TECHNICAL MEMORANDUM

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DATE:	June 10th, 2022
SUBJECT	Northgate Shopping Centre Expansion Technical Traffic Memorandum - Final

This Technical Traffic Memorandum details the assumptions, methodology, findings, and recommendations from a review completed for Marwest Property Management development in the Northgate Shopping Centre located within the Seven Oaks neighbourhood in Winnipeg, Manitoba. The development is to be located in the southeast corner of the shopping centre along Cottingham Street, Carruthers Avenue.

The purposes of the Traffic Review were to:

- Review previous TIA completed by WATT Consulting Group in November 2019
- Quantify how the development will impact traffic conditions on McPhillips Street and its surrounding roads
- Determine whether those impacts are significant enough to require mitigation
- Complete collision analysis required by City of Winnipeg in their comment response to the 2019 TIA

TABLE OF CONTENTS

1 Introduction 1

2 Context 1

2.1 Location 1
2.2 Development Parameters 3

3 Traffic Volumes 5

3.1 Background Traffic Volumes 5
3.2 Development Generated Traffic Volumes 6
3.3 Post Development Volumes 9
3.4 Comparisons to WATT Consulting Group's TIA Volumes 10

4 Transportation Analysis 11

4.1 Traffic Signal Warrant 11
4.2 Collision Analysis 12

5 Conclusions & Recommendations 24

LIST OF TABLES

Table 1: Development Vehicle Traffic Generation Estimates 7

Table 2: Traffic Signal Warrant Results 12

Table 3: Intersection Collision Rates Per Million Entering Vehicles 14

LIST OF FIGURES

Figure 1: Local Context 2

Figure 2: Site Plan Schematic 4

Figure 3: Raw Volumes 5

Figure 4: Forecast 2028 Background Traffic 6

Figure 5: Development Generated Volumes 8

Figure 6: 2028 Post-Development Volumes 9

Figure 7: Carruthers Avenue Widening 10

Figure 8: Development Generated Volumes Compared 11

Figure 9: 2015 – 2020 Collision Distributions 13

Figure 10: Collision Severity 14

Figure 11: Collision Configurations 15

Figure 12: Lighting Conditions 16

Figure 13: Weather Conditions 17

Figure 14: Road Surface Conditions 18

Figure 15: Intersection Collision Configurations (No Inkster Boulevard at McPhillips Street) 19

Figure 16: Inkster Boulevard at McPhillips Street Collision Configurations 20

Figure 17: Intersection 90 Degree Collision Severity (Inkster Blvd at Wiginton St) 21

Figure 18: Intersection 90 Degree Collision by Time Periods (Inkster Blvd at Wiginton St) 22

Figure 19: Intersection 90 Degree Collision Movements 23

1 INTRODUCTION

On behalf of Marwest Property Management, McGowan Russell Group retained MORR Transportation Consulting Ltd. (MORR) to complete a Traffic Review for a proposed 221-unit residential development at the southeast corner of the Northgate Shopping Centre within the Seven Oaks neighbourhood in Winnipeg, Manitoba. The development is to be located along Cottingham Street and Carruthers Avenue. Vehicular access is to be provided via existing private approaches on Cottingham Street, Carruthers Avenue and the signalized intersection at McPhillips Street at Mapleglen Drive.

The purposes of the Traffic Review were to:

- Review previous TIA completed by WATT Consulting Group in November 2019
- Quantify how the development will impact traffic conditions on McPhillips Street, Inkster Boulevard, and its surrounding roads
- Determine whether those impacts are significant enough to require mitigation
- Complete collision analysis required by City of Winnipeg in their comment response to the 2019 TIA

The scope of the Review was limited to the development access intersections, Mapleglen Drive, Dafoe Boulevard, Lansdowne Avenue, and Wiginton Street, under forecast conditions at a 2028 horizon year, corresponding to the completion of the development. The Traffic Review also includes brief recommendations related to geometry at the site access intersections if necessary.

The purposes were fulfilled by completing the following tasks:

- Document the study context (site location, development parameters, study area, existing and future land uses).
- Quantify existing traffic volumes on in the study area, and forecast how those volumes may grow independent of the proposed development
- Forecast weekday AM peak hour, PM peak hour, and daily traffic generation resulting from the residential development, and assign those volumes to the access intersections
- Conduct a Traffic Signal Warrant Analysis to evaluate the mitigation need
- Conduct a collision analysis to evaluate overall safety of the study area

The following sections detail the assumptions, data, processes, and results for each task.

2 CONTEXT

2.1 Location

The proposed development is located on an existing site that is currently occupied by Northgate Car Wash within Northgate Shopping Centre. Lands immediately to the north are developed with other commercial land uses. Lands to the west are developed with commercial land uses along McPhillips Street. Lands to the south includes an elementary school and residential homes, and lands to the east are predominately residential homes.

Figure 1 shows the development in its local context.

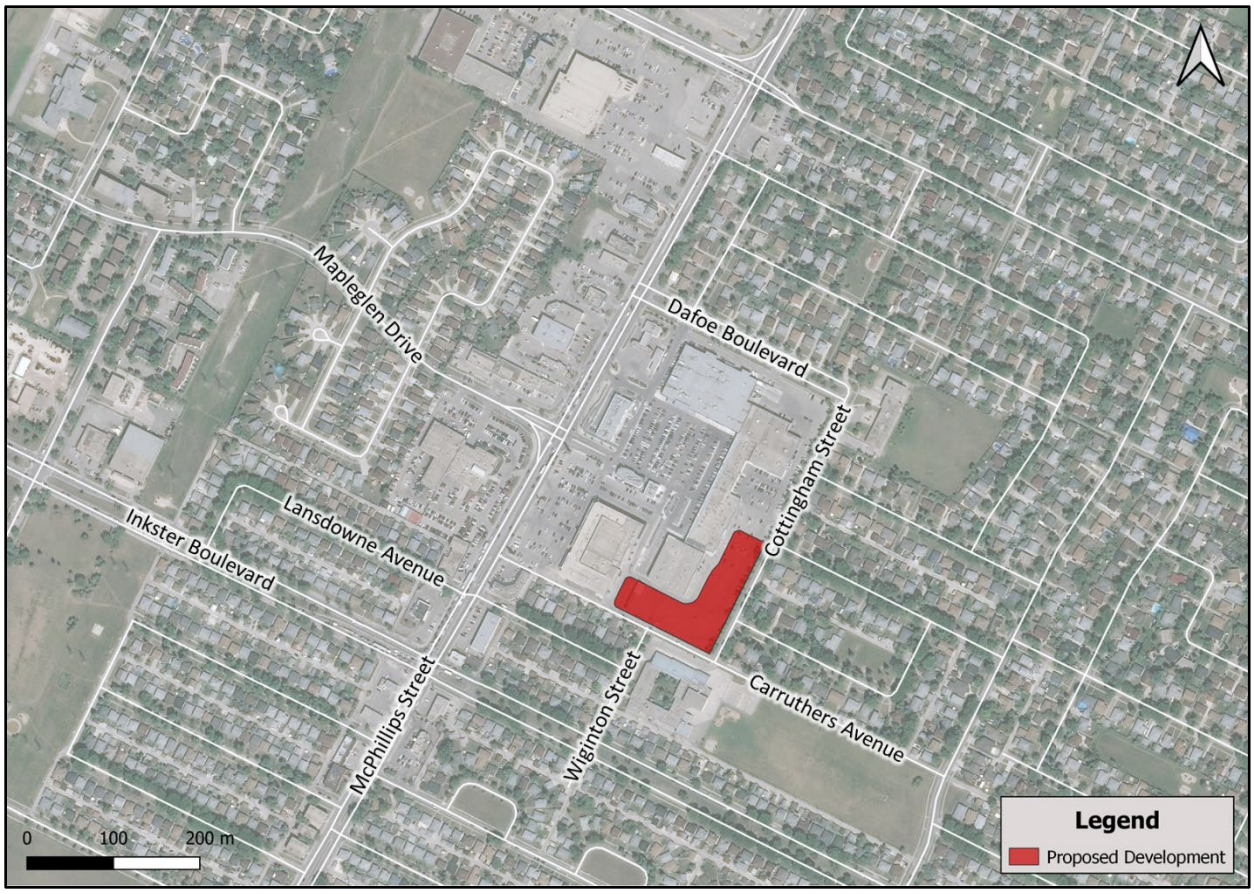


FIGURE 1: LOCAL CONTEXT

McPhillips Street functions as a major arterial, providing a connection between Notre Dame Avenue and the Perimeter Highway. The road within the study area has a six-lane divided cross-section. An existing development access is located at the intersection of McPhillips Street at Mapleglen Drive. There are currently sidewalks on both sides but no other active transportation infrastructure along McPhillips Street.

Inkster Boulevard functions as a minor arterial, providing a connection between Route 90 and Main Street where it transitions to CentrePort Canada Way west of Route 90. The road within the study area has a two-lane divided cross-section. There are currently sidewalks on both sides but no other active transportation infrastructure along Inkster Boulevard.

Mapleglen Drive functions as a collector road, providing connection between Sheppard Street to McPhillips Street. The road within the study area has a two-lane undivided cross section. There are currently sidewalks on the north side of the road east of McPhillips Street and sidewalks on both side of the road west of McPhillips Street. There is no other active transportation infrastructure along Mapleglen Drive.

Dafoe Boulevard functions as a local road, providing connection from McPhillips Street to Cottingham Street. It has a four-lane divided cross-section with the curb lane functioning as a parking lane on both sides. There are sidewalks provided on both sides, but no other active transportation infrastructure provided along Dafoe Boulevard.

Carruthers Avenue functions as a back lane road, providing connection from McPhillips Street to Main Street. The road has a two-lane undivided cross section with no sidewalks or other active transportation infrastructure along Carruthers Avenue.

Wiginton Street functions as a local road providing a connection between Inkster boulevard and Carruthers Avenue. The road has a two-lane undivided cross section with sidewalks only present on the east side of the road. There is no other active transportation infrastructure along Wiginton Street.

Lansdowne Avenue functions as a local road proving connections to McPhillips Street to Main Street. The road has a two-lane undivided cross section with sidewalks on both sides, but no other active transportation infrastructure present.

2.2 Development Parameters

The study team understands that the proposed development was initially planned for 277 units of mid-rise apartments, 199 units of high rise apartments, and 140 units of assisted living for senior. The initial development parameters were subjected to a Traffic Impact Assessment completed by WATT Consulting Group in November 2019 and recommends the following:

- Widening of Carruthers Avenue
- Streetscape Enhancements along Cottingham Street
- Geometric Improvements to the North Access on Dafoe Boulevard

The proposed development has since been revised and now consists of 221-unit residential development in three buildings. Vehicular access is to be provided via three existing private approaches – which are located on Cottingham Street, Carruthers Avenue, and at McPhillips Street at Mapleglen Drive.

Figure 2 shows the current site plan schematic.

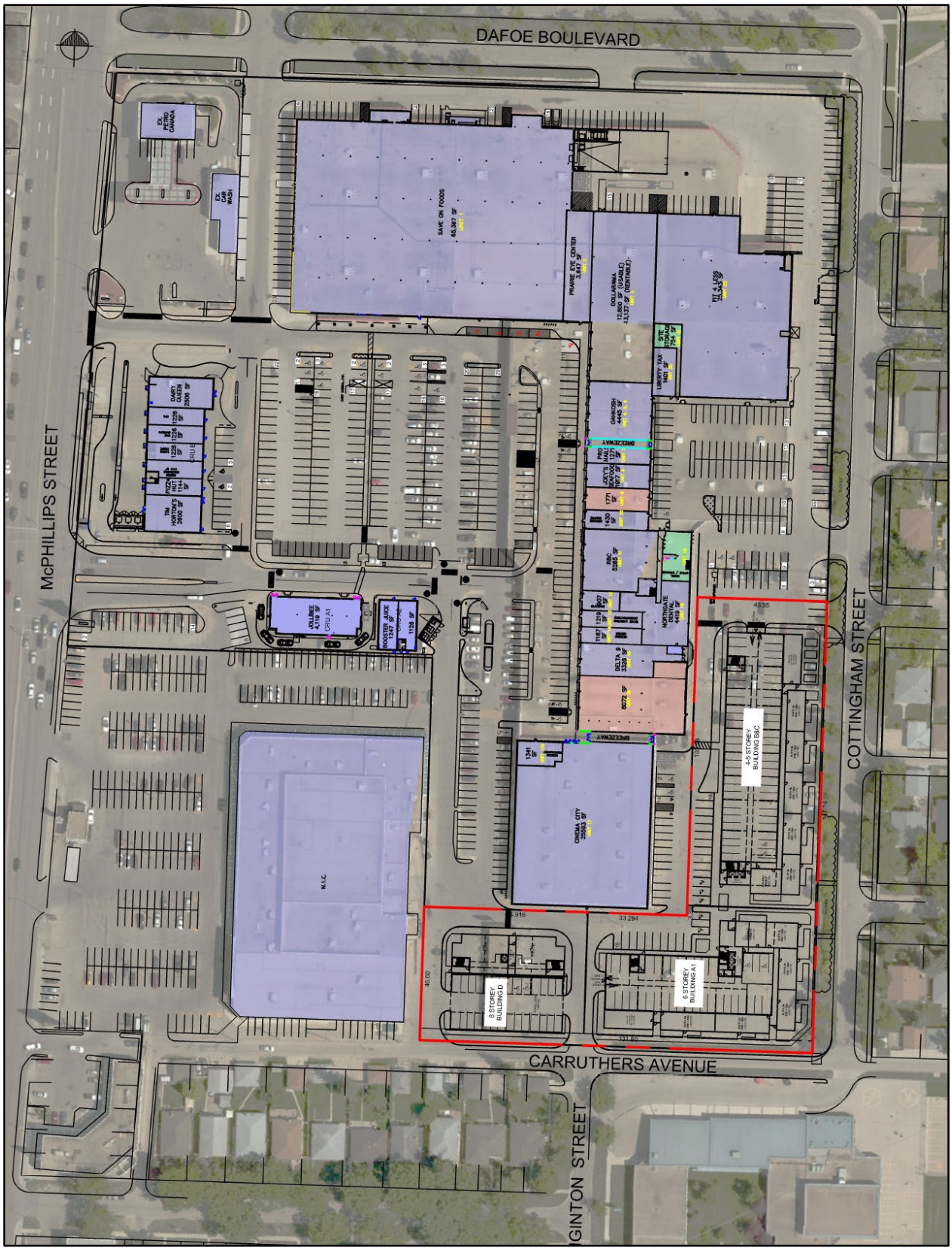


FIGURE 2: SITE PLAN SCHEMATIC

3 TRAFFIC VOLUMES

The traffic projections required traffic volume estimates at all study intersections – which are based on expected land use and traffic distribution. The following sections outline the estimate considerations.

3.1 Background Traffic Volumes

Background traffic volumes were forecast for the 2028 horizon year. The forecast was based on existing traffic volumes from WATT Consulting Group's 2019 report. Turning movement data from WATT's report was collected between 2018 to 2019 for the following study intersections:

- McPhillips Street at Dafoe Boulevard
- McPhillips Street at Mapleglen Drive
- McPhillips Street at Landsdowne Avenue
- McPhillips Street at Inkster Boulevard
- Wiginton Street at Inkster Boulevard
- Wiginton Street at Carruthers Avenue

Figure 3 shows the raw counted traffic volumes. Volumes are shown first for the AM peak hour, with PM peak hour volumes following in parentheses and estimated ADT volumes noted as such. No balancing was applied to raw volumes as a) to maintain consistency to the 2019 WATT's report and b) there are a number of commercial approaches between intersections which requires engineering judgement to balance.

