



Welland Transportation Master Plan

Appendix 4 – Transportation Planning Assessment

Final

**Prepared for:
The City of Welland**

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WELLAND TRANSPORTATION MASTER PLAN (TMP)

TRANSPORTATION PLANNING ASSESSMENT

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1.0 Introduction

As part of the City of Welland (Welland) Transportation Master Plan (TMP) Study, a transportation planning assessment was completed to determine the need for future road improvements by the 2051 horizon. The assessment included a comprehensive review of local geography, demographics, travel patterns, and trends, to ensure that the solutions are tailored to the mobility context of Welland. Understanding how, why, and where people are moving within the City and beyond will help identify initiatives that enable livable communities and thriving businesses.

1.1 Vision Statement

At the onset of the TMP study, numerous objectives were established to guide the study process. These objectives include:

- (1) connecting residential, commercial and industrial areas;
- (2) enhancing active transportation including cycling and walking;
- (3) promoting safe, environmentally responsible, and accessible mobility;
- (4) providing links to areas of growth, neighbouring municipalities, and key transport corridors; and,
- (5) updating/creating transportation policy documents to support the community vision.

The foregoing objectives were considered in the formulation of a vision statement for the TMP. This vision statement is as follows:

“An inclusive and barrier-free transportation system that promotes the development of vibrant and livable communities through multi-modal mobility, safe roads, intraregional connectivity, and conservation of Welland’s rich heritage and water features.”

2.0 Community Planning Context

2.1 The Community

Located in the heart of the Niagara Peninsula, the City of Welland is a lower-tier municipality within the Region of Niagara, home to a total of 55,750 residents in 2021. The City is abutted by numerous municipalities within the Region, including the Town of Pelham to the northwest, City of Thorold to the northeast, City of Niagara Falls to the east, City of Port

Colborne to the south, and the Township of Wainfleet to the west. Geographically, the City can be easily identified by its distinctive waterways that travel through the City limits. A graphical representation of Welland's location within Niagara Region can be seen in **Figure 2.1**.

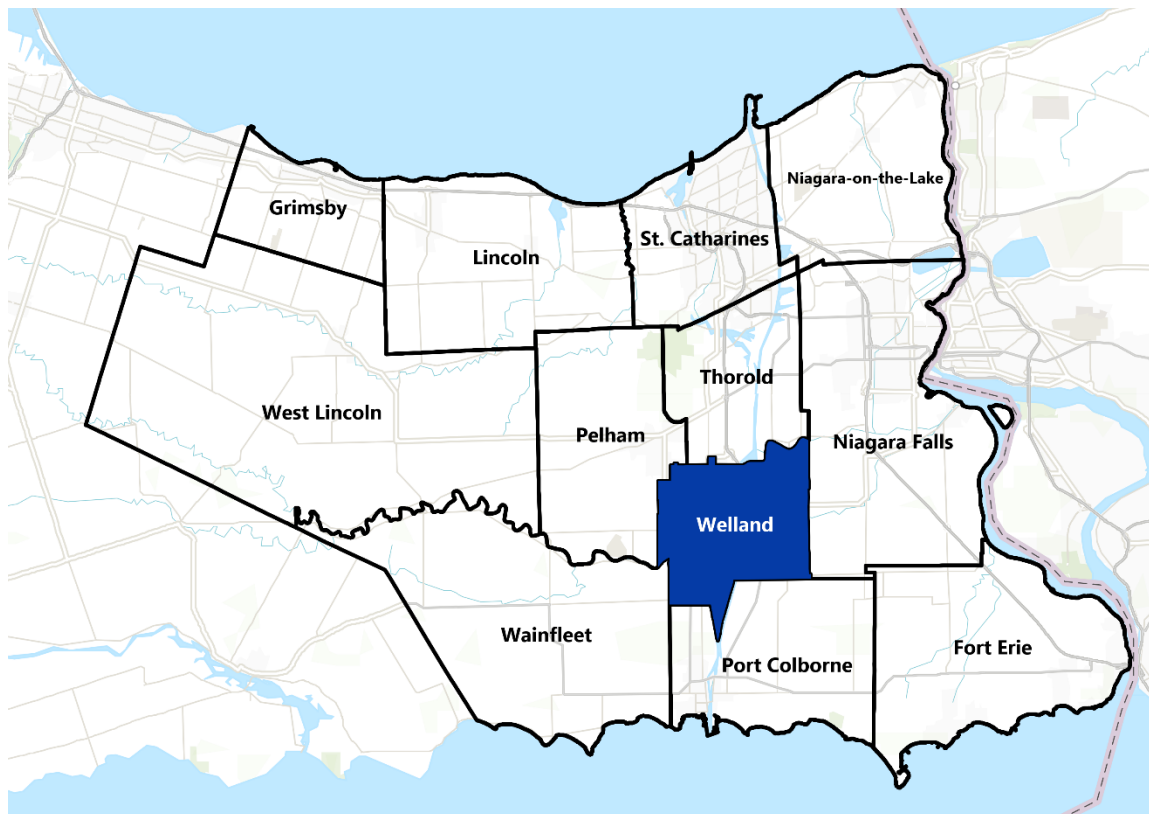


Figure 2.1 – Welland's Location within Niagara Region

2.2 The People

As per the results of the 2021 Census, the age distribution within Welland is reasonably balanced, although there is a significant distribution of the population in the “65 and over” age bracket (23.03% of total population). The age distribution for Welland residents is shown in **Figure 2.2**.

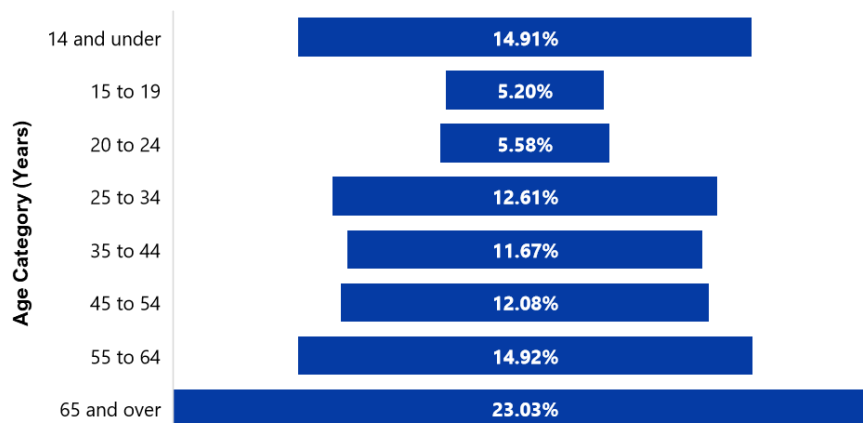


Figure 2.2 – Welland Resident Age Distribution (Statistics Canada, 2021 Census of Population)

The age distribution within the Welland is consistent with the 2021 Census results for the Region of Niagara. However, there are notable differences between the Welland age distribution and the Ontario age distribution, with the primary observation being that Welland has an aging population compared to the provincial average.

In Ontario, the “65 and over” bracket was recorded at 18.56%, which is approximately 4.47% lower than Welland’s distribution. This trend is expected to continue as nearly one third of Welland’s “65 and over” age bracket is comprised of residents aged 65 to 69, and a substantial number of residents in the “55 to 64” age bracket will transition into this group over the coming years. Another notable observation is that Welland consistently recorded lower age distribution than the provincial average for all age brackets from “14 and under” to “45 to 54”. These observations are further supported by the median ages, where Welland has a median age of 45.2 and the Province of Ontario has a median age of 41.6. A more detailed comparison between the City of Welland, the Niagara Region, and the Province of Ontario, can be seen in **Figure 2.3**.

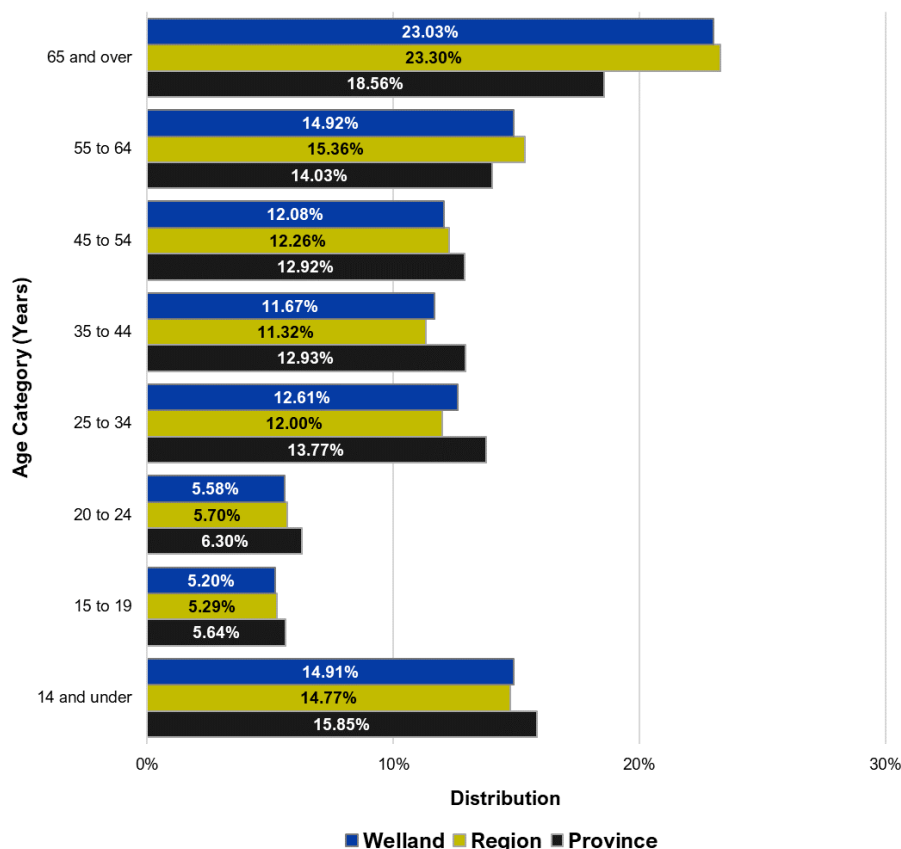


Figure 2.3 – Age Distribution Comparison (Statistics Canada, 2021 Census of Population)

Personal and household income is known to have a considerable influence on the population’s day-to-day transportation choices. The median after-tax income for individual recipients in 2020 was \$34,400 and the median after-tax income for households was \$65,000, both of which are lower than the regional and provincial medians after-tax income.

