

**FORMER CN INTERMODAL TERMINAL LANDS REDEVELOPMENT
KENASTON BOULEVARD & STERLING LYON PARKWAY
PW 2/08 & DASZ 37/08**

TRAFFIC IMPACT STUDY

Prepared for:

Kenaston Intermodal Ltd. & 5083851 Manitoba Ltd.

Submitted by:

MMM Group Limited

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1.0 INTRODUCTION

MMM Group Limited (MMM) was retained by Kenaston Intermodal Limited and 508351 Manitoba Limited to conduct a traffic impact study for a proposed combination commercial/office/residential development in southwest Winnipeg at the intersection of Kenaston Boulevard and Sterling Lyon Parkway. This traffic impact study forms part of the supporting documentation for the Plan Winnipeg amendment application PW 2/08 and the subdivision and rezoning application DASZ 37/08. The location of the proposed multi-use development is illustrated in **Figure 1.1**.

This study will investigate the potential traffic impacts of the proposed development on the adjacent street network during the weekday p.m. peak hour and Saturday peak hour. Transit service as well as pedestrian and cyclist facilities will also be discussed. The City of Winnipeg Public Works Department (Public Works) was contacted to confirm the City's requirements for this traffic impact study. Public Works indicated that they would require the following signalized intersections included in the traffic analysis:

- ▶ Kenaston Boulevard with Corydon Avenue;
- ▶ Kenaston Boulevard with Grant Avenue;
- ▶ Kenaston Boulevard with Taylor Avenue;
- ▶ Kenaston Boulevard with Sterling Lyon Parkway;
- ▶ Kenaston Boulevard with Rothwell Road / Commerce Drive;
- ▶ Kenaston Boulevard with Lindenwood Drive East;
- ▶ Kenaston Boulevard with McGillivray Boulevard;
- ▶ Sterling Lyon Parkway / Wilkes Avenue with Shaftesbury Boulevard / McCreary Road;
- ▶ Sterling Lyon Parkway with Whidden Gate;
- ▶ Sterling Lyon Parkway with Victor Lewis Drive;
- ▶ Wilkes Avenue with Waverley Street; and
- ▶ Waverley Street with Victor Lewis Drive.

Potential access locations for the proposed development along Kenaston Boulevard and Sterling Lyon Parkway will also be reviewed as part of this study.

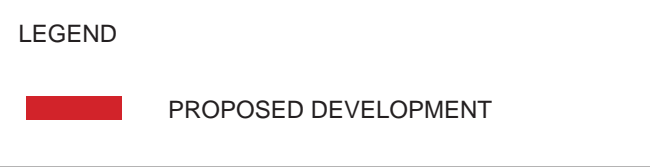


FIGURE 1.1:
PROPOSED DEVELOPMENT LOCATION

2.0 STUDY AREA

The study area for this traffic impact study was identified by Public Works and includes Kenaston Boulevard from Corydon Avenue to the north to McGillivray Boulevard to the south and Sterling Lyon Parkway from Waverley Street to the east to Shaftesbury Boulevard / McCreary Road to the west, as illustrated in **Figure 2.1**.

2.1 Kenaston Boulevard

Kenaston Boulevard is a major arterial that runs north-south through west Winnipeg. Kenaston Boulevard is currently a four-lane divided roadway (two northbound lanes and two southbound lanes) with speed limits within the study area ranging from 80 kilometres per hour adjacent to the development site to 50 kilometres per hour north of Grant Avenue. Kenaston Boulevard has an urban cross section from the north study limit to south of Lawson Crescent and then transitions to a rural cross section. Major intersections along Kenaston Boulevard are signalized. Kenaston Boulevard is part of the City of Winnipeg's designated truck route network and is a major economic route for the City of Winnipeg and Province of Manitoba.

Current daily traffic volumes on Kenaston Boulevard south of Sterling Lyon Parkway were available from a tube count conducted by the City of Winnipeg Public Works Department in November 2008. Average two-way traffic volumes on this portion of Kenaston Boulevard adjacent to the proposed development are over 52,000 vehicles per day. A City of Winnipeg study (*Preliminary Design and Public Consultation for Route 90 from Taylor Avenue to Ness Avenue*) is currently underway to upgrade Kenaston Boulevard from Taylor Avenue north to Ness Avenue, which will likely include widening Kenaston Boulevard to six lanes. The City's plan is to ultimately widen Kenaston Boulevard to six lanes south of Taylor Avenue and eventually to the Perimeter Highway once Kenaston Boulevard is extended through the Waverley West development. Kenaston Boulevard from Taylor Avenue to south of Lawson Crescent adjacent to the development site will be widened to a six-lane divided roadway (three northbound lanes and three southbound lanes) in conjunction with this development. However, it is important to note that the existing traffic volumes along Kenaston Boulevard already make it a candidate for six lanes, and the Mayor of Winnipeg and Premier of Manitoba have both stated publically their intent to accelerate the widening of this portion of Kenaston Boulevard prior to the opening of this proposed multi-use development.

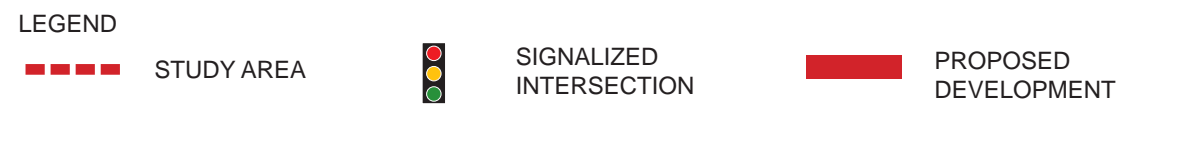


FIGURE 2.1:
STUDY AREA

2.2 Sterling Lyon Parkway

Sterling Lyon Parkway is an east-west arterial roadway in southwest Winnipeg. Sterling Lyon Parkway is currently a four-lane divided roadway (two eastbound lanes and two westbound lanes) east of Kenaston Boulevard. West of Kenaston Boulevard, Sterling Lyon Parkway transitions from a four-lane divided roadway with an urban cross-section to a two-lane undivided roadway with a rural cross-section. The speed limit on Sterling Lyon Parkway is 80 kilometres per hour and major intersections are signalized. Sterling Lyon Parkway is also part of the City of Winnipeg's designated truck route network.

Current daily traffic volumes on Sterling Lyon Parkway at the intersection with Kenaston Boulevard were available from an intersection count conducted by Public Works in October 2007. Average two-way traffic volumes on Sterling Lyon Parkway west of Kenaston Boulevard adjacent to the proposed development were over 14,800 vehicles per day in 2007. The City's approved annual growth rate of 2.5 percent per year for Sterling Lyon Parkway results in over 15,000 vehicles per day on Sterling Lyon Parkway in 2008, and approximately 19,500 vehicles per day by 2018. Generally, urban road authorities begin to look at two-lane undivided arterial roadways with more than 10,000 to 12,000 vehicles per day as candidates for twinning, which means that Sterling Lyon Parkway west of Kenaston Boulevard should already be considered for widening with the background traffic volumes. Sterling Lyon Parkway adjacent to the development site from Kenaston Boulevard to Shaftesbury Boulevard / McCreary Road will be widened to a four-lane divided roadway (two eastbound lanes and two westbound lanes) in conjunction with this development. Similar to Kenaston Boulevard, the Mayor of Winnipeg has stated publically the City's intent to accelerate the widening of this portion of Sterling Lyon Parkway in conjunction with this multi-use development.

3.0 PROPOSED DEVELOPMENT

3.1 Site Development

The proposed development site is located in the northwest and southwest quadrants at the intersection of Kenaston Boulevard and Sterling Lyon Parkway and includes approximately 195 acres of land. The development is planned to consist of a combination of retail, restaurant, gas bar, hotel, movie theatre, office park and multi-family residential and is illustrated in **Figure 3.1** (site plan as of December 2008).

At this point in time, aside from the main anchor home furnishing store (350,000 square feet), the other actual tenants for the proposed retail spaces have not been finalized. However, there is expected to be at least one store in the 200,000 square foot plus range and two other stores in the 140,000 to 200,000 square foot range, plus numerous smaller retail stores (less than 50,000 square feet in size). Tenants of the large format retail stores may include a grocery store, a sporting goods / outdoor store, or a home improvement store; however, for the purposes of this study, all retail space outside of the home furnishing store was designated as general retail for the analysis.

The development is anticipated to be built out over several years. Opening of the first retail store is expected in 2011 (no later than fall 2013) and completion of the site is anticipated by 2018 with the construction of the multi-family residential units (**Figure 3.2**). The following timeframes are considered for the purposes of this study:


- ▶ **Opening Day:** Year 2011 following opening of the 350,000 square foot home furnishing store, 400,000 square foot of general retail, and the gas bar (eight pumps).
- ▶ **Full Build-Out:** Year 2018 following opening of all remaining retail space (additional 695,000 square feet), the 100-room hotel, 16-screen movie theatre, 150 thousand square feet of office park and 500 residential condominium units.

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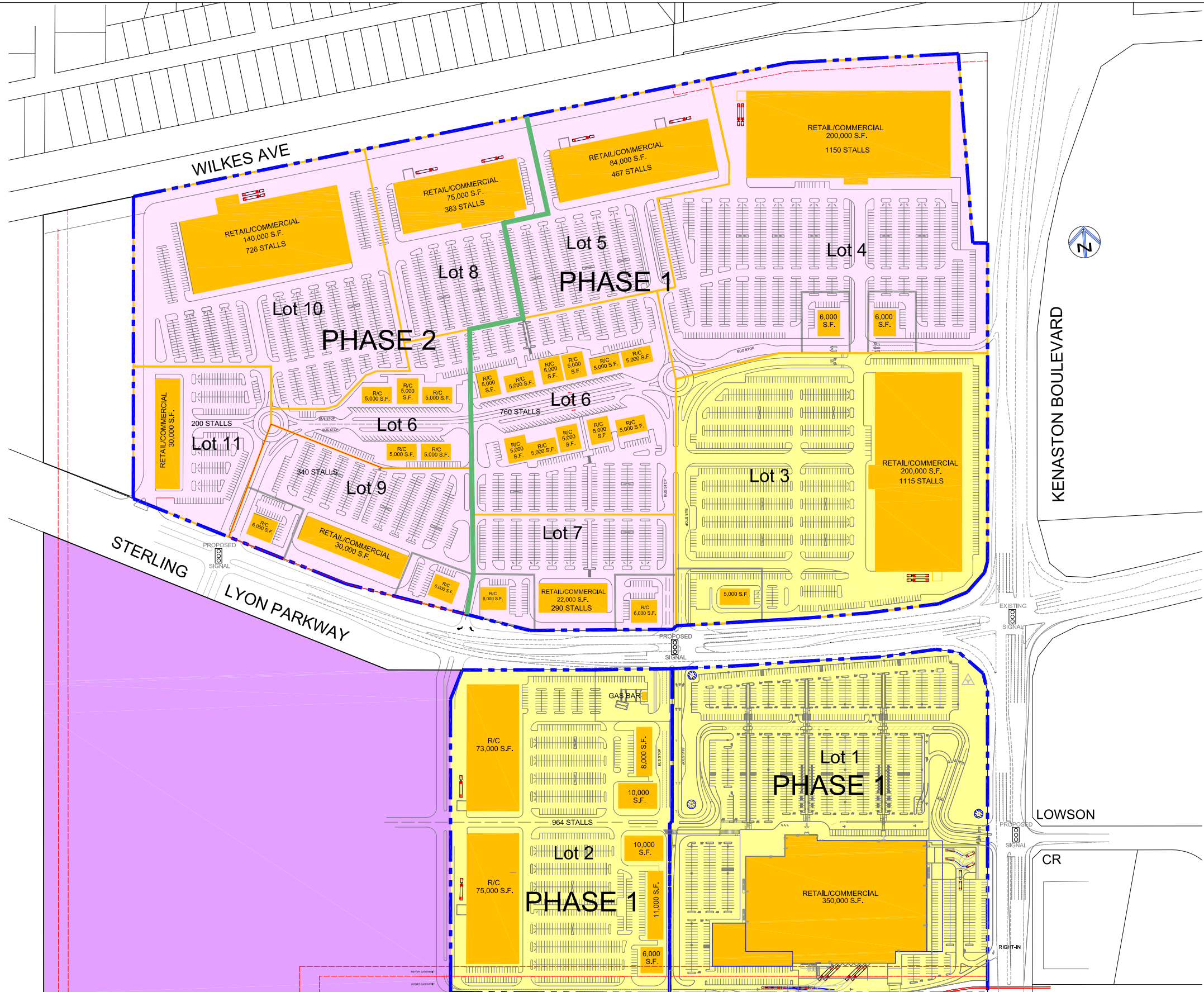


"PRELIMINARY"

FIGURE 3.1: PROPOSED SITE PLAN

	KENASTON/STERLING LYON LANDS		
	SCALE: NTS	DATE: Dec.24.08	DWG. No. 41878-PF-054

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- OPENING 2010 -2011
- OPENING 2012 -2014
- OPENING 2015 -2018

"PRELIMINARY"

FIGURE 3.2: DEVELOPMENT TIMING

	KENASTON/STERLING LYON LANDS		
	SCALE: NTS	DATE: Dec.24.08	DWG. No. 41878-PF-053

For the purposes of this study, traffic operations will be reviewed for five scenarios for both the weekday p.m. peak hour and Saturday peak hour:

- (1) 2008 Background;
- (2) 2011 Background (Optimized);
- (3) 2011 Opening Day;
- (4) 2018 Background (Optimized); and
- (5) 2018 Full Build-Out.

3.2 On-Site Parking

Winnipeg Zoning By-law 200/2006 requires one parking space for every 250 square feet of floor area for a shopping centre. The commercial portion of the proposed development is estimated at a maximum of 1,500,000 square feet of development, which results in a requirement for 6,000 parking stalls. All parking stalls for the commercial development will be provided through at-grade parking spaces.

The Zoning By-law requires two parking spaces for every three guest rooms plus one parking space for every eight seats in any auxiliary rooms. A 100 room hotel results in a requirement for a minimum of 67 parking stalls, plus the requirement for the auxiliary rooms. All parking stalls for the hotel will be provided through at-grade parking spaces.

The Zoning By-law requires one parking space for every six persons maximum occupancy load for a theatre. A 16-screen movie theatre has a maximum capacity of approximately 3,000 seats, which results in a requirement for 500 parking stalls. All parking stalls for the movie theatre will be provided through at-grade parking spaces.

The Zoning By-law requires one parking space for every 750 square feet of floor area for an office development. The proposed 150,000 square foot office park results in a requirement for 200 parking stalls. All parking stalls for the office park will be provided through at-grade parking spaces.

The Zoning By-law requires 1.5 parking spaces for every multi-family dwelling unit. The proposed 500 unit condo development results in a requirement for 750 parking stalls. All parking stalls for the condo units will be provided through at-grade parking spaces.

In total, a minimum of 7,517 parking spaces are required for the proposed development.

3.3 Site Access and Circulation

The size and scale of the proposed mixed-use development requires multiple vehicular access points into the site. The proposed access locations are illustrated in **Figure 3.1**.

A major access to the development is proposed on Kenaston Boulevard opposite Lawson Crescent, which is currently a three-legged unsignalized T-intersection. Northbound and southbound traffic on Kenaston Boulevard is free flowing, while westbound vehicles on Lawson Crescent approach a stop sign at the intersection. Following development of the proposed multi-use site, the intersection of Kenaston Boulevard and Lawson Crescent is proposed to become a four-legged signalized intersection, with the access to the home furnishing store forming the fourth leg of the intersection on the west side of Kenaston Boulevard.

There is an existing approach to the site on southbound Kenaston Boulevard located north of Sterling Lyon Parkway. The approach on Kenaston Boulevard is currently a right-in only and will remain a right-in only with the development.

Three additional access points for the development are proposed along Sterling Lyon Parkway. There is an existing unsignalized access into the north side development site on Sterling Lyon Parkway west of Kenaston Boulevard. Following development of the proposed multi-use site, this access will shift slightly to the west (approximately 345 metres west of Kenaston Boulevard) and become a four-legged signalized intersection, with the access to the south side development forming the fourth leg of the intersection on the south side of Sterling Lyon Parkway.

A second access point to the development will be located approximately 290 metres west of the east access on Sterling Lyon Parkway. Eastbound and westbound right-in / right-outs only are proposed for this location.

A third access to the development will be located approximately 240 metres west of the right-in / right-out access on Sterling Lyon Parkway. This location is proposed as an all-directional signalized access.

Two dedicated truck / delivery access locations are also proposed for the development. A right-in only is proposed at the south end of the development off Kenaston Boulevard at an existing right-in / right-out location to serve the south side development. A right-in / right-out is proposed on Sterling Lyon Parkway at the west end of the development to serve the north side development. These approaches will provide dedicated access for delivery vehicles and allow

trucks to manoeuvre through the site behind the buildings without mixing with the passenger vehicular traffic on site. The proposed truck access locations were not considered in the traffic analysis.

It should be noted that both Kenaston Boulevard and Sterling Lyon Parkway are listed on Schedule "A" of the City of Winnipeg Private Access By-law 49/2008, which means that no private approach can be constructed or altered on either road without approval by the City of Winnipeg Standing Policy Committee on Infrastructure Renewal and Public Works.

4.0 TRAFFIC VOLUMES

4.1 Current Traffic

Existing traffic volumes along the study area roadways and at the study area intersections were obtained from Public Works and supplemented by traffic counts conducted by MMM on Saturday, November 8, 2008, Wednesday, November 12, 2008, Thursday, November 13, 2008 and Saturday, November 15, 2008. The weekday p.m. peak hour was analyzed as it is generally the busiest time and therefore the most critical period for on-street traffic. The Saturday peak hour was also selected for analysis as it is generally the busiest time and therefore the most critical period for retail-oriented commercial developments.

The traffic counts within the study area were collected during different months of the year and significant differences between some adjacent intersections were identified upon review. The counts were therefore adjusted to ensure that traffic volumes moving between adjacent intersections are approximately balanced. At some intersections the balancing resulted in an increase in traffic volumes, at other intersections it resulted in a reduction in traffic volumes. It should be noted that the traffic counts still do not balance exactly as there may be unsignalized intersections or private approaches located between signalized intersections that are not included in the study network. As well, peak hours at adjacent intersections do not always occur at the same time.

Year 2008 weekday p.m. peak hour traffic volumes and Saturday peak hour traffic volumes are illustrated in **Figures 4.1** and **4.2**. Traffic volumes have been rounded to the nearest five vehicles per hour in all figures.

