merchandise exports plus imports) as provided by the economics firm Metro Economics and foreign exchange rate forecasts from Moody's. The share of total Frontier traffic using the Gordie Howe International Bridge was determined using the Frontier traffic regression analysis results and the crossing choice model. A six lane Ambassador Bridge opening at the same time as the Gordie Howe International Bridge was assumed in the baseline analysis.

Induced Demand from an Additional Detroit River International Crossing

In 2008, MDOT studied the potential for induced demand that might result from an additional international crossing at the Detroit River[1]. Induced demand, for the purpose of that study and this current analysis, is additional growth and redistribution of population and employment in SEMCOG's seven county region solely generated because of increased accessibility provided by a new international bridge crossing of the Detroit River.

Table 1 shows the growth in demand for the SEMCOG Region from 2005 to 2035. There is a very small increase in population and employment over and above otherwise anticipated growth due to increased accessibility. Roughly 40 percent of this increase would be expected to occur in Wayne County, and only a small portion of this growth will affect the international crossings themselves, making the impact to traffic volumes on the crossings even less. In addition, given the proximity of the crossings and their locations in a largely built-up area, it is expected this will hold true for the current analysis. Thus, the same 2040 socio-economic forecasts were used for developing both the no build and the build scenarios.

[1] Induced Demand Analysis Technical Report – The Detroit River International Crossing Study. Michigan Department of Transportation. January 2008.

Table 1: Growth and Induced Demand for SEMCOG Region, 2005 to 2035

Measure	Population	Employment
2005 Base	4,938,807	2,780,162
2035 Baseline	5,526,780	3,220,732
Change 2005 to 2035	587,973	440,570
Additional Induced Demand from Border Crossing	4,563	3,352
Percent induced demand of Growth	0.80%	0.80%

Source: The Corradino Group, 2008

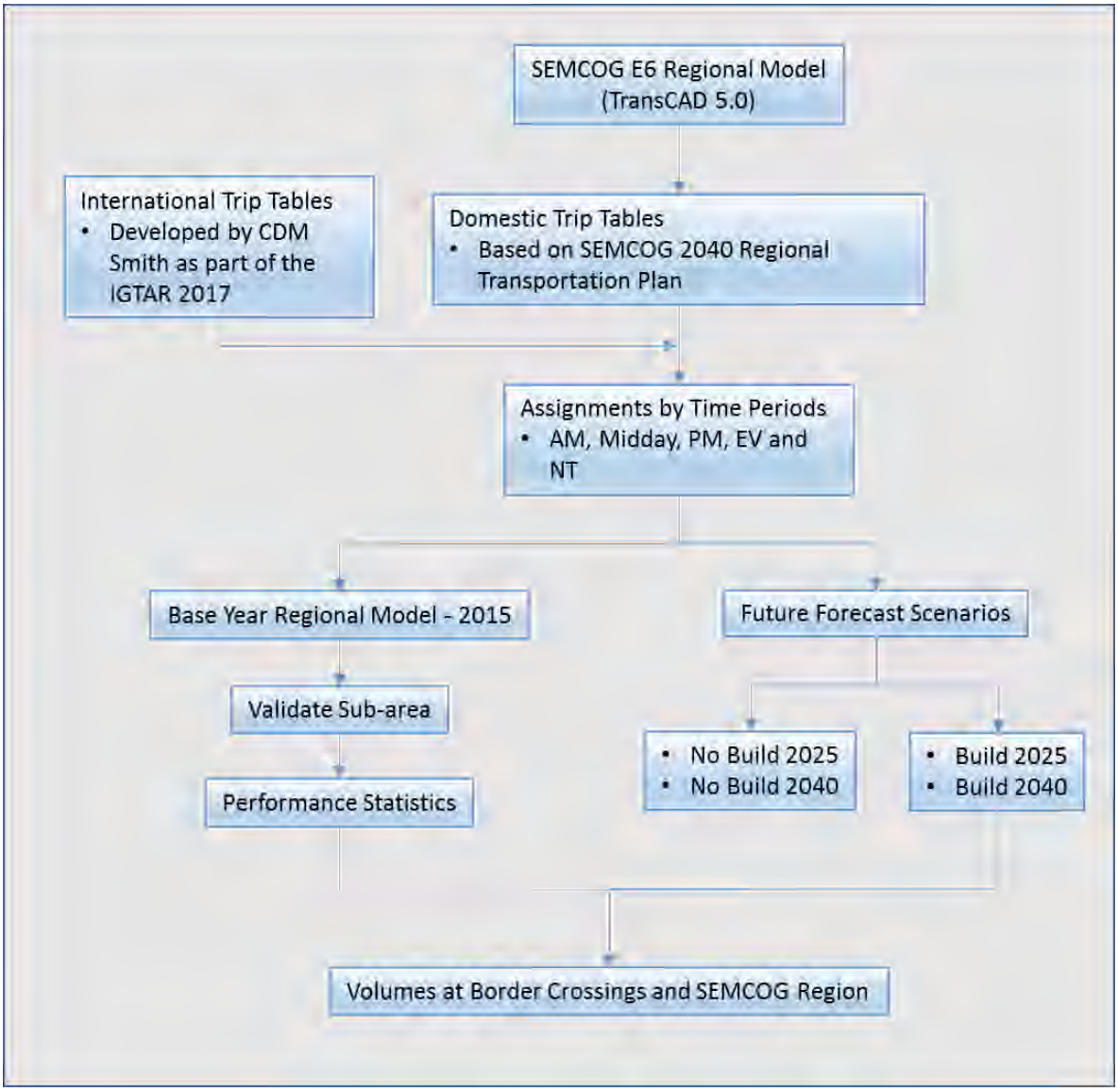
3.0 Travel Demand Modeling

As part of the 2017 NEPA Re-Evaluation, the SEMCOG E6 regional travel demand model was used in conjunction with their latest 2040 Regional Transportation Plan to develop preliminary forecasts for 2025 and 2040.

After review of the volumes along the international crossings corridor in comparison to the Investment Grade Traffic and Tolling Revenue study, it was decided that the CDM Smith forecast provided the best available crossing data. Therefore, this analysis incorporated the domestic trips from the SEMCOG E6 model and the international trips from the latest 2017 CDM Smith IGTAR.

The following tasks detail the effort undertaken to integrate the SEMCOG E6 model with SEMCOG domestic trip tables and the latest Origin Destination (OD) trip tables for international bridge crossings developed by CDM Smith; the modeling process is illustrated in Figure 2.

Figure 2: Travel Demand Modeling Flowchart



Source: WSP 2018

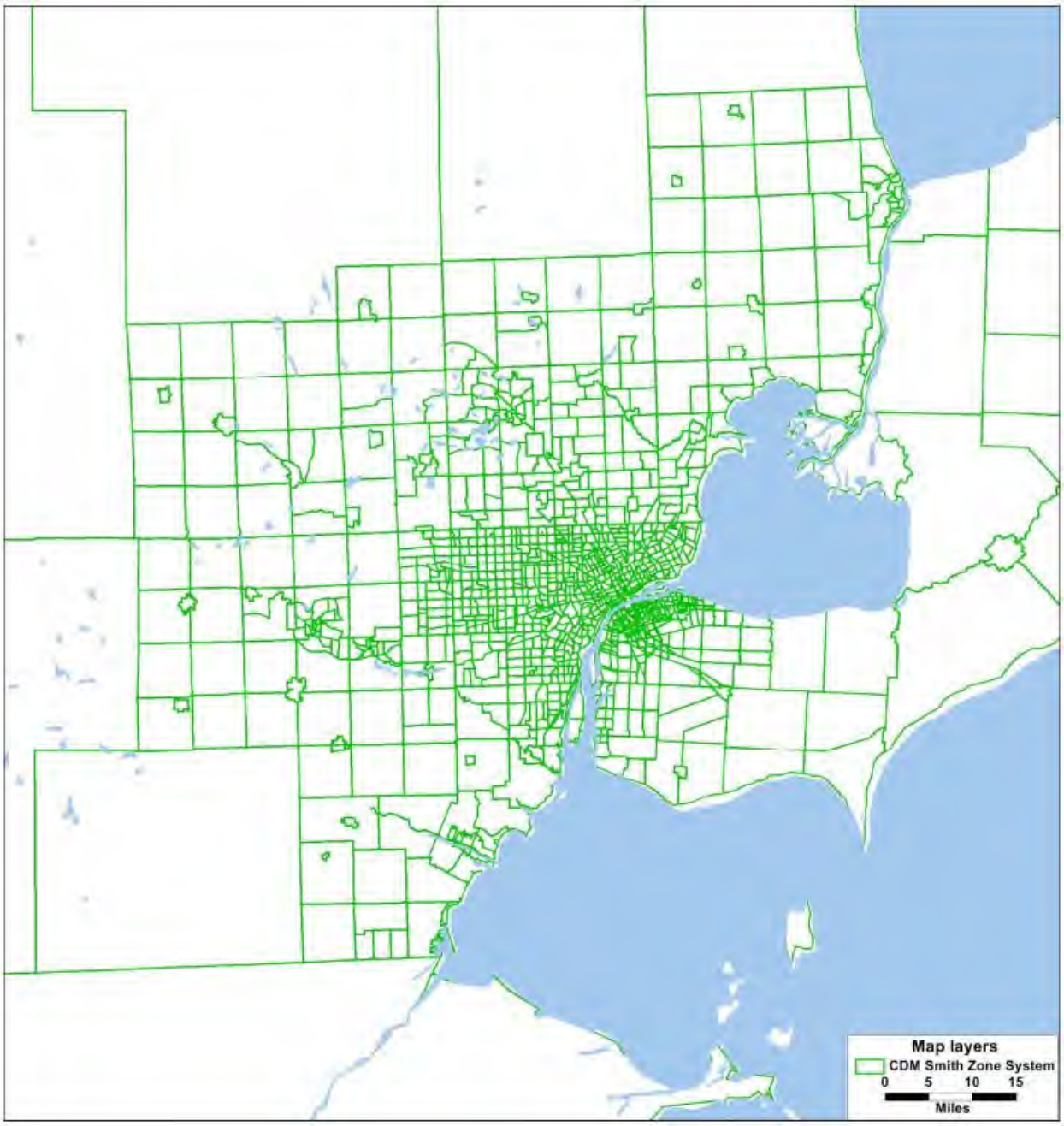
Task 1 – Modify CDM Smith International Bridge Crossings OD Trip Tables into SEMCOG Regional Model Zone Format.

The CDM Smith OD trip tables were developed based on a zone system from three pre-existing models: SEMCOG model covering Southeast Michigan, Windsor Area Long Range Transportation Study (WALTS) model covering the greater Windsor Area and the Ontario Ministry of Transportation (MTO) Truck model, which focused primarily on Ontario, but also covered North America – Figures 3 and 4.

Figure 3: CDM Smith Zone Structure

Source: WSP 2018

Figure 4: CDM Smith Zone Structure (zoomed)



Source: WSP 2018

The CDM Smith OD trip tables contain international trips that use the three-existing bridge crossings, Ambassador Bridge (AMB), Detroit-Windsor Tunnel (DWT) and the Blue Water Bridge (BWB), for 2017 and includes the Gordie Howe International Bridge (GHIB) for the future year scenarios – 2025 and 2040. These trip tables were developed for both Passenger Cars (PC) and Commercial Vehicles (CV).

Tables 2 through 4 show the CDM Smith OD international trip tables for all crossings summarized by Counties within the region and the rest of Canada and USA for 2017, 2025 and 2040. Table 5 shows the annual growth rate for each of the bridge crossings. Detailed summaries of these trip tables by each of the international bridge crossing and vehicle classification are included in Appendix A.