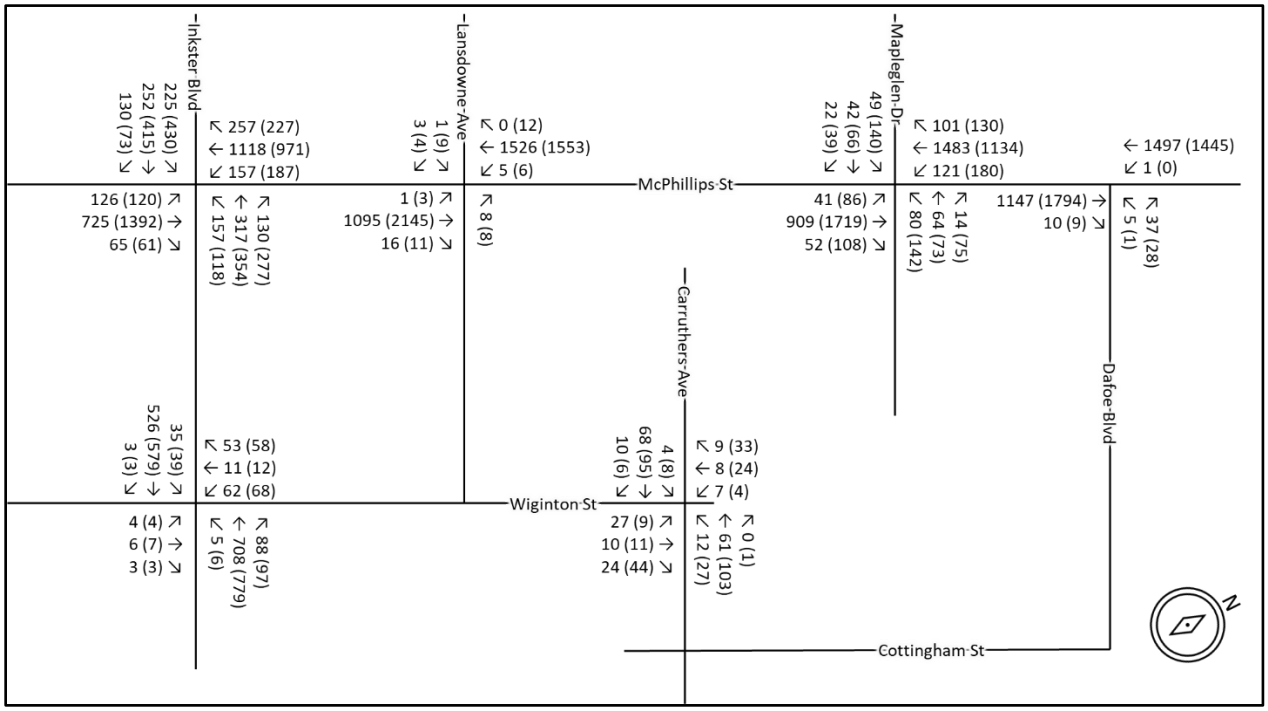


FIGURE 3: RAW VOLUMES

Wiginton Street sees an average of 2,800 vehicles per day north of Inkster and Carruthers Avenue sees an average of 2,700 vehicles per day east of Wiginton Street.

Count data is included in **Appendix A.**

The raw volumes were grown to represent 2028 background conditions using CAGR provided by the City. The CAGR was different for each peak hour and daily traffic which was based on historical river crossing counts. The AM peak hour saw no growth, PM peak hour saw a growth of 0.20%, and daily volumes saw a growth of 0.50%. The CAGR was only applied to northbound and southbound through movements on McPhillips Street and on eastbound and westbound through movements on Inkster Boulevard. The exception was at McPhillips Street at Inkster Boulevard where the CAGR was applied for through and turning movements.

Figure 4 shows the 2028 background volumes after growth.

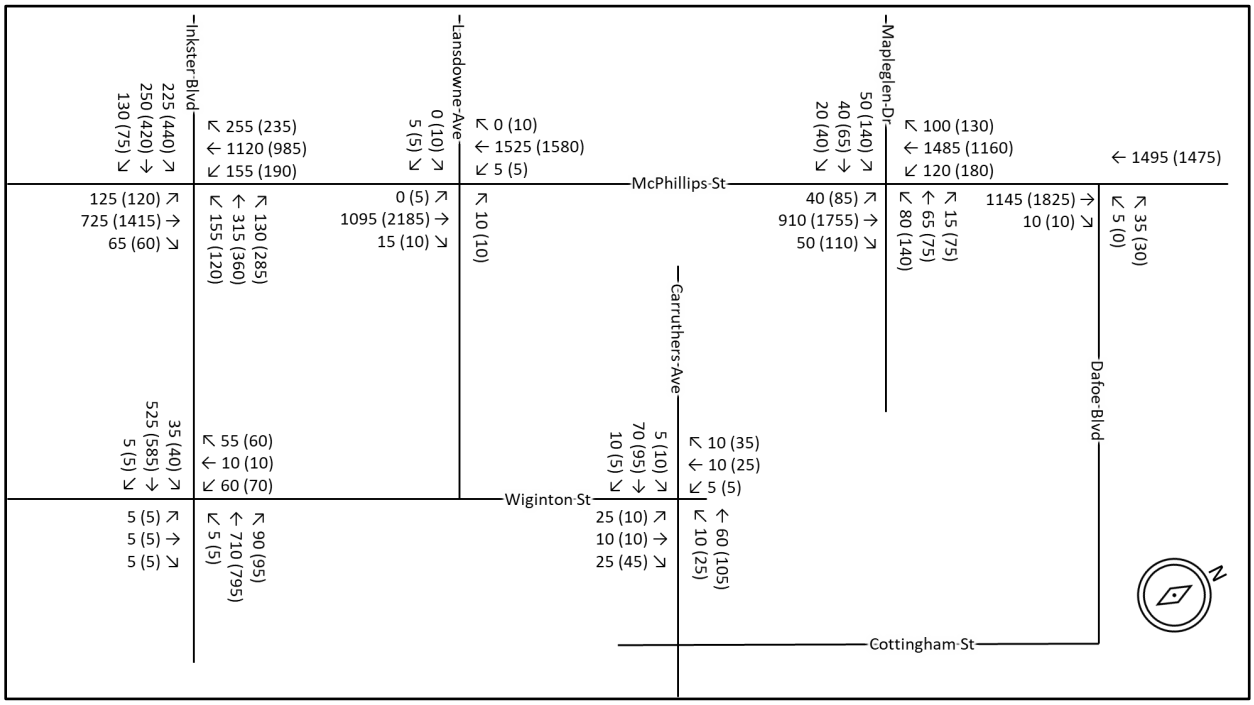


FIGURE 4: FORECAST 2028 BACKGROUND TRAFFIC

In 2028, Wiginton Street sees an average of 2,800 vehicles per day north of Inkster and Carruthers Avenue sees an average of 2,700 vehicles per day east of Wiginton Street as growth rates were not applied to minor roads.

3.2 Development Generated Traffic Volumes

Site generated traffic was estimated using a three-step travel demand forecasting process:

1. **Trip Generation** – How many trips will be made to and from the development?
2. **Mode Split and Internal Capture** – What portion of trips are likely to be made by modes other than personal vehicles, and what portion of trips may be made between land uses within the development, with no travel on the external highway network?
3. **Directional Distribution and Assignment** – What origins and destinations will the trips be coming from and going to, and what routes will they take to get there?

The following sections document the process, assumptions, and results of each step of the process.

3.2.1 Trip Generation

The trip generation step was completed using data from the Institute of Transportation Engineers (ITE) *Trip Generation Manual (11th Edition)*. The *Manual* contains trip generation rates based on traffic counts conducted at existing developments across North America, from the 1970s to the present day. Rates are categorized by land use type and independent variable (such as number of residential dwelling units, commercial floor area, or acreage of an industrial site), with data provided for various time periods including AM and PM peak hours and average weekday traffic. In addition to trip generation rates, the *Manual* also includes data on the split between inbound and outbound traffic.

For the proposed development, the project team used the following land use categories from the *Manual*:

- Category #220 Multifamily Housing (Low Rise) to represent the residential development

3.2.2 Mode Split and Internal Capture

Where developments include a complimentary mix of land uses, external vehicle trip generation can be lower than typical due to some trips being made between land uses within the development, without impacting the external transportation system. Since the proposed development is purely residential, the study team considered that an internal capture reduction would not be necessary for the proposed development, and no internal capture was applied.

The ITE trip generation rates are based on studies conducted at existing developments, largely in suburban areas where most trips are made by vehicle. Where there is reason to believe that a greater-than-typical share of trips will be made by walking, cycling, or transit, a "mode split reduction" can be applied to the vehicle trip estimates. The proposed development is located within Northgate Shopping Centre, as such, it is nearby frequent transit services (10 to 15 minute wait times). Additionally, developments in the Seven Oaks Neighbourhood saw approximately 6% to 10% of trips made by public transit. With all that considered, the study team applied a mode split reduction of 10%.

TABLE 1: DEVELOPMENT VEHICLE TRAFFIC GENERATION ESTIMATES

Land Use (ITE Category #)	Quantity	Period	Trip Generation Rate	% Inbound	Trip Generation Estimate
Multifamily (220)	221 units	AM	0.40 trips per unit	24%	88 trips (21 in, 67 out)
		PM	0.51 trips per unit	63%	113 trips (71 in, 42 out)
		Daily	6.74 trips per unit	50%	1,490 trips (745in, 745 out)
					-12 trips (-3 in, -9 out)
				10% Reduction	-16 trips (-10 in, -6 out)
					-210 trips (-105 in, -105 out)
					76 trips (18 in, 58 out)
				Total	**97 trips (61 in, 36 out)**
					1,280 trips (640 in, 640 out)

The development is anticipated to generate 76 AM peak hour trips, 97 PM peak hour trips, and 1,280 daily trips.

3.2.3 Directional Distribution and Assignment

Vehicle trips were distributed by direction and assigned to the street network based on consideration of the site's location within the City of Winnipeg.

The study team considered that the development would likely add trips to Dafoe Boulevard, Cottingham Street, Carruthers Avenue, McPhillips Street, and Inkster Boulevard.

Trips were distributed by direction with:

- 20% of trips to/from North via McPhillips Street
- 35% of trips to/from South via McPhillips Street
- 20% of trips to/from West via Inkster Boulevard
- 25% of trips to/from East via Inkster Boulevard

Figure 5 shows the development generated volumes assigned to the study intersections. Volumes are first shown for the AM peak hour, with PM peak hour following in parentheses.

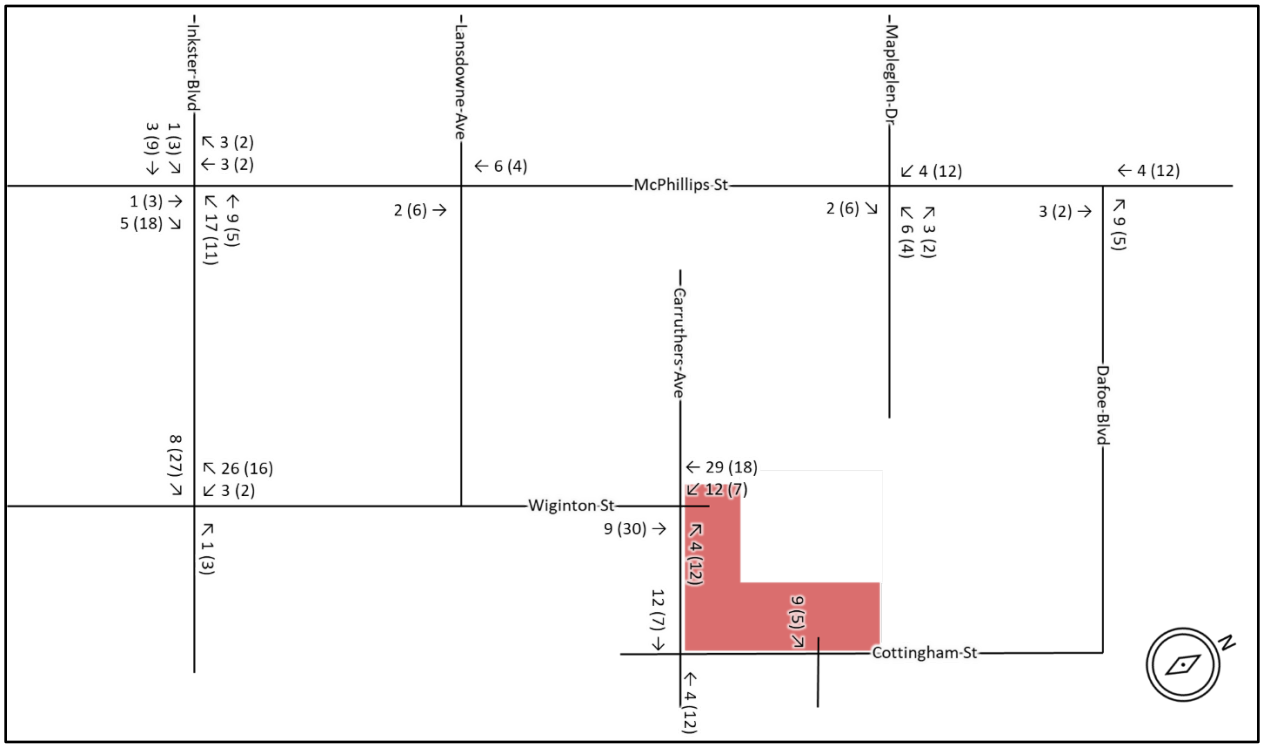


FIGURE 5: DEVELOPMENT GENERATED VOLUMES

The development is anticipated to generate 640 trips per day onto Wiginton Street south of Carruthers. During the a.m. peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 38 vehicles (approximately a vehicle every 95 seconds) as compared to the current volume of 255 vehicles (approximately a vehicle every 14 seconds). During the p.m. peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 48 vehicles (approximately a vehicle every 75 seconds) as compared to the current volume of 281 vehicle (approximately a vehicle every 12 seconds).

The development is anticipated to generate 260 trips per day onto Carruthers Avenue east of Wiginton Street. During the a.m. peak hour, the increase in traffic on Carruthers Avenue due to development is anticipated to be 16 vehicles (approximately a vehicle every 3 minutes and 45 seconds) as compared to the current volume of 170 vehicles (approximately a vehicle every 21 seconds). During the p.m. peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 19 vehicles (approximately a vehicle every 3 minutes and 9 seconds) as compared to the current volume of 275 vehicles (approximately a vehicle every 13 seconds).

3.3 Post Development Volumes

The study team added the development generated traffic from 2028 background traffic volumes to give 2028 post development volumes.

Figure 6 shows the post development traffic volumes for the 2028 horizon year. Volumes are shown first for the AM peak hour, with PM peak hour volumes following in parentheses and average daily traffic volumes noted as such.

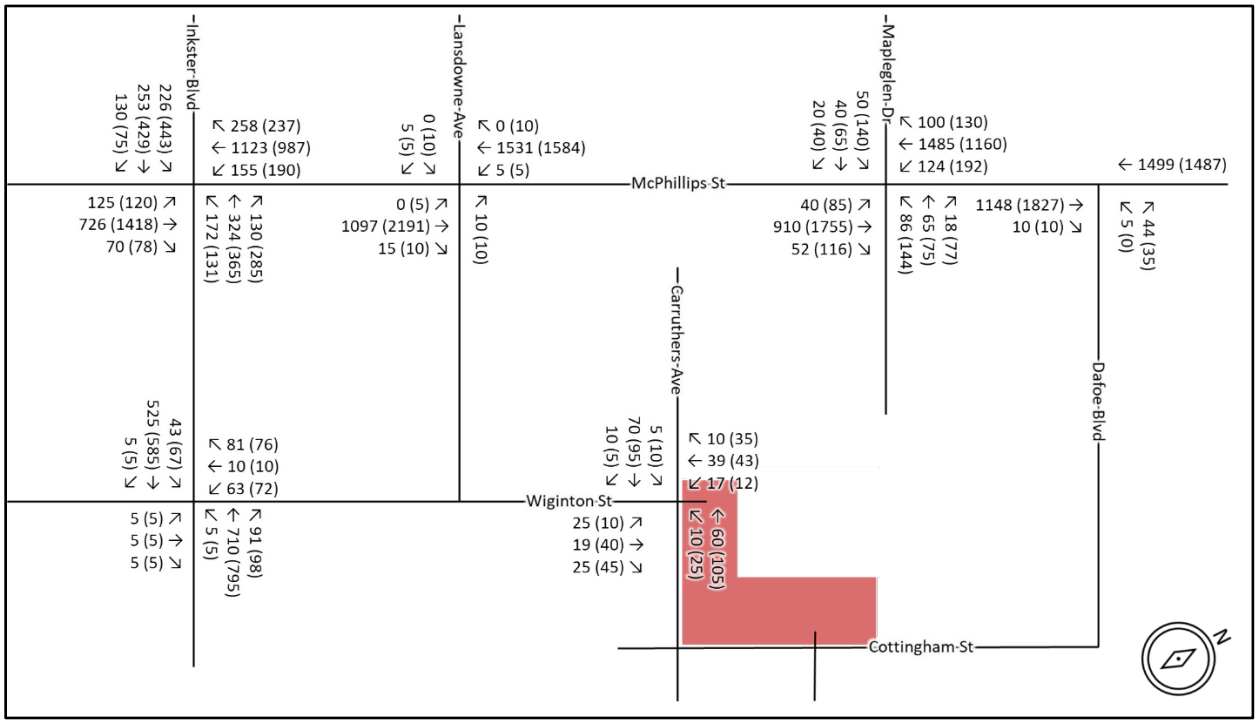


FIGURE 6: 2028 POST-DEVELOPMENT VOLUMES

Under 2028 post development conditions, daily volumes on McPhillips Street south of Dafoe Boulevard were estimated to increase to 37,360 vpd, McPhillips Street north of Inkster Boulevard were estimated to increase to 41,130 vpd, Inkster Boulevard east of McPhillips Street were estimated to increase to 17,180 vpd, and Inkster Boulevard east of Wiginton Street were estimated to increase to 16,860 vpd. At minor streets, Wiginton Street increased to 3,440 vpd north of Inkster Boulevard, and Carruthers Avenue increased to 2,960 vpd east of Wiginton Street.

