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The Gateway Centre

TRAFFIC IMPACT STUDY

Charis Developments

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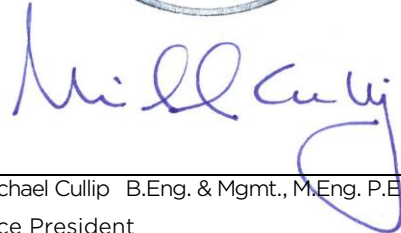
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Issue	Date	Description
1	April 1, 2022	Final Report
2	September 17, 2024	Revised Site Plan
3	June 30, 2025	Revised Site Plan
4	January 26, 2026	4 th Submission

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1 Introduction

Tatham Engineering Limited was retained by Charis Developments to prepare a Traffic Impact Study in support of a commercial development to be located on the northeast corner of the Poplar Sideroad/County Road 32 intersection with Hurontario Street/County Road 124 in the Town of Collingwood. The location of the development site is illustrated in Figure 1.

1.1 STUDY PURPOSE

The purpose of this study is to address the requirements of the Town of Collingwood and County of Simcoe with respect to the potential transportation impacts of the development on the local road network. In particular, the following will be discussed:

- the operations of the road system through the study area prior to the proposed development.
- the growth in the traffic volumes not otherwise attributed to the development (i.e. from overall growth in the area and/or other developments);
- the number of trips the proposed development is likely to generate;
- the operations of the study area road system upon completion of the development; and
- the resulting impacts and need for mitigating measures (if required) to ensure acceptable overall road operations.

1.2 REPORT HISTORY

The initial *The Gateway Centre Traffic Impact Study*¹ was completed in April 2022 and submitted to the Town as part of the development application. The second and third versions were issued in September 2024 and June 2025, respectively, reflective of Town comments regarding the preceding submission and modifications to the site plan.

This fourth version has addressed Town comments received regarding the third submission. To maintain consistency with the third version, the same existing and future horizon years have been considered (which remain valid in consideration of the anticipated project timelines).

¹ *The Gateway Centre Traffic Impact Study*. Tatham Engineering, April 1, 2022.



1.3 REPORT FORMAT

The Traffic Impact Study report is structured as follows:

- Chapter 1: introduction and study purpose;
- Chapter 2: existing conditions, detailing the road system, transit and active transportation networks, and corresponding traffic operations;
- Chapter 3: future conditions, prior to the completion of the proposed development (referred to as future background conditions), and the expected growth in traffic levels and the resulting operating conditions;
- Chapter 4: proposed development and associated details including land use, access, traffic volumes and parking;
- Chapter 5: future conditions, with completion of the proposed development (referred to as future total conditions);
- Chapter 6: considerations for transportation demand management (TDM) measures; and
- Chapter 7: summary of the report and key findings.



2 Existing Conditions

This chapter will describe the road, transit and active transportation networks, traffic volumes and traffic operations for the existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Poplar Sideroad/County Road 32, Hurontario Street/County Road 124 and their respective intersection.

2.1.1 Key Road Sections

Mapping and photographs of the road network are provided in Figure 2 and Figure 3, with further details provided below.

Poplar Sideroad/County Road 32

Key elements/characteristics of Poplar Sideroad/County Road 32 are as follows:

- under the jurisdiction of Simcoe County;
- designated a primary arterial within the *Simcoe County Official Plan*;
- oriented east-west through the study area;
- 1 travel lane per direction
- urban cross-section from Hurontario Street/County Road 124 to beyond High Street to the west;
- semi-urban cross-section from Hurontario Street/County Road 124 to Hughes Steet to the east (curb and gutter on the north side and open ditch on the south side) reverting to a rural cross-section beyond this;
- posted speed limit of 60 km/h through the study area (increases to 80 km/h east of Raglan Street); and
- relatively straight and flat alignment albeit there are some slight vertical curves.

County Road 124

County Road 124 is very similar to Poplar Sideroad/County Road 32, as follows:

- under the jurisdiction of Simcoe County (County Road 124 ends at Poplar Sideroad);
- designated a primary arterial within the *Simcoe County Official Plan*;



- oriented north-south through the study area;
- 1 travel lane per direction within a rural cross-section;
- posted speed limit of 70 km/h; and
- relatively straight and flat alignment.

Hurontario Street

Hurontario Street is the extension of County Road 124 into the Town of Collingwood, having the following characteristics:

- under the jurisdiction of the Town of Collingwood (Hurontario Street begins at Poplar Sideroad);
- designated an arterial within the *Town of Collingwood Official Plan*;
- oriented north-south through the study area;
- 1 travel lane per direction with a centre turn lane within a rural cross-section;
- posted speed limit of 50 km/h (speed changes just north of Poplar Sideroad); and
- relatively straight and flat alignment.

2.1.2 Key Intersection

Poplar Sideroad/County Road 32 & Hurontario Street/County Road 124

As illustrated in Figure 4, the intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 is a 4-leg intersection operating under signal control. The intersection configuration is as follows:

North Leg (southbound travel)	▪ left turn lane (centre turn lane) ▪ through-right lane
South Leg (northbound travel)	▪ left turn lane (60 m storage and parallel + 140 m taper) ▪ through lane ▪ right turn lane (60 m parallel + 80 m taper)
West Leg (eastbound travel)	▪ left turn lane (20 m storage + 40 m parallel + 115 m taper) ▪ through-right lane
East Leg (westbound travel)	▪ left turn lane (25 m storage + 40 m parallel + 115 m taper) ▪ through lane ▪ right turn lane (45 m parallel + 60 m taper)

The geometric design standards for turn lanes are provided in Table 1 for various design speeds (which are typically taken as 10 km/h over speed limits of 60 km/h and below, and 20 km/h over



speed limits in excess of 60 km/h). The turn lanes on Poplar Sideroad/County Road 32 comply with the requirements for a 70 km/h design speed (10 km/h over the speed limit), whereas those on County Road 124 vary between 80 and 100 km/h. While the latter are not 20 km/h in excess of the posted 70 km/h speed limit for each metric, they are considered appropriate in that they exceed the speed limit and further recognizing that the speed reduces to 50 km/h immediately to the north.

Table 1: Turn Lane Geometric Requirements

DESIGN SPEED	LEFT TURN LANE		RIGHT TURN LANE	
	Parallel	Taper	Parallel	Taper
60 km/h	30	100	30	50
70 km/h	40	115	45	60
80 km/h	50	130	60	70
90 km/h	60	145	70	75
100 km/h	70	160	85	80

Further to the separate left turn lanes on each approach, there are provisions for advance green phases in the westbound, northbound and eastbound directions (no southbound advance green).

2.2 TRANSIT NETWORK

There are several transit services/routes operating within the Town of Collingwood including several Town routes (West, East and Crosstown) and services linking Collingwood to Blue Mountain and Wasaga Beach. Notwithstanding, there are currently no transit routes operating on the frontage roads of the subject site or operating in the immediate area. The closest services are provided along Lockhart Road to the north (approximately 650 metres walking distance) and Raglan Street to the east (1,500 metres).

2.3 ACTIVE TRANSPORTATION NETWORK

A number of sidewalks and trails are provided in the immediate area as evident in the aerial photographs of Figure 2 and Figure 4. These include:

- the Hamilton Drain Trail (3.0 metre asphalt) which runs along the north limit of the development site;



- a multi-use trail (3.0 metre concrete) extending from Poplar Sideroad/County Road 32 north to the Hamilton Drain Trail, beyond which it continues as a standard sidewalk into the Town;
- a standard sidewalk on the north side of Poplar Sideroad/County Road 32 from Hurontario Street to the commercial access to the gas station/Tim Hortons on the northwest corner of the intersection; and
- sidewalk system throughout the adjacent residential subdivision to the east which includes several points of the connection to the Hamilton Drain Trail.

Immediately adjacent to the site, there is the following:

- a gravel shoulder along the east side of Hurontario Street;
- a 1.5 metre paved boulevard on the north side of Poplar Sideroad/County Road 32 (immediately behind the curb); and
- a 1.0 metre paved shoulder on the south side of Poplar Sideroad/County Road 32.

2.4 TRAFFIC VOLUMES

2.4.1 Traffic Counts

In support of the initial traffic impact study, turning movement counts were obtained for the intersection of Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 from July 2019 and October 2021. Recognizing that this data is dated (count data should be no older than 3 years old), new count data was obtained at the intersection from January 2023, June 2024, and August 2024, details of which are summarized in Table 2.

Table 2: Traffic Counts – Poplar Sideroad & Hurontario Street

COUNT DATE	COUNT PERIODS	WEEKDAY AM PEAK HOUR	WEEKDAY PEAK HOUR	SATURDAY PEAK HOUR
Wednesday Jan 18, 2023	7:00 – 10:00 15:00 – 18:00	8:30 – 9:30 1,551 vehicles	16:00 – 17:00 1,713 vehicles	-
Wednesday June 19, 2024	7:00 – 10:00 15:00 – 18:00	7:45 – 8:45 1,658	16:30 – 17:30 1,767	-
Saturday, June 22, 2024	12:00 – 14:00	-	-	12:45 – 13:45 1,537
Thursday Aug 1, 2024	6:00 – 9:00 15:00 – 18:00	8:00 – 9:00 1,399	15:45 – 16:45 1,753	-



2.4.2 Factors & Adjustments

Seasonal Peak

Within recreational areas such as Collingwood, summer traffic volumes are typically the greatest and thus counts completed outside of the summer period are often adjusted accordingly. To explore the need for such, seasonal traffic counts were obtained from Simcoe County for Poplar Sideroad/County Road 32 east of Hurontario Street and County Road 124 south of Hurontario Street (in the immediate vicinity of the development site). The corresponding volumes are provided in Table 3. As noted, the summer and fall volumes are typically comparable to each other ($\pm 5\%$) and are higher than spring volumes. As such, no seasonal adjustment is considered necessary given the periods in which the traffic counts were completed.

Table 3: Seasonal Traffic Volumes

ROAD SECTION	YEAR	SPRING	SUMMER	FALL
Poplar Sideroad/County Road 32 County Road 124 to Raglan Street	2018	9,687	10,342	10,441
	2021	8,835 ¹	10,070	10,329
	2024	11,366	11,791	n/a
County Road 124 Poplar Sideroad to 33/34 Sideroad	2018	9,186	8,841	8,929
	2021	7,851 ¹	8,597	8,879
	2024	7,862	7,813	n/a

¹ considered low due to COVID-19 implications

2.4.3 2024 Traffic Volumes

To ensure a conservative approach to the study, the greatest individual movement volumes from the 2023 and 2024 counts were employed.

The resulting traffic volumes employed to reflect 2024 peak hour conditions are provided in Figure 6.

2.5 TRAFFIC OPERATIONS

In considering traffic operations on the study area road network, consideration has been given to the following:

- intersection operations; and
- queue operations.



2.5.1 Intersection Operations

The assessment of existing conditions provides the baseline from which the future traffic volumes and operations (both with and without the subject development) can be assessed. The capacity, and hence operations, of a road system is effectively dictated by its intersections. As such, the analysis focused on the operations of the Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 intersection. The analysis is based on:

- the 2024 traffic volumes;
- the existing intersection configuration and control; and
- procedures outlined in the *2000 Highway Capacity Manual*² (using Synchro v.11 software).

For signalized intersections, the review considers the average delay (measured in seconds), level of service (LOS) and volume to capacity (v/c) for each lane movement and the overall intersection. For unsignalized intersections, the review considers the average delay (measured in seconds), level of service (LOS) and volume to capacity (v/c) for the critical lane movements, namely the stop movements on the minor approaches. With respect to the noted metrics:

- level of service A corresponds to the best operating condition with minimal delays whereas level of service F corresponds to poor operations resulting from high intersection delays (additional details regarding Level of Service definitions are provided in Appendix B); and
- a v/c ratio of less than 1.0 indicates the intersection movement/approach is operating at less than capacity while v/c of 1.0 indicates capacity has been reached.

A summary of the 2024 intersection analyses is provided in Table 4 considering advance green phases as currently provided and optimized signal timings; detailed operations worksheets for the existing traffic conditions are included in Appendix C.

Based on the existing volumes, configuration and control, the study area intersection provides good overall levels of service (LOS C), good individual movement levels of service (LOS A, B or C) and nominal delays for most movements during both peak hours. As such, no intersection improvements are required to support the existing conditions.

² *Highway Capacity Manual*. Transportation Research Board, Washington DC, 2000.



Table 4: Intersection Operations – 2024

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	14	B	0.20	15	B	0.11	15	B	0.09
	EB TR	signal	32	C	0.81	34	C	0.86	27	C	0.78
	WB L	signal	18	B	0.24	16	B	0.30	17	B	0.08
	WB T	signal	24	C	0.62	19	B	0.47	21	C	0.55
	WB R	signal	19	B	0.14	16	B	0.11	17	B	0.06
	NB L	signal	16	B	0.36	18	B	0.38	12	B	0.23
	NB T	signal	15	B	0.28	18	B	0.24	12	B	0.21
	NB R	signal	14	B	0.06	16	B	0.03	11	B	0.02
	SB L	signal	28	C	0.61	29	C	0.63	18	B	0.28
	SB TR	signal	23	C	0.33	28	C	0.60	19	B	0.39
overall		signal	23	C	0.65	25	C	0.69	19	B	0.54

L left lane T through lane R right lane LT left-through TR through-right LTR left-through-right

2.5.2 Queue Operations

Queue operations have also been considered on each leg of the intersection, considering their respective configurations and employing SimTraffic, the traffic microsimulation module which accompanies Synchro software. As there is a centre turn lane on Hurontario Street, the available storage for the southbound left turn lane exceeds 100 metres. The queueing assessment consists of the average results of 5 simulation runs per peak period, with each run consisting of a 15-minute seed time and 60-minute run time.

The results of the queue operations are summarized in Table 5 for the following queue lengths (measured in metres), with the corresponding queue worksheets provided in Appendix D:

- 50th percentile queue (average queue), which will be exceeded 50% of the time; and
- 95th percentile queue, which will be exceeded only 5% of the time.



Table 5: Queue Operations – 2024

INTERSECTION & MOVEMENT			WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR		SATURDAY PEAK HOUR	
			50 th	95 th	50 th	95 th	50 th	95 th
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	60 m	11 m	20 m	6 m	15 m	7 m	15 m
	EB TR	thru lane	46	76	66	116	46	74
	WB L	65 m	10	21	14	30	4	12
	WB T	thru lane	38	64	37	64	33	58
	WB R	50 m	15	26	14	31	10	18
	NB L	60 m	18	35	16	29	12	24
	NB T	thru lane	18	36	17	32	14	27
	NB R	60 m	7	15	5	12	3	9
	SB L	TWLTL	28	51	32	56	15	28
	SB TR	thru lane	19	40	36	61	27	46

TWLTL – two-way left turn lane (centre lane)

As noted, the anticipated 50th and 95th percentile queues can be readily accommodated within the existing lanes. As there is currently no southbound advance green, the southbound left turn queues are increased as compared to the westbound left turn queues (which have an advance green).

2.6 ROAD NETWORK IMPROVEMENTS

Based on the results of the existing intersection and queue operations, no improvements to the road network are considered necessary.



3 Future Background Conditions

This chapter will describe the road network and background traffic volumes expected for the following horizon years:

- 2030 to reflect full build-out of the proposed Gateway Centre;
- 2035 which corresponds to 5 years beyond build-out; and
- 2040 which corresponds to 10 years beyond build-out.

The latter horizons (+5 and +10 years) are required to address Simcoe County requirements.

3.1 ROAD NETWORK

No significant changes to the area road system are anticipated over the study horizon and thus the existing road system as described in Section 2.1 has been maintained.

3.2 TRANSIT NETWORK

The Town of Collingwood commissioned a transit service review study in 2021³, through which a number of service options were considered including:

- fixed routes that would be similar to the existing service but with modifications to the Town routes to better serve newer and future developments, including provision of services along Hurontario Street and Poplar Sideroad/County Road 32 that would serve the subject site;
- on-demand service that would cover the entire town and be responsive to user needs; and
- hybrid service that would include 2 fixed routes through the core of the Town (including along Hurontario Street and Poplar Sideroad/County Road 32) in addition to on-demand service within the west and east limits of the Town.

The recommended service strategy under the 5-year service plan was to implement the on-demand transit service option beginning in 2022. As of June 2023, on-demand service has been partially implemented, with such services provided along the existing fixed routes on weekends only.

3.3 ACTIVE TRANSPORTATION NETWORK

The *Town of Collingwood Active Transportation Framework 2017* and the *Collingwood Active Transportation Plan 2012-2017* identify Poplar Sideroad/County Road 32 as a possible future

³ *Collingwood Transit Service Review*. IBI Group, September 29, 2021.



corridor for a trail system to support both recreational and active transportation uses, albeit they provide no recommendations or directions with respect to facility type or timing.

3.4 TRAFFIC VOLUMES

Background traffic volumes expected for the future background horizon years have been determined based on the existing traffic volumes, historical and projected growth, and consideration for other development specific traffic volumes.

3.4.1 Background Growth

Population Growth

In considering historical and projected population levels for the Town of Collingwood, the following are noted:

- based on the Census data for the years 2006 and 2021, the population of the Town increased from 17,290 to 24,811 persons, which translates to an annual growth of 2.4%;
- as per the *2021 Community Profile*⁴, the Town's 2030 population is estimated at 29,866, which translates to 2.1% annual growth over the 9-year period 2021 to 2030;
- as per the County of Simcoe's *Growth Forecast and Land Needs Assessment*⁵, the Town has been allocated a population of 42,690 by 2051 which yields an annual growth of 1.8% when considering a 2021 population of 24,811.

The corresponding population figures are provided in Table 6.

Table 6: Town of Collingwood Population

	2001	2006	2011	2016	2021	2030	2051
Population	16,039	17,290	19,241	21,793	24,811	29,866	42,690
Annual Growth	2006 to 2021 – 2.4%				2021 to 2051 – 1.8%		

Traffic Growth

Historical traffic volumes on Poplar Sideroad/County Road 32 and County Road 124 were reviewed as provided by Simcoe County. The County typically undertakes counts during the spring, summer and fall periods for each road section on a 3-year cycle. In review of the noted counts, there is no discernable difference between the seasons (with the exception of the Spring 2021 volumes which were notably less, likely due to COVID-19 implications at the time), and thus

⁴ *2021 Community Profile*. Town of Collingwood, May 2021.

⁵ *Growth Forecast and Land Needs Assessment*. March 31, 2022, Hemson for the County of Simcoe.



average volumes have been considered (i.e. average of the spring, summer and fall counts) as summarized in Table 7.

Table 7: Historical Traffic Volumes

ROAD SECTION	AVERAGE ANNUAL DAILY TRAFFIC (AADT)				ANNUAL GROWTH (2015 TO 2024)
	2015	2018	2021	2024	
Poplar Sideroad/County Road 32 County Road 124 to Raglan Street	9,600	10,200	10,200 ¹	11,600 ²	2.1%
County Road 124 Poplar Sideroad to 33/34 Sideroad	8,000	9,000	8,700 ¹	7,800 ²	-0.2%

¹ does not include spring volumes as they were significant less due to COVID-19

² considers only spring and summer volumes

As noted, volumes on Poplar Sideroad/County Road 32 increased in the order of 2.1% per annum over the period 2015 to 2024, whereas those on County Road 124 decreased 0.2% per annum over the same period. In considering the more current period 2018 to 2014, growth rates of 2.5% and -2.3% have been realized.

Consideration of Other Studies

Background growth rates have been considered as employed in several other studies as follows:

- the 2017 *Eden Oak Homes – Proposed Residential Development Traffic Impact Study Update*⁶ (Eden Oak is the residential development just north and east of the subject site) employed a background growth rate of 1% per annum for both Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 in estimating future traffic volumes;
- the 2018 *Blackmoor Gates Traffic Impact Study*⁷ employed a 2% annual growth rate for background traffic;
- the 2019 *Collingwood Transportation Study Update*⁸ employed a 0.5% background growth rate, applied to all Town roads considered in the assessment;
- the 2021 *Indigo 2 Traffic Impact Study*⁹ (Indigo 2 is located at the south end of Peel Street) assumed an annual growth rate of 0.5% per annum to be consistent with the *Collingwood Transportation Study Update*, with consideration for a number of other area developments (many of which are common to this study);

⁶ *Eden Oak Homes – Proposed Residential Development Traffic Impact Study Update*. Cole Engineering, September 2017.

⁷ *Blackmoor Gates Traffic Impact Study*. WSP, May 2018.

⁸ *Collingwood Transportation Study Update*. RJ Burnside & Associates Limited, August 2019.

⁹ *Indigo 2 Traffic Impact Study*. C.F. Crozier & Associates Inc., December 2021.



- the 2022 *Pretty River Estates Transportation Impact Study*¹⁰ (Townhomes of Pretty River which are located on Poplar Sideroad to the east of the subject site) employed a 2% annual growth on County roads (Poplar Sideroad and Hurontario Street to the south) and 0.5% annual growth on Town roads, as provided by the County and Town respectively;
- the 50 *Saunders Street Traffic Impact Brief*¹¹ considered a 2% annual increase on Poplar Sideroad; and
- the 2024 *Summit View Phase 3 Traffic Impact Study*¹² assumed 2% annual growth on Poplar Sideroad (as per Town comments).

Overall Background Growth

To maintain consistency with the previously completed transportation studies, and ensure a conservative approach, a 2% annual growth rate has been assumed to represent background growth.

3.4.2 Development Growth

Further to the historical growth in traffic volumes and anticipated population growth in the area, consideration has been given to a number of area developments that are expected to increase traffic volumes through the study area, as illustrated in Figure 7 and listed below:

- 50 Saunders Street;
- Summit View Phase 1 & 2;
- Summit View Phase 3;
- Six 5 Five;
- Townhomes of Pretty River (Pretty River Estates Phase 2);
- Blackmoor Gate;
- Indigo 2; and
- DiPoce Lands.

Additional details pertaining to each development are provided below, as determined from respective traffic impact studies and/or information obtained through the Town of Collingwood Land Use Planning Services website and/or staff. The traffic volumes associated with each

¹⁰ *Pretty River Estates Transportation Impact Study*. Paradigm, May 2022.

¹¹ *50 Saunders Street Traffic Impact Brief*. Tatham Engineering Limited, February 9, 2024.

¹² *Summit View Phase 3 Traffic Impact Study*. Tatham Engineering Limited, August 2024.



background development that are expected to travel through the study area road network (assuming full build-out) are also provided in Appendix E.

Recognizing that nearly all of these developments are residential or industrial in nature, none of the associated studies, excluding the Dipoce Lands, assessed a weekend peak period. Given the need to assess the Saturday peak period in this study, the Saturday peak hour trip generation of each development was established as follows:

- Trip generation and travel patterns for the weekday PM peak period were compared to those for the Saturday peak period, as per relevant trip data from the ITE *Trip Generation Manual*¹³ (e.g. a detached house generates 0.85 times as many inbound trips during the Saturday peak than the weekday PM peak).
- Based on this comparison, the weekday PM peak hour trip assignment was adjusted to reflect Saturday peak conditions.

50 Saunders Street

50 Saunders Street is a residential subdivision proposed at the northwest corner of Poplar Sideroad and Saunders Street, consisting of 64 detached residential units with an assumed build-out horizon of 2030. Details with respect to the resulting traffic volumes and assignment of such through the study area road system were determined from the *50 Saunders Street Traffic Impact Brief*.

Summit View Phase 2

The Summit View subdivision is located at the northwest corner of Poplar Sideroad and High Street. Phase 1 is complete and occupied, with Phase 2, which consists of 151 single detached and 42 semi-detached residential units, under development. At present, approximately 75% of the development is completed and occupied; 50 units remain to be built and/or occupied. Full build-out is anticipated by 2025.

Details with respect to the resulting traffic volumes and assignment of such through the study area road system were determined from the *Summit View Phase 3 Traffic Impact Study* which considered the remaining of the Phase 2 lands. It is noted however that the referenced study was based on 107 remaining units (which was reflective of the time of the study traffic counts) within Phase 3. As such, the respective volumes have been reduced accordingly to reflect the current development levels (50 outstanding units vs 107).

¹³ *Trip Generation Manual, 11th Edition*. Institute of Transportation Engineers, September 2021.



Summit View Phase 3

Summit View Phase 3 is located at the northwest corner of Poplar Sideroad and High Street, immediately abutting the roundabout to the south and east, and the Summit View Phase 1 and 2 lands to the west and north. Phase 3 is to consist of 38 semi-detached units and 97 townhouse units (135 total units) with build-out anticipated by 2030. Details with respect to the associated traffic volumes and assignment of such to the local road system were determined from the *Summit View Phase 3 Traffic Impact Study*.

Six 5 Five

Six 5 Five, located at 655 Hurontario Street, consists of 50 residential apartment units, to be located on the northeast corner of Hurontario Street and Lockhart Road. Development details and traffic volumes were determined from the *655 Hurontario Street Traffic Impact Brief*¹⁴.

The Townhomes of Pretty River

The Townhomes of Pretty River (previously referenced as Pretty River Estates Phase 2) is the easterly extension of the Pretty River Estates residential development, located on the north side of Poplar Sideroad just east of the subject site. As per the *Pretty River Estates Transportation Impact Study*, the development is to consist of 90 townhouse units, to be built-out by 2024 (the units are currently under construction and thus build-out is expected within 1 to 2 years). The associated traffic volumes and assignment to the study area road network have been established from the noted study, and extended through the study area based on the overall trip distribution patterns.

Blackmoor Gate

As per the *Blackmoor Gates Traffic Impact Study*, this development is to consist of 34 residential units (30 single detached units and 4 semi-detached units) with access to Campbell Street. The associated traffic volumes to result from this development and the allocation of such to the area road system are based on the respective traffic study (with volumes extended through the study area intersections as appropriate).

Indigo 2

The Indigo 2 development is to consist of 21 single detached units and 107 townhouse units, as referenced in the *Indigo 2 Traffic Impact Study*. While a build-out of 2024 was assumed in the noted study, construction has yet to commence and thus a revised build-out of 2030 has been

¹⁴ 655 Hurontario Street Traffic Impact Brief. C.C. Tatham & Associates Ltd., March 19, 2019.



assumed. The association traffic volumes and assignment through the study area road network reflect the assumptions and methodology employed in the noted study.

DiPoce Lands

The DiPoce Lands consist of approximately 130 acres of undeveloped land located on the north side of Poplar Sideroad between Raglan Street and Sixth Line, with the lands including the Georgian College campus. It is understood that a significant development is proposed for this site, currently referred to as the Poplar Health and Wellness Village. As per available information on the development website¹⁵, this development will consist of an integrated medical, residential, and wellness campus. Current concepts envision the construction of approximately 2,200 residential units, over 90,000 m² of medical and wellness services, and over 50,000 m² of office and research spaces, though no formal concept plans are publicly available. Once concept plans are developed, given the scale of this development, it is likely that the completion of comprehensive master planning studies will be required to determine the impacts of the site on the surrounding transportation network, environment, municipal servicing, etc.

Through discussion with the Town, given the very limited information available and preliminary state of planning, it was agreed that consideration for much of this development was not necessary in this study. Notwithstanding, the Town requested that consideration be given to the new hospital planned for the site, for which planning is at a more advanced stage. Through correspondence with the transportation consultant working on the development, the hospital will contain 132 beds and is expected to generate approximately 235 trips during the weekday AM peak hour, 225 trips during the weekday PM peak hour, and 260 trips during the Saturday peak hour. The distribution of trips from the hospital was resolved with the consultant as follows:

- to/from the north via Hurontario Street 15%
- to/from the north via Raglan Street 10%
- to/from the south via Hurontario Street 5%
- to/from the east via Poplar Sideroad 40%
- to/from the west via Poplar Sideroad 30%

Based on information presented on the new hospital's website¹⁶, the construction is expected to begin in late 2028 with the hospital operational no sooner than 2033.

¹⁵ www.poplarhealthandwellnessvillage.com

¹⁶ www.yourfuturehospital.com



Phasing & Horizon Years

With respect to the background developments, assumptions as detailed in Table 8 have been employed relating to phasing and completion dates (as determined from existing conditions, development details in the respective traffic studies, and consideration for existing project status and approvals).

Table 8: Background Development Phasing & Completion

DEVELOPMENT	SIZE	PERCENT COMPLETE			
		2024	2030	2035	2040
50 Saunders	64 units	0%	100%	100%	100%
Summit View Phase 2	193 units	75%	100%	100%	100%
Summit View Phase 3	135 units	0%	100%	100%	100%
Six 5 Five	50 units	0%	100%	100%	100%
Townhomes of Pretty River	90 units	0%	50%	100%	100%
Blackmoor Gates	34 units	0%	100%	100%	100%
Indigo 2	128 units	0%	100%	100%	100%
Dipoce Lands – new hospital	132 beds	0%	0%	100%	100%

3.4.3 Background Traffic Volumes

Background traffic volumes (i.e. prior to consideration for the subject development) for the 2030, 2035 and 2040 horizon years have been determined based on the following:

- the 2024 volumes as per Figure 6;
- the noted annual background growth rate; and
- the additional traffic volumes associated with the background developments.

The resulting background traffic volumes are illustrated in Figure 8 through Figure 10.

3.5 TRAFFIC OPERATIONS

3.5.1 Intersection Operations

The intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 was again analyzed for each horizon year given the projected background volumes. The results



are summarized in Table 9 through Table 11 for the respective horizon years with detailed worksheets provided in Appendix F. In each case, the existing intersection configuration and control have been maintained, and signal cycle lengths and phasing plans have been optimized.

As indicated, acceptable overall intersection operations will be provided through the 2035 horizon during all peak periods (LOS C or D). However, at the 2040 horizon during both weekday peak periods, the eastbound through-right and southbound left movements will operate at/over capacity (i.e. $v/c \geq 1.00$) with increased delays (>80 seconds). This is largely a function of the increased background volumes through the intersection, and the provision of a shared through-right lane for the eastbound movements. Improvements are required to address these operational issues.

Table 9: Intersection Operations – 2030 Background Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	16	B	0.25	15	B	0.14	16	B	0.11
	EB TR	signal	44	D	0.92	45	D	0.93	34	C	0.86
	WB L	signal	19	B	0.37	21	C	0.46	17	B	0.15
	WB T	signal	25	C	0.66	22	C	0.54	21	C	0.57
	WB R	signal	19	B	0.16	17	B	0.13	17	B	0.07
	NB L	signal	19	B	0.49	24	C	0.55	15	B	0.32
	NB T	signal	18	B	0.34	21	C	0.29	15	B	0.26
	NB R	signal	16	B	0.07	19	B	0.04	14	B	0.03
	SB L	signal	39	D	0.76	45	D	0.79	23	C	0.37
	SB TR	signal	26	C	0.42	39	D	0.76	25	C	0.51
overall		signal	28	C	0.78	32	C	0.82	24	C	0.64
L left lane	T through lane	R right lane	LT left-through			TR through-right			LTR left-through-right		



Table 10: Intersection Operations – 2035 Background Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Huronario Street/ Cty Road 124	EB L	signal	17	B	0.29	15	B	0.17	15	B	0.13
	EB TR	signal	59	E	0.99	59	E	1.00	38	D	0.90
	WB L	signal	24	C	0.49	26	C	0.58	18	B	0.21
	WB T	signal	27	C	0.68	23	C	0.62	22	C	0.61
	WB R	signal	19	B	0.21	17	B	0.17	16	B	0.09
	NB L	signal	26	C	0.59	34	C	0.71	19	B	0.43
	NB T	signal	22	C	0.39	24	C	0.33	19	B	0.31
	NB R	signal	19	B	0.08	21	C	0.05	17	B	0.04
	SB L	signal	68	E	0.93	73	E	0.94	29	C	0.52
	SB TR	signal	30	C	0.45	46	D	0.83	30	C	0.61
overall		signal	37	D	0.90	41	D	0.93	27	C	0.71

Table 11: Intersection Operations – 2040 Background Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Huronario Street/ Cty Road 124	EB L	signal	19	B	0.39	17	B	0.20	15	B	0.13
	EB TR	signal	96	F	1.10	81	F	1.06	40	D	0.91
	WB L	signal	26	C	0.53	31	C	0.62	19	B	0.24
	WB T	signal	31	C	0.76	25	C	0.63	22	C	0.62
	WB R	signal	21	C	0.26	18	B	0.21	16	B	0.11
	NB L	signal	28	C	0.66	84	F	0.96	24	C	0.55
	NB T	signal	22	C	0.41	27	C	0.37	22	C	0.35
	NB R	signal	19	B	0.09	24	C	0.05	19	B	0.04
	SB L	signal	88	F	1.00	98	F	1.02	33	C	0.57
	SB TR	signal	30	C	0.47	58	E	0.89	36	D	0.69
overall		signal	50	D	0.99	55	E	1.02	30	C	0.77

L left lane T through lane R right lane LT left-through TR through-right LTR left-through-right



The intersection was reassessed at the 2040 horizon considering the following improvements:

- an advanced green signal phase for the southbound left turn; and
- an eastbound right turn lane, allowing for separation of the eastbound through and right turning movements.

It is noted that these improvements are consistent with those recommended in the *Summit View Phase 3 Traffic Impact Study*. Results of the reassessment are summarized in Table 12 with detailed operations worksheets provided in Appendix F. As indicated, the intersection will provide improved operations overall (LOS C) with most individual movements expected to operate at LOS B or C with average delays. All movements will operate with reserve capacity remaining during both weekday peak periods.

Table 12: Intersection Operations – 2040 Background + Improvements

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Huronario Street/ Cty Road 124	EB L	signal	19	B	0.41	18	B	0.25	17	B	0.17
	EB T	signal	40	D	0.89	43	D	0.91	34	C	0.85
	EB R	signal	19	B	0.16	19	B	0.21	19	B	0.14
	WB L	signal	20	B	0.46	27	C	0.62	18	B	0.19
	WB T	signal	32	C	0.81	30	C	0.76	28	C	0.75
	WB R	signal	19	B	0.27	19	B	0.23	18	B	0.12
	NB L	signal	27	C	0.64	32	C	0.70	19	B	0.44
	NB T	signal	34	C	0.67	31	C	0.50	26	C	0.49
	NB R	signal	26	C	0.09	27	C	0.05	23	C	0.04
	SB L	signal	39	D	0.84	28	C	0.71	18	B	0.37
	SB TR	signal	29	C	0.52	44	D	0.84	28	C	0.63
	overall	signal	31	C	0.86	33	C	0.86	27	C	0.68

3.5.2 Queue Operations

Queue operations were also repeated for the future background conditions, considering the improvements recommended to address poor intersection operations, with the results provided in Table 13 and Appendix G for the 2040 horizon (as this horizon serves the greatest volume, this queue assessment is the most critical). As noted, the average and 95th percentile queues can be accommodated within the existing left and right turn lanes, with exception of the eastbound and



westbound left turn lanes, whose 95th percentile queue may exceed the available storage during the weekday PM peak hour. It is noted that this is not due to excessive volume in the lane, but rather a side effect of queueing in the through lane which results in occasional blocking of access to the left turn lane.

Table 13: Queue Operations – 2040 Background Conditions + Improvements

INTERSECTION & MOVEMENT		LANE LENGTH	WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR		SATURDAY PEAK HOUR	
			50 th	95 th	50 th	95 th	50 th	95 th
Poplar Sideroad/ Cty Road 32 & Huronario Street/ Cty Road 124	EB L	60 m	14 m	38 m	12 m	48 m	8 m	19 m
	EB T	thru lane	64	104	101	178	66	109
	EB R	50 m	15	41	38	98	16	43
	WB L	65 m	16	32	18	31	8	16
	WB T	thru lane	59	94	63	97	53	83
	WB R	50 m	23	49	23	56	13	33
	NB L	60 m	32	55	31	56	24	42
	NB T	thru lane	36	60	37	68	30	53
	NB R	60 m	12	23	9	19	7	16
	SB L	TWLTL	48	76	61	86	26	50
	SB TR	thru lane	52	106	91	146	43	67

TWLTL – two-way left turn lane (centre lane)

3.6 ROAD NETWORK IMPROVEMENTS

3.6.1 Advance Green Phases

As previously noted, the analysis of the existing and future background conditions considers advance green phases for the northbound, eastbound and westbound left turn movements (as currently exist). As identified above, a southbound left turn advance green phase is also recommended to accommodate the projected 2040 background traffic volumes. As there are currently no provisions for a southbound advance green, such will have to be implemented (namely replacement of the southbound signal heads to facilitate the advance green arrow and modifications to the traffic signal timing plan). It is noted that given the existing southbound left turn movement (nearly 200 vehicles during the PM peak hour), the provision of a southbound advance green to serve existing conditions would be advantageous, as would implementation at an earlier horizon under background conditions.



3.6.2 EB Right Turn Lane

To improve the 2040 operating conditions (and primarily address the increased through volumes on Poplar Sideroad/County Road 32), the provision of an eastbound right turn lane is recommended by the 2040 horizon (during the PM peak hour, the through and right turn volumes will amount to 595 and 200 vehicles respectively).

3.6.3 Recommended Improvements

To ensure acceptable operations for background traffic through to the 2040 horizon year and beyond, the following road network improvements are recommended:

- provide a southbound advance green signal phase (would provide immediate benefit); and
- provide an eastbound right turn lane on Poplar Sideroad (for 2040).

While the first improvement is desired and will provide improved operations, the intersection will continue to operate acceptably should it not be constructed.

It is recognized that additional property will be required along the south side of Poplar Sideroad to accommodate the eastbound right turn lane, and that this property will not likely be obtained until the property on the southwest corner is developed. It is recommended that the County monitor the intersection operations to confirm the need for the turn lane, and seek to obtain the required property to facilitate its implementation.



4 Proposed Development

This chapter will provide additional details with respect to the proposed development, including its location, the projected site generated traffic volumes and the assignment of such to the adjacent road network.

4.1 LOCATION

As illustrated in Figure 1, the proposed development is to be located at the northeast corner of the Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 intersection in the Town of Collingwood.

4.2 LAND-USE

Details with respect to the proposed land uses, sizes and phases (2 phases are proposed) are provided in Table 14. The corresponding site plan is illustrated in Figure 11.

Table 14: Development Land Use & Size Details

BUILDING & LAND USE		PHASE	COMMERCIAL AREA		RESIDENTIAL
1	Starbucks + drive-thru	1	226 m ²	2,427 ft ²	-
2	Dollarama	1	929 m ²	10,000 ft ²	-
3	commercial/retail	2	655 m ²	7,045 ft ²	-
	residential	2	-	-	165 units
4	commercial/retail	2	600 m ²	6,456 ft ²	-
	office	2	1,200 m ²	12,912 ft ²	-
5	grocery store	1	2,880 m ²	31,000 ft ²	-
6	commercial/retail	1	272 m ²	2,928 ft ²	-
	Shoppers Drug Mart	1	1,579 m ²	17,000 ft ²	-
7	McDonalds + drive-thru	1	376 m ²	4,049 ft ²	-
8	commercial/retail	1	475 m ²	5,115 ft ²	-
	Pet Valu	1	372 m ²	4,000 ft ²	-
	restaurant	1	491 m ²	5,290 ft ²	-



4.3 PHASING

With respect to completion and build-out, Phase 1 construction (all but Buildings 3 and 4) will begin promptly upon approval with completion by 2028. Phase 2 (Buildings 3 and 4) will be built out by 2030.

4.4 ACCESS

4.4.1 Configuration & Location

As per the site plan and further illustrated in Figure 12, the development will be served by 2 access points as referenced below (both of which are to be constructed as part of Phase 1):

- Access 1: full moves access approximately 190 metres north of Poplar Sideroad/County Road 32 (measured centre to centre) with a width of 9.0 metres; and
- Access 2: full moves access approximately 150 metres east of Hurontario Street/County Road 124 and 120 metres west of Hughes Street (measured centre to centre) with a width of 9.0 metres.

4.4.2 Spacing

TAC Guidelines

The Transportation Association of Canada (TAC) has established guidelines with respect to access spacing/corner clearances in relation to signalized intersections recognizing the implications that each can have on the other (e.g. queued vehicles at the signalized intersection can block the access thus interfering with inbound and outbound movements). For operating speeds of 50 km/h, the TAC guidelines recommend a minimum spacing (i.e. corner clearance) of 70 metres, measured from the edge of the access to the edge of the road.

As noted, Access 1 is 190 metres north of Poplar Sideroad (centre to centre) and thus satisfies this requirement.

Access 2 is located 150 metres east of Hurontario Street (centre to centre) and therefore also satisfies the 70 metre requirement. It is noted however, that the speed limit on Poplar Sideroad is 60 km/h through the study area whereas the TAC guideline is based on an operating speed of 50 km/h). As the corner clearances are based on stopping sight distances on the departure leg between the signalized intersection and the access, the stopping sight distance requirement for 60 km/h was reviewed. As per TAC standards, the requirement is 85 metres, which can also be achieved with Access 2. Notwithstanding, additional analyses will be undertaken with respect to intersection operations and potential for queue spillback.



Town of Collingwood Standards

As per the *Collingwood Zoning By-Law*¹⁷ and in consideration of the proposed land uses, the required site access width is 7.5 to 15.0 metres. As such, the access widths as proposed (9.0 metres) are considered appropriate.