Table 2: IGTAR 2017 - International OD Trip Tables - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	97	5,161	1,097	1,243	**7,598**
Macomb, MI	-	-	-	-	-	-	-	-	26	1,686	304	375	**2,392**
St. Clair, MI	-	-	-	-	-	-	-	-	40	88	1,467	213	**1,808**
Oakland, MI	-	-	-	-	-	-	-	-	65	2,893	593	456	**4,006**
Livingston, MI	-	-	-	-	-	-	-	-	4	46	17	30	**96**
Washtenaw, MI	-	-	-	-	-	-	-	-	11	194	36	125	**365**
Monroe, MI	-	-	-	-	-	-	-	-	-	138	36	138	**312**
Rest of Michigan	-	-	-	-	-	-	-	-	203	451	436	1,024	**2,115**
Rest of USA	49	22	3	38	-	17	-	106	72	822	867	4,921	**6,916**
Windsor, Canada	5,289	1,255	73	2,926	101	219	82	473	1,003	-	-	-	**11,422**
Rest of Ontario	1,195	303	1,493	465	39	6	15	650	1,059	-	-	25	**5,248**
Rest of Canada	1,245	390	231	509	42	168	65	1,083	4,683	31	49	70	**8,566**
Total	**7,777**	**1,969**	**1,800**	**3,938**	**182**	**410**	**163**	**2,311**	**7,263**	**11,510**	**4,902**	**8,619**	**50,844**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

Table 3: IGTAR 2017 - International OD Trip Tables - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	102	4,997	1,084	1,347	**7,530**
Macomb, MI	-	-	-	-	-	-	-	-	26	1,660	301	401	**2,388**
St. Clair, MI	-	-	-	-	-	-	-	-	39	89	1,394	220	**1,742**
Oakland, MI	-	-	-	-	-	-	-	-	61	2,748	561	439	**3,810**
Livingston, MI	-	-	-	-	-	-	-	-	4	45	19	30	**98**
Washtenaw, MI	-	-	-	-	-	-	-	-	10	185	36	126	**357**
Monroe, MI	-	-	-	-	-	-	-	-	-	151	36	155	**342**
Rest of Michigan	-	-	-	-	-	-	-	-	206	464	453	1,083	**2,206**
Rest of USA	50	21	4	38	-	16	-	107	74	890	956	5,430	**7,586**
Windsor, Canada	5,122	1,225	75	2,785	103	212	85	479	1,079	-	-	-	**11,166**
Rest of Ontario	1,184	301	1,418	446	38	5	17	660	1,147	-	-	23	**5,240**
Rest of Canada	1,342	416	245	507	43	169	72	1,141	5,153	29	47	66	**9,228**
Total	**7,697**	**1,964**	**1,742**	**3,775**	**183**	**403**	**174**	**2,387**	**7,902**	**11,258**	**4,888**	**9,321**	**51,695**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

Table 4: IGTAR 2017 - International OD Trip Tables - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	121	5,088	1,152	1,675	**8,036**
Macomb, MI	-	-	-	-	-	-	-	-	27	1,749	321	488	**2,586**
St. Clair, MI	-	-	-	-	-	-	-	-	42	98	1,363	253	**1,755**
Oakland, MI	-	-	-	-	-	-	-	-	60	2,685	545	444	**3,734**
Livingston, MI	-	-	-	-	-	-	-	-	4	47	24	35	**109**
Washtenaw, MI	-	-	-	-	-	-	-	-	10	183	39	139	**371**
Monroe, MI	-	-	-	-	-	-	-	-	-	190	40	204	**434**
Rest of Michigan	-	-	-	-	-	-	-	-	230	530	527	1,297	**2,584**
Rest of USA	57	23	5	40	-	16	-	120	83	1,105	1,223	6,945	**9,617**
Windsor, Canada	5,216	1,270	87	2,733	115	217	97	534	1,328	-	-	-	**11,596**
Rest of Ontario	1,264	323	1,386	445	38	5	21	737	1,429	-	-	22	**5,672**
Rest of Canada	1,656	507	293	545	48	186	93	1,358	6,562	28	45	64	**11,385**
Total	**8,192**	**2,123**	**1,772**	**3,763**	**201**	**424**	**212**	**2,748**	**9,896**	**11,704**	**5,280**	**11,566**	**57,880**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

Table 5: IGTAR 2017 - Annual Growth Rates by Bridge Crossing

Crossing	Total Volume			Annual Growth Rates	
	2017	2025	2040	2017 - 2025	2025 - 2040
Gordie Howe International Bridge (GHIB)		14,938	16,887	-	0.82%
Ambassador Bridge (AMB)	23,434	16,417	18,243	-4.35%	0.71%
Detroit-Windsor Tunnel (DWT)	13,369	8,895	9,451	-4.97%	0.41%
Blue Water Bridge (BWB)	14,040	11,445	13,299	-2.52%	1.01%
Total International Frontier Crossing	**50,844**	**51,695**	**57,880**	**0.17%**	**0.76%**

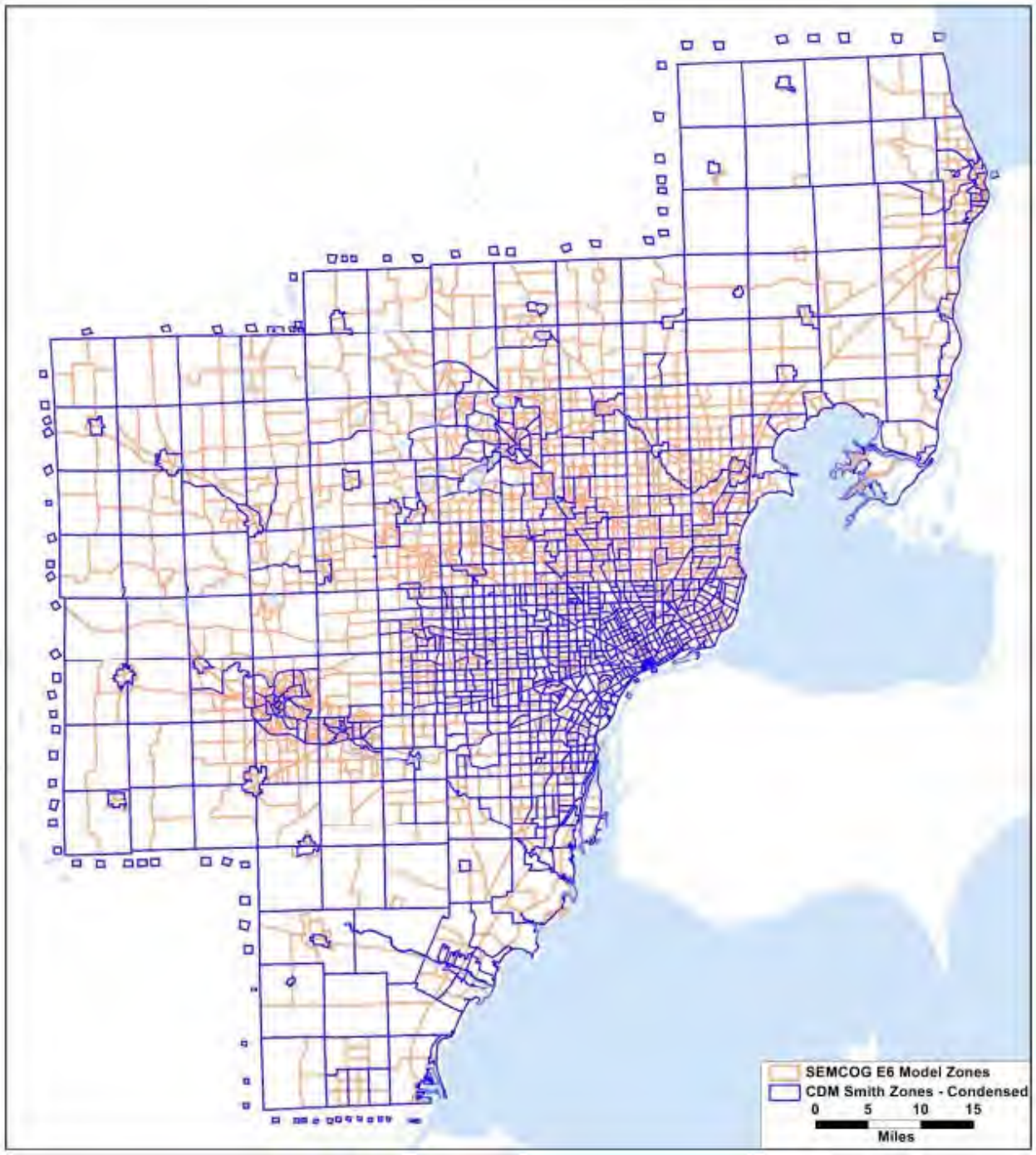
Source: IGTAR Trip Tables, compiled by WSP 2018.

In relation to the SEMCOG area, these international crossing trip tables consist of external-external trips, internal-external and external-internal trips. The external-external trips are defined as trips that enter the SEMCOG region at an external station and exit the region via any other external station. Similarly, the internal-external and external-internal trips are defined as trips that have one origin at an external station and a destination within the SEMCOG region or vice-versa.

A process was developed to assign each of the OD trips to the external stations (as defined in the current SEMCOG E6 Model) both at the origin and destination ends. For example, a trip heading from Greater Toronto Area to Ohio using the Ambassador bridge would be tagged with entering the region at the Ambassador bridge external station and exiting it at the I-75 South external station. Since these are mostly long-distance external trips; it is assumed that the trips would use higher functional class facilities and were assigned to the external stations on the highest functional class where applicable (i.e. the trip end that wasn't one of the international bridge crossings)[2]. Using this process, the CDM Smith OD trip tables were condensed from a zone system representing the entire continental USA and Canada into a zone system representing the SEMCOG region, albeit to an older TAZ system than that used by the current SEMCOG E6 model. Figure 5 shows the representation of the CDM Smith condensed zone system in comparison to the current SEMCOG E6 zone system.

[2] Chapter 6.0 External Travel - http://www.semcog.org/Portals/0/Documents/Plans-For-The-Region/Transportation/Travel-Forecast/TravelDemandForecastModelVersionE5June2010.pdf

Figure 5: Zone System Comparison



Source: WSP 2018

This condensed OD trip table was then expanded to the zone structure used in the current SEMCOG E6 model using matrix disaggregating procedures in TransCAD.

Task 2 – Incorporate Modified OD Trip Tables into SEMCOG Regional Model Trip Table Format

The 2017 CDM Smith OD trip tables were adjusted to 2015 base year based on the overall change between 2015 and 2017 volumes at each of the three international crossings being modeled – AMB, BWB and DWT. The Bridge and Tunnel Operators Association (BTOA) data was used for computing the change between 2015 and 2017.

Although the trip tables are now in the same zone format, the time periods used in the CDM Smith analysis were different from the SEMCOG model. The CDM Smith analysis used four time periods as compared to five used in the SEMCOG E6 model, in addition, the durations of the time periods also differ between models.

The CDM Smith time periods are:

AM (6 AM – 9 AM),

MD (9 AM – 3 PM)

PM (3 PM – 7 PM)

NE (7 PM – 6 AM)

Whereas, the time periods used in the SEMCOG model are:

AM (6:30 AM – 8:59 AM)

MD (9:00 AM – 2:59 PM)

PM (3:00 PM – 6:29 PM)

EV (6:30 PM – 9:59 PM)

NT (10:00 PM – 6:29 AM)

To convert CDM Smith OD trip table time periods to SEMCOG regional model time periods, the 2017 count data at the three existing international crossings – AMB, BWB and DWT, were reviewed and time of day factors developed by fifteen minute increments and by direction (i.e. Canada to USA and USA to Canada). Ratios of total trips by time period schemes (used by CDM Smith and SEMCOG) were derived from 2017 count data and applied to the CDM Smith OD trip tables, by direction and time periods. The resulting trip tables were then normalized to the total trips in CDM Smith trip tables to ensure that the total number of trips between both the trip tables remains the same.

The modified and recompiled international OD trip tables based on zone and time period adjustments were used to update the border crossings in the SEMCOG external trip tables which were then combined with the domestic trip tables from the SEMCOG E6 model for assignment. The procedure for incorporating these trip tables included disaggregating passenger vehicles to SOV, HOV2, HOV3+ and commercial vehicles to light trucks, medium trucks and heavy trucks; this disaggregation was done based on the current distribution of vehicle classes in the existing SEMCOG OD matrices by time period.

The SEMCOG E6 regional model assignment was run for the five time periods with the updated OD matrices for 2015 base year and 2025, 2040 future build and no build scenarios.

Tables 6 shows the comparison of the international border crossing volumes from the 2015 SEMCOG E6 model run with CDM Smith IGTAR 2017, the results show that the process and procedures for translation of the international trip tables from the CDM Smith IGTAR 2017 study to SEMCOG E6 model input format, faithfully replicates the trips (less than one fourth of a percent difference).