Road width on Carruthers Avenue between Cottingham Street and Wiginton Street is approximately 4.7 metres (15 feet) in width currently with barrier curb on both sides. This is an unusual configuration that is insufficient for the existing and post-development two-way volumes on the street. Considering this deficiency, it is recommended to widen Carruthers Avenue between Cottingham Street and Wiginton Street on its existing centreline to be 6.7 metres wide. Parking should continue to be prohibited from both sides of the street to accommodate current and projected future traffic volumes. This results in 3.35 m lanes and maintains a 2-metre-wide south boulevard for snow storage. West of Wiginton Street and east of the Northgate north-south drive aisle, Carruthers Avenue remains at 4.7 metres wide with no curbs on the north side and a small transition area.

No changes are recommended to Carruthers further west past the Northgate north-south drive aisle along the 1375 McPhillips property. Figure 7 illustrates the proposed widening of Carruthers Avenue.

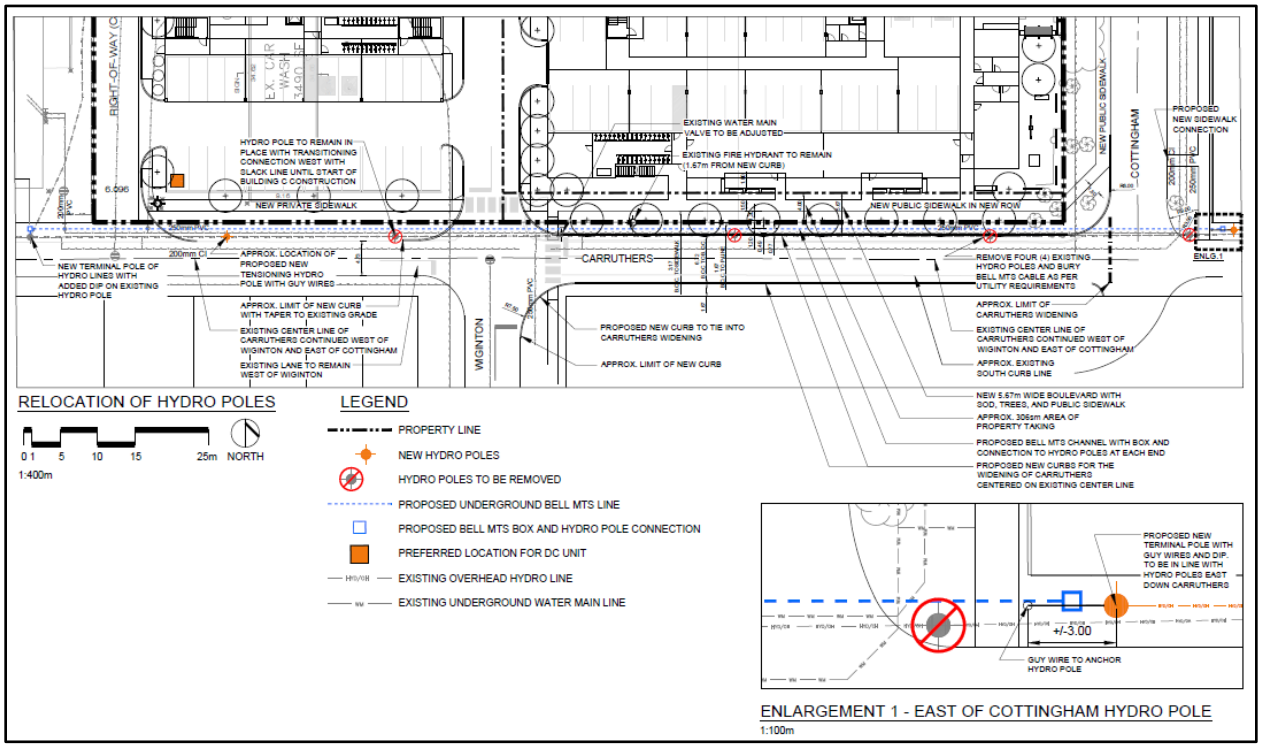


FIGURE 7: CARRUTHERS AVENUE WIDENING

3.4 Comparisons to WATT Consulting Group's TIA Volumes

The study team compared the post development volumes to WATT's 2019 TIA, which shows that more traffic will likely utilize the access on Carruthers Avenue and make their way to Wiginton Street or continue on Carruthers Avenue despite the decrease in units.

Recall that volumes on Wiginton Street increased from 2,800 vpd to 3,440 vpd, and volumes on Carruthers Avenure increased from 2,700 to 2,960. The development generated volumes accounts for 23% of 2028 background traffic at Wiginton Street, and 9% of 2028 background traffic at Carruthers Avenue.

Figure 8 shows the development generated volumes with movements greater than WATT Consulting Group's projected volumes in red.

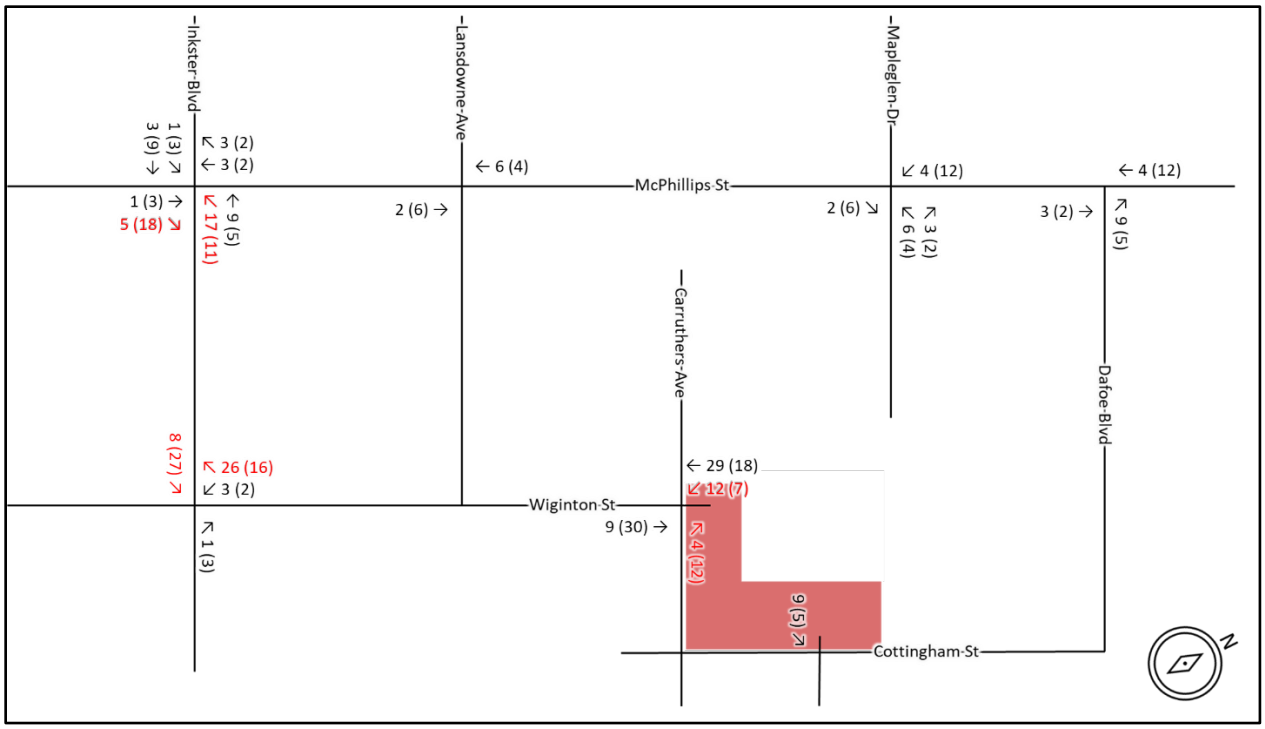


FIGURE 8: DEVELOPMENT GENERATED VOLUMES COMPARED

4 TRANSPORTATION ANALYSIS

4.1 Traffic Signal Warrant

Traffic Signal Warrant Analyses (TSWA) were completed using the procedure developed by the Transportation Association of Canada (TAC) and documented in the *Traffic Signal and Pedestrian Signal Head Warrant Handbook*. The process considers the intersection traffic volumes over the peak six hours (two hours in the morning, two hours at mid-day, and two hours in the afternoon) of a typical weekday and returns a number of warrant points.

The TSWA was limited to the intersection of Inkster Boulevard at Wiginton Street as this is the only intersection that saw an increase in traffic compared to WATT's report. WATT's report indicated that no signals were required at McPhillips Street/Dafoe Boulevard nor at McPhillips Street/Lansdowne Avenue, and this would remain true with the revised residential units.

Peak six-hour traffic volumes were calculated by multiplying the sum of the AM and PM peak hour volumes by an expansion factor developed from McPhillips Street at Inkster Boulevard turning movement counts. The peak 6-hour volume was three times the sum of AM and PM peak hour volumes.

Where warrant points meet or exceed 100, traffic signals can be considered warranted based on peak six-hour traffic volumes. However, high warrant points can sometimes result from intersections with heavy traffic on the major approaches and little traffic on the minor approaches. The TSWA process therefore includes a check on minor approach volumes—where all minor approaches have peak six-hour volumes averaging less than 75 vph (including minor through and left-turn volumes but excluding right-turn volumes), traffic signals are considered

not warranted due to insufficient minor approach activity. Warrant results may also not result in signalization due to other considerations such as spacings to other intersections, intersection function of involved streets, or other engineering judgement considerations.

TABLE 2: TRAFFIC SIGNAL WARRANT RESULTS

Intersection	2028 Background	2028 Post Development
Inkster Boulevard at Wiginton Street	68	80

The analysis indicates there was not enough traffic to warrant traffic signal control on Wiginton Street at Inkster Boulevard.

4.2 Collision Analysis

The study team obtained and reviewed reported collision data for a six-year period from the years 2015 to 2020. The reported collision data included the intersections listed below and the segments of Inkster Boulevard and McPhillips Street connecting these intersections. This is referred to as the collision study area in the remainder of this section.

- Inkster Boulevard at McPhillips Street
- Inkster Boulevard at Wiginton Street
- McPhillips Street at Dafoe Boulevard
- McPhillips Street at Mapleglen Drive
- McPhillips Street at Lansdowne Avenue
- Inkster Boulevard – McPhillips to Wiginton
- McPhillips Street – Dafoe to Mapleglen
- McPhillips Street – Mapleglen to Lansdowne
- McPhillips Street – Lansdowne to Inkster

Figure 9 illustrates the overall distribution of collisions at intersections and segments within the study area. The intersection of Inkster Boulevard at McPhillips Street experienced the most collisions with approximately 60% (462 collisions) of all collisions (763 collisions) that have occurred in the 6-year period in the collision study area. McPhillips Street at Mapleglen Drive was second in terms of proportion of reported collisions at 23%. Segment collisions represented 2% (10 collisions) of the reported collisions with 98% (753 collision) of reported collisions assigned to intersections.

Due to the low collisions recorded along segments, the collision analysis will focus on collisions that occurred at intersections.

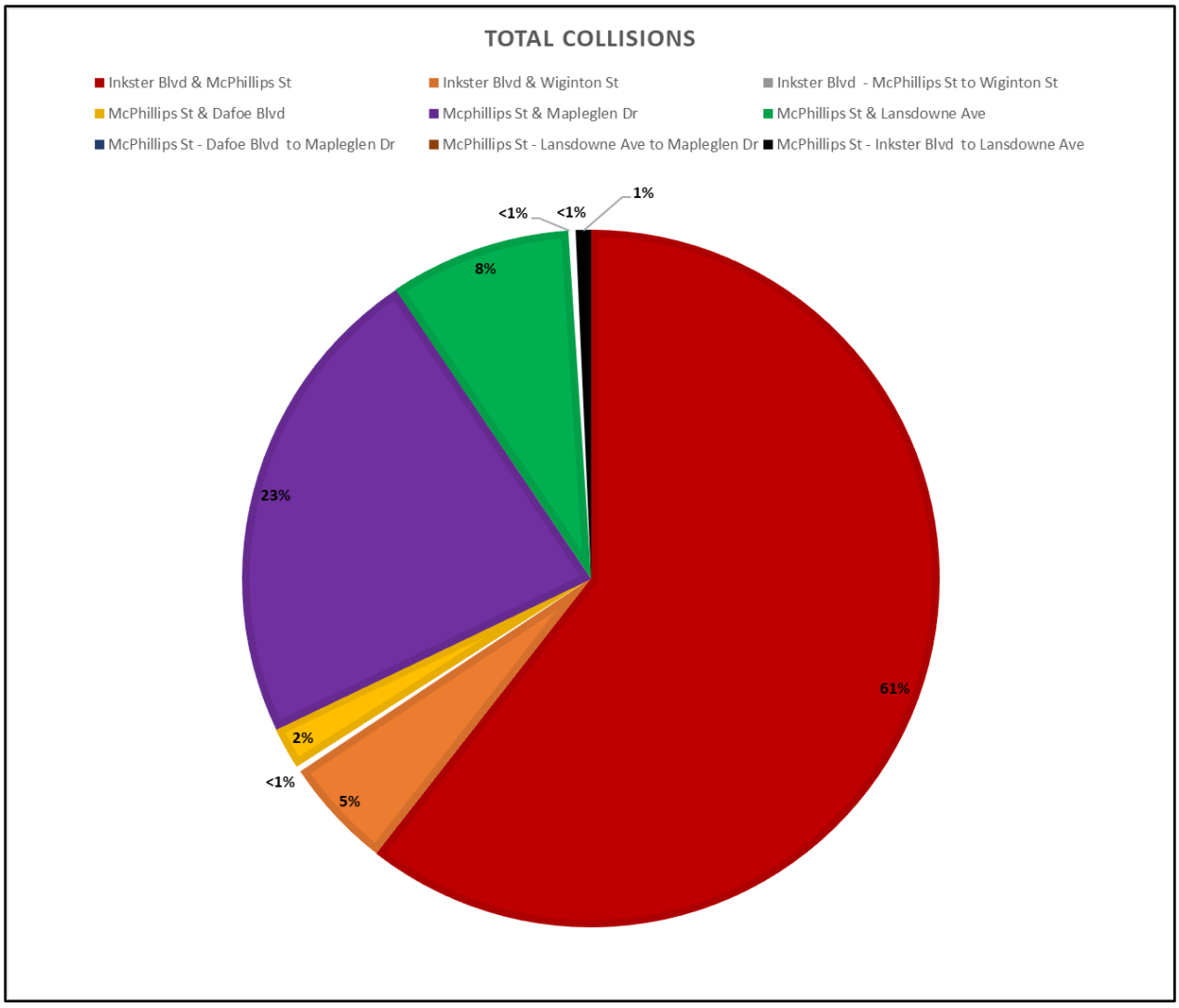


FIGURE 9: 2015 – 2020 COLLISION DISTRIBUTIONS

To identify intersection overrepresented in the collision data, collision rates were calculated in terms of collision per million entering vehicles (MEV). Intersection MEV values were calculated using the following equation:

$$MEV = ADT * \frac{365\ days}{year} * 6\ years * 0.93$$

For the volume component, ADTs were taken from WATT Consulting Group's report where available and factored intersection volume counts and engineering judgement were used when no ADT information was available. The 0.93 factor accounted for the assumed 25% lower ADT on weekends than weekdays. The 0.93 factor was calculated as follows:

$$0.93 = \frac{100\%\ Weekday\ ADT}{Weekday\ ADT} * \frac{5\ days}{7\ days} * \frac{75\%\ Weekend\ ADT}{Weekday\ ADT} * \frac{2\ days}{7\ days}$$

Table 3 shows the calculated MEV collision rate for the study intersections:

TABLE 3: INTERSECTION COLLISION RATES PER MILLION ENTERING VEHICLES

Intersections	Collision Rate (Per MEV)
Inkster Boulevard at McPhillips Street	2.19
Inkster Boulevard at Wiginton Street	0.57
McPhillips Street at Dafoe Boulevard	0.11
McPhillips Street at Mapleglen Drive	1.09
McPhillips Street at Lansdowne Avenue	0.45

The results indicate that Inkster Boulevard at McPhillips Street and McPhillips Street at Mapleglen Drive both exceeded a threshold of 1 collision per million entering vehicles with the McPhillips/Inkster intersection well above the typical threshold.