As for education, 58.3% of residents were recorded to have a post-secondary education in the form of a certificate, diploma or degree. This is lower than the provincial average of 67.8%.

The Census results indicated that 11.9% of residents within Welland identified as immigrants, which is substantially lower than the provincial distribution of 30%. The most common birth places among recent immigrants include India (18.9%), the United States (8.4%), and the Philippines (5.6%). A total of 4.3% of Welland’s population identifies as indigenous, predominantly split between those who identify as First Nations (2.9%) and Métis (1.4%).

2.3 The Employment

The identity and context of Welland's employment is dynamic and subject to considerable change over the next twenty years. However, barring an approximate 15-year period between 2001 and 2016 where manufacturing employment dwindled as a result of recessions, free trade agreements, and increased prevalence of automation, the City has historically been defined as one of Niagara Region's primary industrial and manufacturing cores. Since this recession in the manufacturing industry, the economic focus on manufacturing within Welland has experienced a resurgence with the arrival of numerous businesses in recent years, which has resulted in the manufacturing job share within Welland increasing from 7.8% in 2016 to 9.5% in 2021. Furthermore, as per the Region's Land Needs Assessment (August 2021), the City of Welland is forecast to accommodate the principal share of the Region's growth in urban industrial-type employment areas through to 2051.

2.4 The Housing

In terms of residential context, the City recorded a total of 23,660 residential dwellings in 2021 with an average household size of 2.3 persons per dwelling unit. The housing consists of predominantly single family detached dwellings (64.5%), with a moderate share of semi-detached homes (7.1%), townhomes (4.5%), and a fair share of apartments (17.1% for low- and mid-rise apartments, 6.3% for high-rise apartments). The remaining dwellings (0.5%) were classified as other single-attached housing units or movable units (RVs). This dwelling type distribution is illustrated in **Figure 2.4** below.

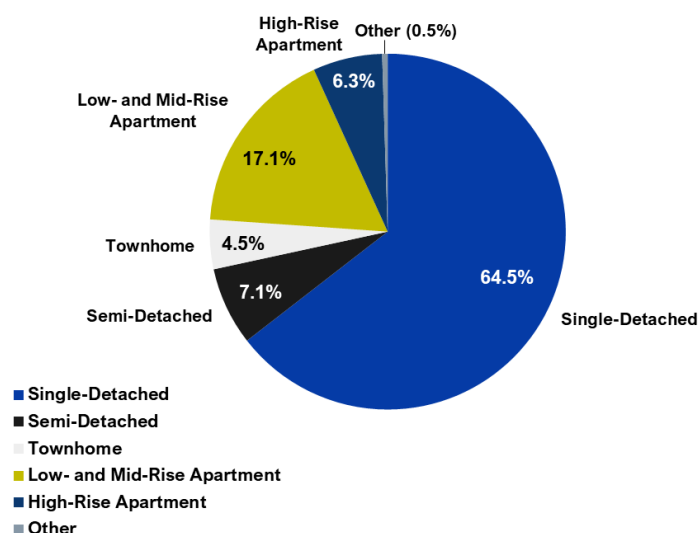


Figure 2.4 – Occupied Private Dwellings by Type (Statistics Canada, 2021 Census of Population)

3.0 Mobility Planning Context

3.1 Travel Mode Share

Based on the 2016 Transportation Tomorrow Survey (TTS) results, the predominant travel mode choice for Welland residents is the single-occupancy automobile at 74.4%. This trend is consistent with the 2011 results which also exhibit a high dependency on automobiles. A comparison between the 2011 and 2016 transportation mode splits are shown in **Figure 3.1**.

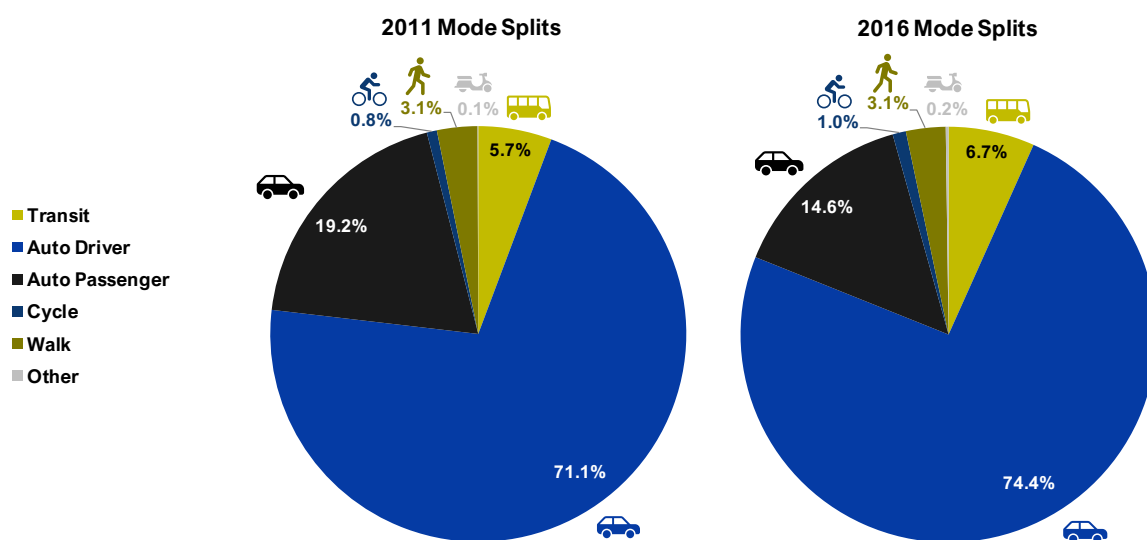


Figure 3.1 – 2011 to 2016 Mode Share Comparison (Transportation Tomorrow Survey)

As seen in **Figure 3.1**, the modal splits from 2011 to 2016 indicate a notable reduction in the distribution of automobile passengers, with these trips being distributed to single-occupancy vehicle and transit. The use of active transportation remained generally consistent across both survey periods.

These findings are expected given that low density housing is the predominant dwelling type within Welland. It is widely understood that lower density housing such as single-detached and semi-detached dwellings foster the use of private automobiles, while higher density housing encourages the use of alternate modes such as transit, walking, and cycling. Generally, modes such as transit and active transportation are a more desirable form of travel within metropolitan areas where residential and employment land uses intertwine. In Welland, the land uses are typically partitioned in a way that common trips (i.e., commuting, shopping, etc.) are strenuous or inconvenient for walkers and cyclists, and transit options may be limited.

3.1.1 Transit Usage

Transit within Welland and Port Colborne was formerly provided by the Welland Transit Service but has since been assumed by the Niagara Region Transit Service as of January 2023. Data reflecting annual transit ridership has been compiled from the *Canadian Urban Transit Association (CUTA) Operating Data* factbooks from 2011 to 2020, this information is summarized in **Figure 3.2**.

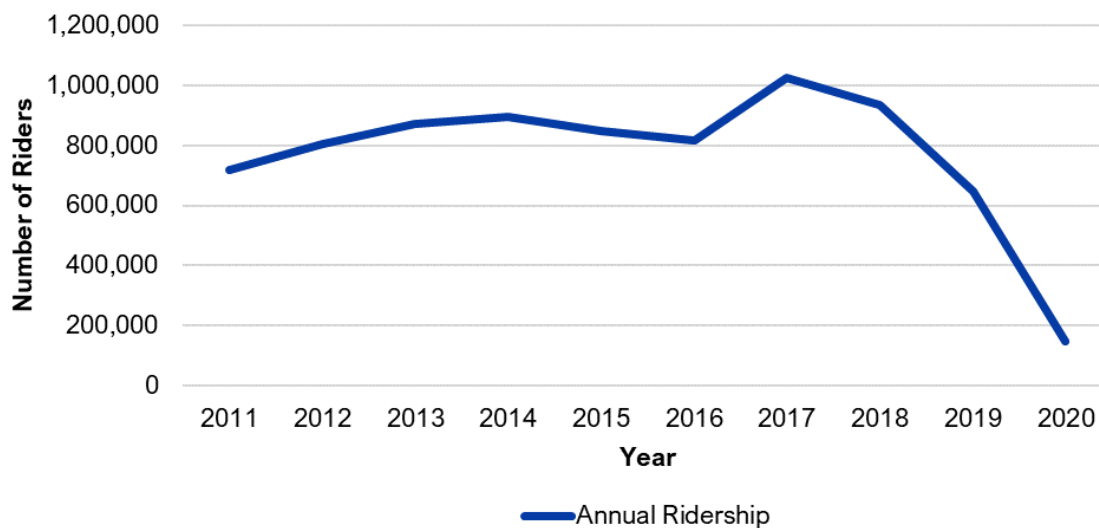


Figure 3.2 – Welland Transit Service Annual Ridership (Source: CUTA Factbook, 2011 to 2020)

As shown in **Figure 3.2**, transit ridership on the Welland Transit Service peaked in the year 2017 but was immediately followed by a consistent and steep decline. In fact, transit ridership in 2019 was the lowest in the decade, barring 2020 when transit ridership was heavily impacted by the COVID-19 pandemic (i.e., work-from-home, online school, etc.). These trends align with the aforementioned travel mode share trends that indicate a high dependency on automobiles within the City.

3.2 Trip Characteristics

Commuter statistics from the *Transportation Tomorrow Survey (2016)* have been referenced to establish travel patterns within the City; the commuter trends are summarized in **Table 3.1**.