Table 6: CDM Smith OD Trip Table – SEMCOG E6 Model Assignment Comparison

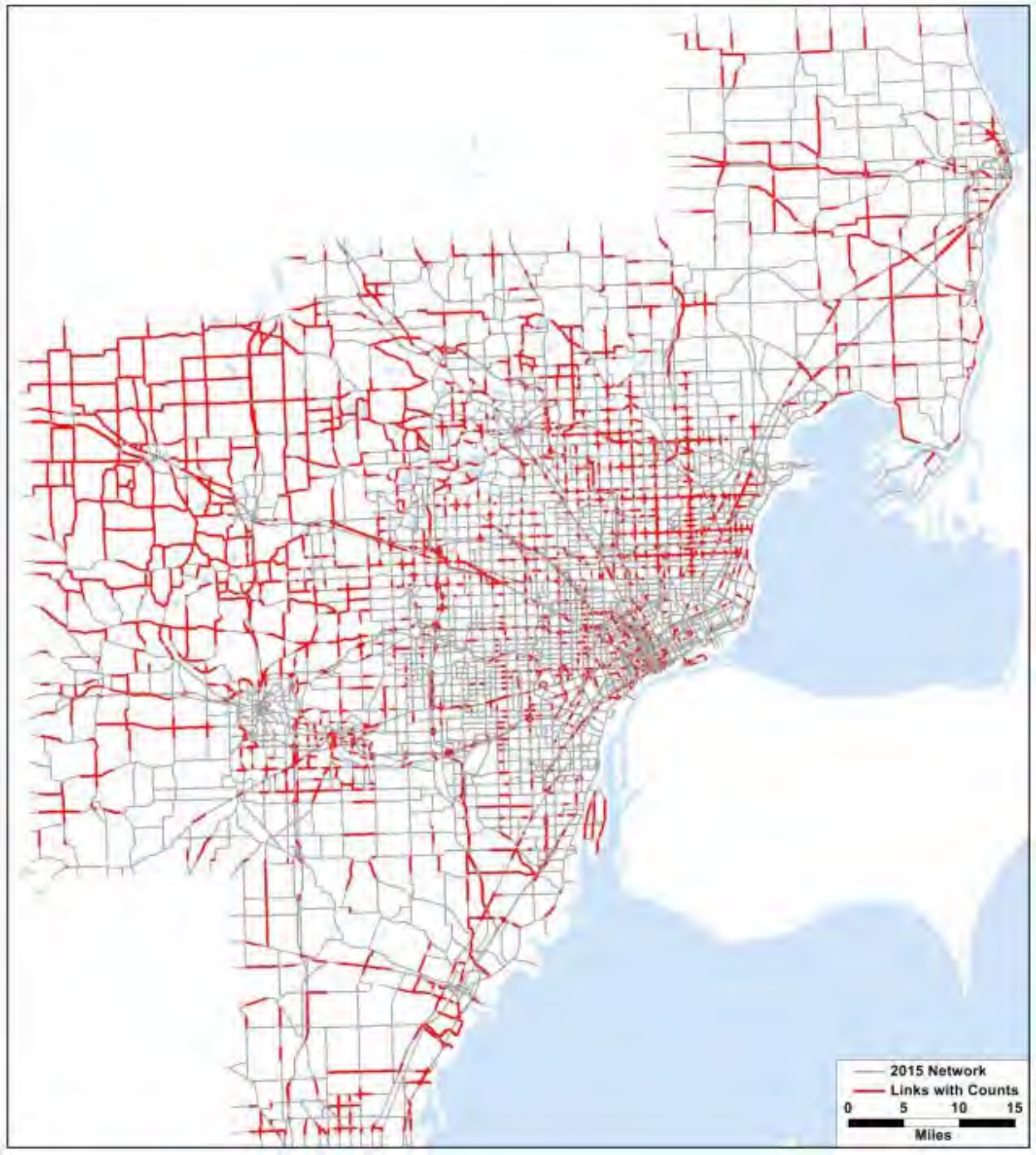
Crossing	CDM Smith Tolling and Revenue Study - 2017 (Trip tables adjusted to 2015)	SEMCOG Regional Model Assignment with CDM Smith Trip tables - 2015	Difference	Percent Difference
Ambassador Bridge	23,619	23,449	**(170)**	-0.7%
Detroit-Windsor Tunnel	13,097	12,947	**(150)**	-1.1%
Blue Water Bridge	14,533	14,733	**200**	1.4%
Gordie Howe International Bridge			**-**	
Total Frontier	**51,249**	**51,129**	**(121)**	**-0.24%**

Source: WSP 2018

Task 3 – Model Validation

As part of validating the model outputs, the SEMCOG count database was used to tag the existing 2015 base year network links with counts, the counts on MDOT facilities were reviewed by MDOT for consistency and validity. Figure 6 shows the 2015 base year network links with counts highlighted in red.

Figure 6: 2015 Network Links with Counts



Source: WSP 2018

An initial review of the outputs from 2015 base year model run was done for the GHIB project area (I-94 to Riverfront and Springwells to I-75/I-96 – Figure 7). Aggregated summary statistics

were reviewed for the project area and as shown in Table 7, the volume comparison – observed (traffic counts) vs. modeled is reasonable.

Figure 8 shows the comparison of model output volumes on the horizontal axis to the latest counts for 2015 on the vertical axis. The slope of the trendline is about 40 degrees, instead of an optimal 45 degrees. The overall Percent Root Mean Square Error (PRMSE) of 37.1 percent is reasonable, given the mix of links by volume.

For road segments with higher volume (greater than 50,000), the percentage difference is 15.1 percent, this shows that the model assigning more trips than the counts on this classification of roads, it should provide a conservative estimate for the upcoming analyses.

Table 7: GHIB Project Area - Link Volume Statistics

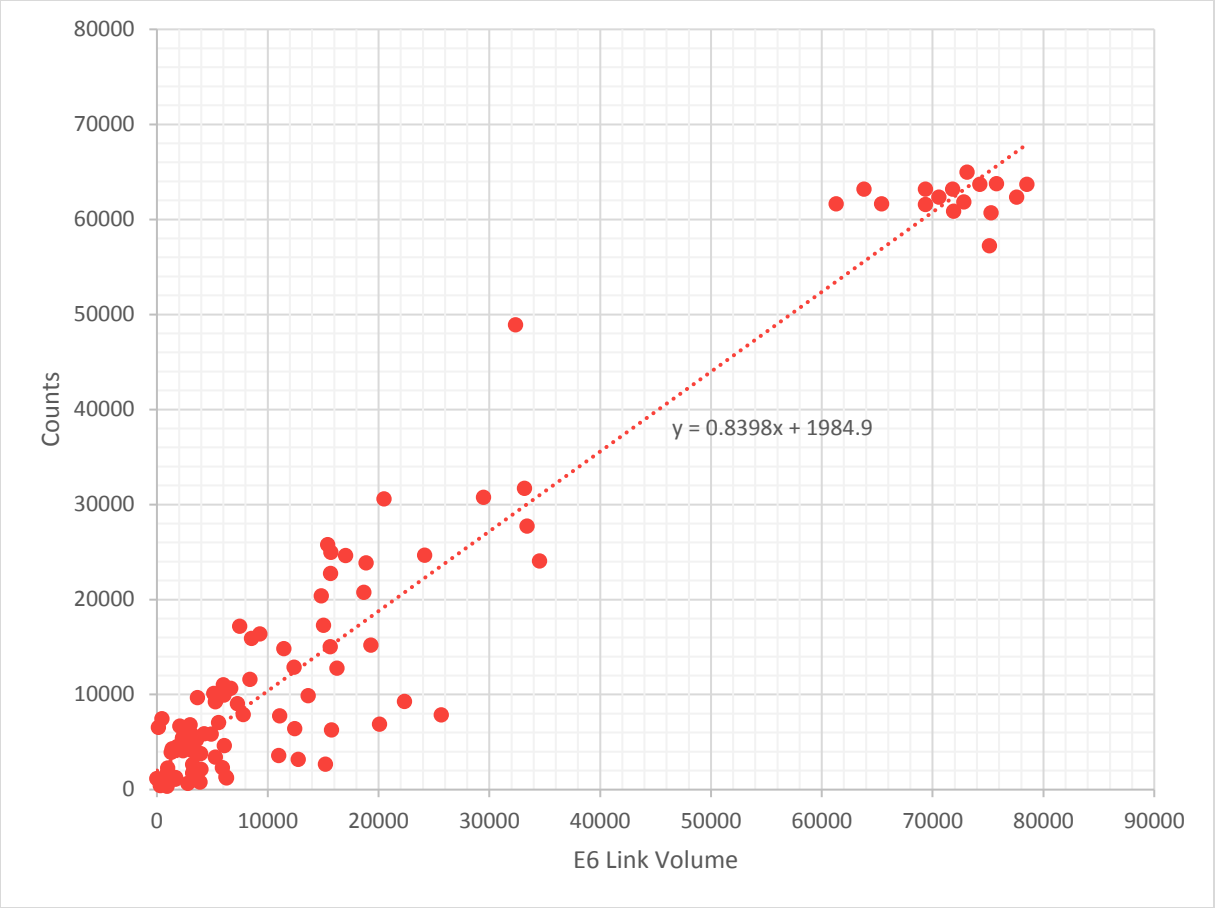
Link Filters	Number of Observations	Mean of Traffic Counts	Mean of Model Volumes	Percentage Difference	Percent Root Mean Square Error (PRMSE)	R-Squared	Mean Difference	Mean Squared Error
GHIB Project area	102	17,819	18,855	5.8%	37.1%	0.94	1,036	43,741,138
Links with Volume greater than 50,000	16	62,244	71,617	15.1%	17.1%	0.00	9,373	112,629,660
Links with Volume between 25,000 - 50,000	6	32,587	27,388	-16.0%	28.6%	0.19	(5,199)	86,616,235
Links with Volume between 10,000 - 25,000	21	17,475	14,330	-18.0%	32.7%	0.50	(3,145)	32,666,137
Links with Volume between 5,000 - 10,000	24	7,409	7,835	5.8%	88.0%	0.08	426	42,458,718
Links with Volume less than 5,000	35	2,322	3,543	52.6%	151.8%	0.08	1,221	12,423,599

Source: WSP 2018

Figure 7: GHIB Project Area for Link Volume Statistics

Source: WSP 2018

Figure 8: GHIB Project Area – Observed vs. Estimated

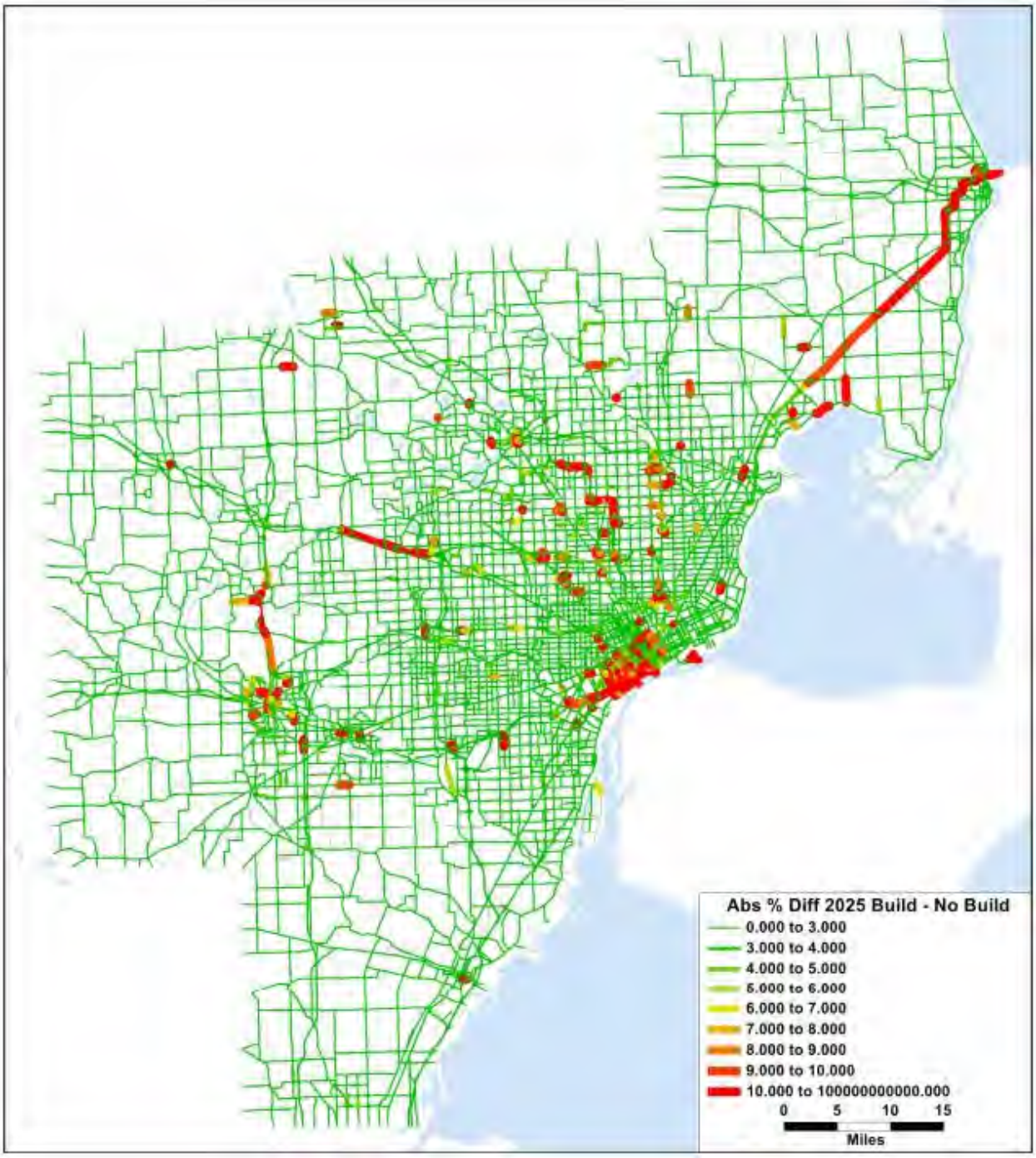


Source: WSP 2018

After the initial examination of the model results for the GHIB project area, the project team decided that the model needed to be validated to a larger sub-area, as the influence of the international bridge crossings is not limited to the two crossings closer to downtown, but also extends to the Blue Water Bridge further to the northeast.

To identify the extents of larger sub-area for validation; 2025 build and no-build scenarios were compared and reviewed for changes in volumes and vehicle miles traveled (VMT); Figure 9 shows the change in absolute percent difference of volumes (at the link level) between build and no-build.