Figure 10 illustrates the overall distribution of collisions by severity within the study area. The most common collision severity was property damage only (72%) followed by non-fatal injuries (28%). No fatal injuries were reported during the six year period.

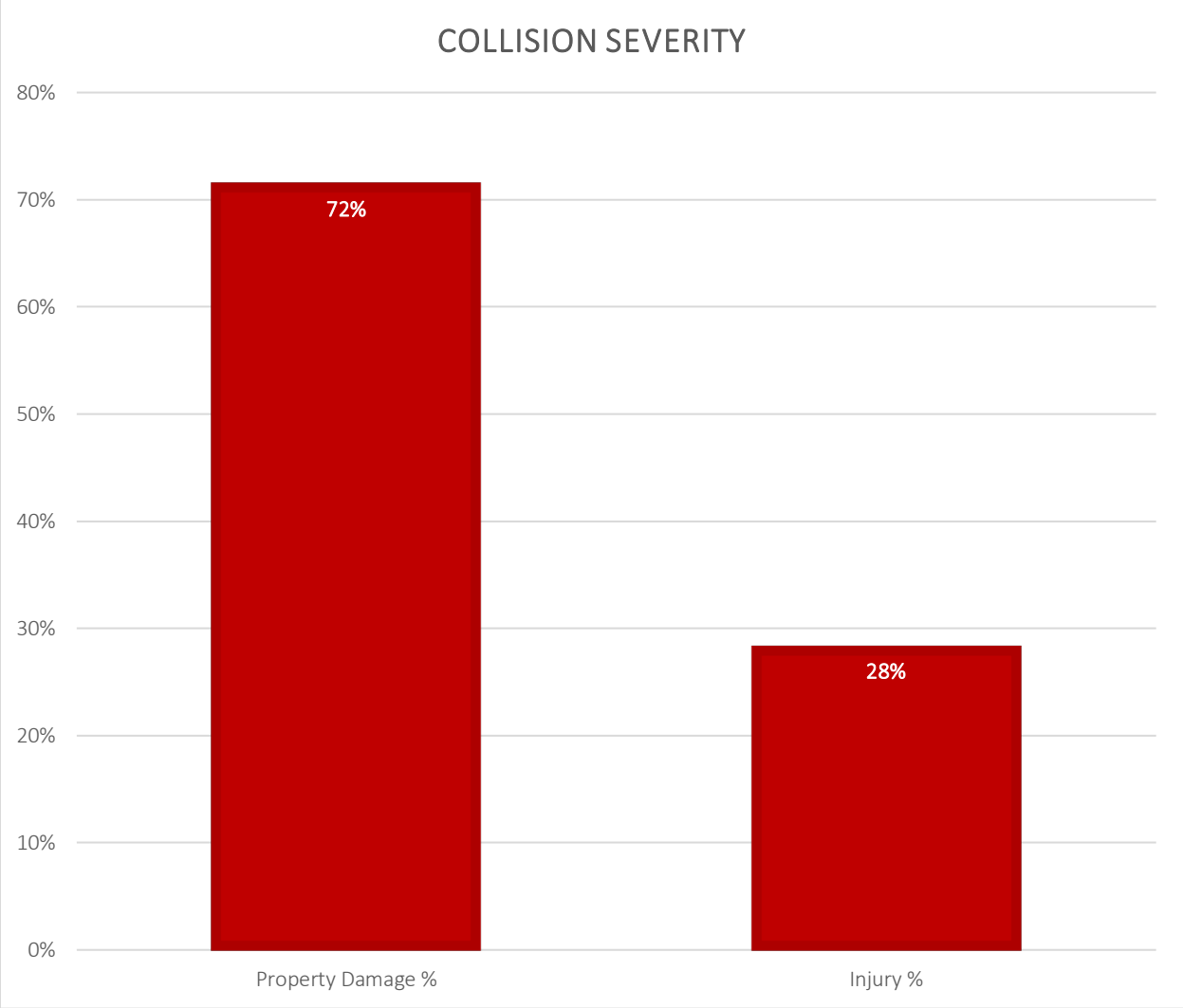


FIGURE 10: COLLISION SEVERITY

Figure 11 illustrates the collision configurations experienced within the study area. The most common configuration was rear end at 48% (363 collisions). Of the 363 rear end collisions, 267 occurred at McPhillips Street at Inkster Boulevard, and 66 occurred at McPhillips Street at Mapleglen Drive. The high proportion of rear end collisions is not uncommon on high volume arterial roadways with traffic signal control.

The second most common collision configuration was Intersection 90 Degrees at 16% (125 collisions). Out of 125 Intersection 90 Degree collisions, 43 occurred at McPhillips Street at Inkster Boulevard (traffic signal controlled), and around 25 collisions each occurred at McPhillips Street at Mapleglen Drive (traffic signal controlled), at McPhillips Street at Lansdowne Avenue, and at Inkster Boulevard at Wiginton Street.

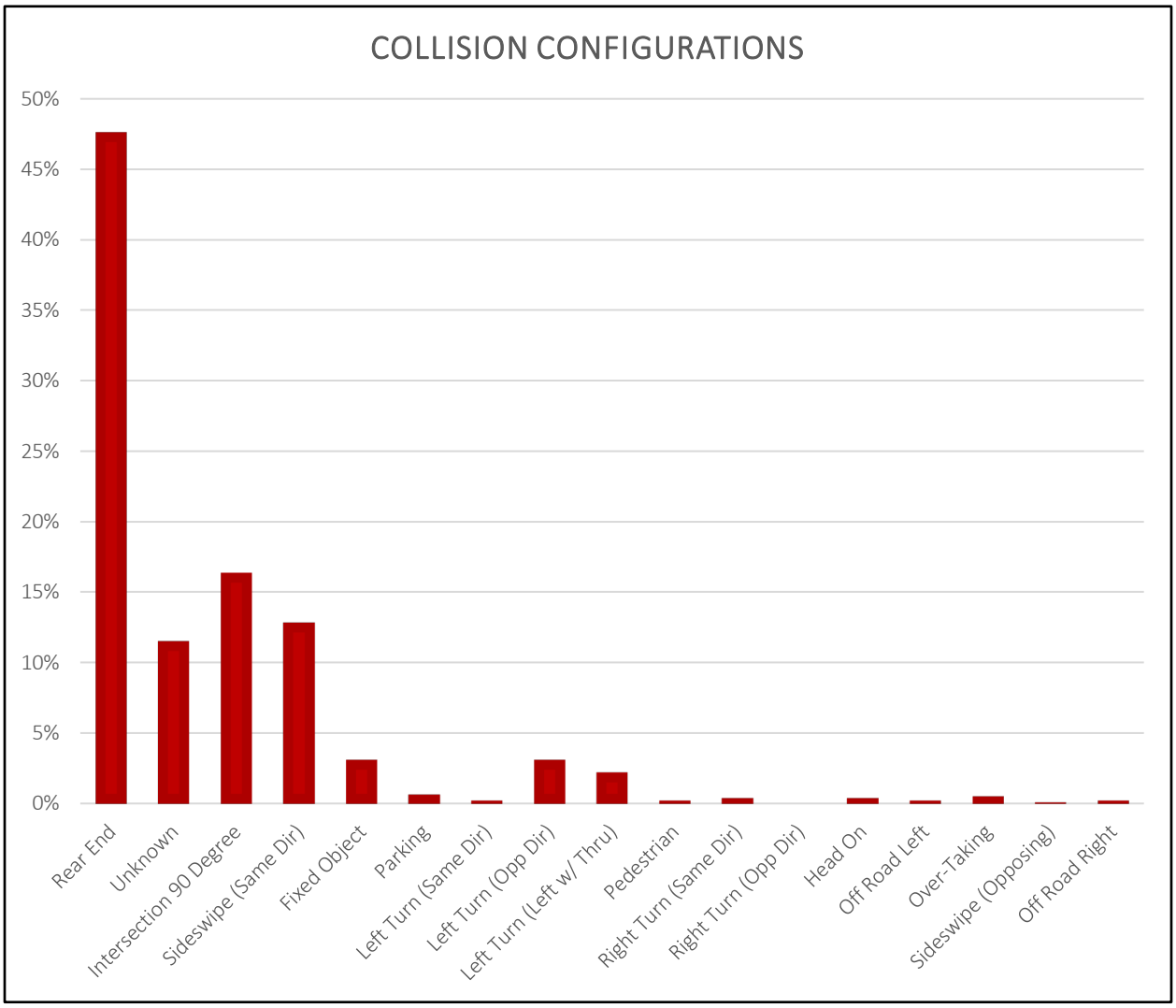


FIGURE 11: COLLISION CONFIGURATIONS

Figure 12 illustrates the collisions experienced during different lighting conditions within the study area. The most common light condition was during the day at 77% (587 collisions) followed by artificial lighting and dark both at 9% (70 collisions).

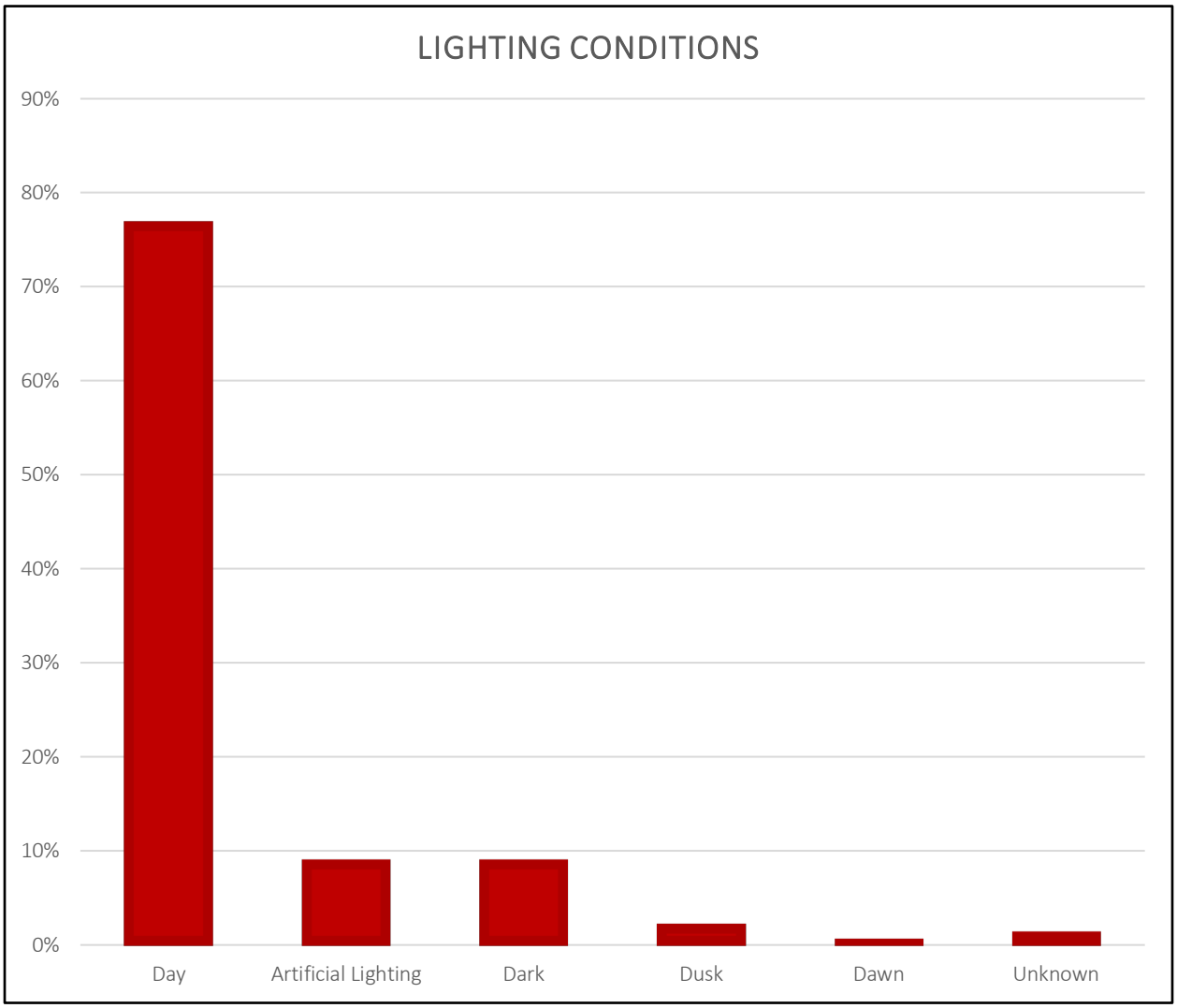


FIGURE 12: LIGHTING CONDITIONS

Figure 13 illustrates the collisions experienced during different weather conditions within the study area. The most common weather condition was during clear weather conditions at 68% (516 collisions). The second most frequent condition was cloudy conditions at 16% (119 collisions).