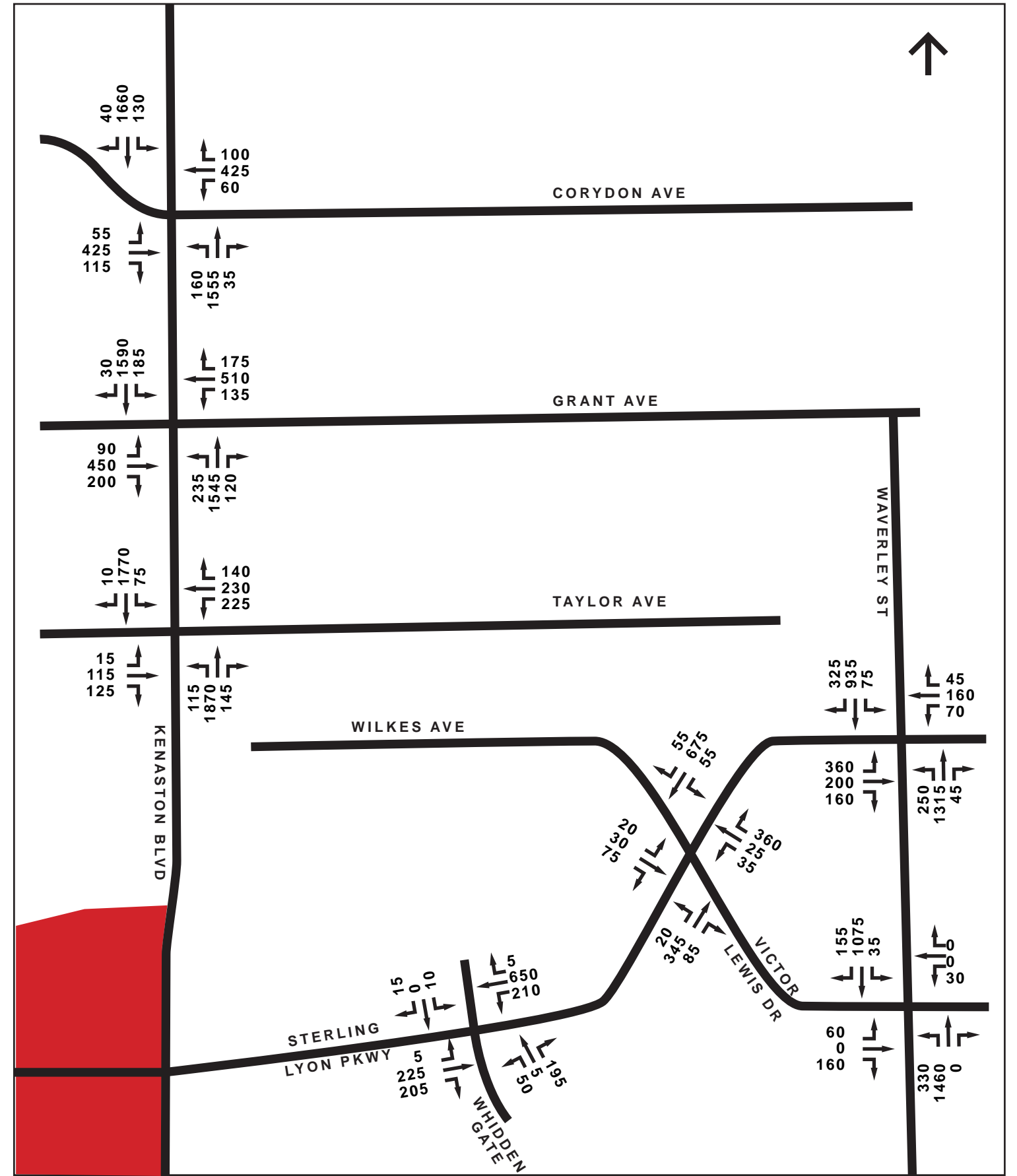
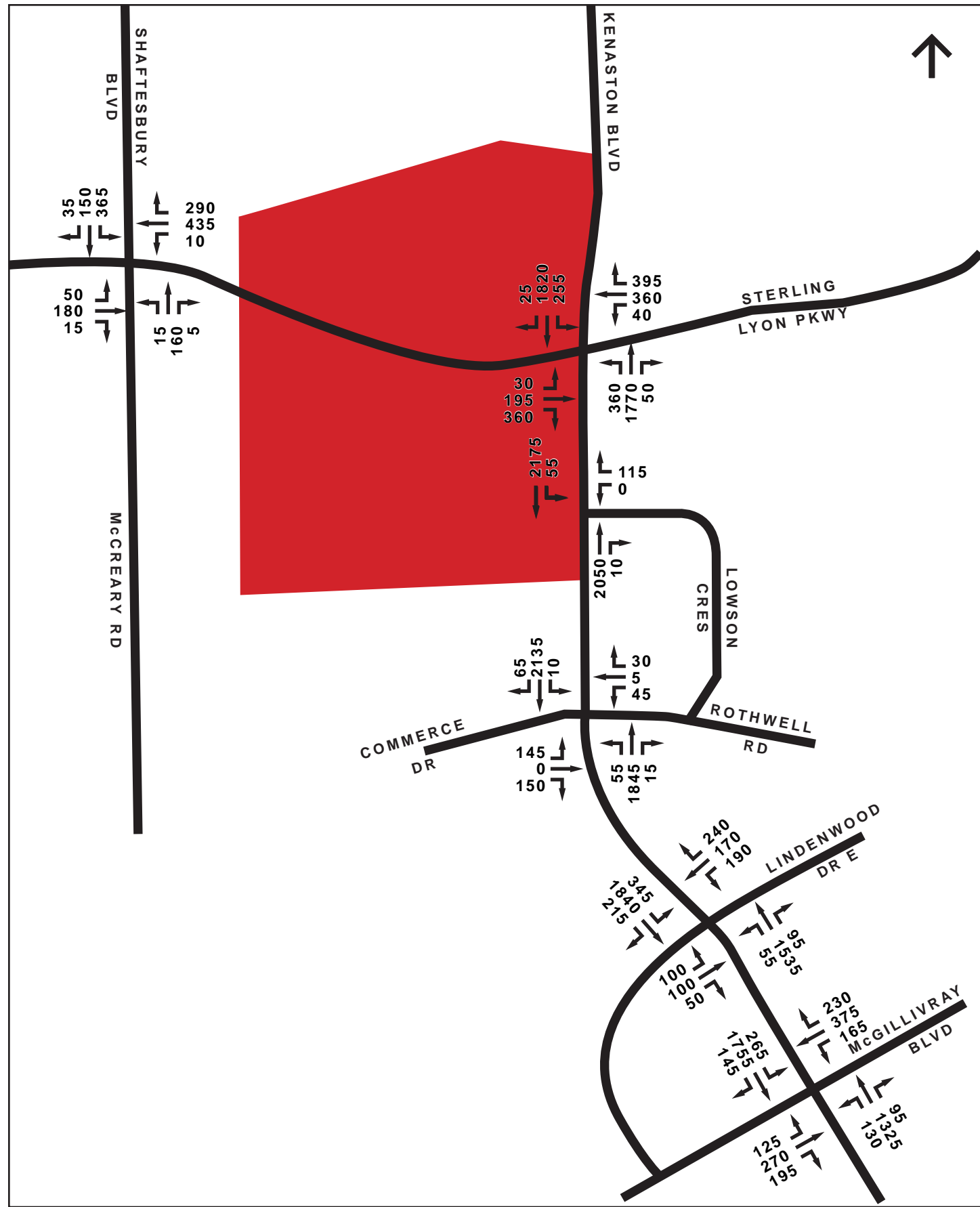
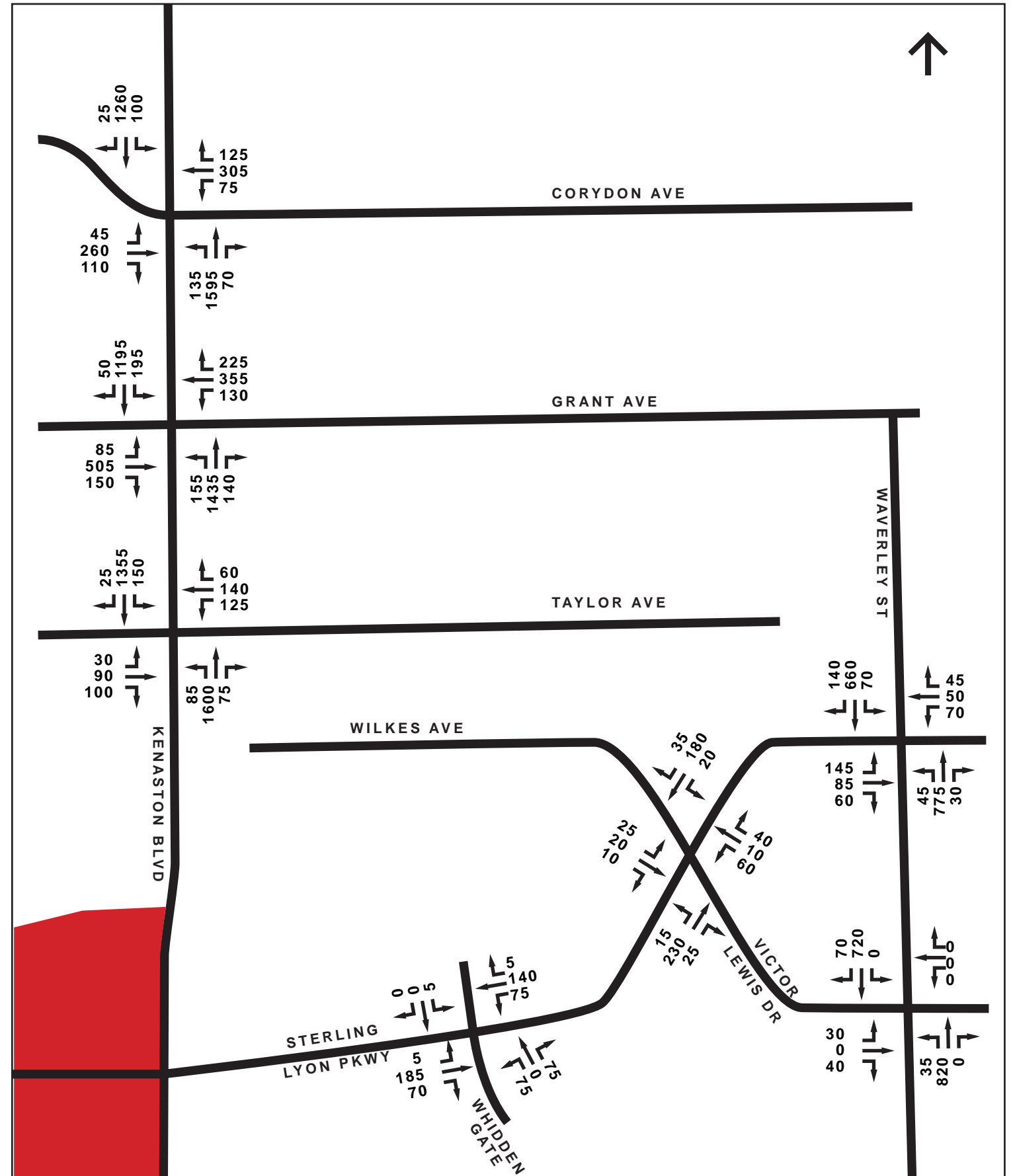
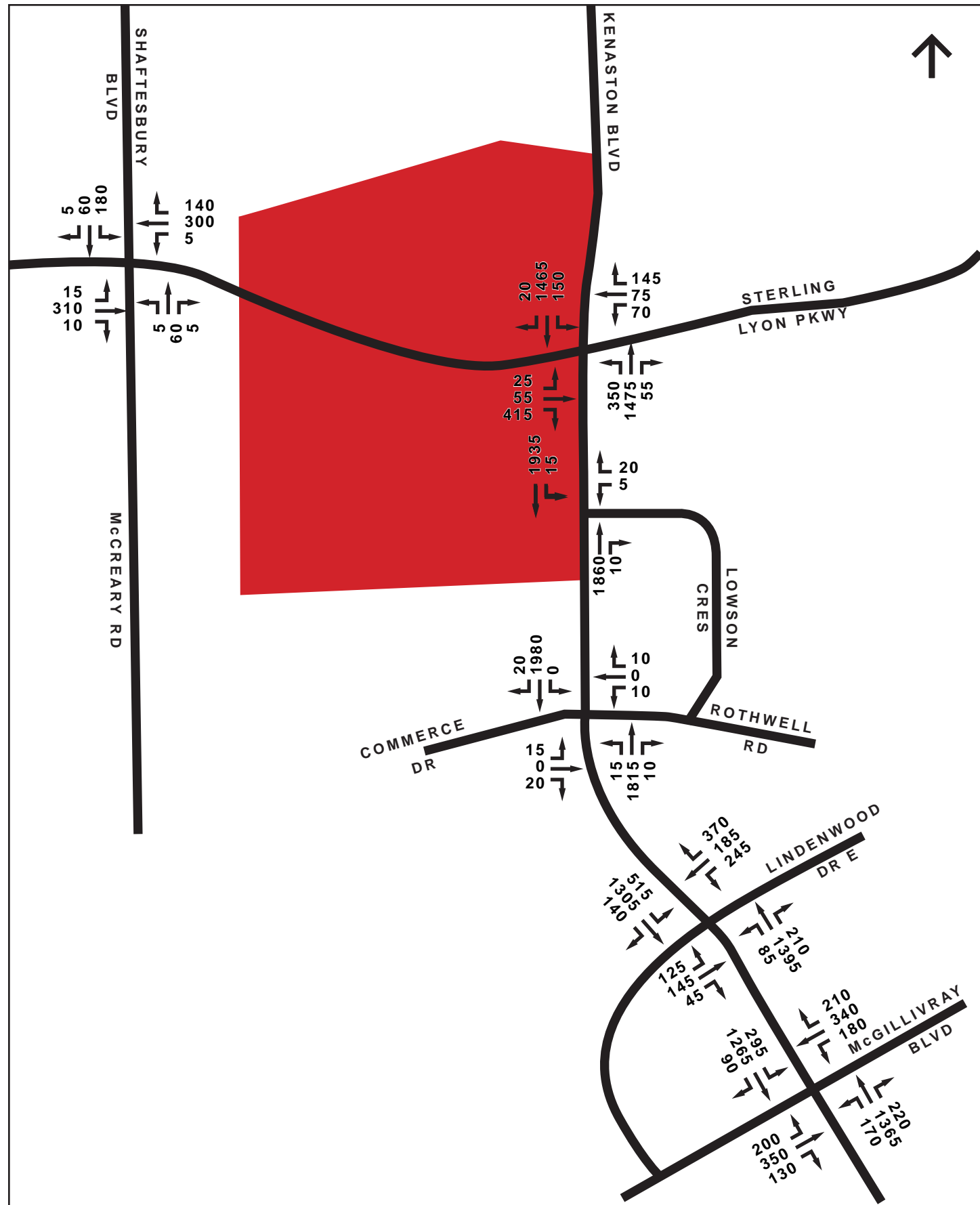


FIGURE 4.1:
WEEKDAY PM PEAK HOUR
2008 EXISTING TRAFFIC VOLUMES



LEGEND
 PROPOSED DEVELOPMENT

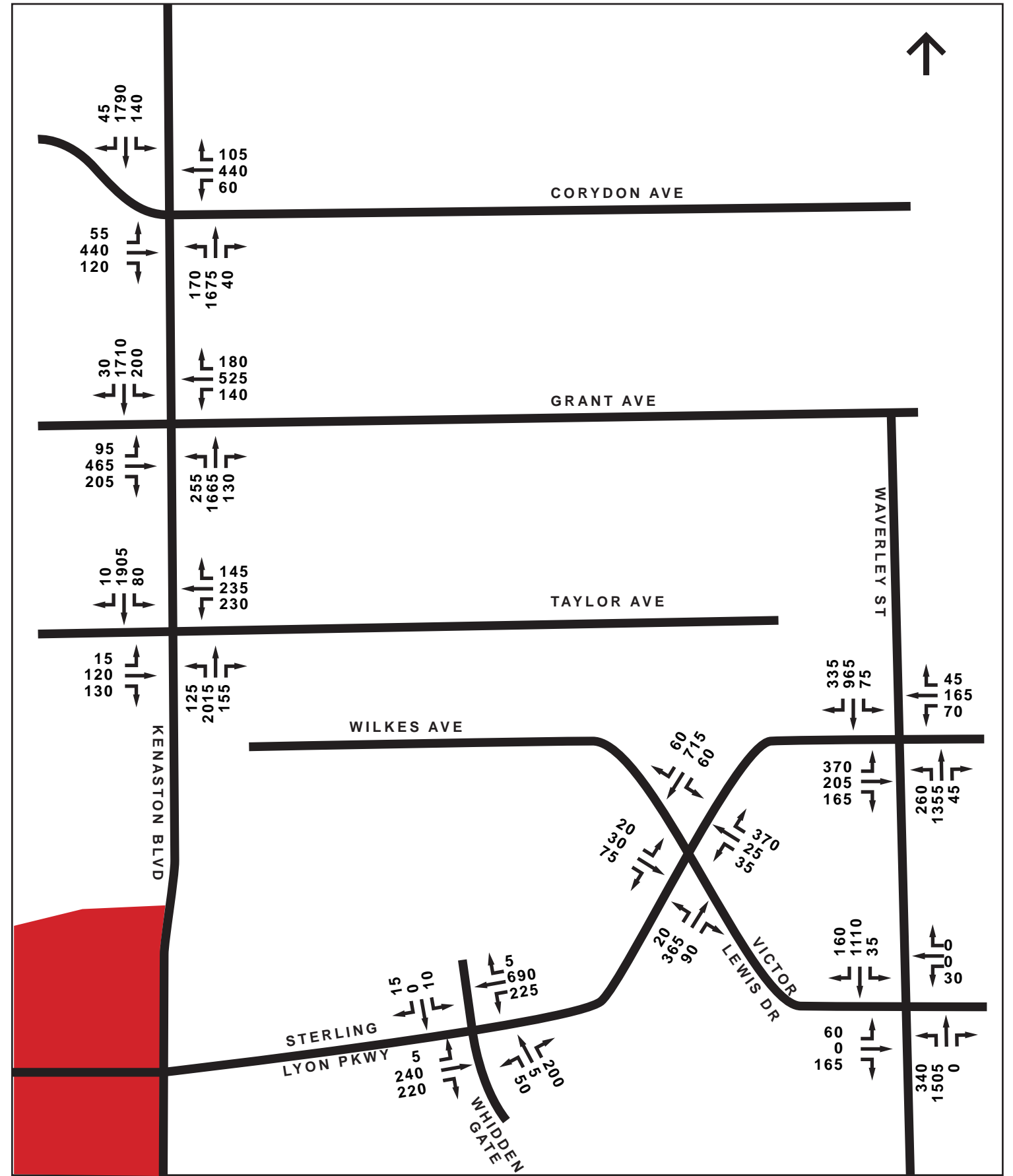
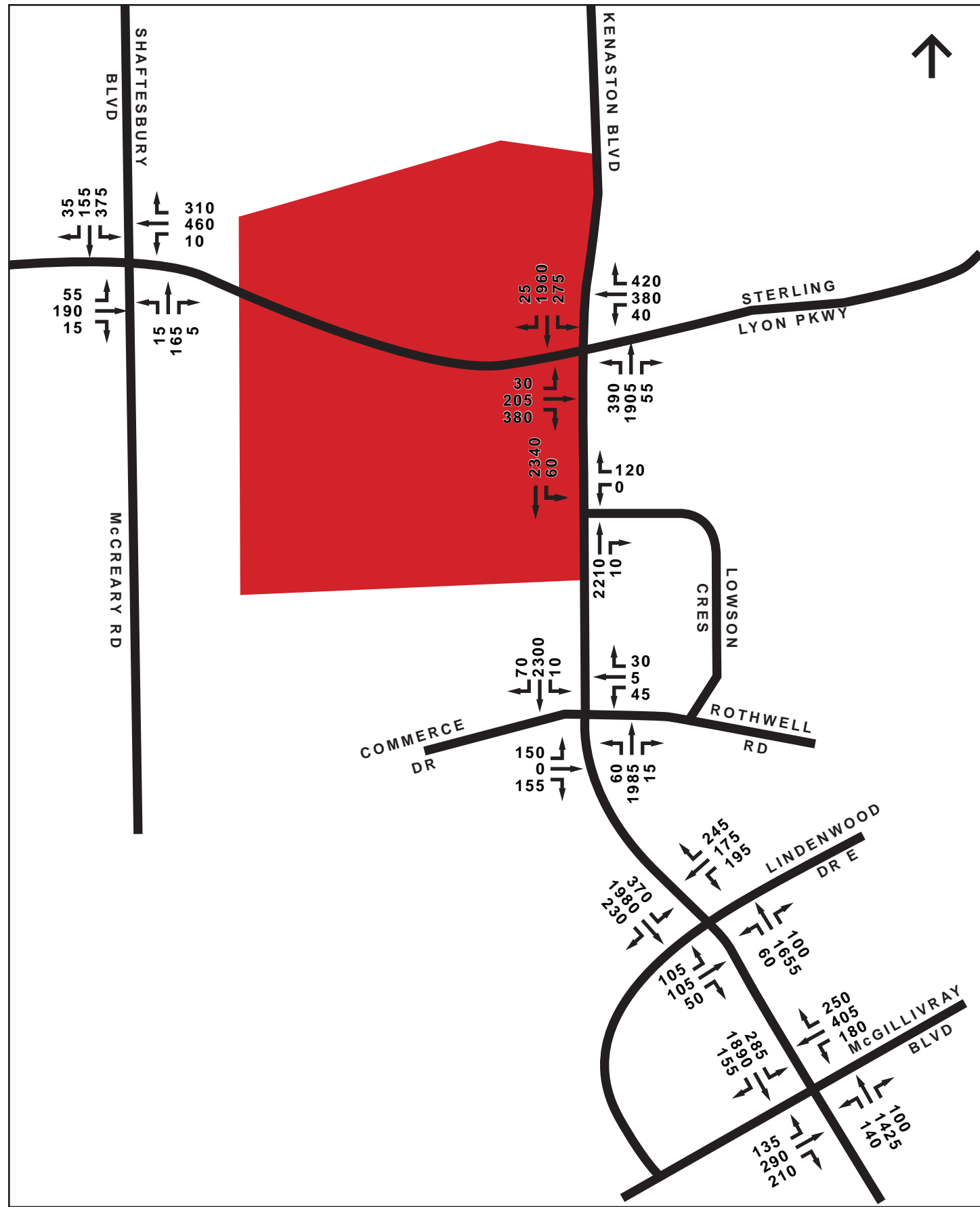
FIGURE 4.2:
 SATURDAY PEAK HOUR
 2008 EXISTING TRAFFIC VOLUMES

4.2 Future Traffic

In order to forecast future background traffic volumes, historical traffic volumes within the study area were also obtained from Public Works. The data was analyzed, selected growth rates were reviewed with the City, and forecast traffic volumes were then estimated as follows:

- ▶ **Kenaston Boulevard:** Traffic growth rates along Kenaston Boulevard vary by time of day and location. For this study, traffic volumes on Kenaston Boulevard are assumed to increase at a rate of 2.5 percent per year. This rate includes the forecast development within the Waverley West neighbourhood.
- ▶ **Sterling Lyon Parkway:** Traffic growth rates along Sterling Lyon Parkway have increased considerably over the past few years, and are expected to continue to increase in the near future. For this study, traffic volumes on Sterling Lyon Parkway are assumed to increase at a rate of 2.5 percent per year.
- ▶ **McGillivray Boulevard:** Traffic volumes on McGillivray Boulevard near Kenaston Boulevard have increased substantially over the last ten years in conjunction with the commercial development in this area. For this study, traffic volumes on McGillivray Boulevard are assumed to increase at a rate of 2.5 percent per year.
- ▶ **Other Roadways:** Historical traffic volumes on other roadways within the study area were reviewed and a growth rate of 1.0 percent per year was assumed for this study.

Background traffic volumes for the study area were estimated for Opening Day in 2011 and Full Build-Out in 2018. Future background peak hour traffic volumes are illustrated in **Figures 4.3 through 4.6**.