4.4.3 Sight Line Analysis

The sight line analysis completed at the proposed site access points has considered both minimum stopping sight distance and intersection sight distance as per Transportation Association of Canada (TAC) guidelines and defined below.

- Minimum stopping sight distance provides sufficient distance for an approaching motorist to observe a hazard in the road and bring their vehicle to a complete stop prior to the hazard.
- Intersection sight distance allows a vehicle to enter a main road from a side street (or site access) and attain the appropriate operating speed without significantly impacting the operating speed of an approaching vehicle.

In addition, given that Poplar Sideroad/County Road 32 is under the jurisdiction of Simcoe County, the County's sight distance requirements have also been considered, as per their entrance by-law.

The corresponding sight distance requirements are provided in Table 15, as are the available sight distances as determined through site investigations (and further evident in Figure 13). In all cases, the available sight distances exceed the minimum stopping sight distance, the intersection sight distance and the County of Simcoe sight distance requirements and thus the access locations are considered appropriate without the need for sight line improvements.

Table 15: Sight Line Assessment

ACCESS	DESIGN SPEED	TAC SIGHT DISTANCE			COUNTY SIGHT DISTANCE	AVAILABLE SIGHT DISTANCE TO/FROM	
		Stopping	Left Turn	Right Turn		West/North	East/South
Access 1	60 km/h	85 m	130 m	110 m	135 m	>200 m	>200 m
Access 2	70 km/h	105 m	150 m	130 m	170 m	>200 m	>200 m

4.5 DAYLIGHT TRIANGLES

The provision of daylight triangles at the site access intersections and also at the intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 will be resolved with

¹⁷ *Collingwood Zoning By-law 2010-040*. Town of Collingwood, consolidated to November 2025.



Simcoe County through the site plan approval process. The provision of such has no bearing on the transportation operations or traffic impacts and thus need not be resolved in support of this study.

4.6 VEHICLE CIRCULATION

As per the site plan, the parking aisles are a minimum width of 6.0 metres, thus complying with the *Collingwood Zoning By-Law* (for parking spaces at 70° or more, the aisle is to be 6.0 metres). Notwithstanding, a vehicle turning assessment was completed throughout the site for a delivery truck and a fire truck to ensure that sufficient manoeuvring space is provided for each. Completed vehicle turning drawings are provided in Appendix H.

4.7 TRANSIT NETWORK

As per pre-consultation comments from Colltrans, the proposed development is expected to serve as a transit hub/stop in the future. As such, space for a transit shelter is provided in front of the grocery store to accommodate this future service.

4.8 ACTIVE TRANSPORTATION

As illustrated in the site plan of Figure 11, the following pedestrian and cyclist measures will be provided:

- sidewalks to be constructed across the site frontage along both Hurontario Street and Poplar Sideroad/County Road 32, including connectivity to their respective intersection to facilitate crossings (this also assists the Town's stated goal of providing an active transportation corridor along Poplar Sideroad, as detailed in Section 3.3);
- 2 sidewalk connections between the site and the sidewalk along Hurontario Street which will provide access to/from the Dollarama, Starbucks and McDonalds, and access to the remaining development via the internal pedestrian system;
- sidewalk to be constructed north-south through the site, connecting to Poplar Sideroad/County Road 32 to the south and the Hamilton Drain Trail to the north; and
- bicycle racks to be provided adjacent to all buildings to facilitate bicycle travel and parking.

All sidewalk crossings of the internal road system will be continuous, thus improving visibility and prominence of the crossing, and hence enhancing safety of the pedestrians.



4.9 PARKING

4.9.1 Parking Requirements

Parking requirements are dictated in the *Collingwood Zoning By-Law* for specific land uses. Those considered for this assessment are as follows:

- dwelling, apartment 0.5 resident spaces + 0.25 visitor spaces per unit;
- restaurant 8 spaces per 100 m² gross floor area; and
- all other non-residential uses 3 spaces per 100 m² gross floor area.

As defined by the Town's *Zoning By-law*, the gross floor area (GFA) of non-residential uses excludes "any space used for storage, mechanical rooms, common halls, stairwells, private kitchens, washrooms and garages" from the gross area of the building. As such, the GFA identified for each building is reflective of the following reductions (as established by the site developer):

- for general commercial uses, the GFA is 10% less than the gross area; and
- for grocery store and restaurant uses, the GFA is 30% less than the gross area.

These generalized reductions have been employed as detailed floor plans for each use are not yet final. These reductions are, however, based on the experience of the developer of this site and are considered conservative; for other developments in the area, commercial GFA reductions in excess of 20% and restaurant GFA reductions in excess of 30% have been realized and approved by the Town.

The resulting parking requirements are detailed in Table 16. As there are no parking rates specific to general commercial, supermarket or office space, the parking requirement for the "all other non-residential uses" classification has been applied. The calculations include reductions to gross floor area (i.e. discounting of space used for mechanical rooms, storage, etc.) as defined above. As indicated:

- 285 parking spaces are required for the commercial, retail and office uses;
- 125 parking spaces are required for the residential uses; and
- 410 total parking spaces are required.

It is noted that this parking requirement is the cumulative requirement considering each independent land use and does not consider any on-site synergies (i.e. shared parking or internal trips) that may result between 2 or more land uses (e.g. a patron going to both the grocery store and Shoppers Drug Mart, or a resident walking to the grocery store). It is acknowledged that the



parking requirements for this development will be further reviewed for compliance with the Town's Zoning By-law at the Site Plan and Building Permit stages.

Table 16: Development Parking Requirements

BUILDING & LAND USE		PARKING RATE		GFA	COMMERCIAL PARKING	RESIDENTIAL PARKING
1	Starbucks + drive-thru	8	per 100 m ²	158 m ²	12.6 spaces	-
2	Dollarama	3	per 100 m ²	836 m ²	25.1	-
3	commercial/retail	3	per 100 m ²	589 m ²	17.7	-
	residential	0.50 0.25	per unit (res) per unit (vis)	165 units	-	83 42
4	commercial/retail	3	per 100 m ²	540 m ²	16.2	-
	office			1,080 m ²	32.4	
5	grocery store	3	per 100 m ²	2,016 m ²	60.5	-
6	commercial/retail	3	per 100 m ²	245 m ²	7.4	-
	Shoppers Drug Mart			1,421 m ²	42.6	
7	McDonalds + drive-thru	8	per 100 m ²	263 m ²	21.0	-
8	commercial/retail	3	per 100 m ²	428 m ²	12.8	-
	Pet Value			334 m ²	10.0	
	restaurant	8	per 100 m ²	344 m ²	27.5	-
Total					285	125

For a parking requirement in excess of 100 spaces, the Town requires that 2% of the total requirement be configured as accessible parking. Based on the need for 410 spaces, the accessible requirement amounts to 9 spaces (6 spaces for commercial and 3 for residential).

4.9.2 Parking Supply

The site plan currently provides 294 surface parking spaces, including 14 accessible spaces, which provides sufficient supply for the non-residential uses per Town requirements.



With respect to the residential parking, 213 parking spaces, including a minimum of 6 barrier-free spaces, will be provided in an underground parking lot constructed as part of Phase 2 development. This parking supply allows for 1 space per unit in addition to the 0.25 spaces per unit for visitor parking.

4.9.3 Parking Stall Configuration

Standard parking stalls are 2.8 x 6.0 metres in accordance with the *Collingwood Zoning By-Law*. The accessible stall dimensions will reflect AODA requirements for Type A (3.4 x 6.0 metres with 1.5 metre shared aisle) and Type B (2.4 x 6.0 metres with 1.5 metre shared aisle) spaces.

4.10 DELIVERY & LOADING SPACES

The Town's delivery and loading space regulations, as per the *Collingwood Zoning By-Law*, are:

- no requirements for a development of less than 460 m² GFA;
- 1 delivery space for a development of 460 m² to 2,500 m² GFA;
- 1 loading space for a development of 2,501 to 7,000 m² gross floor area;
- 2 loading spaces for a development of 7,001 to 10,000 m² gross floor area; and
- 1 additional loading space for every additional 2,500 m² gross floor area.

Considering the needs of each building separately, all buildings excluding Buildings 1 and 7 require 1 delivery space, as each has a GFA between 460 m² and 2,500 m².

As per the site plan, one delivery space will be provided at each building with exception of Buildings 2 and 5. Buildings 2 and 5 will be provided with one and two loading spaces, respectively. Building 6 will be provided with one loading space in addition to its delivery space. Considering the proposed supply of delivery and loading spaces, the Town requirements are surpassed.

4.11 DRIVE-THRUS

For restaurant uses, the *Collingwood Zoning By-Law* requires 10 queueing spaces within a drive-thru.

Measured from the pick-up window, the drive-thru at the Starbucks will provide space for 12 queued vehicles, whereas that at the McDonalds will accommodate 14 vehicles. A further 2 queueing spaces are provided in each drive-thru beyond the pick-up window.



4.12 SITE TRAFFIC

4.12.1 Trip Generation

Gross Trips

The number of vehicle trips to be generated by the proposed development for the weekday AM, weekday PM, and Saturday peak hours has been determined based on type of use, development size and trip generation rates as per the *ITE Trip Generation Manual, 11th Edition* noted in Table 17. Trip rates specific to McDonalds and Starbucks were also identified from other development specific traffic studies and are included in Table 17 for comparative purposes. The McDonalds rates are based on surveys of such restaurants with drive-thrus in the City of Ottawa¹⁸ whereas the Starbucks rates are based on 4 separate surveys of a site in New Jersey¹⁹.

Table 17: Trip Rates

LAND-USE & ITE CODE	VARIABLE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
multifamily housing (high-rise)	222 dwelling units	0.09	0.18	0.27	0.18	0.14	0.32	0.21	0.15	0.36
small office building	712 1,000 ft ² GFA	1.59	0.33	1.92	0.78	1.67	2.45	-	-	-
variety store (dollar store)	814 1,000 ft ² GLA	1.67	1.37	3.04	3.42	3.28	6.70	4.10	3.94	8.04
shopping plaza, w/o supermarket	821 1,000 ft ² GLA	0.58	0.36	0.94	1.83	1.98	3.81	3.23	2.99	6.22
supermarket	850 1,000 ft ² GLA	1.69	1.17	2.86	4.48	4.48	8.95	5.05	5.05	10.10
pet supply superstore	866 1,000 ft ² GLA	-	-	-	1.78	1.78	3.55	3.46	3.60	7.06
drug store w/o drive-thru	880 1,000 ft ² GLA	1.91	1.03	2.94	4.17	4.34	8.51	5.23	5.45	10.68
high-turnover restaurant	932 1,000 ft ² GFA	5.26	4.31	9.57	5.52	3.53	9.05	5.71	5.48	11.19
fast food + drive-thru	934 1,000 ft ² GFA	22.75	21.86	44.61	17.18	15.85	33.03	28.18	27.07	55.25
coffee/donut shop + drive-thru	937 1,000 ft ² GFA	43.80	42.08	85.88	19.50	19.50	38.99	43.96	43.96	87.91
McDonalds	- 1000 ft ² GFA	12.12	11.18	23.30	10.02	8.88	18.90	30.17	27.84	58.01
Starbucks	- total trips	93	93	186	46	46	92	-	-	-

¹⁸ 886 March Road McDonalds Transportation Study. HDR Corporation, March 2013.

¹⁹ Traffic Impact Study Proposed Starbucks Drive-Thru Only Facility. Stonefield Engineering & Design, LLC, February 24, 2021.



The resulting trip estimates are provided in Table 18.

Table 18: Trip Estimates – Gross Trips

BUILDING & LAND USE	SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
1 Starbucks	2.4 1000 ft ²	106	102	208	47	47	95	107	107	213
2 Dollarama	10.0 1000 ft ²	17	14	30	34	33	67	41	39	80
3 commercial/ retail	7.0 1000 ft ²	8	5	12	18	19	37	23	21	44
residential	165 units	15	29	45	30	23	53	34	26	59
4 commercial/ retail	6.5 1000 ft ²	7	4	11	16	17	34	21	19	40
office	12.9 1000 ft ²	18	4	22	9	18	28	-	-	-
5 grocery store	31.0 1000 ft ²	52	36	89	139	139	277	157	157	313
6 commercial/ retail	2.9 1000 ft ²	3	2	5	7	8	15	9	9	18
Shoppers Drug Mart	17.0 1000 ft ²	32	17	50	71	74	145	89	93	182
7 McDonalds	4.0 1000 ft ²	92	89	181	70	64	134	114	110	224
8 commercial/ retail	5.1 1000 ft ²	5	3	9	13	14	27	17	15	32
Pet Valu	4.0 1000 ft ²	-	-	-	7	7	14	14	14	28
restaurant	5.3 1000 ft ²	28	23	51	29	19	48	30	29	59
Total Gross Trips		384	328	712	491	481	972	655	638	1,293

In determining the above noted trip estimates, the following were considered and/or assumed:

- the commercial areas for each building/use noted in Table 14 have been employed (the reduced floor areas were only used for parking calculations);
- any commercial uses with a specific tenant identified on the site plan (i.e. Dollarama, Pet Valu, etc.) have used rates representative of that use;
- the *shopping plaza without supermarket* trip rates have been applied to the general commercial/retail uses (i.e. without a specific tenant identified) and while the rates are based on gross leasable area (GLA), it is assumed to equal the gross floor area (GFA) in that no “internal corridors” as would occur in a shopping mall are expected. Furthermore, while



ITE rates are available for a *shopping plaza with supermarket*, consideration of the supermarket as a separate independent building and use results in higher, thus more conservative, trip estimates;

- the fast food + drive-thru trip rates have been applied to the McDonalds as opposed to the specific “McDonalds” rates as the former were significantly higher than the latter (thus ensuring a conservative approach);
- the coffee/donut shop + drive-thru trip rates yields comparable trip estimates to the “Starbucks” rates (the ITE rates have been employed as they reflect industry standards, result in slight greater volumes and include trip data for a Saturday).

Trip Adjustments

With commercially-oriented development, not all trips generated will be new trips. Rather, a portion of the trips generated are expected to be already on the adjacent road network for other purposes but will visit the site as they are driving past (e.g. on the way to work, on the way home, etc.). These are referred to as pass-by trips. In terms of the study area road network, pass-by trips will occur as existing traffic travelling along Poplar Sideroad/County Road 32 and/or Hurontario Street/County Road 124 access the site prior to continuing along their normal route.

As per the *ITE Trip Generation Handbook, 3rd Edition*, the following uses are expected to generate significant pass-by traffic:

- | | |
|---------------------------------|--|
| ▪ supermarket | 0% AM (not typically open) and 51% PM; |
| ▪ drug store without drive-thru | 0% AM (not typically open) and 53% PM; |
| ▪ fast food with drive-thru | 49% AM and 50% PM; and |
| ▪ shopping plaza | 0% AM (not typically open) and 34% PM. |

In addition, given the range of uses within the site, some degree of shared/internal trips is expected. A shared/internal trip occurs when there is interaction between the uses on a single site (e.g. patrons of the restaurants may also visit the retail shops, residents of the site may work in one of the offices). For shared/internal trips, it is common practice to apply a reduction to the trip estimates in order to avoid double counting. To account for this, ITE recommends using the methodologies outlined in the National Cooperative Highway Research Program’s *Report 684*²⁰, which considers factors such as the trips to be generated by each use in a mixed-use development (residential, retail, office, etc.) and their proximity to each other. The corresponding NCHRP worksheet, which calculates the estimated internal trip capture, is provided in Appendix

²⁰ *Report 684 – Enhancing Internal Trip Capture Estimation for Mixed-Use Developments*. Transportation Research Bureau, Washington D.C., 2011.



I. For the proposed development, an internal trip capture of 10% is estimated for the weekday AM peak period and 30% for the PM peak period. The internal capture data for a Saturday peak is not provided, thus an internal capture proportion is not calculated for this period.

The assumed pass-by and internal/shared trips are summarized in Table 19 and Table 20, based on the following:

- for pass-by trips, a 30% reduction was applied to most commercial uses, whereas 50% was applied to the restaurant uses;
- a 10% reduction for internal trips was applied to all uses during the AM peak period, whereas a 20% reduction was applied to the PM and Saturday peak period – in line with the estimated AM peak capture and lower than the estimated PM peak capture.

Table 19: Trip Estimates – Pass-By Trips

BUILDING & LAND USE	TRIPS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
1 Starbucks	50% pass-by	53	53	106	24	24	48	53	53	106
2 Dollarama	30% pass-by	5	5	10	10	10	20	12	12	24
3 comm/retail	30% pass-by	2	2	4	5	5	10	7	7	14
residential	n/a	-	-	-	-	-	-	-	-	-
4 comm/retail	30% pass-by	2	2	4	5	5	10	6	6	12
office	n/a	-	-	-	-	-	-	-	-	-
5 grocery store	30% pass-by	16	16	32	42	42	84	47	47	94
6 comm/retail	30% pass-by	1	1	2	2	2	4	3	3	6
Shoppers Drug Mart	30% pass-by	10	10	20	21	21	42	27	27	54
7 McDonalds	50% pass-by	46	46	92	35	35	70	57	57	114
8 comm/retail	30% pass-by	2	2	4	4	4	8	5	5	10
Pet Valu	30% pass-by	-	-	-	2	2	4	4	4	8
restaurant	50% pass-by	14	14	28	15	15	30	15	15	30
Total Pass-by		151	151	302	165	165	330	237	237	474



Table 20: Trip Estimates – Internal/Shared Trips

BUILDING & LAND USE	TRIPS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
All uses	10- internal/ 20% shared	38	33	71	98	96	194	132	127	259
Total Internal/Shared		38	33	71	98	96	194	132	127	259

The resulting new trips to be generated by the development (i.e. gross trips minus pass-by and internal/shared trips) are summarized in Table 21. These represent the new trips to the road system that are expected.

Table 21: Trip Estimates – New Trips

BUILDING & LAND USE	TRIPS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
1 Starbucks	new trips	42	39	81	13	14	27	32	32	64
2 Dollarama	new trips	10	7	17	17	16	33	21	19	40
3 commercial/retail	new trips	5	2	7	10	9	19	11	10	21
residential	new trips	13	27	40	23	19	42	27	20	47
4 commercial/retail	new trips	4	2	6	9	8	17	10	9	20
office	new trips	16	3	19	7	15	22			
5 grocery store	new trips	31	16	47	69	70	139	79	78	156
6 commercial/retail	new trips	2	1	3	4	4	8	5	4	8
Shoppers Drug Mart	new trips	19	6	25	35	38	73	44	48	92
7 McDonalds	new trips	37	34	71	21	16	37	34	31	65
8 commercial/retail	new trips	3	1	4	6	7	13	8	7	15
Pet Valu	new trips	-	-	-	3	4	7	7	7	14
restaurant	new trips	11	6	17	9	0	9	9	8	17
Total New Trips		194	144	338	226	221	447	287	274	561



4.12.2 Trip Distribution

New Trips

The distribution of the new trips generated by the site has been established based on the existing travel patterns observed at the study area intersection and consideration for development within the immediate areas (recognizing that a significant amount of site patrons are likely to come from the residential developments in the immediate area). While there may be subtle differences in the AM and PM peak hours, a common distribution has been assumed for both.

The overall distribution of traffic was applied as follows:

- to/from the north via Hurontario Street 40%;
- to/from the south via County Road 124 10%;
- to/from the west via Poplar Sideroad 25%; and
- to/from the east via Poplar Sideroad 25%.

Pass-By Trips

As previously noted, pass-by trips are those trips already on the road system that are expected to stop at the site as they travel past. As such, the distribution of the pass-by trips was based on the directional volumes on Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 as observed at their respective intersection. The greatest approach volumes past the site will contribute the greatest number of pass-by trips. While the northbound to westbound and eastbound to southbound movements will not travel past the site per se, such have been considered as a source of pass-by traffic given their proximity to the site and ease of access (i.e. people will deviate from their initial path to accommodate a visit to the site).

4.12.3 Trip Assignment

The assignment of the trips generated by the development to the area road network and site access points is based on the trip distribution noted above with consideration given to the expected travel routes. In terms of access assignment, site trips have been assigned to the 2 access points based on the site layout and the location of each access in relation to the proposed building that is generating the trips.

The resulting site generated traffic volumes are illustrated in Figure 14, Figure 15 and Figure 16 for the new trips, pass-by trips and total trips. Additional details specific to the new trips and pass-by trips generated by each specific building and land use are provided in Appendix J.



5 Future Total Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road system with a focus on the following:

- operations of the study area road network, including the site access points;
- available sight lines at the proposed access points; and
- potential improvements to the study area road network, if necessary.

5.1 TRAFFIC VOLUMES

To assess the impacts of the increased traffic volumes resulting from the proposed development, the site generated traffic was combined with the 2030, 2035 and 2040 background traffic volumes. In addition, an interim horizon year of 2028 was also considered (corresponding to build out of Phase 1). The resulting total traffic volumes are presented in Figure 17 through Figure 20 for the respective horizons.

5.2 TURN LANE REQUIREMENTS

Prior to assessing the operations of the study area intersections under the future total conditions (i.e. with the development traffic), the need for additional turn lanes to serve the site access points has been reviewed based on the following:

- MTO warrants/guidelines for auxiliary turn lanes at unsignalized intersections;
- a design speed of 60 km/h on Hurontario Street (posted speed of 50 km/h + 10 km/h);
- a design speed of 70 km/h on Poplar Sideroad/County Road 32 (posted speed of 60 km/h + 10 km/h); and
- the future total traffic volumes.

5.2.1 Right Turn Lanes

MTO guidelines suggest that an exclusive right turn lane be considered where right turn volumes exceed 60 vehicles per hour and impede the operations of through traffic. The projected right turn volumes are illustrated in Figure 17 through Figure 20 and summarized in Table 22 (the maximum of the peak hour volumes under each horizon year are noted). Similarly, the results of the warrant analysis are also noted, with indication of time of need should a right turn lane be warranted.



Table 22: Site Access Right Turn Volumes & Warrants

ACCESS & MOVEMENT		2028 PH 1	2030 BUILD-OUT	2035	2040	WARRANTED
Access 1	NB right	65 turns	80	80	80	Warranted SAT only
Access 2	WB right	85	95	95	95	Warranted All peak periods

The right turn volumes at Access 1 meet the noted threshold for the 2028 horizon and beyond, however, only during the Saturday peak hour. Given that the turning volumes only meet the threshold for a limited period on a weekend, a right turn lane is not considered necessary.

The volume threshold is exceeded at Access 2 by the 2028 horizon during all peak periods, thus a westbound right turn lane is required by the 2028 horizon, to be implemented in conjunction with build-out of Phase 1. Given the limited volumes, a 60 metre taper is recommended to facilitate the right turns (which is consistent with the right turn taper provided at Hughes Street immediately to the east).

5.2.2 Left Turn Lanes

For left turns, the warrant analysis considers the following:

- volume of left turning traffic;
- volume of advancing and opposing traffic (i.e. volumes in both directions on the through road); and
- design speed of the through road.

There is currently a centre turn lane on Hurontario Street that will serve Access 1. In this regard, the need for a left turn lane was considered only at Access 2. The corresponding turn volumes and associated warrant analyses are summarized in Table 23 for each horizon. If warranted, the storage requirement of the left turn lane, which is also dependent on the noted factors, is reported considering the most critical peak hour requirements. Completed MTO warrant nomographs are provided in Appendix K.

Table 23: Site Access Left Turn Lane Warrants

ACCESS & MOVEMENT		2028 PHASE 1	2030 BUILD-OUT	2035	2040
Access 2	EB left	145 turns Warranted 55 m storage	150 Warranted 65 m storage	150 Warranted 65 m storage	150 Warranted 65 m storage



As noted, a left turn lane is warranted at Access 2, to be implemented in conjunction with Phase 1. The ultimate storage requirement of 65 metres should be constructed at the onset.

In considering design standards for a 70 km/h design speed, the turn lane should also include a 115 metre taper and a 40 metre parallel lane. However, as Access 2 is only 150 metres from Hurontario Street, the effective separation distance is limited to 130 metres. In conjunction with this, a runout lane is required to transition back to the 2 lane configuration on Poplar Sideroad to the east of Access 2 (to include a 30 metre parallel lane as measured from the centre of Access 2 and a 115 metre taper). The separation between Access 2 and Hughes Street to the east is approximately 120 metres (measured centre to centre), which is insufficient to accommodate the full runout lane length. In consideration of the constrained environment around Access 2, implementation of a two-way left turn lane between Hurontario Street and Hughes Street would be most practical. This would have the added benefit of improving outbound operations of Access 2, as outbound left turning traffic would be able to complete a two-step left turn (Step 1: turn into the centre turn lane; and Step 2 accelerate to speed and merge with eastbound travel) as required.

5.3 TRAFFIC OPERATIONS

5.3.1 Intersection Operations

The operations of the Poplar Sideroad/County Road 32 intersection with Hurontario Street/County Road 124 were again investigated considering the total traffic volumes for each horizon year, and considering any improvements identified as required under background conditions. In addition to this, the site access operations have also been reviewed, assuming a single outbound lane, stop control upon exit of the site, and implementation of exclusive turn lanes as warranted, namely a westbound right turn taper and eastbound left turn lane at Access 2 (a southbound left turn lane at Access 1 will be accommodated via the existing turn lane).

Summaries of the 2028, 2030, 2025 and 2040 intersection operations are provided in Table 24 through Table 27 with corresponding worksheets provided in Appendix L.



Table 24: Intersection Operations – 2028 Total Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	16	B	0.28	15	B	0.15	14	B	0.13
	EB TR	signal	44	D	0.92	42	E	0.92	33	C	0.85
	WB L	signal	21	B	0.52	23	C	0.60	16	B	0.37
	WB T	signal	26	C	0.69	21	C	0.54	21	C	0.58
	WB R	signal	19	B	0.15	17	B	0.12	16	B	0.07
	NB L	signal	18	B	0.41	24	C	0.48	17	B	0.30
	NB T	signal	18	B	0.35	23	C	0.31	18	B	0.31
	NB R	signal	16	B	0.08	21	C	0.05	16	B	0.04
	SB L	signal	38	D	0.75	46	D	0.78	24	C	0.39
	SB TR	signal	26	C	0.38	39	D	0.73	25	C	0.47
	overall	signal	28	C	0.77	31	C	0.81	24	C	0.63
Access 1 & Hurontario St.	WB LR	stop	13	B	0.20	14	B	0.26	14	B	0.32
Access 2 & Poplar SR	SB LR	stop	22	C	0.46	29	D	0.59	28	D	0.67
L left lane T through lane R right lane LT left-through TR through-right LTR left-through-right											

Table 25: Intersection Operations – 2030 Total Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	17	B	0.30	15	B	0.18	15	B	0.16
	EB TR	signal	42	D	0.91	46	D	0.94	32	C	0.84
	WB L	signal	23	C	0.57	28	C	0.68	17	B	0.39
	WB T	signal	26	C	0.68	21	C	0.55	19	B	0.58
	WB R	signal	19	B	0.17	16	B	0.12	15	B	0.07
	NB L	signal	20	B	0.48	28	C	0.57	19	B	0.35
	NB T	signal	19	B	0.37	24	C	0.34	19	B	0.34
	NB R	signal	18	B	0.08	22	C	0.05	17	B	0.04



INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
	SB L	signal	43	D	0.78	54	D	0.84	27	C	0.42
	SB TR	signal	28	C	0.43	45	D	0.80	28	C	0.53
	overall	signal	29	C	0.79	34	C	0.85	24	C	0.66
Access 1 & Hurontario St.	WB LR	stop	14	B	0.28	16	C	0.38	16	C	0.41
Access 2 & Poplar SR	SB LR	stop	24	C	0.50	40	E	0.72	37	E	0.76
L left lane	T through lane	R right lane	LT left-through	TR through-right	LTR left-through-right						

Table 26: Intersection Operations – 2035 Total Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	19	B	0.35	17	B	0.22	15	B	0.17
	EB TR	signal	64	E	1.00	58	E	0.98	36	D	0.88
	WB L	signal	31	C	0.64	63	E	0.88	19	B	0.51
	WB T	signal	29	C	0.71	24	C	0.61	23	C	0.64
	WB R	signal	21	C	0.24	18	B	0.19	16	B	0.10
	NB L	signal	29	C	0.57	44	D	0.75	23	C	0.44
	NB T	signal	26	C	0.43	29	C	0.37	23	C	0.38
	NB R	signal	22	C	0.09	25	C	0.06	21	C	0.05
	SB L	signal	78	E	0.95	78	E	0.94	34	C	0.58
	SB TR	signal	33	C	0.45	53	D	0.84	34	C	0.64
	overall	signal	41	D	0.92	45	D	0.95	28	C	0.74
Access 1 & Hurontario St.	WB LR	stop	16	C	0.31	18	C	0.42	17	C	0.44
Access 2 & Poplar SR	SB LR	stop	37	E	0.64	82	F	0.93	72	F	0.95
L left lane	T through lane	R right lane	LT left-through	TR through-right	LTR left-through-right						



Table 27: Intersection Operations – 2040 Total Conditions

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
			Delay	LOS	V/C	Delay	LOS	V/C	Delay	LOS	V/C
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	signal	21	C	0.45	19	B	0.32	18	B	0.24
	EB T	signal	45	D	0.91	46	D	0.92	36	D	0.86
	EB R	signal	19	B	0.15	20	C	0.20	19	B	0.11
	WB L	signal	27	C	0.61	46	D	0.83	21	B	0.50
	WB T	signal	34	C	0.82	30	C	0.75	30	C	0.77
	WB R	signal	22	C	0.29	19	B	0.24	19	B	0.13
	NB L	signal	31	C	0.62	41	D	0.73	24	C	0.42
	NB T	signal	46	D	0.78	40	D	0.63	34	C	0.62
	NB R	signal	32	C	0.10	32	C	0.06	27	C	0.05
	SB L	signal	46	D	0.87	33	C	0.76	20	C	0.43
	SB TR	signal	33	C	0.52	49	D	0.85	32	C	0.62
overall		signal	36	D	0.90	37	D	0.90	29	C	0.72
Access 1 & Hurontario St.	WB LR	stop	17	C	0.33	20	C	0.45	18	C	0.46
Access 2 & Poplar SR	SB LR	stop	53	F	0.74	138	F	1.10	115	F	1.08
L left lane	T through lane	R right lane	LT left-through	TR through-right	LTR left-through-right						

Analysis of Operations

Acceptable operations will be provided at the intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 (levels of service E or better on each movement) through the 2040 horizon with the timeline of improvements identified under background conditions. As discussed under the background conditions, implementation of the eastbound right turn lane and advanced southbound left turn phase at an earlier horizon will result in correspondingly improved operations at those horizons.

With respect to the site access operations, Access 1 (on Hurontario Street) will operate acceptably through the 2040 horizon, whereas Access 2 (on Poplar Sideroad) will operate acceptably through the 2030 horizon.

Beginning at the 2035 horizon, Access 2 will experience a delay of up to 82 seconds – amounting to a level of service F – during the weekday PM and Saturday peaks. This delay increases to a



maximum of 138 seconds by the 2040 horizon. This operating level is a result of the increased volumes on Poplar Sideroad (in both directions) and the difficulty in completing left turns from the site, despite the benefits afforded by the implementation of the centre two-way left turn lane. Signalization of the access intersection is not recommended due to its proximity to the signalized intersection at Hurontario Street (TAC recommends a minimum signalized intersection spacing of 200 metres). With the provision of separate left and right turn lanes exiting the site (as opposed to a single, shared outbound lane as otherwise assumed), the overall delays will be reduced to a maximum of approximately 70 seconds by the 2040 horizon.

It is noted that Access 1 and the intersection of Poplar Sideroad with Hurontario Street have sufficient reserve capacity to accommodate some of the left-turning traffic (i.e. eastbound outbound traffic) from Access 2 during the weekday PM peak. Diversion of 40 of those trips via Access 1 was found to improve operations of Access 2 to an acceptable level (i.e. LOS E; less than 50 seconds delay) without significant impact to the operations of the other intersections. Considering this, it is expected that motorists experiencing high delays at Access 2 will redistribute through Access 1 until an equilibrium is reached.

5.3.2 Queue Operations

Queue operations were again investigated at the intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 for the 2040 total traffic conditions, the results of which are summarized in Table 28; worksheets are provided in Appendix M. Queues are also noted for each site access. For the site access queues (internal queues) such are noted assuming single exit lanes. The noted queue lengths are provided in metres; an average vehicle in queue amounts to 7.5 metres (and thus a queue of 30 metres translates to 4 vehicles).

At the Poplar Sideroad/County Road 32 intersection with Hurontario Street/County Road 124, the average westbound left and right turn queues can be accommodated within the existing storage lanes (the greatest left turn queue is 30 metres whereas the right turn queue is 50 metres). 95th percentile queues in the right turn lane may slightly exceed the available storage during some periods (by approximately 1-2 vehicles). During the PM peak hour, the 95th percentile queue for the westbound through movement may extend up to 104 metres; this is less than the separation distance to Access 2 (which is approximately 130 metres), thus will not block the access.

Access 1 is to be located approximately 190 metres north of Poplar Sideroad with a queue separation distance of approximately 150 metres. During the PM peak hour, the 95th percentile queues are expected to be 85 metres for the southbound left turn on Hurontario Street at Poplar Sideroad and 150 metres for the southbound through-right movement; this is equal to or less



than the separation distance, thus southbound queues on Hurontario Street are not expected to block Access 1.

Table 28: Queue Operations – 2040 Total Conditions

INTERSECTION & MOVEMENT			WEEKDAY AM PEAK HOUR		WEEKDAY PM PEAK HOUR		SATURDAY PEAK HOUR	
			50 th	95 th	50 th	95 th	50 th	95 th
Poplar Sideroad/ Cty Road 32 & Hurontario Street/ Cty Road 124	EB L	60 m	16 m	30 m	23 m	88 m	10 m	19 m
	EB T	thru lane	71	110	120	207	72	107
	EB R	50	17	53	43	107	16	48
	WB L	65	20	43	30	56	17	30
	WB T	thru lane	64	100	66	104	58	98
	WB R	50	26	60	22	53	12	29
	NB L	60	35	64	40	83	24	43
	NB T	thru lane	47	81	46	81	40	70
	NB R	60	16	31	11	25	10	22
	SB L	TWLTL	46	73	64	85	27	54
	SB TR	thru lane	50	95	104	150	46	79
Hurontario Street & Access 1	WB LR	internal	15	26	28	47	23	38
	SB L	TWLTL	11	22	16	31	15	27
Poplar Sideroad/ CR 32 & Access 2	EB L	40	10	18	12	19	13	21
	SB LR	internal	33	47	38	50	38	50

TWLTL - two-way left turn lane (centre lane)

Access 2 is to be located 150 metres east of Hurontario Street which will provide approximately 130 metres of separation. In considering the maximum combined westbound left queue at Hurontario Street (56 metres) and eastbound left queue at Access 2 (19 metres), such can be accommodated (75 metres total vs 130 metres available). The outbound queue at Access 2 will be up to 47 metres, though this is assuming that no trips divert to Access 1 and that only a single outbound lane is provided. If some outbound trips divert, or if separated outbound left and right turn lanes are provided, the internal queues will be shorter.



5.3.3 Drive-Thru Operations

As per the site plan, there are 2 restaurants with drive-thru operations as follows:

- McDonalds (storage for 14 vehicles in queue); and
- Starbucks (storage for 12 vehicles in queue).

McDonalds

The analysis of the McDonalds drive-thru operations considers the number of vehicles expected to use the drive-thru, the drive-thru configuration and the associated services times.

The trip estimates to be generated by McDonalds are detailed in Section 4.12.1 and repeated in Table 29. As per research provided by the NPD Group²¹, 57% of customers at hamburger fast food restaurants use the drive-thru window. For the purposes of this assessment, it is assumed that 60% of all patrons will use the drive-thru, the resulting trips for which are illustrated in Table 29.

Table 29: Development Trip Estimates – McDonalds

BUILDING & LAND USE	TRIPS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
7 McDonalds	Total	92	89	181	70	64	134	114	110	224
	Drive-Thru ¹	55	53	108	42	38	80	68	66	134

¹ assumes 60% to use the drive-thru for purposes of the drive-thru analysis

In considering the McDonalds drive-thru operations, there are effectively 3 separate service stations with established service times as follows²²:

1. order board 25 to 30 seconds;
2. payment window 15 to 20 seconds; and
3. pick-up window 25 to 30 seconds.

A sample survey was completed at the Collingwood McDonalds on Thursday January 6, 2022, over the period 8:00 to 8:30. During this time, there were 2 order boards, a payment window and

²¹ A customer at a hamburger fast food restaurant, such as Burger King or McDonald's, is more likely to use the drive-thru window than a customer at a quick-service Mexican restaurant, such as Del Taco or Taco Bell, or a chicken fast food restaurant, such as Kentucky Fried Chicken or Popeyes. About 57 percent of customers at hamburger fast food restaurants use the drive-thru window, compared to 40 percent at quick-service Mexican restaurants and 38 percent at chicken fast food restaurants, according to The NPD Group. (<https://smallbusiness.chron.com/percentage-sales-drive-through-windows-fast-food-restaurants-75713.html>)

²² McDonald's Project Parking and Drive-Thru Queue Analysis. Ganddini Group, Inc., April 17, 2019.



pick-up window in operation. A total of 58 vehicles were serviced at the pick-up window over the 30 minute period, resulting in an average service time of 31 seconds. The service times at the order board and the payment window were not recorded, albeit it is noted that the service time at the payment window was observed to be less (in that vehicles were not often impeded at the payment window). The 30 second service time at the order board was also confirmed through a separate study²³. In this regard, the above noted service time targets are considered appropriate.

The operations of the drive-thru and analysis of resulting queues has been based on the following:

- Saturday peak hour (given the increased traffic volumes and hence representing the more critical case);
- single channel queue with 3 phases (order board, payment window and pick-up window);
- arrivals assumed to follow a Poisson distribution with exponential services times (M/M/1 queue model); and
- service times of 30, 20 and 30 seconds for the order board, payment window and pick-up window (the order board service times are expected to be reduced given the provision of 2 parallel order boards, but 30 seconds has been assumed to maintain a conservative approach).

The results of the analysis are provided in Table 30, for both the average and 95th percentile queues (the 95th percentile queues will only be exceeded 5% of the time); queue worksheets are provided in Appendix N.

Table 30: Drive-Thru Operations – McDonalds

BUILDING & LAND USE		QUEUE	ORDER BOARD	PAY WINDOW	PICK-UP WINDOW	TOTAL
7	McDonalds	Average	1.3 veh	0.6 veh	1.3 veh	3.3 veh
		95 th Percentile	5.0	3.0	5.0	13.0

As indicated, and in considering each service point as a separate queue operation independent from the others and that all will experience peak queues simultaneously, the total 95th percentile queue length for the McDonalds drive-thru is projected to be 13 vehicles. This equates to 85 metres assuming 6.5 metres per vehicle (which recognizes that vehicles in drive-thru queues will be more closely spaced as compared to more traditional queues on the road). The proposed

²³ Purcellville McDonalds Queuing Analysis. Kimley Horn, July 14, 2014.



drive-thru has approximately 95 metres of storage and thus can accommodate the projected queues.

It must also be acknowledged that the queue for the payment and pick-up windows will be effectively controlled or metered by the operations at the order board, and thus the order board queues are the more critical to ensure accommodation of. In this regard, a minimum of 5 vehicles should be accommodated prior to the order boards. As demonstrated on the site plan, a total of 6 vehicles are able to queue prior to the order boards.

Starbucks

The Starbucks drive-thru has been analyzed employing the same methodology of that of the McDonalds drive-thru, and considering:

- the Saturday peak hour (given the increased traffic volumes);
- 70% of the site traffic to utilize the drive-thru (increased use given the type of facility proposed);
- single channel queue with 2 phases (order board and payment/pick-up window);
- arrivals assumed to follow a Poisson distribution with exponential services times (M/M/1 queue model); and
- service times of 30 seconds for each of the order board and payment/pick-up window.

The associated Starbucks drive-thru volumes are summarized in Table 31 whereas the queue analyses are summarized in Table 32; queue worksheets are provided in Appendix N.

Table 31: Development Trip Estimates – Starbucks

BUILDING & LAND USE	TRIPS	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR			SATURDAY PEAK HOUR		
		In	Out	Total	In	Out	Total	In	Out	Total
1 Starbucks	Total	106	102	208	47	47	95	107	107	213
	Drive-Thru ¹	74	71	145	33	33	66	75	75	150

¹ assumes 70% to use the drive-thru for purposes of the drive-thru analysis

Table 32: Drive-Thru Operations – Starbucks

BUILDING & LAND USE		QUEUE	ORDER BOARD	PAY & PICK-UP WINDOW	TOTAL
1 Starbucks	Average		1.6 veh	1.6 veh	3.2 veh
	95 th Percentile		6.0	6.0	12.0



As noted, the average queue considering both operations together, is 3.2 vehicles whereas the 95th percentile queue is 12.0 vehicles. The latter queue amounts to a queue length of 78 metres based on 6.5 metres per vehicle, which will match the proposed storage and accommodate the projected queues. As noted with the McDonalds drive-through, the payment/pick-up window will be effectively controlled or metered by the operations at the order board, and thus the order board queues are the more critical to ensure accommodation of. In this regard, a minimum of 6 vehicles should be accommodated prior to the order boards; as demonstrated on the site plan, a total of 4 vehicles are able to queue prior to the order boards.