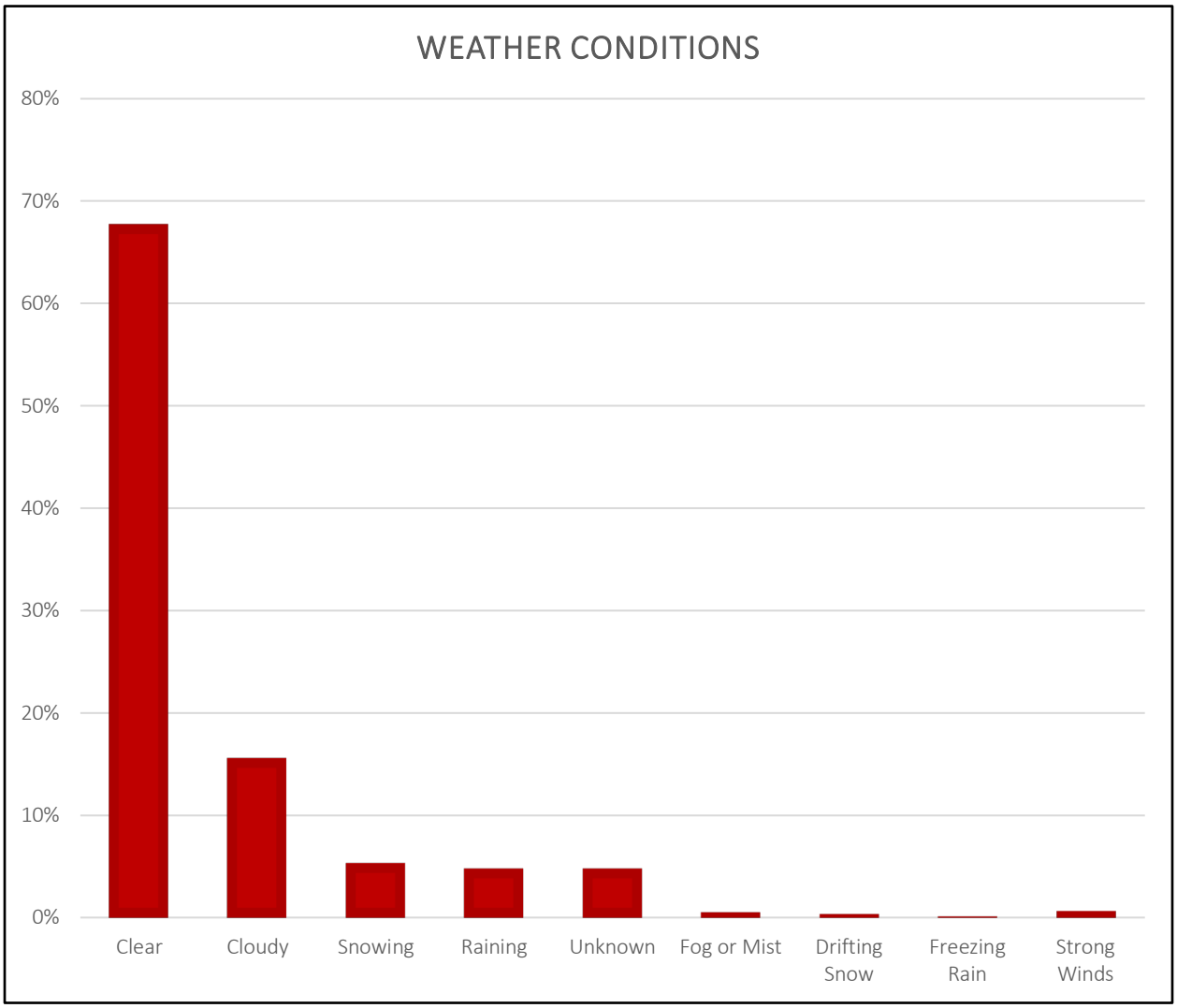


FIGURE 13: WEATHER CONDITIONS

The study team checked road surface conditions as well. The largest proportion of collisions occurred on a dry surface at 58% (439 collisions). The second largest proportion was ice surface at 15% (111 collisions).

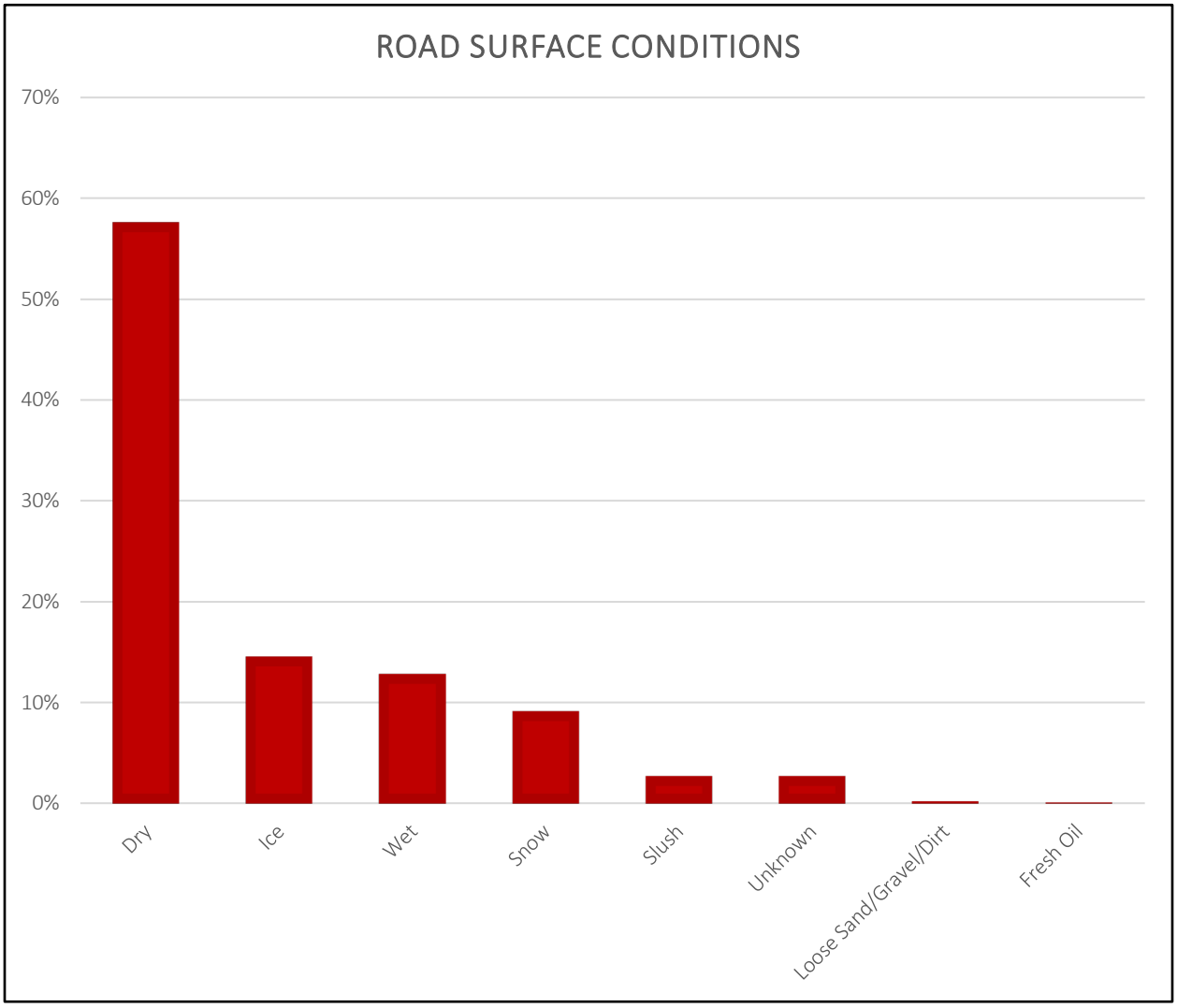


FIGURE 14: ROAD SURFACE CONDITIONS

Figure 15 shows the distribution of collisions by configuration and intersection. The study site intersections are organized along the horizontal axis of the table by cross street, with the most southeast intersection at the far left and the most northern intersection at the far right. However, Inkster Boulevard at McPhillips Street collisions (462 collisions of the 763 collisions) is shown separately in Figure 16 to allow for easier interpretation of the results.

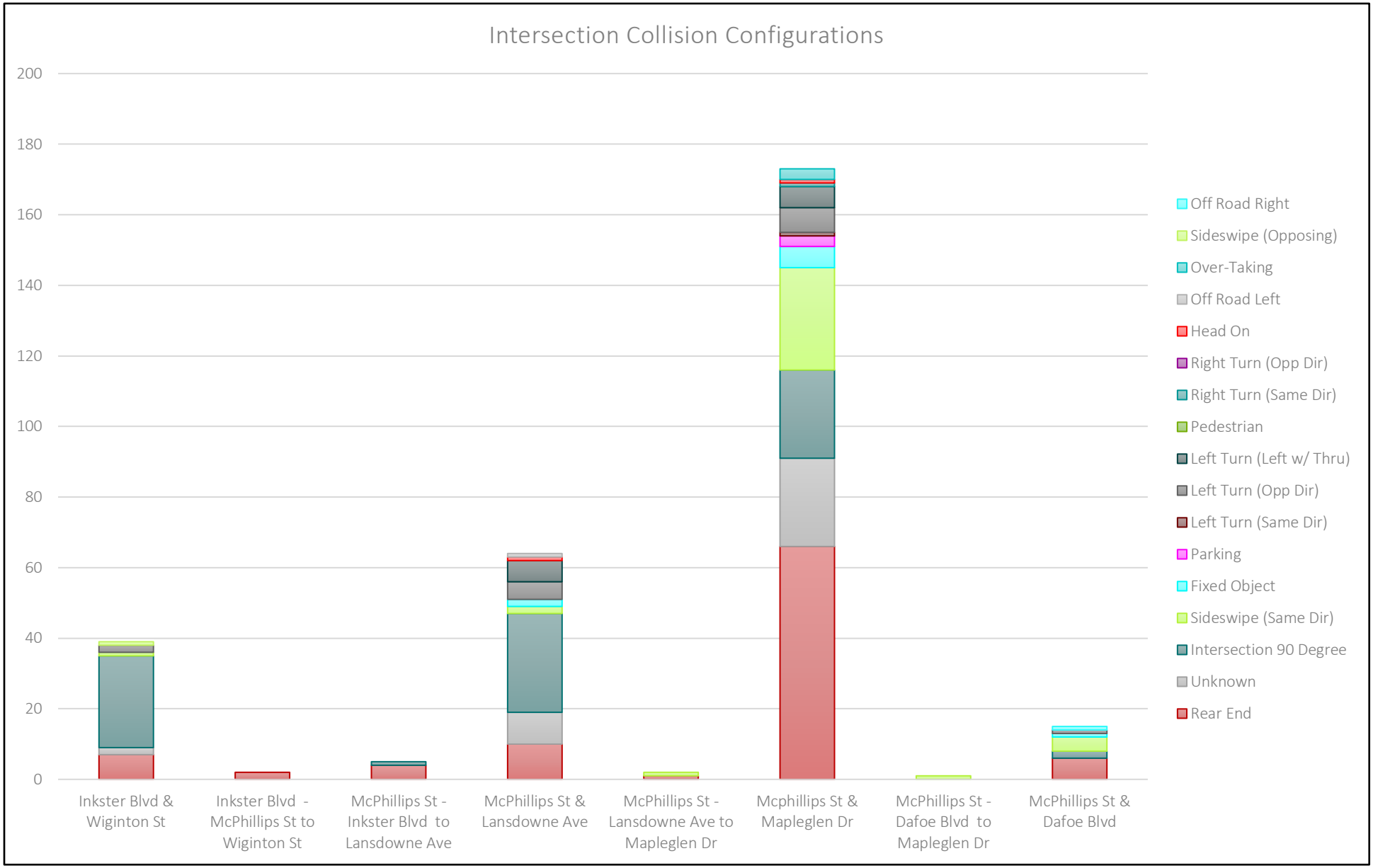


FIGURE 15: INTERSECTION COLLISION CONFIGURATIONS (NO INKSTER BOULEVARD AT MCPHILLIPS STREET)

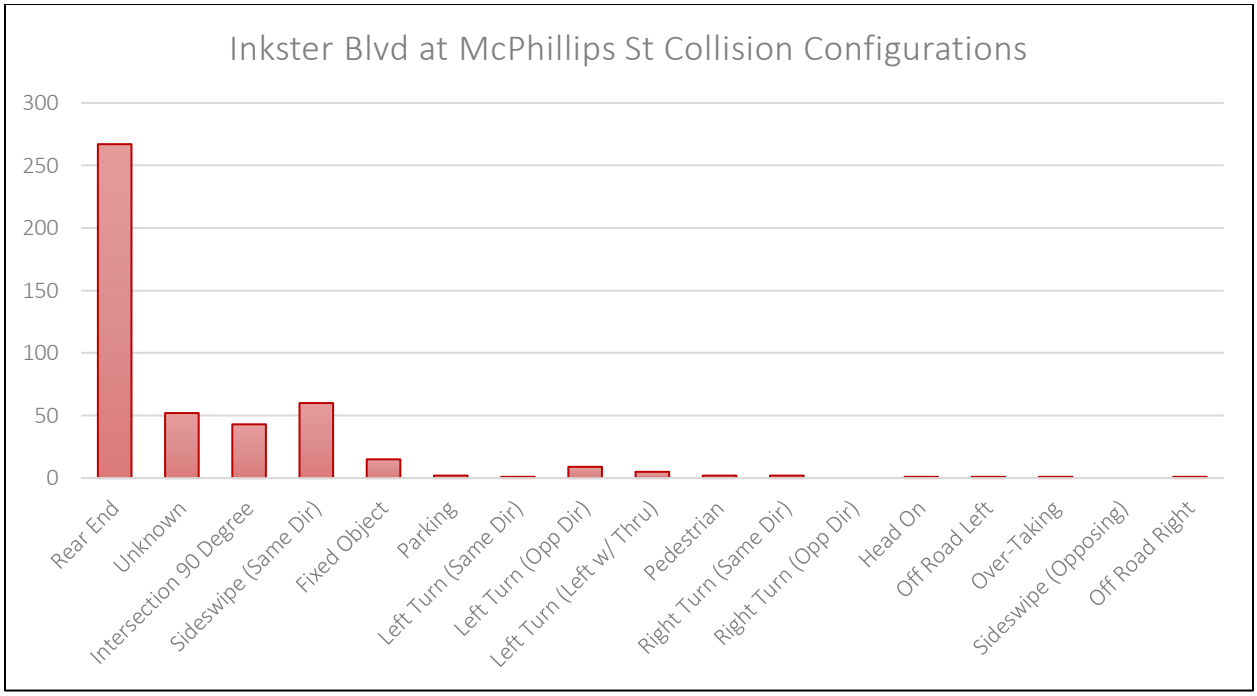


FIGURE 16: INKSTER BOULEVARD AT MCPHILLIPS STREET COLLISION CONFIGURATIONS

From the distribution, the study team observed that the majority of collisions are rear end collisions, concentrated at Inkster Boulevard at McPhillips Street and at McPhillips Street at Mapleglen Drive.

There are indications of higher proportions of Intersection 90 Degree collisions along McPhillips Streets and at Inkster Boulevard at Wiginton Street.

4.2.1 Inkster Boulevard at Wiginton Street

Intersection 90 Degree collisions at Inkster Boulevard at Wiginton Street were further analyzed by breaking the data down to collision severity, directional of travel from involved vehicles, and time periods.

Figure 17 illustrates the overall collision severity at Inkster Boulevard at Wiginton Street.