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.3:
 WEEKDAY PM PEAK HOUR
 2011 BACKGROUND TRAFFIC VOLUMES

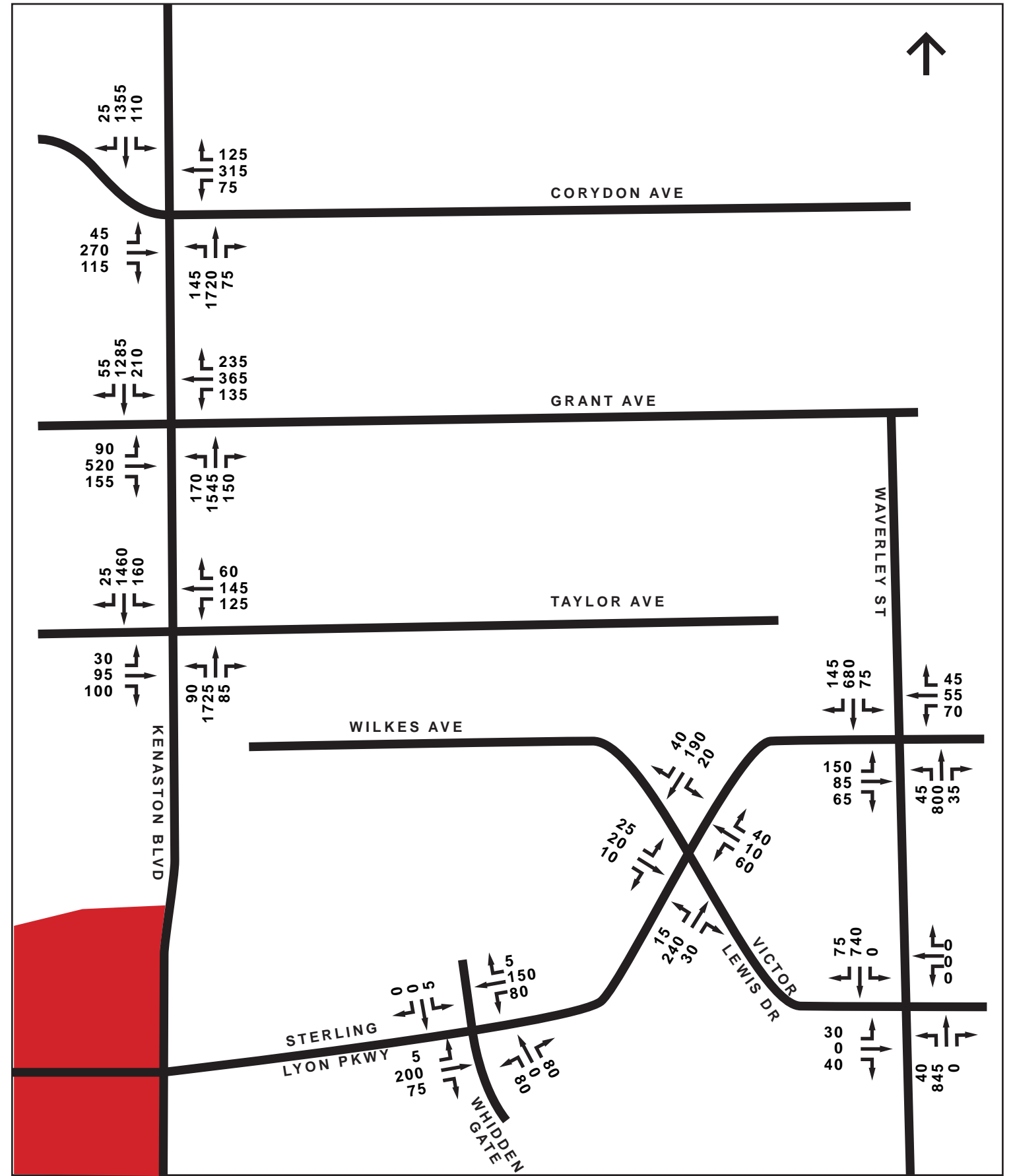
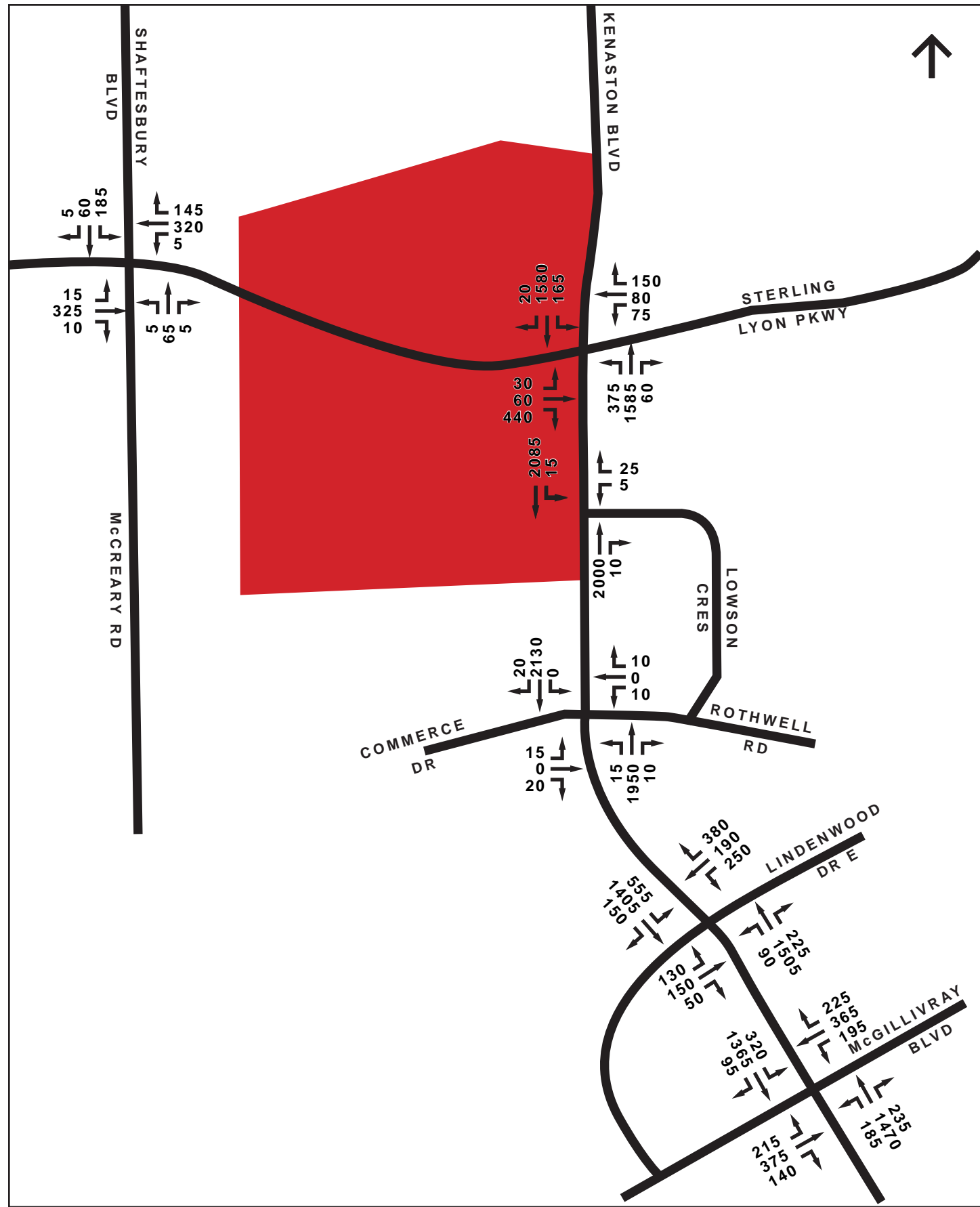


FIGURE 4.4:
SATURDAY PEAK HOUR
2011 BACKGROUND TRAFFIC VOLUMES

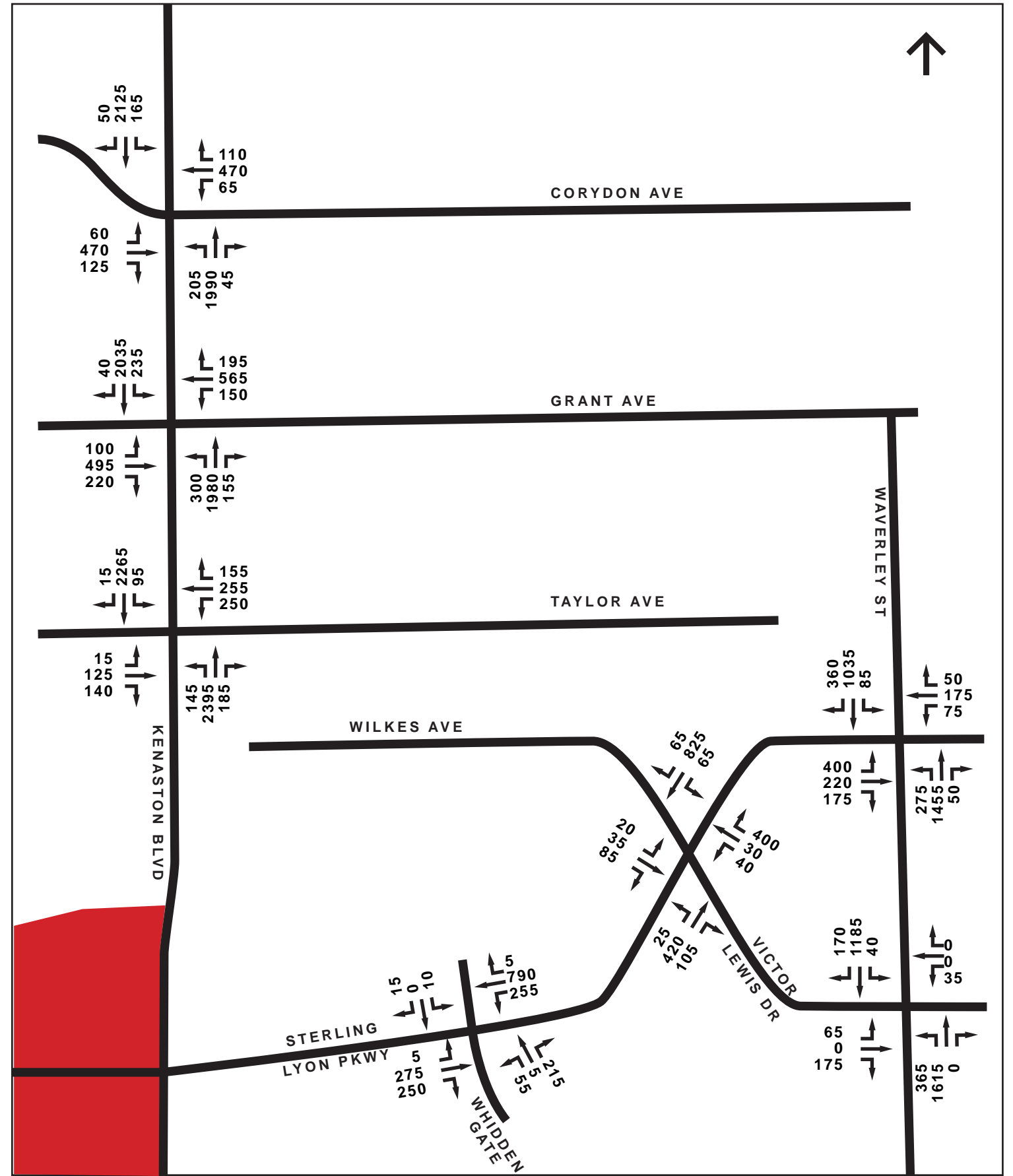
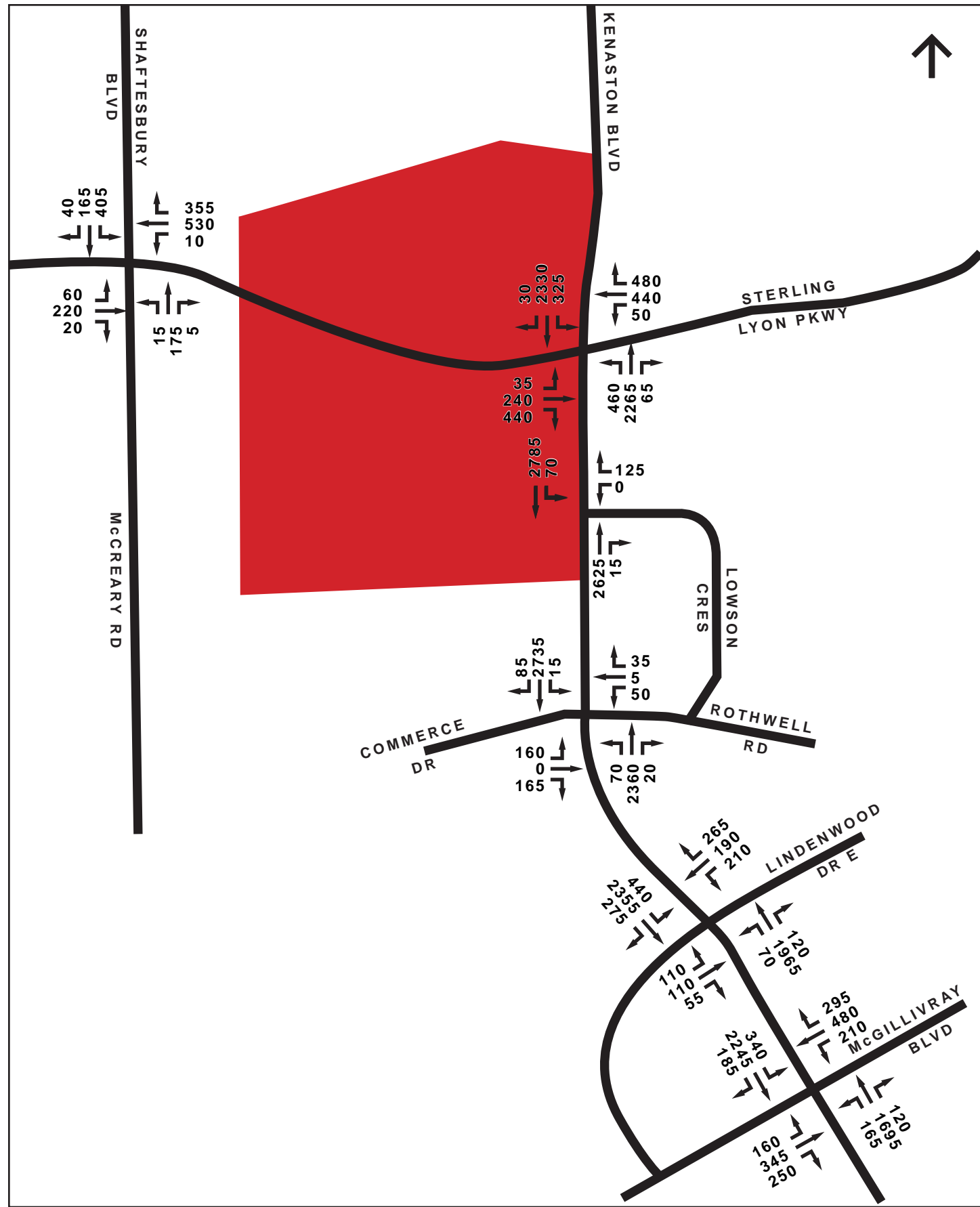
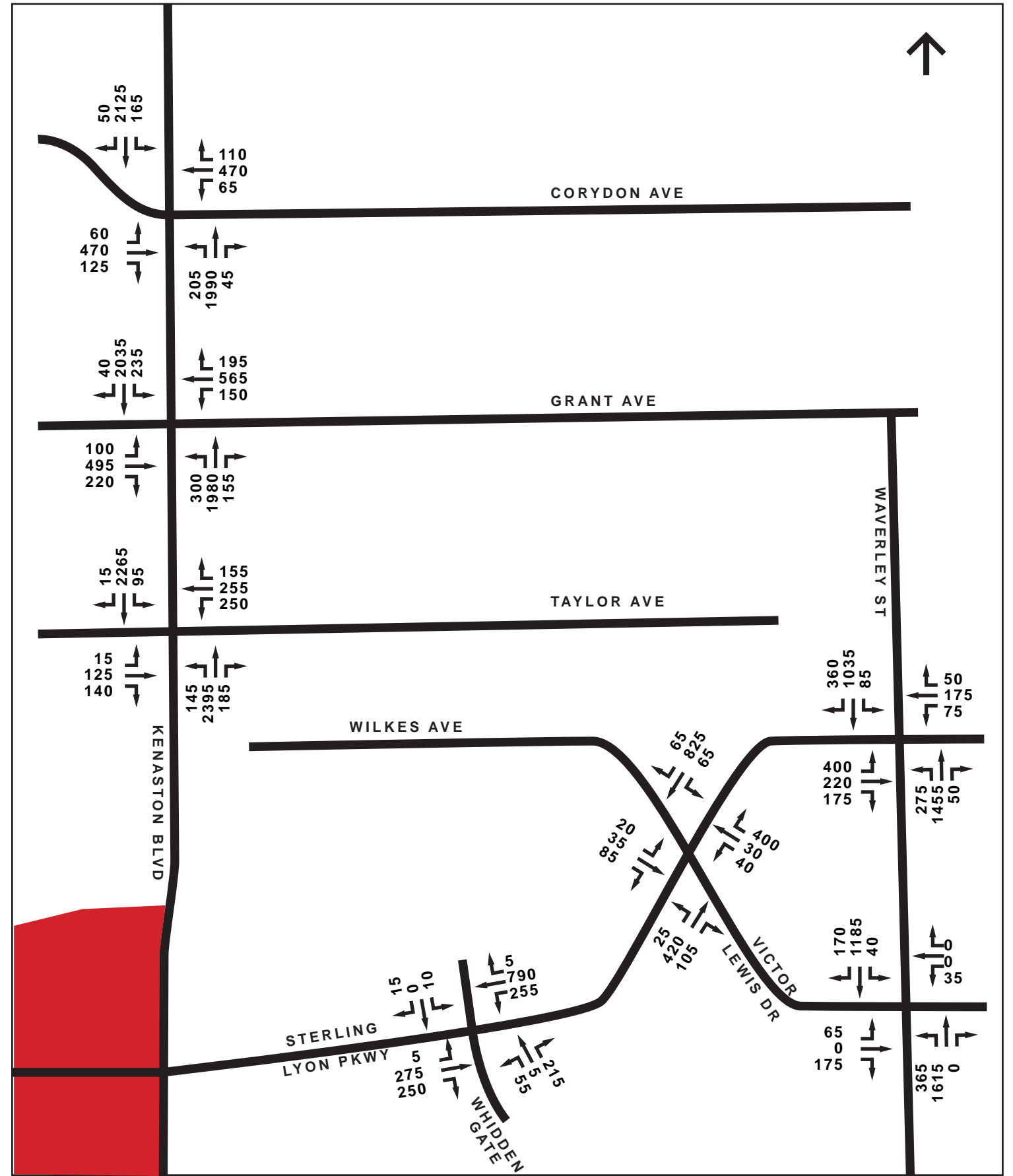
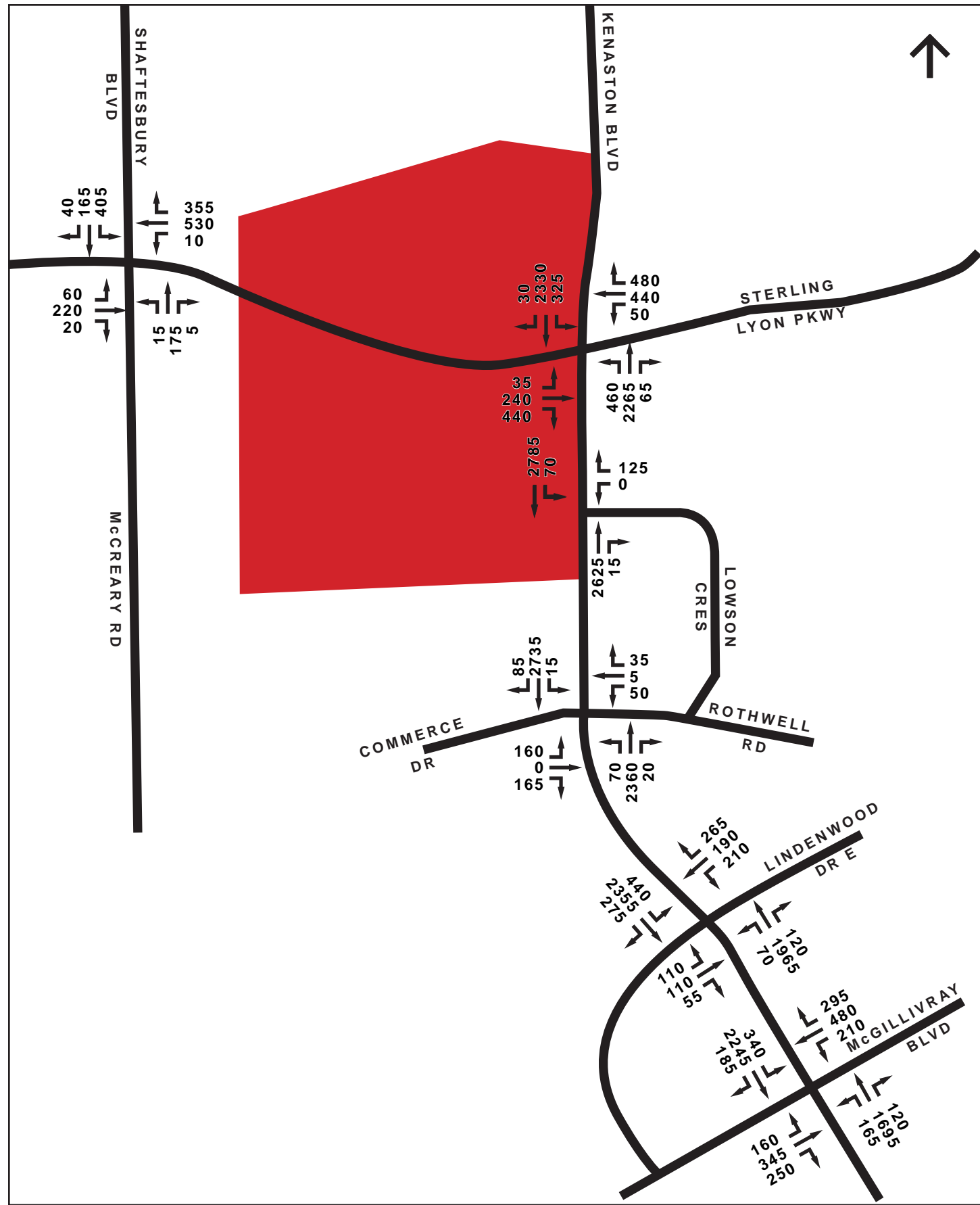


FIGURE 4.5:
WEEKDAY PM PEAK HOUR
2018 BACKGROUND TRAFFIC VOLUMES



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.6:
 SATURDAY PEAK HOUR
 2018 BACKGROUND TRAFFIC VOLUMES

4.3 Development Traffic

4.3.1 Trip Generation

Trips generated by the proposed development were estimated for the weekday p.m. peak hour of adjacent street traffic and Saturday peak hour of generator, as well as daily trip estimates for a typical weekday and Saturday. Estimates of inbound and outbound trips per hour are based on trip rates obtained from the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 8th Edition*, while joint use rates and drop-in rates were obtained from the *ITE Trip Generation Handbook, Second Edition*. Where available, fitted curve equations as opposed to average trip generation rates were used to estimate the number of vehicle trips.

As was noted in Section 3.0, the actual tenants for the proposed retail spaces have not been finalized for this development. For the purposes of this study, all retail other than the home furnishing store was designated as general retail.

The following assumptions were used to generate the weekday p.m. peak hour trip generation forecasts:

- ▶ The trip generation rate and trip direction used for the home furnishing store were based on actual trip generation data collected at two Canadian stores located in British Columbia and Ontario.
- ▶ The joint use rate used for the gas bar was verified in the field at a gas station in Steinbach, Manitoba.

The following assumptions were used to generate the Saturday peak hour trip generation forecasts:

- ▶ Saturday peak hour joint use rates and drop-in rates were assumed to be the same as the weekday p.m. peak hour rates if not specifically available for Saturday.
- ▶ The trip generation rate and trip direction used for the home furnishing store were based on actual trip generation data collected at two Canadian stores located in British Columbia and Ontario.
- ▶ The Saturday peak hour trip generation rate used for the gas station was estimated from the ratio of the Saturday peak hour trip generation rate to the weekday p.m. peak hour trip generation rate for ITE Land Use 946 (Gasoline/Service Station with Convenience Market and Car Wash).

- ▶ Saturday trips for the movie theatre were generated for the Saturday peak hour of street traffic between 11:00 a.m. and 1:00 p.m. instead of the peak hour of generator as the peak hour for movie theatres occurs in the evenings, while commercial usages peak during the early afternoon.

The following assumptions were used to generate the weekday trip generation forecasts:

- ▶ The trip generation rate and trip direction used for the home furnishing store were based on ITE Land Use 869 (Discount Home Furnishing Superstore).
- ▶ The joint use rate used for the gas bar was assumed to be the same as the weekday p.m. peak hour.