It is noted that the existing Collingwood Starbucks has a drive-thru lane of approximately 42 metres with 18 metres available prior to the order board (both measures extend past the sidewalk to the edge of First Street). This is sufficient to accommodate approximately 3 vehicles in advance of the order board and 3 to 4 vehicles between the order board and the payment/pick-up window. The queue often extends out to First Street which can result in vehicles queuing on the road. As previously noted, the proposed Starbucks will provide storage for 12 vehicles which represents an additional 5 vehicles. Further, should queues extend beyond this, they will remain within the development site and thus are not expected to impact operations on the external road system. It is also noted that there is ample and accessible parking within the immediate area and thus patrons have an opportunity to utilize walk-in service as opposed to drive-thru service should lengthy queues build in the drive-thru.

5.4 SPEED LIMIT REVIEW

As discussed in Section 2.1.1 and illustrated in Figure 3, the speed limit on Hurontario Street/County Road 124 transitions from 70 to 50 km/h just north of Poplar Sideroad and prior to Access 1. To ensure approaching motorists have reduced their speeds accordingly, it is recommended that the speed transition be relocated to the south of Poplar Sideroad, thereby providing additional opportunity for motorists to ensure their approach speed complies with the speed limit. As it is, motorists approaching from the south are travelling at 70 km/h (if not greater) through the intersection, assuming they were not required to stop at the traffic signals, and will only start their deceleration at the 50 km/h speed sign.

5.5 ROAD NETWORK IMPROVEMENTS

5.5.1 Background Traffic Conditions

As outlined in Section 3.6, the following improvements are recommended to address the future background conditions (i.e. prior to consideration for the development)

- provide a southbound advance green signal phase (would provide immediate benefit); and
- provide an eastbound right turn lane on Poplar Sideroad (for 2040).



5.5.2 Site Access Turn Lanes

A right turn taper (60 metres) is recommended on Poplar Sideroad at Access 2.

A southbound left turn lane is required to serve Access 1. As there is an existing southbound left turn lane on Hurontario Street across the site frontage, it is recommended that it be reconfigured accordingly, as discussed below.

An eastbound left turn lane is required to serve Access 2 on Poplar Sideroad. Rather than provide a dedicated turn lane, it is recommended that such be integrated into a centre turn lane on Poplar Sideroad as discussed below.

5.5.3 Hurontario Street Centre Turn Lane

There is an existing centre turn lane on Hurontario Street that transitions to a dedicated southbound left turn just north of the Hamilton Drail Trail pedestrian crossover (approximately 245 metres north of Poplar Sideroad). Access 1 is to be located approximately 190 metres north of Poplar Sideroad and thus it is recommended that the centre turn lane be extended an additional 100 metres thereby providing service to Access 1 (allowing outbound left turns to be completed in 2 stages). The transition would therefore occur approximately 95 metres north of the intersection, which would provide a dedicated southbound storage length of 80 metres (which is sufficient to accommodate the projected southbound left turn queue).

Given that the turn lane is continuous through the limits noted, this recommendation can be achieved solely through pavement markings and redesignation of the exiting lane.

5.5.4 Poplar Sideroad Centre Turn Lane

In consideration of the existing westbound left turn lane at Hurontario Street, the warranted eastbound left turn lane at Access 2, the desire to accommodate 2-stage outbound movements from Access 2 and the proximity of Hughes Street and Portland Street (the latter of which has an eastbound left turn lane), a continuous centre turn lane is recommended from Hurontario Street to Portland Street.

5.5.5 Recommended Improvements

The following improvements are recommended to address the future total conditions (i.e. with consideration for the development):

- Poplar Sideroad/County Road 32 intersection with Hurontario Street/County Road 124
 - provide a southbound advance green signal phase (warranted under existing conditions and thus not attributed to the proposed development);



- provide an eastbound right turn lane on Poplar Sideroad (warranted under 2040 background conditions and thus not attributed to the proposed development);
- Hurontario Street
 - extend the 50 km/h speed zone on Hurontario Street to south of Poplar Sideroad (2028);
 - extend the centre turn lane on Hurontario Street 100 metres to the south to serve Access 1 (2028);
- Poplar Sideroad
 - construct a centre turn lane on Poplar Sideroad from Hurontario Street to Portland Street to serve Access 2 (2028); and
 - construct a westbound right taper (60 metres) at Access 2 (2028).



6 Transportation Demand Management

Transportation Demand Management (TDM) is the use of policies, infrastructure, services, and marketing and educational programs to influence or encourage a behavioural shift in people with respect to how they travel. More specifically, TDM aims to reduce single occupancy vehicle trips and ultimately, the reliance on private automobiles by promoting alternative travel options. It is noted that the city requires that a TDM program or plan be developed and implemented in support of the noted development. The transportation demand management requirements and recommendations are included below.

6.1 TDM OPPORTUNITIES

6.1.1 Public Transit

As noted in Section 2.2, the nearest existing transit routes to the study area are provided along Lockhart Road to the north (approximately 650 metres walking distance) and Raglan Street to the east (1,500 metres). In the future, the site may serve as a local transit hub, with routes adjusted to provide transit services directly to the subject site.

6.1.2 Active Transportation

As noted in Section 2.3, a number of sidewalks and trails are provided in the immediate area, providing active transportation connections beyond the immediate study area. Future connections within the study area will provide opportunities to connect to these existing facilities.

6.2 TDM MEASURES

The following measures have been identified for this site.

6.2.1 TDM Coordinator

A TDM Coordinator is the promoter, educator, and facilitator for the TDM program, and is responsible for the implementation and management of the TDM program on an ongoing basis. The responsibilities of the TDM Coordinator include the following:

- champion of the TDM program;
- liaise with the Town to tailor and deliver a TDM program that meets the needs of the site;
- liaise with local transit providers in order to gather and disseminate transit service information (i.e. fare structures, schedules and maps) to the future residents and employees to ensure that commuters are educated regarding transit options; and
- act as the TDM point of contact for residents.



6.2.2 Marketing & Education

A site-specific TDM marketing and education package can be prepared and distributed to all new residents and employees of the development. The TDM package should include the following information:

- introduction to TDM objectives, goals and benefits;
- a travel survey;
- maps of cycling routes/sidewalk network in the Town;
- bicycle safety information;
- school travel planning initiatives;
- transit schedules for local services (i.e. Colltrans); and
- carpool/rideshare information and registration forms.

6.2.3 Transit Initiatives

Encouraging the use of the available transit services is a cornerstone of a successful TDM program. In order to increase the likelihood that a commuter will try transit, it is important to remove or lessen the barriers or hurdles that currently prevent commuters from making the switch. Such can include the distribution of prepaid or discounted ride cards for the new residents of the site to use on local transit services. The intent of such is to provide a financial incentive to encourage commuters to try public transit, with the ultimate goal of a more permanent shift to transit use by commuters.

In addition to the noted transit incentives, real-time transit display boards may be provided within the site (such as at the proposed transit hub) as a means of providing transit information to residents, employees and visitors.

6.2.4 Outreach Programs

The TDM coordinator will remain a point of contact with the Town to support future outreach programs, whether site-specific or as part of wider TDM initiatives spearheaded by the Town.

6.2.5 Other Support Measures

In addition to the above, other measures to be implemented in support of the TDM plan include:

- provision of long and short-term bicycle parking; and
- designated car-share spaces (predicated on attracting a car share provider to the area).



6.2.6 TDM Monitoring Program

Program monitoring is an essential component for all TDM plans. A TDM program must be periodically measured and evaluated with respect to the overall effectiveness of the program and its individual components. The intent of program monitoring is to ensure that the TDM program remains relevant to the needs of the residents and commuters and properly reflects any changes to the available transportation services and infrastructure in the area. In this respect, a TDM program must be dynamic. The monitoring of the program informs the process of change.

The most common method of monitoring a TDM program is through administration of a travel or commuter survey to residents of the site. A commuter survey is an electronic or paper-based tool used for gathering important information regarding travel habits and attitudes of the residents. As previously noted, an initial survey must be conducted in order to establish a benchmark with respect to existing travel behaviour. Going forward, the survey should be administered annually or biannually, and results compared to previous survey results in order to identify any successes or short comings of the TDM program and/or wider TDM initiatives spearheaded by the Town.



7 Summary

7.1 PROPOSED DEVELOPMENT

This study has addressed the transportation impacts associated with the proposed Gateway Centre development located at the intersection of Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 in the Town of Collingwood. The proposed development will consist of approximately 8,850 m² (95,200 ft²) of commercial and retail development space including McDonalds and Starbucks restaurants, 1,200 m² (12,900 ft²) of office space, and 165 residential apartment units. With respect to trip generation, the site will generate the following:

- gross trips: 712 during the weekday AM peak hour, 972 during the weekday PM peak hour, and 1,293 during the Saturday peak hour;
- internal and shared trips (assumed as 10-20% of all site trips): 71 during the weekday AM peak hour, 194 during the weekday PM peak hour, and 259 during the Saturday peak hour;
- pass-by trips: 302 during the weekday AM peak hour, 330 during the weekday PM peak hour, and 474 during the Saturday peak hour; and
- new trips: 338 during the weekday AM peak hour, 447 during the weekday PM peak hour, and 561 during the Saturday peak hour.

With respect to completion and build-out, the following has been assumed:

- Phase 1 (Buildings 1, 2 and 5 through 8) to be complete by 2028; and
- Phase 2 (Buildings 3 and 4) to be completed by 2030.

7.2 SITE PARKING, LOADING & CIRCULATION

The site plan was reviewed with respect to the parking provision, loading space provisions and circulation. All are considered appropriate in consideration of Town standard requirements and appropriate design vehicles.

7.3 EXTERNAL ROAD SYSTEM OPERATIONS

In addressing the study area traffic operations, the intersection of Poplar Sideroad/County Road 32 with Hurontario Street/County Road 124 was analysed under existing (2024) and future (2028, 2030, 2035, and 2040) horizon periods. The site access points were also reviewed under the noted future horizons. The review included an assessment of intersection operations and a review of exclusive turn lane requirements. Based on the assessment of existing, background and total conditions, the following improvements are recommended:



- 2030 Background Conditions
 - consider a southbound advance green on Hurontario Street at Poplar Sideroad;
- 2040 Background Conditions
 - provide an eastbound right turn lane on Poplar (subject to property acquisition);
- 2028 Total Conditions (Phase 1 of the development)
 - extend the 50 km/h speed zone on Hurontario Street to south of Poplar Sideroad;
 - extend the centre turn lane on Hurontario Street 100 metres to the south to serve Access 1;
 - construct a centre turn lane on Poplar Sideroad from Hurontario Street to Portland Street to serve Access 2; and
 - construct a westbound right taper (60 metres) at Access 2.

It is noted that the improvements identified herein under both background and total conditions are predicated on significant development occurring in the area and along the Poplar Sideroad corridor. Should development of the area not occur or be delayed, the improvements identified may not be required or may be deferred. Thus, it is recommended that ongoing monitoring of development and traffic levels be conducted to confirm the need for and timing of the recommended improvements.

7.4 INTERNAL DRIVE-THRU OPERATIONS

The drive-thrus proposed for the McDonalds and Starbucks were reviewed in context of the projected traffic volumes, service times and resulting queues. In consideration of the anticipated restaurant and drive thru operations, and in assessing the operations based on standard queue modelling methodologies, the proposed drive thru lanes are considered appropriate.

7.5 SIGHT LINES

The available sight lines along both Poplar Sideroad/County Road 32 and Hurontario Street/County Road 124 at the proposed site access points were reviewed and determined to exceed the Transportation Association of Canada and Simcoe County design guidelines for sight distance requirements.

7.6 TRANSPORTATION DEMAND MANAGEMENT

Transportation Demand Management (TDM) measures applicable to the site were reviewed and discussed, including appointing of a TDM coordinator, marking and education initiatives, transit initiatives, outreach programs, and a TDM monitoring program.





Source: Simcoe Maps

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 1: Site Location





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 2A: Area Road Network





Source: Simcoe Maps

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 2B: Area Road Network





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 3: Area Speed Limits & Intersection Control





Source: Simcoe Maps

Intersection of poplar Sideroad/County Road 32 & Hurontario Street/County Road 124

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 4A: Key Intersections





Source: Google Streetview

Looking north on Hurontario Street from intersection with Poplar Sideroad/County Road 32



Source: Google Streetview

Looking south on County Road 124 from intersection with Poplar Sideroad/County Road

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 4B: Key Intersections





Looking east on Poplar Sideroad/County Road 32 from intersection with Hurontario Street/County Road 124

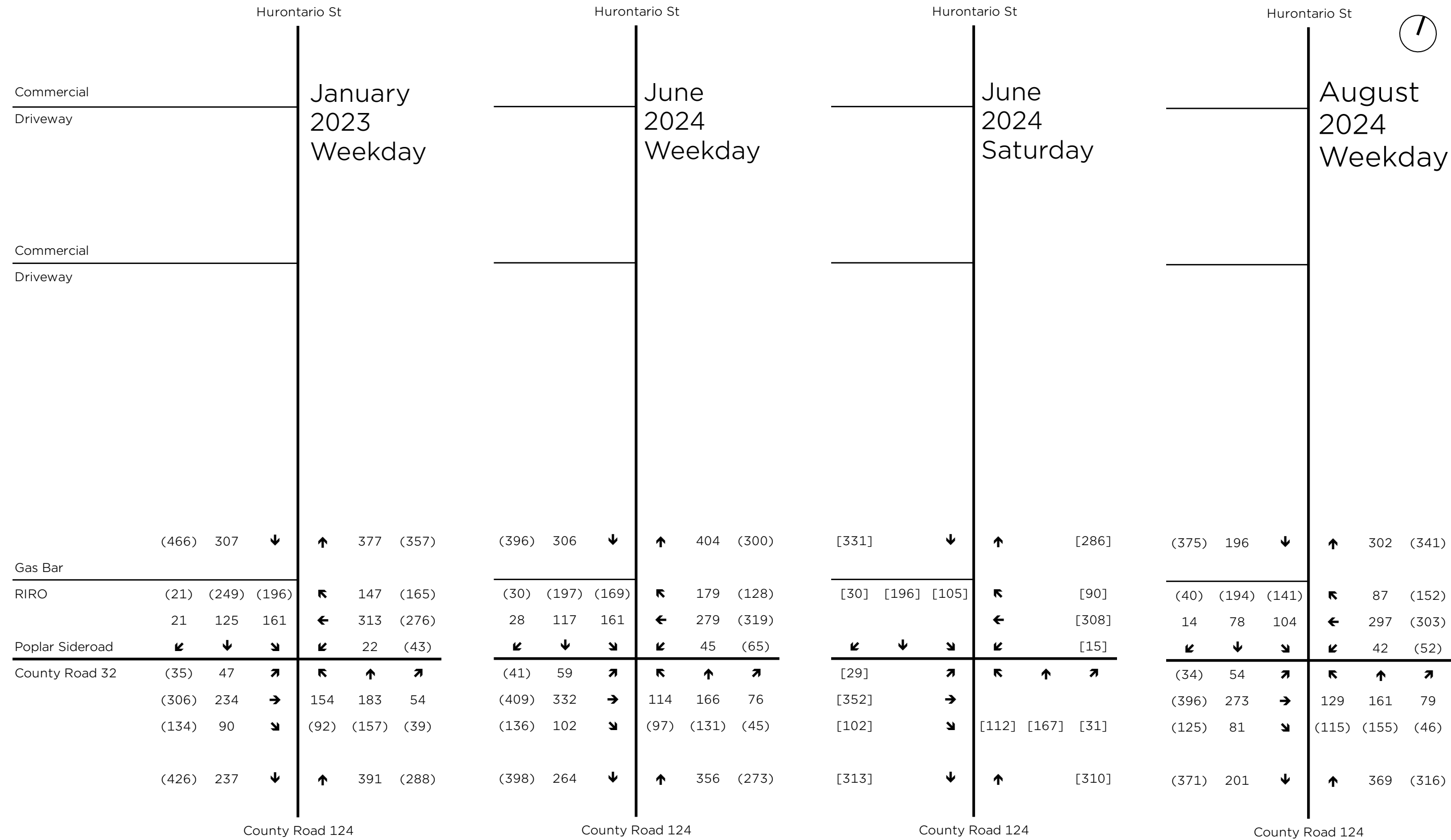


Looking west on Poplar Sideroad/County Road 32 from intersection with Hurontario Street/County Road 124

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

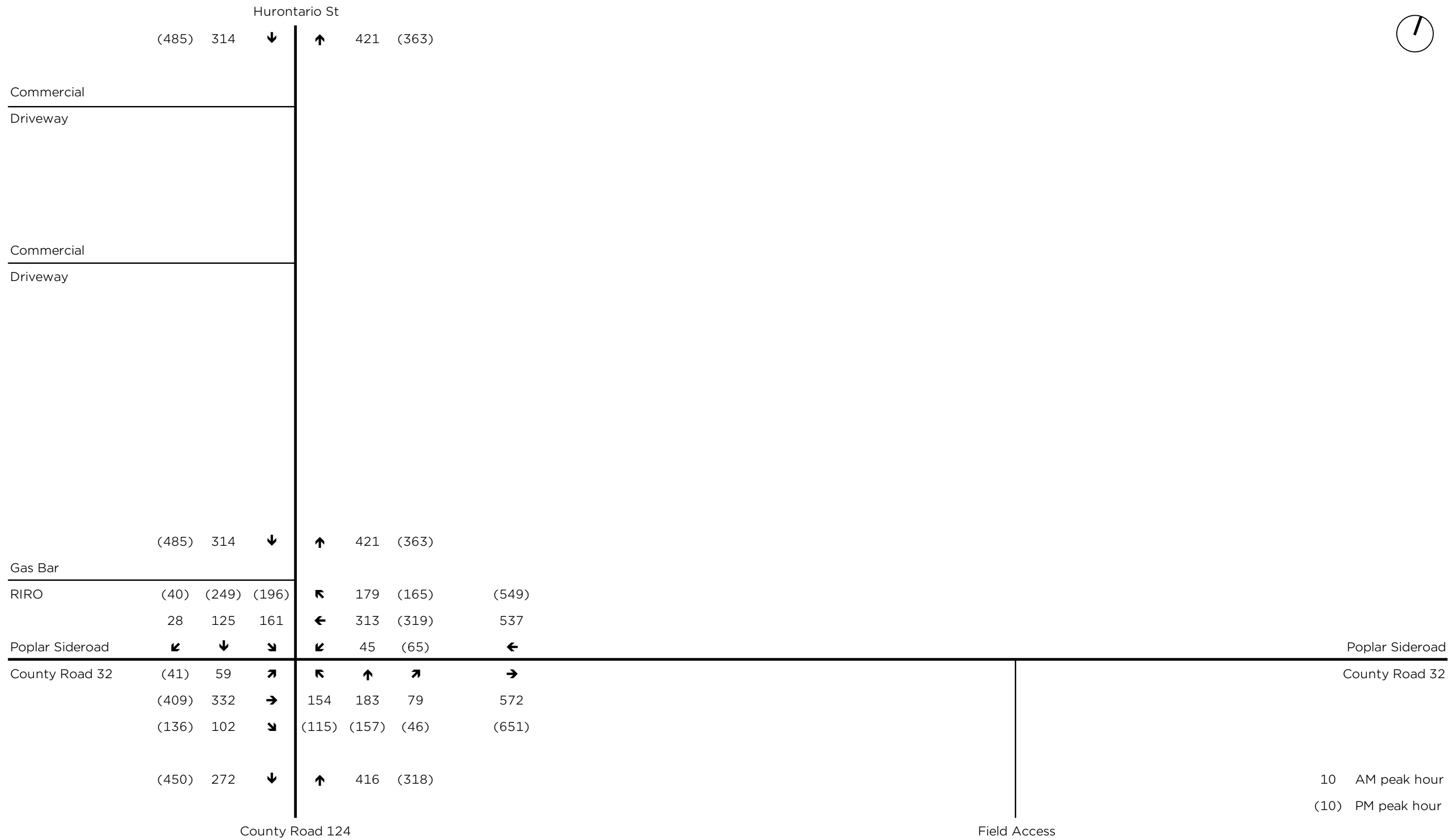
Figure 4C: Key Intersections





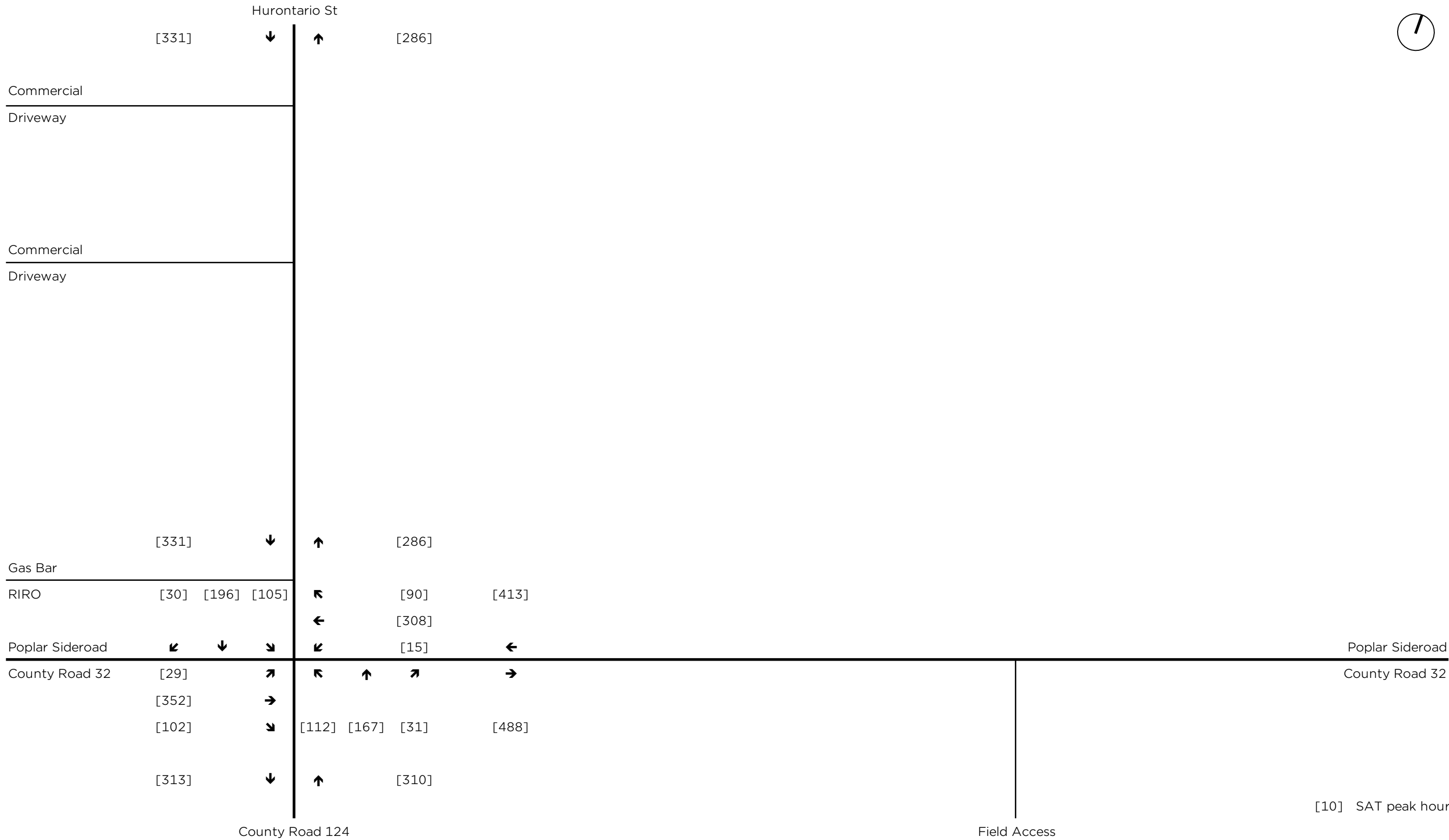
THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 5: 2023 & 2024 Traffic Counts





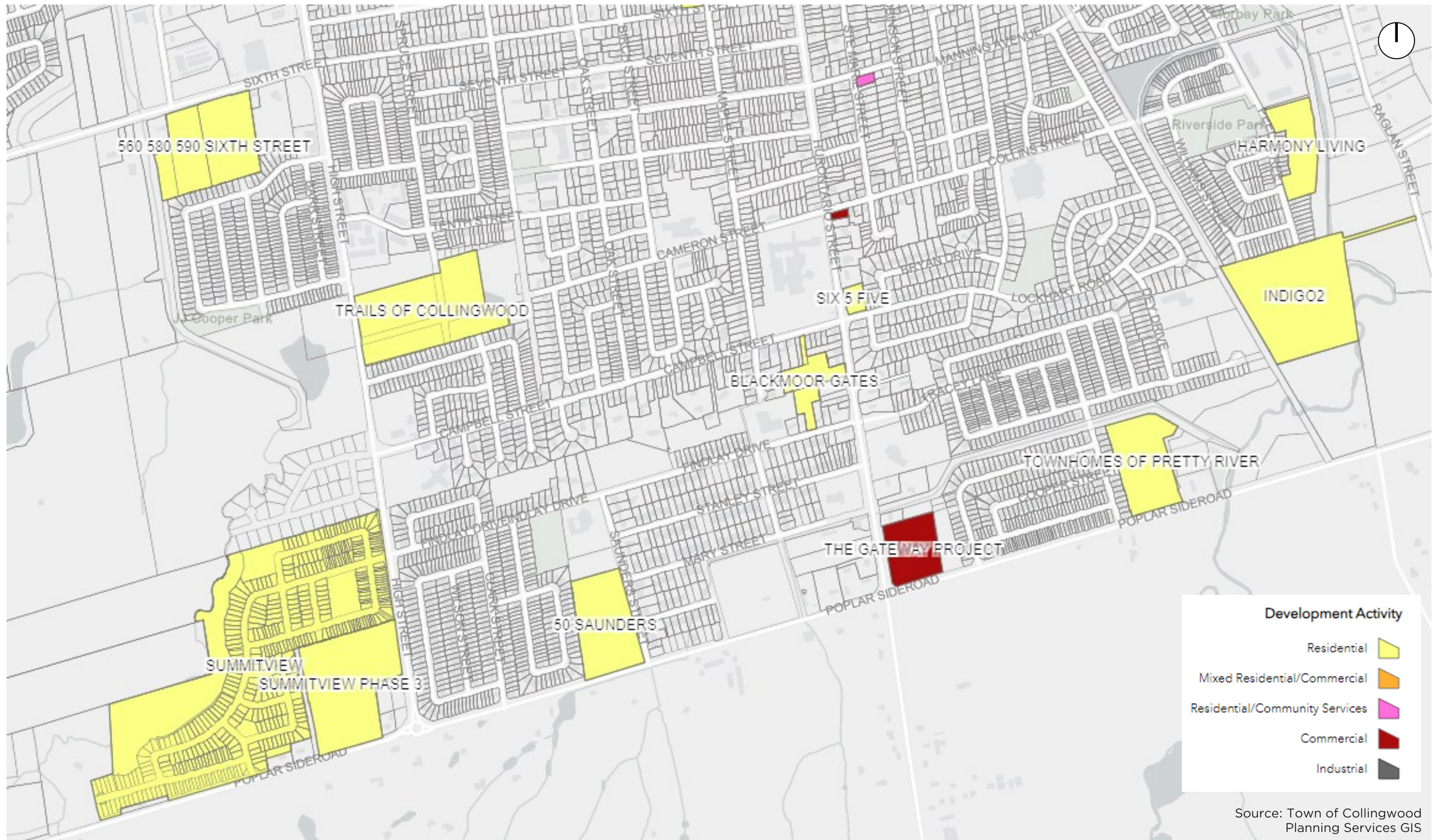
THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 6A: Traffic Volumes – 2024 Weekday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 6B: Traffic Volumes - 2024 Saturday

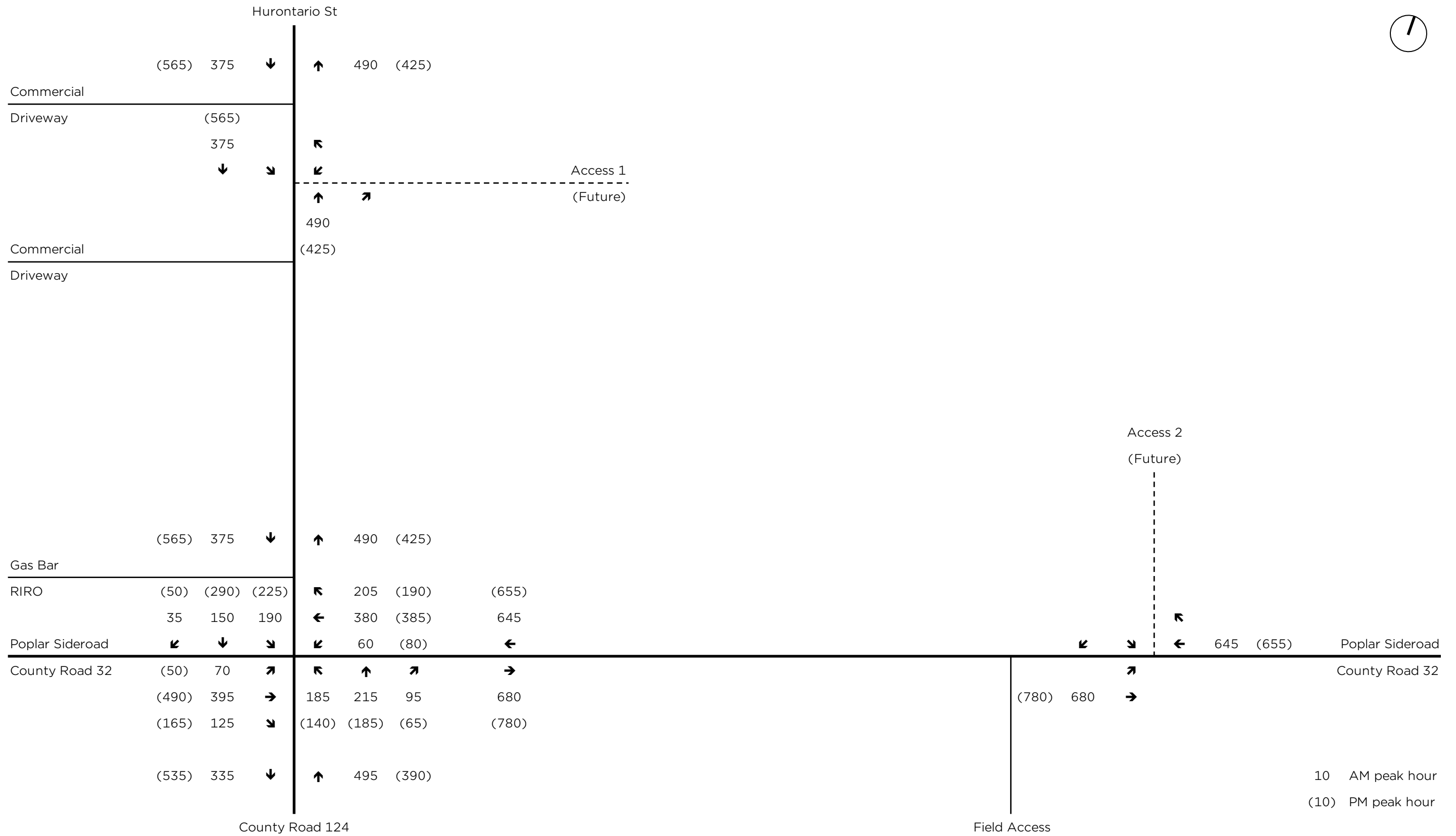




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

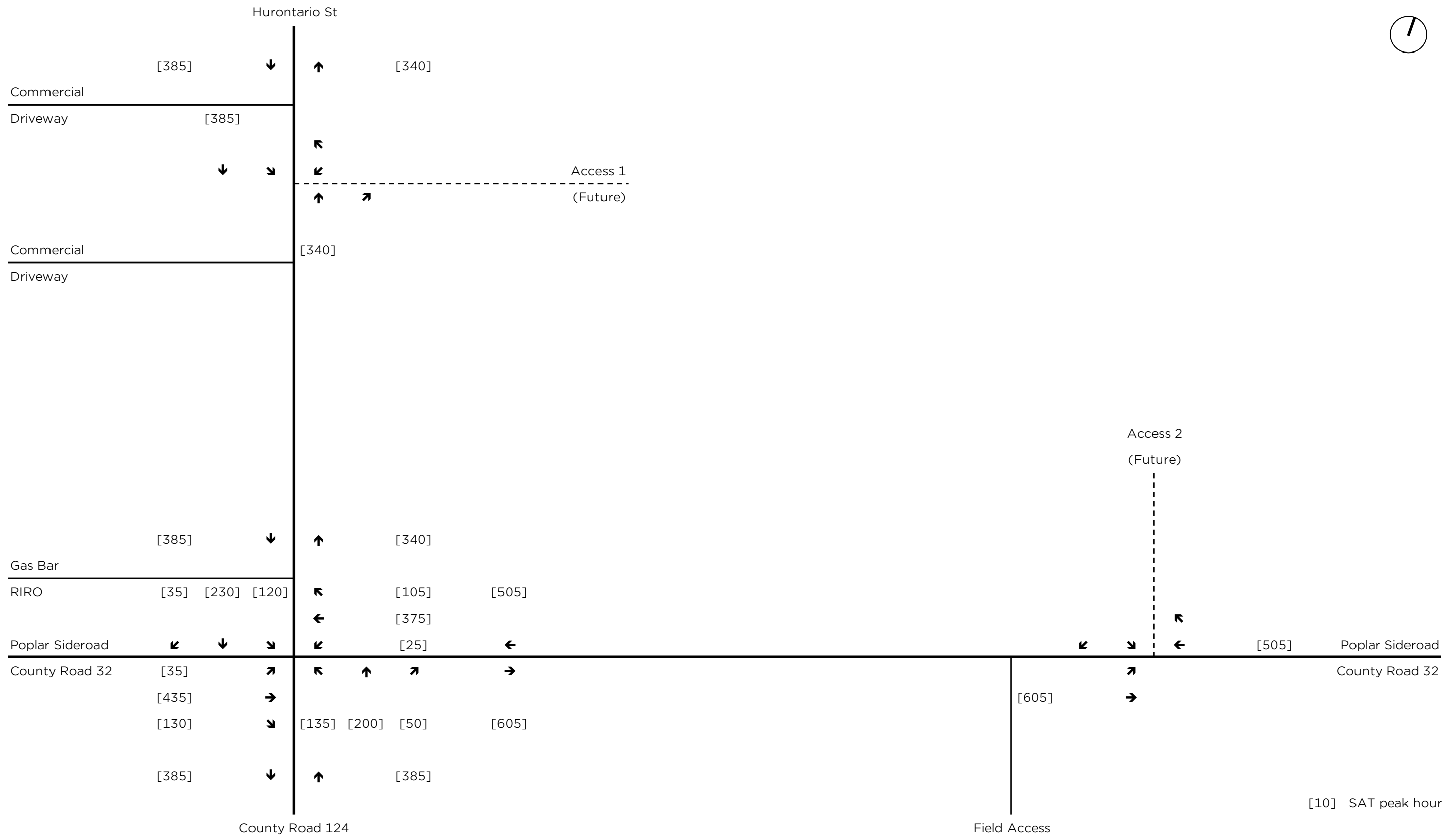
Figure 7: Area Developments





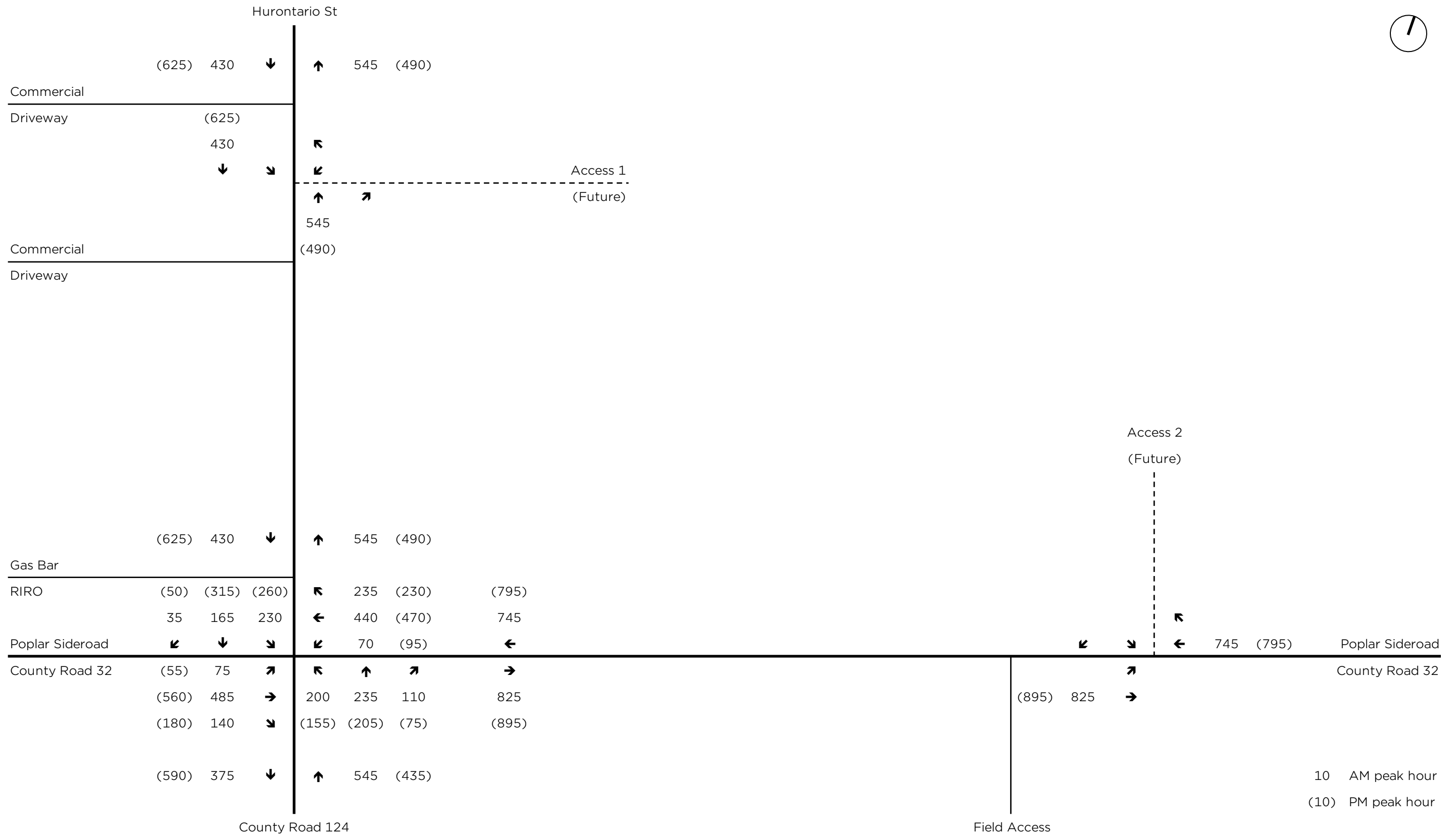
THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 8A: Traffic Volumes – 2030 Background Weekday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 8B: Traffic Volumes - 2030 Background Saturday