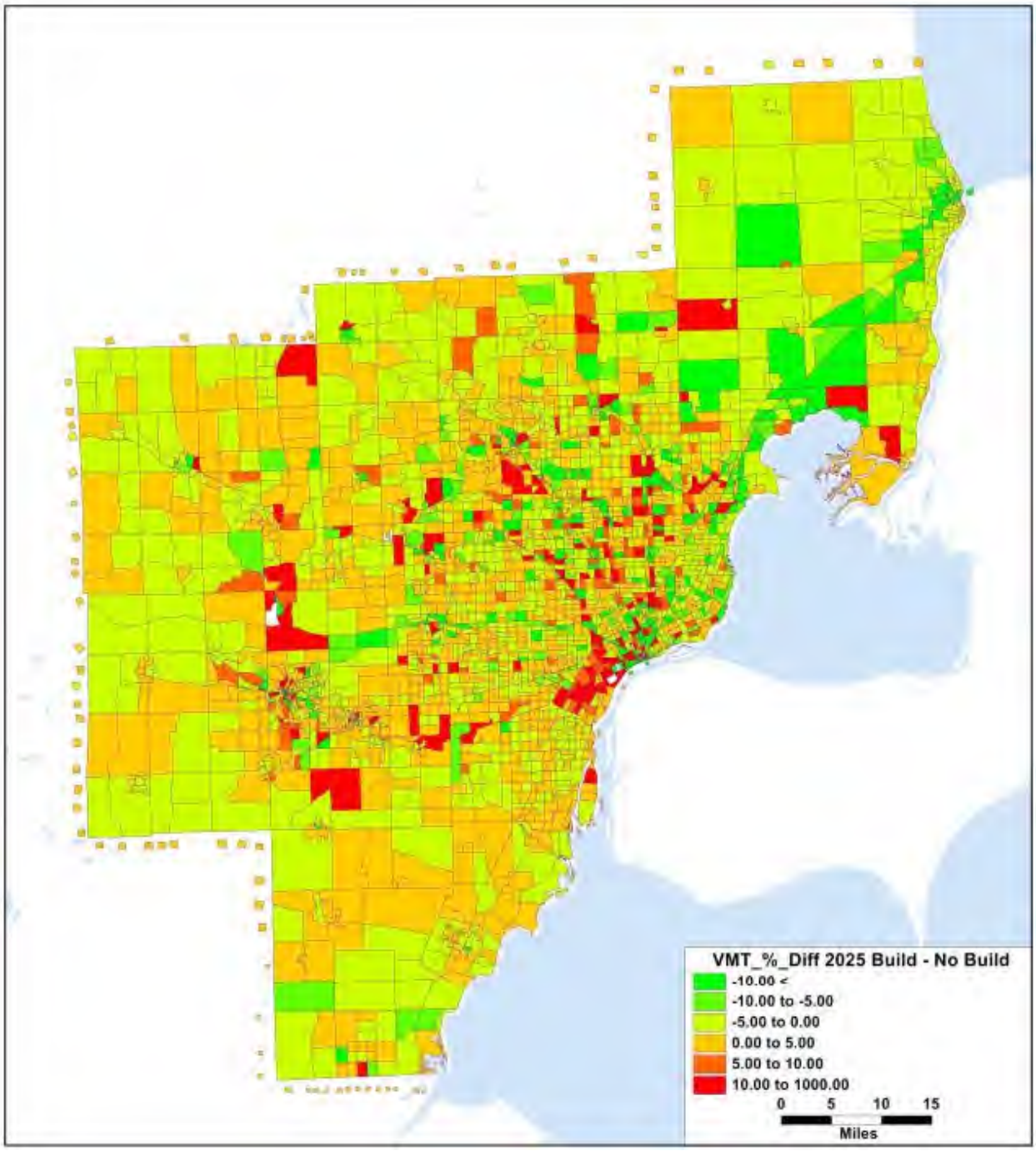
Figure 9: 2025 Build - No Build Network Volumes - Absolute Percent Difference



Source: WSP 2018

Similarly, Figure 10 shows the percent difference of VMT aggregated to the traffic analysis zones (TAZ).

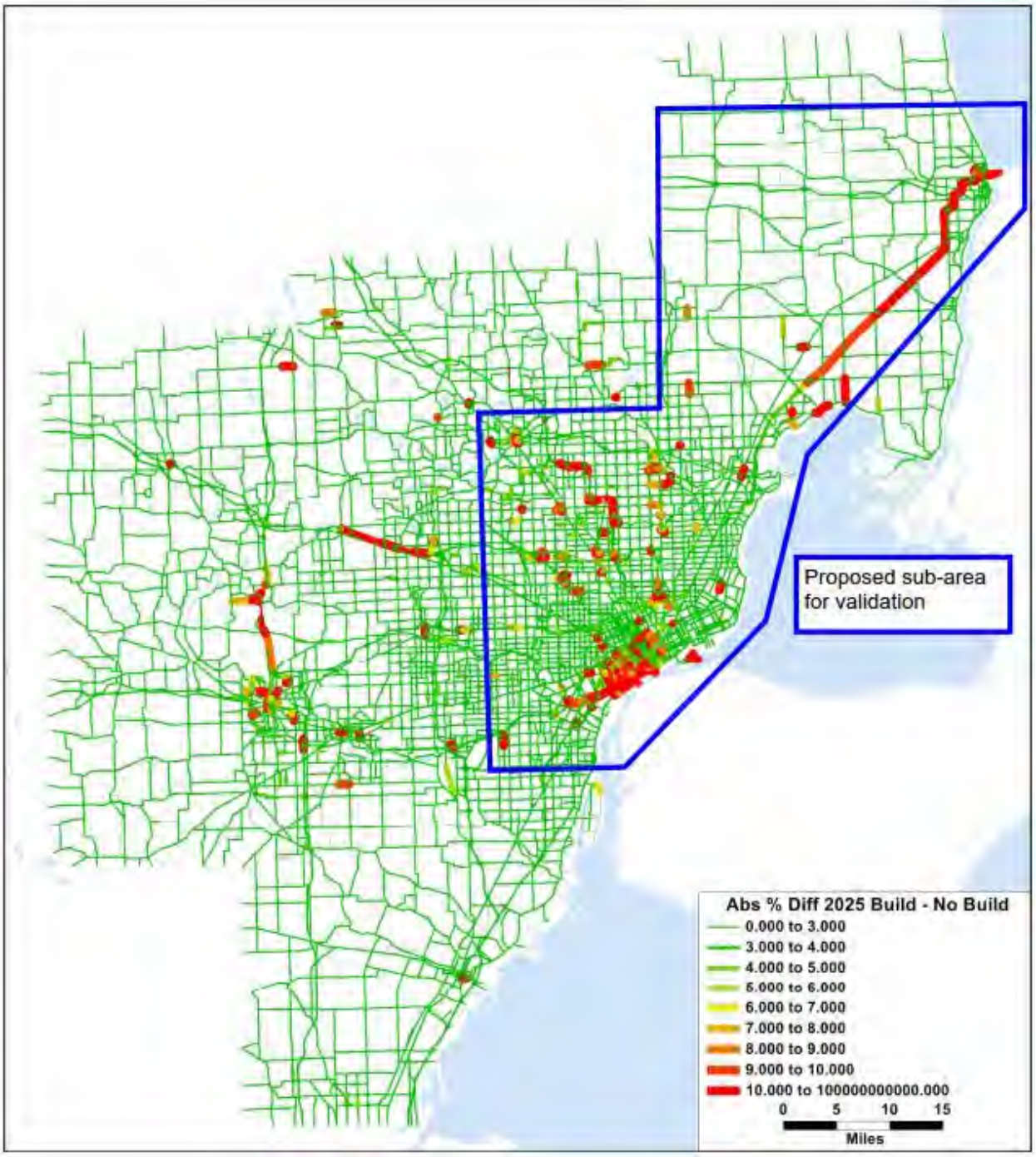
Figure 10: 2025 Build - No Build VMT – Percent Difference



Source: WSP 2018

The difference in network level volumes and VMT changes at the TAZ level were reviewed to identify areas with large shifts and include a majority of those areas in the larger sub-area for validation as shown in Figure 11.

Figure 11: Validation Sub-Area



Source: WSP 2018

Once the validation sub-area was agreed upon by the project team, an initial set of assignments for all time periods were run for 2015. Network links with zero volume (from model assignment) but with 2015 traffic counts were reviewed for network coding errors and count inconsistencies; links with counts on Belle Isle were dropped because of inconsistencies and its

negligible influence on the study area. Similarly, some links that connect express and general purpose lanes along I-96 were dropped as they were not on the paths used by model assignment procedures. Some of the truck-only off-ramps at the Ambassador Bridge were also dropped from the validation set as they were on similar unused paths, care was taken to include links downstream that would still capture their impact.

Model assignments were rerun and results reviewed iteratively to identify and modify network links with zero volumes and also review the number of lanes on links.

Table 8 shows the aggregate level summary statistics from the sub-area validation.

Table 8: Validation Sub-Area – Link Statistics

Link Filters	Number of Observations	Mean of Traffic Counts	Mean of Model Volumes	Percentage Difference	Percent Root Mean Square Error (PRMSE)	R-Squared	Mean Difference	Mean Squared Error
Validation Sub-Area	2,362	15,675	15,526	-0.9%	39.3%	0.81	(149)	37,892,473
Links by Functioncal Classification								
Freeways	89	41,880	43,402	3.6%	23.9%	0.86	1,521	100,578,946
Arterial with wide medians	351	27,301	28,067	2.8%	27.1%	0.68	766	54,891,126
Major Arterials	396	23,672	23,787	0.5%	33.3%	0.55	115	62,223,192
Minor Arterials	505	13,681	13,093	-4.3%	43.7%	0.53	(587)	35,711,088
Collectors	284	4,141	4,268	3.1%	98.4%	0.29	127	16,614,494
Local Streets	2	5,274	3,738	-29.1%	54.5%	1.00	(1,536)	8,263,449
Ramps	705	8,081	7,389	-8.6%	53.7%	0.61	(692)	18,853,284
Freeway Connectors	27	20,240	18,248	-9.8%	22.7%	0.86	(1,992)	21,147,821
Gravel Streets	3	643	1,889	193.9%	306.3%	1.00	1,246	3,875,351
Links by Volume Classification								
Links with Volume greater than 50,000	65	61,499	59,840	-2.7%	18.6%	0.42	(1,659)	131,397,923
Links with Volume between 25,000 - 50,000	454	33,236	30,575	-8.0%	25.9%	0.27	(2,661)	74,259,884
Links with Volume between 10,000 - 25,000	764	16,653	17,013	2.2%	39.7%	0.25	360	43,626,136
Links with Volume between 5,000 - 10,000	506	7,231	7,566	4.6%	57.4%	0.07	335	17,203,149
Links with Volume less than 5,000	573	2,717	3,624	33.4%	111.0%	0.17	907	9,095,998

Source: WSP 2018

A review of link statistics by functional class and volume classification reveals that the arterial streets carrying higher volumes (greater than 25,000 vehicles per day) are under forecasting and hence show a positive percentage difference for arterials (links by functional classification) but show a negative percentage difference for links with volume greater than 25,000 vehicles per day.

Overall, the Percent Root Mean Square Error (PRMSE) of 39% indicates a good fit for a sub-area with approximately 2300 count locations and the results for the volume based groupings compares favorably with validation criteria from FHWA - Table 9.

Table 9: MDOT, FHWA Validation Standards

Volume Group Validation Standards	
Individual link targets (percent deviation of assignment vs.count volumes on a link-by-link basis)	
Volume Group	**FHWA Standards**
> 50,000	+/- 21%
25,000 to 50,000	+/- 22%
10,000 to 25,000	+/- 25%
5,000 to 10,000	+/- 29%
2,500 to 5,000	+/- 36%
1,000 to 2,500	+/- 47%
< 1,000	+/- 60%
Source: MDOT presentation dated December 3, 2008.	
https://www.michigan.gov/documents/mdot/MDOT_Travel_Demand_Modeling_Project_Planning_MayleOsborneFaussett_MDOT_12.3.2008_302244_7.pdf	

Figure 12: Validation Sub-Area - Observed vs. Estimated

Source: WSP 2018

The plot in figure 12 comparing the observed (traffic counts) versus estimated shows that the model is 10% low overall, but is slightly high on the major arterials and freeways. The counts versus assignment (-0.9%) in Table 8 and the VMT comparisons (-1.2%) in Table 10 indicate that the correct number of trips are assigned within the sub-area.