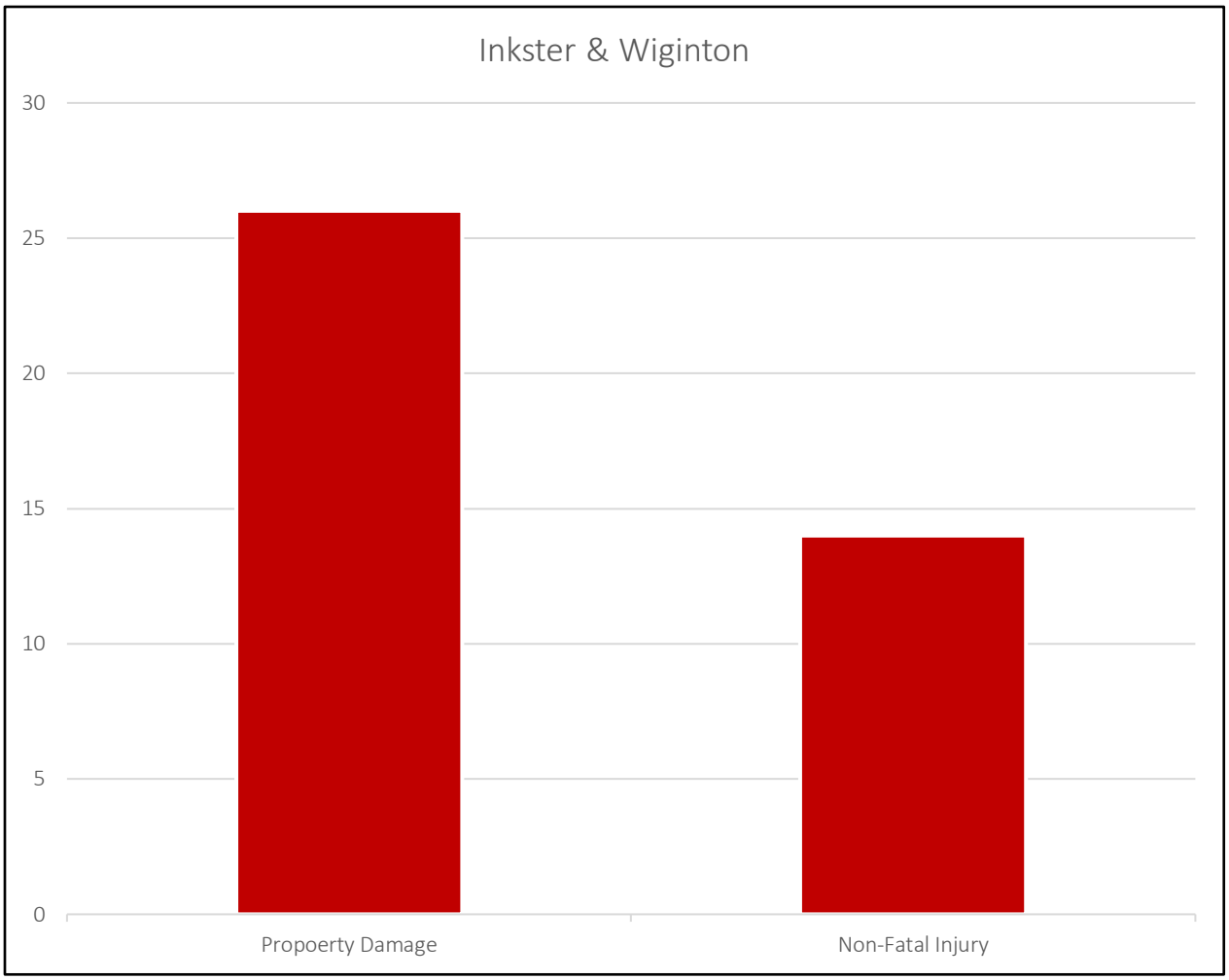


FIGURE 17: INTERSECTION 90 DEGREE COLLISION SEVERITY (INKSTER BLVD AT WIGINTON ST)

The overall collision severity is approximately 60/40 which means that 40% of reported Intersection 90 Degree collisions resulted in an injury.

Figure 18 illustrates the breakdown of total collision on Inkster Boulevard at Wiginton Street in terms of time periods. The time period review indicates that the most common time period for right angle collisions is around 09:00 to 12:00 accounting for 38% of all Intersection 90 Degree collisions followed by the 06:00 to 09:00 time period which accounted for 23% of those collisions.

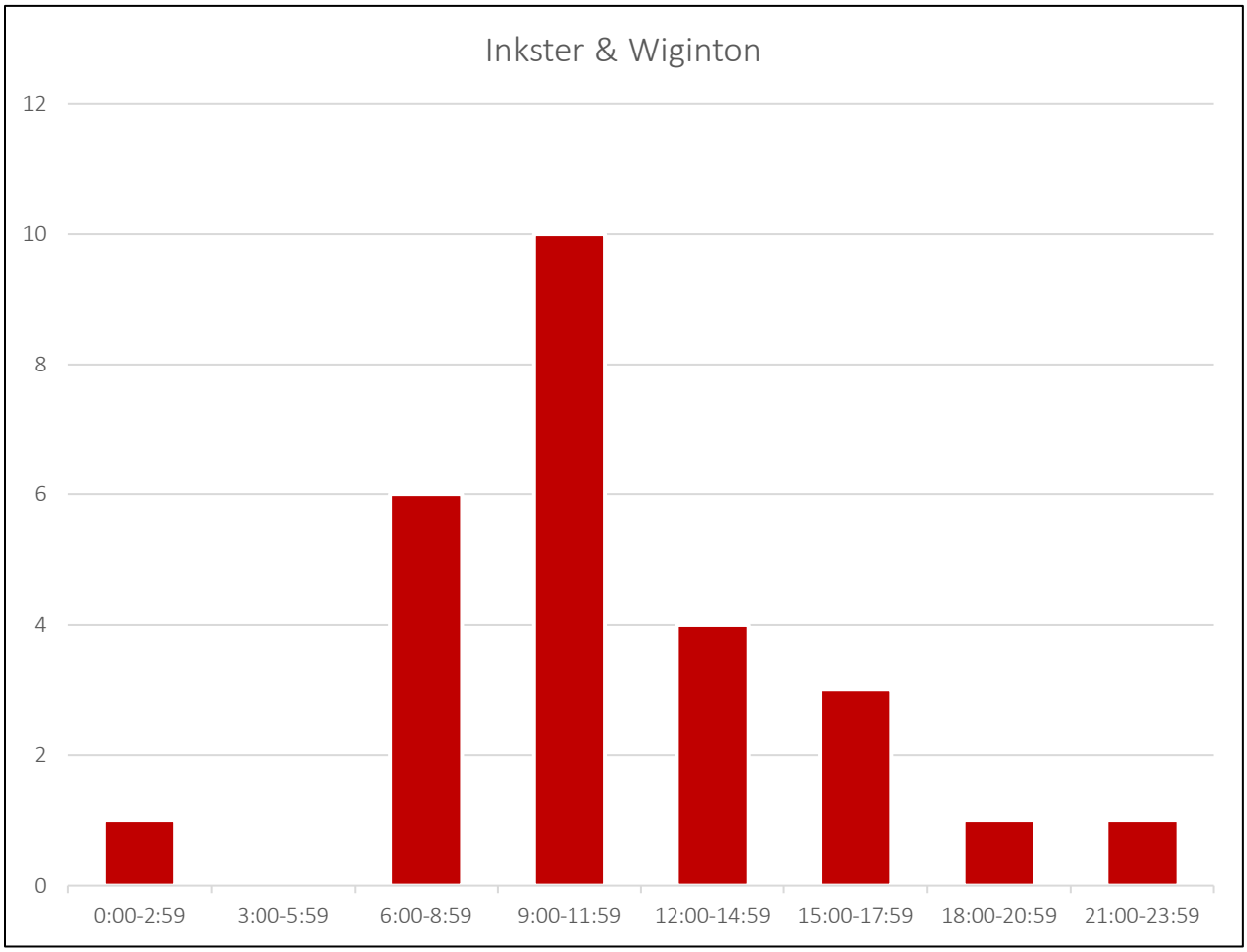


FIGURE 18: INTERSECTION 90 DEGREE COLLISION BY TIME PERIODS (INKSTER BLVD AT WIGINTON ST)

Figure 19 illustrates the directions of travel involved in reported Intersection 90 Degree collisions.

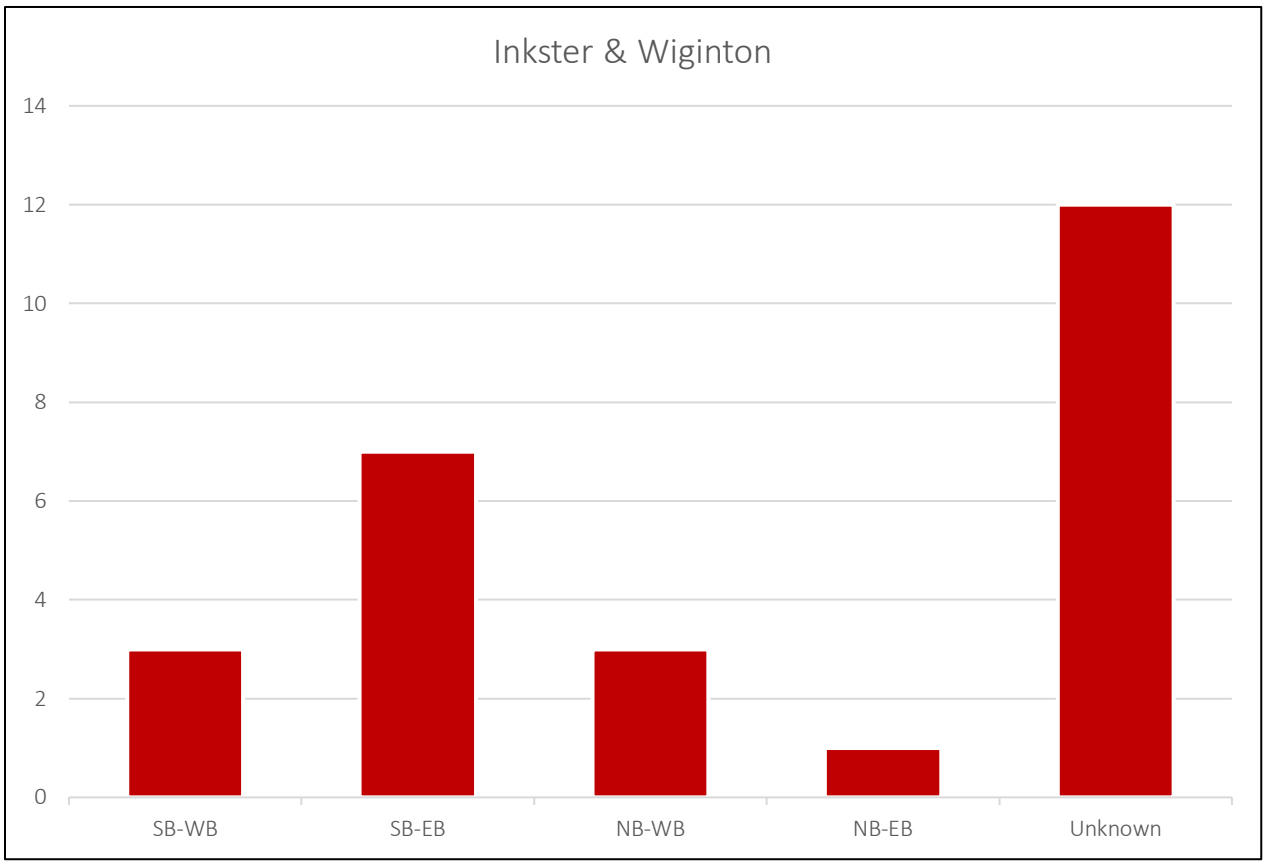


FIGURE 19: INTERSECTION 90 DEGREE COLLISION MOVEMENTS

Although the largest portion of right-angle collisions were not identified with movements (remained unknown), the second largest portion was from vehicles travelling SB and EB. Majority of the SB-EB right-angle collisions occurred during peak hours (either AM or PM) and with the road surface either snowy or clear.

To provide some context for the number of Intersection 90 Degree collisions at Inkster/Wiginton the study team referenced the City's Technical Guidelines & Practices for Stop Signs which applies a collision threshold of more than 15 right-angle, or left with opposing through, collisions in a 3-year period as a consideration for change in traffic control. The collision data of right-angle or left turns with opposing throughs recorded 18 collisions between 2015 to 2017, and under 15 collisions from 2018 to 2020 – which indicate that these collision configurations are approaching a level of concern.

The study team recommends prohibiting northbound and southbound through movements at the Inkster/Wiginton intersection to limit permitted movements to Inkster Boulevard through movements and turns on and off of Inkster Boulevard.

5 CONCLUSIONS & RECOMMENDATIONS

The study team reached the following conclusions based on the results of the review:

- The development is intended to have 221 multi-family units developed by 2028.
- At full build out, the development is forecast to generate 76 AM peak hour trips, 97 PM peak hour trips, and 1,280 daily trips during a typical weekday.
- Wiginton Street sees an average of 2,800 vehicles per day north of Inkster currently and that is not expected to change by 2028 without development. Post-development, volume of Wiginton is expected to increase by 640 vehicles per day to 3,440 vehicles per day. During the AM peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 38 vehicles (approximately a vehicle every 95 seconds) as compared to the current volume of 255 vehicles (approximately a vehicle every 14 seconds). During the PM peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 48 vehicles (approximately a vehicle every 75 seconds) as compared to the current volume of 281 vehicle (approximately a vehicle every 12 seconds).
- Carruthers Avenue sees an average of 2,700 vehicles per day east of Wiginton Street and that is not expected to change by 2028 without development. Post-development, volume on Carruthers Avenue between Wiginton and Cottingham is expected to increase by 260 vehicles to 2,960 vehicles per day. During the AM peak hour, the increase in traffic on Carruthers Avenue due to development is anticipated to be 16 vehicles (approximately a vehicle every 3 minutes and 45 seconds) as compared to the current volume of 170 vehicles (approximately a vehicle every 21 seconds). During the PM peak hour, the increase in traffic on Wiginton Street due to development is anticipated to be 19 vehicles (approximately a vehicle every 3 minutes and 9 seconds) as compared to the current volume of 275 vehicles (approximately a vehicle every 13 seconds).
- The addition of traffic signal control is not warranted at the Inkster Boulevard and Wiginton Street intersection.
- Reported collision rates above 1 per million entering vehicles were experienced on Inkster Boulevard at McPhillips Street (2.19) and on McPhillips Streets at Mapleglen (1.09).
- Inkster Boulevard at Wiginton Street experienced a notable number of reported Intersection 90 Degree collisions:
    - Collision severity of Intersection 90 Degrees were approximately 60% property damage and 40% injuries
    - There most common time-period for collisions were from 09:00 to 12:00 followed by 06:00 to 09:00 period.
    - Direction of travel involvement in Intersection 90 Degree collisions were mostly unknown.

The following is recommended based on the review:

- Widen Carruthers Avenue between Cottingham Street and Wiginton Street to be 6.7 metres wide to match local street standards as per Figure 7. Prohibit parking from both sides of the widened street to accommodate current and projected future traffic volumes.

APPENDIX A – TRAFFIC DATA

Input Needed
Formulated

AM

Raw Counts

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00			1147	10		1	1497							5		37	2697
2	McPhillips at Mapleglen	2018	7:00		41	909	52		121	1483	101		49	42	22		80	64	14	2978
3	McPhillips at Lansdowne	2019	7:45		1	1095	16		5	1526	0		1	0	3		0	0	8	2655
4	McPhllips at Inkster	2019	7:45		126	725	65		157	1118	257		225	252	130		157	317	130	3659
5	Wiginton at Inkster	2019	7:45		4	6	3		62	11	53		35	526	3		5	708	88	1504
6	Wiginton at Carruthers	2018	8:00		27	10	24		7	8	9		4	68	10		12	61	0	240

Peak Hour Factor

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00																	0.98
2	McPhillips at Mapleglen	2018	7:00																	0.99
3	McPhillips at Lansdowne	2019	7:45																	0.94
4	McPhllips at Inkster	2019	7:45																	0.99
5	Wiginton at Inkster	2019	7:45																	0.97
6	Wiginton at Carruthers	2018	8:00																	0.78

Heavy Vehicle Counts

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00			72	1			65							1		6	145
2	McPhillips at Mapleglen	2018	7:00		4	71	3			48	2		3	2	5		1			139
3	McPhillips at Lansdowne	2019	7:45			79				90					1					170
4	McPhllips at Inkster	2019	7:45		22	44	2		2	44	15		36	8	13		3	7		196
5	Wiginton at Inkster	2019	7:45										2	14				15	4	35
6	Wiginton at Carruthers	2018	8:00											1	1			1		3

Heavy Vehicle %

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00			6%	10%		0%	4%							20%		16%	
2	McPhillips at Mapleglen	2018	7:00		10%	8%	6%		0%	3%	2%		6%	5%	23%		1%	0%	0%	
3	McPhillips at Lansdowne	2019	7:45		0%	7%	0%		0%	6%			0%		33%				0%	
4	McPhllips at Inkster	2019	7:45		17%	6%	3%		1%	4%	6%		16%	3%	10%		2%	2%	0%	
5	Wiginton at Inkster	2019	7:45		0%	0%	0%		0%	0%	0%		6%	3%	0%		0%	2%	5%	
6	Wiginton at Carruthers	2018	8:00		0%	0%	0%		0%	0%	0%		0%	1%	10%		0%	2%		

Pedestrian Counts

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00				1				7				1					9
2	McPhillips at Mapleglen	2018	7:00				3				16				2				2	23
3	McPhillips at Lansdowne	2019	7:45				4				9				1				2	16
4	McPhllips at Inkster	2019	7:45																	0
5	Wiginton at Inkster	2019	7:45																	0
6	Wiginton at Carruthers	2018	8:00				1				10				30				2	43