**Table 3.1 – Commuter Distribution for
Welland Residents (2016 TTS)**

Destination	Distribution
Welland	40.75%
St. Catharines	17.15%
Niagara Falls	11.55%
Pelham	5.13%
Thorold	4.92%
Hamilton	4.30%
Port Colborne	4.26%
Niagara-on-the-Lake	2.67%
Greater Toronto Area	2.49%
Lincoln	2.22%
Fort Erie	1.90%
Wainfleet	0.95%
Grimsby	0.55%
West Lincoln	0.53%
Other	0.63%

The data shows that approximately 41% of Welland commuters work within the limits of the City, with other notable commuter generators including the City of St. Catharines and the City of Niagara Falls. Majority of the remaining commuters are dispersed through neighbouring municipalities within the Niagara Region as well as the Greater Toronto-Hamilton Area. Responses also indicated that a small number of residents commute to the Region of Waterloo, the City of Cambridge, Haldimand County, and the City of Brantford; however, all of these trips comprise less than one (1) percent of the commuters within Welland.

The general commuter trends originating from the City of Welland are illustrated in **Figure 3.3**.

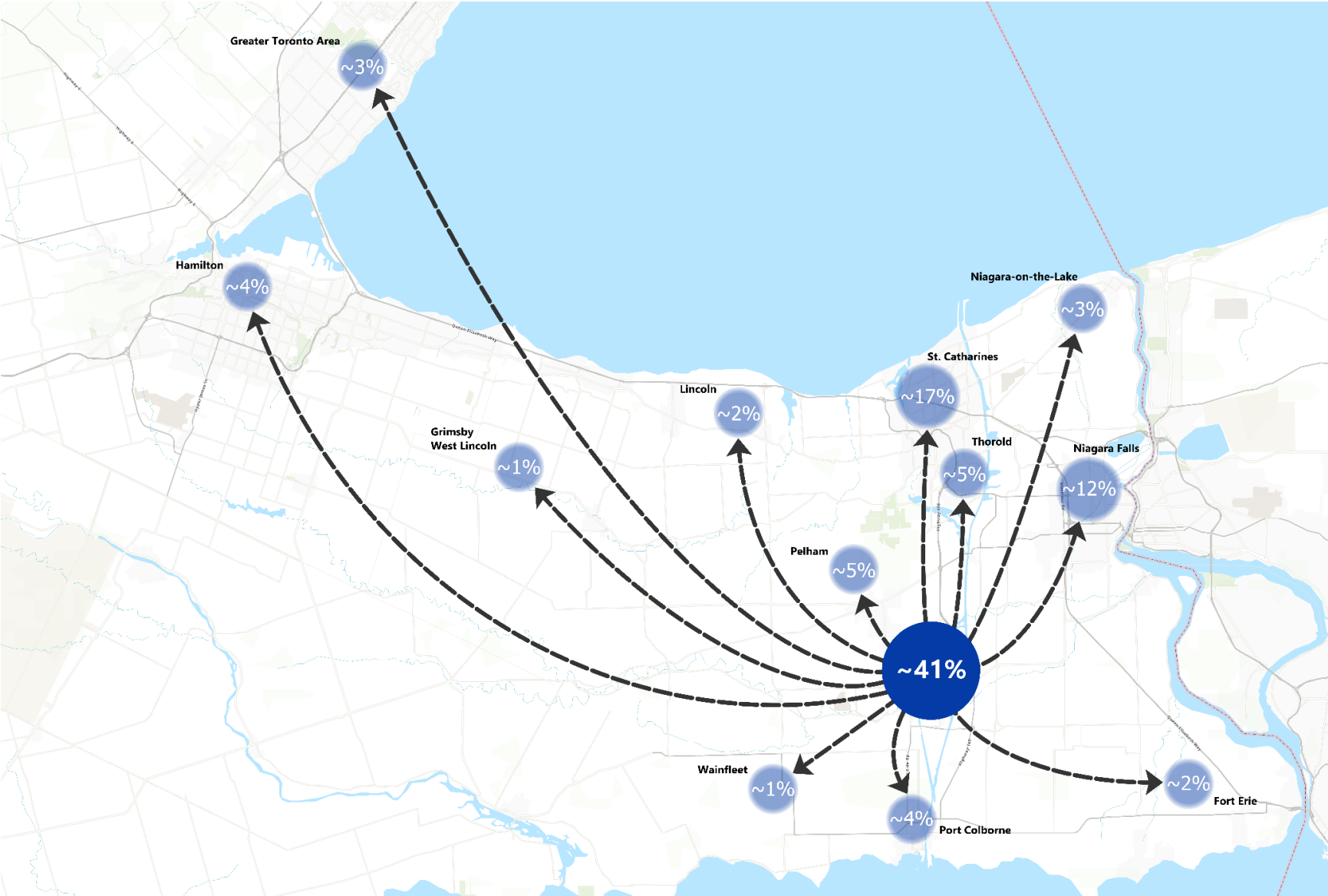


Figure 3.3 – Welland Commuter Distribution (2016 TTS)

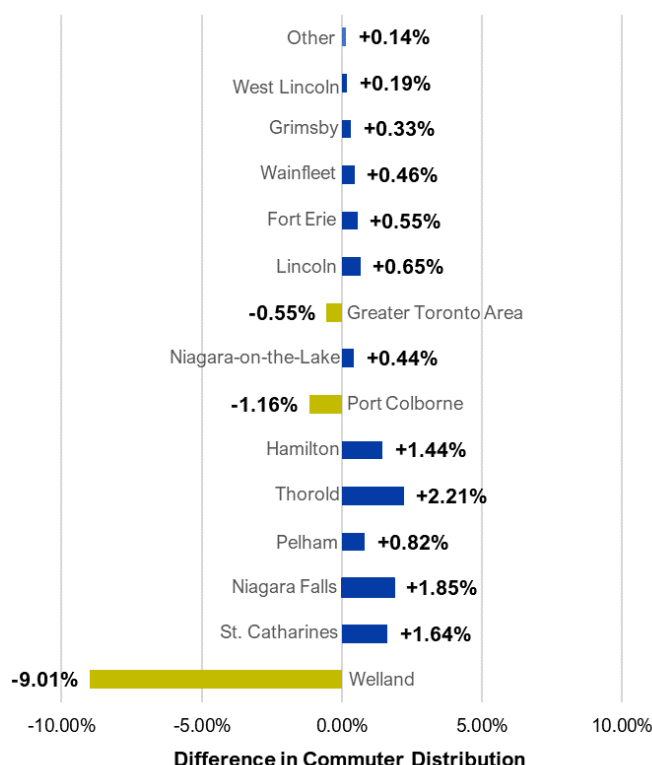


Figure 3.4 – Changes in Commuter Distribution from 2011 to 2016

When compared to the commuter statistics from 2011, there is a noteworthy reduction in the percentage of the City population that work within Welland. As seen in **Figure 3.4**, an approximate 9% of the population that worked within Welland was dispersed across the City of Hamilton and Niagara Region municipalities, barring Port Colborne which exhibited a decrease as well. There was also a slight decrease in the number of commuters to the greater Toronto area municipalities. The municipalities that showed the greatest increase in commuters from Welland were the City of Thorold, the City of Niagara Falls, the City of St. Catharines and the City of Hamilton

Fully remote and hybrid work arrangements are becoming more prevalent, making it easier for individuals to live in a separate municipality from the one they work in. This new trend belies the traditional approach where individuals attempted to reduce commute times by living near their workplace. As a result, many municipalities may experience a shift in commuter distribution to reflect more dispersed commuter statistics. However, this realization may not be made by Welland over the coming years, as the resurgence of the manufacturing industry within Welland is expected to bring an influx of on-site industrial jobs.

4.0 Future Conditions

The City of Welland is anticipating sizeable population growth through to 2041. This growth was previously projected at 105,975 by the year 2041 in the *2022 Development Charges Background Study* ("DC study"). However, the ongoing OP Update has noted an even greater growth projection as a result of proposed major residential developments throughout the City and increased intensification within identified intensification areas.

To evaluate the impacts of the increased population, the Niagara Region Travel Forecasting Model was used to identify future constraints within the network. As part of the TMP study,

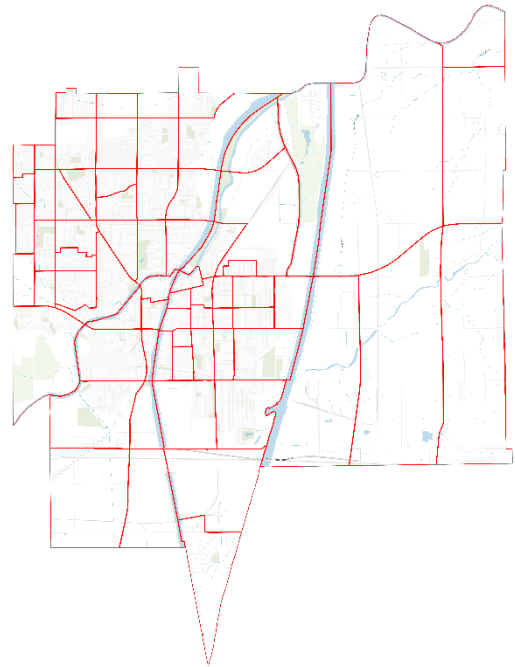
new population projections were formulated in consultation with City Planning staff and integrated with the model thereafter. Subsequent sections outline the methodology that was utilized in this process.

4.1 City Planning Projections

The traffic analysis zones (TAZ) that were refined as part of the model update were adopted for this analysis, with their associated minimum and maximum dwelling unit and employment population projections for 2041 and 2051 being provided by the City. These traffic analysis zones are used in transportation planning models, and are established based on origin/destination characteristics, population, and other spatial attributes that could impact travel patterns (i.e., natural barriers, etc.). The traffic assessment zones are shown in **Figure 4.1**.

As a conservative approach for transportation analysis, the maximum dwelling unit projection was adopted for forecasting purposes. This approach magnifies capacity constraints within the model and allows mitigation measures to be proactive rather than reactive.

The approximate locations of dwelling unit and employment forecasts for the 2051 horizon year are illustrated in **Figure 4.2** and **Figure 4.3**, respectively.