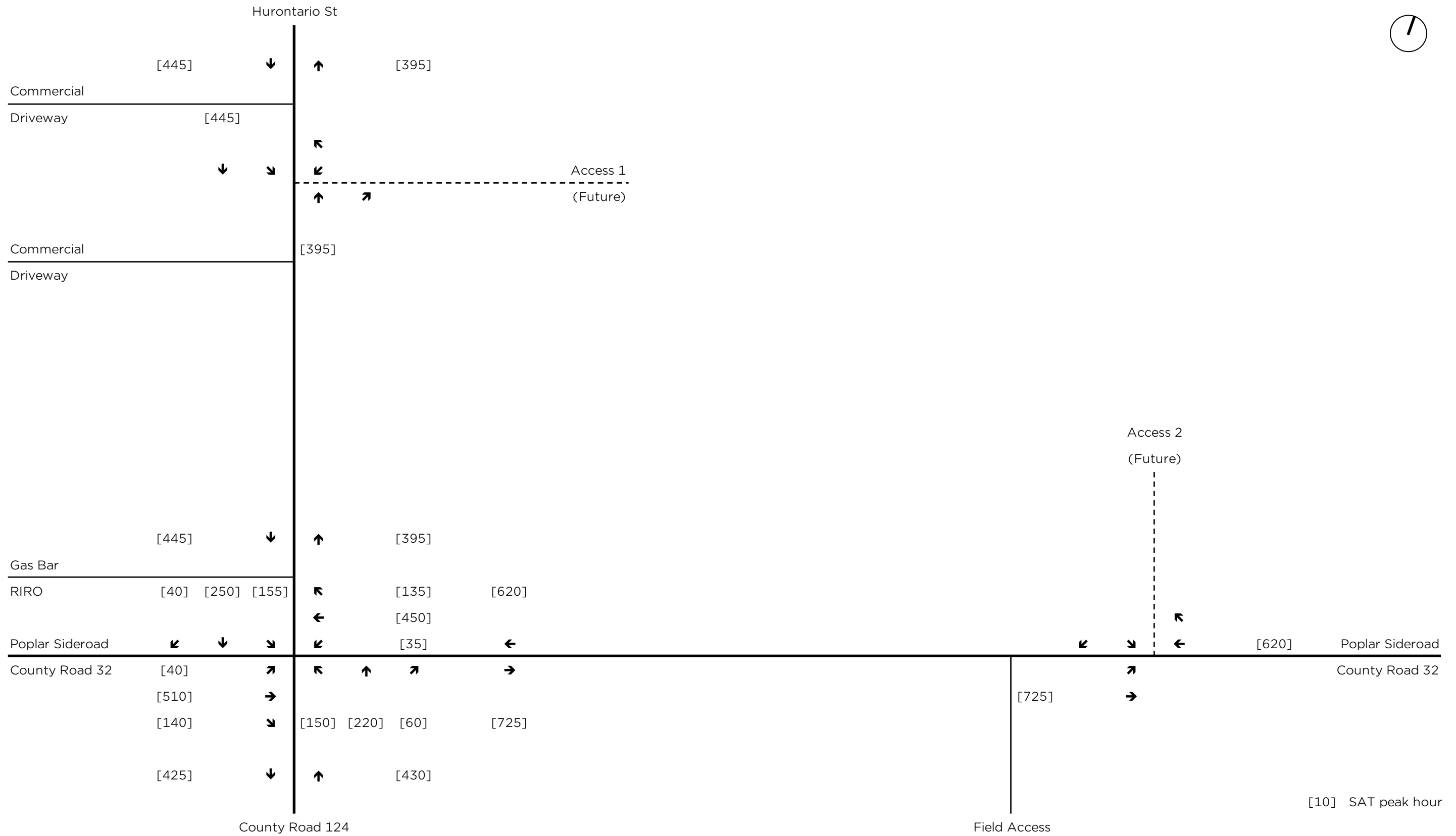




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

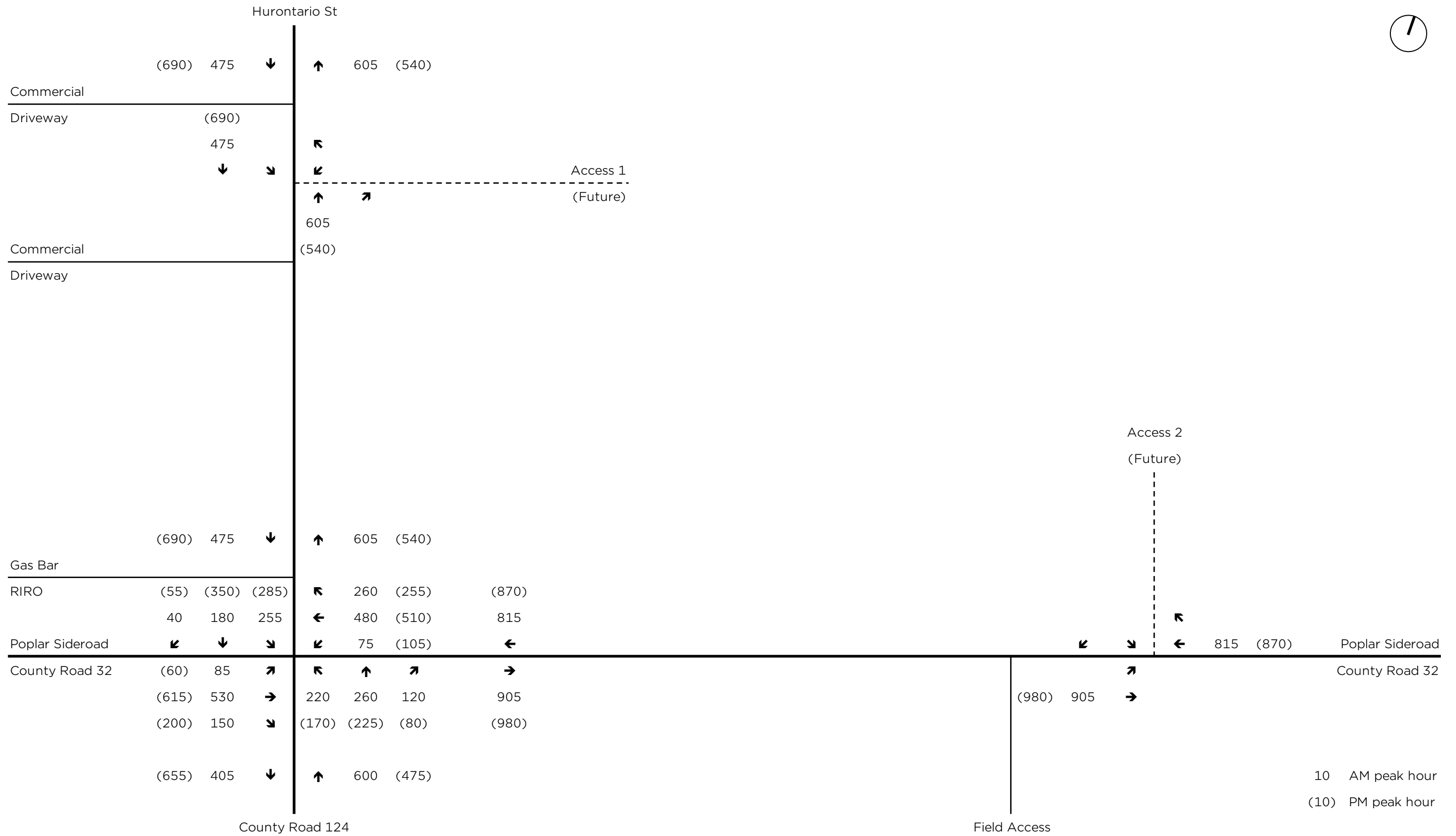
Figure 9A: Traffic Volumes – 2035 Background Weekday





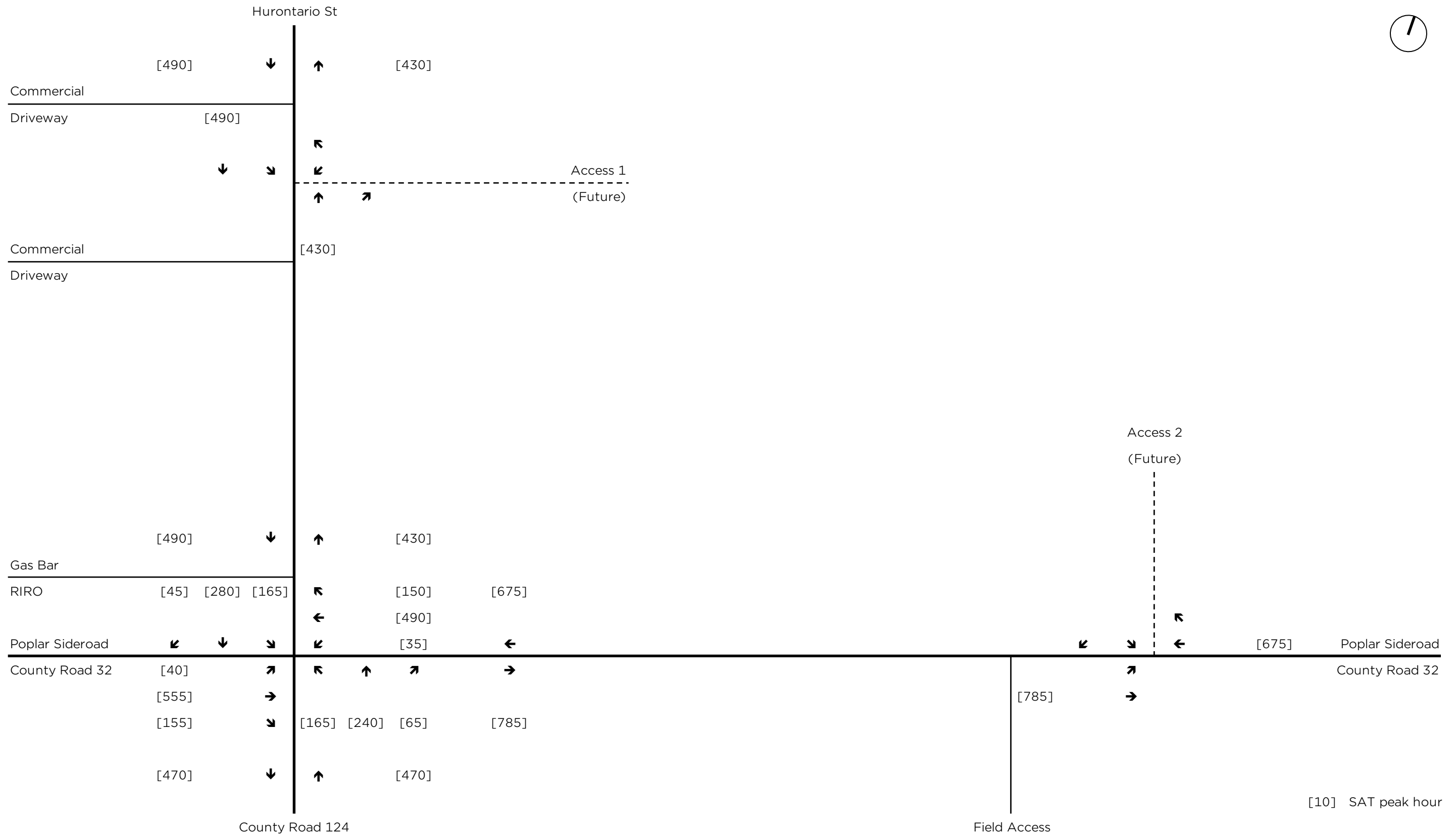
THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 9B: Traffic Volumes - 2035 Background Saturday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 10A: Traffic Volumes - 2040 Background Weekday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 10B: Traffic Volumes - 2040 Background Saturday





Figure 11: Site Plan





Source: Simcoe Maps

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 12: Site Access





Looking north on Hurontario Street from proposed Access 1



Looking south on Hurontario Street from proposed Access 1

Source: Google Streetview

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 13A: Sight Lines at Site Access Points – Access 1





Looking east on Poplar Sideroad from proposed Access 2



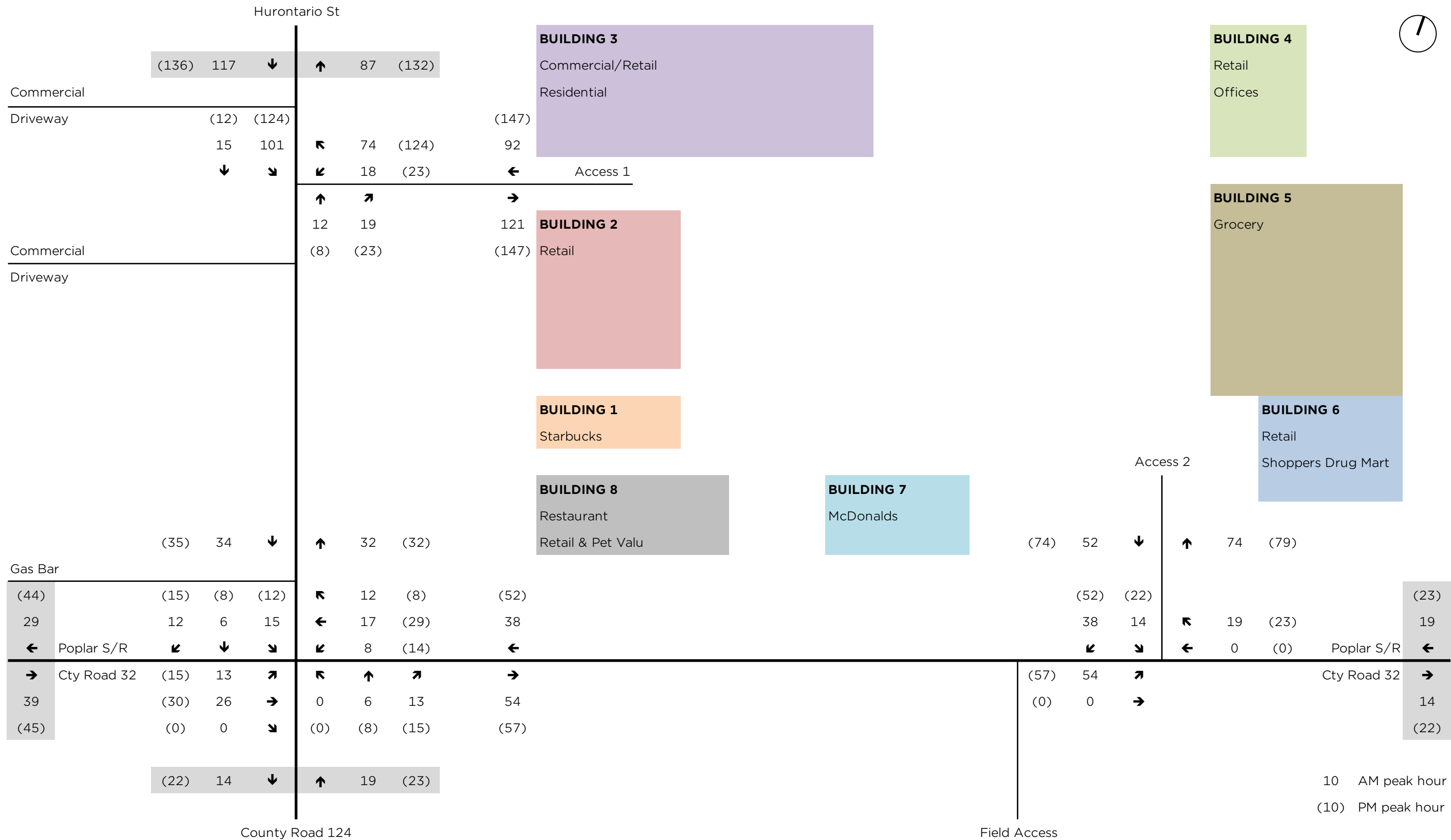
Looking west on Poplar Sideroad from proposed Access 2

Source: Google Streetview

THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 13B: Sight Lines at Site Access Points – Access 2

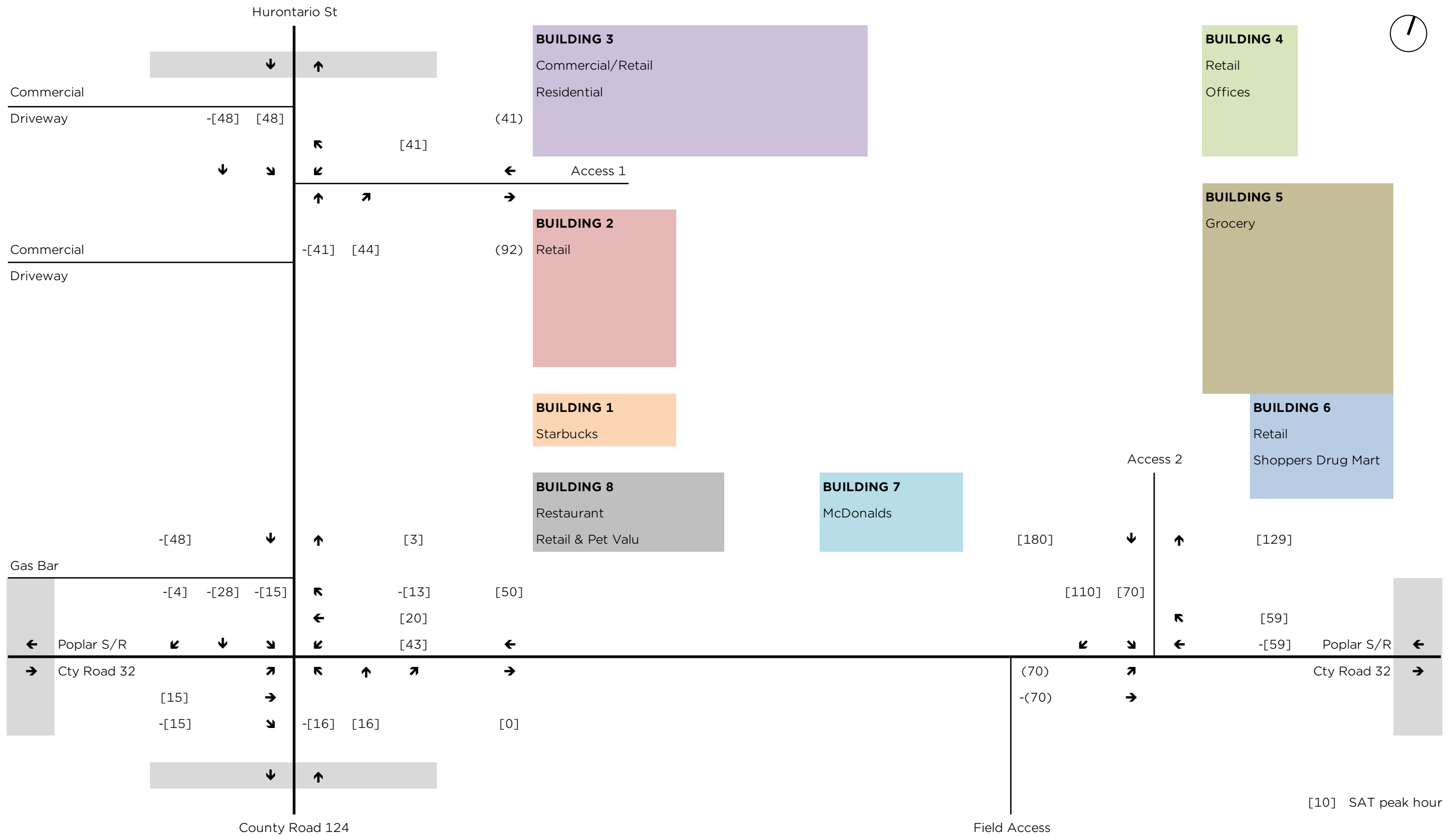




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 14A: Site Traffic - New Trips Weekday



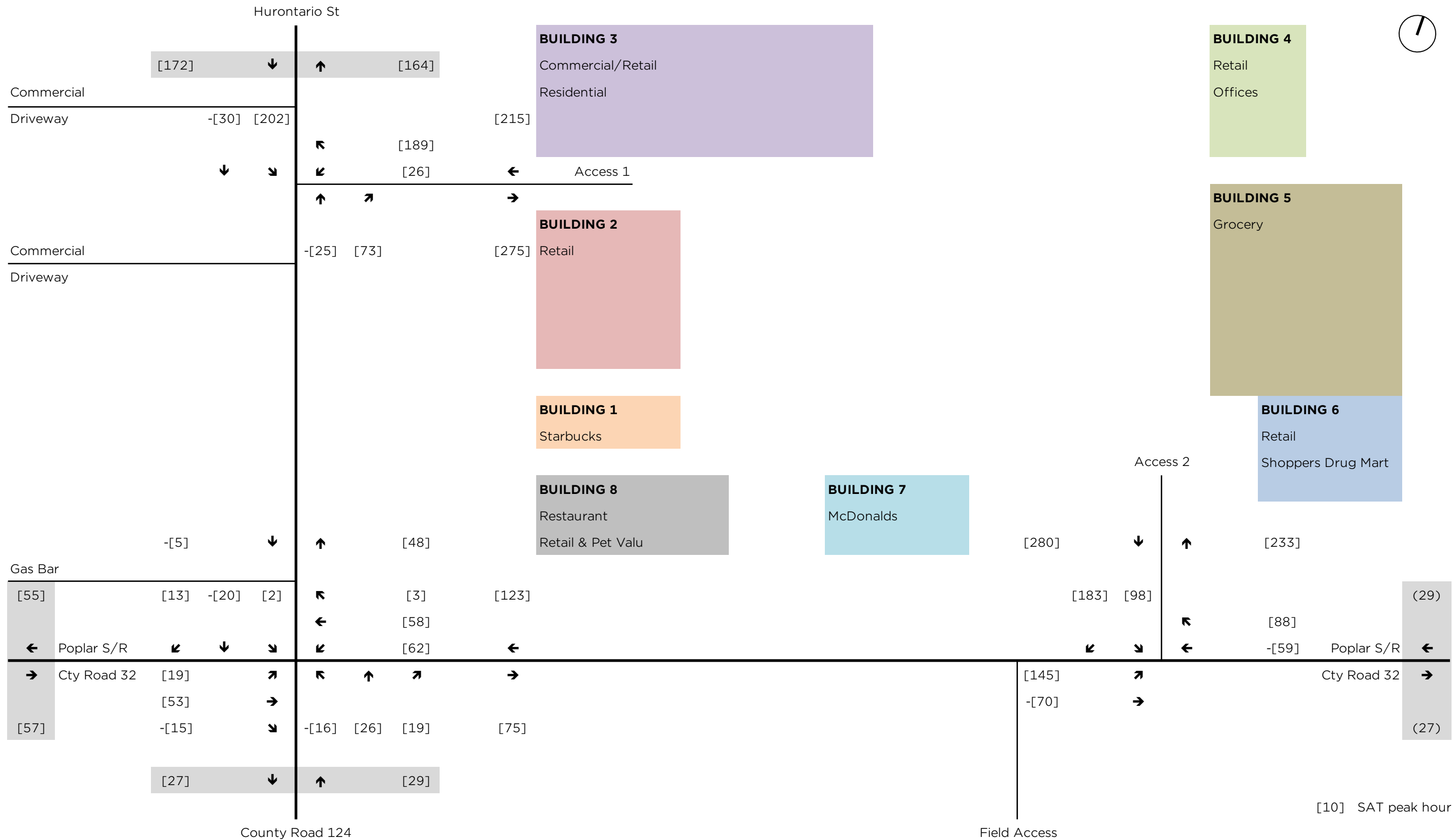


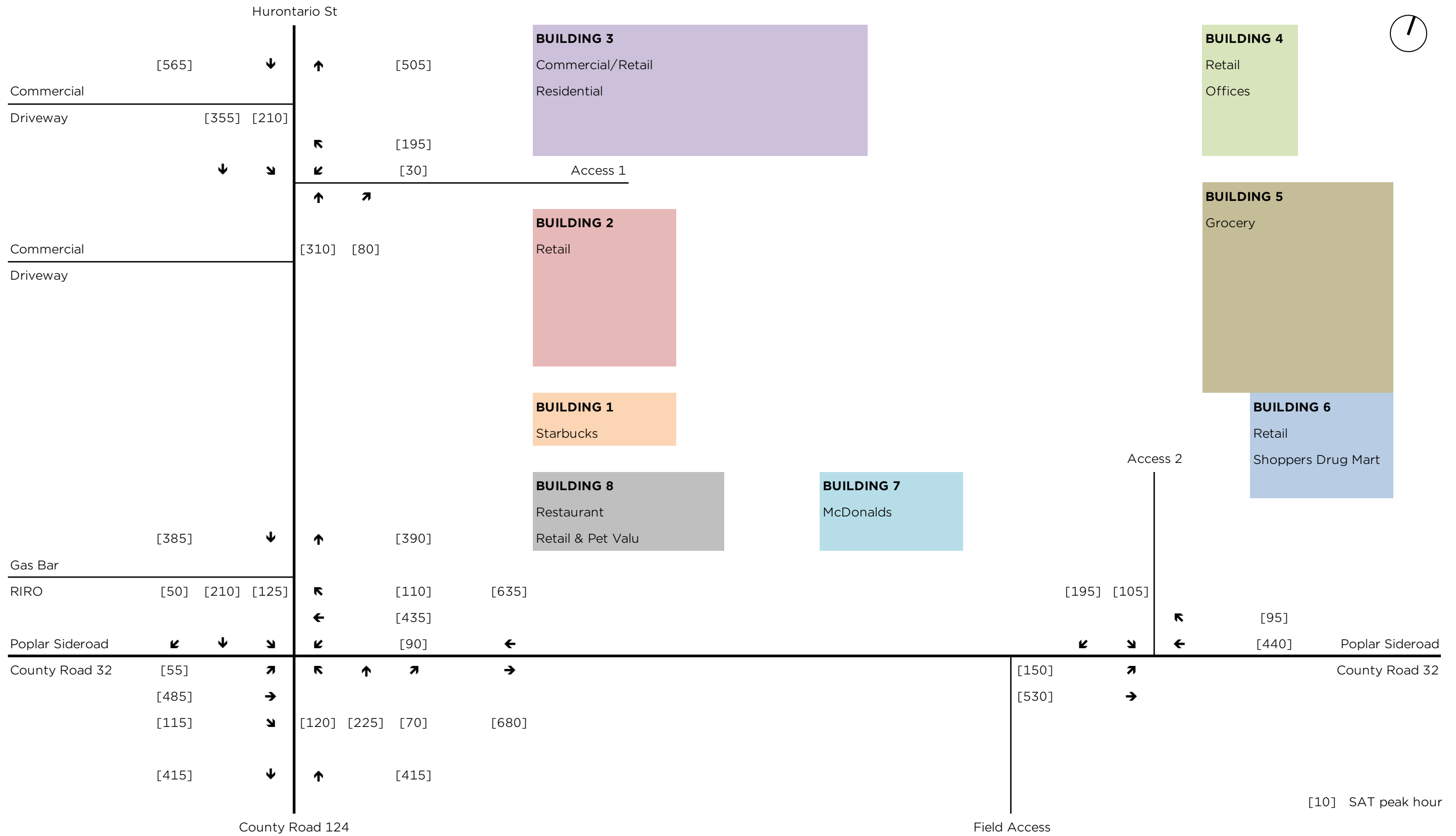


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 16A: Site Traffic - Total Trips Weekday



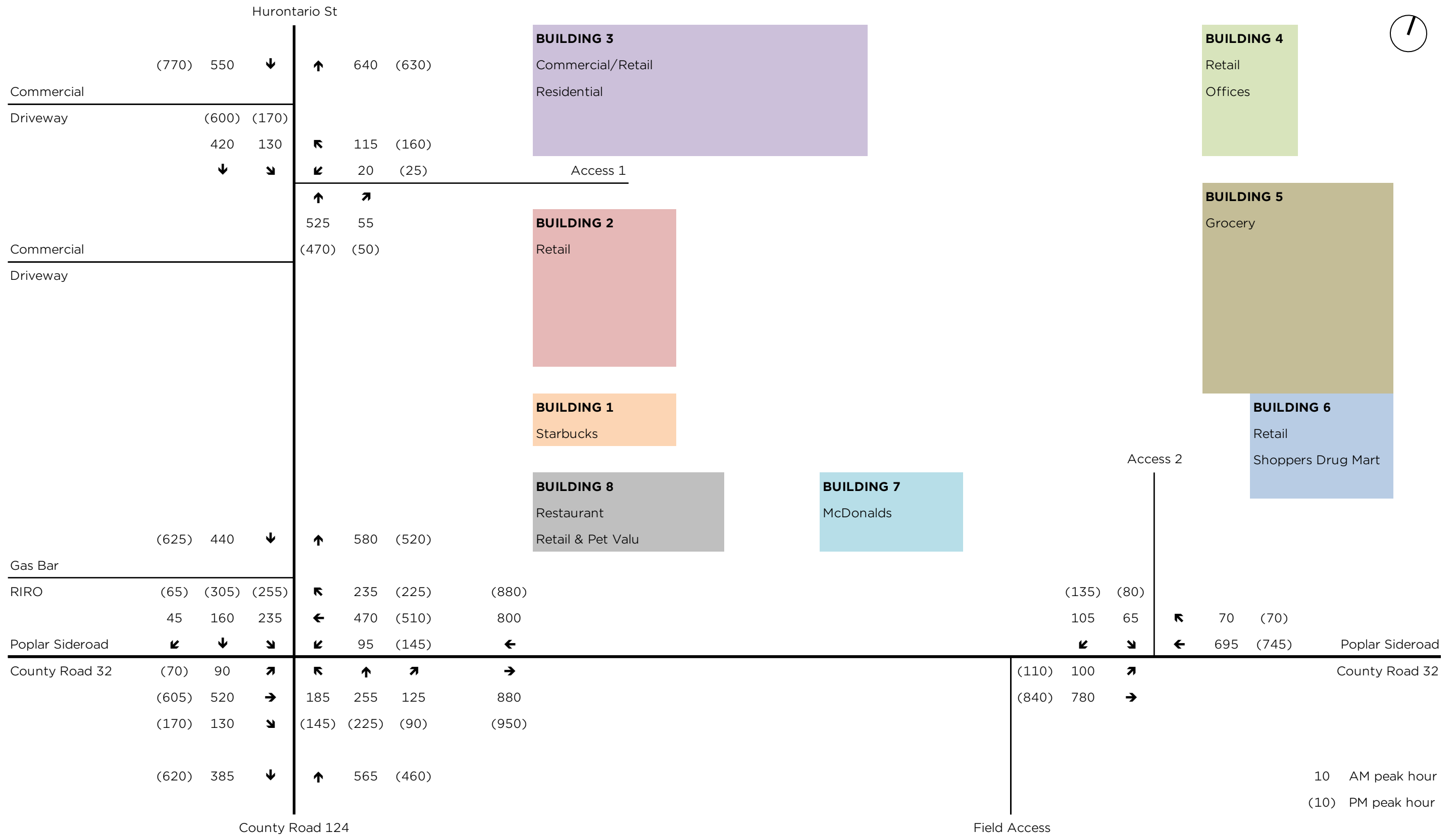


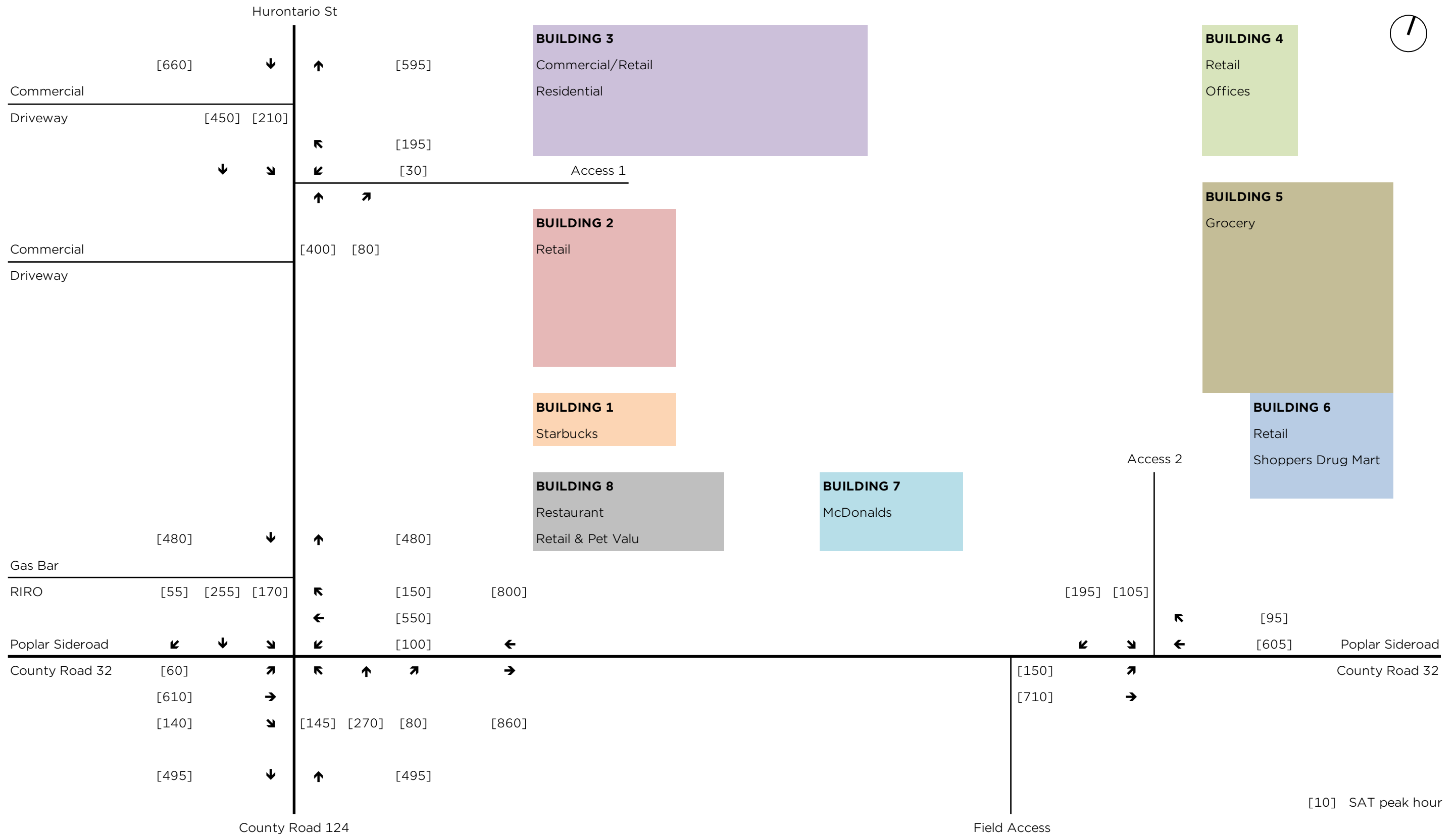


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure 18B: Traffic Volumes – 2030 Total Saturday







THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure 20B: Traffic Volumes - 2040 Total Saturday



Appendix A: Traffic Counts

Morning Peak Diagram		Specified Period From: 7:00:00 To: 10:00:00	One Hour Peak From: 7:45:00 To: 8:45:00
Municipality: Collingwood Site #: 2410900001 Intersection: Poplar Sideroad & Hurontario St TFR File #: 1 Count date: 19-Jun-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Poplar Sideroad runs W/E	

North Leg Total: 710 North Entering: 306 North Peds: 1 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">2</td> <td style="text-align: right;">4</td> <td style="text-align: right;">17</td> <td style="border-left: 1px solid black; text-align: right;">23</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">1</td> <td style="text-align: right;">1</td> <td style="text-align: right;">1</td> <td style="border-left: 1px solid black; text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">25</td> <td style="text-align: right;">112</td> <td style="text-align: right;">143</td> <td style="border-left: 1px solid black; text-align: right;">280</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">28</td> <td style="text-align: right;">117</td> <td style="text-align: right;">161</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Heavys	2	4	17	23	Trucks	1	1	1	3	Cars	25	112	143	280	Totals	28	117	161		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">13</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">6</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">385</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">404</td> </tr> </table>	Heavys	13	Trucks	6	Cars	385	Totals	404	East Leg Total: 1072 East Entering: 503 East Peds: 0 Peds Cross:
Heavys	2	4	17	23																											
Trucks	1	1	1	3																											
Cars	25	112	143	280																											
Totals	28	117	161																												
Heavys	13																														
Trucks	6																														
Cars	385																														
Totals	404																														

Heavys	Trucks	Cars	Totals
20	19	382	421

Hurontario St
 Poplar Sideroad

Cars	Trucks	Heavys	Totals
171	0	8	179
256	12	11	279
35	0	10	45
462	12	29	

Heavys	Trucks	Cars	Totals
0	0	59	59
8	6	318	332
6	2	94	102
14	8	471	

Hurontario St
 Poplar Sideroad

Cars	Trucks	Heavys	Totals
532	9	28	569

Peds Cross: West Peds: 0 West Entering: 493 West Leg Total: 914	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">241</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">20</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">264</td> </tr> </table>	Cars	241	Trucks	3	Heavys	20	Totals	264	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">101</td> <td style="text-align: right;">155</td> <td style="text-align: right;">71</td> <td style="border-left: 1px solid black; text-align: right;">327</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">6</td> <td style="text-align: right;">6</td> <td style="text-align: right;">2</td> <td style="border-left: 1px solid black; text-align: right;">14</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">7</td> <td style="text-align: right;">5</td> <td style="text-align: right;">3</td> <td style="border-left: 1px solid black; text-align: right;">15</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">114</td> <td style="text-align: right;">166</td> <td style="text-align: right;">76</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Cars	101	155	71	327	Trucks	6	6	2	14	Heavys	7	5	3	15	Totals	114	166	76		Peds Cross: South Peds: 0 South Entering: 356 South Leg Total: 620
Cars	241																														
Trucks	3																														
Heavys	20																														
Totals	264																														
Cars	101	155	71	327																											
Trucks	6	6	2	14																											
Heavys	7	5	3	15																											
Totals	114	166	76																												

Comments

Afternoon Peak Diagram		Specified Period From: 15:00:00 To: 18:00:00	One Hour Peak From: 16:30:00 To: 17:30:00
Municipality: Collingwood Site #: 2410900001 Intersection: Poplar Sideroad & Hurontario St TFR File #: 1 Count date: 19-Jun-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Signalized Intersection **		Major Road: Poplar Sideroad runs W/E	

North Leg Total: 696 North Entering: 396 North Peds: 1 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">1</td> <td style="text-align: right;">1</td> <td style="text-align: right;">1</td> <td style="border-left: 1px solid black; text-align: right;">3</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">2</td> <td style="text-align: right;">0</td> <td style="border-left: 1px solid black; text-align: right;">2</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">29</td> <td style="text-align: right;">194</td> <td style="text-align: right;">168</td> <td style="border-left: 1px solid black; text-align: right;">391</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">30</td> <td style="text-align: right;">197</td> <td style="text-align: right;">169</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Heavys	1	1	1	3	Trucks	0	2	0	2	Cars	29	194	168	391	Totals	30	197	169		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">298</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">300</td> </tr> </table>	Heavys	2	Trucks	0	Cars	298	Totals	300	East Leg Total: 1135 East Entering: 512 East Peds: 0 Peds Cross:
Heavys	1	1	1	3																											
Trucks	0	2	0	2																											
Cars	29	194	168	391																											
Totals	30	197	169																												
Heavys	2																														
Trucks	0																														
Cars	298																														
Totals	300																														

Heavys	Trucks	Cars	Totals
8	3	435	446

Poplar Sideroad ←

Heavys	Trucks	Cars	Totals
0	0	41	41
14	9	386	409
4	6	126	136
18	15	553	

N
S
E
W

Hurontario St

Cars	Trucks	Heavys	Totals
128	0	0	128
312	3	4	319
64	0	1	65
504	3	5	

→ Poplar Sideroad

Cars	Trucks	Heavys	Totals
593	10	20	623

Peds Cross: West Peds: 3 West Entering: 586 West Leg Total: 1032	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">384</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">8</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">6</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">398</td> </tr> </table>	Cars	384	Trucks	8	Heavys	6	Totals	398	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">94</td> <td style="text-align: right;">129</td> <td style="text-align: right;">39</td> <td style="border-left: 1px solid black; text-align: right;">262</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="border-left: 1px solid black; text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Heavys</td> <td style="text-align: right;">3</td> <td style="text-align: right;">2</td> <td style="text-align: right;">5</td> <td style="border-left: 1px solid black; text-align: right;">10</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">97</td> <td style="text-align: right;">131</td> <td style="text-align: right;">45</td> <td style="border-left: 1px solid black;"></td> </tr> </table>	Cars	94	129	39	262	Trucks	0	0	1	1	Heavys	3	2	5	10	Totals	97	131	45		Peds Cross: South Peds: 0 South Entering: 273 South Leg Total: 671
Cars	384																														
Trucks	8																														
Heavys	6																														
Totals	398																														
Cars	94	129	39	262																											
Trucks	0	0	1	1																											
Heavys	3	2	5	10																											
Totals	97	131	45																												