Cyclist Counts

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00																	0
2	McPhillips at Mapleglen	2018	7:00																	0
3	McPhillips at Lansdowne	2019	7:45																	0
4	McPhllips at Inkster	2019	7:45																	0
5	Wiginton at Inkster	2019	7:45																	0
6	Wiginton at Carruthers	2018	8:00																	0

Input Needed
Formulated

PM

Raw Counts

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00			1794	9		0	1445							1		28	3277
2	McPhillips	2018	17:00		86	1719	108		180	1134	130		140	66	39		142	73	75	3892
3	McPhillips	2019	16:15		3	2145	11		6	1553	12		9	0	4		0	0	8	3751
4	McPhllips a	2019	16:30		120	1392	61		187	971	227		430	415	73		118	354	277	4625
5	Wiginton a	2019	16:45		4	7	3		68	12	58		39	579	3		6	779	97	1655
6	Wiginton a	2018	17:00		9	11	44		4	24	33		8	95	6		27	103	1	365

Peak Hour Factor

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00																	0.96
2	McPhillips	2018	17:00																	0.93
3	McPhillips	2019	16:15																	0.98
4	McPhllips a	2019	16:30																	0.99
5	Wiginton a	2019	16:45																	0.97
6	Wiginton a	2018	17:00																	0.89

Heavy Vehicle Counts

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00			27				28										55
2	McPhillips	2018	17:00		7	228	7		1	35			9	6	7		4			304
3	McPhillips	2019	16:15		1	40				57	1									99
4	McPhllips a	2019	16:30		13	29	1			18	21		13	4	2		3	2		106
5	Wiginton a	2019	16:45										2	15				17	4	38
6	Wiginton a	2018	17:00																	0

Heavy Vehicle %

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00			2%	0%			2%							0%		0%	
2	McPhillips	2018	17:00		8%	13%	6%		1%	3%	0%		6%	9%	18%		3%	0%	0%	
3	McPhillips	2019	16:15		33%	2%	0%		0%	4%	8%		0%		0%				0%	
4	McPhllips a	2019	16:30		11%	2%	2%		0%	2%	9%		3%	1%	3%		3%	1%	0%	
5	Wiginton a	2019	16:45		0%	0%	0%		0%	0%	0%		5%	3%	0%		0%	2%	4%	
6	Wiginton a	2018	17:00		0%	0%	0%		0%	0%	0%		0%	0%	0%		0%	0%	0%	

Pedestrian Counts

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00								5									5
2	McPhillips	2018	17:00				13				12				8				7	40
3	McPhillips	2019	16:15				1				14				1				5	21
4	McPhllips a	2019	16:30				8				13				10				13	44
5	Wiginton a	2019	16:45				11				13				16					40
6	Wiginton a	2018	17:00				3				1				5				2	11

Cyclist Counts

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00																	0
2	McPhillips	2018	17:00																	0
3	McPhillips	2019	16:15																	0
4	McPhllips a	2019	16:30																	0
5	Wiginton a	2019	16:45																	0
6	Wiginton a	2018	17:00																	0

Input Needed
Formulated

Daily

Raw Counts

ID	Intersection	Year	Time	North	South	East	West
1	McPhillips at Dafoe	2019			33800		
2	McPhillips at Mapleglen	2018		33800	32300	6400	5300
3	McPhillips at Lansdowne	2019		32300	37300	190	
4	McPhllips at Inkster	2019		37300		15100	
5	Wiginton at Inkster	2019		2800	400	15300	15100
6	Wiginton at Carruthers	2018		800		2700	2500

Peak Hour Factor

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	
2	McPhillips at Mapleglen	2018	
3	McPhillips at Lansdowne	2019	
4	McPhllips at Inkster	2019	
5	Wiginton at Inkster	2019	
6	Wiginton at Carruthers	2018	

Heavy Vehicle Counts

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	
2	McPhillips at Mapleglen	2018	
3	McPhillips at Lansdowne	2019	
4	McPhllips at Inkster	2019	
5	Wiginton at Inkster	2019	
6	Wiginton at Carruthers	2018	

Heavy Vehicle %

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	
2	McPhillips at Mapleglen	2018	
3	McPhillips at Lansdowne	2019	
4	McPhllips at Inkster	2019	
5	Wiginton at Inkster	2019	
6	Wiginton at Carruthers	2018	

Pedestrian Counts

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	
2	McPhillips at Mapleglen	2018	
3	McPhillips at Lansdowne	2019	
4	McPhllips at Inkster	2019	
5	Wiginton at Inkster	2019	
6	Wiginton at Carruthers	2018	

Cyclist Counts

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	
2	McPhillips at Mapleglen	2018	
3	McPhillips at Lansdowne	2019	
4	McPhllips at Inkster	2019	
5	Wiginton at Inkster	2019	
6	Wiginton at Carruthers	2018	

ITE Rates

Type	ITE Code	Independent Var	Week Rate	Week % In	AM Rate	AM % In	PM Rate	PM % In	Week In	Week Out	AM In	AM Out	PM In	PM Out
Multi Family	220	221	6.74	50%	0.4	24%	0.51	63%	745	745	21	67	71	42
									0	0	0	0	0	0
									0	0	0	0	0	0
									0	0	0	0	0	0
									0	0	0	0	0	0
									0	0	0	0	0	0
- Based on Winnipeg Transit nearby, and WATS Survey, 10% Reduction is applied							10% Reduction	Total	671	671	19	60	64	38

Directional Distribution

Movements	%	Week In	Week Out	AM In	AM Out	PM In	PM Out
McPhllips North	20%	134	134	4	12	13	8
McPhllips South	35%	235	235	7	21	22	13
Inkster West	20%	134	134	4	12	13	8
Inkster East	25%	168	168	5	15	16	10

- To/from North: Cottingham->Dafoe->McPhillips (15%) & Mapleglen-> McPhillips (5%)
- To/from South: Wiginton->Inkster->McPhillips (30%) & Mapleglen-> McPillips (5%)
- To/from West: Wiginton->Inkster (15%) & Mapleglen-> McPillips (5%)
- To/from East: Wiginton->Inkster (5%) & Carruthers->Airlies->Inkster (20%)

Access Distribution - Outbound **Inbound**

Access	%	Week In	Week Out	AM In	AM Out	PM In	PM Out	%	Week In	Week Out	AM In	AM Out	PM In	PM Out
Cottingham Access	15%		101		9		6	0%	0		0		0	
Carruthers Access	70%		470		42		27	70%	470		13		45	
Mapleglen Access	15%		101		9		6	30%	201		6		19	

Route Assignment - AM

ID	Intersection	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe			3				4									9	16
2	McPhillips at Mapleglen				2		4								6		3	15
3	McPhillips at Lansdowne			2				6										8
4	McPhllips at Inkster			1	6			3	3		1	3			18	9		44
5	Wiginton at Inkster						3		27		9						1	40
6	Wiginton at Carruthers			10			12	30									4	56

Route Assignment - PM

ID	Intersection	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe			2				13									6	21
2	McPhillips at Mapleglen				6		13								4		2	25
3	McPhillips at Lansdowne			6				4										10
4	McPhllips at Inkster			3	19			2	2		3	10			11	6		56
5	Wiginton at Inkster						2		17		29						3	51
6	Wiginton at Carruthers			32			8	19									13	72

Route Assignment - Weekday

ID	Intersection	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe			34				134									101	269
2	McPhillips at Mapleglen				68		134								68		34	304
3	McPhillips at Lansdowne			68				68										136
4	McPhllips at Inkster			34	201			34	34		34	101			201	101		740
5	Wiginton at Inkster						34		302		302						34	672
6	Wiginton at Carruthers			336			134	336									134	940

Future CAGR AM

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2019	8:00																	
2	McPhillips at Mapleglen	2018	7:00																	
3	McPhillips at Lansdowne	2019	7:45																	
4	McPhllips at Inkster	2019	7:45																	
5	Wiginton at Inkster	2019	7:45																	
6	Wiginton at Carruthers	2018	8:00																	
0	0	0	0:00																	

2022 Background

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2022	8:00	0	0	1145	10	0	0	1495	0	0	0	0	0	0	5	0	35	2690
2	McPhillips at Mapleglen	2022	7:00	0	40	910	50	0	120	1485	100	0	50	40	20	0	80	65	15	2975
3	McPhillips at Lansdowne	2022	7:45	0	0	1095	15	0	5	1525	0	0	0	0	5	0	0	0	10	2655
4	McPhllips at Inkster	2022	7:45	0	125	725	65	0	155	1120	255	0	225	250	130	0	155	315	130	3650
5	Wiginton at Inkster	2022	7:45	0	5	5	5	0	60	10	55	0	35	525	5	0	5	710	90	1510
6	Wiginton at Carruthers	2022	8:00	0	25	10	25	0	5	10	10	0	5	70	10	0	10	60	0	240
0	0	0	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2028 Background

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2028	8:00	0	0	1145	10	0	0	1495	0	0	0	0	0	0	5	0	35	2690
2	McPhillips at Mapleglen	2028	7:00	0	40	910	50	0	120	1485	100	0	50	40	20	0	80	65	15	2975
3	McPhillips at Lansdowne	2028	7:45	0	0	1095	15	0	5	1525	0	0	0	0	5	0	0	0	10	2655
4	McPhllips at Inkster	2028	7:45	0	125	725	65	0	155	1120	255	0	225	250	130	0	155	315	130	3650
5	Wiginton at Inkster	2028	7:45	0	5	5	5	0	60	10	55	0	35	525	5	0	5	710	90	1510
6	Wiginton at Carruthers	2028	8:00	0	25	10	25	0	5	10	10	0	5	70	10	0	10	60	0	240
0	0	2028	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trips Generated

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe			0	0	3	0	0	0	4	0	0	0	0	0	0	0	0	9	16
2	McPhillips at Mapleglen			0	0	0	2	0	4	0	0	0	0	0	0	0	6	0	3	15
3	McPhillips at Lansdowne			0	0	2	0	0	0	6	0	0	0	0	0	0	0	0	0	8
4	McPhllips at Inkster			0	0	1	6	0	0	3	3	0	1	3	0	0	18	9	0	44
5	Wiginton at Inkster			0	0	0	0	0	3	0	27	0	9	0	0	0	0	0	1	40
6	Wiginton at Carruthers			0	0	10	0	0	12	30	0	0	0	0	0	0	0	0	4	56
0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2028 Post Development

ID	Intersection	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe	2028	8:00	0	0	1148	10	0	0	1499	0	0	0	0	0	0	5	0	44	2706
2	McPhillips at Mapleglen	2028	7:00	0	40	910	52	0	124	1485	100	0	50	40	20	0	86	65	18	2990
3	McPhillips at Lansdowne	2028	7:45	0	0	1097	15	0	5	1531	0	0	0	0	5	0	0	0	10	2663
4	McPhllips at Inkster	2028	7:45	0	125	726	71	0	155	1123	258	0	226	253	130	0	173	324	130	3694
5	Wiginton at Inkster	2028	7:45	0	5	5	5	0	63	10	82	0	44	525	5	0	5	710	91	1550
6	Wiginton at Carruthers	2028	8:00	0	25	20	25	0	17	40	10	0	5	70	10	0	10	60	4	296
0	0	2028	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Future CAGR PM

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2019	17:00			0.20%				0.20%										
2	McPhillips	2018	17:00			0.20%				0.20%										
3	McPhillips	2019	16:15			0.20%				0.20%										
4	McPhllips a	2019	16:30		0.20%	0.20%	0.20%		0.20%	0.20%	0.20%		0.20%	0.20%	0.20%		0.20%	0.20%	0.20%	
5	Wiginton a	2019	16:45											0.20%				0.20%		
6	Wiginton a	2018	17:00																	
0	0	0	0:00																	

2022 Background

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2022	17:00	0	0	1805	10	0	0	1455	0	0	0	0	0	0	0	0	30	3300
2	McPhillips	2022	17:00	0	85	1735	110	0	180	1145	130	0	140	65	40	0	140	75	75	3920
3	McPhillips	2022	16:15	0	5	2160	10	0	5	1560	10	0	10	0	5	0	0	0	10	3775
4	McPhllips a	2022	16:30	0	120	1400	60	0	190	975	230	0	435	415	75	0	120	355	280	4655
5	Wiginton a	2022	16:45	0	5	5	5	0	70	10	60	0	40	580	5	0	5	785	95	1665
6	Wiginton a	2022	17:00	0	10	10	45	0	5	25	35	0	10	95	5	0	25	105	0	370
0	0	0	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2028 Background

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2028	17:00	0	0	1825	10	0	0	1475	0	0	0	0	0	0	0	0	30	3340
2	McPhillips	2028	17:00	0	85	1755	110	0	180	1160	130	0	140	65	40	0	140	75	75	3955
3	McPhillips	2028	16:15	0	5	2185	10	0	5	1580	10	0	10	0	5	0	0	0	10	3820
4	McPhllips a	2028	16:30	0	120	1415	60	0	190	985	235	0	440	420	75	0	120	360	285	4705
5	Wiginton a	2028	16:45	0	5	5	5	0	70	10	60	0	40	585	5	0	5	795	95	1680
6	Wiginton a	2028	17:00	0	10	10	45	0	5	25	35	0	10	95	5	0	25	105	0	370
0	0	2028	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Trips Generated

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips at Dafoe			0	0	2	0	0	0	13	0	0	0	0	0	0	0	0	6	21
2	McPhillips at Mapleglen			0	0	0	6	0	13	0	0	0	0	0	0	0	4	0	2	25
3	McPhillips at Lansdowne			0	0	6	0	0	0	4	0	0	0	0	0	0	0	0	0	10
4	McPhllips at Inkster			0	0	3	19	0	0	2	2	0	3	10	0	0	11	6	0	56
5	Wiginton at Inkster			0	0	0	0	0	2	0	17	0	29	0	0	0	0	0	3	51
6	Wiginton at Carruthers			0	0	32	0	0	8	19	0	0	0	0	0	0	0	0	13	72
0	0			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

2028 Post Development

ID	Intersectio	Year	Time	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	Total
1	McPhillips	2028	17:00	0	0	1827	10	0	0	1488	0	0	0	0	0	0	0	0	36	3361
2	McPhillips	2028	17:00	0	85	1755	116	0	193	1160	130	0	140	65	40	0	144	75	77	3980
3	McPhillips	2028	16:15	0	5	2191	10	0	5	1584	10	0	10	0	5	0	0	0	10	3830
4	McPhllips a	2028	16:30	0	120	1418	79	0	190	987	237	0	443	430	75	0	131	366	285	4761
5	Wiginton a	2028	16:45	0	5	5	5	0	72	10	77	0	69	585	5	0	5	795	98	1731
6	Wiginton a	2028	17:00	0	10	42	45	0	13	44	35	0	10	95	5	0	25	105	13	442
0	0	2028	0:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Future CAGR Daily

ID	Intersection	Year	Time
1	McPhillips at Dafoe	2019	0:00
2	McPhillips at Mapleglen	2018	0:00
3	McPhillips at Lansdowne	2019	0:00
4	McPhllips at Inkster	2019	0
5	Wiginton at Inkster	2019	0
6	Wiginton at Carruthers	2018	0
0	0	0	0

2022 Background

ID	Intersection	Year	Time	North	South	East	West
1	McPhillips at Dafoe	2022	0:00	0	34300	0	0
2	McPhillips at Mapleglen	2022	0:00	34500	33000	6400	5300
3	McPhillips at Lansdowne	2022	0:00	32800	37900	190	0
4	McPhllips at Inkster	2022	0:00	37900	0	15300	0
5	Wiginton at Inkster	2022	0:00	2800	400	15500	15300
6	Wiginton at Carruthers	2022	0:00	800	0	2700	2500
0	0	0	0:00				

2028 Background

ID	Intersection	Year	Time	North	South	East	West
1	McPhillips at Dafoe	2028	0:00	0	35400	0	0
2	McPhillips at Mapleglen	2028	0:00	35500	34000	6400	5300
3	McPhillips at Lansdowne	2028	0:00	33800	39000	200	0
4	McPhllips at Inkster	2028	0:00	39000	0	15800	0
5	Wiginton at Inkster	2028	0:00	2800	400	16000	15800
6	Wiginton at Carruthers	2028	0:00	800	0	2700	2500
0	0	2028	0:00				