**Figure 4.1 – Welland Traffic Analysis
Boundaries**

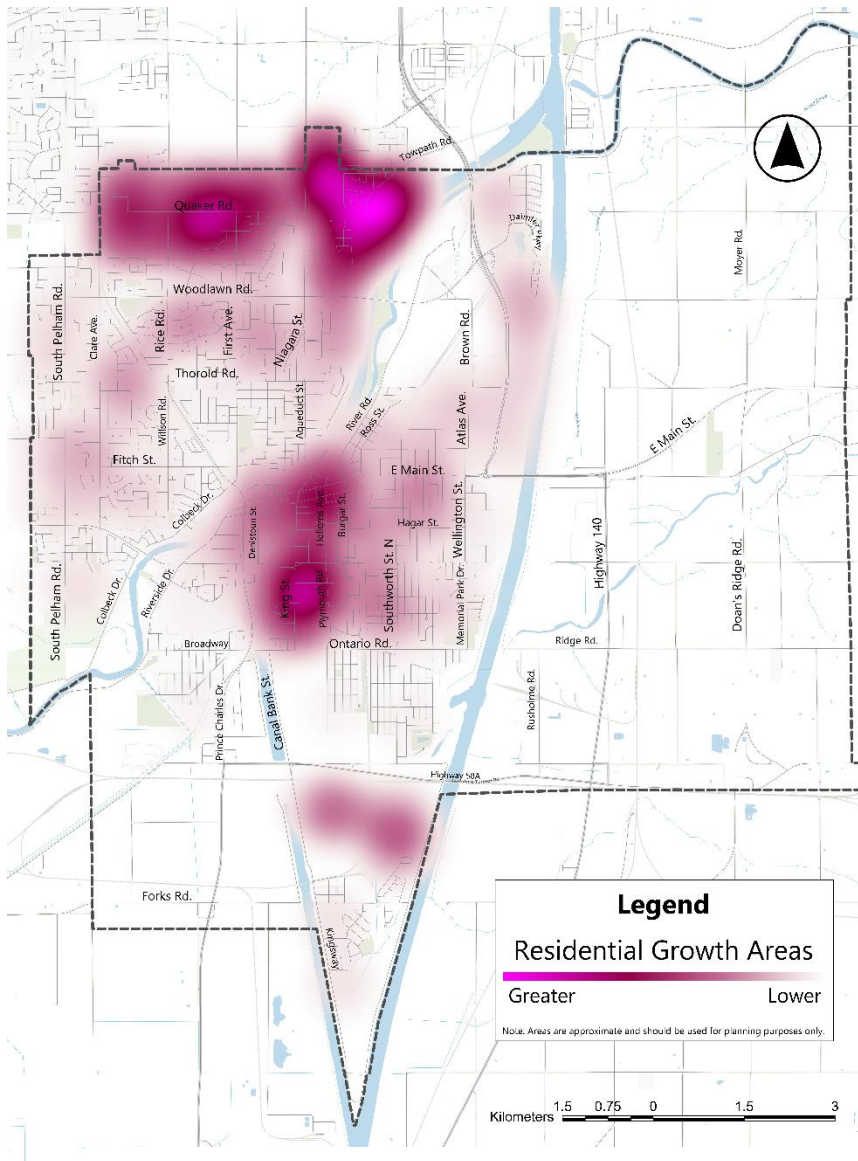


Figure 4.2 – Residential Growth (2051 Horizon Year)

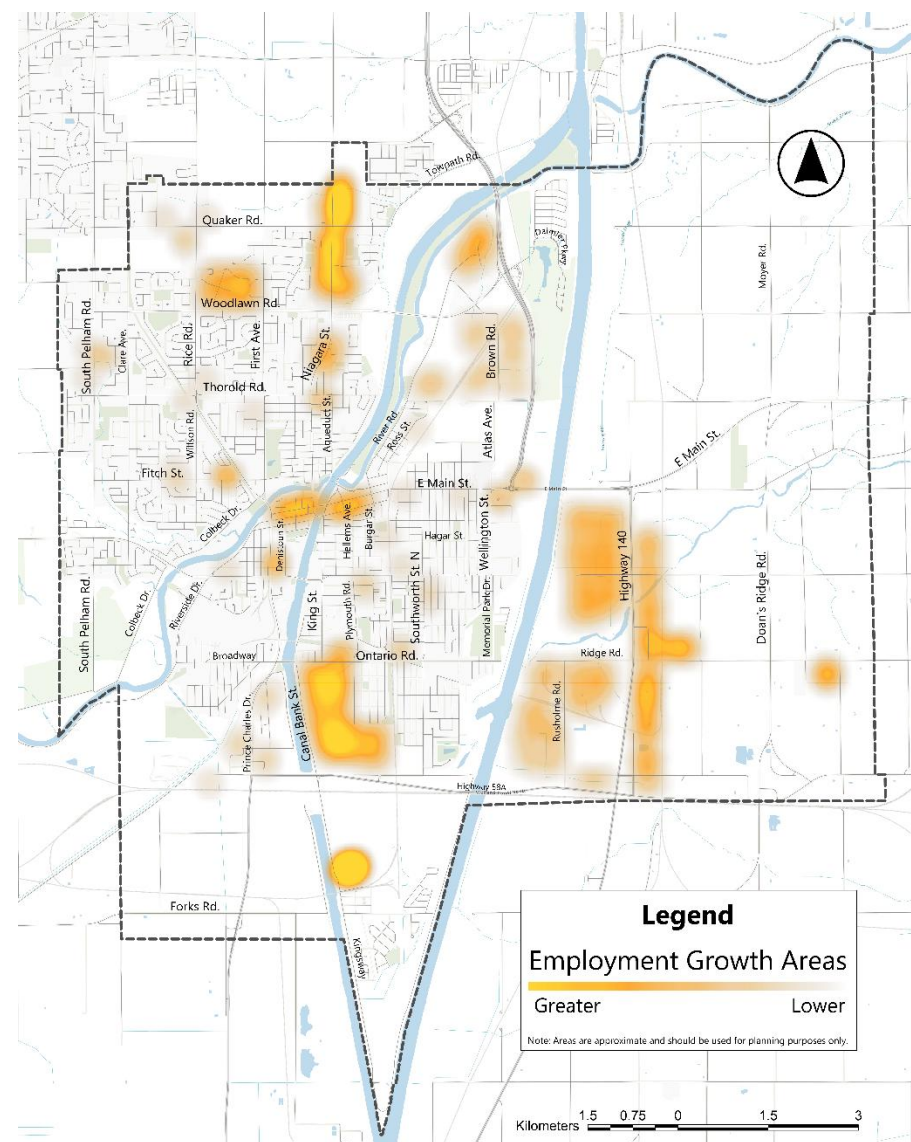


Figure 4.3 – Employment Growth (2051 Horizon Year)

In addition to the dwelling unit projections, the analysis required housing densities for each zone that were reflective of the anticipated changes in housing type mix. Therefore, the dwelling unit housing mixes outlined in the 2022 DC Study were reviewed to calibrate the residential population forecasts. Although the projections in the DC Study have changed as part of the OP update, the general overview still illustrates a considerable shift in the housing mix by 2041, largely attributed to the greater emphasis on medium-to-high density housing.

The 2022 DC study aggregated the City-wide housing mix as follows: 40.1% single/semi-detached, 23.5% row homes and townhomes, 30.5% apartment units, and 5.9% accessory dwellings. The DC study also aggregated a separate housing mix for the Northwest Welland Secondary Plan, which has a lower density of 67.03% single/semi-detached, 24.78% row homes and townhomes and 8.19% apartment units. These distributions are presented in Figure 4.4.

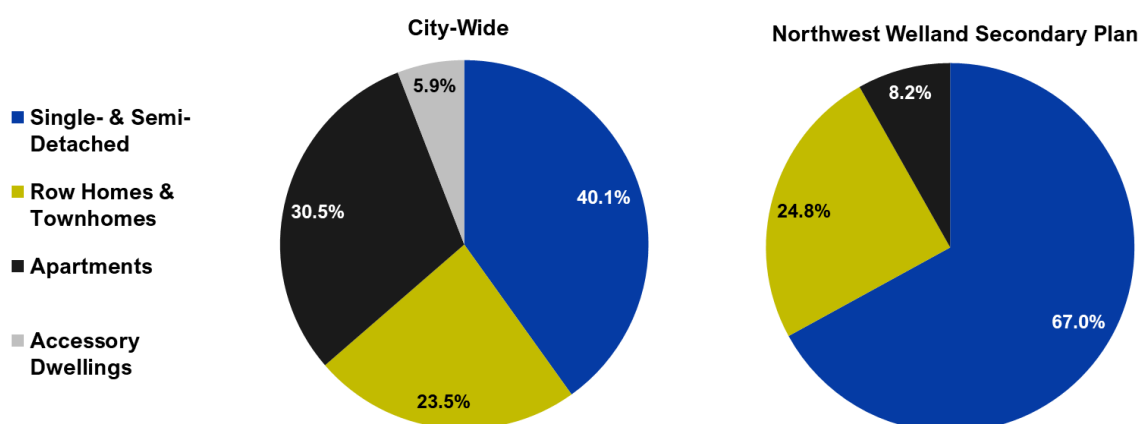


Figure 4.4 – 2041 Housing Type Mix (2022 DC Study)

These distributions differ considerably from the existing city-wide housing mix of 71.6% for single- and semi-detached dwellings, 4.5% for townhomes, and 23.4% for apartment units. Furthermore, considering the additional intensification outlined in the OP update, it can be reasonably assumed that the higher density housing such as apartment buildings will be even more prevalent than what is reflected in the DC Study. To ensure that these trends were reflected in the residential population forecasts, the housing densities for each zone were reviewed in consultation with City Planning staff, with manual adjustments being made as needed to calibrate with the density assumptions (i.e., reducing persons per dwelling unit in high-density areas). The average housing density across all zones was 2.23 persons per

dwelling which is lower than the provincial average of 2.58 persons per dwelling (2016 Census).

Using the upper-limit dwelling unit projections in conjunction with the calibrated housing densities, maximum residential population forecasts were established for the 2031, 2041 and 2051 horizon years. Employment populations were provided by City Planning staff. These projections are shown in **Table 4.1**, with the projections by traffic zone available in **Appendix 1**. It should be noted that the subsequent values represent the absolute total for dwelling units and populations, they are not additional to the existing numbers.