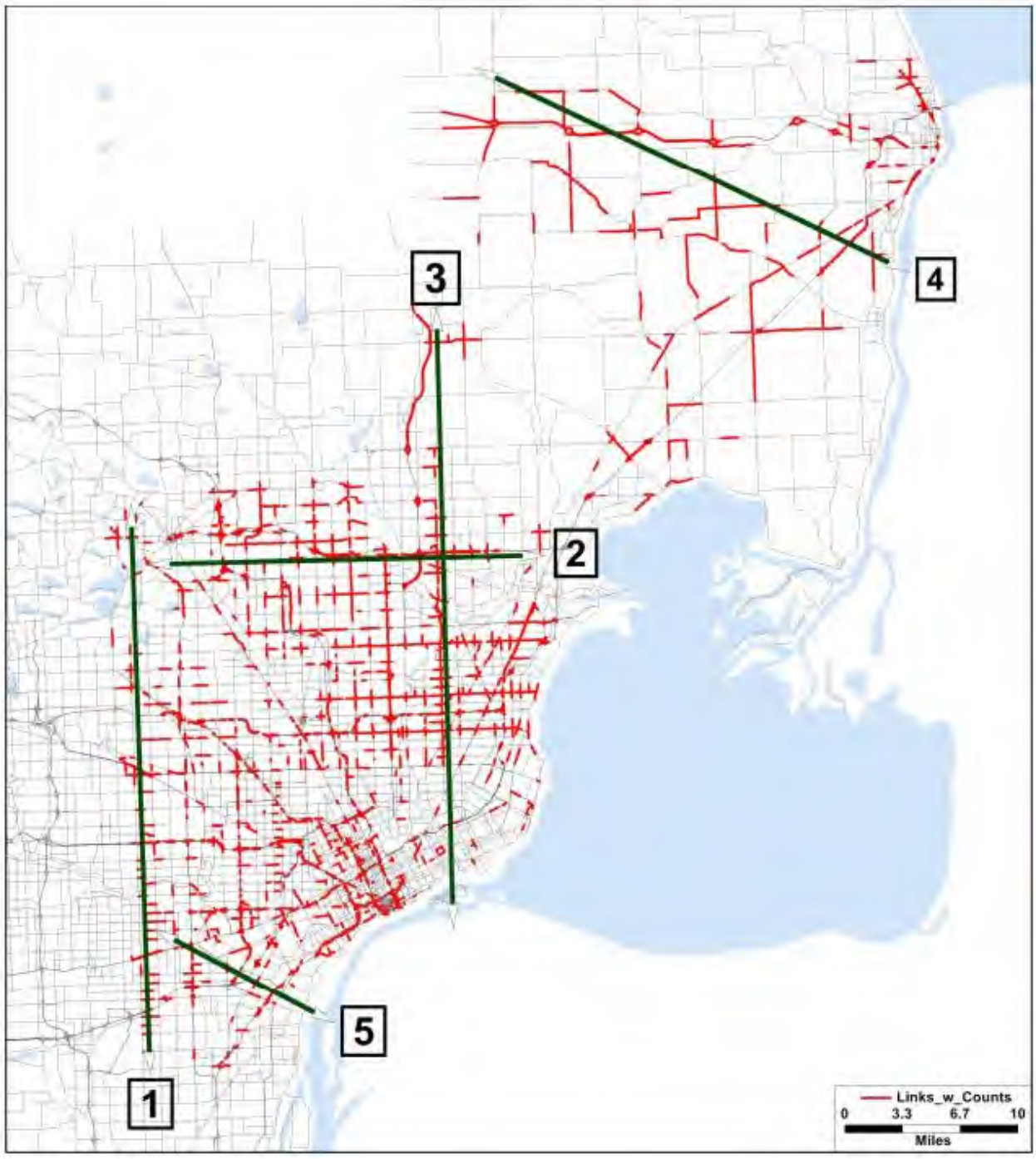
Table 10: Validation Sub-Area VMT Comparison

Functional Class	Model VMT	Count VMT	Difference	% Difference
Freeway	2,571,717	2,532,075	39,642	1.57%
Major Arterial	6,399,923	6,311,379	88,544	1.40%
Minor Arterial	2,333,873	2,535,330	-201,458	-7.95%
Ramps	1,131,406	1,252,602	-121,196	-9.68%
Collector etc.	727,900	694,145	33,755	4.86%
Total	**13,164,819**	**13,325,531**	**-160,712**	**-1.21%**

Source: WSP 2018

The volumes across screenlines (Figure 13) were also reviewed and found to be reasonable; as shown in Table 11, three of the five screenlines are within 10 percent and the two that are higher than 10 percent are screenlines in the sub-area but actually act as cutlines in the regional model, and hence may not be capturing the flows that bypass them.

Figure 13: Validation Sub-Area Screenlines



Source: WSP 2018

Table 11: Validation Sub-Area Screenlines - Volume Comparison

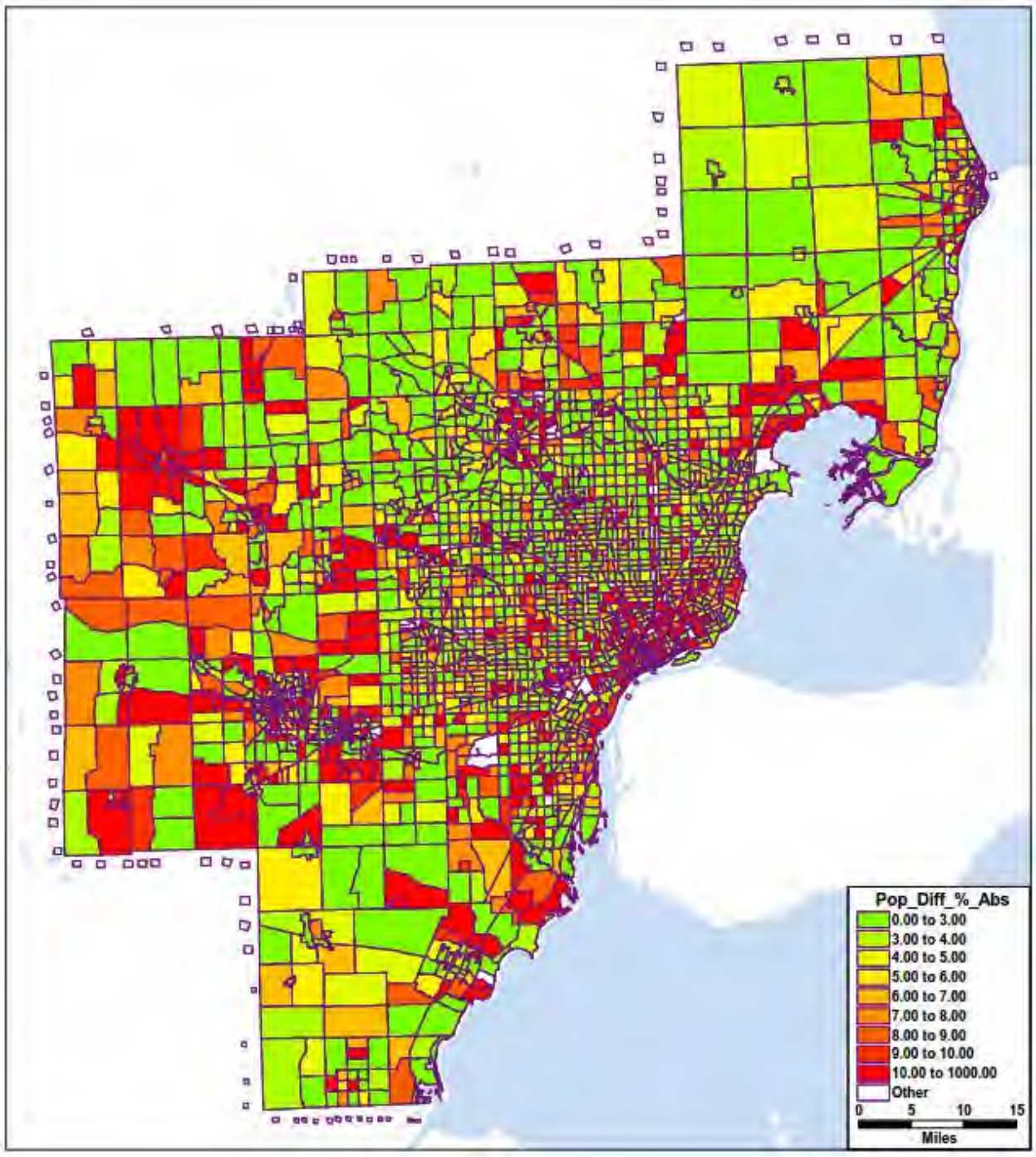
Screenline	Counts	Assgn Volumes	Difference	% Difference
1	539,274	624,948	85,674	15.89%
2	416,374	416,860	486	0.12%
3	64,910	69,628	4,718	7.27%
4	796,820	740,035	-56,785	-7.13%
5	214,085	245,129	31,044	14.50%

Source: WSP 2018

The project team reviewed the sub-area validation results and summaries and concluded that the model is behaviorally sound and compares well with the existing counts when run with the CDM Smith international bridge crossing OD trip tables. It was also agreed that the model is sufficiently validated to develop and evaluate future build and no-build scenarios.

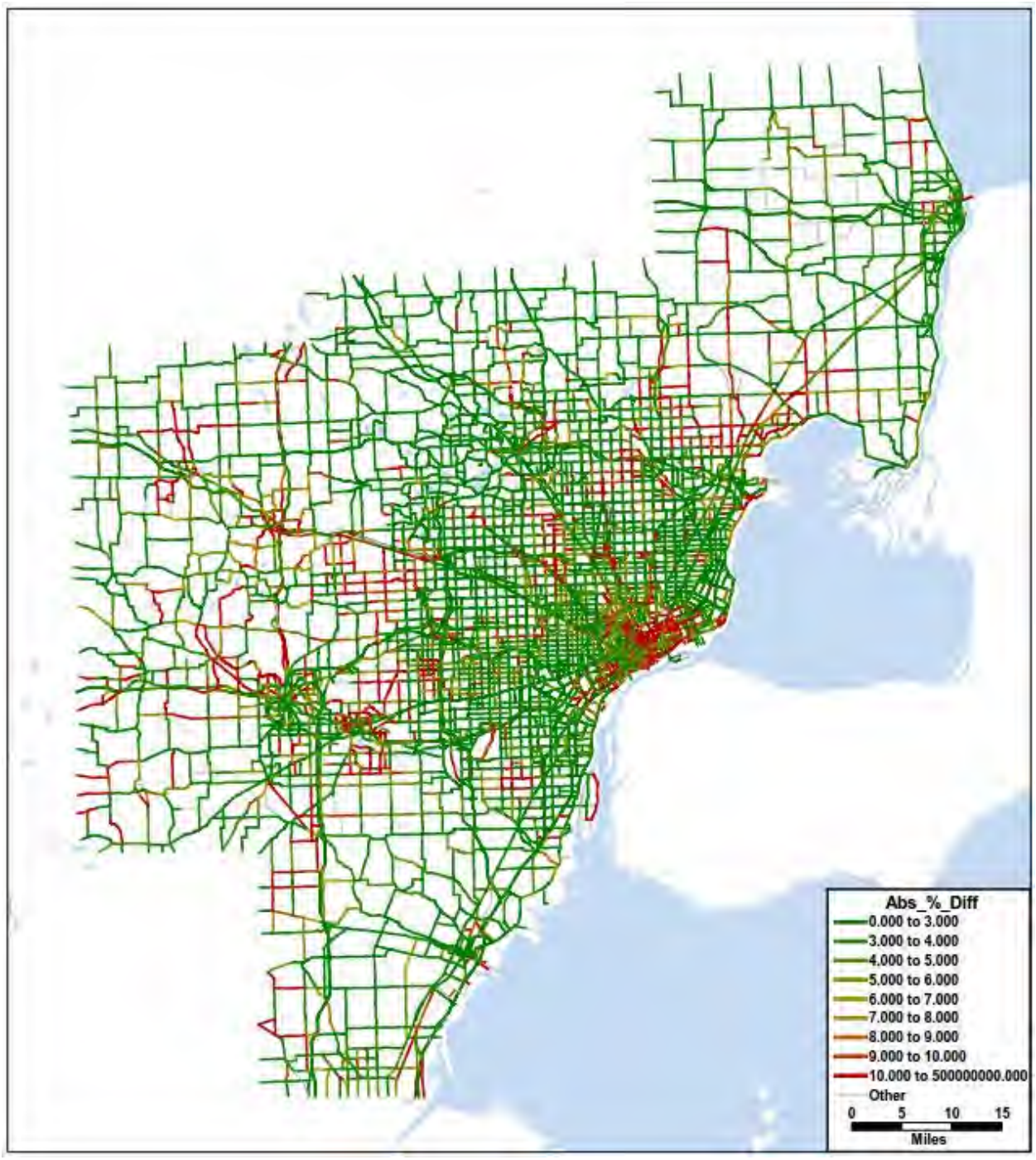
In addition, the sensitivity of the model to changes in demographic inputs was also reviewed by comparing the absolute percent change in network volumes in relation to change in population between 2015 and 2025. As seen in figures 14 and 15, the areas with change in volumes correspond with areas that see a change in population, this shows that the model outputs are sensitive to changes in the underlying demographic inputs.