Trips Generated

ID	Intersection	Year	Time	North	South	East	West
1	McPhillips at Dafoe			270	170	100	0
2	McPhillips at Mapleglen			170	140	300	0
3	McPhillips at Lansdowne			140	140	0	0
4	McPhllips at Inkster			140	470	600	270
5	Wiginton at Inkster			670	0	70	600
6	Wiginton at Carruthers			940	670	270	0
0	0						

2028 Post Development

ID	Intersection	Year	Time	North	South	East	West
1	McPhillips at Dafoe	2028	0:00	270	37370	100	0
2	McPhillips at Mapleglen	2028	0:00	37470	35840	6700	5300
3	McPhillips at Lansdowne	2028	0:00	35640	41140	200	0
4	McPhllips at Inkster	2028	0:00	41140	470	17200	270
5	Wiginton at Inkster	2028	0:00	3470	400	16870	17200
6	Wiginton at Carruthers	2028	0:00	1740	670	2970	2500
0	0	2028	0:00	0	0	0	0

Using Intersection: **McPhillips Street at Inkster Boulevard**

	Volume
AM Peak 1	6843
AM Peak 2	0
PM Peak 1	7654
PM Peak 2	0
Off-Peak 1	9157
Off-Peak 2	0
Peak 6	23654
AM + PM	8284
Factor	3.00

Intersection: **Wiginton Street at Inkster Boulevard**

Scenario	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR
2028 BG	0	30	30	30	0	390	60	345	0	225	3330	30	0	30	4515	555
2028 PD	0	30	30	30	0	405	60	477	0	339	3330	30	0	30	4515	567

APPENDIX B – TRAFFIC SIGNAL WARRANT ANALYSIS

City of Winnipeg - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Inkster	Direction (EW or NS)	EW
Side Street (name)	Wiginton	Direction (EW or NS)	NS
Quadrant / Int #	Wiginton St at Inkster Blvd	Comments	2028 b
	CHECK SHEET		

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	City of Winnipeg
City:	Winnipeg
Analysis Date:	2022 Jan 14, Fri
Count Date:	
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Inkster	WB	0	1	0	0	1	0	0	400	2			
Inkster	EB	0	1	0	0	1	0	0	200	2			
Wiginton	NB	0	0	0	1	0	0	0	2000	1			
Wiginton	SB	0	0	0	1	0	0	0	2000	1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the Wiginton NB right turns significantly impeded by through movements? (y/n)	n	
Are the Wiginton SB right turns significantly impeded by through movements? (y/n)	n	
Are the Inkster WB right turns significantly impeded by through movements? (y/n)	n	
Are the Inkster EB right turns significantly impeded by through movements? (y/n)	n	

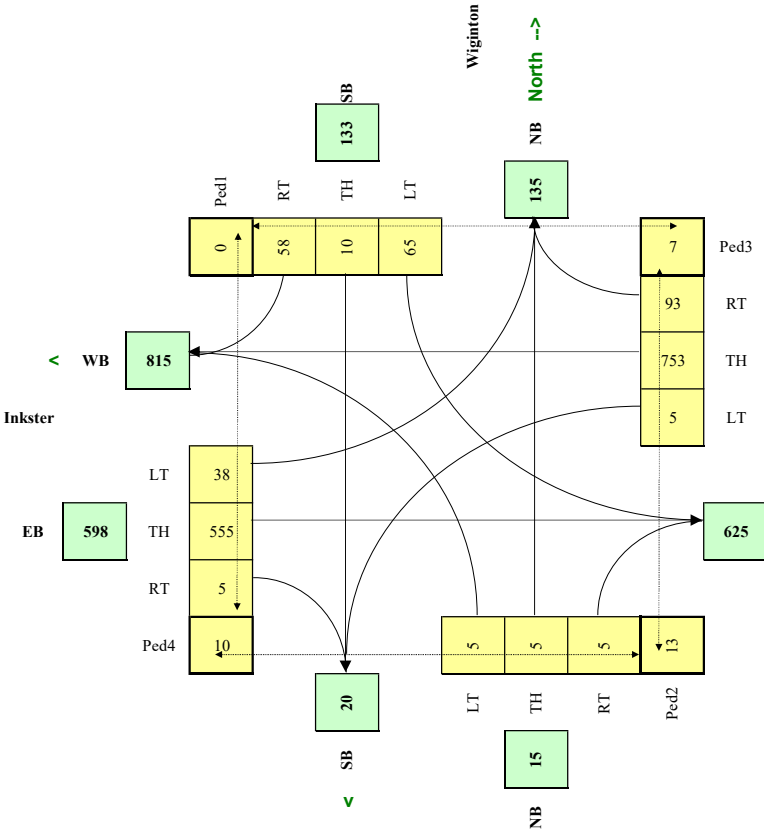
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	815,240
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Inkster	EW	60	0.0%	n	10.0
Wiginton	NS	50	0.0%	n	10.0

Set Peak Hours

Traffic Input	NB			SB			EB			WB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	30	30	30	390	60	345	225	3330	30	30	4515	555	0	12	12	6
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1	13
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1	13
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13	7
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13	7
	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	14
Total (6-hour peak)	30	30	30	390	60	345	225	3,330	30	30	4,515	555	0	78	41	60
Average (6-hour peak)	5	5	5	65	10	58	38	555	5	5	753	93	0	13	7	10
Actual Pedestrian Crossing Distance (m)													21.0	23.0	17.0	13.0

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F (X_{v\text{-}p}) L) / K_2] \times C_i$

W =	68	58	10
		Veh	*Ped*

Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 14

Warranted - Complex Intersection

Traffic Signal Warrant Spreadsheet - v2.0 © 2014 Transportation Association of Canada

City of Winnipeg - Traffic Signal & Pedestrian Signal Head Warrant Analysis

Main Street (name)	Inkster	Direction (EW or NS)	EW
Side Street (name)	Wiginton	Direction (EW or NS)	NS
Quadrant / Int #	Wiginton St at Inkster Blvd	Comments	2028 d
	CHECK SHEET		

for Warrant Calculation Results, please hit 'Page Down'

Road Authority:	City of Winnipeg
City:	Winnipeg
Analysis Date:	2022 Jan 14, Fri
Count Date:	
Date Entry Format:	(yyyy-mm-dd)

Lane Configuration		Excl LT	Th & LT	Through	Th+RT+LT	Th & RT	Excl RT	RT Channelization (y/n)	UpStream Signal (m)	# of Thru Lanes	LT Phase Type	RTOR Allowed (y/n)	Actuated Thru Phase
Inkster	WB	0	1	0	0	1	0	0	400	2			
Inkster	EB	0	1	0	0	1	0	0	200	2			
Wiginton	NB	0	0	0	1	0	0	0	2000	1			
Wiginton	SB	0	0	0	1	0	0	0	2000	1			

Saturation Flow Rates (if not default) (vphpl)		Default Saturation Flow Rates (vphpl)
Left Turn		1,650
Through		1,800
Right Turn		1,500

Are the Wiginton NB right turns significantly impeded by through movements? (y/n)	n	
Are the Wiginton SB right turns significantly impeded by through movements? (y/n)	n	
Are the Inkster WB right turns significantly impeded by through movements? (y/n)	n	
Are the Inkster EB right turns significantly impeded by through movements? (y/n)	n	

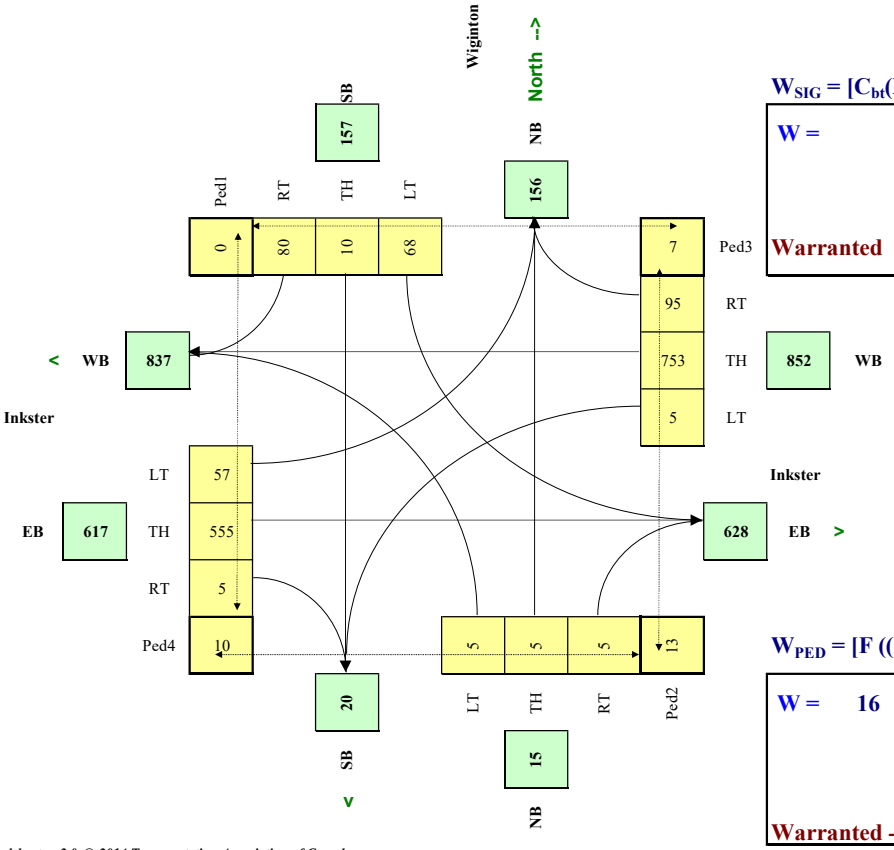
Demographics		
Elem. School/Mobility Challenged	(y/n)	n
Senior's Complex	(y/n)	n
Pathway to School	(y/n)	n
Metro Area Population	(#)	815,240
Central Business District	(y/n)	n

Other input		Speed (Km/h)	Truck %	Bus Rt (y/n)	Median (m)
Inkster	EW	60	0.0%	n	10.0
Wiginton	NS	50	0.0%	n	10.0

Set Peak Hours

Traffic Input	NB			SB			EB			WB			Ped1 NS	Ped2 NS	Ped3 EW	Ped4 EW
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT	W Side	E Side	N Side	S Side
7:00 - 8:00	30	30	30	405	60	477	339	3330	30	30	4515	567	0	12	12	6
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1	13
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	1	13
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13	7
	0	0	0	0	0	0	0	0	0	0	0	0	0	13	13	7
	0	0	0	0	0	0	0	0	0	0	0	0	0	14	1	14
Total (6-hour peak)	30	30	30	405	60	477	339	3,330	30	30	4,515	567	0	78	41	60
Average (6-hour peak)	5	5	5	68	10	80	57	555	5	5	753	95	0	13	7	10
Actual Pedestrian Crossing Distance (m)													21.0	23.0	17.0	13.0

Average 6-hour Peak Turning Movements



$W_{SIG} = [C_{bt}(X_{v\text{-}v}) / K_1 + (F (X_{v\text{-}p}) L) / K_2] \times C_i$

W =	80	70	10
		Veh	*Ped*

Warranted

RESET SHEET

$W_{PED} = [F ((Xped_m)d_m/K_2) + (Xped_s)d_s/K_3)]$

W = 16

Warranted - Complex Intersection

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APPENDIX C – COLLISION ANALYSIS

	Locations	**Inkster Blvd & McPhillips St**		**Inkster Blvd & Wiginton St**		**McPhillips St & Mapleglen Dr**		**McPhillips St & Dafoe Blvd**		**McPhillips St & Lansdowne Ave**	
	Total Collisions	462		39		173		15		64	
		Quantity	%	Quantity	%	Quantity	%	Quantity	%	Quantity	%
Severity	Propoerty Damage	342	74%	21	54%	126	73%	11	73%	41	64%
	Non-Fatal Injury	120	26%	18	46%	47	27%	4	27%	23	36%
	Fatal	0	0%	0	0%	0	0%	0	0%	0	0%
		Total Collisions		Total Collisions		Total Collisions		Total Collisions		Total Collisions	
Collision Sites	Intersection	64		9		41		2		9	
	Between Intersections	379		29		126		12		52	
	Back Lane (Intersection)	5		1		0		0		0	
	Parking Lot (Intersection)	2		0		3		1		1	
	Intersection of Private Drive/Lane	1		0		0		0		0	
	Tunnel/Underpass	0		0		0		0		0	
	Passing/Climbing Lane	1		0		0		0		0	
	Unknown	10		0		3		0		2	
		Total Collisions	Injuries	Total Collisions	Injuries	Total Collisions	Injuries	Total Collisions	Injuries	Total Collisions	Injuries
	Rear End	267	84	7	2	66	27	6	3	10	4
	Unknown	52	11	2	0	25	9	0	0	9	4
	Intersection 90 Degree	43	12	26	14	25	4	2	0	28	9
	Sideswipe (Same Dir)	60	7	1	0	29	0	4	0	2	0
	Fixed Object	15	1	0	0	6	1	1	0	2	0
	Parking	2	0	0	0	3	1	0	0	0	0
	Left Turn (Same Dir)	1	1	0	0	1	0	0	0	0	0
	Left Turn (Opp Dir)	9	2	2	1	7	3	1	0	5	4
	Left Turn (Left w/ Thru)	5	1	0	0	6	1	0	0	6	1
	Pedestrian	2	1	0	0	0	0	0	0	0	0
	Right Turn (Same Dir)	2	0	0	0	1	0	0	0	0	0
	Right Turn (Opp Dir)	0	0	0	0	0	0	0	0	0	0
	Head On	1	0	0	0	1	0	0	0	1	1
	Off Road Left	1	0	0	0	0	0	0	0	1	0
	Over-Taking	1	0	0	0	3	1	0	0	0	0
	Sideswipe (Opposing)	0	0	1	1	0	0	0	0	0	0
	Off Road Right	1	0	0	0	0	0	1	1	0	0
Lighting Conditions	Day	354		33		130		12		50	
	Artificial Lighting	46		2		15		1		5	
	Dark	40		2		17		2		9	
	Dusk	12		1		4		0		0	
	Dawn	2		1		3		0		0	
	Unknown	8		0		4		0		0	
Weather Conditions	Clear	308		27		119		13		41	
	Cloudy	61		10		28		2		16	
	Snowing	31		0		8		0		2	
	Raining	24		2		8		0		3	
	Unknown	27		0		9		0		1	
	Fog or Mist	4		0		0		0		0	
	Drifting Snow	2		0		0		0		1	
	Freezing Rain	1		0		0		0		0	
	Strong Winds	4		0		1		0		0	
Road Surface	Dry	261		24		99		8		40	
	Ice	72		2		23		4		8	
	Wet	61		7		20		1		9	
	Snow	41		4		18		2		5	
	Slush	11		2		6		0		1	
	Unknown	15		0		6		0		0	
	Loose Sand/Gravel/Dirt	1		0		0		0		1	
	Fresh Oil	0		0		1		0		0	
Direction	North	123		4		62		10		20	
	South	115		7		46		3		21	
	East	79		12		8		1		6	
	West	75		11		16		0		5	
	Unknown	69		5		40		1		12	
	(Blanks)	1		0		1		0		0	
				Intersection 90 Degree							
Time Periods	0:00-2:59	7		1	1	3		0		0	
	3:00-5:59	4		0	0	1		0		0	
	6:00-8:59	32		7	6	21		2		0	
	9:00-11:59	55		10	10	26		0		0	
	12:00-14:59	104		7	4	48		3		0	
	15:00-17:59	167		12	3	37		6		0	
	18:00-20:59	72		1	1	25		3		0	
	21:00-23:59	21		1	1	12		1		0	
		Quantity		Quantity		Quantity		Quantity		Quantity	
Entering ADT	North	37300		2800		33800		33800		32300	
	South	29840		400		32300		33800		37300	
	East	15100		15300		6400					
	West	21300		15100		5300		380		190	
	Total	103540		33600		77800		67980		69790	
	Collison Rate [per MEV]	2.19		0.57		1.09		0.11		0.45	