The following assumptions were used to generate the Saturday trip generation forecasts:

- ▶ Saturday joint use rates and drop-in rates were assumed to be the same as the weekday rates if not specifically available for Saturday.
- ▶ The trip generation rate and trip direction used for the home furnishing store were based on ITE Land Use 869 (Discount Home Furnishing Superstore).
- ▶ The Saturday trip generation rate used for the gas station was the same as the weekday trip generation rate.
- ▶ The Saturday trip generation rate used for the movie theatre was estimated from the ratio of the weekday trip generation rate to the weekday p.m. peak hour trip generation rate for ITE Land Use 445 (Multiplex Movie Theatre).

No reductions were made to the trip generation estimates to account for transit, cyclist or pedestrian mode split.

The site plan illustrated in **Figure 3.1** was used for the trip generation forecasts and is the most up-to-date information available as of December 2008. Forecast trip generation for the proposed development is summarized below in **Table 4.1** for the weekday p.m. peak hour, **Table 4.2** for the Saturday peak hour, **Table 4.3** for a weekday, and **Table 4.4** for a Saturday. Trip estimates have been rounded to the nearest five vehicles per hour during the peak hour and to the nearest 50 vehicles per day for daily estimates.

Table 4.1: Development Trip Generation – Weekday P.M. Peak Hour

Development Type	Land Use	Development Size	Trip Equation / Rate (trips / unit size)	Joint Use	Trip Direction		Total Trips (veh/hour)			Drop-In Trips (veh/hour)					New Trips (veh/hour)		
					In	Out	In	Out	Total	Equation	Rate	In	Out	Total	In	Out	Total
Home Furnishing	869	350,000 sq.ft.	1.85	20 %	45 %	55 %	230	285	515	--	20 %	45	55	100	185	230	415
General Retail	820	1,095,000 sq.ft.	$\ln(T) = 0.67 \ln(X) + 3.37$	20 %	49 %	51 %	1,240	1,290	2,530	$\ln(T) = -0.29 \ln(X) + 5.0$	20 %	250	260	510	990	1,030	2,020
Gas Bar	944	8 fueling positions	13.87	90 %	50 %	50 %	10	10	20	--	42 %	5	5	10	5	5	10
Hotel	310	100 rooms	0.59	20 %	53 %	47 %	25	20	45	--	0 %	--	--	--	25	20	45
Movie Theatre	445	16 screens	13.64	20 %	45 %	55 %	80	95	175	--	0 %	--	--	--	80	95	175
Office Park	750	150,000 sq.ft.	$T = 1.22 (X) + 95.83$	25 %	14 %	86 %	30	180	210	--	0 %	--	--	--	30	180	210
Multi-Family	230	500 units	$\ln(T) = 0.81 \ln(X) + 0.03$	50 %	66 %	34 %	50	25	75	--	0 %	--	--	--	50	25	75
TOTAL TRIP GENERATION							1,665	1,905	3,570			300	320	620	1,365	1,585	2,950

Table 4.2: Development Trip Generation – Saturday Peak Hour

Development Type	Land Use	Development Size	Trip Equation / Rate (trips / unit size)	Joint Use	Trip Direction		Total Trips (veh/hour)			Drop-In Trips (veh/hour)					New Trips (veh/hour)		
					In	Out	In	Out	Total	Equation	Rate	In	Out	Total	In	Out	Total
Home Furnishing	869	350,000 sq.ft.	5.43	20 %	50 %	50 %	760	760	1,520	--	20 %	150	150	300	610	610	1,220
General Retail	820	1,095,000 sq.ft.	$\ln(T) = 0.65 \ln(X) + 3.76$	20 %	52 %	48 %	1,690	1,560	3,250	$T = -0.02 (X) + 38.59$	17 %	285	265	550	1,400	1,295	2,695
Gas Bar	944	8 fueling positions	20.11	90 %	50 %	50 %	10	10	20	--	42 %	5	5	10	5	5	10
Hotel	310	100 rooms	$T = 0.69 (X) + 4.32$	20 %	56 %	44 %	35	25	60	--	0 %	--	--	--	35	25	60
Movie Theatre	445	16 screens	$T = 30.28 (X) - 188.62$	20 %	72 %	28 %	170	65	235	--	0 %	--	--	--	170	65	235
Office Park	750	150,000 sq.ft.	0.14	25 %	74 %	26 %	10	5	15	--	0 %	--	--	--	10	5	15
Multi-Family	230	500 units	$T = 0.29 (X) + 42.63$	20 %	54 %	46 %	50	45	95	--	0 %	--	--	--	50	45	95
TOTAL TRIP GENERATION							2,725	2,470	5,195			440	420	860	2,280	2,050	4,330

Table 4.3: Development Trip Generation – Weekday

Development Type	Land Use	Development Size	Trip Equation / Rate (trips / unit size)	Joint Use	Trip Direction		Total Trips (veh/day)			Drop-In Trips (veh/day)					New Trips (veh/day)		
					In	Out	In	Out	Total	Equation	Rate	In	Out	Total	In	Out	Total
Home Furnishing	869	350,000 sq.ft.	20.00	30 %	50 %	50 %	2,450	2,450	4,900	--	20 %	500	500	1,000	1,950	1,950	3,900
General Retail	820	1,095,000 sq.ft.	$\text{Ln}(T) = 0.65 \text{Ln}(X) + 5.83$	30 %	50 %	50 %	11,250	11,250	22,500	$\text{Ln}(T) = -0.29 \text{Ln}(X) + 5.0$	20 %	2,250	2,250	4,500	9,000	9,000	18,000
Gas Bar	944	8 fueling positions	168.56	90 %	50 %	50 %	100	100	200	--	42 %	50	50	100	50	50	100
Hotel	310	100 rooms	$T = 8.95 (X) - 373.16$	30 %	50 %	50 %	200	200	400	--	0 %	--	--	--	200	200	400
Movie Theatre	445	16 screens	292.50	30 %	50 %	50 %	1,650	1,650	3,300	--	0 %	--	--	--	1,650	1,650	3,300
Office Park	750	150,000 sq.ft.	$T = 10.42 (X) + 409.04$	20 %	50 %	50 %	800	800	1,600	--	0 %	--	--	--	800	800	1,600
Multi-Family	230	500 units	$\text{Ln}(T) = 0.87 \text{Ln}(X) + 2.46$	35 %	50 %	50 %	850	850	1,700	--	0 %	--	--	--	850	850	1,700