Figure 14: Model Sensitivity - 2025 - 2015 Population Absolute Percentage Difference



Source: WSP 2018

Figure 15: Model Sensitivity - 2025 - 2015 Volume Absolute Percentage Difference



Source: WSP 2018

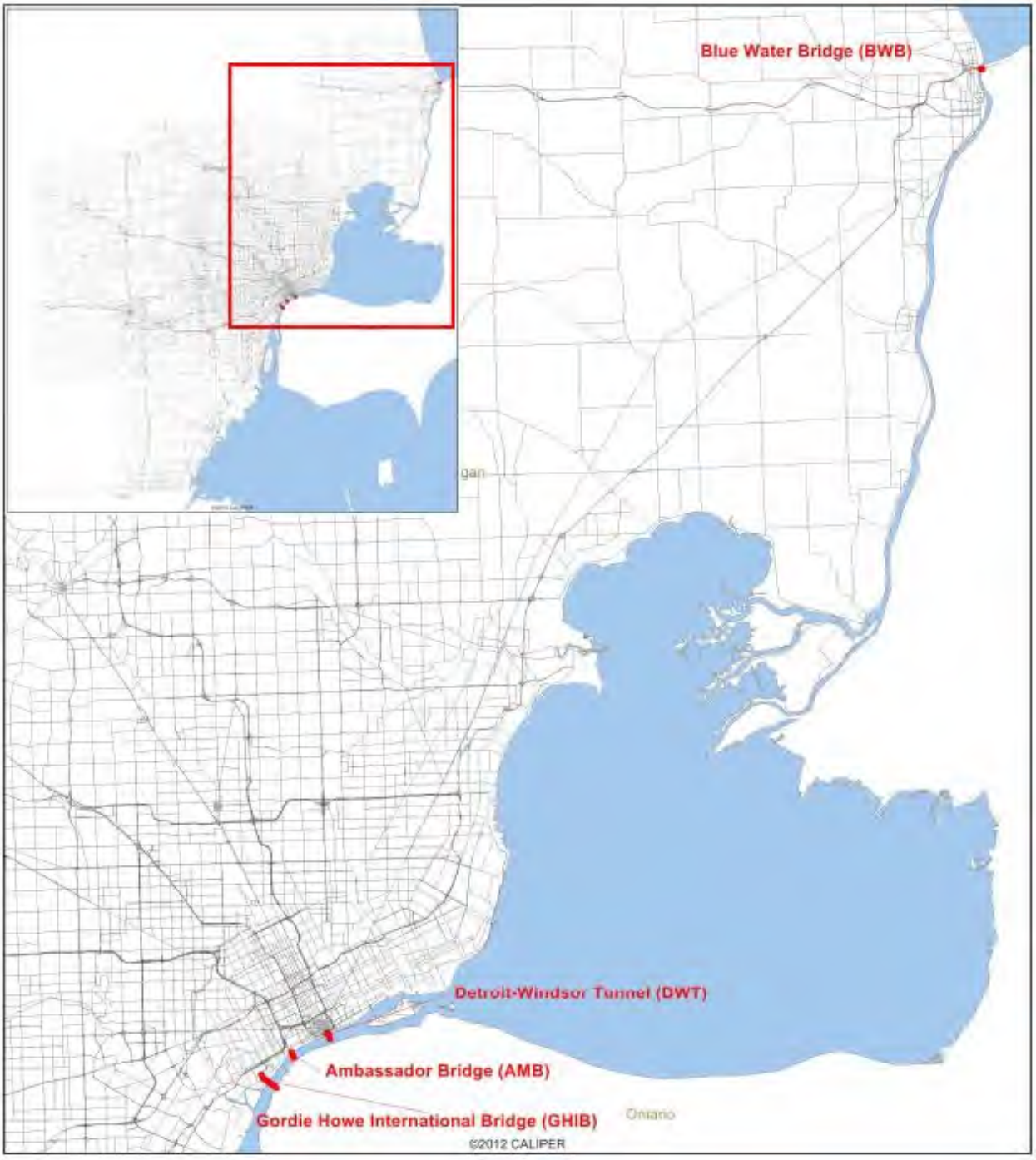
Task 4 – Execute SEMCOG Regional Model Runs with Updated OD Trip Tables

Developing 2025 and 2040 Future No-Build Trip Tables

The CDM Smith international OD trip tables were used to develop growth rates between 2015 - 2025 and 2025 - 2040 for each of the three international bridge crossings (AMB, DWT and BWB) by direction (USA to Canada and Canada to USA) and vehicle type. These growth factors were then applied to the 2015 base year OD trip tables to develop future no-build trip tables for 2025 and similarly growth rates were applied to 2025 trip tables to generate 2040 no-build trip tables. The future no-build trips were then normalized to the total build trips across the international frontier to ensure trips were conserved between future build and no-build scenarios. The methodology used for developing the no-build trip tables is based on two important assumptions: 1) there is no induced demand included in the CDM Smith international OD build trip tables for 2025 and 2040, 2) there are no new OD pairs with trips for the future year build scenarios.

The model assignments were then run to develop future year build and no build forecasts for 2025 and 2040. The primary focus of the forecasts are the directional traffic volumes for international passenger cars and commercial vehicles (trucks) at the international bridge crossings – AMB, BWB, DWT and GHIB as shown in Tables 12 through 16. Table 17 shows the final growth rates by each crossing and the international frontier. Tables 18 and 19 summarize the population and employment growth rates by county, this provides an overview of demographic growth for the region. Figure 16 provides an overview and the location of the international bridge crossings in relation to the SEMCOG region.

Figure 16: Map of the International Bridge Crossings



Source: WSP 2018

Table 12: 2015 Base Year – Average Weekday Volumes

Crossing	Passenger Cars (PC)			Commercial Vehicles (CV)			Total Crossing Volumes (PC + CV)
	USA to Canada	Canada to USA	Total PC	USA to Canada	Canada to USA	Total CV	
Gordie Howe International Bridge (GHIB)							
Ambassador Bridge (AMB)	5,949	5,711	11,660	5,853	5,936	11,789	23,449
Detroit-Windsor Tunnel (DWT)	6,952	5,797	12,749	157	42	198	12,947
Blue Water Bridge (BWB)	4,378	4,236	8,614	3,130	2,989	6,119	14,733
Total International Frontier Crossing	**17,279**	**15,744**	**33,023**	**9,140**	**8,966**	**18,106**	**51,129**

Source: WSP 2018

Table 13: 2025 No-Build – Average Weekday Volumes

Crossing	Passenger Cars (PC)			Commercial Vehicles (CV)			Total Crossing Volumes (PC + CV)
	USA to Canada	Canada to USA	Total PC	USA to Canada	Canada to USA	Total CV	
Gordie Howe International Bridge (GHIB)							
Ambassador Bridge (AMB)	5,369	5,242	10,611	6,775	6,537	13,313	23,923
Detroit-Windsor Tunnel (DWT)	5,800	5,168	10,968	182	46	228	11,196
Blue Water Bridge (BWB)	4,695	4,858	9,554	3,546	3,390	6,936	16,489
Total International Frontier Crossing	**15,864**	**15,268**	**31,132**	**10,503**	**9,973**	**20,476**	**51,609**

Source: WSP 2018

Table 14: 2025 Build – Average Weekday Volumes

Crossing	Passenger Cars (PC)			Commercial Vehicles (CV)			Total Crossing Volumes (PC + CV)
	USA to Canada	Canada to USA	Total PC	USA to Canada	Canada to USA	Total CV	
Gordie Howe International Bridge (GHIB)	3,205	3,501	6,706	4,214	3,896	8,109	14,816
Ambassador Bridge (AMB)	4,264	4,046	8,310	4,020	3,963	7,983	16,294
Detroit-Windsor Tunnel (DWT)	4,631	3,998	8,628	111	27	139	8,767
Blue Water Bridge (BWB)	3,765	3,723	7,488	2,158	2,086	4,245	11,732
Total International Frontier Crossing	**15,864**	**15,268**	**31,132**	**10,503**	**9,973**	**20,476**	**51,609**

Source: WSP 2018

Table 15: 2040 No-Build – Average Weekday Volumes

Crossing	Passenger Cars (PC)			Commercial Vehicles (CV)			Total Crossing Volumes (PC + CV)
	USA to Canada	Canada to USA	Total PC	USA to Canada	Canada to USA	Total CV	
Gordie Howe International Bridge (GHIB)							
Ambassador Bridge (AMB)	4,961	4,699	9,661	8,952	8,678	17,630	27,290
Detroit-Windsor Tunnel (DWT)	5,756	5,387	11,143	287	70	357	11,500
Blue Water Bridge (BWB)	4,610	4,656	9,266	4,983	4,754	9,737	19,003
Total International Frontier Crossing	**15,327**	**14,743**	**30,070**	**14,222**	**13,502**	**27,724**	**57,794**

Source: WSP 2018

Table 16: 2040 Build – Average Weekday Volumes

Crossing	Passenger Cars (PC)			Commercial Vehicles (CV)			Total Crossing Volumes (PC + CV)
	USA to Canada	Canada to USA	Total PC	USA to Canada	Canada to USA	Total CV	
Gordie Howe International Bridge (GHIB)	2,925	3,053	5,978	5,586	5,180	10,766	16,744
Ambassador Bridge (AMB)	3,903	3,533	7,435	5,360	5,308	10,668	18,103
Detroit-Windsor Tunnel (DWT)	4,690	4,395	9,085	185	46	231	9,316
Blue Water Bridge (BWB)	3,810	3,762	7,572	3,091	2,968	6,059	13,631
Total International Frontier Crossing	**15,327**	**14,743**	**30,070**	**14,222**	**13,502**	**27,724**	**57,794**

Source: WSP 2018

Table 17: SEMCOG E6 Model with CDM Smith OD Trip Tables - Annual Growth Rates by Bridge Crossing

Crossing	Total Volume			Annual Growth Rates	
	2015	2025	2040	2015 - 2025	2025 - 2040
Gordie Howe International Bridge (GHIB)		14,816	16,744	-	0.82%
Ambassador Bridge (AMB)	23,449	16,294	18,103	-3.57%	0.70%
Detroit-Windsor Tunnel (DWT)	12,947	8,767	9,316	-3.82%	0.41%
Blue Water Bridge (BWB)	14,733	11,732	13,631	-2.25%	1.00%
Total International Frontier Crossing	**51,129**	**51,609**	**57,794**	**0.09%**	**0.76%**

Source: WSP 2018

Table 18: SEMCOG Region – Annual Population Growth Rates by County

County	Population			Annual Growth Rates	
	2015	2025	2040	2015-2025	2025-2040
Detroit	648,350	612,442	615,029	-0.57%	0.03%
Wayne	1,093,946	1,063,050	1,041,932	-0.29%	-0.13%
Oakland	1,215,322	1,221,340	1,246,854	0.05%	0.14%
Macomb	855,378	872,733	905,354	0.20%	0.24%
Washtenaw	350,784	360,366	386,290	0.27%	0.46%
Monroe	155,696	158,347	164,777	0.17%	0.27%
St. Clair	161,667	162,541	167,615	0.05%	0.21%
Livingston	186,011	198,014	214,338	0.63%	0.53%
SEMCOG Region	**4,667,154**	**4,648,833**	**4,742,189**	**-0.04%**	**0.13%**

Source: WSP 2018

Table 19: SEMCOG Region - Annual Employment Growth Rates by County

County	Employment			Annual Growth Rates	
	2015	2025	2040	2015-2025	2025-2040
Detroit	242,679	236,789	235,952	-0.25%	-0.02%
Wayne	409,205	414,110	422,856	0.12%	0.14%
Oakland	631,404	657,423	682,740	0.40%	0.25%
Macomb	278,894	284,625	300,310	0.20%	0.36%
Washtenaw	185,914	195,241	214,372	0.49%	0.63%
Monroe	38,063	38,820	41,374	0.20%	0.43%
St. Clair	43,387	44,477	47,476	0.25%	0.44%
Livingston	45,045	48,077	53,822	0.65%	0.76%
SEMCOG Region	**1,874,591**	**1,919,562**	**1,998,902**	**0.24%**	**0.27%**

Source: WSP 2018

4.0 Appendix A – IGTAR 2017 - Summaries of International OD Trips

This appendix includes a series of summary tables that summarize the IGTAR 2017 CDM Smith OD international trip tables by Counties within the region and the rest of Canada and USA for 2017, 2025 and 2040 by each of the international bridge crossing and vehicle classification.