Comments

Total Count Diagram

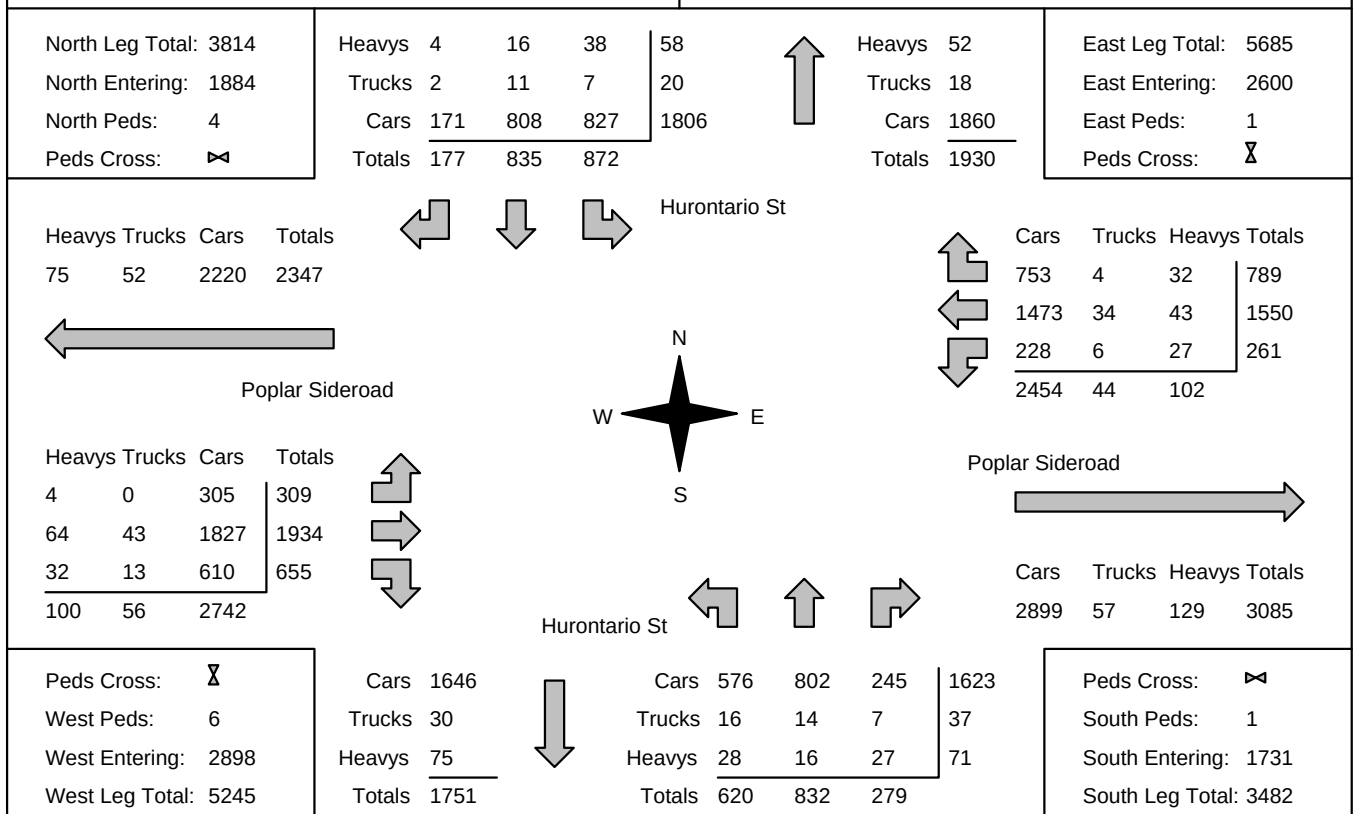
Municipality: Collingwood
Site #: 2410900001
Intersection: Poplar Sideroad & Hurontario St
TFR File #: 1
Count date: 19-Jun-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs W/E



Comments

Traffic Count Summary

Intersection: Poplar Sideroad & Hurontario St					Count Date: 19-Jun-24		Municipality: Collingwood					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	147	101	19	267	2	547	8:00:00	89	133	58	280	1
9:00:00	143	98	27	268	1	613	9:00:00	126	154	65	345	0
10:00:00	112	109	27	248	0	550	10:00:00	121	130	51	302	0
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	159	163	40	362	0	627	16:00:00	94	137	34	265	0
17:00:00	153	201	35	389	0	661	17:00:00	100	135	37	272	0
18:00:00	158	163	29	350	1	617	18:00:00	90	143	34	267	0
Totals:	872	835	177	1884	4	3615	S Totals:	620	832	279	1731	1
East Approach Totals						East/West Total Approaches	West Approach Totals					
Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds		Hour Ending	Includes Cars, Trucks, & Heavys				Total Peds
	Left	Thru	Right	Grand Total				Left	Thru	Right	Grand Total	
7:00:00	0	0	0	0	0	0	7:00:00	0	0	0	0	0
8:00:00	37	190	167	394	0	749	8:00:00	43	239	73	355	1
9:00:00	46	308	144	498	0	977	9:00:00	59	320	100	479	0
10:00:00	35	233	113	381	0	839	10:00:00	54	288	116	458	1
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	42	242	110	394	1	918	16:00:00	64	348	112	524	0
17:00:00	56	278	123	457	0	1025	17:00:00	51	382	135	568	3
18:00:00	45	299	132	476	0	990	18:00:00	38	357	119	514	1
Totals:	261	1550	789	2600	1	5498	W Totals:	309	1934	655	2898	6
Calculated Values for Traffic Crossing Major Street												
Hours Ending:	7:00	8:00	9:00	10:00			15:00	16:00	17:00	18:00		
Crossing Values:	0	370	423	364			0	417	457	412		



Count Date: 19-Jun-24 Site #: 2410900001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Heavys - North Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		North Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	26	26	16	16	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	47	21	39	23	5	1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
7:45:00	84	37	59	20	8	3	1	1	1	1	0	0	0	0	1	1	0	0	2	1
8:00:00	130	46	95	36	17	9	1	0	1	0	1	1	16	16	5	4	1	1	2	0
8:15:00	170	40	127	32	24	7	1	0	1	0	1	0	16	0	5	0	1	0	3	1
8:30:00	202	32	152	25	30	6	2	1	2	1	1	0	16	0	5	0	1	0	3	0
8:45:00	227	25	171	19	33	3	2	0	2	0	1	0	17	1	5	0	2	1	3	0
9:00:00	265	38	190	19	43	10	2	0	4	2	1	0	23	6	5	0	2	0	3	0
9:15:00	297	32	226	36	52	9	2	0	5	1	1	0	26	3	7	2	2	0	3	0
9:30:00	323	26	256	30	58	6	2	0	5	0	1	0	26	0	7	0	2	0	3	0
9:45:00	349	26	277	21	62	4	2	0	7	2	1	0	26	0	7	0	2	0	3	0
10:00:00	372	23	294	17	70	8	3	1	7	0	1	0	27	1	7	0	2	0	3	0
10:15:00	372	0	294	0	70	0	3	0	7	0	1	0	27	0	7	0	2	0	3	0
15:00:00	372	0	294	0	70	0	3	0	7	0	1	0	27	0	7	0	2	0	3	0
15:15:00	400	28	333	39	75	5	3	0	7	0	1	0	29	2	8	1	2	0	3	0
15:30:00	431	31	368	35	84	9	3	0	7	0	1	0	30	1	9	1	2	0	3	0
15:45:00	472	41	419	51	97	13	5	2	7	0	1	0	35	5	10	1	2	0	3	0
16:00:00	519	47	454	35	109	12	6	1	7	0	1	0	36	1	10	0	3	1	3	0
16:15:00	567	48	493	39	119	10	6	0	7	0	2	1	37	1	11	1	3	0	3	0
16:30:00	601	34	553	60	126	7	7	1	7	0	2	0	37	0	12	1	3	0	3	0
16:45:00	633	32	604	51	131	5	7	0	7	0	2	0	38	1	12	0	3	0	3	0
17:00:00	669	36	652	48	142	11	7	0	7	0	2	0	38	0	13	1	4	1	3	0
17:15:00	720	51	691	39	148	6	7	0	7	0	2	0	38	0	13	0	4	0	4	1
17:30:00	769	49	747	56	155	7	7	0	9	2	2	0	38	0	13	0	4	0	4	0
17:45:00	800	31	776	29	166	11	7	0	9	0	2	0	38	0	14	1	4	0	4	0
18:00:00	827	27	808	32	171	5	7	0	11	2	2	0	38	0	16	2	4	0	4	0
18:15:00	827	0	808	0	171	0	7	0	11	0	2	0	38	0	16	0	4	0	4	0
18:15:15	827	0	808	0	171	0	7	0	11	0	2	0	38	0	16	0	4	0	4	0



Count Date: 19-Jun-24 Site #: 2410900001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Heavys - South Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		South Cross	
	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr	Cum	Incr
7:00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15:00	19	19	13	13	12	12	0	0	1	1	0	0	0	0	1	1	1	1	0	0
7:30:00	42	23	39	26	19	7	1	1	1	0	0	0	2	2	1	0	2	1	0	0
7:45:00	60	18	73	34	26	7	2	1	3	2	1	1	3	1	6	5	4	2	1	1
8:00:00	79	19	118	45	52	26	4	2	6	3	1	0	6	3	9	3	5	1	1	0
8:15:00	97	18	154	36	69	17	5	1	6	0	1	0	7	1	11	2	5	0	1	0
8:30:00	135	38	189	35	87	18	7	2	7	1	1	0	8	1	11	0	6	1	1	0
8:45:00	161	26	228	39	97	10	8	1	9	2	3	2	10	2	11	0	7	1	1	0
9:00:00	194	33	267	39	110	13	8	0	9	0	4	1	13	3	11	0	9	2	1	0
9:15:00	226	32	303	36	120	10	10	2	9	0	4	0	15	2	12	1	11	2	1	0
9:30:00	260	34	346	43	134	14	11	1	10	1	4	0	15	0	12	0	15	4	1	0
9:45:00	289	29	370	24	143	9	13	2	11	1	4	0	17	2	12	0	17	2	1	0
10:00:00	304	15	393	23	150	7	14	1	12	1	5	1	18	1	12	0	19	2	1	0
10:15:00	304	0	393	0	150	0	14	0	12	0	5	0	18	0	12	0	19	0	1	0
15:00:00	304	0	393	0	150	0	14	0	12	0	5	0	18	0	12	0	19	0	1	0
15:15:00	323	19	414	21	159	9	14	0	12	0	5	0	20	2	12	0	20	1	1	0
15:30:00	347	24	452	38	164	5	15	1	13	1	6	1	21	1	12	0	21	1	1	0
15:45:00	362	15	480	28	171	7	15	0	13	0	6	0	22	1	13	1	22	1	1	0
16:00:00	392	30	528	48	180	9	15	0	13	0	6	0	23	1	13	0	22	0	1	0
16:15:00	411	19	564	36	187	7	16	1	13	0	6	0	24	1	13	0	22	0	1	0
16:30:00	443	32	600	36	194	7	16	0	13	0	6	0	25	1	13	0	22	0	1	0
16:45:00	459	16	626	26	203	9	16	0	13	0	6	0	28	3	13	0	24	2	1	0
17:00:00	486	27	661	35	215	12	16	0	13	0	6	0	28	0	15	2	24	0	1	0
17:15:00	511	25	705	44	228	13	16	0	13	0	7	1	28	0	15	0	25	1	1	0
17:30:00	537	26	729	24	233	5	16	0	13	0	7	0	28	0	15	0	27	2	1	0
17:45:00	552	15	760	31	241	8	16	0	14	1	7	0	28	0	15	0	27	0	1	0
18:00:00	576	24	802	42	245	4	16	0	14	0	7	0	28	0	16	1	27	0	1	0
18:15:00	576	0	802	0	245	0	16	0	14	0	7	0	28	0	16	0	27	0	1	0
18:15:15	576	0	802	0	245	0	16	0	14	0	7	0	28	0	16	0	27	0	1	0

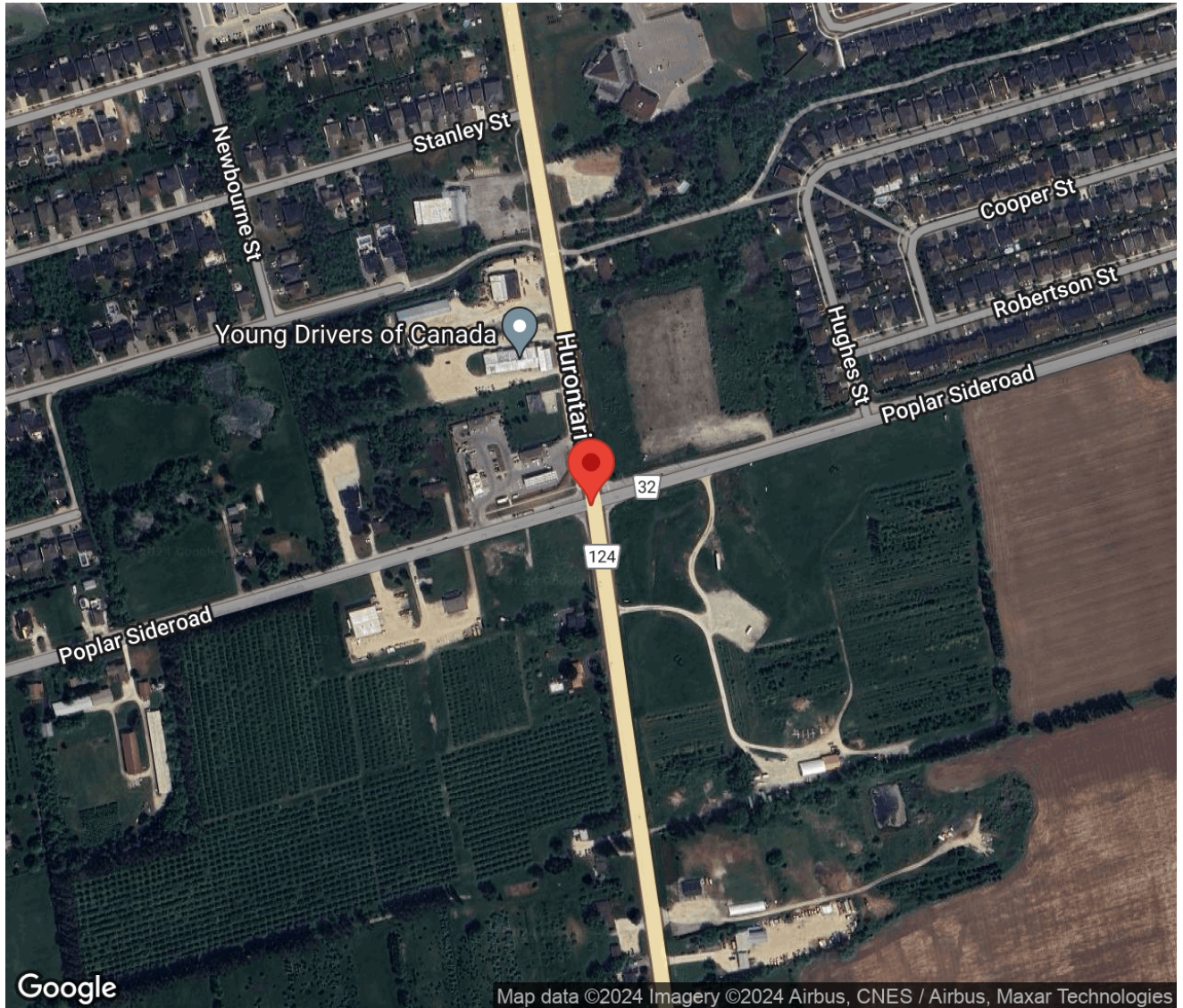
Project #24-321 - County of Simcoe

Intersection Count Report

Intersection: CR 124 & Poplar Sideroad
Municipality: Collingwood
Count Date: Thursday, Aug 01, 2024
Site Code: 2432100001
Count Categories: Cars, Light Trucks, Medium Trucks, Heavy Trucks, Bicycles, Peds
Count Period: 06:00-09:00, 11:00-13:00, 15:00-18:00
Weather: Clear
Comments:

Traffic Count Map

Intersection:	CR 124 & Poplar Sideroad
Site Code:	2432100001
Municipality:	Collingwood
Count Date:	Aug 01, 2024



Traffic Count Summary

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

CR 124 - Traffic Summary

Hour	North Approach Totals						South Approach Totals						Total
	Includes Cars, Light Trucks, Medium Trucks, Heavy Trucks, Bicycles						Includes Cars, Light Trucks, Medium Trucks, Heavy Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
06:00 - 07:00	24	38	3	0	65	0	58	53	22	0	133	0	198
07:00 - 08:00	85	83	19	0	187	1	92	91	54	0	237	0	424
08:00 - 09:00	104	78	14	0	196	0	129	161	79	0	369	0	565
BREAK													
11:00 - 12:00	119	168	27	0	314	2	110	164	41	0	315	0	629
12:00 - 13:00	100	163	40	0	303	1	92	139	44	0	275	0	578
BREAK													
15:00 - 16:00	106	162	23	0	291	2	101	141	46	0	288	0	579
16:00 - 17:00	145	191	37	0	373	0	105	151	50	0	306	0	679
17:00 - 18:00	147	164	24	0	335	0	94	124	47	0	265	0	600
GRAND TOTAL	830	1047	187	0	2064	6	781	1024	383	0	2188	0	4252

Traffic Count Summary

Intersection: CR 124 & Poplar Sideroad
 Site Code: 2432100001
 Municipality: Collingwood
 Count Date: Aug 01, 2024

Poplar Sideroad - Traffic Summary

Hour	East Approach Totals						West Approach Totals						Total
	Includes Cars, Light Trucks, Medium Trucks, Heavy Trucks, Bicycles						Includes Cars, Light Trucks, Medium Trucks, Heavy Trucks, Bicycles						
	Left	Thru	Right	U-Turn	Total	Peds	Left	Thru	Right	U-Turn	Total	Peds	
06:00 - 07:00	17	132	18	0	167	0	20	91	36	0	147	0	314
07:00 - 08:00	39	210	54	0	303	0	24	240	74	0	338	0	641
08:00 - 09:00	42	297	87	0	426	0	54	273	81	0	408	0	834
BREAK													
11:00 - 12:00	32	221	87	0	340	0	51	294	126	0	471	0	811
12:00 - 13:00	38	252	101	0	391	0	46	345	99	0	490	0	881
BREAK													
15:00 - 16:00	45	274	108	0	427	0	36	359	105	0	500	0	927
16:00 - 17:00	53	322	142	0	517	0	30	368	110	0	508	0	1025
17:00 - 18:00	53	274	111	0	438	0	28	378	99	0	505	1	943
GRAND TOTAL	319	1982	708	0	3009	0	289	2348	730	0	3367	1	6376

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

North Approach - CR 124

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
Start Time					Total					Total					Total					Total					Total	
06:00	2	7	0	0	9	0	1	0	0	1	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
06:15	2	5	0	0	7	2	2	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30	4	5	1	0	10	2	4	0	0	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45	5	9	2	0	16	6	5	0	0	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00	15	14	5	0	34	7	5	3	0	15	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:15	12	15	4	0	31	5	3	0	0	8	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:30	19	18	0	0	37	6	4	0	0	10	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
07:45	15	13	4	0	32	4	8	3	0	15	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	1
08:00	17	16	1	0	34	4	4	1	0	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:15	20	11	2	0	33	7	5	0	0	12	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
08:30	15	13	3	0	31	5	6	0	0	11	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0
08:45	25	19	3	0	47	8	2	4	0	14	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	151	145	25	0	321	56	49	11	0	116	4	5	0	0	9	2	0	0	0	0	2	0	0	0	0	1

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

North Approach - CR 124

Start Time	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	←	↑	→	↺	Total	
11:00	24	48	3	0	75	6	8	2	0	16	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:15	21	32	4	0	57	13	6	2	0	21	0	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0
11:30	22	22	5	0	49	7	5	2	0	14	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
11:45	16	40	4	0	60	7	5	4	0	16	1	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0
12:00	20	27	8	0	55	5	11	2	0	18	1	3	0	0	4	0	0	0	0	0	0	0	0	0	0	0
12:15	18	38	5	0	61	5	11	2	0	18	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	1
12:30	22	29	2	0	53	3	9	5	0	17	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
12:45	17	28	12	0	57	8	5	4	0	17	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0
SUBTOTAL	160	264	43	0	467	54	60	23	0	137	4	6	1	0	11	1	1	0	0	2	0	0	0	0	0	3

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

North Approach - CR 124

Start Time	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	23	24	1	0	48	5	8	1	0	14	0	3	0	0	3	0	0	0	0	0	1	0	0	0	1	2
15:15	14	32	3	0	49	4	7	1	0	12	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
15:30	22	40	4	0	66	6	6	2	0	14	2	1	0	0	3	1	1	0	0	2	0	0	0	0	0	0
15:45	24	29	10	0	63	3	8	1	0	12	1	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0
16:00	33	57	8	0	98	8	12	0	0	20	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16:15	27	34	10	0	71	11	12	0	0	23	4	0	1	0	5	0	0	0	0	0	0	0	0	0	0	0
16:30	23	28	4	0	55	6	10	6	0	22	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0
16:45	21	27	7	0	55	11	8	1	0	20	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:00	24	34	6	0	64	10	5	1	0	16	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
17:15	29	35	3	0	67	8	8	2	0	18	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
17:30	26	36	3	0	65	13	6	1	0	20	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
17:45	22	24	6	0	52	14	13	2	0	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SUBTOTAL	288	400	65	0	753	99	103	18	0	220	9	11	1	0	21	1	3	0	0	4	1	0	0	0	1	2
GRAND TOTAL	599	809	133	0	1541	209	212	52	0	473	17	22	2	0	41	4	4	0	0	8	1	0	0	0	1	6

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

South Approach - CR 124

Start Time	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
06:00	4	5	0	0	9	4	2	1	0	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15	6	8	1	0	15	3	3	0	0	6	0	0	0	0	0	3	0	2	0	5	0	0	0	0	0	0
06:30	7	14	4	0	25	7	4	3	0	14	0	2	0	0	2	2	0	1	0	3	0	0	0	0	0	0
06:45	11	10	6	0	27	9	5	3	0	17	1	0	0	0	1	1	0	1	0	2	0	0	0	0	0	0
07:00	13	17	3	0	33	6	3	6	0	15	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
07:15	8	8	6	0	22	4	13	3	0	20	0	0	1	0	1	3	1	0	0	4	0	0	0	0	0	0
07:30	12	6	5	0	23	10	10	3	0	23	2	1	0	0	3	1	1	1	0	3	0	0	0	0	0	0
07:45	17	19	17	0	53	10	11	6	0	27	0	1	0	0	1	6	0	2	0	8	0	0	0	0	0	0
08:00	15	19	7	0	41	8	9	7	0	24	5	1	1	0	7	8	0	1	0	9	0	0	0	0	0	0
08:15	21	28	14	0	63	10	11	9	0	30	4	0	2	0	6	1	2	1	0	4	0	0	0	0	0	0
08:30	22	38	5	0	65	4	10	9	0	23	2	1	1	0	4	3	0	2	0	5	0	0	0	0	0	0
08:45	22	33	11	0	66	3	7	8	0	18	0	1	0	0	1	1	1	1	0	3	0	0	0	0	0	0
SUBTOTAL	158	205	79	0	442	78	88	58	0	224	14	7	5	0	26	29	5	13	0	47	0	0	0	0	0	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

South Approach - CR 124

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles							
Start Time					Total					Total					Total					Total					Total	Total Peds		
11:00	16	28	3	0	47	6	5	4	0	15	1	1	1	0	3	0	0	2	0	2	0	1	0	1	0	0	0	0
11:15	14	39	8	0	61	7	7	2	0	16	2	1	0	0	3	4	1	1	0	6	0	1	0	0	0	1	0	0
11:30	18	35	5	0	58	9	8	2	0	19	0	1	1	0	2	1	0	0	0	1	0	0	0	0	0	0	0	0
11:45	20	24	6	0	50	7	11	6	0	24	0	1	0	0	1	5	0	0	0	5	0	0	0	0	0	0	0	0
12:00	12	15	2	0	29	6	10	1	0	17	1	2	0	0	3	4	1	2	0	7	0	0	0	0	0	0	0	0
12:15	14	31	11	0	56	7	11	5	0	23	1	1	0	0	2	4	0	0	0	4	0	0	0	0	0	0	0	0
12:30	10	26	6	0	42	6	6	4	0	16	2	0	0	0	2	3	0	0	0	3	0	0	0	0	0	0	0	0
12:45	17	31	8	0	56	4	5	4	0	13	1	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0
SUBTOTAL	121	229	49	0	399	52	63	28	0	143	8	7	2	0	17	21	2	6	0	29	0	2	0	0	0	2	0	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

South Approach - CR 124

Start Time	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	21	27	7	0	55	4	6	4	0	14	2	0	0	0	2	1	0	0	0	1	0	0	0	0	0	0
15:15	16	24	2	0	42	2	6	4	0	12	0	0	0	0	0	1	0	4	0	5	0	0	0	0	0	0
15:30	11	26	8	0	45	4	12	4	0	20	0	1	0	0	1	5	0	1	0	6	0	1	0	0	1	0
15:45	25	28	7	0	60	3	9	1	0	13	2	0	2	0	4	4	1	2	0	7	0	0	0	0	0	0
16:00	12	25	5	0	42	8	10	2	0	20	0	1	0	0	1	0	0	1	0	1	0	0	0	0	0	0
16:15	24	28	10	0	62	6	12	3	0	21	0	1	0	0	1	1	0	0	0	1	0	0	0	0	0	0
16:30	21	36	7	0	64	5	4	2	0	11	0	0	1	0	1	4	0	3	0	7	0	0	0	0	0	0
16:45	18	24	11	0	53	5	10	4	0	19	0	0	0	0	0	1	0	1	0	2	0	0	0	0	0	0
17:00	14	29	8	0	51	7	6	3	0	16	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
17:15	17	22	12	0	51	2	5	3	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	20	16	7	0	43	10	8	2	0	20	0	0	1	0	1	0	1	2	0	3	0	0	0	0	0	0
17:45	18	31	4	0	53	6	6	1	0	13	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0
SUBTOTAL	217	316	88	0	621	62	94	33	0	189	4	3	4	0	11	17	2	18	0	37	0	1	0	0	1	0
GRAND TOTAL	496	750	216	0	1462	192	245	119	0	556	26	17	11	0	54	67	9	37	0	113	0	3	0	0	3	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

East Approach - Poplar Sideroad

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
Start Time					Total					Total					Total					Total						
06:00	2	13	0	0	15	0	5	1	0	6	1	1	0	0	2	0	0	0	0	0	0	0				
06:15	5	12	2	0	19	0	7	0	0	7	0	0	0	0	0	0	0	0	0	0	0	0				
06:30	1	24	6	0	31	0	11	3	0	14	1	0	0	0	1	2	0	0	0	2	0	0				
06:45	3	36	2	0	41	0	19	2	0	21	1	2	0	0	3	1	0	0	0	1	0	0				
07:00	7	25	6	0	38	1	10	3	0	14	2	2	0	0	4	2	0	0	0	2	0	0				
07:15	2	24	12	0	38	2	24	5	0	31	1	0	0	0	1	2	1	0	0	3	0	0				
07:30	5	32	8	0	45	1	23	1	0	25	0	2	1	0	3	0	0	0	0	0	0	0				
07:45	10	43	12	0	65	3	18	4	0	25	0	3	1	0	4	1	3	0	0	4	0	0				
08:00	5	39	7	0	51	1	18	6	0	25	0	4	1	0	5	2	2	0	0	4	0	0				
08:15	6	54	15	0	75	3	16	6	0	25	0	2	1	0	3	0	4	0	0	4	0	0				
08:30	6	42	11	0	59	1	24	6	0	31	0	4	1	0	5	1	1	0	0	2	0	0				
08:45	11	62	28	0	101	4	22	5	0	31	2	1	0	0	3	0	1	0	0	1	0	0				
SUBTOTAL	63	406	109	0	578	16	197	42	0	255	8	21	5	0	34	11	12	0	0	23	0	3				

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
 Site Code: 2432100001
 Municipality: Collingwood
 Count Date: Aug 01, 2024

East Approach - Poplar Sideroad

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
Start Time					Total					Total					Total					Total					Total	
11:00	3	44	11	0	58	3	9	4	0	16	0	5	1	0	6	0	0	0	0	0	0	0	0	0	0	0
11:15	9	28	11	0	48	4	16	2	0	22	1	7	1	0	9	1	0	0	0	1	0	0	0	0	0	0
11:30	1	35	20	0	56	0	12	6	0	18	1	0	2	0	3	0	1	0	0	1	0	0	0	0	0	0
11:45	7	48	19	0	74	0	14	8	0	22	1	2	2	0	5	1	0	0	0	1	0	0	0	0	0	0
12:00	4	49	22	0	75	5	19	5	0	29	1	1	0	0	2	0	0	0	0	0	1	1	0	0	2	0
12:15	8	46	23	0	77	5	13	6	0	24	0	1	0	0	1	0	1	1	0	2	0	0	1	0	1	0
12:30	7	45	13	0	65	1	19	7	0	27	0	0	1	0	1	0	4	0	0	4	0	0	0	0	0	0
12:45	4	43	20	0	67	2	8	1	0	11	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	0
SUBTOTAL	43	338	139	0	520	20	110	39	0	169	4	18	7	0	29	3	6	1	0	10	0	1	2	0	3	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

East Approach - Poplar Sideroad

Start Time	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	←	↑	→	↻	Total	
15:00	10	41	18	0	69	2	13	4	0	19	0	1	1	0	2	0	2	0	0	2	0	0	0	0	0	0
15:15	6	51	19	0	76	3	14	6	0	23	0	4	0	0	4	0	1	0	0	1	0	0	0	0	0	0
15:30	9	68	18	0	95	3	16	9	0	28	1	0	0	0	1	0	1	0	0	1	0	0	0	0	0	0
15:45	6	52	26	0	84	4	9	6	0	19	0	1	1	0	2	1	0	0	0	1	0	0	0	0	0	0
16:00	6	53	23	0	82	3	10	12	0	25	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0
16:15	8	55	31	0	94	6	18	13	0	37	1	2	0	0	3	1	2	0	0	3	0	0	0	0	0	0
16:30	10	84	36	0	130	3	15	3	0	21	0	1	0	0	1	1	1	0	0	2	0	0	0	0	0	0
16:45	7	65	18	0	90	4	15	5	0	24	0	0	0	0	0	1	1	0	0	2	0	0	0	0	0	0
17:00	10	46	18	0	74	5	13	5	0	23	0	2	0	0	2	1	0	0	0	1	0	0	0	0	0	0
17:15	12	62	27	0	101	5	14	7	0	26	1	1	1	0	3	0	1	0	0	1	0	0	0	0	0	0
17:30	6	49	17	0	72	4	11	7	0	22	0	1	0	0	1	0	1	0	0	1	0	0	0	0	0	0
17:45	6	61	22	0	89	1	11	7	0	19	0	1	0	0	1	2	0	0	0	2	0	0	0	0	0	0
SUBTOTAL	96	687	273	0	1056	43	159	84	0	286	5	14	4	0	23	7	10	0	0	17	0	0	0	0	0	0
GRAND TOTAL	202	1431	521	0	2154	79	466	165	0	710	17	53	16	0	86	21	28	1	0	50	0	4	5	0	9	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

West Approach - Poplar Sideroad

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
Start Time					Total					Total					Total					Total						
06:00	0	10	5	0	15	0	7	0	0	7	0	1	0	0	1	0	1	0	0	0	0	0				
06:15	4	3	10	0	17	3	4	0	0	7	0	1	0	0	1	0	0	0	0	0	0	0				
06:30	3	12	6	0	21	2	10	3	0	15	0	2	0	0	2	0	1	0	0	0	0	0				
06:45	3	29	9	0	41	4	10	2	0	16	0	0	0	0	0	1	0	1	0	2	0	0				
07:00	2	32	9	0	43	2	16	5	0	23	0	0	0	0	0	0	1	3	0	4	0	0				
07:15	4	43	7	0	54	2	12	6	0	20	0	1	0	0	1	0	1	0	0	1	0	0				
07:30	4	38	15	0	57	2	8	9	0	19	0	1	1	0	2	0	0	1	0	1	0	0				
07:45	4	66	8	0	78	4	18	6	0	28	0	2	0	0	2	0	1	4	0	5	0	0				
08:00	7	38	19	0	64	1	10	9	0	20	1	3	1	0	5	0	0	0	0	0	0	0				
08:15	8	52	11	0	71	1	14	3	0	18	1	3	2	0	6	0	0	4	0	4	0	0				
08:30	9	48	10	0	67	5	7	6	0	18	1	1	1	0	3	1	2	1	0	4	0	1				
08:45	14	68	11	0	93	4	20	2	0	26	0	5	0	0	5	1	1	1	0	3	0	0				
SUBTOTAL	62	439	120	0	621	30	136	51	0	217	3	20	5	0	28	3	8	15	0	26	0	1				

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
 Site Code: 2432100001
 Municipality: Collingwood
 Count Date: Aug 01, 2024

West Approach - Poplar Sideroad

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					Total Peds
Start Time					Total					Total					Total					Total					Total	
11:00	8	67	20	0	95	3	15	9	0	27	0	2	2	0	4	0	2	7	0	9	0	0	0	0	0	0
11:15	7	55	14	0	76	0	8	7	0	15	1	1	0	0	2	0	2	2	0	4	0	0	0	0	0	0
11:30	11	60	28	0	99	3	16	10	0	29	2	5	0	0	7	0	0	0	0	0	0	0	0	0	0	0
11:45	9	44	19	0	72	7	11	7	0	25	0	4	0	0	4	0	2	1	0	3	0	0	0	0	0	0
12:00	8	60	12	0	80	4	9	6	0	19	0	3	0	0	3	1	1	4	0	6	0	0	0	0	0	0
12:15	6	65	17	0	88	5	19	6	0	30	0	3	0	0	3	0	3	3	0	6	0	0	0	0	0	0
12:30	3	80	16	0	99	2	7	8	0	17	0	1	0	0	1	0	5	1	0	6	0	0	0	0	0	0
12:45	14	62	21	0	97	3	23	5	0	31	0	1	0	0	1	0	3	0	0	3	0	0	0	0	0	0
SUBTOTAL	66	493	147	0	706	27	108	58	0	193	3	20	2	0	25	1	18	18	0	37	0	0	0	0	0	0

Traffic Count Data

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Municipality: Collingwood
Count Date: Aug 01, 2024

West Approach - Poplar Sideroad

	Cars					Light Trucks					Medium Trucks					Heavy Trucks					Bicycles					
Start Time					Total					Total					Total					Total					Total	Total Peds
15:00	10	52	17	0	79	2	16	4	0	22	0	4	0	0	4	0	0	5	0	5	0	0	0	0	0	0
15:15	4	58	12	0	74	3	21	5	0	29	0	1	2	0	3	0	0	1	0	1	0	0	0	0	0	0
15:30	6	71	15	0	92	0	29	8	0	37	0	2	1	0	3	0	0	1	0	1	0	0	0	0	0	0
15:45	8	77	24	0	109	2	24	7	0	33	1	4	2	0	7	0	0	1	0	1	0	0	0	0	0	0
16:00	8	49	14	0	71	3	34	5	0	42	0	2	0	0	2	0	1	3	0	4	0	0	0	0	0	0
16:15	3	70	25	0	98	2	23	8	0	33	0	2	0	0	2	0	2	2	0	4	0	0	0	0	0	0
16:30	5	74	25	0	104	2	30	7	0	39	0	3	0	0	3	0	1	2	0	3	0	0	0	0	0	0
16:45	6	49	11	0	66	1	27	6	0	34	0	1	2	0	3	0	0	0	0	0	0	0	0	0	0	0
17:00	3	75	19	0	97	1	24	6	0	31	0	1	1	0	2	0	1	0	0	1	0	0	0	0	0	0
17:15	6	88	23	0	117	1	22	3	0	26	0	4	0	0	4	0	0	0	0	0	0	0	0	0	0	1
17:30	8	58	24	0	90	3	25	5	0	33	0	3	0	0	3	0	0	0	0	0	0	0	0	0	0	0
17:45	6	64	16	0	86	0	12	2	0	14	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0
SUBTOTAL	73	785	225	0	1083	20	287	66	0	373	1	27	8	0	36	0	6	15	0	21	0	0	0	0	0	1
GRAND TOTAL	201	1717	492	0	2410	77	531	175	0	783	7	67	15	0	89	4	32	48	0	84	0	1	0	0	1	1

Peak Hour Diagram

Specified Period

From: 06:00:00
To: 09:00:00

One Hour Peak

From: 08:00:00
To: 09:00:00

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Count Date: Aug 01, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs E/W

North Approach

	Out	In	Total
	145	217	362
LT	46	71	117
MT	4	9	13
HT	1	5	6
	0	0	0
Totals	196	302	498

CR 124

	0	0	0	0
HT	0	0	1	0
MT	0	2	2	0
LT	5	17	24	0
	9	59	77	0
Totals	14	78	104	0

East Approach

	Out	In	Total
	286	320	606
LT	112	108	220
MT	16	18	34
HT	11	9	20
	1	1	2
Totals	426	456	882

Poplar Sideroad

	HT	MT	LT		Totals
	0	0	0	0	0
	0	2	3	38	54
	1	3	12	51	273
	0	6	4	20	81

Peds: 0



Poplar Sideroad

Totals		LT	MT	HT	
0	0	0	0	0	0
87	61	23	3	0	0
297	197	80	11	8	1
42	28	9	2	3	0

West Approach

	Out	In	Total
	295	286	581
LT	82	110	192
MT	19	22	41
HT	11	21	32
	1	1	2
Totals	408	440	848

Totals				
	80	118	37	0
LT	25	37	33	0
MT	11	3	4	0
HT	13	3	5	0
	0	0	0	0

CR 124

South Approach

	Out	In	Total
	235	138	373
LT	95	46	141
MT	18	8	26
HT	21	9	30
	0	0	0
Totals	369	201	570

- Cars

LT - Light Trucks

MT - Medium Trucks

HT - Heavy Trucks

- Bicycles

Comments

Peak Hour Summary

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Count Date: Aug 01, 2024
Period: 06:00 - 09:00

Peak Hour Data (08:00 - 09:00)

Start Time	North Approach CR 124						South Approach CR 124						East Approach Poplar Sideroad						West Approach Poplar Sideroad						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
08:00	21	20	2	0	0	43	36	29	16	0	0	81	8	63	14	0	0	85	9	51	29	0	0	89	298
08:15	28	17	2	0	0	47	36	41	26	0	0	103	9	76	22	0	0	107	10	69	20	0	0	99	356
08:30	21	20	3	0	0	44	31	49	17	0	0	97	8	72	18	0	0	98	16	59	18	0	0	93	332
08:45	34	21	7	0	0	62	26	42	20	0	0	88	17	86	33	0	0	136	19	94	14	0	0	127	413
Grand Total	104	78	14	0	0	196	129	161	79	0	0	369	42	297	87	0	0	426	54	273	81	0	0	408	1399
Approach %	53.1	39.8	7.1	0	-	-	35	43.6	21.4	0	-	-	9.9	69.7	20.4	0	-	-	13.2	66.9	19.9	0	-	-	-
Totals %	7.4	5.6	1	0	-	14	9.2	11.5	5.6	0	-	26.4	3	21.2	6.2	0	-	30.5	3.9	19.5	5.8	0	-	29.2	-
PHF	0.76	0.93	0.5	0	-	0.79	0.9	0.82	0.76	0	-	0.9	0.62	0.86	0.66	0	-	0.78	0.71	0.73	0.7	0	-	0.8	0.85
Cars	77	59	9	0	-	145	80	118	37	0	-	235	28	197	61	0	-	286	38	206	51	0	-	295	961
% Cars	74	75.6	64.3	0	-	74	62	73.3	46.8	0	-	63.7	66.7	66.3	70.1	0	-	67.1	70.4	75.5	63	0	-	72.3	68.7
Light Trucks	24	17	5	0	-	46	25	37	33	0	-	95	9	80	23	0	-	112	11	51	20	0	-	82	335
% Light Trucks	23.1	21.8	35.7	0	-	23.5	19.4	23	41.8	0	-	25.7	21.4	26.9	26.4	0	-	26.3	20.4	18.7	24.7	0	-	20.1	23.9
Medium Trucks	2	2	0	0	-	4	11	3	4	0	-	18	2	11	3	0	-	16	3	12	4	0	-	19	57
% Medium Trucks	1.9	2.6	0	0	-	2	8.5	1.9	5.1	0	-	4.9	4.8	3.7	3.4	0	-	3.8	5.6	4.4	4.9	0	-	4.7	4.1
Heavy Trucks	1	0	0	0	-	1	13	3	5	0	-	21	3	8	0	0	-	11	2	3	6	0	-	11	44
% Heavy Trucks	1	0	0	0	-	0.5	10.1	1.9	6.3	0	-	5.7	7.1	2.7	0	0	-	2.6	3.7	1.1	7.4	0	-	2.7	3.1
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	0	0	-	1	0	1	0	0	-	1	2
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0.3	0	0	-	0.2	0	0.4	0	0	-	0.2	0.1
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	

Peak Hour Diagram

Specified Period

From: 11:00:00
To: 13:00:00

One Hour Peak

From: 11:30:00
To: 12:30:00

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Count Date: Aug 01, 2024

Weather conditions: Clear

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs E/W

North Approach

	Out	In	Total
Car	225	223	448
LT	66	84	150
MT	8	11	19
HT	0	3	3
Bike	0	2	2
Totals	299	323	622

CR 124

Bike	0	0	0	0
HT	0	0	0	0
MT	1	4	3	0
LT	10	32	24	0
Car	22	127	76	0
Totals	33	163	103	0






East Approach

	Out	In	Total
Car	282	329	611
LT	93	93	186
MT	11	19	30
HT	4	8	12
Bike	3	0	3
Totals	393	449	842

Poplar Sideroad

	HT	MT	LT	Car	Totals
Bike	0	0	0	0	0
Car	0	1	2	19	34
LT	0	6	15	55	229
MT	0	8	0	29	76
Totals	0	116	243	34	0






Peds: 2

Peds: 0	N	E	S	W
Peds: 0				
Peds: 0				
Peds: 0				

Poplar Sideroad

	Car	LT	MT	HT	Bike
Car	0	0	0	0	0
LT	84	25	4	1	2
MT	178	58	4	2	1
HT	20	10	3	1	0
Totals	0	116	243	34	0