TOTAL TRIP GENERATION							17,300	17,300	34,600			2,800	2,800	5,600	14,500	14,500	29,000

Table 4.4: Development Trip Generation – Saturday

Development Type	Land Use	Development Size	Trip Equation / Rate (trips / unit size)	Joint Use	Trip Direction		Total Trips (veh/day)			Drop-In Trips (veh/day)					New Trips (veh/day)		
					In	Out	In	Out	Total	Equation	Rate	In	Out	Total	In	Out	Total
Home Furnishing	869	350,000 sq.ft.	33.29	30 %	50 %	50 %	4,050	4,050	8,100	--	20 %	800	800	1,600	3,250	3,250	6,500
General Retail	820	1,095,000 sq.ft.	$\text{Ln}(T) = 0.63 \text{Ln}(X) + 6.23$	30 %	50 %	50 %	14,600	14,600	29,200	$T = -0.02 (X) + 38.59$	17 %	2,500	2,500	5,000	12,100	12,100	24,200
Gas Bar	944	8 fueling positions	168.56	90 %	50 %	50 %	100	100	200	--	42 %	50	50	100	50	50	100
Hotel	310	100 rooms	$T = 9.62 (X) - 294.56$	30 %	50 %	50 %	250	250	500	--	0 %	--	--	--	250	250	500
Movie Theatre	445	16 screens	321.57	30 %	50 %	50 %	1,800	1,800	3,600	--	0 %	--	--	--	1,800	1,800	3,600
Office Park	750	150,000 sq.ft.	1.64	20 %	50 %	50 %	100	100	200	--	0 %	--	--	--	100	100	200
Multi-Family	230	500 units	$T = 3.62 (X) + 427.93$	35 %	50 %	50 %	750	750	1,500	--	0 %	--	--	--	750	750	1,500
TOTAL TRIP GENERATION							21,650	21,650	43,300			3,350	3,350	6,700	18,300	18,300	36,600

The proposed development is anticipated to generate a total of:

- ▶ 2,950 new trips (1,365 entering and 1,585 exiting) plus an additional 620 drop-in trips (300 entering and 320 exiting) during the weekday p.m. peak hour at full build-out.
- ▶ 4,330 new trips (2,280 entering and 2,050 exiting) plus an additional 860 drop-in trips (440 entering and 420 exiting) during the Saturday peak hour at full build-out.
- ▶ 29,000 new trips (14,500 entering and 14,500 exiting) plus an additional 5,600 drop-in trips (2,800 entering and 2,800 exiting) on a typical weekday at full build-out.
- ▶ 36,600 new trips (18,300 entering and 18,300 exiting) plus an additional 6,700 drop-in trips (3,350 entering and 3,350 exiting) on a typical Saturday at full build-out.

The proposed development site is currently designated as industrial land. By comparison, if the entire site (195 acres) was built out as an industrial park (ITE Land Use 130), it would generate a total of:

- ▶ 1,030 new trips (215 entering and 815 exiting) during the weekday p.m. peak hour at full build-out.
- ▶ 920 new trips (295 entering and 625 exiting) during the Saturday peak hour at full build-out.
- ▶ 9,900 new trips (4,950 entering and 4,950 exiting) on a typical weekday at full build-out.
- ▶ 6,350 new trips (3,175 entering and 3,175 exiting) on a typical Saturday at full build-out.

4.3.2 Trip Distribution and Assignment

Trip distribution refers to the directional split of traffic entering and exiting the overall study area while trip assignment refers to the detailed assignment of distributed trips to the adjacent road network. Trip distribution for this study is based on a review of traffic volumes adjacent to the proposed development site and within the study area as well as a review of residential development throughout Winnipeg and the capital region.

Trip distribution for the proposed mixed use development is as follows:

- ▶ 30 percent from/to the north via Kenaston Boulevard (north of Corydon Avenue);
- ▶ 25 percent from/to the south via Kenaston Boulevard and McGillivray Boulevard, as well as Lindenwood Drive East;
- ▶ 25 percent from/to the east via Sterling Lyon Parkway, Waverley Street, Taylor Avenue, Grant Avenue and Corydon Avenue; and
- ▶ 20 percent from/to the west via Sterling Lyon Parkway, Wilkes Avenue, Shaftesbury Boulevard, Grant Avenue and Corydon Avenue.

New trips generated by the proposed development were assigned to the road network using the distribution noted above. New development traffic volumes for the two development phases are illustrated in **Figures 4.7** through **4.10**.

Background traffic was redistributed based on 2008 existing traffic patterns to account for drop-in trips. Drop-in traffic volumes for the two development phases are illustrated in **Figures 4.11** through **4.14**.

4.4 Forecast Traffic Volumes

Redistributed background traffic was combined with new traffic generated, distributed and assigned to the road network to determine traffic projections for the post development scenarios. Post development traffic volumes for the weekday p.m. peak hour and Saturday peak hour are illustrated in **Figures 4.15** through **4.18**.

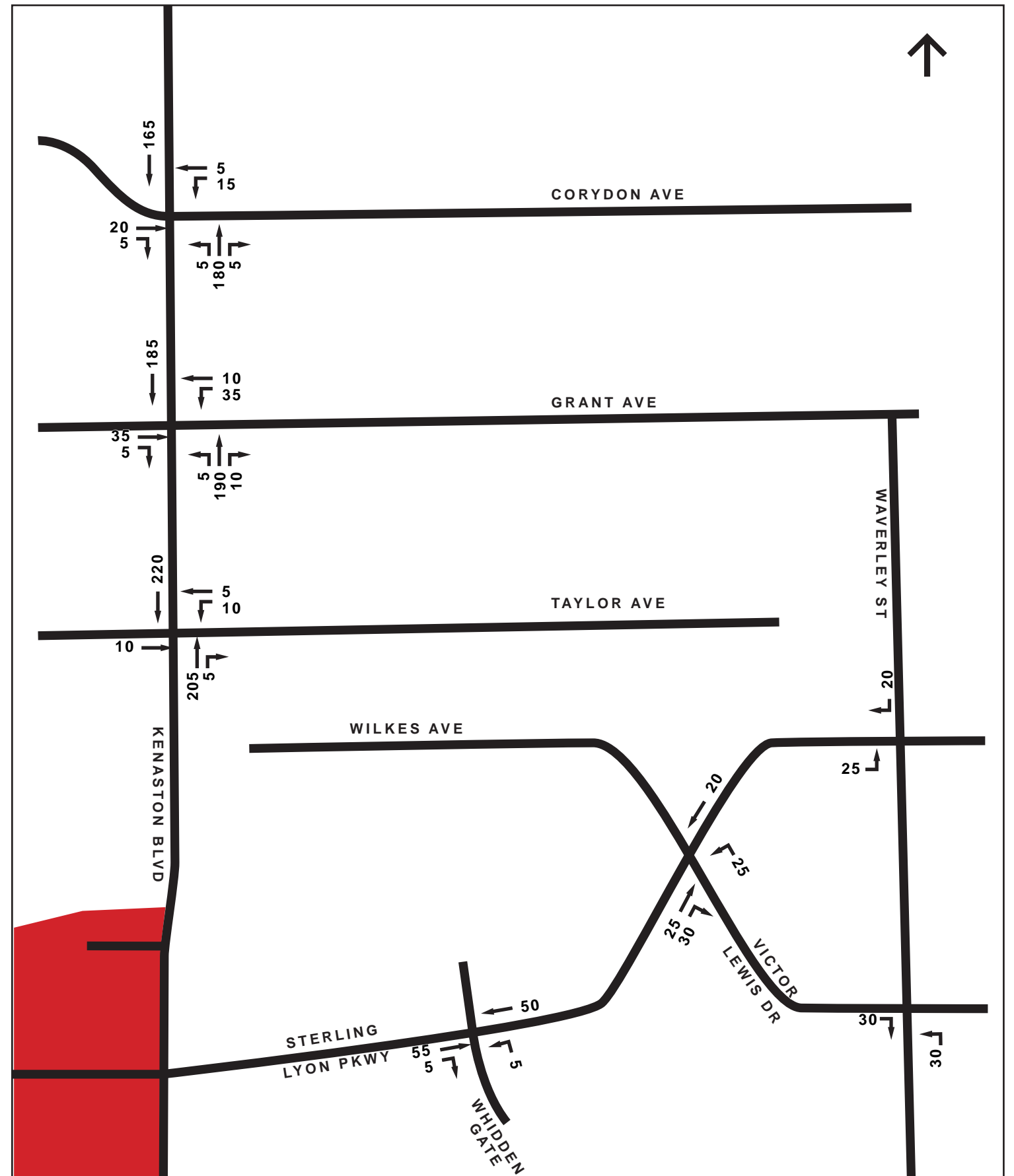
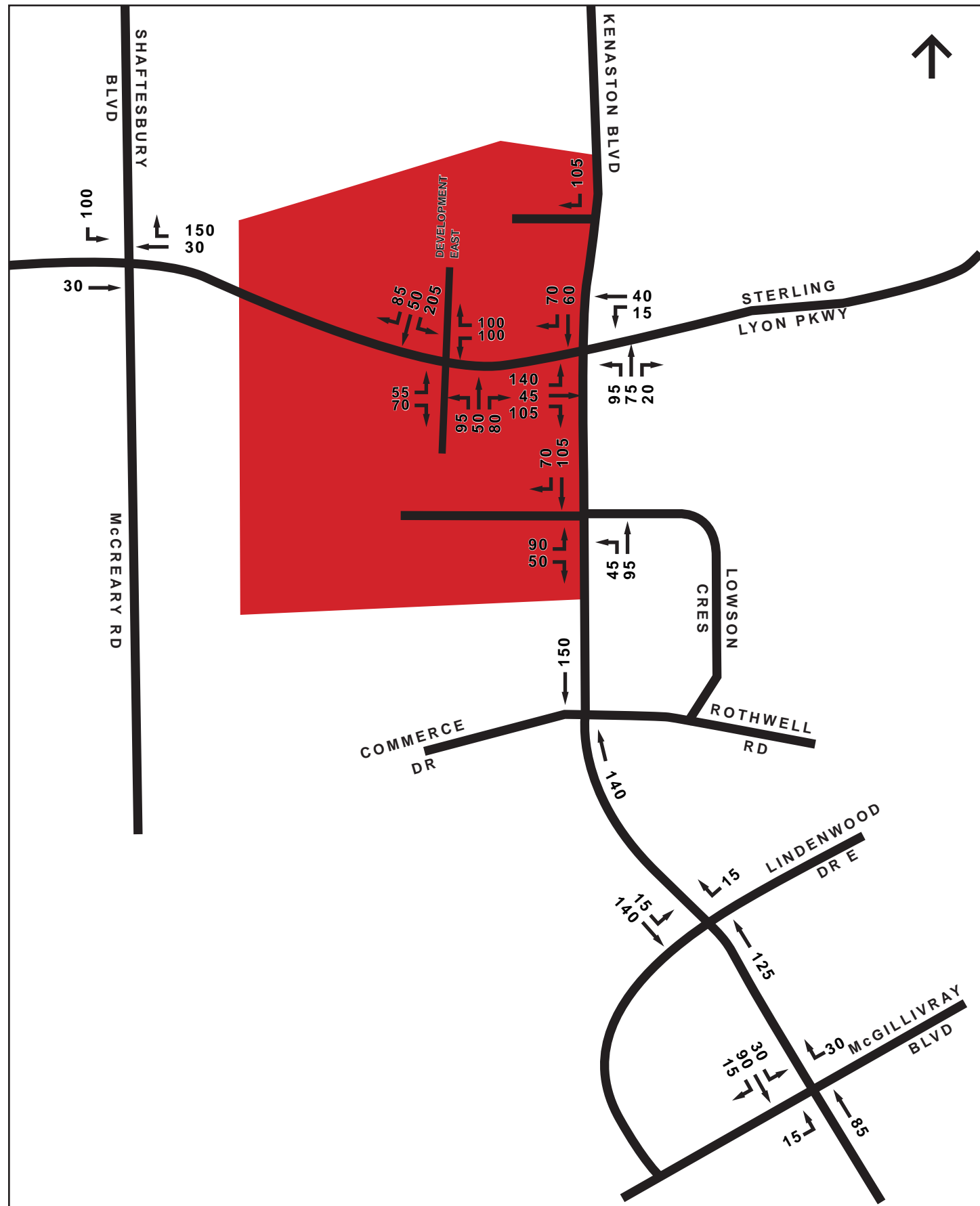
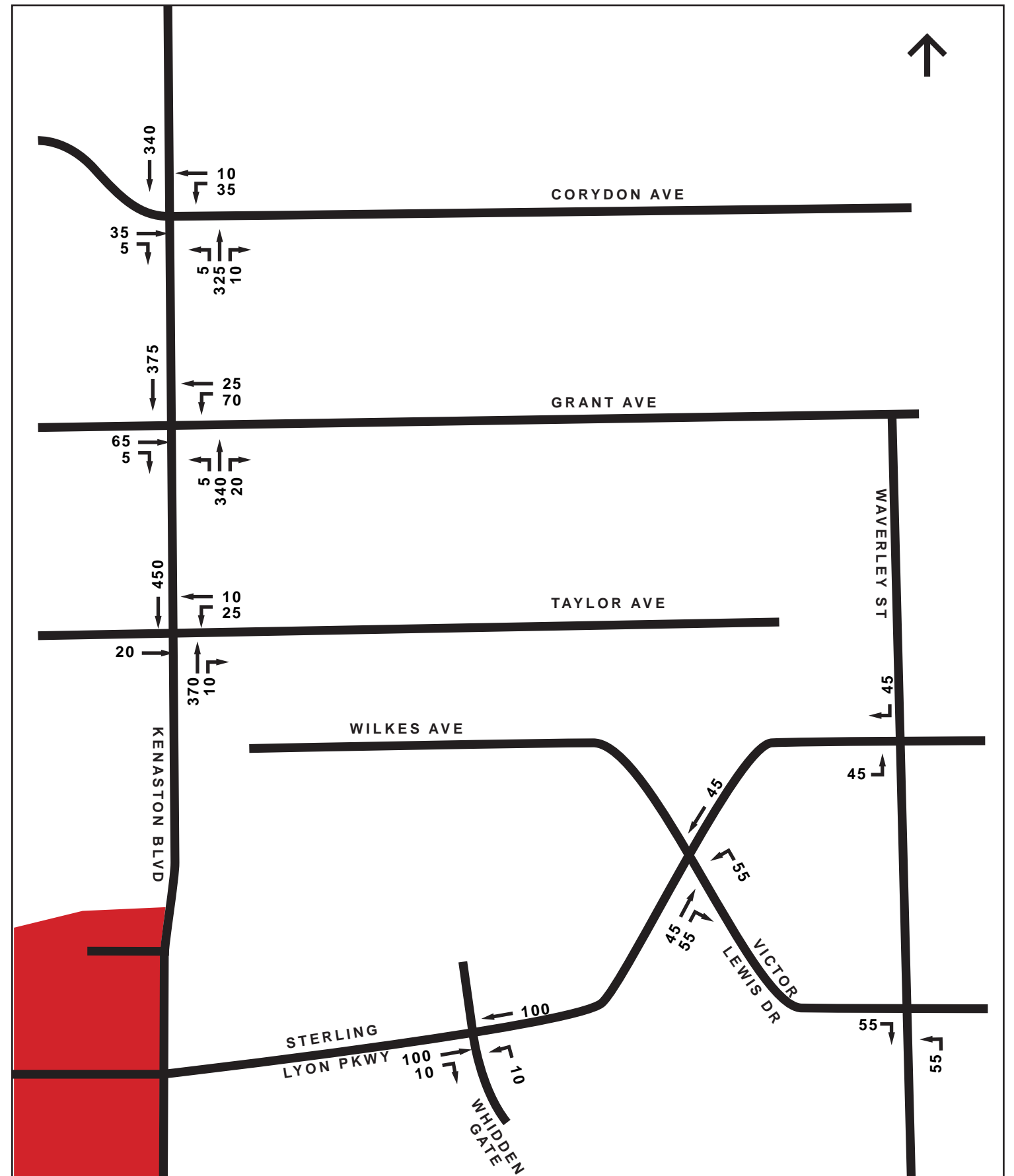
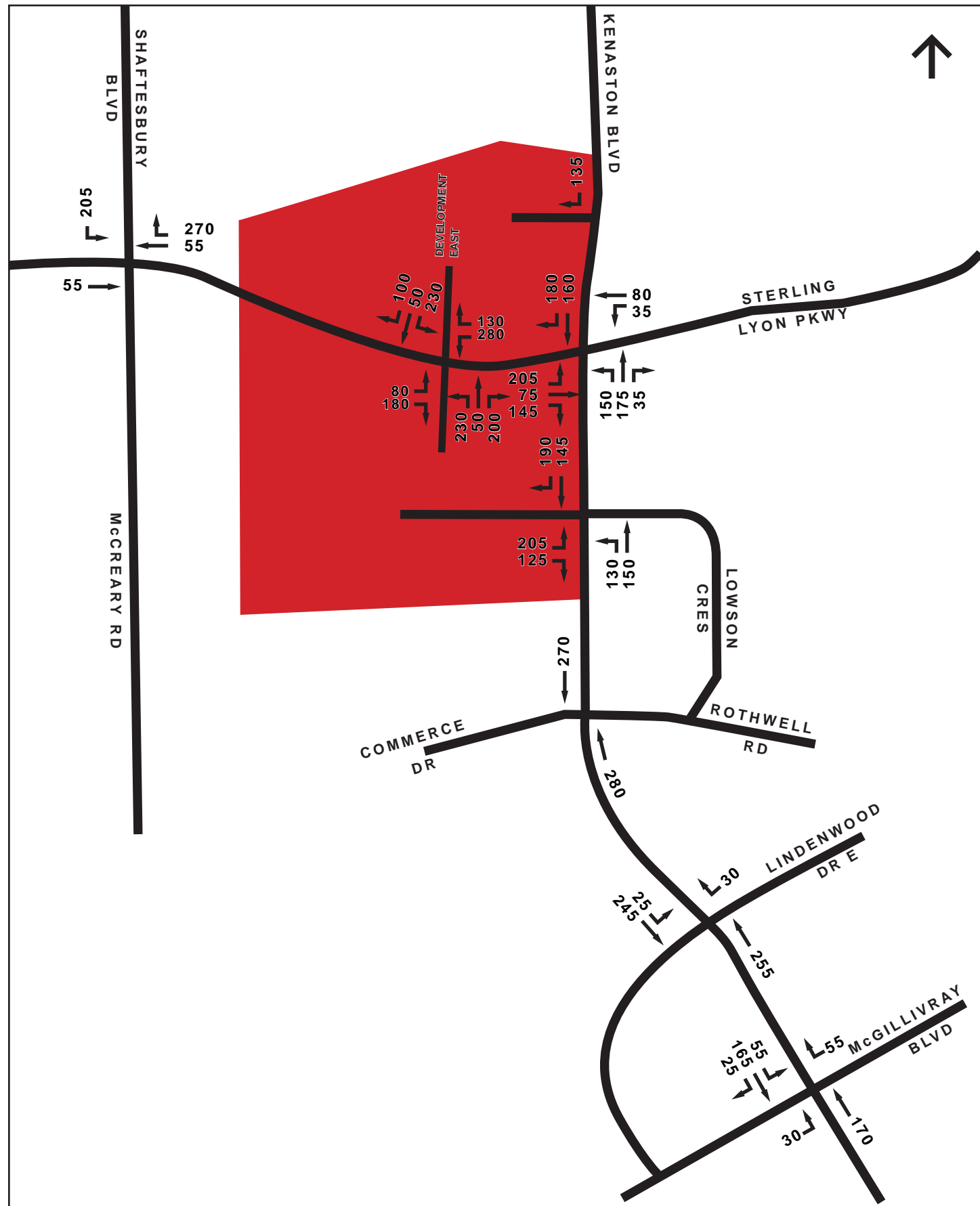
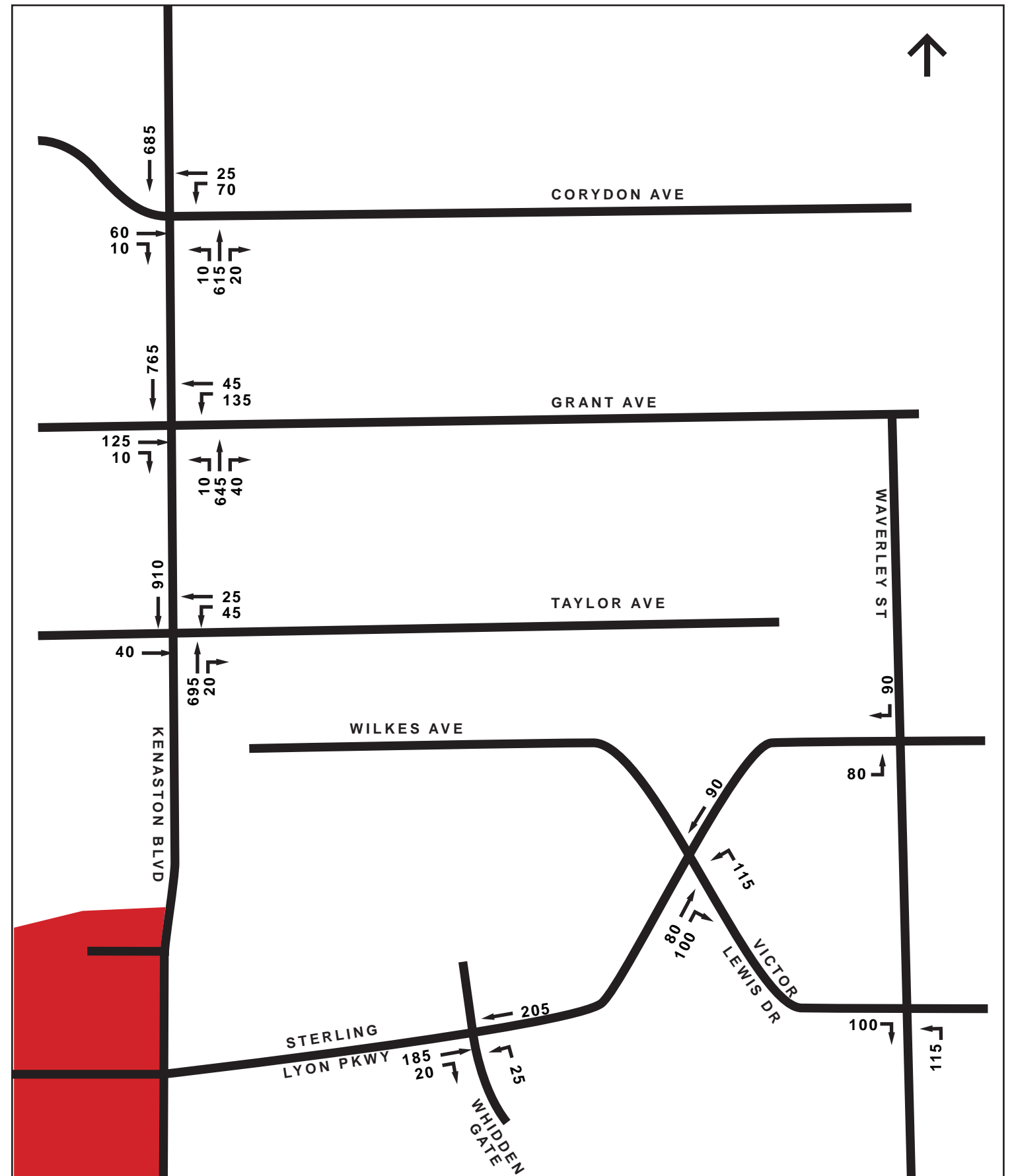
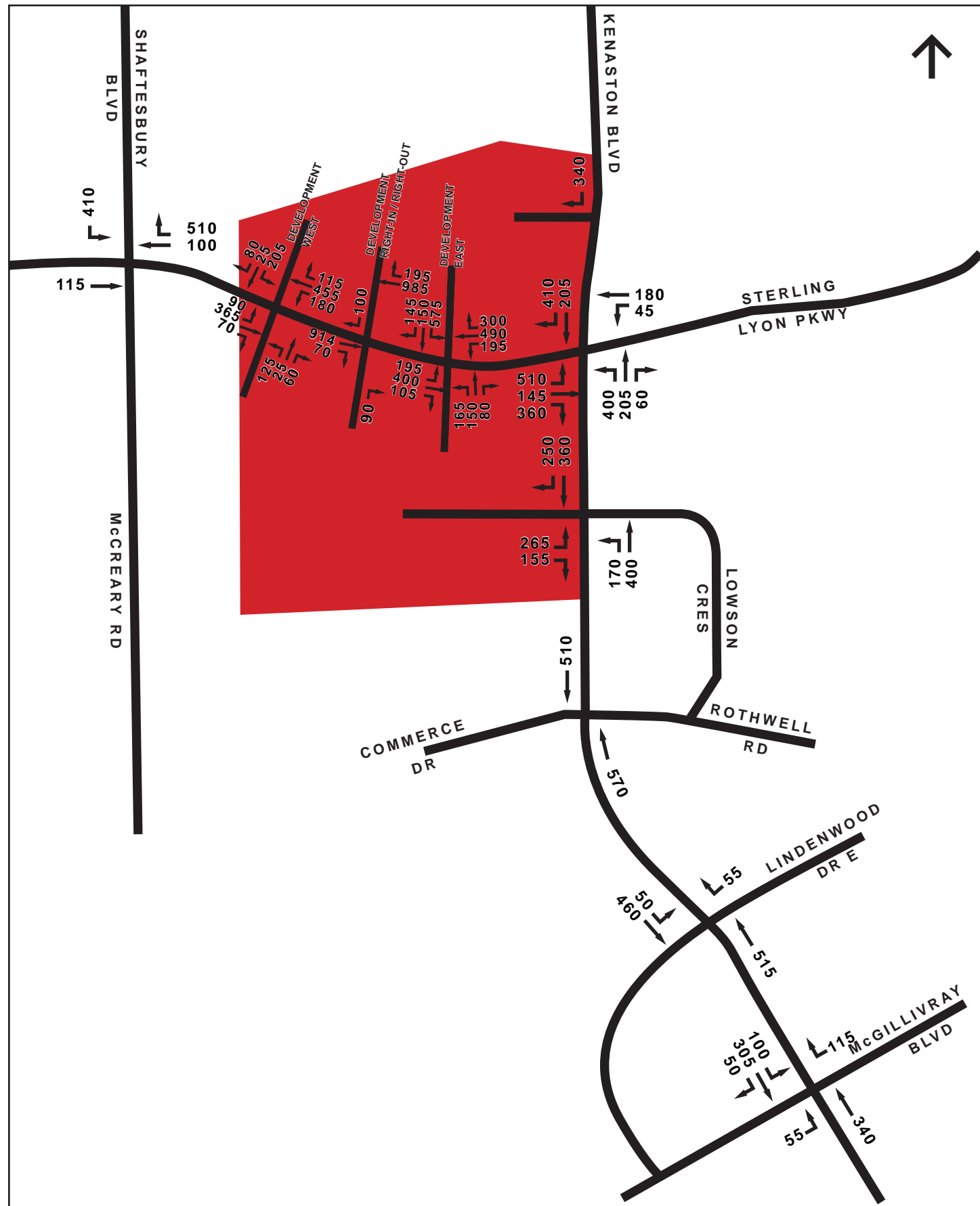