1. Ambassador Bridge, Passenger Cars - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	13	2,086	357	133	**2,590**
Macomb, MI	-	-	-	-	-	-	-	-	1	549	45	5	**599**
St. Clair, MI	-	-	-	-	-	-	-	-	0	25	0	-	**25**
Oakland, MI	-	-	-	-	-	-	-	-	8	1,205	205	57	**1,475**
Livingston, MI	-	-	-	-	-	-	-	-	0	17	1	3	**21**
Washtenaw, MI	-	-	-	-	-	-	-	-	4	88	9	30	**131**
Monroe, MI	-	-	-	-	-	-	-	-	-	20	11	6	**37**
Rest of Michigan	-	-	-	-	-	-	-	-	4	109	24	19	**157**
Rest of USA	8	1	-	1	-	6	-	1	13	138	72	362	**602**
Windsor, Canada	2,322	448	17	1,308	31	99	24	140	197	-	-	-	**4,586**
Rest of Ontario	427	59	0	134	18	0	2	69	112	-	-	4	**825**
Rest of Canada	144	6	-	51	3	43	5	35	358	15	2	11	**674**
Total	**2,901**	**514**	**17**	**1,494**	**53**	**149**	**32**	**245**	**708**	**4,252**	**727**	**630**	**11,722**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

2. Ambassador Bridge, Passenger Cars - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	10	1,545	241	98	**1,893**
Macomb, MI	-	-	-	-	-	-	-	-	0	430	33	5	**468**
St. Clair, MI	-	-	-	-	-	-	-	-	0	20	0	-	**20**
Oakland, MI	-	-	-	-	-	-	-	-	7	924	148	48	**1,127**
Livingston, MI	-	-	-	-	-	-	-	-	0	13	1	2	**16**
Washtenaw, MI	-	-	-	-	-	-	-	-	3	64	6	22	**95**
Monroe, MI	-	-	-	-	-	-	-	-	-	14	7	4	**25**
Rest of Michigan	-	-	-	-	-	-	-	-	3	87	17	16	**123**
Rest of USA	6	0	-	1	-	4	-	1	9	98	48	258	**426**
Windsor, Canada	1,573	328	13	934	23	67	16	101	121	-	-	-	**3,176**
Rest of Ontario	270	39	0	90	11	0	1	47	70	-	-	2	**531**
Rest of Canada	102	6	-	42	3	30	3	25	242	11	2	9	**474**
Total	**1,950**	**374**	**13**	**1,066**	**37**	**101**	**21**	**175**	**466**	**3,205**	**502**	**465**	**8,374**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

3. Ambassador Bridge, Passenger Cars - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	8	1,433	222	83	**1,748**
Macomb, MI	-	-	-	-	-	-	-	-	0	401	30	4	**435**
St. Clair, MI	-	-	-	-	-	-	-	-	0	18	0	-	**19**
Oakland, MI	-	-	-	-	-	-	-	-	5	855	137	38	**1,034**
Livingston, MI	-	-	-	-	-	-	-	-	0	12	1	2	**14**
Washtenaw, MI	-	-	-	-	-	-	-	-	2	59	6	19	**86**
Monroe, MI	-	-	-	-	-	-	-	-	-	13	7	4	**23**
Rest of Michigan	-	-	-	-	-	-	-	-	3	80	16	12	**110**
Rest of USA	4	0	-	1	-	3	-	1	8	91	43	218	**370**
Windsor, Canada	1,397	287	11	823	20	59	15	88	108	-	-	-	**2,808**
Rest of Ontario	240	35	0	79	10	0	1	41	60	-	-	2	**468**
Rest of Canada	83	5	-	31	2	24	3	20	195	11	1	7	**381**
Total	**1,723**	**327**	**11**	**934**	**32**	**87**	**18**	**150**	**390**	**2,973**	**463**	**387**	**7,496**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

4. Gordie Howe International Bridge, Passenger Cars - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	9	1,101	226	92	**1,428**
Macomb, MI	-	-	-	-	-	-	-	-	0	283	27	4	**314**
St. Clair, MI	-	-	-	-	-	-	-	-	0	12	0	-	**13**
Oakland, MI	-	-	-	-	-	-	-	-	5	630	124	39	**799**
Livingston, MI	-	-	-	-	-	-	-	-	0	9	1	2	**12**
Washtenaw, MI	-	-	-	-	-	-	-	-	3	47	6	21	**77**
Monroe, MI	-	-	-	-	-	-	-	-	-	11	8	4	**23**
Rest of Michigan	-	-	-	-	-	-	-	-	3	54	15	15	**86**
Rest of USA	6	0	-	1	-	5	-	1	9	73	49	263	**407**
Windsor, Canada	1,308	247	9	714	15	55	14	76	124	-	-	-	**2,561**
Rest of Ontario	280	38	0	83	11	0	1	44	83	-	-	2	**543**
Rest of Canada	104	6	-	37	3	31	4	28	279	6	1	9	**507**
Total	**1,698**	**291**	**9**	**835**	**28**	**91**	**19**	**149**	**516**	**2,227**	**457**	**451**	**6,771**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

5. Gordie Howe International Bridge, Passenger Cars - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	7	1,024	208	78	**1,318**
Macomb, MI	-	-	-	-	-	-	-	-	0	263	25	3	**291**
St. Clair, MI	-	-	-	-	-	-	-	-	-	12	0	-	**12**
Oakland, MI	-	-	-	-	-	-	-	-	4	583	115	31	**732**
Livingston, MI	-	-	-	-	-	-	-	-	0	9	0	1	**10**
Washtenaw, MI	-	-	-	-	-	-	-	-	2	44	6	18	**70**
Monroe, MI	-	-	-	-	-	-	-	-	-	10	7	4	**21**
Rest of Michigan	-	-	-	-	-	-	-	-	2	49	13	11	**77**
Rest of USA	4	0	-	1	-	4	-	1	8	68	44	222	**351**
Windsor, Canada	1,165	215	8	628	13	49	12	66	111	-	-	-	**2,268**
Rest of Ontario	249	34	0	73	10	0	1	39	71	-	-	2	**479**
Rest of Canada	85	4	-	28	2	25	3	22	227	6	1	7	**409**
Total	**1,502**	**253**	**8**	**731**	**25**	**78**	**17**	**128**	**433**	**2,067**	**420**	**377**	**6,038**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

6. Detroit-Windsor Tunnel, Passenger Cars - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	17	2,488	353	141	**2,999**
Macomb, MI	-	-	-	-	-	-	-	-	1	811	54	7	**872**
St. Clair, MI	-	-	-	-	-	-	-	-	0	36	1	-	**36**
Oakland, MI	-	-	-	-	-	-	-	-	10	1,619	237	70	**1,936**
Livingston, MI	-	-	-	-	-	-	-	-	0	19	1	3	**24**
Washtenaw, MI	-	-	-	-	-	-	-	-	4	97	8	30	**139**
Monroe, MI	-	-	-	-	-	-	-	-	-	19	10	6	**35**
Rest of Michigan	-	-	-	-	-	-	-	-	4	158	29	20	**212**
Rest of USA	8	1	-	2	-	6	-	1	11	133	62	315	**538**
Windsor, Canada	2,365	613	25	1,523	35	93	23	175	166	-	-	-	**5,017**
Rest of Ontario	389	59	0	139	14	0	2	71	83	-	-	4	**761**
Rest of Canada	142	8	-	56	3	38	4	32	289	16	3	10	**600**
Total	**2,904**	**681**	**25**	**1,719**	**52**	**136**	**29**	**278**	**585**	**5,397**	**757**	**606**	**13,170**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

7. Detroit-Windsor Tunnel, Passenger Cars - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	11	1,678	213	92	**1,994**
Macomb, MI	-	-	-	-	-	-	-	-	1	572	35	6	**613**
St. Clair, MI	-	-	-	-	-	-	-	-	0	25	1	-	**26**
Oakland, MI	-	-	-	-	-	-	-	-	8	1,115	151	51	**1,325**
Livingston, MI	-	-	-	-	-	-	-	-	0	13	1	2	**16**
Washtenaw, MI	-	-	-	-	-	-	-	-	2	64	5	19	**90**
Monroe, MI	-	-	-	-	-	-	-	-	-	12	5	3	**21**
Rest of Michigan	-	-	-	-	-	-	-	-	3	113	18	14	**148**
Rest of USA	5	1	-	2	-	3	-	1	7	85	36	195	**335**
Windsor, Canada	1,548	427	18	1,028	24	60	15	120	98	-	-	-	**3,338**
Rest of Ontario	233	37	0	87	8	0	1	45	49	-	-	3	**463**
Rest of Canada	94	7	-	42	2	24	2	21	183	12	2	7	**396**
Total	**1,880**	**472**	**18**	**1,158**	**35**	**87**	**19**	**187**	**362**	**3,687**	**467**	**393**	**8,764**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

8. Detroit-Windsor Tunnel, Passenger Cars - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	11	1,718	217	86	**2,033**
Macomb, MI	-	-	-	-	-	-	-	-	0	578	35	5	**618**
St. Clair, MI	-	-	-	-	-	-	-	-	0	25	0	-	**26**
Oakland, MI	-	-	-	-	-	-	-	-	7	1,141	154	45	**1,346**
Livingston, MI	-	-	-	-	-	-	-	-	0	13	1	2	**16**
Washtenaw, MI	-	-	-	-	-	-	-	-	2	66	5	18	**91**
Monroe, MI	-	-	-	-	-	-	-	-	-	12	6	3	**21**
Rest of Michigan	-	-	-	-	-	-	-	-	3	115	19	12	**149**
Rest of USA	5	0	-	1	-	4	-	1	7	88	37	183	**326**
Windsor, Canada	1,716	467	19	1,133	27	67	17	132	112	-	-	-	**3,690**
Rest of Ontario	259	40	0	97	9	0	1	50	53	-	-	3	**514**
Rest of Canada	97	6	-	40	2	25	3	21	190	12	2	7	**405**
Total	**2,078**	**514**	**20**	**1,272**	**38**	**96**	**21**	**204**	**384**	**3,767**	**475**	**365**	**9,234**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

9. Blue Water Bridge, Passenger Cars - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	17	-	152	130	**299**
Macomb, MI	-	-	-	-	-	-	-	-	20	-	137	136	**294**
St. Clair, MI	-	-	-	-	-	-	-	-	31	0	1,428	124	**1,583**
Oakland, MI	-	-	-	-	-	-	-	-	45	-	144	285	**474**
Livingston, MI	-	-	-	-	-	-	-	-	4	-	2	12	**18**
Washtenaw, MI	-	-	-	-	-	-	-	-	3	-	8	26	**37**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	4	5	**8**
Rest of Michigan	-	-	-	-	-	-	-	-	125	0	184	422	**730**
Rest of USA	14	16	-	27	-	6	-	67	21	-	62	433	**645**
Windsor, Canada	-	-	0	-	-	-	-	0	-	-	-	-	**0**
Rest of Ontario	110	111	1,455	159	3	6	-	287	146	-	-	17	**2,293**
Rest of Canada	151	142	103	277	21	36	3	441	484	-	45	49	**1,753**
Total	**275**	**269**	**1,558**	**463**	**24**	**47**	**3**	**795**	**897**	**0**	**2,167**	**1,637**	**8,135**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

10. Blue Water Bridge, Passenger Cars - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	14	-	135	100	**250**
Macomb, MI	-	-	-	-	-	-	-	-	19	-	129	125	**273**
St. Clair, MI	-	-	-	-	-	-	-	-	29	0	1,349	117	**1,496**
Oakland, MI	-	-	-	-	-	-	-	-	39	-	130	250	**420**
Livingston, MI	-	-	-	-	-	-	-	-	3	-	2	11	**16**
Washtenaw, MI	-	-	-	-	-	-	-	-	2	-	7	19	**28**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	3	3	**7**
Rest of Michigan	-	-	-	-	-	-	-	-	116	-	173	392	**682**
Rest of USA	11	15	-	25	-	4	-	63	17	-	53	332	**519**
Windsor, Canada	-	-	0	-	-	-	-	-	-	-	-	-	**0**
Rest of Ontario	93	104	1,375	148	3	5	-	266	120	-	-	16	**2,130**
Rest of Canada	114	129	98	242	18	26	2	406	365	-	42	41	**1,483**
Total	**217**	**247**	**1,472**	**415**	**21**	**35**	**2**	**735**	**726**	**0**	**2,023**	**1,407**	**7,302**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

11. Blue Water Bridge, Passenger Cars - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	16	-	139	121	**277**
Macomb, MI	-	-	-	-	-	-	-	-	18	-	125	123	**267**
St. Clair, MI	-	-	-	-	-	-	-	-	28	0	1,304	113	**1,445**
Oakland, MI	-	-	-	-	-	-	-	-	41	-	129	263	**433**
Livingston, MI	-	-	-	-	-	-	-	-	3	-	2	11	**17**
Washtenaw, MI	-	-	-	-	-	-	-	-	3	-	7	24	**34**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	3	4	**8**
Rest of Michigan	-	-	-	-	-	-	-	-	114	-	168	386	**668**
Rest of USA	12	14	-	24	-	5	-	61	19	-	56	390	**582**
Windsor, Canada	-	-	0	-	-	-	-	-	-	-	-	-	**0**
Rest of Ontario	98	101	1,328	144	3	5	-	259	127	-	-	15	**2,081**
Rest of Canada	134	128	94	250	19	32	3	402	420	-	41	44	**1,567**
Total	**245**	**243**	**1,422**	**419**	**21**	**42**	**3**	**722**	**792**	**0**	**1,973**	**1,495**	**7,377**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