Table 4.1 – City of Welland Upper Limit Growth Projections

Horizon Year	Maximum Dwelling Unit Projections	Residential Population	Employment Population
2031*	39,036	89,135	21,079
2041	54,343	121,422	26,134
2051	66,342	149,406	31,227

*In absence of 2031 dwelling unit projections, 2031 volumes were interpolated based on the 2041 projection.

It is understood that the projections shown in **Table 4.1** are conservative in nature and represent full build-out of many of the planned development areas. As previously noted, the maximum growth projections were adopted to identify potential capacity constraints within the transportation network. The implementation of the mitigation measures is subject to further study and will be reviewed as growth projections materialize and adapt.

5.0 Travel Demand Modelling

5.1 Methodology

The Niagara Region Travel Forecasting Model is an analysis tool that is utilized to predict travel behaviours in the Niagara Region and Greater Toronto and Hamilton Area (GTHA). The model is a valuable instrument in quantifying the degree to which policy adjustments, changes to infrastructure, and more, will impact travel patterns within the Region. The modelling exercise has been completed using an agent-based microsimulation (ABM) model within the Emme interface.

The activity-based model is a departure from the trip-based, “four-step” approach that was formerly used in the Niagara Region TMP (2017). Trip-Based Models have been the most prevalent form of travel demand modelling for many years. However, a limitation of this approach is that it effectively models individual person trips in isolation, and therefore does not consider the reality that different trips are normally completed in sequence (i.e., commuters stopping for groceries on the way home from work). The activity-based model seeks to represent an individual’s travel behaviour throughout the day and is influenced by a number of household and person attributes. For example, a household’s ability to produce auto trips will be limited by the number of vehicles that they have—and personal characteristics such as gender, age, and worker status, will impact a person’s travel tendencies. As a result, the activity-based approach is generally viewed as a more comprehensive methodology for deriving the complex trips (i.e., trip chaining, off-peak trips, etc.) that occur within the transportation system on a daily basis.

The modelling exercise was an iterative process that included three (3) separate model runs. In general, each model run consisted of refinements to roadway characteristics at a localized level or adjustments to planning and/or policy direction. The behaviour of the activity-based model is largely based on zonal characteristics (i.e., number of households, type of households, employment, etc.), in addition to anonymized household and person attributes that are extracted from Statistics Canada Census data at an aggregate level.

Despite the change in modelling approach, the modelling exercise adopted similar roadway characteristics to that of the Region TMP (2017). The road class assumptions utilized in the modelling exercise are summarized in **Table 5.1**.

Table 5.1 – Model Roadway Characteristics

Road Class	Free-Flow Speed (km/hr)	Capacity (veh/hr/lane)
Local	40-50	500
Minor Collector	40-50	500-700
Major Collector	50-60	700
Arterial	50-60	700-1000

5.2 Results

Emme model outputs were exported for the 2016 base year, as well as the 2031, 2041, and 2051 horizon years. The final results for the future horizons represent that of the third iteration, which encompasses the revised population and employment statistics from the

Official Plan (OP) Update, as well as numerous calibration adjustments to model architecture and zonal characteristics.

There are a variety of outputs from the Emme model; one of the key exports, however, is the volume-to-capacity (V/C) result for links within the network. The V/C ratio is a comparative measure for traffic volumes along a roadway and its corresponding operating capacity. In general, as the V/C ratio approaches 1.0, a greater degree of traffic congestion is expected. The V/C ratios that are deemed acceptable vary by municipality; however, a high-level description of various V/C results are described in **Table 5.2**. The link v/c ratio outputs are provided in **Appendix 2**.

Table 5.2 – V/C Ratio Descriptions

V/C	Description
0.60 or less	Uncongested operations; free-flow traffic
0.60 > 0.75	Very light congestion; stable traffic flow
0.75 > 0.85	Mild congestion; small delays and queueing expected
0.85 > 0.95	Moderate congestion; tolerable delays and queueing expected
0.95 > 1.00	Nearing capacity; longer delays and queueing expected
< 1.00	Over capacity; severe delays and queueing expected

In the 2016 base year, all City-owned corridors are operating with ample reserve capacity. In the PM peak hour, select Regional corridors are approaching or at capacity, including the Niagara Street Bridge, Main Street Bridge, Ontario Road Bridge, and certain segments along East Main Street. However, a screenline analysis for these areas concludes that the road network overall has sufficient capacity available for the base year traffic demands. Moreover, it is noted that an environmental assessment has been completed for the Niagara Street bridge in 2022, with the preferred alternative consisting of two (2) vehicular travel lanes and a conventional bicycle lane in each direction. Given that the model reflects a single vehicular travel lane over this crossing, the preferred alternative would mitigate capacity constraints along this link.

In the 2031 horizon year, congestion is expected along certain sections of East Main Street, specifically near the Highway 406/Highway 140 interchange. Similar to the base year however, the road network as a whole is forecast to have sufficient capacity to accommodate the traffic demands.

The 2041 horizon year reflects three (3) new corridors: (1) the Northwest Welland Secondary Plan collector road; (2) the Downs Drive extension; and (3), the new collector roadway, east of the Seaway Mall. In this horizon year, the bottleneck locations in the preceding analysis sets remain, and some new City-owned corridors in central Welland start to approach capacity, although still at an acceptable level.

In the final 2051 horizon year, Daimler Parkway is forecast to be over capacity, largely due to its role as the sole entrance/exit point to the lands east of Highway 406. As these lands develop, additional capacity will be necessary for the safe and efficient circulation of road users in this area. As for Regional facilities, the Niagara Street bridge preferred design will alleviate capacity constraints for north-south traffic, with a screenline analysis showing that the forecasted volumes will be accommodated within the available capacity along Niagara Street and Prince Charles Drive North. For East Main Street however, congestion is anticipated along this corridor in peak hours, and it is therefore recommended that the Region include East Main Street as a case study for the next Regional TMP Update.

6.0 Summary of Conclusions

The conclusions of the Transportation Planning Assessment can be summarized as follows:

- The City of Welland has an aging population compared to the provincial average, with this trend expected to continue over the next decade.
- The City of Welland is experiencing a resurgence in the manufacturing industry and will accommodate the principal share of Niagara Region's urban industrial-type employment through to the 2051 horizon year.
- The existing housing mix within Welland is predominantly single- and semi-detached housing, but future development will be focused on medium-to-high density housing such as townhomes and apartment units.
- Automobile is the primary mode share for Welland residents, as typical with Canadian municipalities. However, Welland has fewer residents who commute through walking or transit than the provincial averages.
- Between the period of 2010 and 2020, transit ridership peaked in 2017 but dwindled significantly thereafter.
- Approximately 41% of Welland residents commute to a place of work within the City. Other notable employment areas include the City of St. Catharines (17%) and the City of Niagara Falls (12%).

- The dwelling unit and employment projections per traffic zone were increased as part of the ongoing OP update.
- Population projections were estimated using calibrated housing densities per traffic zone and the corresponding maximum dwelling unit projections for 2041 and 2051. 2031 projections were estimated by interpolation in absence of 2031 dwelling unit projections.
- The residential dwelling unit and population projections are conservative in nature and will be re-evaluated as development materializes and adapts. These projections are as follows:

<u>2031</u>	<u>2041</u>	<u>2051</u>
Dwelling units: 39,036	Dwelling units: 54,343	Dwelling units: 66,342
Population: 89,135	Population: 121,422	Population: 149,406

- The Niagara Region travel demand forecasting model is an activity-based model completed on the Emme interface. The modelling exercise for the TMP was an iterative process consisting of three (3) separate model runs, with each run incorporating localized calibrations as a result of planning, policy, or operational adjustments.
- The modelling exercise found that all City-owned roadways, barring Daimler Parkway, are forecast to operate with reserve link capacity through to the ultimate 2051 horizon year. Strategies to provide additional physical capacity to the lands east of Highway 406 should be pursued to ensure the safe and efficient circulation of vehicles near the Highway 406 and Daimler Parkway area.
- An Environmental Assessment (EA) was completed in 2022 for the Niagara Street bridge. The preferred alternative in this EA consists of two (2) vehicular travel lanes and a conventional bicycle lane in each direction. This new configuration, alongside the Prince Charles Drive North bridge, is expected to provide enough capacity to accommodate the forecasted north-south traffic volumes in 2051.
- Capacity constraints are forecast along the Regional corridor of East Main Street, particularly near the Highway 406/Highway 140 interchange. It is recommended that this corridor be included as a case study for the next Region TMP Update.

APPENDIX 1

Population and Employment Projections by Zone



Regional Traffic Zone	2021 Residential Population (Regional Census Update)	2021 Dwellings (Based on 2021 Census)	Planning Forecasts (Maximum Estimates)			Regional Employment Data		
			Maximum Future Dwelling Units (2031)	Maximum Dwelling Unit Growth (2041)	Maximum Dwelling Unit Growth (2051)	2031 Employment Forecast	2041 Employment Forecast	2051 Employment Forecast
6190	1211	505	194	387	404	165	165	166
6191	5	5	1155	2309	2326	374	639	1027
6193**	951	385	55	110	127	1283	1816	2350
6195	5	5	0	0	0	472	512	578
6196	2945	1115	66	132	149	222	224	228
6197**	331	125	0	0	0	600	1980	2323
6198	1267	515	36	71	88	449	468	500
6199	1546	660	121	241	508	334	337	345
6200	671	340	372	744	1090	233	236	242
6201	1272	565	129	258	815	444	463	495
6202	2060	880	165	329	487	345	365	395
6204	315	145	195	389	406	111	112	113
6205	178	110	144	287	367	257	267	285
6206	849	435	81	161	178	85	85	88
6207	748	375	391	781	798	291	411	589
6208	926	460	78	155	312	153	159	169
6209	610	265	17	34	51	298	323	364
6210	2106	685	73	145	271	261	265	273
6211	1892	815	59	118	135	613	654	722
6212	1760	775	17	34	51	187	192	200
6213	951	405	168	335	352	194	200	211
6214	1455	610	17	34	84	277	279	284
6215	910	375	17	34	51	238	248	266
6216	1836	750	140	279	949	512	545	596
6217	844	330	435	869	886	303	352	429
6218	799	280	55	109	126	184	206	240
6219	346	130	607	1213	2331	716	903	1197
6220	778	370	2552	5104	5121	827	952	1150
6221**	1628	625	190	379	1031	726	928	1069
6222	351	135	339	677	1414	77	87	101
6223**	641	255	1890	3780	3797	472	780	780
6224	275	95	0	0	0	31	36	43
6258	92	40	0	0	0	1614	2480	3749
6259	982	430	68	136	441	199	218	251
6260	488	195	469	938	1389	25	25	25
6261	209	70	168	336	853	1112	1148	1214
6262	1734	815	198	395	710	187	192	202
6263	1073	475	66	131	171	86	87	89
6264	631	305	235	470	517	192	205	229
6265	264	125	622	1243	1260	660	741	871
6266	5	5	0	0	0	770	889	1073
6267	834	350	117	234	351	163	165	169
6268	61	25	0	0	0	102	108	116
6269	1165	600	109	217	381	106	142	194
6270	702	335	147	293	468	229	236	249