FIGURE 4.7:
 WEEKDAY PM PEAK HOUR
 2011 OPENING DAY NEW DEVELOPMENT TRAFFIC



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.8:
 SATURDAY PEAK HOUR
 2011 OPENING DAY NEW DEVELOPMENT TRAFFIC



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.10
 SATURDAY PEAK HOUR
 2018 FULL BUILD-OUT NEW DEVELOPMENT TRAFFIC

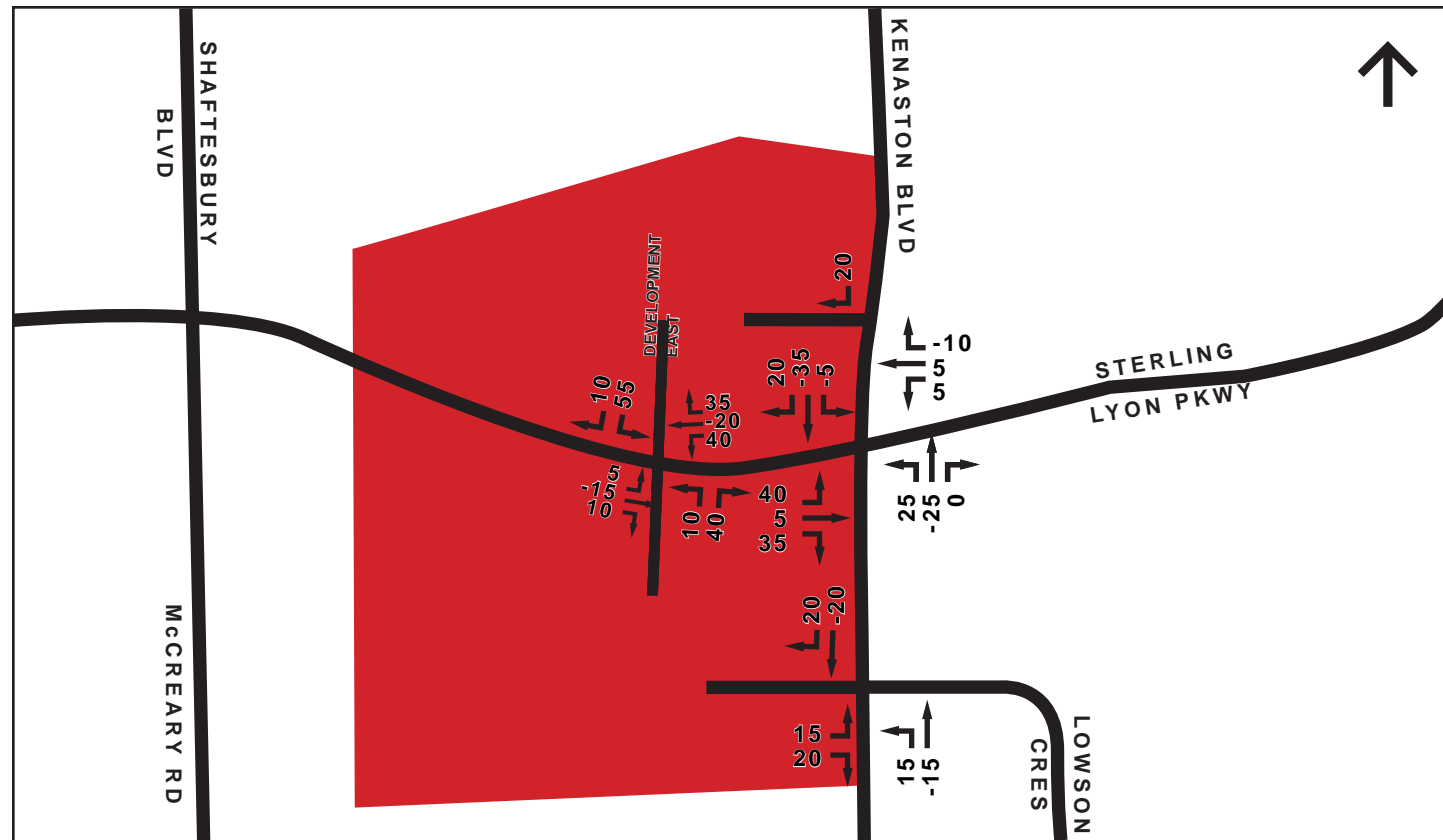


FIGURE 4.11
WEEKDAY PM PEAK HOUR
2011 OPENING DAY DROP-IN TRAFFIC

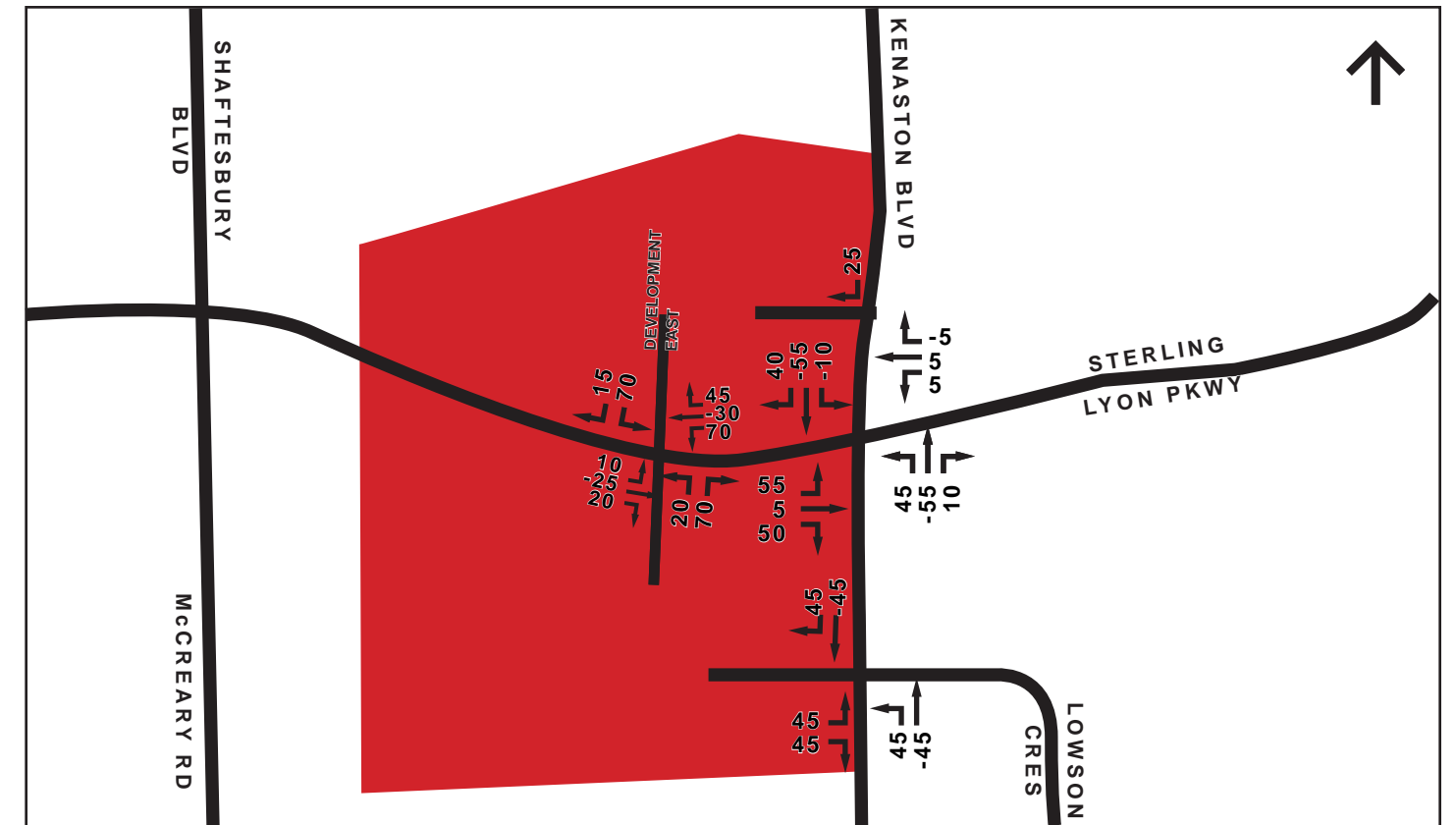


FIGURE 4.12
SATURDAY PEAK HOUR
2011 OPENING DAY DROP-IN TRAFFIC

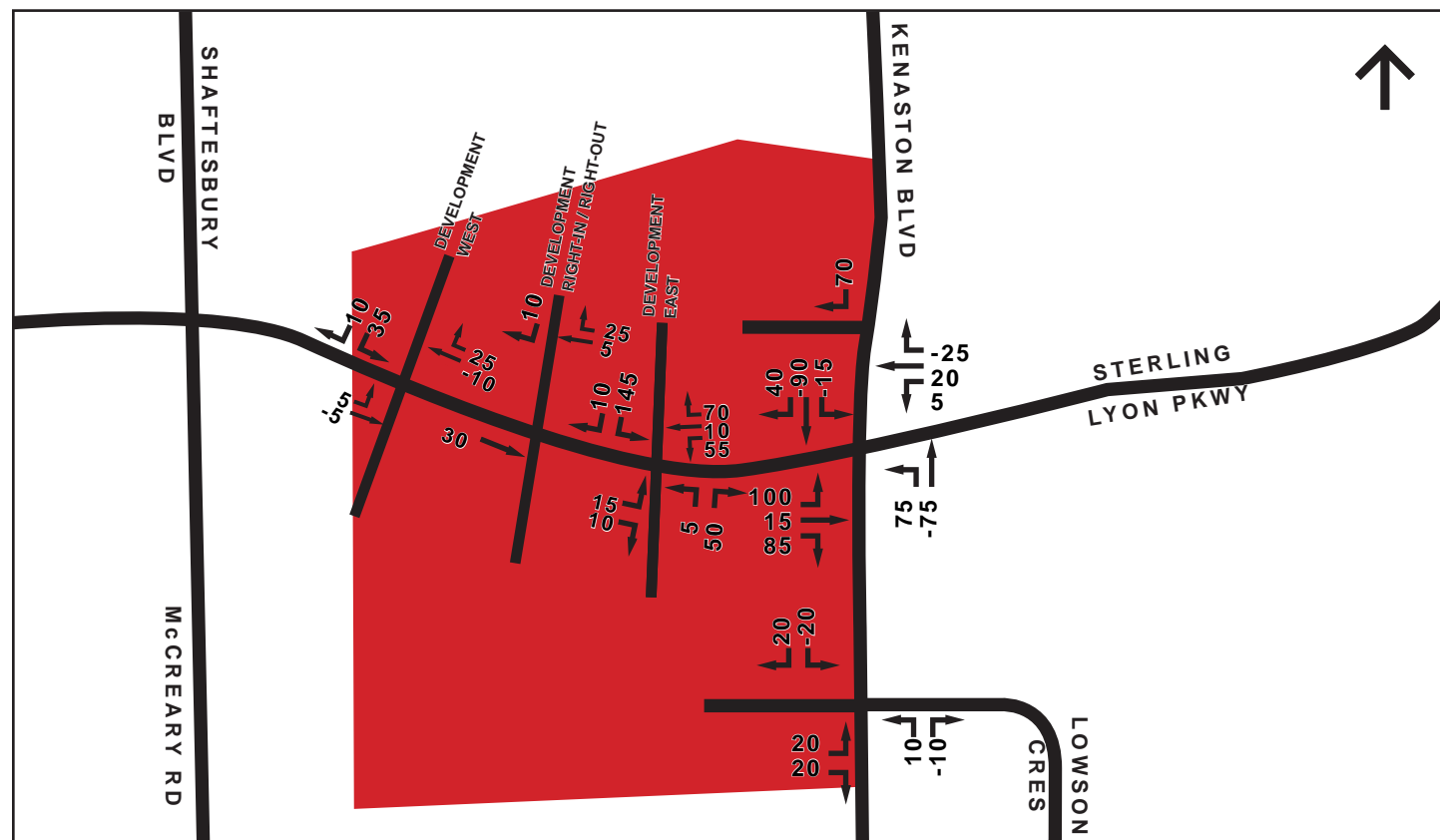


FIGURE 4.13
WEEKDAY PM PEAK HOUR
2018 FULL BUILD-OUT DROP-IN TRAFFIC

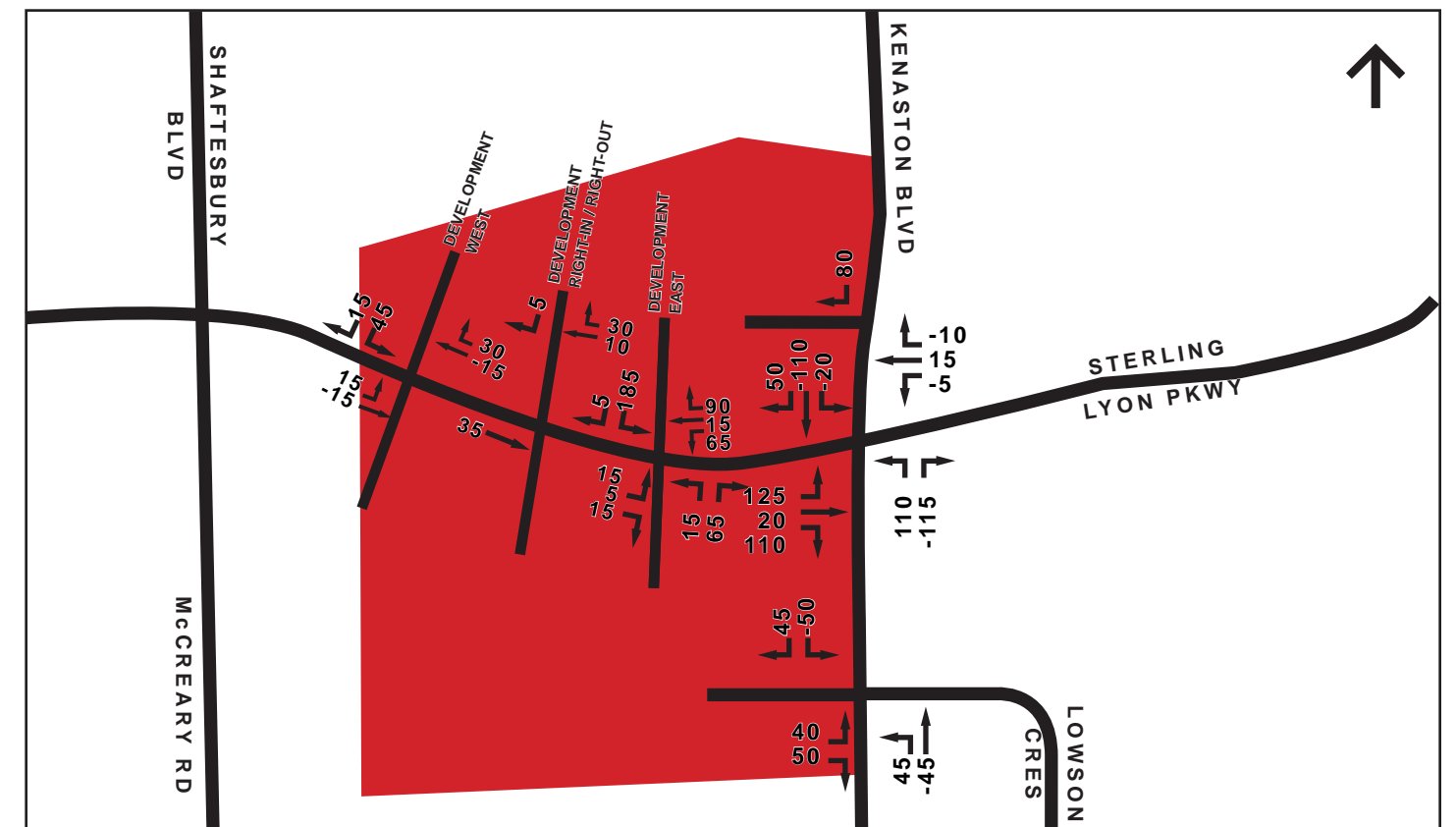
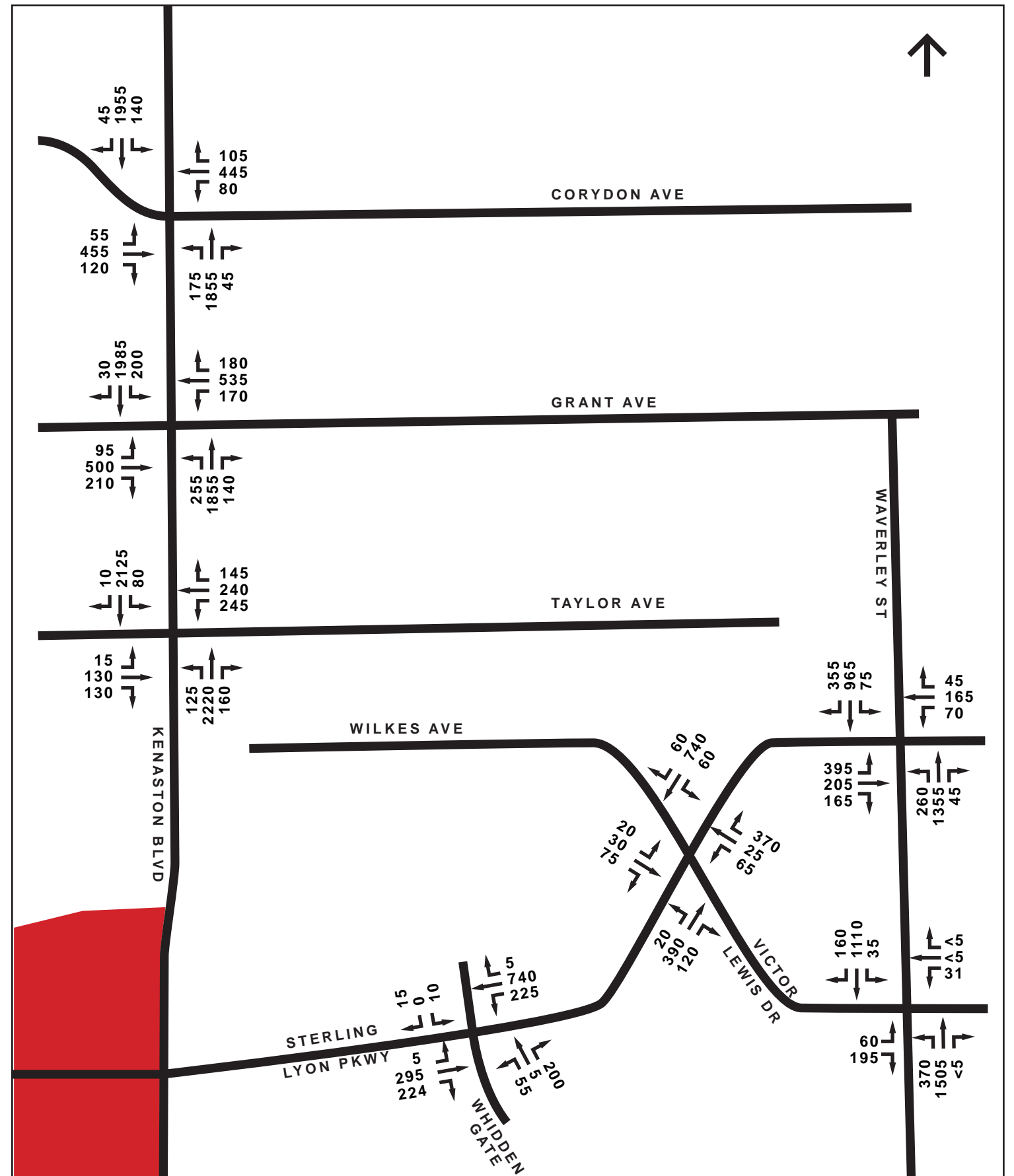
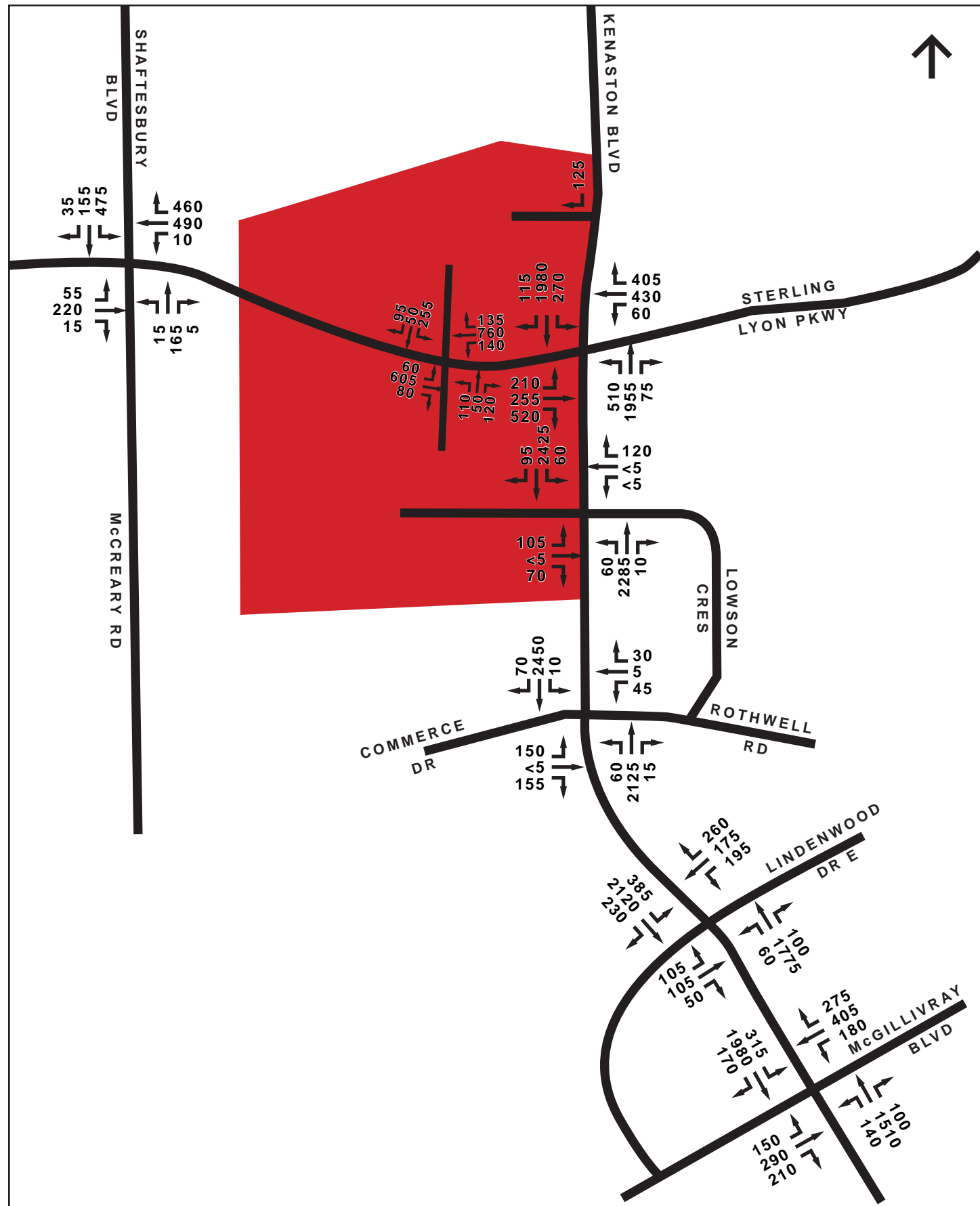


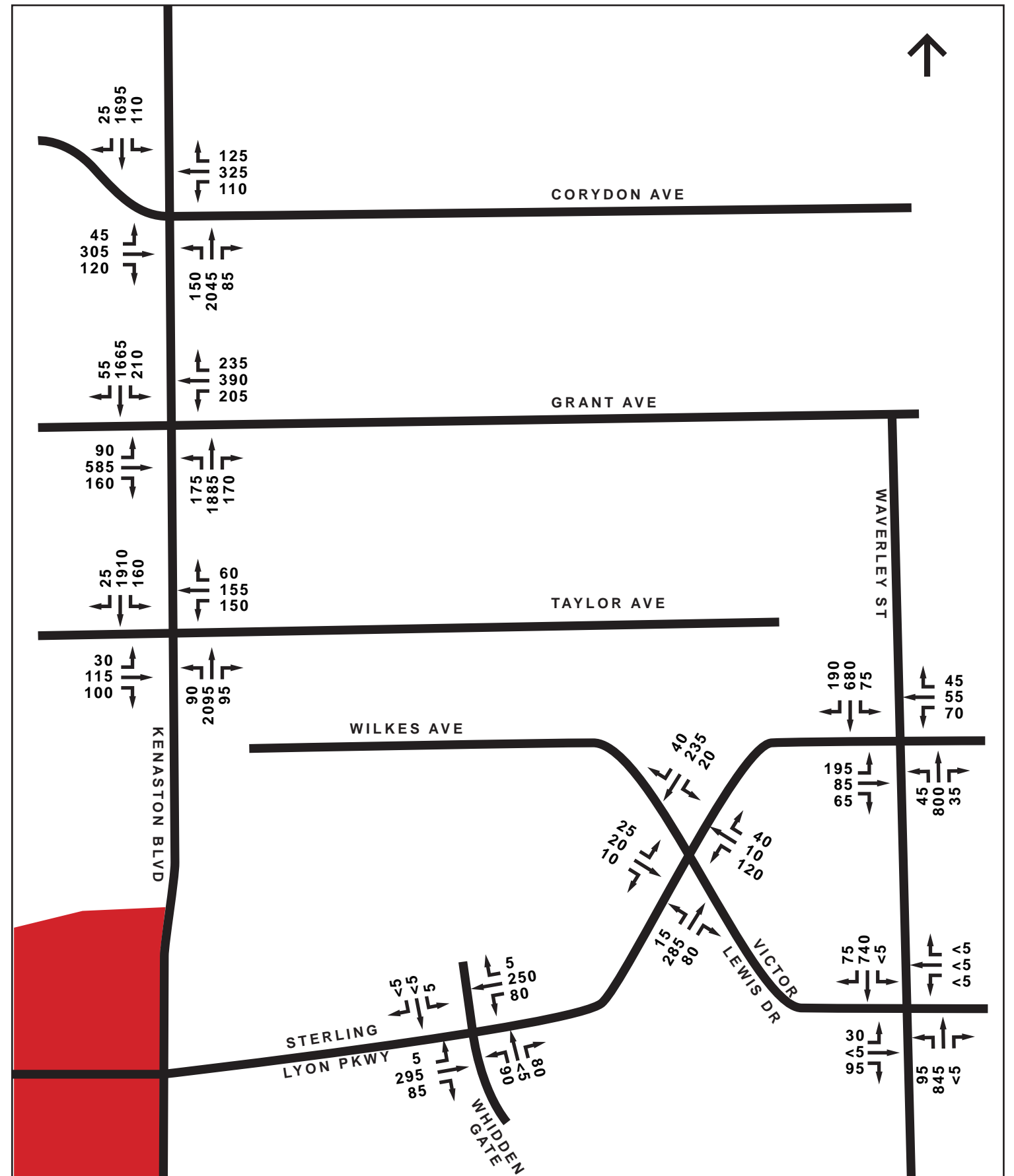
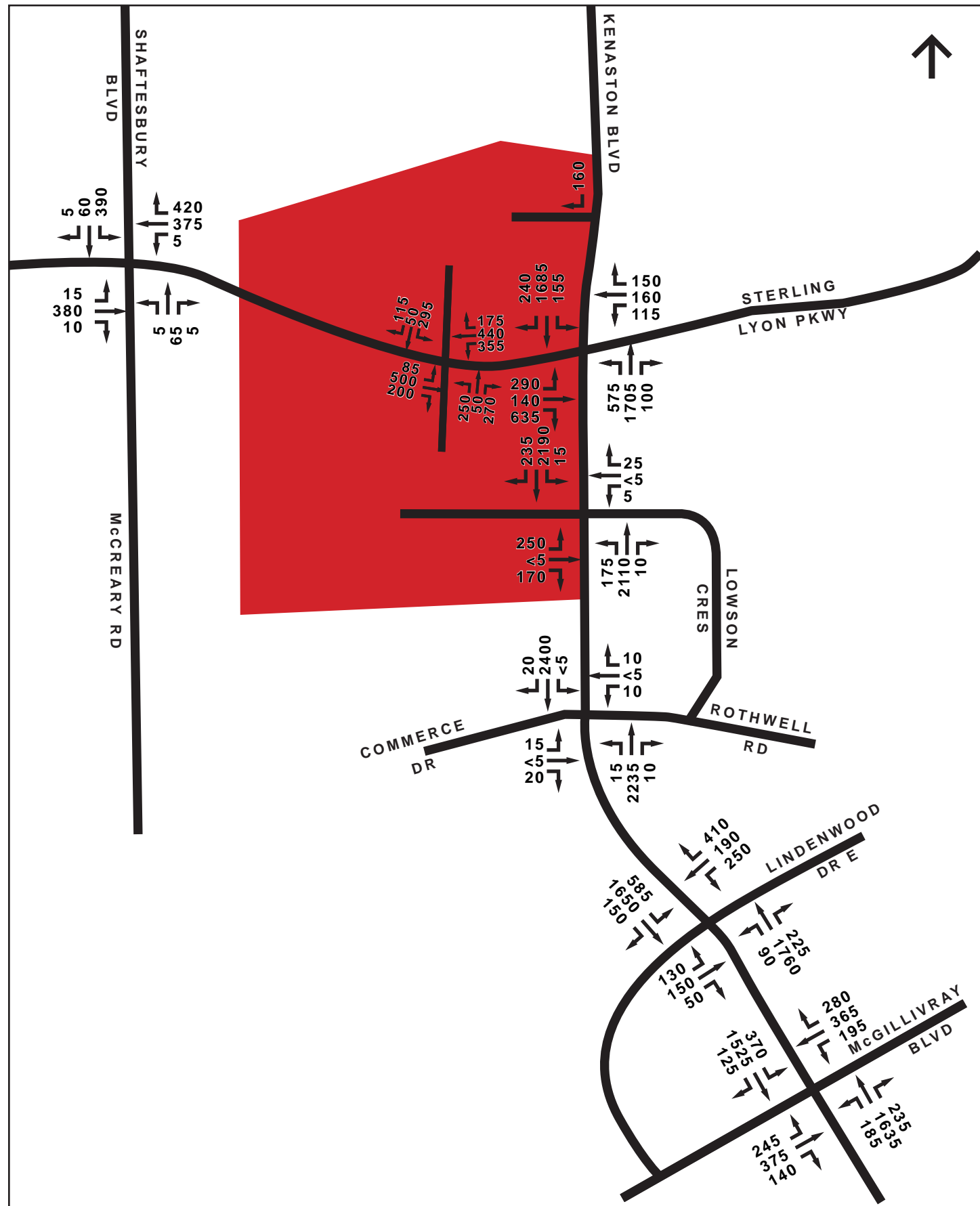
FIGURE 4.14
SATURDAY PEAK HOUR
2018 FULL BUILD-OUT DROP-IN TRAFFIC