West Approach

	Out	In	Total
Car	339	264	603
LT	103	97	200
MT	17	7	24
HT	15	16	31
Bike	0	1	1
Totals	474	385	859

Totals	109	151	41	0
Car	64	105	24	0
LT	29	40	14	0
MT	2	5	1	0
HT	14	1	2	0
Bike	0	0	0	0

CR 124

South Approach

	Out	In	Total
Car	193	223	416
LT	83	71	154
MT	8	7	15
HT	17	9	26
Bike	0	0	0
Totals	301	310	611

Car - Cars

LT - Light Trucks

MT - Medium Trucks

HT - Heavy Trucks

Bike - Bicycles

Comments

Peak Hour Summary

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Count Date: Aug 01, 2024
Period: 11:00 - 13:00

Peak Hour Data (11:30 - 12:30)

Start Time	North Approach CR 124						South Approach CR 124						East Approach Poplar Sideroad						West Approach Poplar Sideroad						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
11:30	30	27	7	0	1	64	28	44	8	0	0	80	2	48	28	0	0	78	16	81	38	0	0	135	357
11:45	24	45	9	0	0	78	32	36	12	0	0	80	9	64	29	0	0	102	16	61	27	0	0	104	364
12:00	26	41	10	0	0	77	23	28	5	0	0	56	10	70	28	0	0	108	13	73	22	0	0	108	349
12:15	23	50	7	0	1	80	26	43	16	0	0	85	13	61	31	0	0	105	11	90	26	0	0	127	397
Grand Total	103	163	33	0	2	299	109	151	41	0	0	301	34	243	116	0	0	393	56	305	113	0	0	474	1467
Approach %	34.4	54.5	11	0	-	-	36.2	50.2	13.6	0	-	-	8.7	61.8	29.5	0	-	-	11.8	64.3	23.8	0	-	-	-
Totals %	7	11.1	2.2	0	-	20.4	7.4	10.3	2.8	0	-	20.5	2.3	16.6	7.9	0	-	26.8	3.8	20.8	7.7	0	-	32.3	-
PHF	0.86	0.82	0.83	0	-	0.93	0.85	0.86	0.64	0	-	0.89	0.65	0.87	0.94	0	-	0.91	0.88	0.85	0.74	0	-	0.88	0.92
Cars	76	127	22	0	-	225	64	105	24	0	-	193	20	178	84	0	-	282	34	229	76	0	-	339	1039
% Cars	73.8	77.9	66.7	0	-	75.3	58.7	69.5	58.5	0	-	64.1	58.8	73.3	72.4	0	-	71.8	60.7	75.1	67.3	0	-	71.5	70.8
Light Trucks	24	32	10	0	-	66	29	40	14	0	-	83	10	58	25	0	-	93	19	55	29	0	-	103	345
% Light Trucks	23.3	19.6	30.3	0	-	22.1	26.6	26.5	34.1	0	-	27.6	29.4	23.9	21.6	0	-	23.7	33.9	18	25.7	0	-	21.7	23.5
Medium Trucks	3	4	1	0	-	8	2	5	1	0	-	8	3	4	4	0	-	11	2	15	0	0	-	17	44
% Medium Trucks	2.9	2.5	3	0	-	2.7	1.8	3.3	2.4	0	-	2.7	8.8	1.6	3.4	0	-	2.8	3.6	4.9	0	0	-	3.6	3
Heavy Trucks	0	0	0	0	-	0	14	1	2	0	-	17	1	2	1	0	-	4	1	6	8	0	-	15	36
% Heavy Trucks	0	0	0	0	-	0	12.8	0.7	4.9	0	-	5.6	2.9	0.8	0.9	0	-	1	1.8	2	7.1	0	-	3.2	2.5
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	1	2	0	-	3	0	0	0	0	-	0	3
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0.4	1.7	0	-	0.8	0	0	0	0	-	0	0.2
Peds	-	-	-	-	2	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	2
% Peds	-	-	-	-	100	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-

Peak Hour Diagram

Specified Period

From: 15:00:00

To: 18:00:00

One Hour Peak

From: 15:45:00

To: 16:45:00

Intersection: CR 124 & Poplar Sideroad

Site Code: 2432100001

Count Date: Aug 01, 2024

Weather conditions:

Clear

**** Signalized Intersection ****

Major Road: Poplar Sideroad runs E/W

North Approach

	Out	In	Total
Car	287	257	544
LT	77	78	155
MT	11	5	16
HT	0	1	1
Bike	0	0	0
Totals	375	341	716

CR 124

Bike	0	0	0	0
HT	0	0	0	0
MT	1	4	6	0
LT	7	42	28	0
Car	32	148	107	0
Totals	40	194	141	0

East Approach

	Out	In	Total
Car	390	406	796
LT	102	147	249
MT	9	20	29
HT	6	10	16
Bike	0	0	0
Totals	507	583	1090

Poplar Sideroad

	HT	MT	LT	Car	Totals
Car	0	0	0	0	0
LT	0	0	1	9	24
MT	0	4	11	111	270
HT	0	8	2	27	88
Totals	0	34	396	125	

Peds: 0



Poplar Sideroad

Totals	Car	LT	MT	HT	Bike
0	0	0	0	0	0
152	116	34	2	0	0
303	244	52	4	3	0
52	30	16	3	3	0

West Approach

	Out	In	Total
Car	382	358	740
LT	147	81	228
MT	14	7	21
HT	12	12	24
Bike	0	0	0
Totals	555	458	1013

Totals	115	155	46	0
Car	82	117	29	0
LT	22	35	8	0
MT	2	2	3	0
HT	9	1	6	0
Bike	0	0	0	0

CR 124

South Approach

	Out	In	Total
Car	228	266	494
LT	65	85	150
MT	7	9	16
HT	16	11	27
Bike	0	0	0
Totals	316	371	687

Car - Cars

LT - Light Trucks

MT - Medium Trucks

HT - Heavy Trucks

Bike - Bicycles

Comments

Peak Hour Summary

Intersection: CR 124 & Poplar Sideroad
Site Code: 2432100001
Count Date: Aug 01, 2024
Period: 15:00 - 18:00

Peak Hour Data (15:45 - 16:45)

Start Time	North Approach CR 124						South Approach CR 124						East Approach Poplar Sideroad						West Approach Poplar Sideroad						Total Vehicles
	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	←	↑	→	↻	Peds	Total	
15:45	28	39	11	0	0	78	34	38	12	0	0	84	11	62	33	0	0	106	11	105	34	0	0	150	418
16:00	41	70	8	0	0	119	20	36	8	0	0	64	11	63	36	0	0	110	11	86	22	0	0	119	412
16:15	42	46	11	0	0	99	31	41	13	0	0	85	16	77	44	0	0	137	5	97	35	0	0	137	458
16:30	30	39	10	0	0	79	30	40	13	0	0	83	14	101	39	0	0	154	7	108	34	0	0	149	465
Grand Total	141	194	40	0	0	375	115	155	46	0	0	316	52	303	152	0	0	507	34	396	125	0	0	555	1753
Approach %	37.6	51.7	10.7	0	-	-	36.4	49.1	14.6	0	-	-	10.3	59.8	30	0	-	-	6.1	71.4	22.5	0	-	-	-
Totals %	8	11.1	2.3	0	-	21.4	6.6	8.8	2.6	0	-	18	3	17.3	8.7	0	-	28.9	1.9	22.6	7.1	0	-	31.7	-
PHF	0.84	0.69	0.91	0	-	0.79	0.85	0.95	0.88	0	-	0.93	0.81	0.75	0.86	0	-	0.82	0.77	0.92	0.89	0	-	0.93	0.94
Cars	107	148	32	0	-	287	82	117	29	0	-	228	30	244	116	0	-	390	24	270	88	0	-	382	1287
% Cars	75.9	76.3	80	0	-	76.5	71.3	75.5	63	0	-	72.2	57.7	80.5	76.3	0	-	76.9	70.6	68.2	70.4	0	-	68.8	73.4
Light Trucks	28	42	7	0	-	77	22	35	8	0	-	65	16	52	34	0	-	102	9	111	27	0	-	147	391
% Light Trucks	19.9	21.6	17.5	0	-	20.5	19.1	22.6	17.4	0	-	20.6	30.8	17.2	22.4	0	-	20.1	26.5	28	21.6	0	-	26.5	22.3
Medium Trucks	6	4	1	0	-	11	2	2	3	0	-	7	3	4	2	0	-	9	1	11	2	0	-	14	41
% Medium Trucks	4.3	2.1	2.5	0	-	2.9	1.7	1.3	6.5	0	-	2.2	5.8	1.3	1.3	0	-	1.8	2.9	2.8	1.6	0	-	2.5	2.3
Heavy Trucks	0	0	0	0	-	0	9	1	6	0	-	16	3	3	0	0	-	6	0	4	8	0	-	12	34
% Heavy Trucks	0	0	0	0	-	0	7.8	0.6	13	0	-	5.1	5.8	1	0	0	-	1.2	0	1	6.4	0	-	2.2	1.9
Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
% Bicycles	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0
Peds					0	-					0	-					0	-					0	-	0
% Peds					0	-					0	-					0	-					0	-	0

Appendix B: Level of Service Definitions

Level of Service – Unsignalized Intersections

Level of Service (LOS) for unsignalized intersections is defined in terms of control delay for each critical lane. Control delay includes initial deceleration, queue move-up time, stopped delay and final acceleration delay, and is a function of the service rate or capacity of the approach and degree of saturation.

The following table describes in detail the characteristics of each level of service, with A being the best and F being the worst.

LOS	EXPECTED DELAY TO STREET TRAFFIC	DELAY (sec/veh)
A	Little or no delays	$0 < d \leq 10$
B	Short traffic delays	$10 < d \leq 15$
C	Average traffic delays	$15 < d \leq 25$
D	Long traffic delays	$25 < d \leq 35$
E	Very long traffic delays	$35 < d \leq 50$
F	Extreme delays with queuing which may cause congestion affecting other traffic movements in the intersection	$50 < d$

source: 2010 Highway Capacity Manual

Level of Service – Signalized Intersections

Level of Service (LOS) for signalized intersections is defined in terms of delay, which is made up of a number of factors that relate to control, geometrics, traffic and incidents. Only the portion of total delay attributed to the control facility is quantified. This control delay includes initial deceleration, queue move-up time, stopped delay and final acceleration delay.

The following table describes in detail the characteristics of each level of service, with A being the best and F being the worst.

LOS	EXPECTED DELAY TO STREET TRAFFIC	DELAY (sec/veh)
A	This level of service occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all at this LOS. Short cycle lengths may also contribute to low delay.	$0 < d \leq 10$
B	This level generally occurs with good progression, short cycle lengths, or both. More vehicles stop at this level than at LOS A, causing longer average delays.	$10 < d \leq 20$
C	These higher delays may result from fair progression, longer cycle length, or both. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, though many still pass through the intersection without stopping.	$20 < d \leq 35$
D	At this level, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavourable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures become noticeable.	$35 < d \leq 55$
E	This level is considered by many agencies to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.	$55 < d \leq 80$
F	At this level, oversaturation occurs when arrival flow rates exceed the design capacity of the intersection. It may also occur at high v/c ratios below 1.0 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors to such high delay levels. LOS F is considered to be unacceptable to most drivers.	$80 < d$

source: 2010 Highway Capacity Manual

Appendix C: Existing Intersection Operations

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2024 Existing Conditions

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	59	332	102	45	313	179	154	183	79	161	125	28
Future Volume (vph)	59	332	102	45	313	179	154	183	79	161	125	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1782		1659	1847	1512	1755	1847	1570	1659	1796	
Flt Permitted	0.36	1.00		0.24	1.00	1.00	0.57	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	669	1782		418	1847	1512	1044	1847	1570	1091	1796	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	69	386	119	52	364	208	179	213	92	187	145	33
RTOR Reduction (vph)	0	13	0	0	0	141	0	0	54	0	9	0
Lane Group Flow (vph)	69	492	0	52	364	67	179	213	38	187	169	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	31.4	26.1		28.4	24.6	24.6	31.9	31.9	31.9	21.7	21.7	
Effective Green, g (s)	31.4	26.1		28.4	24.6	24.6	31.9	31.9	31.9	21.7	21.7	
Actuated g/C Ratio	0.41	0.34		0.37	0.32	0.32	0.42	0.42	0.42	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	348	605		215	591	484	500	767	652	308	507	
v/s Ratio Prot	c0.01	c0.28		c0.01	0.20		c0.03	0.12			0.09	
v/s Ratio Perm	0.07			0.08		0.04	0.12		0.02	c0.17		
v/c Ratio	0.20	0.81		0.24	0.62	0.14	0.36	0.28	0.06	0.61	0.33	
Uniform Delay, d1	14.5	23.1		16.8	22.1	18.6	14.7	14.8	13.5	23.9	21.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	8.2		0.6	1.9	0.1	0.4	0.2	0.0	3.4	0.4	
Delay (s)	14.8	31.4		17.4	24.0	18.7	15.1	15.0	13.5	27.2	22.2	
Level of Service	B	C		B	C	B	B	B	B	C	C	
Approach Delay (s)		29.4			21.7			14.8			24.8	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			22.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			76.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			81.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2024 Existing Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	409	136	65	319	165	115	157	46	196	249	40
Future Volume (vph)	41	409	136	65	319	165	115	157	46	196	249	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1813		1789	1883	1601	1789	1883	1601	1789	1844	
Flt Permitted	0.48	1.00		0.16	1.00	1.00	0.36	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	898	1813		302	1883	1601	685	1883	1601	1225	1844	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	44	440	146	70	343	177	124	169	49	211	268	43
RTOR Reduction (vph)	0	13	0	0	0	109	0	0	30	0	7	0
Lane Group Flow (vph)	44	573	0	70	343	68	124	169	19	211	304	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	33.3	29.5		36.1	30.9	30.9	30.2	30.2	30.2	22.0	22.0	
Effective Green, g (s)	33.3	29.5		36.1	30.9	30.9	30.2	30.2	30.2	22.0	22.0	
Actuated g/C Ratio	0.42	0.37		0.45	0.39	0.39	0.38	0.38	0.38	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	416	669		233	728	619	330	711	605	337	507	
v/s Ratio Prot	0.01	c0.32		c0.02	0.18		c0.02	0.09			0.17	
v/s Ratio Perm	0.04			0.12		0.04	0.12		0.01	c0.17		
v/c Ratio	0.11	0.86		0.30	0.47	0.11	0.38	0.24	0.03	0.63	0.60	
Uniform Delay, d1	14.0	23.2		15.2	18.4	15.7	17.2	17.0	15.6	25.3	25.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	10.5		0.7	0.5	0.1	0.7	0.2	0.0	3.6	2.0	
Delay (s)	14.2	33.7		15.9	18.9	15.8	17.9	17.2	15.7	29.0	27.1	
Level of Service	B	C		B	B	B	B	B	B	C	C	
Approach Delay (s)		32.4			17.6			17.2			27.9	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay	24.6			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.69											
Actuated Cycle Length (s)	79.9			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	87.3%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2024 Existing Conditions

1: CR 124/Hurontario St & Poplar S/R

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	29	352	102	15	308	90	112	167	31	105	196	30
Future Volume (vph)	29	352	102	15	308	90	112	167	31	105	196	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1820		1789	1883	1601	1789	1883	1601	1789	1846	
Flt Permitted	0.43	1.00		0.29	1.00	1.00	0.52	1.00	1.00	0.65	1.00	
Satd. Flow (perm)	819	1820		539	1883	1601	978	1883	1601	1224	1846	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	30	359	104	15	314	92	114	170	32	107	200	31
RTOR Reduction (vph)	0	12	0	0	0	64	0	0	18	0	6	0
Lane Group Flow (vph)	30	451	0	15	314	28	114	170	14	107	225	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	23.6	21.3		21.2	20.1	20.1	29.3	29.3	29.3	21.0	21.0	
Effective Green, g (s)	23.6	21.3		21.2	20.1	20.1	29.3	29.3	29.3	21.0	21.0	
Actuated g/C Ratio	0.35	0.32		0.32	0.30	0.30	0.44	0.44	0.44	0.31	0.31	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	323	581		191	567	482	494	827	703	385	581	
v/s Ratio Prot	c0.00	c0.25		0.00	0.17		c0.02	0.09			c0.12	
v/s Ratio Perm	0.03			0.02		0.02	0.08		0.01	0.09		
v/c Ratio	0.09	0.78		0.08	0.55	0.06	0.23	0.21	0.02	0.28	0.39	
Uniform Delay, d1	14.4	20.5		16.2	19.5	16.6	11.3	11.5	10.6	17.2	17.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	6.4		0.2	1.2	0.1	0.2	0.1	0.0	0.4	0.4	
Delay (s)	14.5	27.0		16.4	20.7	16.6	11.6	11.7	10.6	17.6	18.3	
Level of Service	B	C		B	C	B	B	B	B	B	B	
Approach Delay (s)		26.2			19.7			11.5			18.0	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.7		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			66.7		Sum of lost time (s)					18.0		
Intersection Capacity Utilization			73.1%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

Appendix D: Existing Queue Operations

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	T	R	L	TR
Maximum Queue (m)	25.5	88.7	23.6	76.6	32.4	40.8	42.6	19.1	59.9	58.0
Average Queue (m)	9.7	45.9	9.3	37.8	14.5	18.0	17.1	6.3	27.1	18.8
95th Queue (m)	19.7	75.4	20.9	63.2	25.8	34.9	35.9	14.7	50.4	39.9
Link Distance (m)	216.0						197.0			
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	60.0		65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		3		3			0		21	7
Queuing Penalty (veh)		2		6			0		32	11

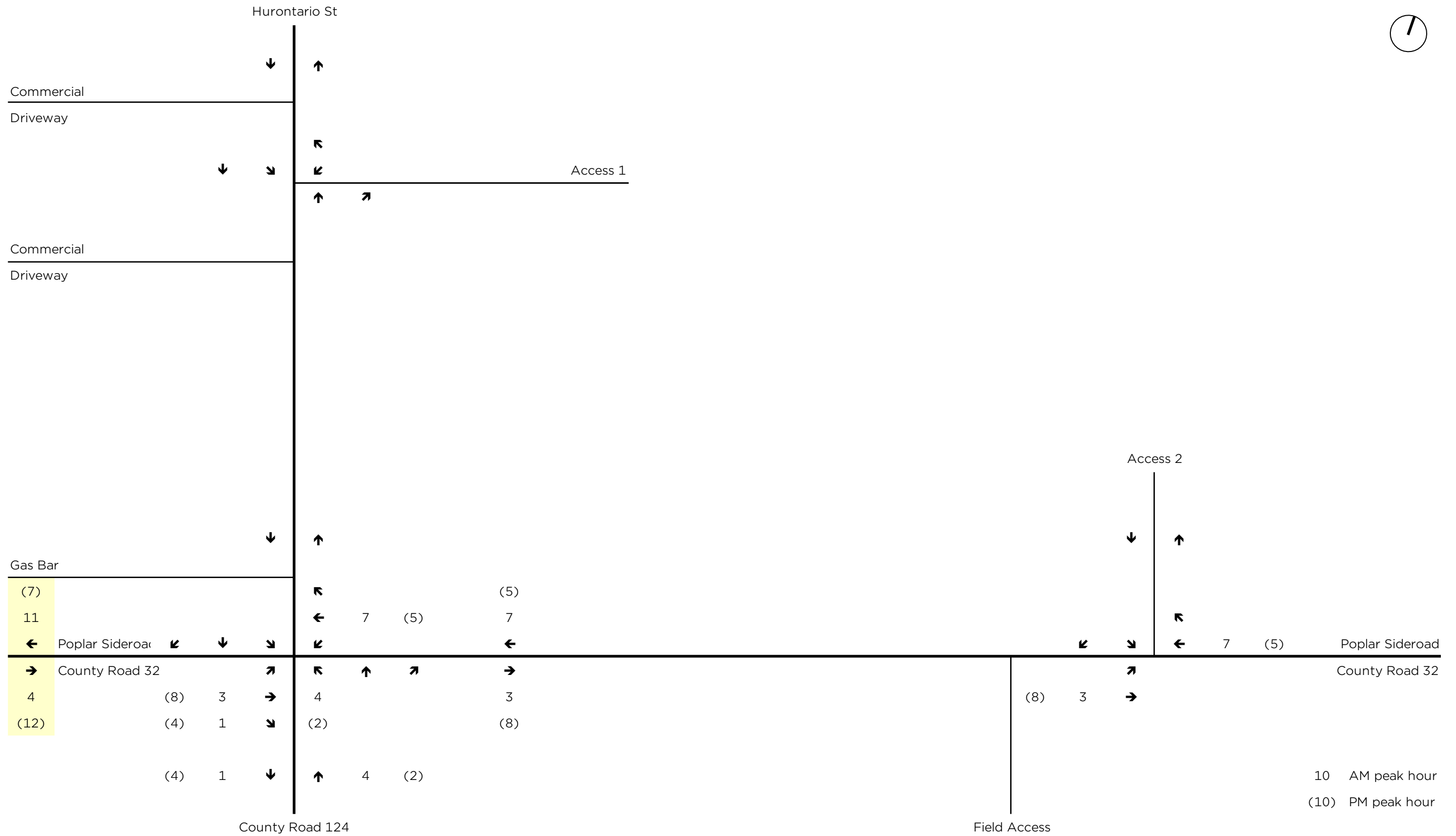
Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	T	R	L	TR
Maximum Queue (m)	19.2	133.8	39.4	71.1	42.5	34.9	40.6	16.0	62.7	65.4
Average Queue (m)	6.0	65.9	13.2	36.1	13.3	15.2	16.2	4.3	31.6	35.4
95th Queue (m)	14.3	115.1	29.3	63.4	30.4	28.8	31.2	11.6	55.5	60.5
Link Distance (m)		216.0					197.0			
Upstream Blk Time (%)		0								
Queuing Penalty (veh)		0								
Storage Bay Dist (m)	60.0		65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		13		3		0			27	27
Queuing Penalty (veh)		5		6		0			79	52

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	TR	L	T	R	L	T	R	L	TR
Maximum Queue (m)	19.6	82.4	12.8	72.9	20.6	28.7	39.3	15.9	35.7	53.7
Average Queue (m)	6.3	45.1	4.0	32.2	9.5	12.0	13.4	2.8	14.6	26.3
95th Queue (m)	15.0	73.2	11.5	57.8	17.9	23.5	26.9	9.0	27.6	45.5
Link Distance (m)	216.0					197.0				
Upstream Blk Time (%)										
Queuing Penalty (veh)										
Storage Bay Dist (m)	60.0		65.0		50.0		60.0		60.0 20.0	
Storage Blk Time (%)	3		2						4 15	
Queuing Penalty (veh)	1		2						10 16	

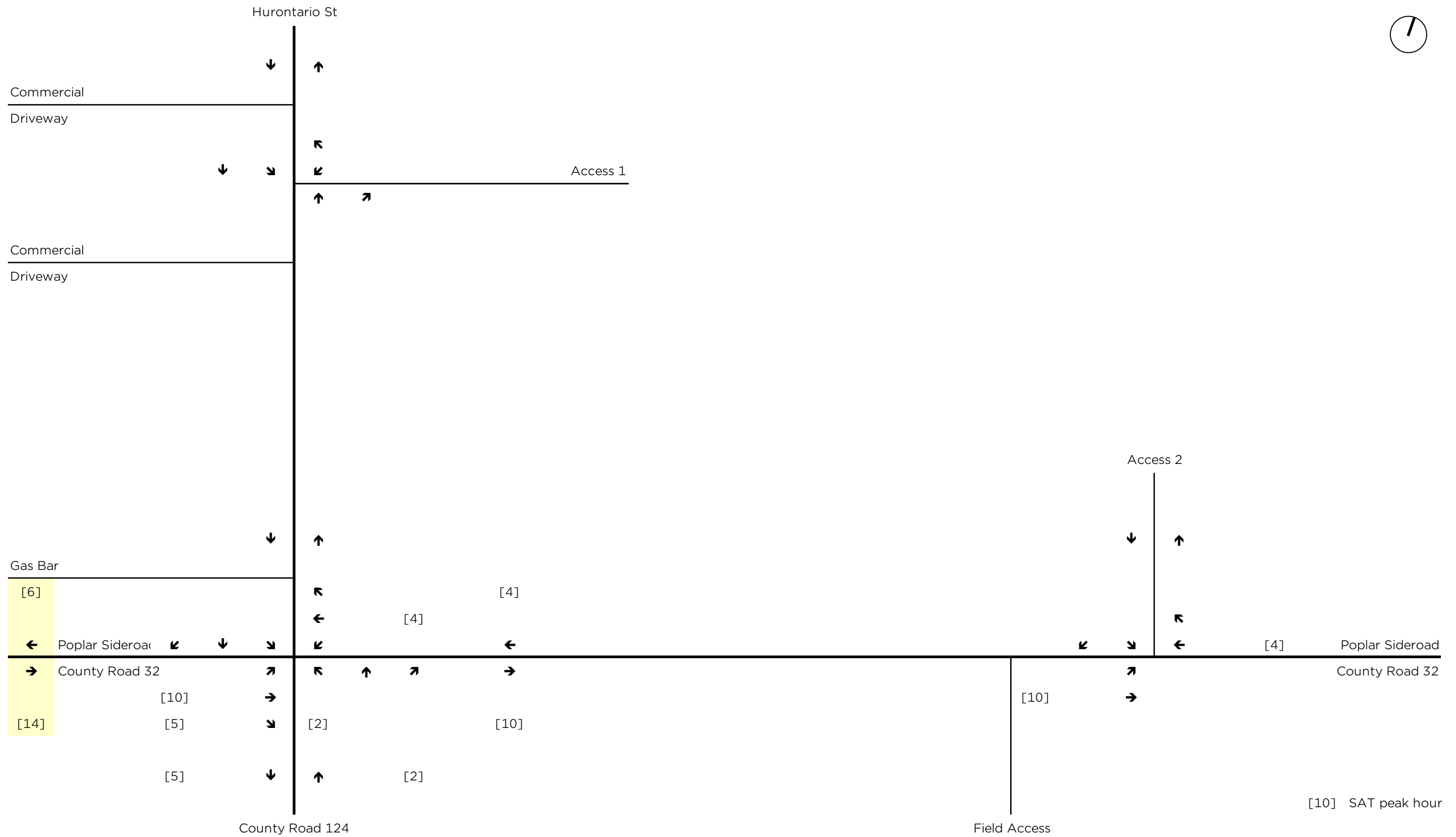
Appendix E: Background Development Traffic



THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E1A: Background Development - 50 Saunders Street Weekday

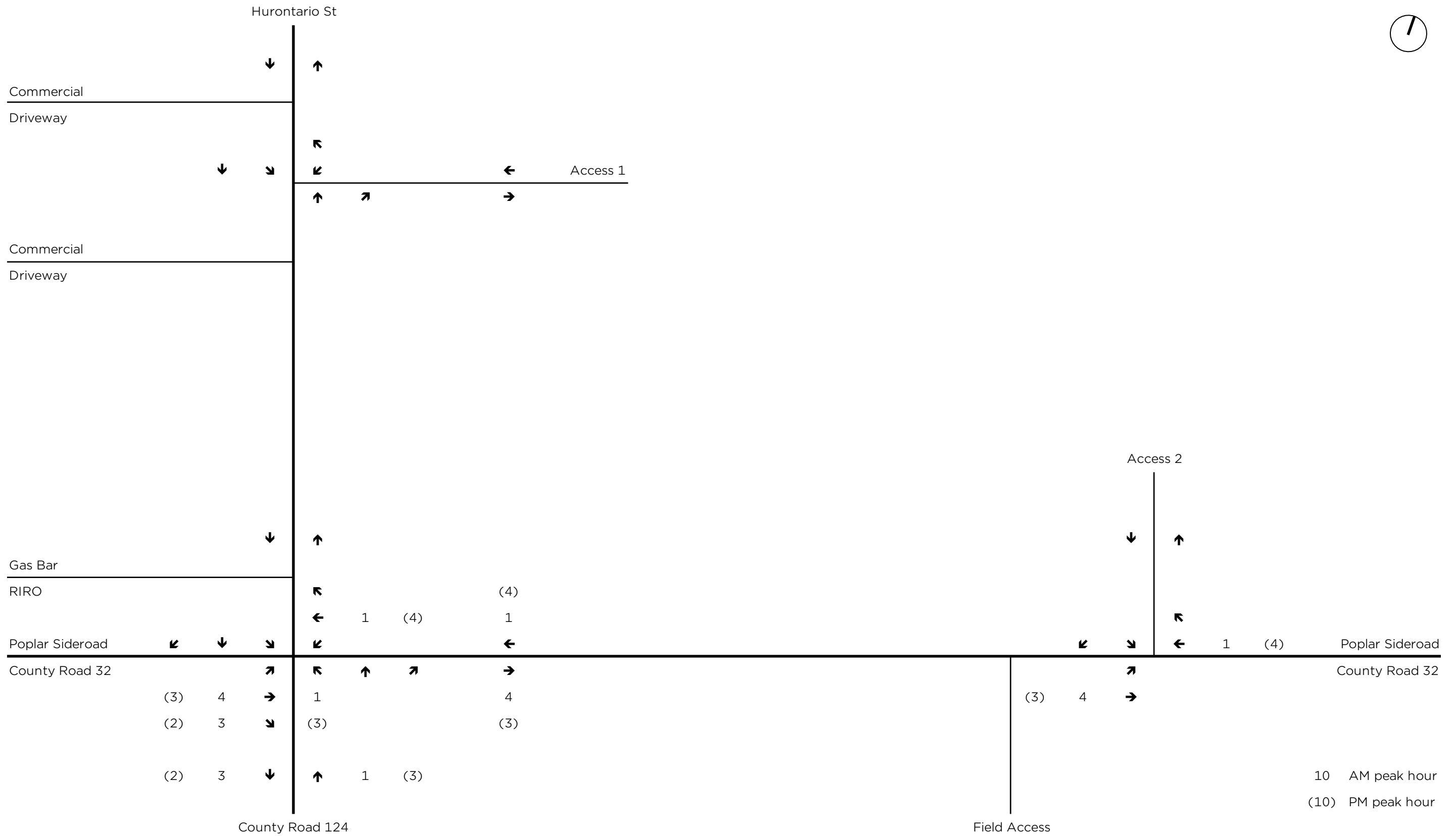




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E1B: Background Development – 50 Saunders Street Saturday

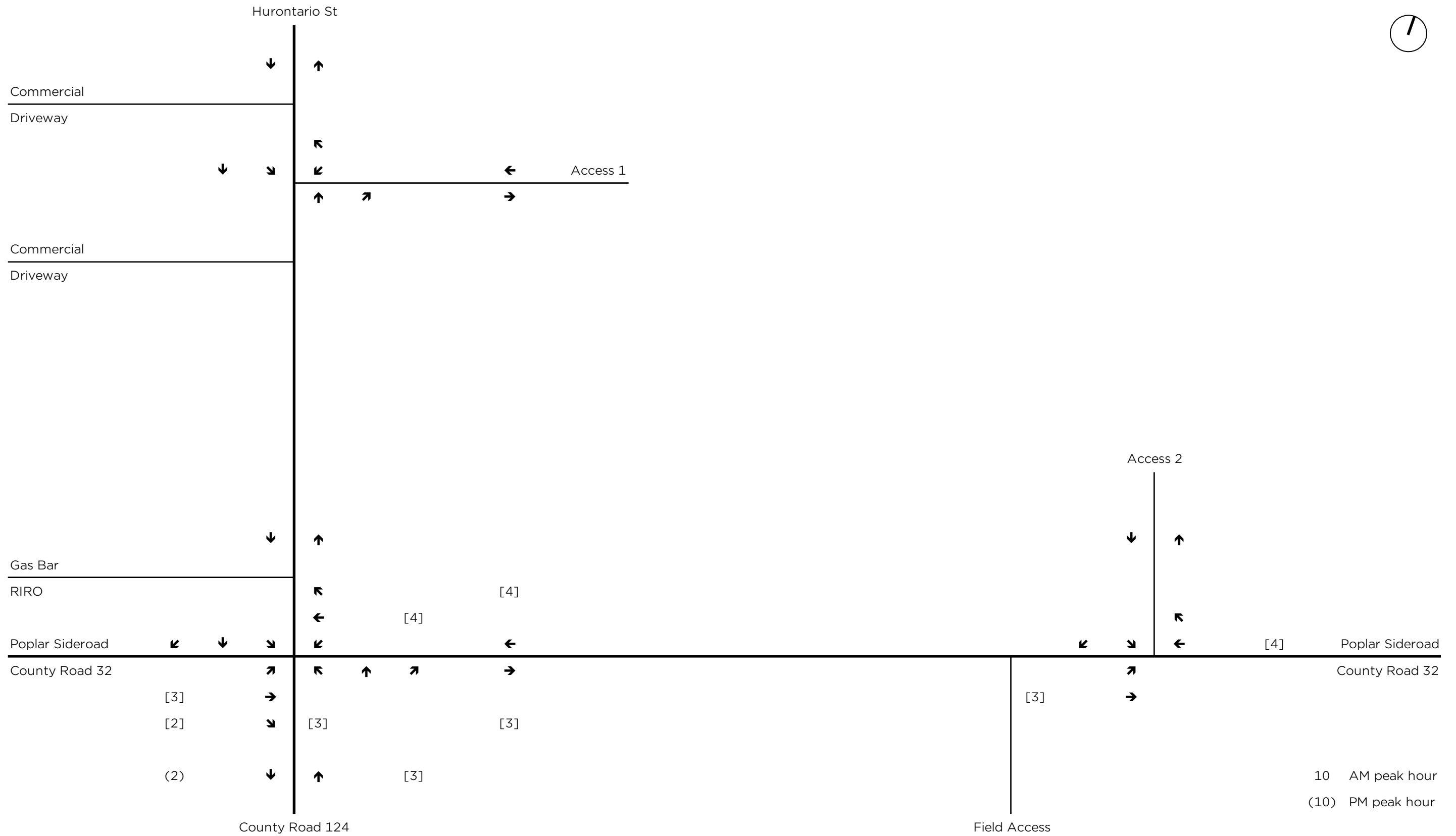




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E2A: Background Development – Summit View Phase 2 Weekday

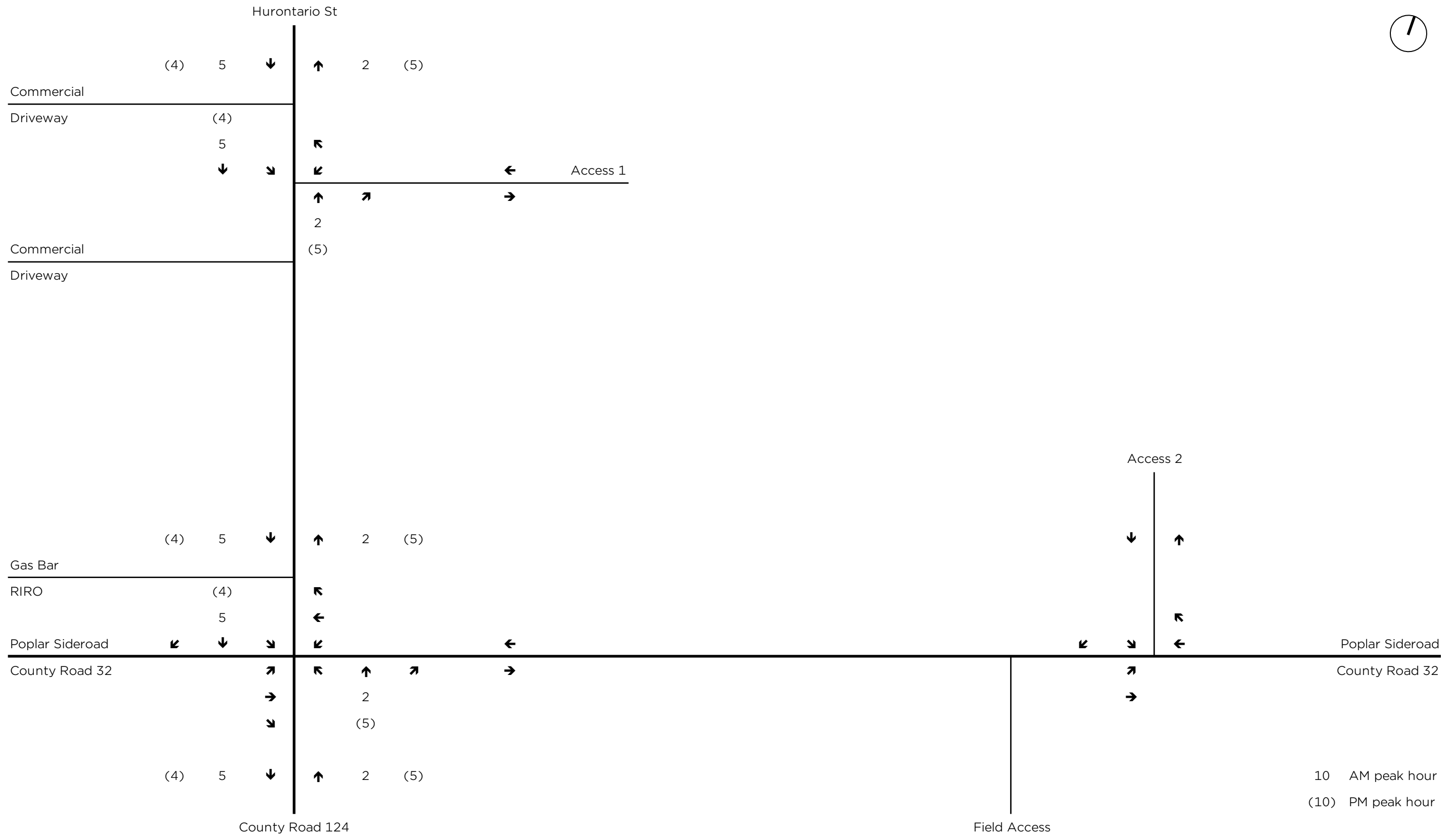




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E2B: Background Development – Summit View Phase 2 Saturday

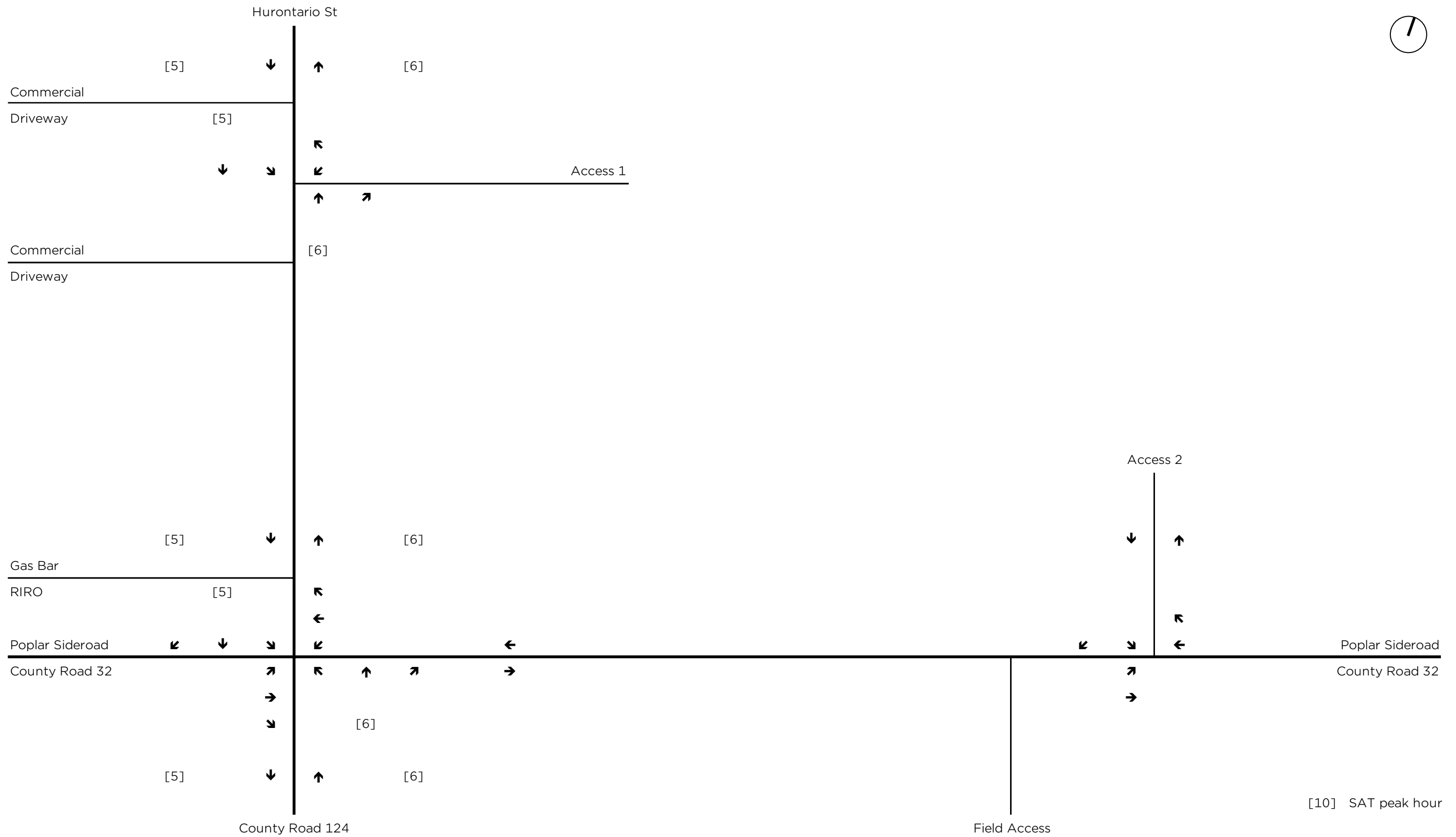




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E4A: Background Development – 655 Hurontario Street Weekday