Regional Traffic Zone	2021 Residential Population (Regional Census Update)	2021 Dwellings (Based on 2021 Census)	Planning Forecasts (Maximum Estimates)			Regional Employment Data		
			Maximum Future Dwelling Units (2031)	Maximum Dwelling Unit Growth (2041)	Maximum Dwelling Unit Growth (2051)	2031 Employment Forecast	2041 Employment Forecast	2051 Employment Forecast
6271	1577	600	17	34	51	184	191	202
6272	86	40	129	258	384	11	11	12
6273	1012	395	85	169	186	261	265	274
6274	804	360	196	392	409	71	72	76
6275	783	335	17	34	51	118	124	138
6276	1231	550	122	244	348	351	383	436
6277	1206	445	91	181	474	108	110	116
6278	529	190	17	34	51	176	176	177
6279	1124	450	17	34	301	111	111	112
6280	1063	380	17	34	676	60	60	62
6281	1297	455	318	635	1372	365	381	409
6284	778	375	834	1667	1684	108	133	171
6285	97	45	233	465	697	927	1117	1424
6425	697	245	17	34	231	150	150	152
6426	539	285	427	854	871	101	105	114
6435	1282	560	74	147	440	314	320	332
6460	753	265	0	0	0	162	218	300
6461	5	2	0	0	0	1	1	2
6462	183	55	0	0	0	22	24	27
6464	142	55	4	8	8	25	28	33
6552	142	55	101	201	327	30	31	32
6553	224	80	24	47	64	47	60	79
6554	417	155	46	91	108	65	66	66
6556	41	15	317	634	1371	12	21	34
6601	31	10	279	558	1295	120	151	198
Avg/Sub-Totals	56745	23697	15339	30646	42645	21079	26134	31227

*Max dwelling unit growth is cumulative and represents dwelling units that are additional to the 2021 base year.