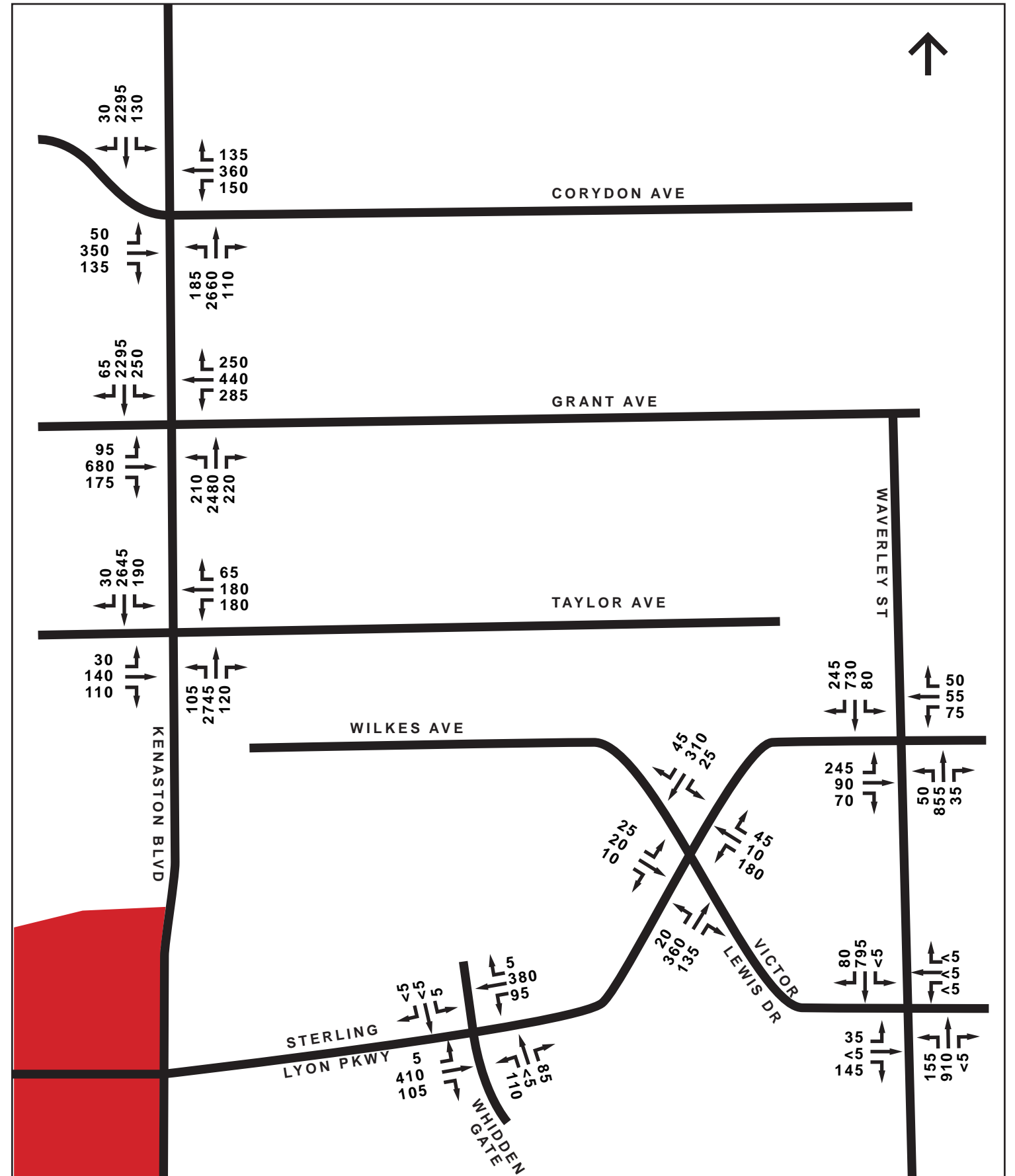
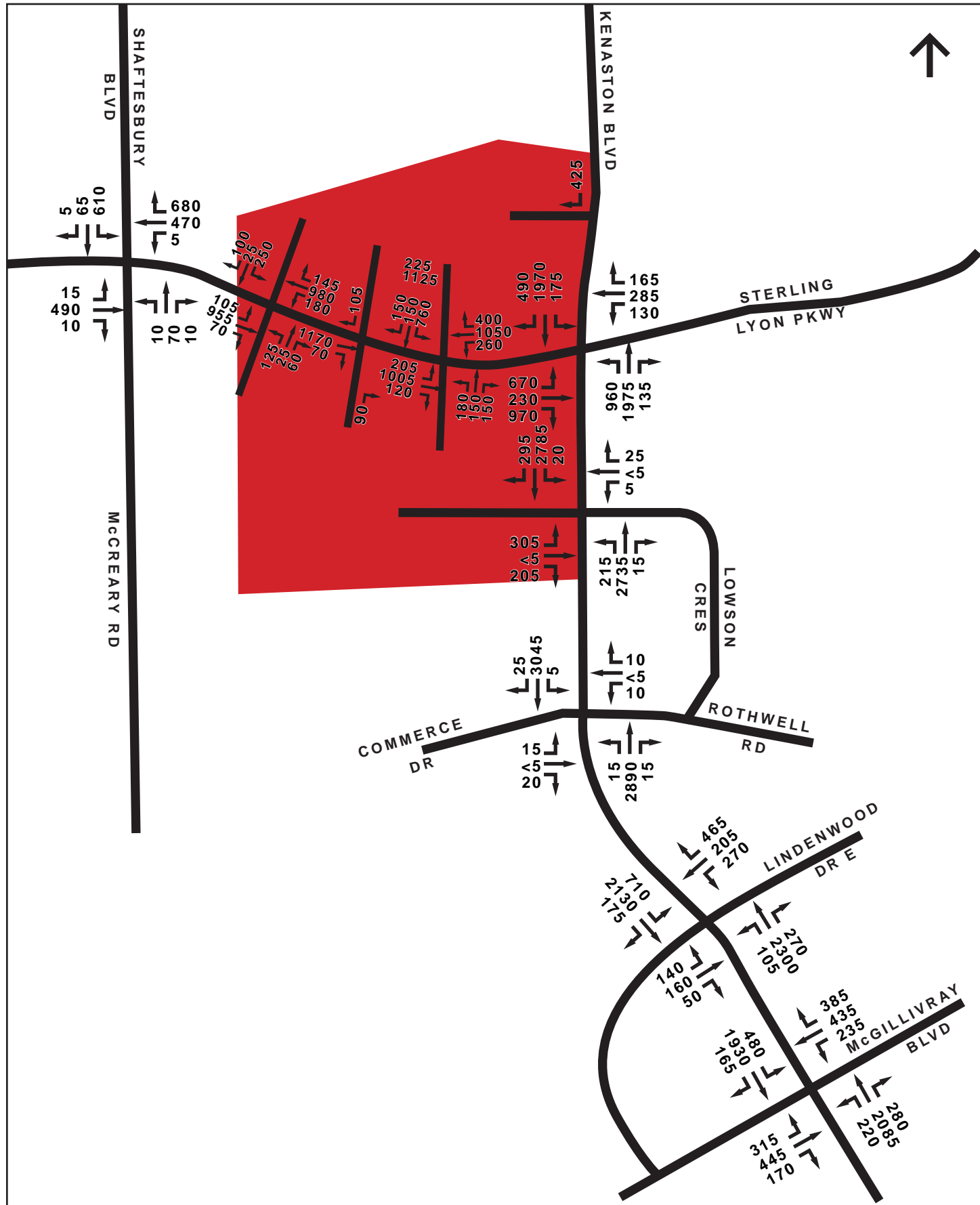
LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.15
 WEEKDAY PM PEAK HOUR
 2011 OPENING DAY POST DEVELOPMENT TRAFFIC



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.16
 SATURDAY PEAK HOUR
 2011 OPENING DAY POST DEVELOPMENT TRAFFIC



LEGEND
 PROPOSED DEVELOPMENT

FIGURE 4.18
 SATURDAY PEAK HOUR
 2018 FULL BUILD-OUT POST DEVELOPMENT TRAFFIC

5.0 INTERSECTION REVIEW

The traffic analysis for the proposed mixed-use development was undertaken using Synchro 7.0 traffic analysis software. The relative performance of an intersection is measured in terms of level of service (LOS). Levels of service range from A (excellent) to F (beyond capacity). In general, LOS E is considered to be at capacity. Level of service for signalized intersections is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Delay is a complex measure and is dependent on a number of variables, including the quality of progression, cycle length, green ratio and ratio for the lane group in question. Level of service criteria for unsignalized intersections is also defined in terms of delay. Delay is the total elapsed time from when a vehicle stops at the end of the queue until the vehicle departs from the stop line. This includes the time required for the vehicle to travel from the last-in-queue position to the first.

Intersection capacity utilization level of service (ICU LOS) provides additional insight into how an intersection is functioning and how much extra capacity is available to handle traffic fluctuations and incidents. ICU is based on the volume to capacity ratio and may not necessarily match the LOS generated due to delay forecasts. ICU LOS ranges from A (excellent) to H (beyond capacity), with ICU LOS E generally considered to be at practical capacity.

Ideally, LOS D or better for the overall intersection is desirable in urban areas during peak hour conditions. At unsignalized intersections, LOS E or better is generally considered acceptable for minor streets accessing a major arterial, with LOS F not uncommon. Oftentimes, a lower LOS is tolerated if no cost effective solution is available and if the proposed development is considered desirable from the City's standpoint. Numerous examples exist of intersections that operate at lower than LOS D in the peak hours in Winnipeg, including many intersections along Lagimodiere Boulevard, Bishop Grandin Boulevard, and other major arterials. Accepting a less than ideal LOS is oftentimes a policy decision on the part of the City.

Traffic signal timing information for existing signalized intersections was obtained from Public Works. Signal timings were optimized for all future scenarios, including the 2011 and 2018 background scenarios.

5.1 Kenaston Boulevard & Corydon Avenue

The intersection of Kenaston Boulevard and Corydon Avenue is a four-legged signalized intersection. All four approaches to the intersection consist of a left-turn lane, a through lane, and a shared through/right-turn lane. As was noted earlier, Public Works is currently working on a study (*Preliminary Design and Public Consultation for Route 90 from Taylor Avenue to Ness Avenue*) to upgrade Kenaston Boulevard from Taylor Avenue north to Ness Avenue, which will likely result in Kenaston Boulevard being widened to six lanes. It was therefore assumed for this study that Kenaston Boulevard will be widened by 2018 and there will be three northbound lanes and three southbound lanes on Kenaston Boulevard north of Taylor Avenue. Kenaston Boulevard is assumed to transition from six lanes to four lanes at the Taylor Avenue intersection (lanes will be added or dropped at the intersection). Following the widening in 2018, the northbound and southbound approaches on Kenaston Boulevard are assumed to consist of a left-turn lane, two through lanes and a shared through/right-turn lane. No changes are proposed for the eastbound and westbound approaches on Corydon Avenue. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.1 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Corydon Avenue.

5.2 Kenaston Boulevard & Grant Avenue

The intersection of Kenaston Boulevard and Grant Avenue is a four-legged signalized intersection. All four approaches to the intersection consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. Following widening of Kenaston Boulevard in 2018, the northbound and southbound approaches on Kenaston Boulevard will each consist of a left-turn lane, three through lanes, and a right-turn cut-off lane. No changes are proposed for the eastbound and westbound approaches on Grant Avenue. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.2 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Grant Avenue.

Table 5.1: Kenaston & Corydon Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday .P.M Peak Hour				
2008 Background	C (32 sec)	F (96%)	WB Left	F (149 sec)
2011 Background (Optimized)	D (37 sec)	G (100%)	WB Left	F (166 sec)
2011 Opening Day	D (53 sec)	G (106%)	WB Left	F (161 sec)
2018 Background (Optimized)	C (29 sec)	F (95%)	EB Left	F (135 sec)
2018 Full Build-Out	D (53 sec)	G (105%)	WB Left	F (151 sec)
Saturday Peak Hour				
2008 Background	C (21 sec)	E (88%)	WB Left	E (78 sec)
2011 Background (Optimized)	C (23 sec)	F (93%)	WB Left	F (101 sec)
2011 Opening Day	D (41 sec)	G (102%)	WB Left	F (148 sec)
2018 Background (Optimized)	C (23 sec)	E (87%)	WB Left	F (99 sec)
2018 Full Build-Out	D (42 sec)	F (99%)	WB Left	F (138 sec)

Table 5.2: Kenaston & Grant Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	D (43 sec)	F (95%)	WB Left	F (117 sec)
2011 Background (Optimized)	D (50 sec)	G (100%)	WB Left	F (127 sec)
2011 Opening Day	D (54 sec)	G (108%)	WB Left	F (157 sec)
2018 Background (Optimized)	C (35 sec)	F (96%)	SB Left	F (93 sec)
2018 Full Build-Out	E (58 sec)	H (113%)	WB Left	F (175 sec)
Saturday Peak Hour				
2008 Background	C (31 sec)	E (90%)	SB Left	F (119 sec)
2011 Background (Optimized)	D (37 sec)	F (95%)	SB Left	F (123 sec)
2011 Opening Day	E (64 sec)	H (110%)	WB Left	F (197 sec)
2018 Background (Optimized)	C (29 sec)	F (91%)	WB Left	F (85 sec)
2018 Full Build-Out	E (66 sec)	H (115%)	SB Left	F (>200 sec)

5.3 Kenaston Boulevard & Taylor Avenue

The intersection of Kenaston Boulevard and Taylor Avenue is a four-legged signalized intersection. The northbound and southbound approaches on Kenaston Boulevard each consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. The eastbound approach on Taylor Avenue consists of a left-turn lane, two through lanes, and a right-turn cut-off lane, while the westbound approach consists of a left-turn lane, a through lane and a right-turn cut-off lane. Following widening of Kenaston Boulevard in 2018, the intersection configuration will remain unchanged, as the third northbound and southbound lanes will be added or dropped at the intersection. With development of the proposed multi-use site, the northbound and southbound approaches on Kenaston Boulevard will each consist of a left-turn lane, three through lanes, and a right-turn cut-off lane. No changes are proposed for the eastbound and westbound approaches on Taylor Avenue.

Table 5.3 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Taylor Avenue.

Table 5.3: Kenaston & Taylor Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	B (17 sec)	E (90%)	WB Thru	E (68 sec)
2011 Background (Optimized)	B (17 sec)	F (95%)	WB Thru	F (73 sec)
2011 Opening Day	E (68 sec)	G (106%)	WB Left	F (172 sec)
2018 Background (Optimized)	C (34 sec)	H (112%)	WB Thru	F (120 sec)
2018 Full Build-Out	D (38 sec)	G (104%)	WB Left	F (134 sec)
Saturday Peak Hour				
2008 Background	B (13 sec)	E (87%)	WB Thru	E (57 sec)
2011 Background (Optimized)	B (16 sec)	E (91%)	WB Thru	E (64 sec)
2011 Opening Day	C (27 sec)	G (102%)	WB Left	F (129 sec)
2018 Background (Optimized)	C (27 sec)	G (102%)	WB Thru	F (96 sec)
2018 Full Build-Out	C (20 sec)	G (100%)	WB Left	F (120 sec)

5.4 Kenaston Boulevard & Sterling Lyon Parkway

The intersection of Kenaston Boulevard and Sterling Lyon Parkway is a four-legged signalized intersection. The northbound and southbound approaches on Kenaston Boulevard each consist of two left-turn lanes, two through lanes, and a right-turn cut-off lane. The eastbound and westbound approaches on Sterling Lyon Parkway each consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. Following development of the proposed multi-use site and the widening of Kenaston Boulevard to six lanes adjacent to the site by 2011, the northbound approach on Kenaston Boulevard will consist of three left-turn lanes, three through lanes and a right-turn cut-off lane, while the southbound approach will consist of two left-turn lanes, three through lanes and a right-turn cut-off lane. The eastbound approach on Sterling Lyon Parkway will consist of three left-turn lanes, two through lanes and a right-turn cut-off lane, while the westbound approach will consist of a left-turn lane, two through lanes and a right-turn cut-off lane. In the 2018 post development scenarios, a second right-turn cut-off lane (signalized) will be added to the southbound approach on Kenaston Boulevard and the eastbound and westbound approaches on Sterling Lyon Parkway.

Table 5.4 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Sterling Lyon Parkway.

The forecast LOS and delays are based on a number of assumptions, including background traffic growth remaining constant over time and estimated trip generation, distribution and assignment for the proposed development. It is suggested that traffic volumes at the intersection be monitored to determine actual LOS and delay levels as development proceeds. It should be noted that a variety of interchange options were examined as part of this review and it was found that they did not relieve the traffic operation issues at the intersection. The interchange issues were primarily due to heavy turning movements and weaving problems brought about by high weaving volumes and limited weaving distances.

Table 5.4: Kenaston & Sterling Lyon Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	D (38 sec)	F (91%)	SB Left	F (94 sec)
2011 Background (Optimized)	D (53 sec)	F (97%)	WB Thru	F (110 sec)
2011 Opening Day	C (32 sec)	E (87%)	EB Left	F (88 sec)
2018 Background (Optimized)	F (111 sec)	H (111%)	WB Thru	F (>200 sec)
2018 Full Build-Out	E (72 sec)	G (104%)	NB Left	F (156 sec)
Saturday Peak Hour				
2008 Background	B (16 sec)	D (74%)	NB Left	E (61 sec)
2011 Background (Optimized)	C (24 sec)	D (79%)	NB Left	E (72 sec)
2011 Opening Day	C (37 sec)	D (78%)	NB Left	E (67 sec)
2018 Background (Optimized)	C (28 sec)	F (93%)	WB Left	F (126 sec)
2018 Full Build-Out	D (47 sec)	F (94%)	WB Left	F (106 sec)

5.5 Kenaston Boulevard & Rothwell Road / Commerce Drive

The intersection of Kenaston Boulevard and Rothwell Road / Commerce Drive is a four-legged signalized intersection. The northbound and southbound approaches on Kenaston Boulevard each consist of a left-turn lane, two through lanes, and a right-turn lane. The westbound approach on Rothwell Road and the eastbound approach on Commerce Drive consist of a left-turn lane and a shared through/right-turn lane. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.5 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Rothwell Road / Commerce Drive.

The low LOS and ICU LOS forecasts at this intersection are the result of high through traffic volumes on Kenaston Boulevard. Adjusting the signal timing or adding turning lanes has little impact on overall intersection operations. The addition of a third southbound through lane on Kenaston Boulevard results in a forecast LOS D and ICU LOS H during the 2018 full build-out weekday p.m. peak hour, and the 95th percentile southbound queue length is reduced from 585 metres to approximately 100 metres. The third southbound lane on Kenaston Boulevard was assumed to continue from Lawson Crescent and extend through the Rothwell Road /

Commerce Drive intersection before transitioning to two lanes north of the CP rail tracks before Lindenwood Drive East.

Table 5.5: Kenaston & Rothwell / Commerce Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	B (16 sec)	F (94%)	EB Left	E (124 sec)
2011 Background (Optimized)	C (26 sec)	F (99%)	EB Left	F (133 sec)
2011 Opening Day	D (42 sec)	G (103%)	EB Left	F (>200 sec)
2018 Background (Optimized)	F (83 sec)	H (111%)	EB Left	F (151 sec)
2018 Full Build-Out	F (137 sec)	H (122%)	SB Thru	F (>200 sec)
Saturday Peak Hour				
2008 Background	A (9 sec)	D (75%)	NB Left	D (48 sec)
2011 Background (Optimized)	A (10 sec)	D (79%)	WB Left	D (45 sec)
2011 Opening Day	B (17 sec)	E (86%)	NB Left	E (72 sec)
2018 Background (Optimized)	D (39 sec)	E (90%)	SB Thru	E (62 sec)
2018 Full Build-Out	F (104 sec)	G (104%)	SB Thru	F (129 sec)

5.6 Kenaston Boulevard & Lindenwood Drive East

The intersection of Kenaston Boulevard and Lindenwood Drive East is a four-legged signalized intersection. The northbound and southbound approaches on Kenaston Boulevard each consist of two left-turn lanes, two through lanes, and a right-turn cut-off lane. The westbound approach on Lindenwood Drive East and the eastbound approach exiting the Kenaston Common development each consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.6 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Lindenwood Drive East.

Table 5.6: Kenaston & Lindenwood Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	C (23 sec)	E (88%)	NB Left	F (83 sec)
2011 Background (Optimized)	C (24 sec)	F (92%)	WB Left	F (96 sec)
2011 Opening Day	C (26 sec)	F (96%)	WB Left	F (118 sec)
2018 Background (Optimized)	D (46 sec)	G (103%)	WB Left	F (142 sec)
2018 Full Build-Out	F (103 sec)	H (113%)	WB Left	F (196 sec)
Saturday Peak Hour				
2008 Background	C (25 sec)	E (91%)	WB Left	F (100 sec)
2011 Background (Optimized)	C (29 sec)	F (95%)	WB Left	F (113 sec)
2011 Opening Day	D (42 sec)	G (103%)	WB Left	F (132 sec)
2018 Background (Optimized)	F (84 sec)	G (108%)	SB Left	F (>200 sec)
2018 Full Build-Out	F (107 sec)	H (123%)	SB Left	F (>200 sec)

5.7 Kenaston Boulevard & McGillivray Boulevard

The intersection of Kenaston Boulevard and McGillivray Boulevard is a four-legged signalized intersection. The northbound and southbound approaches on Kenaston Boulevard each consist of two left-turn lanes, two through lanes, and a right-turn cut-off lane. The eastbound and westbound approaches on McGillivray Boulevard each consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. The City of Winnipeg is currently in the process of twinning McGillivray Boulevard through the Kenaston Boulevard intersection and two eastbound and westbound left-turn lanes will be constructed on McGillivray Boulevard at the intersection as part of this project. All approaches to the intersection will therefore consist of two-left turn lanes, two through lanes, and a right-turn cut-off lane for the 2011 and 2018 scenarios. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.7 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and McGillivray Boulevard.

Table 5.7: Kenaston & McGillivray Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	D (37 sec)	E (89%)	WB Left	F (>200 sec)
2011 Background (Optimized)	D (41 sec)	E (91%)	SB Left	E (67 sec)
2011 Opening Day	D (50 sec)	F (93%)	SB Thru	F (81 sec)
2018 Background (Optimized)	F (84 sec)	G (104%)	SB Left	F (160 sec)
2018 Full Build-Out	F (132 sec)	H (111%)	SB Thru	F (>200 sec)
Saturday Peak Hour				
2008 Background	C (33 sec)	E (85%)	WB Left	F (91 sec)
2011 Background (Optimized)	C (31 sec)	E (84%)	SB Left	E (74 sec)
2011 Opening Day	D (38 sec)	F (91%)	SB Left	F (90 sec)
2018 Background (Optimized)	E (74 sec)	F (97%)	SB Left	F (169 sec)
2018 Full Build-Out	F (105 sec)	H (111%)	SB Left	F (>200 sec)

5.8 Sterling Lyon Parkway / Wilkes Avenue & Shaftesbury Boulevard / McCreary Road

The intersection of Sterling Lyon Parkway / Wilkes Avenue and Shaftesbury Boulevard / McCreary Road is a four-legged signalized intersection. The eastbound approach on Wilkes Avenue and the westbound approach on Sterling Lyon Parkway each consist of a left-turn lane, a through lane, and a right-turn lane. The northbound approach on McCreary Road and the southbound approach on Shaftesbury Boulevard each consist of a shared left-turn/through lane and a right-turn lane. With development of the proposed multi-use site in 2011, the southbound approach on Shaftesbury Boulevard will consist of a left-turn lane and a shared through/right-turn lane, which will require modification of the intersection geometry to properly align the approaches north and south of Sterling Lyon Parkway / Wilkes Avenue. All other approaches are unchanged in 2011. With development of the site in 2018, the southbound approach on Shaftesbury Boulevard will consist of two left-turn lanes and a shared through/right-turn lane. The westbound approach on Sterling Lyon Parkway, eastbound approach on Wilkes Avenue and northbound approach on McCreary Road are unchanged.

Table 5.8 summarizes the results of the background and post development intersection analysis for Sterling Lyon Parkway / Wilkes Avenue and Shaftesbury Boulevard / McCreary Road.

Table 5.8: Sterling Lyon / Wilkes & Shaftesbury / McCreary Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	D (41 sec)	E (83%)	EB Left	F (170 sec)
2011 Background (Optimized)	D (51 sec)	E (86%)	EB Left	F (162 sec)
2011 Opening Day	C (30 sec)	E (85%)	EB Left	F (137 sec)
2018 Background (Optimized)	F (86 sec)	F (91%)	SB Left	F (>200 sec)
2018 Full Build-Out	C (30 sec)	E (83%)	SB Left/Thru	F (>200 sec)
Saturday Peak Hour				
2008 Background	C (21 sec)	A (54%)	EB Thru	D (41 sec)
2011 Background (Optimized)	C (23 sec)	B (56%)	EB Thru	D (44 sec)
2011 Opening Day	C (27 sec)	C (67%)	EB Thru	D (51 sec)
2018 Background (Optimized)	C (25 sec)	B (59%)	EB Thru	D (41 sec)
2018 Full Build-Out	C (23 sec)	C (70%)	EB Thru	D (38 sec)

It should be noted that no development trips were assumed to use McCreary Road due to the limited generation/attraction locations in this area. In reality, as traffic conditions become more congested, people may find alternate routes to use to access the development, including perhaps McCreary Road. This may especially be true as future upgrades to McCreary Road occur as Waverley West development progresses, which would somewhat reduce new development trips along Kenaston Boulevard. The analysis presented in this report can therefore be considered to be a “worst-case” scenario.

5.9 Sterling Lyon Parkway & Whidden Gate

The intersection of Sterling Lyon Parkway and Whidden Gate is a four-legged signalized intersection. The eastbound and westbound approaches on Sterling Lyon Parkway each consist of a left-turn lane, two through lanes and right-turn cut-off lane. The northbound and southbound approaches on Whidden Gate consist of a single approach lane with a right-turn

cut-off. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.9 summarizes the results of the background and post development intersection analysis for Sterling Lyon Parkway and Whidden Gate.