12. Ambassador Bridge, Commercial Vehicles - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	34	571	155	596	**1,356**
Macomb, MI	-	-	-	-	-	-	-	-	1	313	11	25	**350**
St. Clair, MI	-	-	-	-	-	-	-	-	0	26	0	0	**27**
Oakland, MI	-	-	-	-	-	-	-	-	0	66	1	16	**83**
Livingston, MI	-	-	-	-	-	-	-	-	-	9	9	5	**22**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	9	9	27	**45**
Monroe, MI	-	-	-	-	-	-	-	-	-	97	9	95	**200**
Rest of Michigan	-	-	-	-	-	-	-	-	3	178	42	114	**336**
Rest of USA	14	1	0	1	-	-	-	2	20	537	476	2,387	**3,437**
Windsor, Canada	598	191	31	94	35	26	34	157	636	-	-	-	**1,804**
Rest of Ontario	226	23	1	14	1	-	4	82	532	-	-	-	**882**
Rest of Canada	596	32	0	39	8	37	42	86	2,330	-	-	-	**3,170**
Total	**1,434**	**246**	**32**	**149**	**44**	**64**	**80**	**327**	**3,556**	**1,805**	**711**	**3,265**	**11,712**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

13. Ambassador Bridge, Commercial Vehicles - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	25	333	103	415	**877**
Macomb, MI	-	-	-	-	-	-	-	-	1	197	13	33	**245**
St. Clair, MI	-	-	-	-	-	-	-	-	0	15	1	0	**16**
Oakland, MI	-	-	-	-	-	-	-	-	0	41	1	15	**58**
Livingston, MI	-	-	-	-	-	-	-	-	-	6	6	5	**17**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	5	5	19	**29**
Monroe, MI	-	-	-	-	-	-	-	-	-	53	5	61	**119**
Rest of Michigan	-	-	-	-	-	-	-	-	5	106	38	113	**261**
Rest of USA	10	1	0	2	-	-	-	3	13	302	301	1,753	**2,385**
Windsor, Canada	364	122	20	61	22	14	19	98	365	-	-	-	**1,086**
Rest of Ontario	143	18	1	12	1	-	4	63	336	-	-	-	**579**
Rest of Canada	419	41	1	43	7	26	27	100	1,708	-	-	-	**2,372**
Total	**937**	**182**	**21**	**118**	**30**	**40**	**51**	**263**	**2,454**	**1,058**	**473**	**2,416**	**8,043**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

14. Ambassador Bridge, Commercial Vehicles - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	33	451	137	553	**1,175**
Macomb, MI	-	-	-	-	-	-	-	-	2	267	16	43	**328**
St. Clair, MI	-	-	-	-	-	-	-	-	0	21	1	0	**22**
Oakland, MI	-	-	-	-	-	-	-	-	1	55	2	20	**78**
Livingston, MI	-	-	-	-	-	-	-	-	-	8	8	6	**22**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	7	7	26	**40**
Monroe, MI	-	-	-	-	-	-	-	-	-	72	7	82	**161**
Rest of Michigan	-	-	-	-	-	-	-	-	6	143	50	145	**344**
Rest of USA	14	1	0	3	-	-	-	3	18	409	403	2,323	**3,173**
Windsor, Canada	494	166	27	83	30	20	26	133	495	-	-	-	**1,474**
Rest of Ontario	193	24	1	16	1	-	6	84	452	-	-	-	**777**
Rest of Canada	560	54	1	57	9	34	37	127	2,275	-	-	-	**3,153**
Total	**1,261**	**245**	**29**	**159**	**40**	**54**	**68**	**347**	**3,282**	**1,432**	**631**	**3,198**	**10,747**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

15. Gordie Howe International Bridge, Commercial Vehicles - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	25	332	109	437	**903**
Macomb, MI	-	-	-	-	-	-	-	-	1	170	12	30	**213**
St. Clair, MI	-	-	-	-	-	-	-	-	0	15	1	0	**16**
Oakland, MI	-	-	-	-	-	-	-	-	0	37	1	14	**53**
Livingston, MI	-	-	-	-	-	-	-	-	-	4	5	4	**14**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	5	6	21	**32**
Monroe, MI	-	-	-	-	-	-	-	-	-	60	6	68	**134**
Rest of Michigan	-	-	-	-	-	-	-	-	4	102	38	113	**257**
Rest of USA	10	1	0	2	-	-	-	2	14	324	330	1,896	**2,579**
Windsor, Canada	326	99	16	48	19	16	20	83	369	-	-	-	**996**
Rest of Ontario	141	15	1	10	1	-	5	57	351	-	-	-	**581**
Rest of Canada	415	36	0	37	6	27	29	89	1,751	-	-	-	**2,389**
Total	**892**	**150**	**17**	**97**	**26**	**43**	**54**	**232**	**2,515**	**1,051**	**507**	**2,584**	**8,167**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

16. Gordie Howe International Bridge, Commercial Vehicles - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	33	447	144	579	**1,203**
Macomb, MI	-	-	-	-	-	-	-	-	2	228	15	39	**284**
St. Clair, MI	-	-	-	-	-	-	-	-	0	21	1	0	**22**
Oakland, MI	-	-	-	-	-	-	-	-	1	50	1	19	**70**
Livingston, MI	-	-	-	-	-	-	-	-	-	6	7	6	**19**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	7	8	28	**42**
Monroe, MI	-	-	-	-	-	-	-	-	-	81	8	90	**179**
Rest of Michigan	-	-	-	-	-	-	-	-	5	137	49	146	**337**
Rest of USA	13	1	0	2	-	-	-	3	19	436	440	2,500	**3,414**
Windsor, Canada	439	133	21	65	25	22	27	113	498	-	-	-	**1,342**
Rest of Ontario	189	20	1	14	1	-	6	76	469	-	-	-	**776**
Rest of Canada	552	46	1	48	8	35	39	113	2,319	-	-	-	**3,161**
Total	**1,193**	**200**	**23**	**129**	**34**	**57**	**72**	**304**	**3,345**	**1,413**	**673**	**3,406**	**10,849**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

17. Detroit-Windsor Tunnel, Commercial Vehicles - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	1	16	4	16	**37**
Macomb, MI	-	-	-	-	-	-	-	-	0	14	0	1	**15**
St. Clair, MI	-	-	-	-	-	-	-	-	-	1	0	-	**1**
Oakland, MI	-	-	-	-	-	-	-	-	0	2	0	1	**3**
Livingston, MI	-	-	-	-	-	-	-	-	-	0	0	0	**1**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	0	0	1	**1**
Monroe, MI	-	-	-	-	-	-	-	-	-	2	0	2	**5**
Rest of Michigan	-	-	-	-	-	-	-	-	0	6	1	3	**10**
Rest of USA	0	-	-	0	-	-	-	-	0	15	11	59	**86**
Windsor, Canada	5	2	0	1	0	0	0	1	4	-	-	-	**14**
Rest of Ontario	2	0	0	0	0	-	0	1	3	-	-	-	**6**
Rest of Canada	4	0	-	0	0	0	0	1	15	-	-	-	**21**
Total	**10**	**2**	**0**	**1**	**0**	**0**	**1**	**2**	**24**	**56**	**18**	**83**	**199**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

18. Detroit-Windsor Tunnel, Commercial Vehicles - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	1	8	3	11	**22**
Macomb, MI	-	-	-	-	-	-	-	-	0	8	0	1	**10**
St. Clair, MI	-	-	-	-	-	-	-	-	-	0	0	-	**0**
Oakland, MI	-	-	-	-	-	-	-	-	0	1	0	0	**2**
Livingston, MI	-	-	-	-	-	-	-	-	-	0	0	0	**0**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	0	0	1	**1**
Monroe, MI	-	-	-	-	-	-	-	-	-	1	0	1	**3**
Rest of Michigan	-	-	-	-	-	-	-	-	0	3	1	3	**8**
Rest of USA	0	0	-	0	-	-	-	0	0	8	7	42	**57**
Windsor, Canada	3	1	0	1	0	0	0	1	2	-	-	-	**8**
Rest of Ontario	1	0	0	0	0	-	0	0	2	-	-	-	**4**
Rest of Canada	3	0	-	0	0	0	0	1	11	-	-	-	**16**
Total	**7**	**2**	**0**	**1**	**0**	**0**	**0**	**2**	**16**	**31**	**12**	**59**	**130**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

19. Detroit-Windsor Tunnel, Commercial Vehicles - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	1	14	4	18	**37**
Macomb, MI	-	-	-	-	-	-	-	-	0	14	1	2	**16**
St. Clair, MI	-	-	-	-	-	-	-	-	-	1	0	-	**1**
Oakland, MI	-	-	-	-	-	-	-	-	0	2	0	1	**3**
Livingston, MI	-	-	-	-	-	-	-	-	-	0	0	0	**1**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	0	0	1	**1**
Monroe, MI	-	-	-	-	-	-	-	-	-	2	0	2	**4**
Rest of Michigan	-	-	-	-	-	-	-	-	0	5	2	5	**12**
Rest of USA	0	0	-	0	-	-	-	0	0	13	12	70	**95**
Windsor, Canada	5	2	0	1	0	0	0	1	4	-	-	-	**14**
Rest of Ontario	2	0	0	0	0	-	0	1	3	-	-	-	**6**
Rest of Canada	5	1	-	1	0	0	0	1	18	-	-	-	**26**
Total	**11**	**3**	**0**	**2**	**0**	**0**	**1**	**3**	**27**	**52**	**19**	**98**	**217**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

20. Blue Water Bridge, Commercial Vehicles - 2017 Daily Trip Table

2017	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	15	-	75	226	**317**
Macomb, MI	-	-	-	-	-	-	-	-	4	-	57	200	**261**
St. Clair, MI	-	-	-	-	-	-	-	-	8	0	37	90	**135**
Oakland, MI	-	-	-	-	-	-	-	-	2	-	6	27	**35**
Livingston, MI	-	-	-	-	-	-	-	-	-	-	4	7	**11**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	-	1	11	**12**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	2	24	**27**
Rest of Michigan	-	-	-	-	-	-	-	-	67	0	157	446	**670**
Rest of USA	5	4	3	7	-	-	-	35	7	-	183	1,365	**1,608**
Windsor, Canada	-	-	0	-	-	-	-	0	-	-	-	-	**0**
Rest of Ontario	41	50	36	19	3	-	7	141	183	-	-	-	**481**
Rest of Canada	208	202	128	86	7	13	11	488	1,207	-	-	-	**2,349**
Total	**254**	**256**	**167**	**112**	**10**	**13**	**18**	**663**	**1,492**	**0**	**523**	**2,397**	**5,906**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

21. Blue Water Bridge, Commercial Vehicles - 2025 Daily Trip Table

2025	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	7	-	55	101	**164**
Macomb, MI	-	-	-	-	-	-	-	-	3	-	54	196	**252**
St. Clair, MI	-	-	-	-	-	-	-	-	10	0	42	103	**155**
Oakland, MI	-	-	-	-	-	-	-	-	2	-	5	20	**27**
Livingston, MI	-	-	-	-	-	-	-	-	-	-	3	4	**7**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	-	0	5	**5**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	2	10	**11**
Rest of Michigan	-	-	-	-	-	-	-	-	71	0	153	417	**641**
Rest of USA	2	4	4	5	-	-	-	37	3	-	133	690	**879**
Windsor, Canada	-	-	0	-	-	-	-	0	-	-	-	-	**0**
Rest of Ontario	24	51	41	15	3	-	4	136	137	-	-	-	**410**
Rest of Canada	91	192	146	64	4	6	4	471	614	-	-	-	**1,592**
Total	**117**	**246**	**190**	**84**	**7**	**6**	**8**	**644**	**846**	**0**	**448**	**1,546**	**4,143**

Source: IGTAR Trip Tables, compiled by FHWA 2018.

22. Blue Water Bridge, Commercial Vehicles - 2040 Daily Trip Table

2040	Wayne, MI	Macomb, MI	St. Clair, MI	Oakland, MI	Livingston, MI	Washtenaw, MI	Monroe, MI	Rest of Michigan	Rest of USA	Windsor, Canada	Rest of Ontario	Rest of Canada	Total
Wayne, MI	-	-	-	-	-	-	-	-	11	-	79	156	**246**
Macomb, MI	-	-	-	-	-	-	-	-	4	-	74	269	**347**
St. Clair, MI	-	-	-	-	-	-	-	-	13	0	57	139	**209**
Oakland, MI	-	-	-	-	-	-	-	-	2	-	7	28	**37**
Livingston, MI	-	-	-	-	-	-	-	-	-	-	4	6	**10**
Washtenaw, MI	-	-	-	-	-	-	-	-	-	-	1	7	**8**
Monroe, MI	-	-	-	-	-	-	-	-	-	-	2	15	**17**
Rest of Michigan	-	-	-	-	-	-	-	-	97	0	211	580	**888**
Rest of USA	3	5	5	7	-	-	-	50	4	-	190	1,040	**1,305**
Windsor, Canada	-	-	0	-	-	-	-	0	-	-	-	-	**0**
Rest of Ontario	35	70	55	20	4	-	6	187	194	-	-	-	**571**
Rest of Canada	141	264	198	90	6	9	6	653	917	-	-	-	**2,283**
Total	**179**	**339**	**258**	**118**	**10**	**9**	**12**	**890**	**1,242**	**0**	**626**	**2,239**	**5,922**

Source: IGTAR Trip Tables, compiled by FHWA 2018.