**Employment values will differ from Regional forecast.

APPENDIX 2

Travel Demand Forecasting Model Results

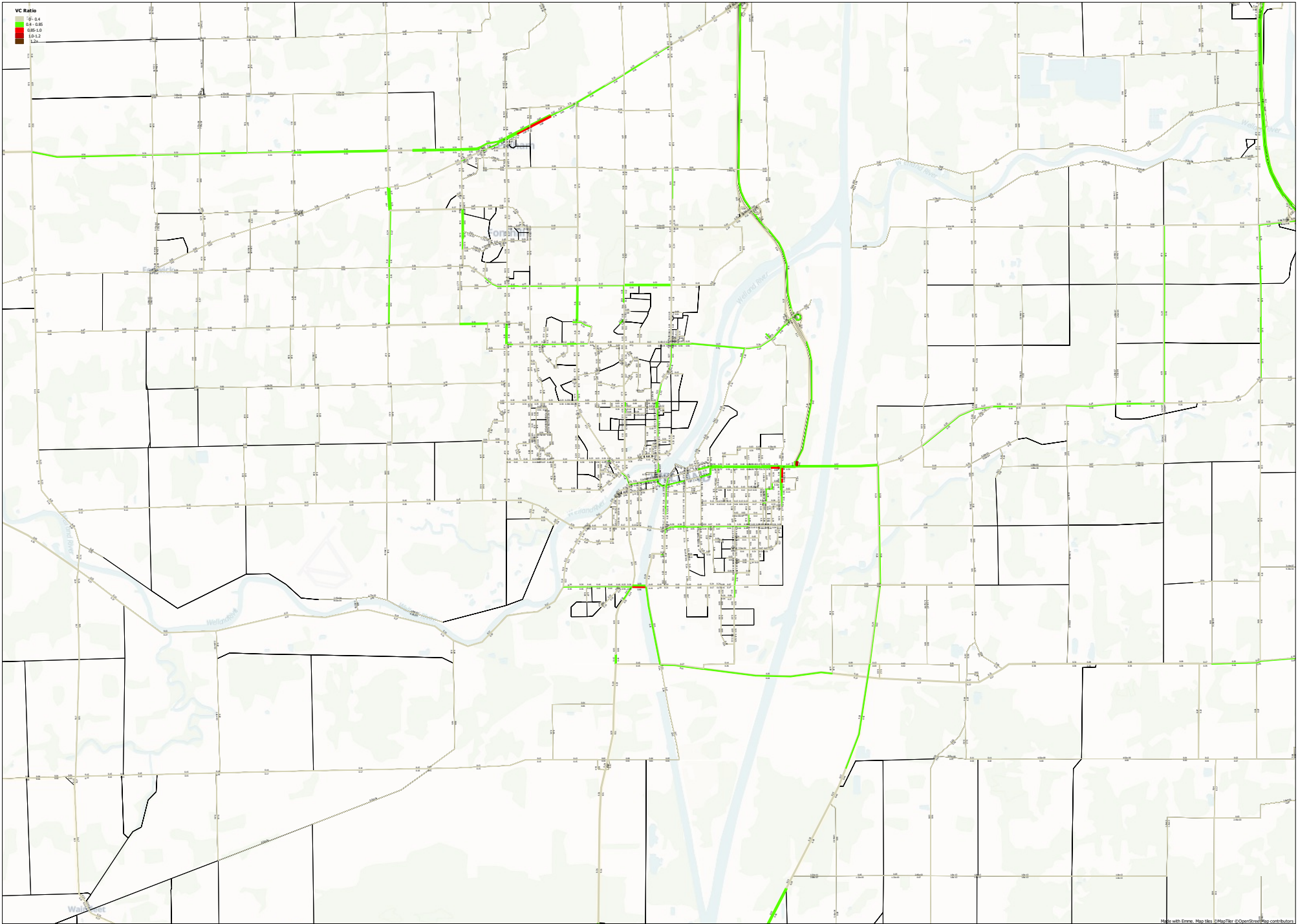


APPENDIX 2-1

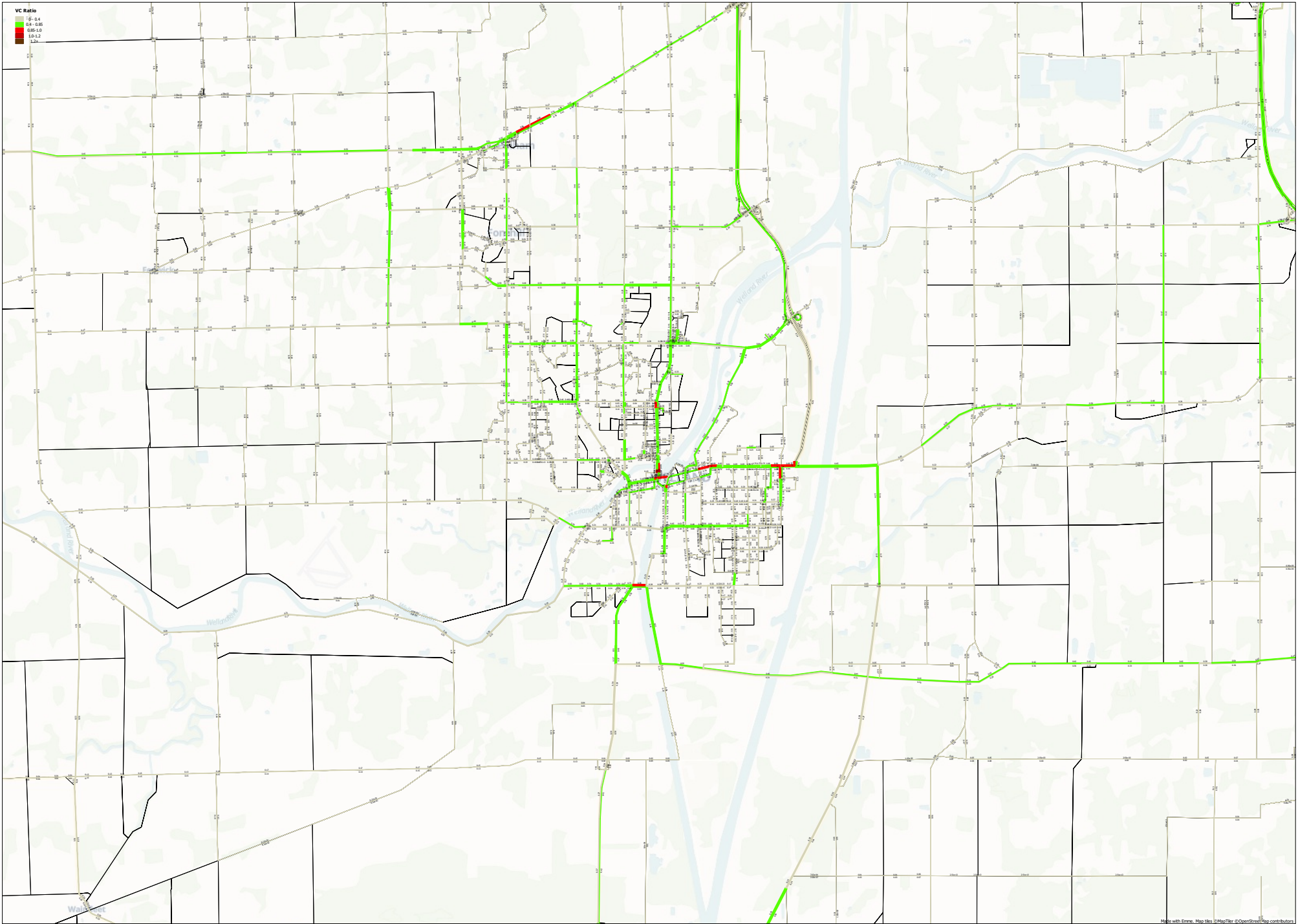
Baseline 2016 Results



2016 Baseline - AM Peak Hour



2016 Baseline - PM Peak Hour

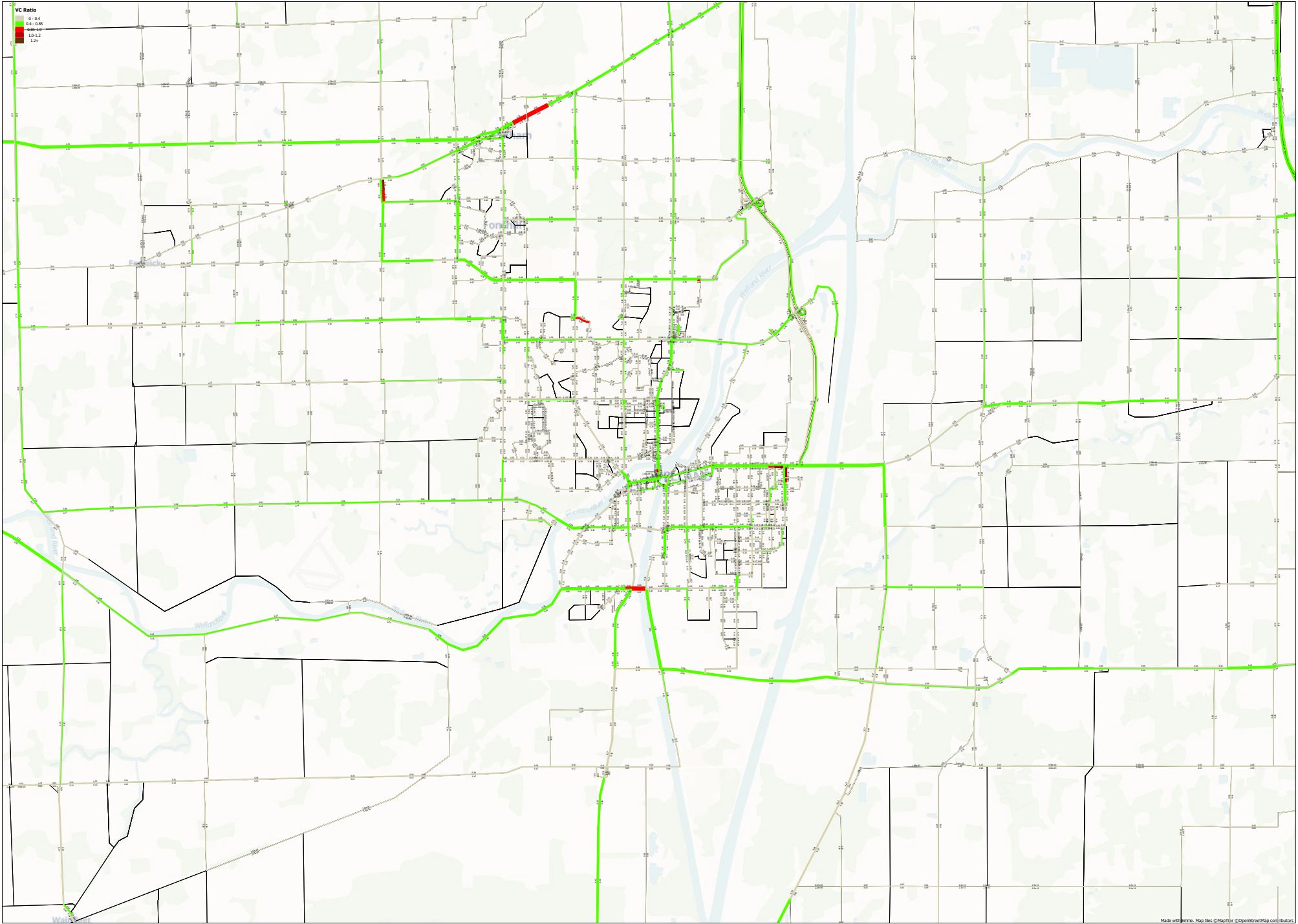


APPENDIX 2-2

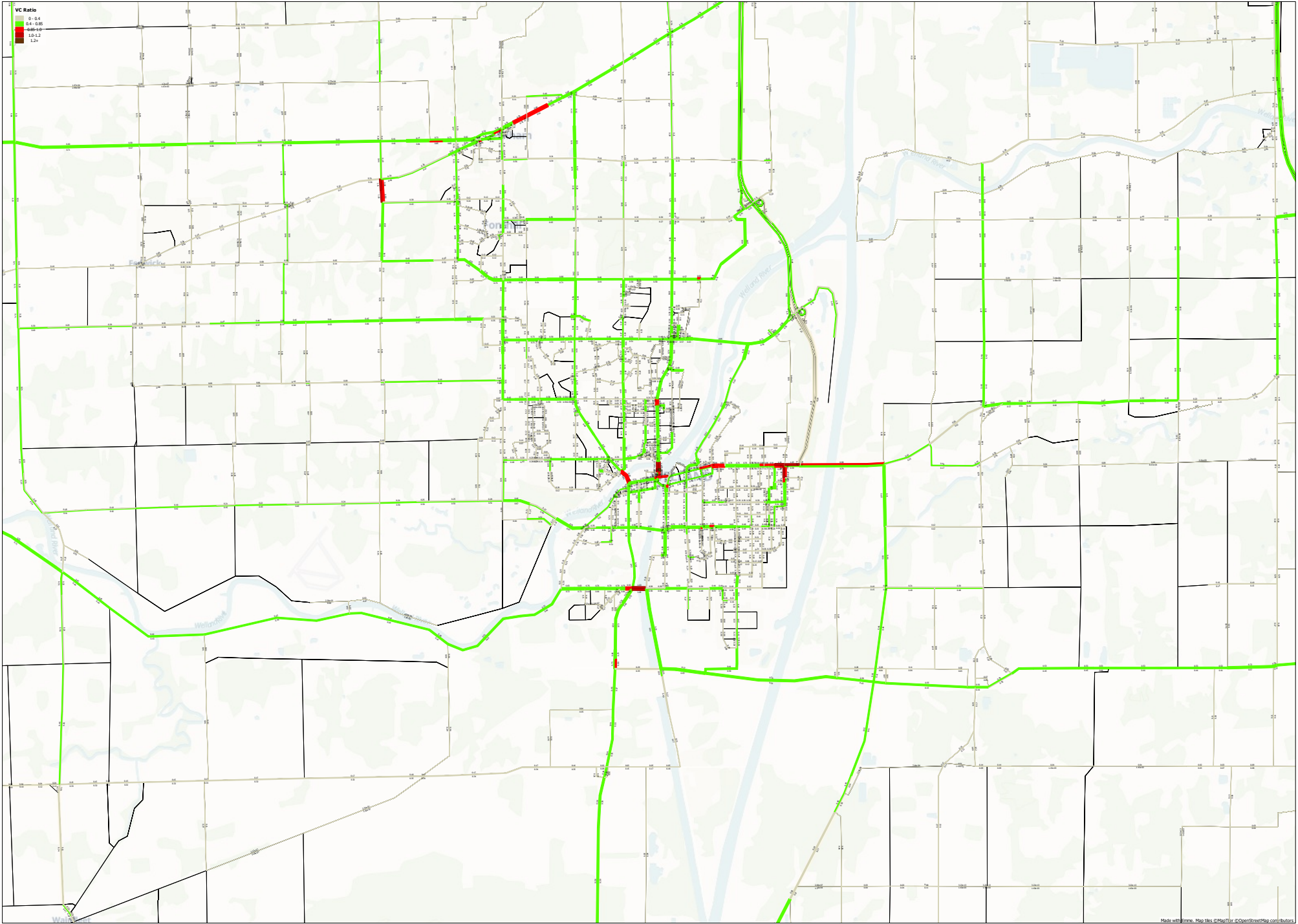
Future Horizon 2031 Results