Table 5.9: Sterling Lyon & Whidden Gate Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	A (6 sec)	A (45%)	NB Left	E (63 sec)
2011 Background (Optimized)	A (6 sec)	A (46%)	NB Left	E (63 sec)
2011 Opening Day	A (6 sec)	A (48%)	NB Left	E (64 sec)
2018 Background (Optimized)	A (6 sec)	A (49%)	NB Left	E (64 sec)
2018 Full Build-Out	A (6 sec)	A (53%)	NB Left	E (64 sec)
Saturday Peak Hour				
2008 Background	A (8 sec)	A (34%)	NB Left	D (53 sec)
2011 Background (Optimized)	A (8 sec)	A (35%)	NB Left	E (60 sec)
2011 Opening Day	A (9 sec)	A (38%)	NB Left	E (65 sec)
2018 Background (Optimized)	B (12 sec)	A (37%)	NB Left	E (64 sec)
2018 Full Build-Out	A (9 sec)	A (44%)	NB Left	E (65 sec)

5.10 Sterling Lyon Parkway & Victor Lewis Drive / Wilkes Avenue

The intersection of Sterling Lyon Parkway and Victor Lewis Drive / Wilkes Avenue is a four-legged signalized intersection. The eastbound and westbound approaches on Sterling Lyon Parkway each consist of a left-turn lane, two through lanes, and a right-turn cut-off lane. The northbound approach on Victor Lewis Drive consists of a left-turn lane, a through lane and a right-turn cut-off lane, while the southbound approach on Wilkes Avenue consists of a left-turn lane and a shared through/right-turn cut-off lane. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.10 summarizes the results of the background and post development intersection analysis for Sterling Lyon Parkway and Victor Lewis Drive / Wilkes Avenue.

Table 5.10: Sterling Lyon & Victor Lewis / Wilkes Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	A (7 sec)	A (42%)	SB Left	E (55 sec)
2011 Background (Optimized)	A (10 sec)	A (43%)	SB Left	E (55 sec)
2011 Opening Day	A (9 sec)	A (46%)	SB Left	E (55 sec)
2018 Background (Optimized)	B (10 sec)	A (47%)	SB Left	D (53 sec)
2018 Full Build-Out	B (11 sec)	A (52%)	NB Left	E (61 sec)
Saturday Peak Hour				
2008 Background	A (10 sec)	A (31%)	SB Left	D (49 sec)
2011 Background (Optimized)	B (11 sec)	A (32%)	SB Left	E (55 sec)
2011 Opening Day	B (14 sec)	A (36%)	SB Left	E (61 sec)
2018 Background (Optimized)	B (11 sec)	A (33%)	SB Left	E (63 sec)
2018 Full Build-Out	B (19 sec)	A (42%)	SB Left	E (59 sec)

5.11 Waverley Street & Wilkes Avenue / Hurst Way

The intersection of Waverley Street and Wilkes Avenue / Hurst Way is a four-legged signalized intersection. The northbound approach on Waverley Street consists of a left-turn lane, a through lane, and a shared through/right-turn lane, while the southbound approach consists of a left-turn lane, a through lane, and a shared through/right-turn cut-off lane. The eastbound approach on Wilkes Avenue consists of a shared left-turn/through lane and a shared through/right-turn cut-off lane, while the westbound approach on Hurst Way consists of a shared left-turn/through lane and a shared through/right-turn lane. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.11 summarizes the results of the background and post development intersection analysis for Waverley Street and Wilkes Avenue / Hurst Way.

Table 5.11: Waverley & Wilkes / Hurst Way Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	D (45 sec)	E (90%)	WB Thru/Right	F (101 sec)
2011 Background (Optimized)	D (48 sec)	F (92%)	WB Thru/Right	F (106 sec)
2011 Opening Day	D (45 sec)	F (93%)	WB Thru/Right	F (106 sec)
2018 Background (Optimized)	E (63 sec)	F (98%)	WB Thru/Right	F (125 sec)
2018 Full Build-Out	E (59 sec)	G (101%)	WB Thru/Right	F (125 sec)
Saturday Peak Hour				
2008 Background	B (17 sec)	B (57%)	WB Left	E (55 sec)
2011 Background (Optimized)	B (18 sec)	B (58%)	WB Left	E (62 sec)
2011 Opening Day	C (21 sec)	B (61%)	WB Left	E (68 sec)
2018 Background (Optimized)	C (23 sec)	B (61%)	WB Left	E (61 sec)
2018 Full Build-Out	C (21 sec)	C (65%)	WB Left	E (70 sec)

5.12 Waverley Street & Victor Lewis Drive

The intersection of Waverley Street and Victor Lewis Drive is a four-legged signalized intersection (the parking lot access for the Winnipeg Soccer Complex makes up the fourth leg of the intersection on the east side of Waverley Street). The northbound approach on Waverley Street consists of a left-turn lane, two through lanes, and a right-turn lane, while the southbound approach consists of a left-turn lane, two through lanes, and a right-turn cut-off lane. The eastbound approach on Victor Lewis Drive consists of a left-turn lane and a shared through/right-turn cut-off lane, while the westbound approach exiting the parking lot consists of a single approach lane. The intersection configuration is assumed to be the same following development of the proposed multi-use site.

Table 5.12 summarizes the results of the background and post development intersection analysis for Waverley Street and Victor Lewis Drive.

Table 5.12: Waverley & Victor Lewis Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	B (19 sec)	E (87%)	WB L/T/R	F (127 sec)
2011 Background (Optimized)	C (23 sec)	E (88%)	NB Left	F (134 sec)
2011 Opening Day	C (24 sec)	E (90%)	NB Left	F (138 sec)
2018 Background (Optimized)	D (37 sec)	F (92%)	NB Left	F (>200 sec)
2018 Full Build-Out	E (71 sec)	F (97%)	NB Left	F (>200 sec)
Saturday Peak Hour				
2008 Background	A (2 sec)	A (42%)	EB Left	D (45 sec)
2011 Background (Optimized)	A (2 sec)	A (47%)	EB Left	D (50 sec)
2011 Opening Day	A (3 sec)	B (57%)	EB Left	E (71 sec)
2018 Background (Optimized)	A (3 sec)	A (47%)	EB Left	E (74 sec)
2018 Full Build-Out	A (4 sec)	B (61%)	EB Left	E (63 sec)

5.13 Kenaston Boulevard & Lawson Crescent

The intersection of Kenaston Boulevard and Lawson Crescent is currently a three-legged unsignalized T-intersection located adjacent to the proposed development site. Northbound and southbound traffic on Kenaston Boulevard is free flowing, while westbound vehicles on Lawson Crescent approach a stop sign at the intersection. The northbound approach on Kenaston Boulevard consists of two through lanes and a right-turn lane, while the southbound approach consists of a left-turn lane and two through lanes. The westbound approach on Lawson Crescent consists of a single lane; however, the approach has a rural cross-section and is wide enough to allow for two vehicles to manoeuvre side-by-side at the intersection.

Following development of the proposed multi-use site, the intersection of Kenaston Boulevard and Lawson Crescent is proposed to become a four-legged signalized intersection, with the access to the home furnishing store forming the fourth leg of the intersection on the west side of Kenaston Boulevard. In the post development scenarios, the northbound approach on Kenaston Boulevard will consist of a left-turn lane, three through lanes and a right-turn lane, while the southbound approach will consist of a left-turn lane, three through lanes and a right-turn lane. The eastbound approach exiting the home furnishing store will consist of a left-turn

lane, a shared left-turn/through lane and a right-turn lane, while the westbound approach on Lowson Crescent will consist of a shared left-turn/through lane and a right-turn lane.

Table 5.13 summarizes the results of the background and post development intersection analysis for Kenaston Boulevard and Lowson Crescent. It should be noted that in the background scenarios the intersection remains unsignalized and therefore an overall intersection LOS is not provided by Synchro.

Table 5.13: Kenaston & Lowson Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2008 Background	(4 sec)	D (74%)	WB Left/Right	F (89 sec)
2011 Background (Optimized)	(7 sec)	D (79%)	WB Left/Right	F (144 sec)
2011 Opening Day	A (6 sec)	B (63%)	EB Left/Thru	E (57 sec)
2018 Background (Optimized)	(14 sec)	F (91%)	WB Left/Right	F (>200 sec)
2018 Full Build-Out	B (12 sec)	D (73%)	EB Left/Thru	E (58 sec)
Saturday Peak Hour				
2008 Background	(8 sec)	B (63%)	WB Left/Right	F (>200 sec)
2011 Background (Optimized)	(124 sec)	C (68%)	WB Left/Right	F (>200 sec)
2011 Opening Day	B (11 sec)	D (79%)	EB Left/Thru	E (57 sec)
2018 Background (Optimized)	(115 sec)	D (79%)	WB Left/Right	F (>200 sec)
2018 Full Build-Out	C (22 sec)	F (99%)	EB Left/Thru	D (55 sec)

5.14 Sterling Lyon Parkway Access Locations

Three access locations are proposed on Sterling Lyon Parkway to serve the multi-use development.

Sterling Lyon Parkway East Access

There is an existing unsignalized access into the north side development site located on Sterling Lyon Parkway west of Kenaston Boulevard. Following development of the proposed multi-use site, this access will shift slightly to the west and become a four-legged signalized intersection, with the access to the south side development forming the fourth leg of the intersection on the south side of Sterling Lyon Parkway. In the 2011 post development

scenarios, all four approaches consist of a left-turn lane, a through lane and a right-turn cut-off lane. In the 2018 post development scenarios, the westbound approach on Sterling Lyon Parkway will consist of two left-turn lanes, two through lanes and a shared through/right-turn cut-off lane, while the eastbound approach will consist of a left-turn lane, two through lanes and a right-turn cut-off lane. The southbound approach exiting the north side development will consist of two left-turn lanes, a through lane and a right-turn cut-off lane. No changes are proposed for the northbound approach exiting the south side development.

Table 5.14 summarizes the results of the post development intersection analysis for the Sterling Lyon Parkway east access location.

Table 5.14: Sterling Lyon East Access Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2011 Opening Day	C (25 sec)	D (79%)	EB Left	F (132 sec)
2018 Full Build-Out	D (36 sec)	D (78%)	EB Left	E (71 sec)
Saturday Peak Hour				
2011 Opening Day	D (40 sec)	E (84%)	NB Left	F (103 sec)
2018 Full Build-Out	D (44 sec)	E (88%)	EB Left	E (80 sec)

Sterling Lyon Parkway Right-In / Right-Out

Eastbound and westbound right-ins / right-outs are planned for the second access point on Sterling Lyon Parkway west of Kenaston Boulevard. In the post development scenarios, the eastbound and westbound approaches on Sterling Lyon Parkway will consist of two through lanes and a right-turn lane. The northbound and southbound approaches exiting the development will each consist of a single right-turn lane. This access will not be constructed by 2011, but will be implemented in the future as development of the site proceeds west.

Table 5.15 summarizes the results of the 2018 post development intersection analysis for the Sterling Lyon Parkway right-in/right-out access location.

Table 5.15: Sterling Lyon Right-In/Right-Out Intersection Analysis

Scenario	Delay	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday P.M. Peak Hour				
2018 Full Build-Out	1 sec	A (52%)	SB Right	B (11 sec)
Saturday Peak Hour				
2018 Full Build-Out	1 sec	A (45%)	SB Right	B (11 sec)

Sterling Lyon Parkway West Access

The third access to the development on Sterling Lyon Parkway is planned as an all-directional signalized access. This access will not be constructed by 2011, but will be implemented in the future as development of the site proceeds west. In the 2018 post development scenarios, the eastbound and westbound approaches on Sterling Lyon Parkway will consist of a left-turn lane, a through lane and a shared through/right-turn lane. The northbound and southbound approaches exiting the development will each consist of a shared left-turn/through lane and a right-turn lane.

Table 5.16 summarizes the results of the 2018 post development intersection analysis for the Sterling Lyon Parkway west access location.

Table 5.16: Sterling Lyon West Access Intersection Analysis

Scenario	LOS (Delay)	ICU LOS (Intersection Utilization)	Critical Movement	
			Movement	LOS (Delay)
Weekday PM Peak Hour				
2018 Full Build-Out	A (10 sec)	C (66%)	SB Left/Thru	C (21 sec)
Saturday Peak Hour				
2018 Full Build-Out	B (15 sec)	C (70%)	WB Left	E (71 sec)

6.0 TRANSPORTATION ISSUES

6.1 Truck Access

Delivery / truck access to the development is proposed via two dedicated delivery locations. A right-in only access off Kenaston Boulevard south of Lawson Crescent is proposed to service the south side development, while a right-in / right-out access off Sterling Lyon Parkway is proposed to service the north side development. The internal site layout has been configured to allow heavy vehicles to access the retail developments behind the buildings without mixing with the passenger vehicle traffic on site. However, all internal roadways have been designed to allow trucks to manoeuvre throughout the site.

6.2 Transit Service

Transit Route 78 (Crosstown West) currently travels down Kenaston Boulevard between Polo Park and the University of Manitoba during the weekday rush hour (approximately 6:30 – 9:30 a.m. and 3:30 – 7:30 p.m.) adjacent to the development site. Bus stops are located on Kenaston Boulevard at Sterling Lyon Parkway for both northbound and southbound transit service. Transit Route 86 travels down Sterling Lyon Parkway east of the development but does not actually reach Kenaston Boulevard. Winnipeg Transit was contacted regarding the proposed development and indicated that existing routes in the area may be altered to access the proposed development. They also noted that they would likely want to have stops within the development site. Provisions to allow transit buses within the site will be made and the final routing and stop locations as well as appropriate pedestrian connections will be confirmed with Winnipeg Transit at a later stage when the details of the site plan are finalized.

6.3 Pedestrian and Cyclist Facilities

There is an existing multi-use pathway located on the south side of Sterling Lyon Parkway adjacent to the proposed development site. The pathway crosses from the west side to the east side of Kenaston Boulevard at the intersection, and connects to existing pathways on the south side of Sterling Lyon Parkway and the east side of Kenaston Boulevard north of Sterling Lyon Parkway. As part of the proposed development, the multi-use pathway will be extended down the west side of Kenaston Boulevard from Sterling Lyon Parkway to the south limit of the development property. The multi-use pathways on Kenaston Boulevard and Sterling Lyon Parkway will connect to appropriate multi-use pathways within the development that will allow pedestrians and cyclists to safely connect from the street to the individual stores within the site.

The final layout of pedestrian and cyclist facilities within the development site will be confirmed at a later stage when the details of the site plan are finalized.

Winnipeg Zoning By-law 200/2006 identifies a requirement for one lockable bicycle space for every 10 required automobile spaces. Therefore, a total of 752 bicycle spaces are required for the proposed commercial development (based on the parking requirement identified in Section 3.2 – this may be subject to revision as changes to the proposed development mix occur). The developer has indicated that bicycle parking facilities will be provided on-site to accommodate cyclists. The final number and location of bicycle parking spaces within the development site will be confirmed at a later stage when the details of the site plan are finalized.

7.0 CONCLUSIONS

The following conclusions are made:

- ▶ A mixed-use development is proposed for approximately 195 acres of land in the northwest and southwest quadrants at the intersection of Kenaston Boulevard and Sterling Lyon Parkway in southwest Winnipeg. The development is planned to consist of a combination of retail, restaurant, gas bar, hotel, movie theatre, office park and multi-family residential development.
- ▶ The development is planned to be built out over several years beginning in 2011 with the opening of the first retail store and completed by 2018 with the construction of the multi-family residential units.
- ▶ Winnipeg Zoning By-law 200/2006 requires a total of 7,517 parking spaces for the proposed development. The site plan will provide parking in excess of the minimum by-law requirement. All parking spaces for the development will be provided through at-grade parking lots.
- ▶ Multiple vehicular access points are proposed for the mixed-use development. A major access to the development is proposed on Kenaston Boulevard opposite Lawson Crescent and there is an existing right-in to the site located on Kenaston Boulevard north of Sterling Lyon Parkway. Three additional access points (two all-directional signalized locations and one right-in/right-out location) are proposed along Sterling Lyon Parkway.
- ▶ Two dedicated truck / delivery access locations are also proposed for the development. A right-in only is proposed at the south end of the development off Kenaston Boulevard at an existing access location to serve the south side development, and a right-in/right-out is proposed on Sterling Lyon Parkway at the west end of the site to serve the north side development.
- ▶ Kenaston Boulevard and Sterling Lyon Parkway are both listed on Schedule “A” of the City of Winnipeg Private Access By-law 49/2008 and any private approach on either road will require approval by the City of Winnipeg Standing Policy Committee on Infrastructure Renewal and Public Works.

- ▶ The proposed mixed-use development is anticipated to generate a total of 2,950 new trips (1,365 entering and 1,585 exiting) plus an additional 620 drop-in trips (300 entering and 320 exiting) during the weekday p.m. peak hour at full build-out.
- ▶ The proposed mixed-use development is anticipated to generate a total of 4,330 new trips (2,280 entering and 2,050 exiting) plus an additional 860 drop-in trips (440 entering and 420 exiting) during the Saturday peak hour at full build-out.
- ▶ The proposed mixed-use development is anticipated to generate a total of 29,000 new trips (14,500 entering and 14,500 exiting) plus an additional 5,600 drop-in trips (2,800 entering and 2,800 exiting) on a typical weekday at full build-out.
- ▶ The proposed mixed-use development is anticipated to generate a total of 36,600 new trips (18,300 entering and 18,300 exiting) plus an additional 6,700 drop-in trips (3,350 entering and 3,350 exiting) on a typical Saturday at full build-out.

8.0 RECOMMENDATIONS

The following recommendations are made:

- ▶ **Kenaston Boulevard:** Kenaston Boulevard adjacent to the site (from Taylor Avenue to south of Lawson Crescent) should be widened to six lanes (three northbound and three southbound lanes) before opening of the first retail store.
- ▶ **Sterling Lyon Parkway:** Sterling Lyon Parkway between Kenaston Boulevard and the Sterling Lyon Parkway East Access should consist of three westbound lanes and three eastbound lanes before opening of the first retail store. This widening should include construction of the ultimate intersection configuration at Kenaston Boulevard and at the Sterling Lyon Parkway East Access (all intersection approaches).

Sterling Lyon Parkway from west of the Sterling Lyon Parkway East Access to the intersection with Shaftesbury Boulevard / McCreary Road should be widened to a four-lane divided roadway (two eastbound and two westbound lanes) in conjunction with the completion of the first phase of retail development (350,000 square foot home furnishing store plus 400,000 square feet of additional retail).

- ▶ **Kenaston Boulevard & Sterling Lyon Parkway Intersection:** Prior to the opening of the first retail store, the intersection of Kenaston Boulevard and Sterling Lyon Parkway should be modified to include three northbound left-turn lanes (120 metres storage length) and three eastbound left-turn lanes (90 metres storage length). To facilitate these intersection upgrades, the southbound right-turn cut-off lane and the westbound right-turn cut-off lane will need to be signalized to separate conflicting movements.

Following completion of the first phase of retail development (350,000 square foot home furnishing store plus 400,000 square feet of additional retail) and prior to full build-out, a second southbound right-turn cut-off lane, a second eastbound right-turn cut-off lane, and a second westbound right-turn cut-off lane should be added to the intersection. The eastbound right-turn cut-off lane will need to be signalized (the southbound and westbound right-turn movements will have been signalized as part of the initial intersection upgrades).

- ▶ **Kenaston Boulevard & Lawson Crescent Intersection:** Prior to the opening of the first retail store, the intersection of Kenaston Boulevard and Lawson Crescent should be

modified to become a four-legged signalized intersection, with the access to the home furnishing store forming the fourth leg of the intersection on the west side of Kenaston Boulevard. A northbound left-turn lane (50 metres storage length) and a southbound right-turn lane should be added on Kenaston Boulevard. The eastbound approach exiting the home furnishing store should include a left-turn lane, a shared left-turn/through lane and a right-turn lane.

- ▶ ***Sterling Lyon Parkway / Wilkes Avenue & Shaftesbury Boulevard / McCreary Road Intersection:*** Prior to the opening of the first retail store, the southbound approach at the intersection of Sterling Lyon Parkway / Wilkes Avenue and Shaftesbury Boulevard / McCreary Road should be modified to consist of a left-turn lane (150 metres) and a shared through/right-turn lane. This will involve re-designation of the two existing southbound lanes and modification of the intersection geometry to properly align the approaches north and south of Sterling Lyon Parkway / Wilkes Avenue.

Following completion of the first phase of retail development (350,000 square foot home furnishing store plus 400,000 square feet of additional retail) and prior to full build-out, a second southbound left-turn lane (100 metres) should be added to the intersection.

- ▶ ***Sterling Lyon East Access:*** Prior to the opening of the first retail store, the existing access on Sterling Lyon Parkway should be modified to become a four-legged signalized intersection, with the access to the south side development forming the fourth leg of the intersection on the south side of Sterling Lyon Parkway. It is recommended to construct the ultimate intersection configuration before opening of the first retail store.

The westbound approach on Sterling Lyon Parkway will consist of two left-turn lanes (40 metres storage length), two through lanes and a shared through/right-turn cut-off lane, while the eastbound approach will consist of a left-turn lane (100 metres storage length), two through lanes, and a right-turn cut-off lane (30 metres storage length). The northbound approach exiting the south side development will consist of a left-turn lane (40 metres storage length), a through lane and a right-turn cut-off lane (30 metres storage length), while the southbound approach exiting the north side development will consist of two left-turn lanes (130 metres storage length), a through lane and a right-turn cut-off lane (30 metres storage length).

- ▶ ***Sterling Lyon Right-In/Right-Out:*** Following completion of the first phase of retail development (350,000 square foot home furnishing store plus 400,000 square feet of additional retail) and prior to full build-out, a right-in/right-out access to both the north side and south side developments should be constructed approximately 290 metres west of the Sterling Lyon East Access. An eastbound right-turn lane (30 metres storage length) on Sterling Lyon Parkway should be constructed and the northbound and southbound approaches exiting the development should consist of a single right-turn lane. The westbound right-turn lane is a continuous through lane from the Sterling Lyon Parkway East Access that will be required to turn right at the Sterling Lyon Parkway Right-In/Right-Out.

- ▶ ***Sterling Lyon West Access:*** Following completion of the first phase of retail development (350,000 square foot home furnishing store plus 400,000 square feet of additional retail) and prior to full build-out, a four-legged signalized access should be constructed approximately 250 metres west of the Sterling Lyon Parkway Right-In/Right-Out. Eastbound and westbound left-turn lanes (60 metres storage length) on Sterling Lyon Parkway should be constructed and the northbound and southbound approaches exiting the development should consist of a shared left-turn/through lane and a right-turn lane (30 metres storage length).