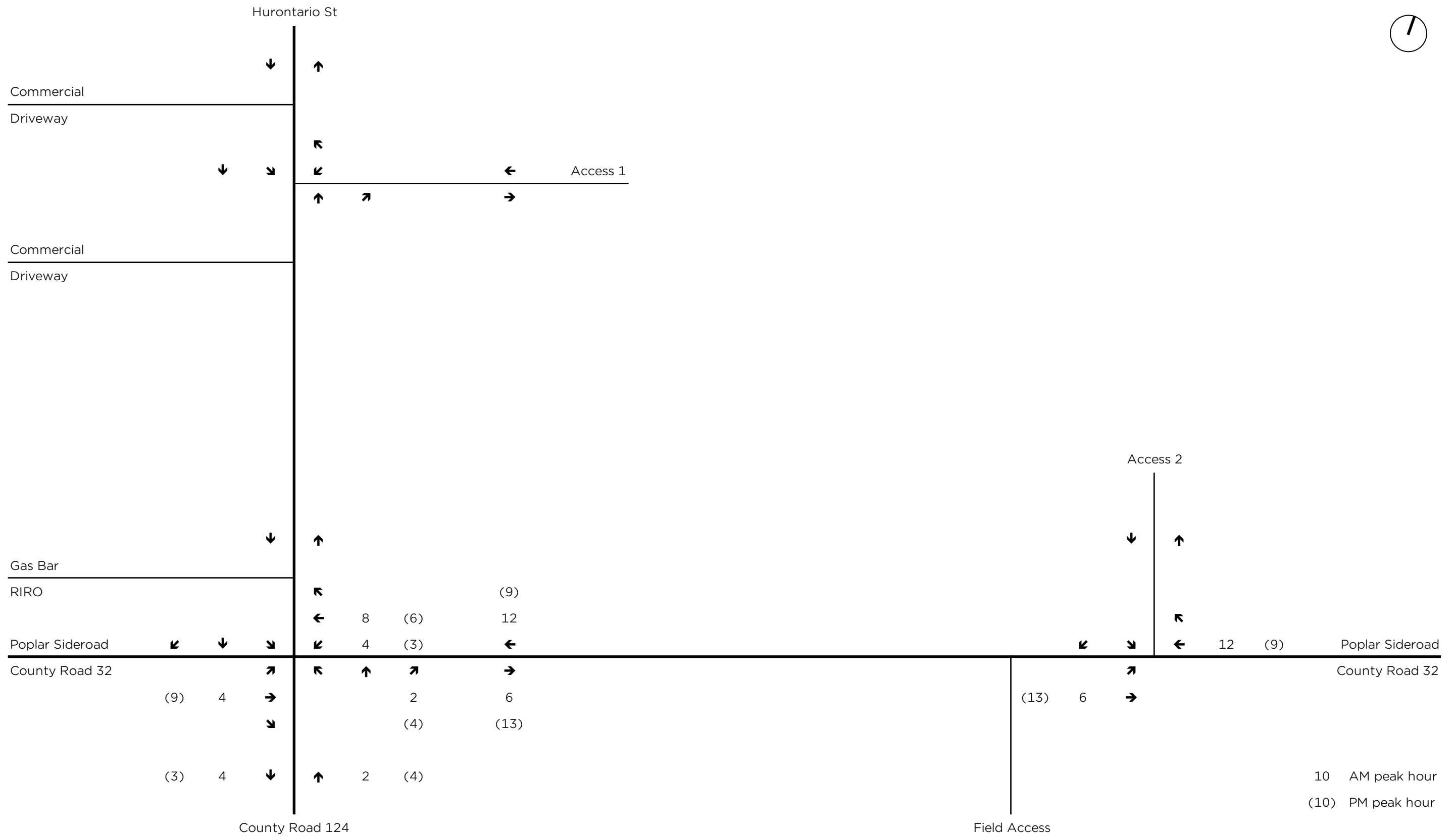




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

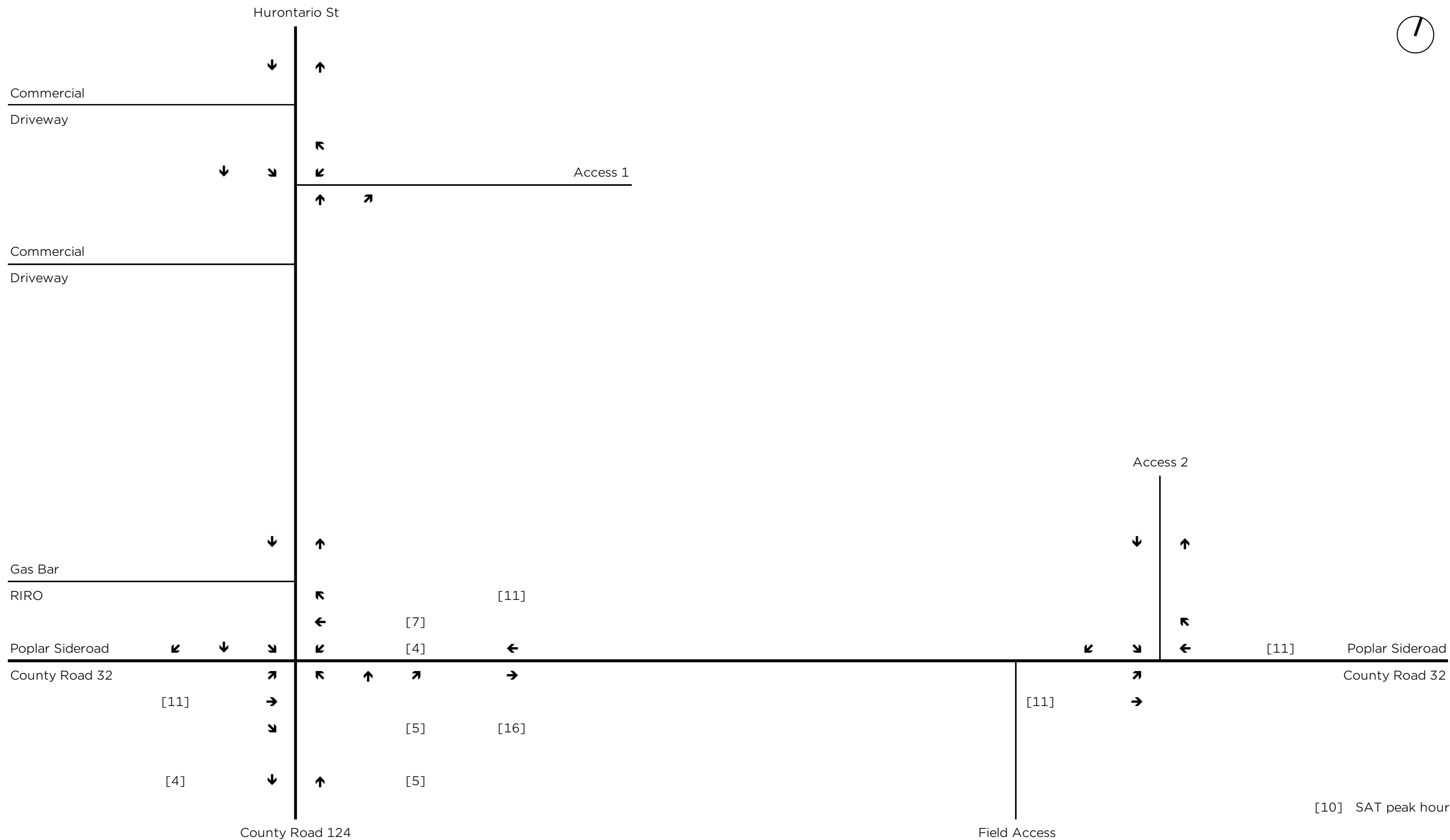
Figure E4B: Background Development – 655 Hurontario Street Saturday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure E5A: Background Development – Townhomes of Pretty River Weekday





THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure E5B: Background Development – Townhomes of Pretty River Saturday



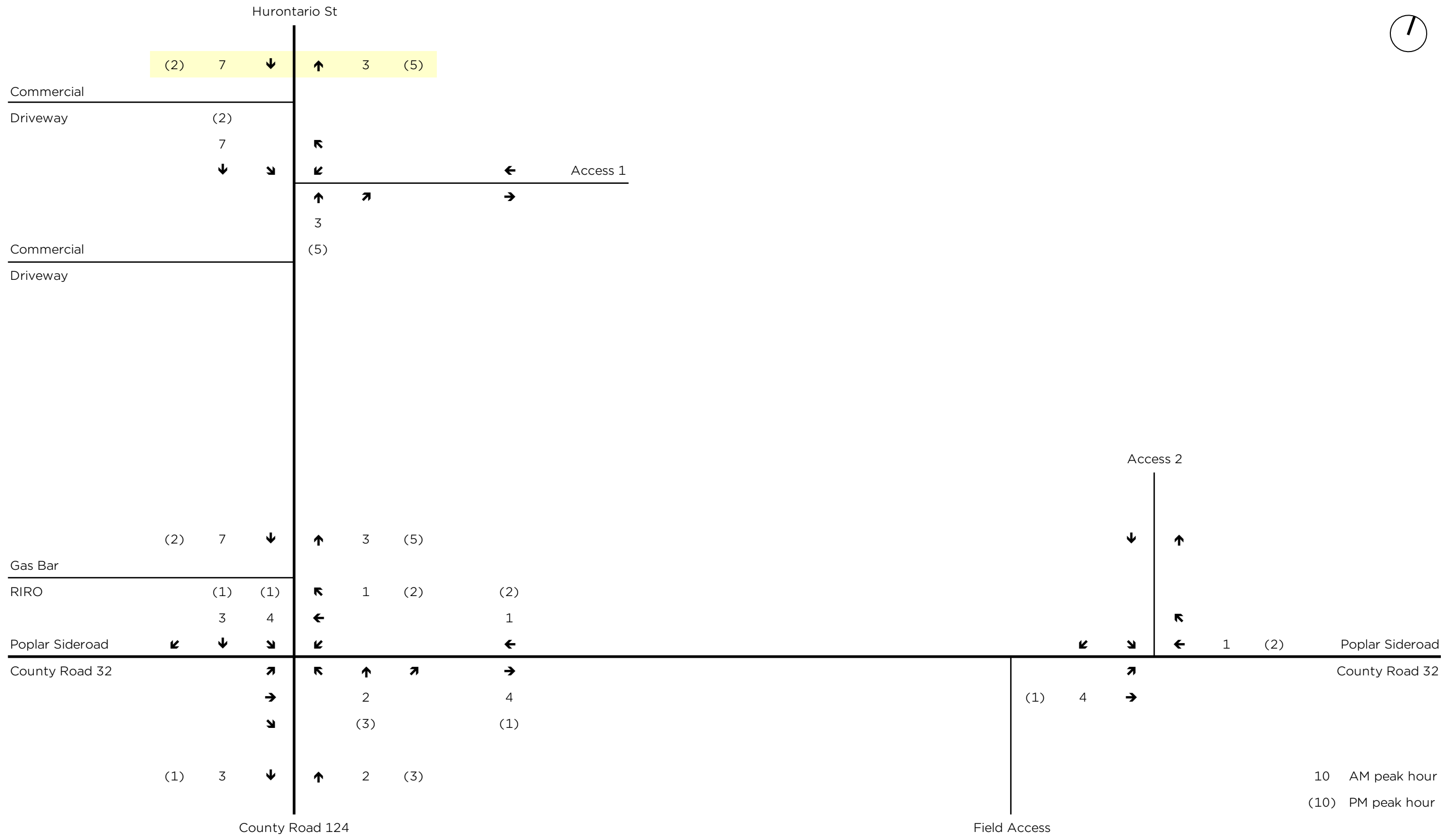
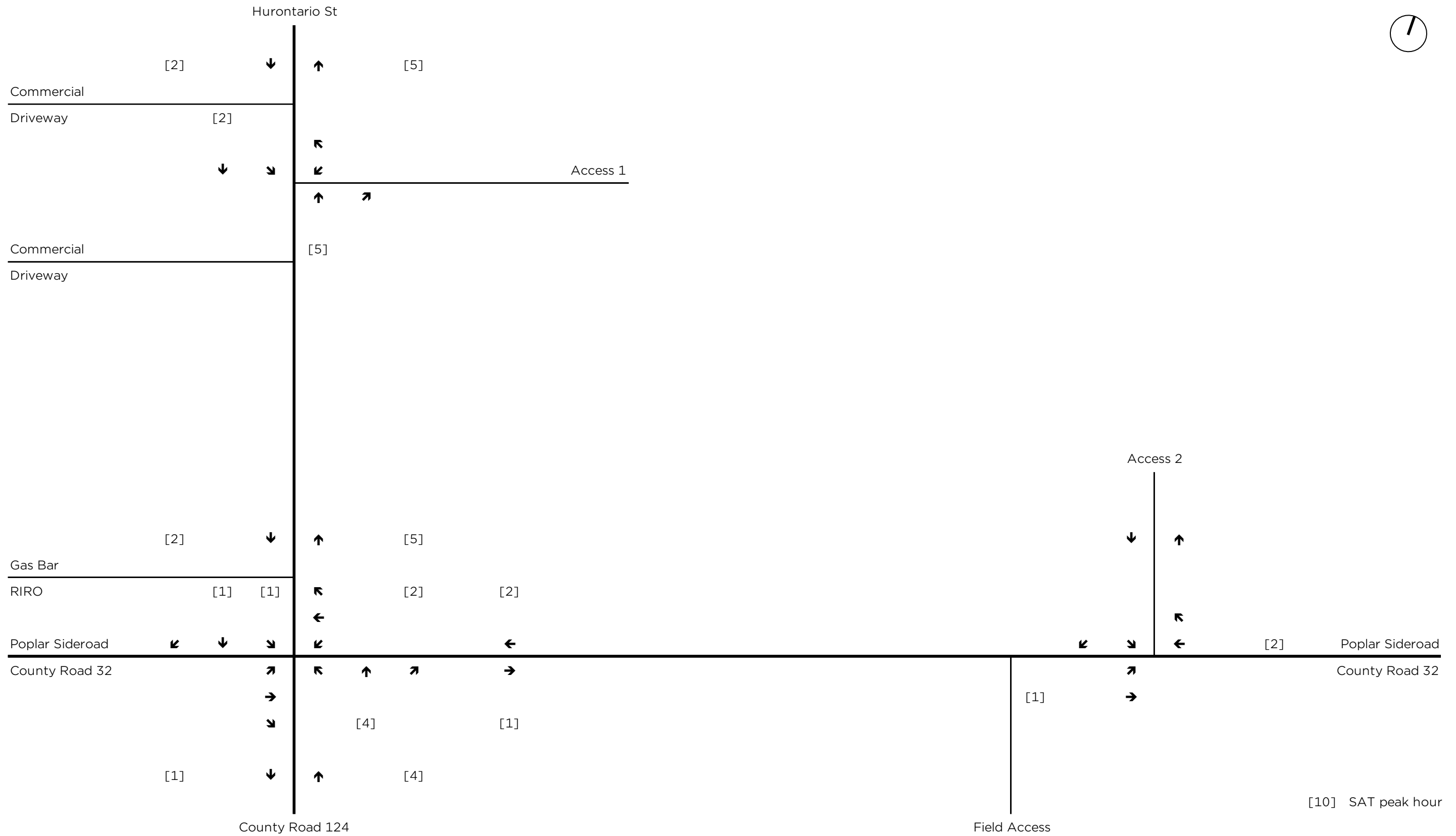


Figure E6A: Background Development - Blackmoor Gates Weekday

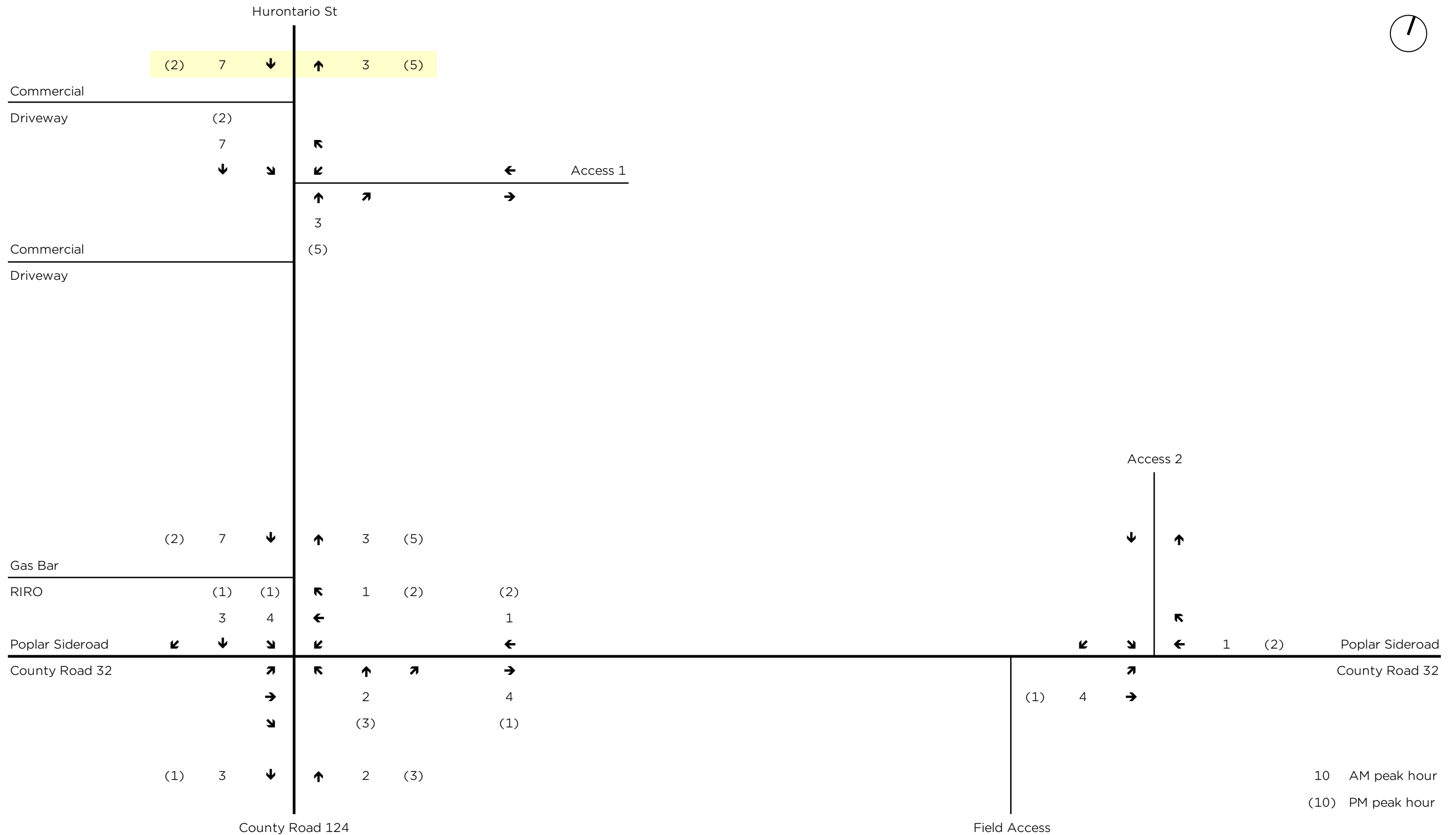




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E6B: Background Development – Blackmoor Gates Saturday

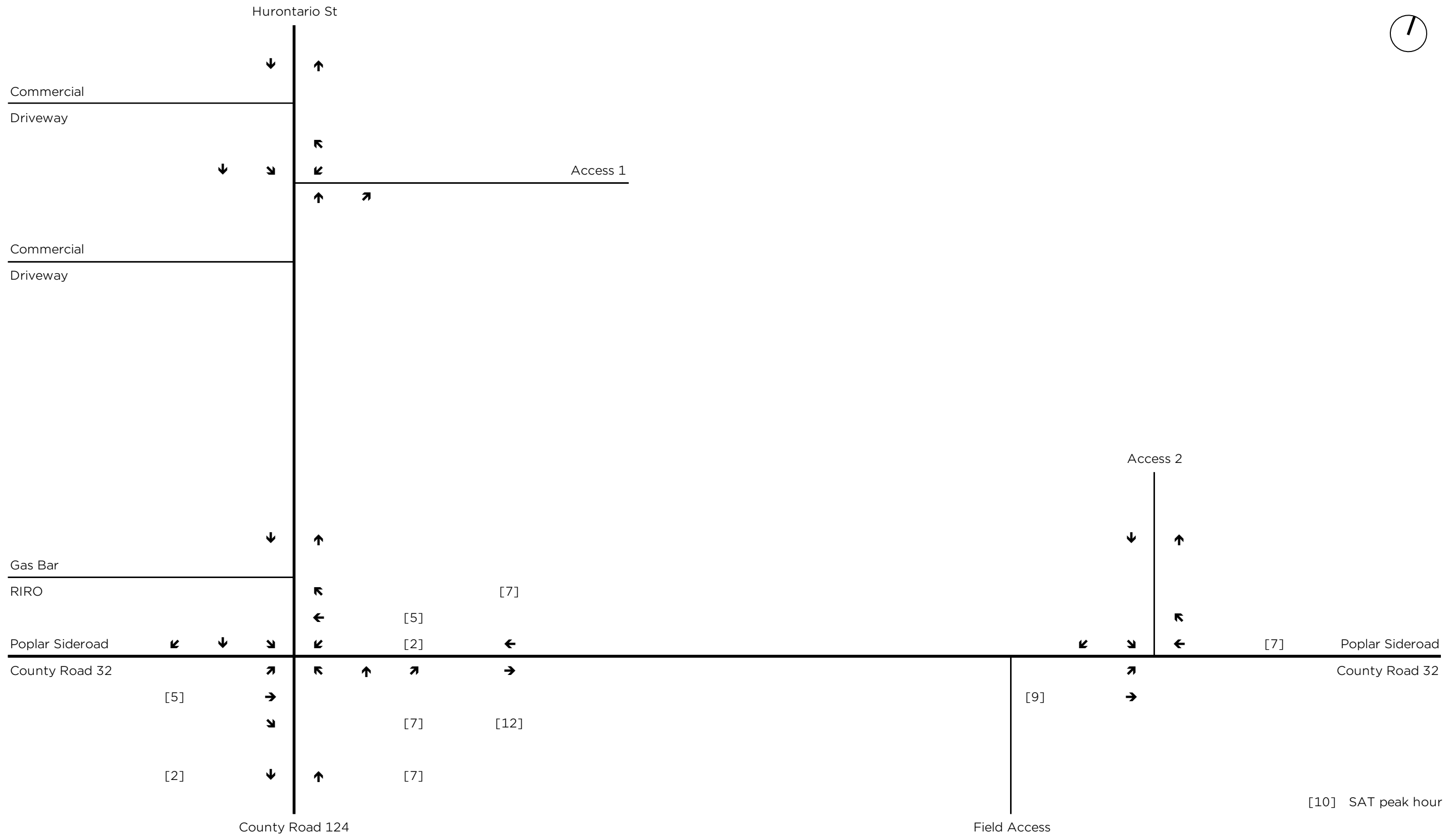




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E7A: Background Development – Indigo 2 Weekday

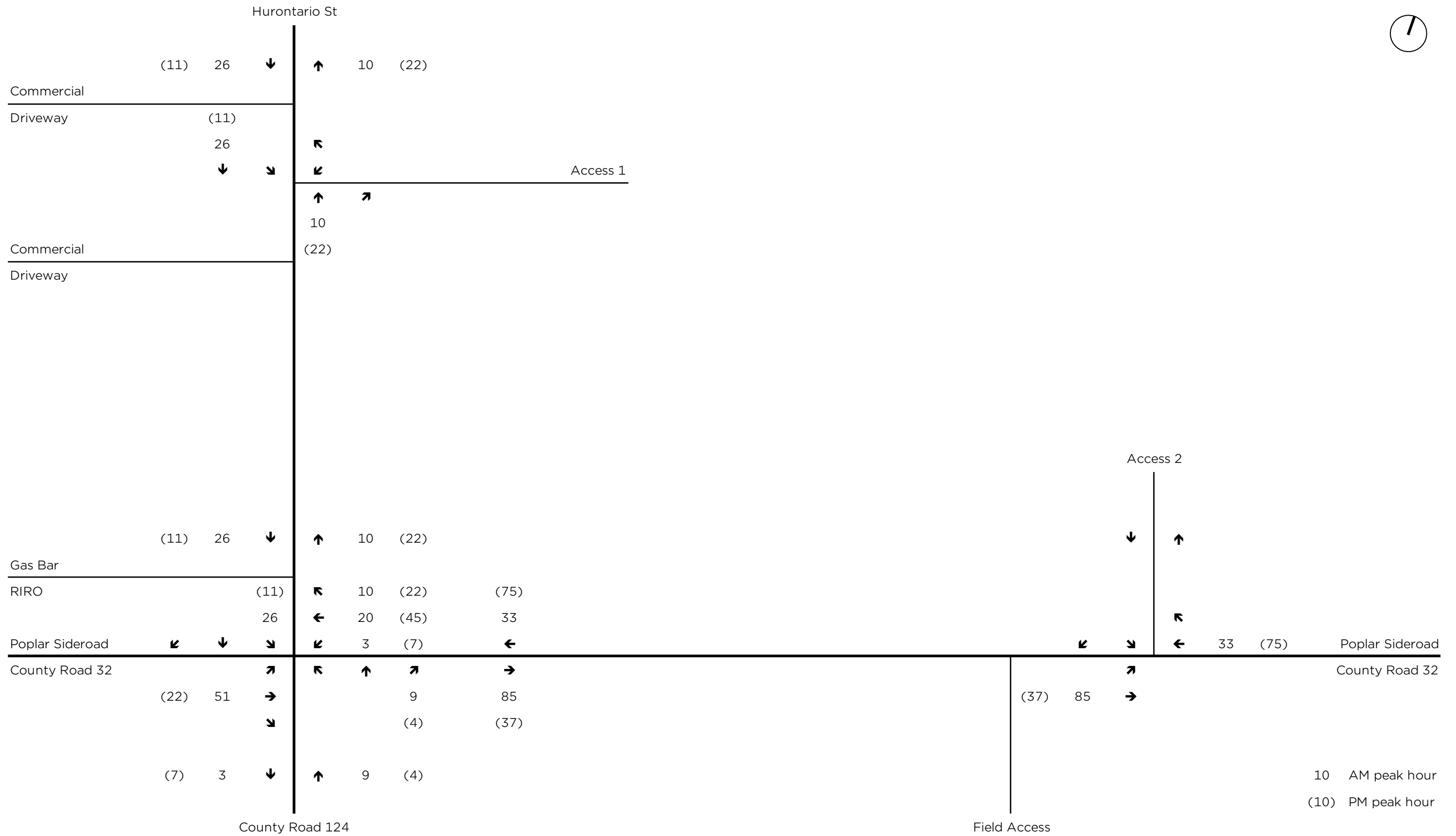


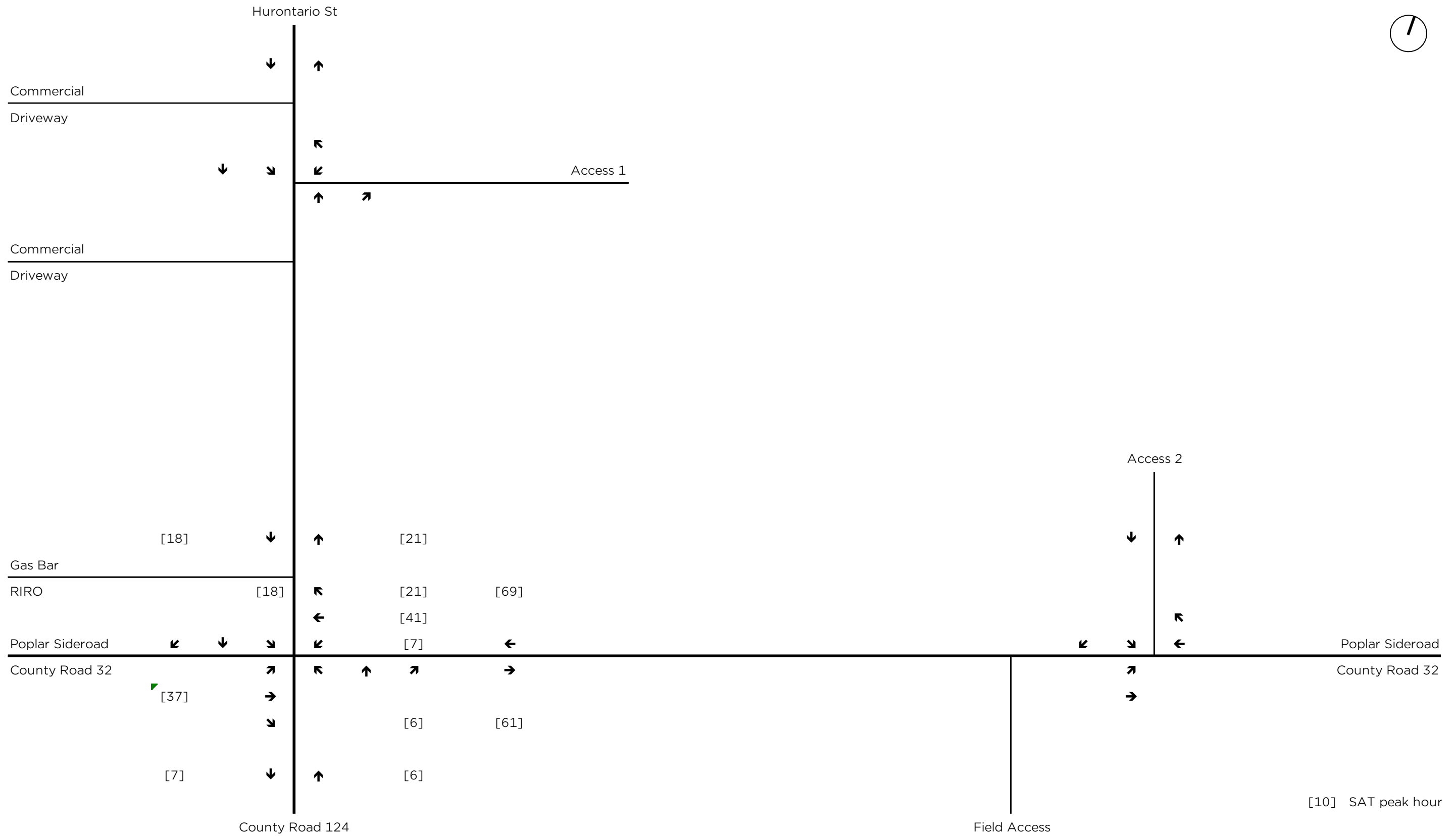


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E7B: Background Development - Indigo 2 Saturday







THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure E8B: Background Development – New Hospital Saturday



Appendix F: Future Background Intersection Operations

HCM Signalized Intersection Capacity Analysis

2030 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	395	125	60	380	205	185	215	95	190	150	35
Future Volume (vph)	70	395	125	60	380	205	185	215	95	190	150	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1781		1659	1847	1512	1755	1847	1570	1659	1794	
Flt Permitted	0.32	1.00		0.13	1.00	1.00	0.50	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	583	1781		233	1847	1512	921	1847	1570	1055	1794	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	81	459	145	70	442	238	215	250	110	221	174	41
RTOR Reduction (vph)	0	13	0	0	0	152	0	0	66	0	9	0
Lane Group Flow (vph)	81	591	0	70	442	86	215	250	44	221	206	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	35.5	30.2		35.5	30.2	30.2	33.1	33.1	33.1	23.0	23.0	
Effective Green, g (s)	35.5	30.2		35.5	30.2	30.2	33.1	33.1	33.1	23.0	23.0	
Actuated g/C Ratio	0.42	0.36		0.42	0.36	0.36	0.40	0.40	0.40	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	321	643		189	667	546	435	731	621	290	493	
v/s Ratio Prot	0.02	c0.33		c0.02	0.24		c0.04	0.14			0.11	
v/s Ratio Perm	0.09			0.13		0.06	0.15		0.03	c0.21		
v/c Ratio	0.25	0.92		0.37	0.66	0.16	0.49	0.34	0.07	0.76	0.42	
Uniform Delay, d1	15.4	25.5		17.3	22.4	18.1	17.6	17.6	15.7	27.8	24.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	18.2		1.2	2.5	0.1	0.9	0.3	0.0	11.2	0.6	
Delay (s)	15.8	43.7		18.6	24.9	18.2	18.5	17.9	15.7	39.0	25.4	
Level of Service	B	D		B	C	B	B	B	B	D	C	
Approach Delay (s)		40.4			22.2			17.7			32.3	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			28.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			83.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			85.9%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2030 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	490	165	80	385	190	140	185	65	225	290	50
Future Volume (vph)	50	490	165	80	385	190	140	185	65	225	290	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1812		1789	1883	1601	1789	1883	1601	1789	1842	
Flt Permitted	0.38	1.00		0.11	1.00	1.00	0.25	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	714	1812		201	1883	1601	469	1883	1601	1192	1842	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	54	527	177	86	414	204	151	199	70	242	312	54
RTOR Reduction (vph)	0	12	0	0	0	120	0	0	44	0	6	0
Lane Group Flow (vph)	54	692	0	86	414	84	151	199	26	242	360	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	42.8	37.5		42.8	37.5	37.5	33.7	33.7	33.7	23.5	23.5	
Effective Green, g (s)	42.8	37.5		42.8	37.5	37.5	33.7	33.7	33.7	23.5	23.5	
Actuated g/C Ratio	0.47	0.41		0.47	0.41	0.41	0.37	0.37	0.37	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	396	742		186	771	656	276	693	589	306	473	
v/s Ratio Prot	0.01	c0.38		c0.03	0.22		c0.04	0.11			0.20	
v/s Ratio Perm	0.06			0.19		0.05	0.16		0.02	c0.20		
v/c Ratio	0.14	0.93		0.46	0.54	0.13	0.55	0.29	0.04	0.79	0.76	
Uniform Delay, d1	14.0	25.8		18.6	20.4	16.8	21.3	20.4	18.6	31.7	31.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	18.4		1.8	0.7	0.1	2.2	0.2	0.0	13.0	7.1	
Delay (s)	14.1	44.2		20.4	21.2	16.9	23.5	20.6	18.6	44.7	38.5	
Level of Service	B	D		C	C	B	C	C	B	D	D	
Approach Delay (s)		42.1			19.8			21.3			41.0	
Approach LOS		D			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			32.0			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			91.5			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			93.3%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2030 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	35	435	130	25	375	105	135	200	50	120	230	35
Future Volume (vph)	35	435	130	25	375	105	135	200	50	120	230	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1818		1789	1883	1601	1789	1883	1601	1789	1846	
Flt Permitted	0.39	1.00		0.17	1.00	1.00	0.43	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	742	1818		318	1883	1601	807	1883	1601	1186	1846	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	36	444	133	26	383	107	138	204	51	122	235	36
RTOR Reduction (vph)	0	12	0	0	0	68	0	0	30	0	5	0
Lane Group Flow (vph)	36	565	0	26	383	39	138	204	21	122	266	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	29.9	27.6		29.9	27.6	27.6	31.8	31.8	31.8	21.5	21.5	
Effective Green, g (s)	29.9	27.6		29.9	27.6	27.6	31.8	31.8	31.8	21.5	21.5	
Actuated g/C Ratio	0.39	0.36		0.39	0.36	0.36	0.41	0.41	0.41	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	320	654		168	677	576	428	780	663	332	517	
v/s Ratio Prot	0.00	c0.31		c0.00	0.20		c0.03	0.11			c0.14	
v/s Ratio Perm	0.04			0.06		0.02	0.10		0.01	0.10		
v/c Ratio	0.11	0.86		0.15	0.57	0.07	0.32	0.26	0.03	0.37	0.51	
Uniform Delay, d1	14.9	22.8		16.5	19.7	16.1	14.6	14.7	13.3	22.1	23.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	11.4		0.4	1.1	0.0	0.4	0.2	0.0	0.7	0.9	
Delay (s)	15.1	34.2		16.9	20.8	16.2	15.0	14.9	13.3	22.8	24.1	
Level of Service	B	C		B	C	B	B	B	B	C	C	
Approach Delay (s)		33.1			19.7			14.8			23.7	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay	23.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.64											
Actuated Cycle Length (s)	76.7			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	79.1%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2035 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	485	140	70	440	235	200	235	110	230	165	35
Future Volume (vph)	75	485	140	70	440	235	200	235	110	230	165	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1785		1659	1847	1512	1755	1847	1570	1659	1798	
Flt Permitted	0.27	1.00		0.10	1.00	1.00	0.46	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	502	1785		178	1847	1512	855	1847	1570	1033	1798	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	87	564	163	81	512	273	233	273	128	267	192	41
RTOR Reduction (vph)	0	10	0	0	0	141	0	0	79	0	8	0
Lane Group Flow (vph)	87	717	0	81	512	132	233	273	49	267	225	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	44.7	39.3		44.7	39.3	39.3	37.0	37.0	37.0	27.0	27.0	
Effective Green, g (s)	44.7	39.3		44.7	39.3	39.3	37.0	37.0	37.0	27.0	27.0	
Actuated g/C Ratio	0.46	0.41		0.46	0.41	0.41	0.38	0.38	0.38	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	302	725		164	750	614	392	706	600	288	502	
v/s Ratio Prot	0.02	c0.40		c0.03	0.28		c0.04	0.15			0.13	
v/s Ratio Perm	0.12			0.20		0.09	0.18		0.03	c0.26		
v/c Ratio	0.29	0.99		0.49	0.68	0.21	0.59	0.39	0.08	0.93	0.45	
Uniform Delay, d1	16.3	28.5		20.7	23.6	18.7	23.0	21.6	19.0	33.9	28.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	30.3		2.3	2.6	0.2	2.4	0.4	0.1	34.0	0.6	
Delay (s)	16.9	58.8		23.1	26.2	18.8	25.5	22.0	19.1	67.9	29.4	
Level of Service	B	E		C	C	B	C	C	B	E	C	
Approach Delay (s)		54.3			23.6			22.7			49.9	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			36.9			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			96.7			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			91.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2035 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	560	180	95	470	230	155	205	75	260	315	50
Future Volume (vph)	55	560	180	95	470	230	155	205	75	260	315	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1815		1789	1883	1601	1789	1883	1601	1789	1845	
Flt Permitted	0.30	1.00		0.09	1.00	1.00	0.20	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	569	1815		179	1883	1601	378	1883	1601	1169	1845	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	602	194	102	505	247	167	220	81	280	339	54
RTOR Reduction (vph)	0	11	0	0	0	130	0	0	52	0	6	0
Lane Group Flow (vph)	59	785	0	102	505	117	167	220	29	280	387	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	47.6	42.2		47.6	42.2	42.2	34.8	34.8	34.8	24.8	24.8	
Effective Green, g (s)	47.6	42.2		47.6	42.2	42.2	34.8	34.8	34.8	24.8	24.8	
Actuated g/C Ratio	0.49	0.43		0.49	0.43	0.43	0.36	0.36	0.36	0.25	0.25	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	345	786		176	815	693	236	672	572	297	469	
v/s Ratio Prot	0.01	c0.43		c0.03	0.27		c0.05	0.12			0.21	
v/s Ratio Perm	0.07			0.25		0.07	0.20		0.02	c0.24		
v/c Ratio	0.17	1.00		0.58	0.62	0.17	0.71	0.33	0.05	0.94	0.83	
Uniform Delay, d1	14.5	27.6		21.3	21.4	16.9	24.0	22.8	20.5	35.6	34.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	31.4		4.6	1.4	0.1	9.3	0.3	0.0	37.0	11.3	
Delay (s)	14.7	59.0		25.9	22.8	17.0	33.3	23.1	20.5	72.6	45.5	
Level of Service	B	E		C	C	B	C	C	C	E	D	
Approach Delay (s)		55.9			21.5			26.3			56.8	
Approach LOS		E			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			41.0			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			97.4			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			97.9%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2035 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	510	140	35	450	135	150	220	60	155	250	40
Future Volume (vph)	40	510	140	35	450	135	150	220	60	155	250	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1823		1789	1883	1601	1789	1883	1601	1789	1844	
Flt Permitted	0.33	1.00		0.12	1.00	1.00	0.36	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	621	1823		231	1883	1601	684	1883	1601	1165	1844	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	520	143	36	459	138	153	224	61	158	255	41
RTOR Reduction (vph)	0	10	0	0	0	83	0	0	38	0	6	0
Lane Group Flow (vph)	41	653	0	36	459	55	153	224	23	158	290	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	37.4	33.7		37.4	33.7	33.7	32.2	32.2	32.2	22.0	22.0	
Effective Green, g (s)	37.4	33.7		37.4	33.7	33.7	32.2	32.2	32.2	22.0	22.0	
Actuated g/C Ratio	0.44	0.40		0.44	0.40	0.40	0.38	0.38	0.38	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	325	726		170	750	637	354	716	609	302	479	
v/s Ratio Prot	0.01	c0.36		c0.01	0.24		c0.04	0.12			c0.16	
v/s Ratio Perm	0.05			0.08		0.03	0.13		0.01	0.14		
v/c Ratio	0.13	0.90		0.21	0.61	0.09	0.43	0.31	0.04	0.52	0.61	
Uniform Delay, d1	14.3	23.9		16.9	20.2	15.9	18.3	18.4	16.5	26.8	27.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	13.9		0.6	1.5	0.1	0.8	0.3	0.0	1.6	2.2	
Delay (s)	14.5	37.8		17.5	21.7	15.9	19.2	18.7	16.5	28.4	29.7	
Level of Service	B	D		B	C	B	B	B	B	C	C	
Approach Delay (s)		36.4			20.2			18.6			29.2	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay	26.9			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.71											
Actuated Cycle Length (s)	84.6			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	83.7%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	530	150	75	480	260	220	260	120	255	180	40
Future Volume (vph)	85	530	150	75	480	260	220	260	120	255	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1786		1659	1847	1512	1755	1847	1570	1659	1796	
Flt Permitted	0.21	1.00		0.10	1.00	1.00	0.44	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	394	1786		179	1847	1512	814	1847	1570	1006	1796	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	99	616	174	87	558	302	256	302	140	297	209	47
RTOR Reduction (vph)	0	10	0	0	0	146	0	0	85	0	8	0
Lane Group Flow (vph)	99	780	0	87	558	156	256	302	55	297	248	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	44.6	39.1		44.6	39.1	39.1	39.1	39.1	39.1	29.1	29.1	
Effective Green, g (s)	44.6	39.1		44.6	39.1	39.1	39.1	39.1	39.1	29.1	29.1	
Actuated g/C Ratio	0.45	0.40		0.45	0.40	0.40	0.40	0.40	0.40	0.29	0.29	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	253	707		163	731	598	389	731	621	296	529	
v/s Ratio Prot	0.02	c0.44		c0.03	0.30		c0.05	0.16			0.14	
v/s Ratio Perm	0.15			0.21		0.10	0.21		0.04	c0.30		
v/c Ratio	0.39	1.10		0.53	0.76	0.26	0.66	0.41	0.09	1.00	0.47	
Uniform Delay, d1	18.2	29.8		22.2	25.8	20.1	23.9	21.5	18.7	34.8	28.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.0	65.6		3.3	4.7	0.2	4.0	0.4	0.1	53.2	0.7	
Delay (s)	19.2	95.4		25.6	30.5	20.3	27.9	21.9	18.7	88.0	29.1	
Level of Service	B	F		C	C	C	C	C	B	F	C	
Approach Delay (s)		86.9			26.8			23.4			60.7	
Approach LOS		F			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			49.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.99									
Actuated Cycle Length (s)			98.7			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			94.5%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	615	200	105	510	255	170	225	80	285	350	55
Future Volume (vph)	60	615	200	105	510	255	170	225	80	285	350	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.96		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1814		1789	1883	1601	1789	1883	1601	1789	1845	
Flt Permitted	0.29	1.00		0.08	1.00	1.00	0.14	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	539	1814		148	1883	1601	270	1883	1601	1146	1845	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	661	215	113	548	274	183	242	86	306	376	59
RTOR Reduction (vph)	0	10	0	0	0	121	0	0	56	0	5	0
Lane Group Flow (vph)	65	866	0	113	548	153	183	242	30	306	430	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	55.2	49.6		58.0	51.0	51.0	39.0	39.0	39.0	29.0	29.0	
Effective Green, g (s)	55.2	49.6		58.0	51.0	51.0	39.0	39.0	39.0	29.0	29.0	
Actuated g/C Ratio	0.50	0.45		0.52	0.46	0.46	0.35	0.35	0.35	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	332	813		181	868	738	191	663	564	300	483	
v/s Ratio Prot	0.01	c0.48		c0.04	0.29		c0.06	0.13			0.23	
v/s Ratio Perm	0.09			0.29		0.10	c0.28		0.02	0.27		
v/c Ratio	0.20	1.06		0.62	0.63	0.21	0.96	0.37	0.05	1.02	0.89	
Uniform Delay, d1	16.1	30.5		24.0	22.7	17.8	31.4	26.6	23.6	40.8	39.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	50.2		6.6	1.5	0.1	52.4	0.3	0.0	57.2	17.9	
Delay (s)	16.4	80.7		30.5	24.2	17.9	83.9	26.9	23.7	98.0	57.2	
Level of Service	B	F		C	C	B	F	C	C	F	E	
Approach Delay (s)		76.3			23.1			46.8			74.0	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM 2000 Control Delay			55.0			HCM 2000 Level of Service				E		
HCM 2000 Volume to Capacity ratio			1.02									
Actuated Cycle Length (s)			110.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			102.0%			ICU Level of Service			G			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2040 Background Conditions