2031 Horizon - AM Peak Hour



2031 Horizon - PM Peak Hour

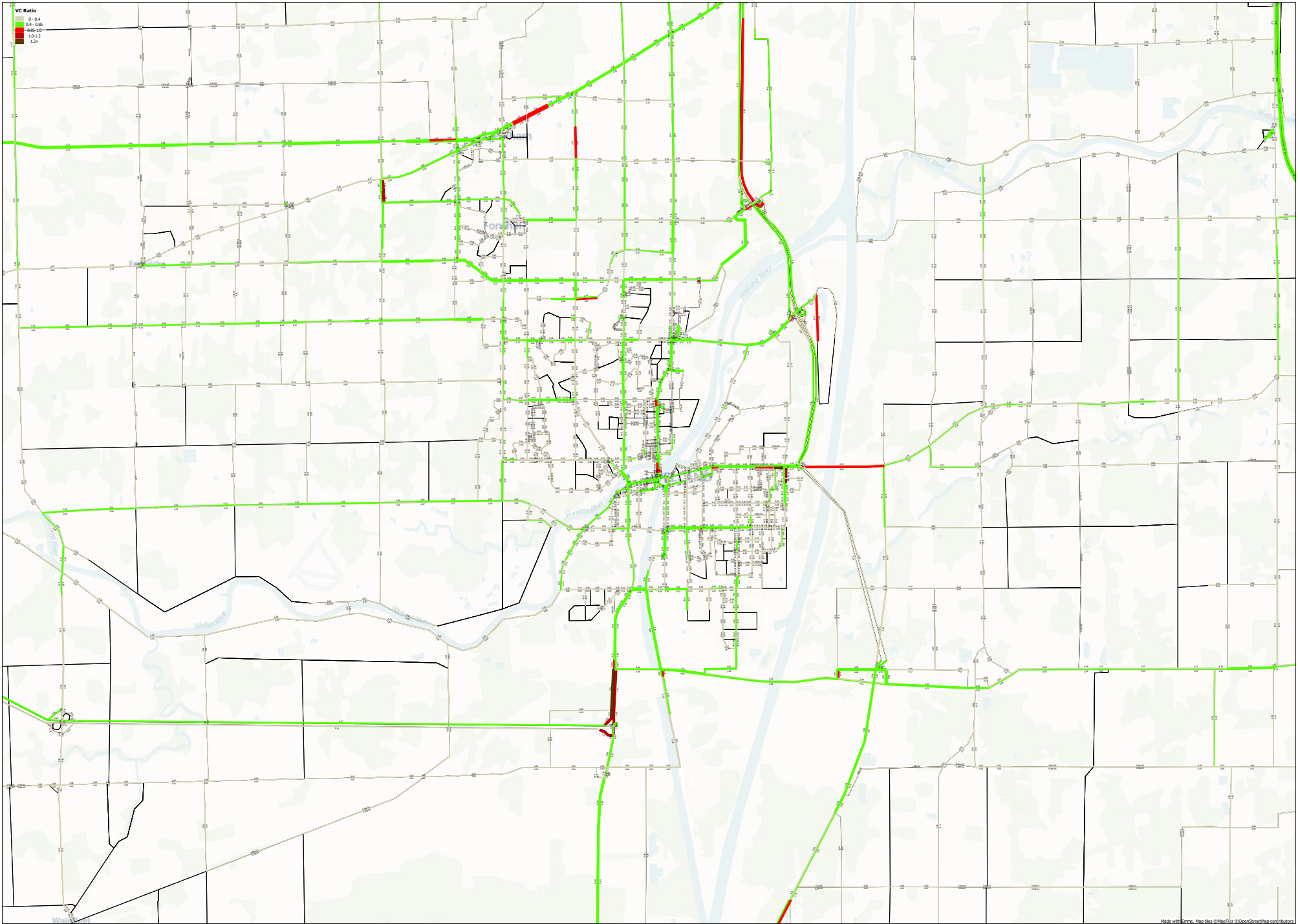


APPENDIX 2-3

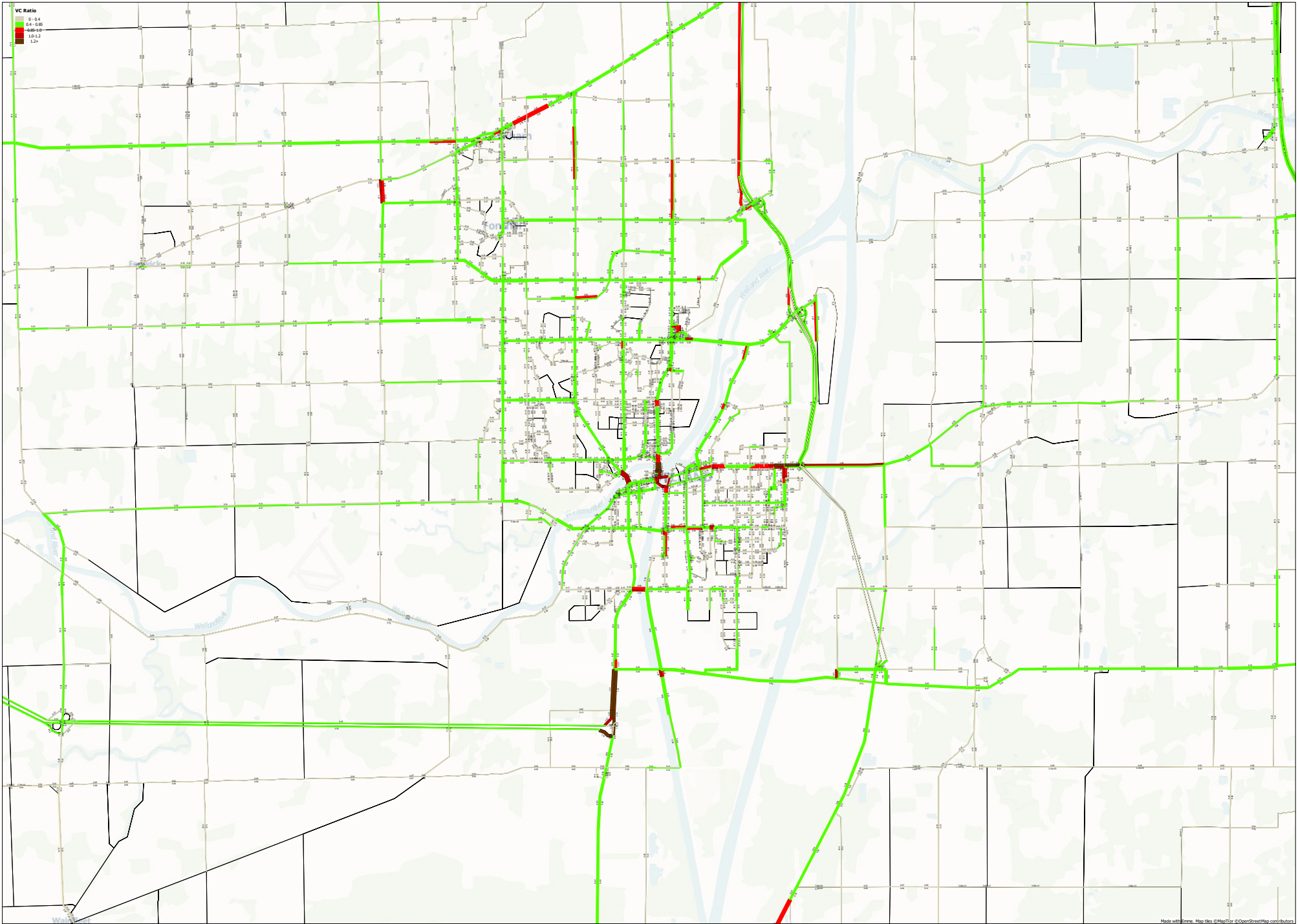
Future Horizon 2041 Results



2041 Horizon - AM Peak Hour



2041 Horizon - PM Peak Hour

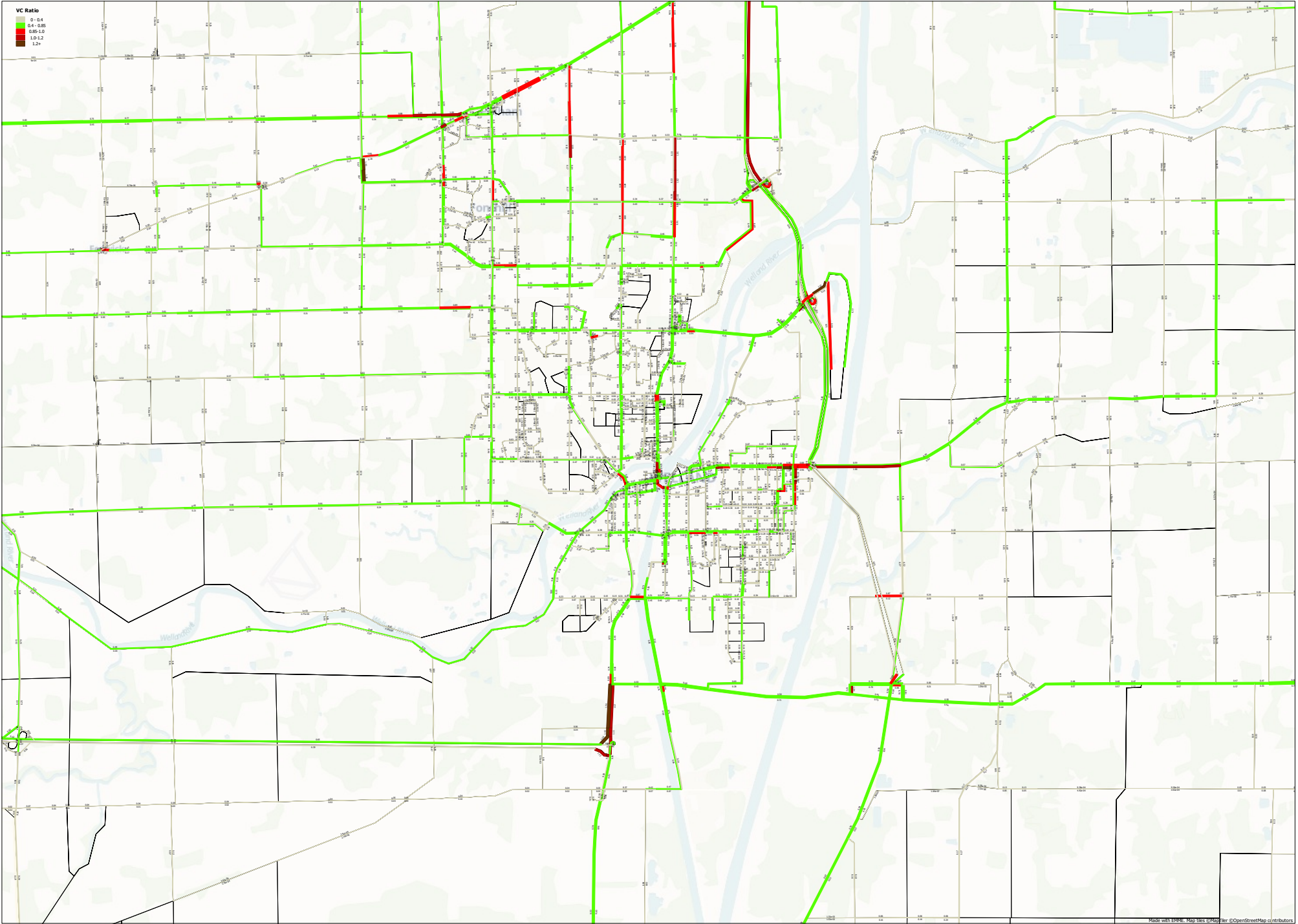


APPENDIX 2-4

Future Horizon 2051 Results



2051 Horizon - AM Peak Hour



2051 Horizon - PM Peak Hour