1: CR 124/Hurontario St & Poplar S/R

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	555	155	35	490	150	165	240	65	165	280	45
Future Volume (vph)	40	555	155	35	490	150	165	240	65	165	280	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1822		1789	1883	1601	1789	1883	1601	1789	1844	
Flt Permitted	0.31	1.00		0.10	1.00	1.00	0.30	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	579	1822		190	1883	1601	560	1883	1601	1143	1844	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	566	158	36	500	153	168	245	66	168	286	46
RTOR Reduction (vph)	0	9	0	0	0	78	0	0	42	0	5	0
Lane Group Flow (vph)	41	715	0	36	500	75	168	245	24	168	327	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	43.4	39.7		43.4	39.7	39.7	34.0	34.0	34.0	23.7	23.7	
Effective Green, g (s)	43.4	39.7		43.4	39.7	39.7	34.0	34.0	34.0	23.7	23.7	
Actuated g/C Ratio	0.47	0.43		0.47	0.43	0.43	0.37	0.37	0.37	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	320	782		153	809	687	303	692	589	293	472	
v/s Ratio Prot	0.01	c0.39		c0.01	0.27		c0.04	0.13			c0.18	
v/s Ratio Perm	0.05			0.10		0.05	0.16		0.02	0.15		
v/c Ratio	0.13	0.91		0.24	0.62	0.11	0.55	0.35	0.04	0.57	0.69	
Uniform Delay, d1	14.5	24.7		18.2	20.5	15.8	21.4	21.2	18.7	29.9	31.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	15.1		0.8	1.4	0.1	2.2	0.3	0.0	2.7	4.4	
Delay (s)	14.6	39.8		19.0	21.9	15.8	23.6	21.5	18.8	32.6	35.4	
Level of Service	B	D		B	C	B	C	C	B	C	D	
Approach Delay (s)		38.5			20.4			21.9			34.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay	29.3			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.77											
Actuated Cycle Length (s)	92.4			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	87.0%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Background Conditions

Weekday AM Peak + Improvements

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	530	150	75	480	260	220	260	120	255	180	40
Future Volume (vph)	85	530	150	75	480	260	220	260	120	255	180	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1847	1570	1659	1847	1512	1755	1847	1570	1659	1796	
Flt Permitted	0.20	1.00	1.00	0.14	1.00	1.00	0.53	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	365	1847	1570	238	1847	1512	970	1847	1570	605	1796	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	99	616	174	87	558	302	256	302	140	297	209	47
RTOR Reduction (vph)	0	0	77	0	0	149	0	0	106	0	8	0
Lane Group Flow (vph)	99	616	97	87	558	153	256	302	34	297	248	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	38.5	33.2	33.2	38.5	33.2	33.2	29.9	21.7	21.7	33.9	23.7	
Effective Green, g (s)	38.5	33.2	33.2	38.5	33.2	33.2	29.9	21.7	21.7	33.9	23.7	
Actuated g/C Ratio	0.44	0.38	0.38	0.44	0.38	0.38	0.34	0.25	0.25	0.38	0.27	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	693	589	188	693	567	400	453	385	353	481	
v/s Ratio Prot	0.02	c0.33		c0.03	0.30		0.06	0.16		c0.10	0.14	
v/s Ratio Perm	0.15		0.06	0.17		0.10	0.16		0.02	c0.23		
v/c Ratio	0.41	0.89	0.16	0.46	0.81	0.27	0.64	0.67	0.09	0.84	0.52	
Uniform Delay, d1	17.2	25.9	18.4	18.2	24.7	19.2	23.2	30.1	25.7	22.4	27.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.1	13.3	0.1	1.8	6.8	0.3	3.5	3.7	0.1	16.4	0.9	
Delay (s)	18.3	39.1	18.5	20.0	31.5	19.4	26.7	33.8	25.8	38.8	28.4	
Level of Service	B	D	B	B	C	B	C	C	C	D	C	
Approach Delay (s)		32.8			26.6			29.6			34.0	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.4									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			88.4									
Intersection Capacity Utilization			81.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Background Conditions

Weekday PM Peak + Improvements

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	615	200	105	510	255	170	225	80	285	350	55
Future Volume (vph)	60	615	200	105	510	255	170	225	80	285	350	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1845	
Flt Permitted	0.22	1.00	1.00	0.11	1.00	1.00	0.22	1.00	1.00	0.45	1.00	
Satd. Flow (perm)	405	1883	1601	210	1883	1601	419	1883	1601	846	1845	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	65	661	215	113	548	274	183	242	86	306	376	59
RTOR Reduction (vph)	0	0	88	0	0	135	0	0	64	0	6	0
Lane Group Flow (vph)	65	661	127	113	548	139	183	242	22	306	429	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	41.1	35.8	35.8	41.1	35.8	35.8	31.9	23.8	23.8	35.9	25.8	
Effective Green, g (s)	41.1	35.8	35.8	41.1	35.8	35.8	31.9	23.8	23.8	35.9	25.8	
Actuated g/C Ratio	0.44	0.38	0.38	0.44	0.38	0.38	0.34	0.26	0.26	0.39	0.28	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	257	724	616	182	724	616	263	481	409	428	511	
v/s Ratio Prot	0.01	c0.35		c0.04	0.29		0.06	0.13		c0.08	c0.23	
v/s Ratio Perm	0.10		0.08	0.24		0.09	0.18		0.01	0.20		
v/c Ratio	0.25	0.91	0.21	0.62	0.76	0.23	0.70	0.50	0.05	0.71	0.84	
Uniform Delay, d1	17.1	27.1	19.1	20.0	24.8	19.3	23.6	29.6	26.1	22.3	31.7	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	15.9	0.2	6.4	4.5	0.2	7.8	0.8	0.1	5.6	11.6	
Delay (s)	17.7	43.0	19.3	26.5	29.4	19.4	31.3	30.4	26.2	27.9	43.2	
Level of Service	B	D	B	C	C	B	C	C	C	C	D	
Approach Delay (s)		35.8			26.1			30.0			36.9	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			32.2									
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			93.0									
Intersection Capacity Utilization			87.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Background Conditions

Saturday Peak + Improvements

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	555	155	35	490	150	165	240	65	165	280	45
Future Volume (vph)	40	555	155	35	490	150	165	240	65	165	280	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1844	
Flt Permitted	0.24	1.00	1.00	0.17	1.00	1.00	0.41	1.00	1.00	0.49	1.00	
Satd. Flow (perm)	457	1883	1601	314	1883	1601	764	1883	1601	914	1844	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	41	566	158	36	500	153	168	245	66	168	286	46
RTOR Reduction (vph)	0	0	79	0	0	87	0	0	48	0	6	0
Lane Group Flow (vph)	41	566	79	36	500	66	168	245	18	168	326	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	32.6	28.9	28.9	32.6	28.9	28.9	29.9	21.9	21.9	32.3	23.1	
Effective Green, g (s)	32.6	28.9	28.9	32.6	28.9	28.9	29.9	21.9	21.9	32.3	23.1	
Actuated g/C Ratio	0.40	0.35	0.35	0.40	0.35	0.35	0.37	0.27	0.27	0.40	0.28	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	242	666	566	192	666	566	379	504	429	459	521	
v/s Ratio Prot	0.01	c0.30		c0.01	0.27		c0.04	0.13		c0.04	c0.18	
v/s Ratio Perm	0.06		0.05	0.07		0.04	0.12		0.01	0.10		
v/c Ratio	0.17	0.85	0.14	0.19	0.75	0.12	0.44	0.49	0.04	0.37	0.63	
Uniform Delay, d1	16.4	24.4	17.9	17.2	23.2	17.8	18.4	25.2	22.1	16.6	25.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	9.9	0.1	0.5	4.8	0.1	0.8	0.7	0.0	0.5	2.4	
Delay (s)	16.7	34.3	18.1	17.7	28.0	17.9	19.2	25.9	22.2	17.1	27.9	
Level of Service	B	C	B	B	C	B	B	C	C	B	C	
Approach Delay (s)		30.0			25.2			23.0			24.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay	26.1			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.68											
Actuated Cycle Length (s)	81.7			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	73.2%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

Appendix G: Future Background Queue Operations

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	57.3	128.4	74.3	45.7	117.2	80.7	64.5	70.6	24.7	69.5	105.8
Average Queue (m)	13.9	64.0	14.5	15.7	58.4	22.7	31.5	35.2	11.4	47.1	51.7
95th Queue (m)	37.1	104.0	40.8	31.5	93.3	48.5	55.0	59.1	22.1	76.0	105.1
Link Distance (m)		215.5			140.4			193.3			121.8
Upstream Blk Time (%)					0						2
Queuing Penalty (veh)					0						8
Storage Bay Dist (m)	60.0		50.0	65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		14			12	0	1	1		59	32
Queuing Penalty (veh)		34			40	1	3	3		129	82

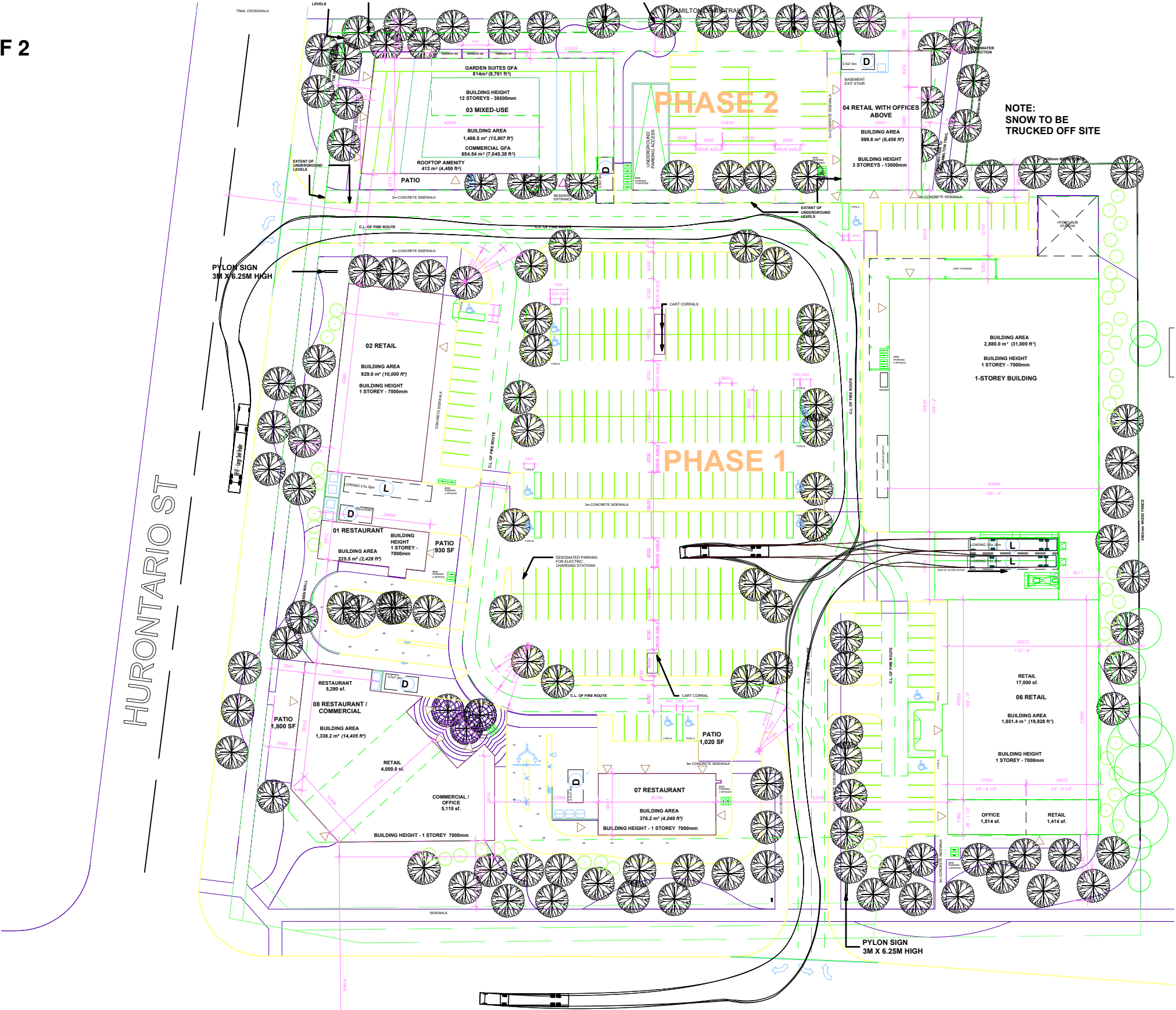
Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	104.0	205.0	105.0	35.8	113.4	91.4	57.7	81.8	23.6	69.9	125.3
Average Queue (m)	11.9	100.3	37.2	17.2	62.2	22.5	30.3	36.3	9.0	60.5	90.7
95th Queue (m)	47.9	177.7	97.7	30.2	97.0	56.0	55.2	67.3	19.0	86.0	145.8
Link Distance (m)		215.5			140.4			193.3			121.8
Upstream Blk Time (%)		1									8
Queuing Penalty (veh)		0									56
Storage Bay Dist (m)	60.0		50.0	65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		31	0		15	0	2	2		66	59
Queuing Penalty (veh)		81	0		53	0	6	5		268	168

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	26.0	129.9	58.9	18.6	95.4	41.0	50.1	66.4	21.2	69.7	78.9
Average Queue (m)	7.1	66.0	15.6	7.5	52.6	12.6	23.4	30.0	7.0	25.8	42.8
95th Queue (m)	18.5	108.5	42.2	16.0	83.0	32.8	41.2	52.6	15.3	49.8	66.2
Link Distance (m)	215.5			140.4			193.3			121.8	
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	60.0		50.0	65.0	50.0		60.0	60.0		20.0	
Storage Blk Time (%)	15			8			0			18	36
Queuing Penalty (veh)	30			15			1			57	60

Appendix H: Vehicle Turning Assessment



**HURONTARIO & POPLAR
VEHICLE TRACKING**

DWG. No.
VT.1

SCALE: 1:1000 | DRAWN: JPK | DATE: JAN/26 | JOB NO. 120119-02



HURONTARIO & POPLAR
VEHICLE TRACKING

DWG. No.
VT.2

SCALE: 1:1000 DRAWN: JPK DATE: JAN/26 JOB NO. 120119-02



**HURONTARIO & POPLAR
VEHICLE TRACKING**

DWG. No.
VT.3

SCALE: 1:1000 DRAWN: JPK DATE: JAN/26 JOB NO. 120119-02



FIRE TRUCK LOOPS



	HURONTARIO & POPLAR VEHICLE TRACKING			DWG. No. VT.6
	SCALE: 1:1000	DRAWN: JPK	DATE: JAN/26	JOB NO. 120119-02

Appendix I: Internal Capture Worksheets

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	The Gateway Centre			Organization:	Tatham Engineering Limited
Project Location:	Huronario St & Poplar SR, Collingwood			Performed By:	MJB
Scenario Description:	Weekday AM Peak Hour			Date:	12/4/2025
Analysis Year:	2030			Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	712	13	1,000 ft2 GFA	22	18	4
Retail	various	84	1,000 ft2 GFA	206	125	82
Restaurant	various	12	1,000 ft2 GFA	456	235	222
Cinema/Entertainment				0		
Residential	222	165	units	45	15	29
Hotel				0		
All Other Land Uses ²				0		
				729	392	337

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	2	0	0	0
Retail	1		11	0	0	0
Restaurant	3	10		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	6	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	730	393	337
Internal Capture Percentage	10%	9%	11%
External Vehicle-Trips ⁵	658	357	301
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	28%	75%
Retail	9%	15%
Restaurant	8%	6%
Cinema/Entertainment	N/A	N/A
Residential	7%	24%
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>).
⁴ Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.
⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.
⁶ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	The Gateway Centre
Analysis Period:	AM Street Peak Hour

Table 7-A: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-A (D): Entering Trips			Table 7-A (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	17.6816928	18	1.00	3.8813472	4
Retail	1.00	124.6239252	125	1.00	81.6861644	82
Restaurant	1.00	234.7806997	235	1.00	221.6030017	222
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	15.147	15	1.00	29.403	29
Hotel	1.00	0	0	1.00	0	0

Table 8-A (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		1	3	0	0	0
Retail	24		11	0	11	0
Restaurant	69	31		0	9	7
Cinema/Entertainment	0	0	0		0	0
Residential	1	0	6	0		0
Hotel	0	0	0	0	0	

Table 8-A (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		40	54	0	0	0
Retail	1		118	0	0	0
Restaurant	3	10		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	21	47	0		0
Hotel	1	5	14	0	0	

Table 9-A (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	5	13	18	13	0	0
Retail	11	114	125	114	0	0
Restaurant	19	216	235	216	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	1	14	15	14	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-A (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	3	1	4	1	0	0
Retail	12	70	82	70	0	0
Restaurant	14	208	222	208	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	7	22	29	22	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A

²Person-Trips

³Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

*Indicates computation that has been rounded to the nearest whole number.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	The Gateway Centre			Organization:	Tatham Engineering Limited
Project Location:	Huronario St & Poplar SR, Collingwood			Performed By:	MJB
Scenario Description:	Weekday PM Peak Hour			Date:	12/4/2025
Analysis Year:	2030			Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office	712	13	1,000 ft2 GFA	28	9	18
Retail	various	84	1,000 ft2 GFA	615	306	309
Restaurant	various	12	1,000 ft2 GFA	289	152	136
Cinema/Entertainment				0		
Residential	222	165	units	53	30	23
Hotel				0		
All Other Land Uses ²				0		
				984	497	487

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		304	485		312	
Retail					357	
Restaurant					391	
Cinema/Entertainment						
Residential		357	391			
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	1	0	0	0
Retail	3		44	0	14	0
Restaurant	3	56		0	5	0
Cinema/Entertainment	0	0	0		0	0
Residential	1	9	5	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	983	497	486
Internal Capture Percentage	29%	29%	30%
External Vehicle-Trips ⁵	695	353	342
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	78%	22%
Retail	22%	20%
Restaurant	33%	47%
Cinema/Entertainment	N/A	N/A
Residential	63%	65%
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>).
⁴ Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be
⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.
⁶ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

Project Name:	The Gateway Centre
Analysis Period:	PM Street Peak Hour

Table 7-P: Conversion of Vehicle-Trip Ends to Person-Trip Ends						
Land Use	Table 7-P (D): Entering Trips			Table 7-P (O): Exiting Trips		
	Veh. Occ.	Vehicle-Trips	Person-Trips*	Veh. Occ.	Vehicle-Trips	Person-Trips*
Office	1.00	9.4825728	9	1.00	18.4073472	18
Retail	1.00	305.6706758	306	1.00	309.4603847	309
Restaurant	1.00	152.4887168	152	1.00	136.1128035	136
Cinema/Entertainment	1.00	0	0	1.00	0	0
Residential	1.00	29.568	30	1.00	23.232	23
Hotel	1.00	0	0	1.00	0	0

Table 8-P (O): Internal Person-Trip Origin-Destination Matrix (Computed at Origin)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		3	1	0	0	0
Retail	6		90	12	80	15
Restaurant	4	56		11	24	10
Cinema/Entertainment	0	0	0		0	0
Residential	1	9	5	0		1
Hotel	0	0	0	0	0	

Table 8-P (D): Internal Person-Trip Origin-Destination Matrix (Computed at Destination)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		24	3	0	1	0
Retail	3		44	0	14	0
Restaurant	3	153		0	5	0
Cinema/Entertainment	1	12	5		1	0
Residential	5	29	20	0		0
Hotel	0	6	8	0	0	

Table 9-P (D): Internal and External Trips Summary (Entering Trips)						
Destination Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	7	2	9	2	0	0
Retail	68	238	306	238	0	0
Restaurant	50	102	152	102	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	19	11	30	11	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

Table 9-P (O): Internal and External Trips Summary (Exiting Trips)						
Origin Land Use	Person-Trip Estimates			External Trips by Mode*		
	Internal	External	Total	Vehicles ¹	Transit ²	Non-Motorized ²
Office	4	14	18	14	0	0
Retail	61	248	309	248	0	0
Restaurant	64	72	136	72	0	0
Cinema/Entertainment	0	0	0	0	0	0
Residential	15	8	23	8	0	0
Hotel	0	0	0	0	0	0
All Other Land Uses ³	0	0	0	0	0	0

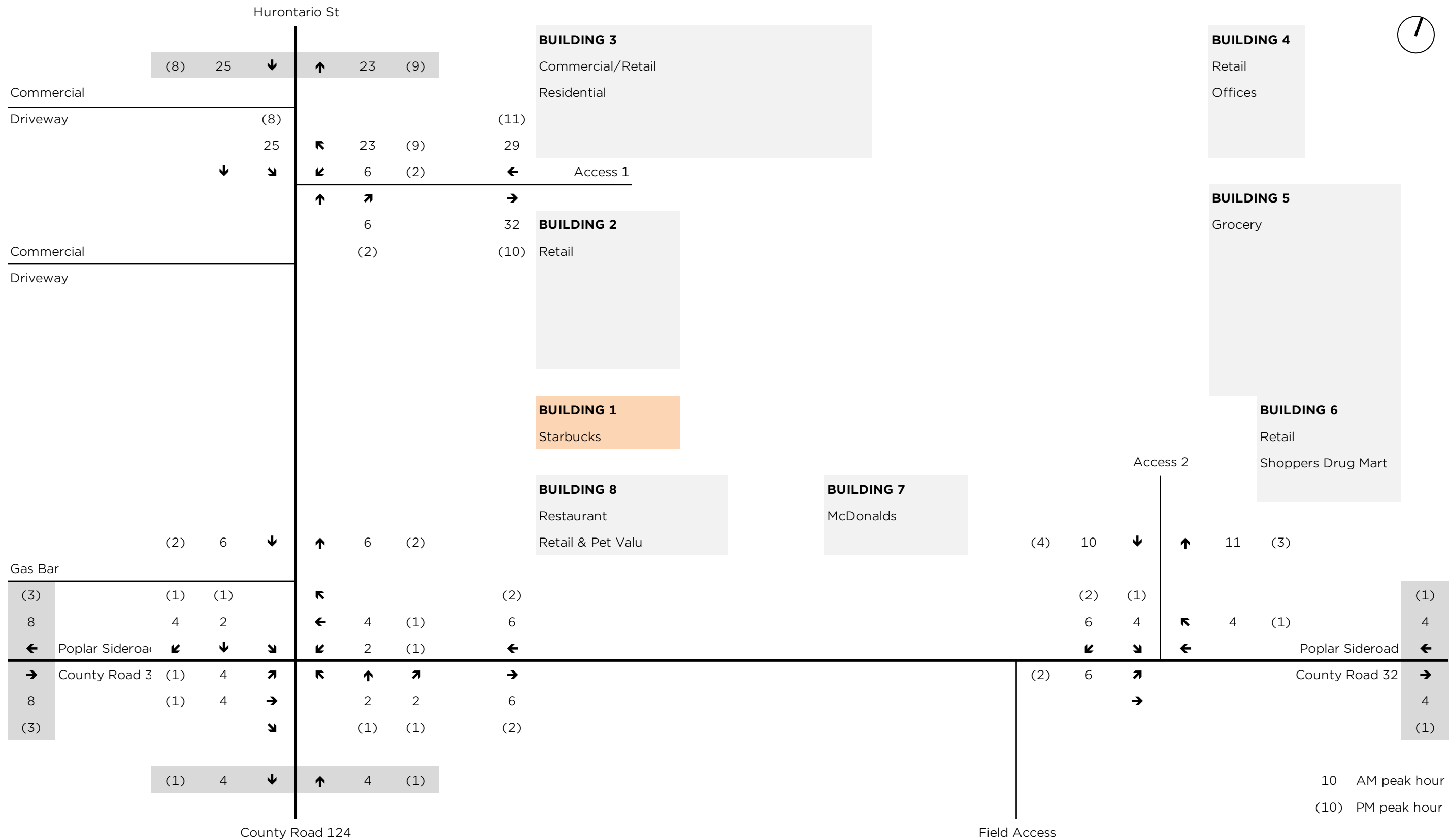
¹Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P

²Person-Trips

³Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator

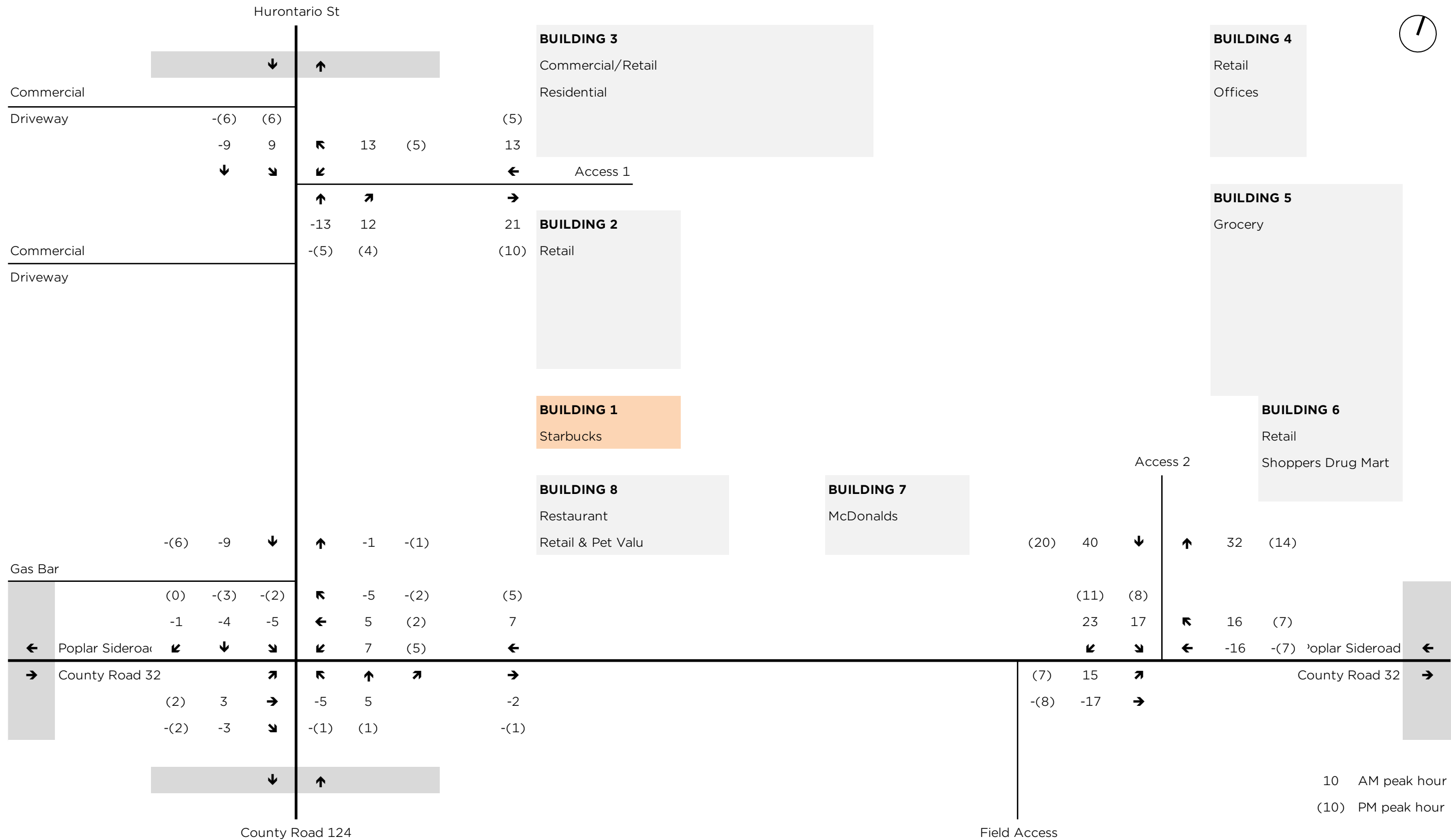
*Indicates computation that has been rounded to the nearest whole number.

Appendix J: Site Traffic



THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY
Figure J1A: Site Traffic - Building 1, Starbucks New Weekday Trips

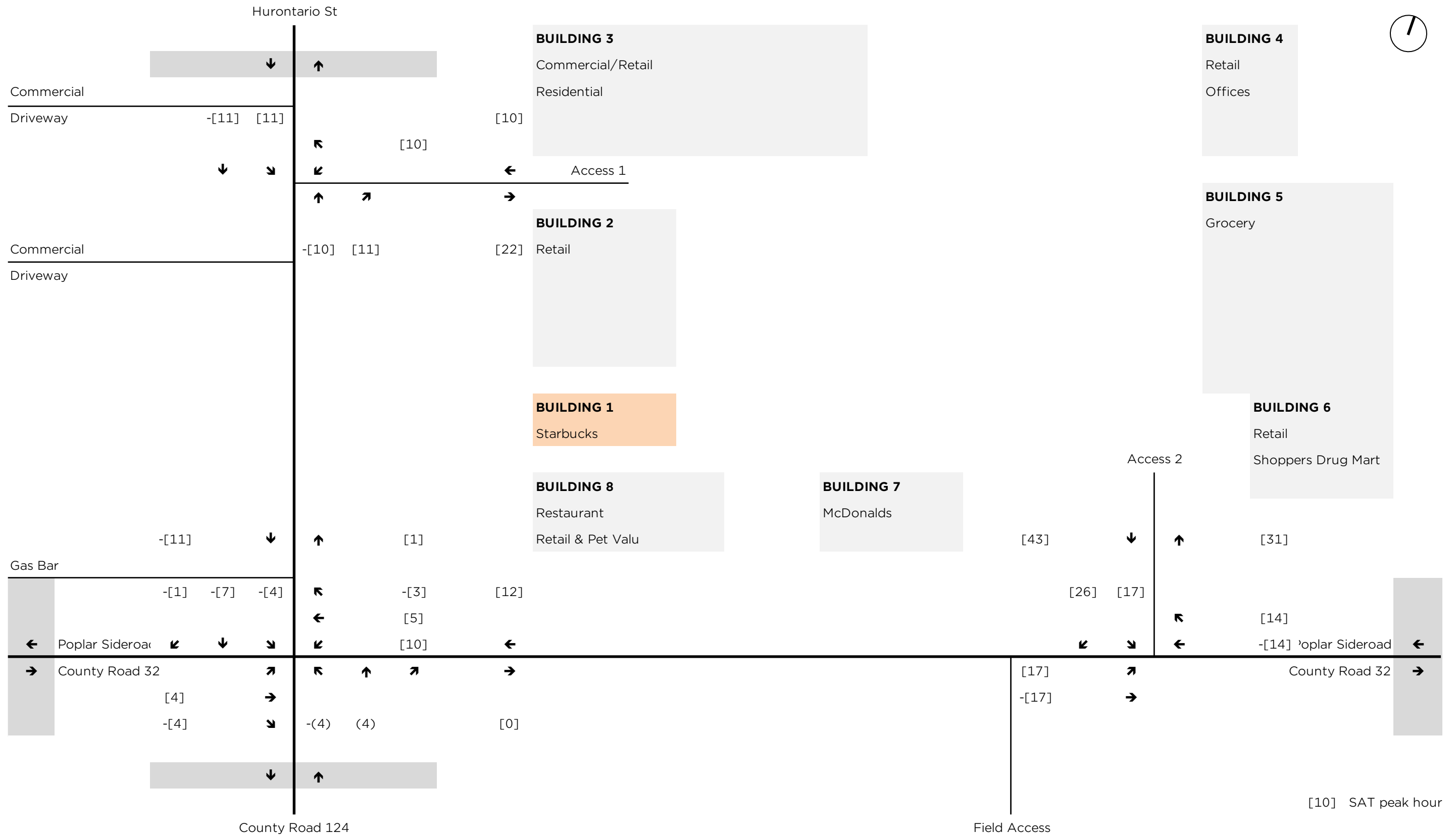




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J2A: Site Traffic - Building 1, Starbucks Weekday Pass-by Trips

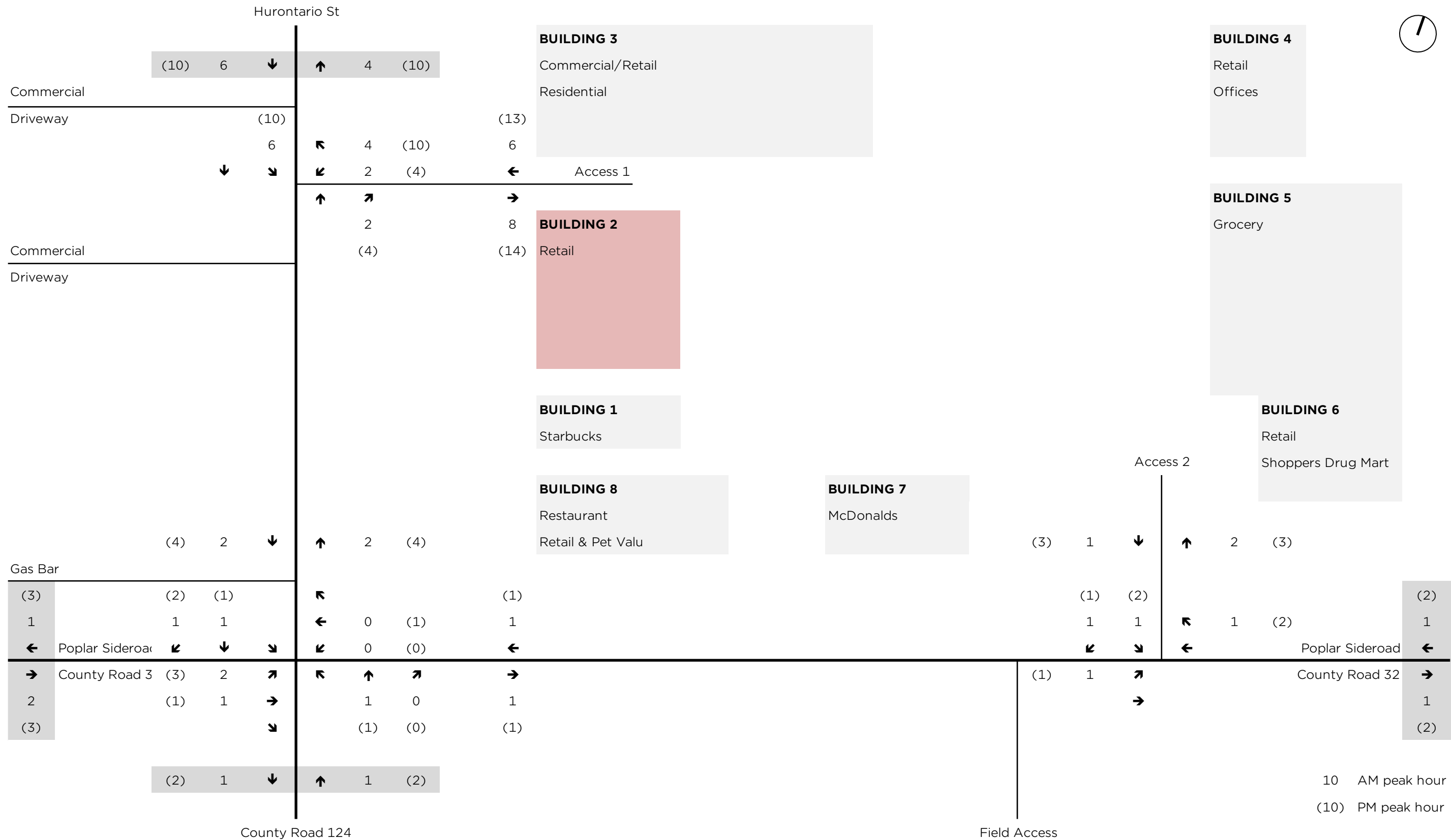


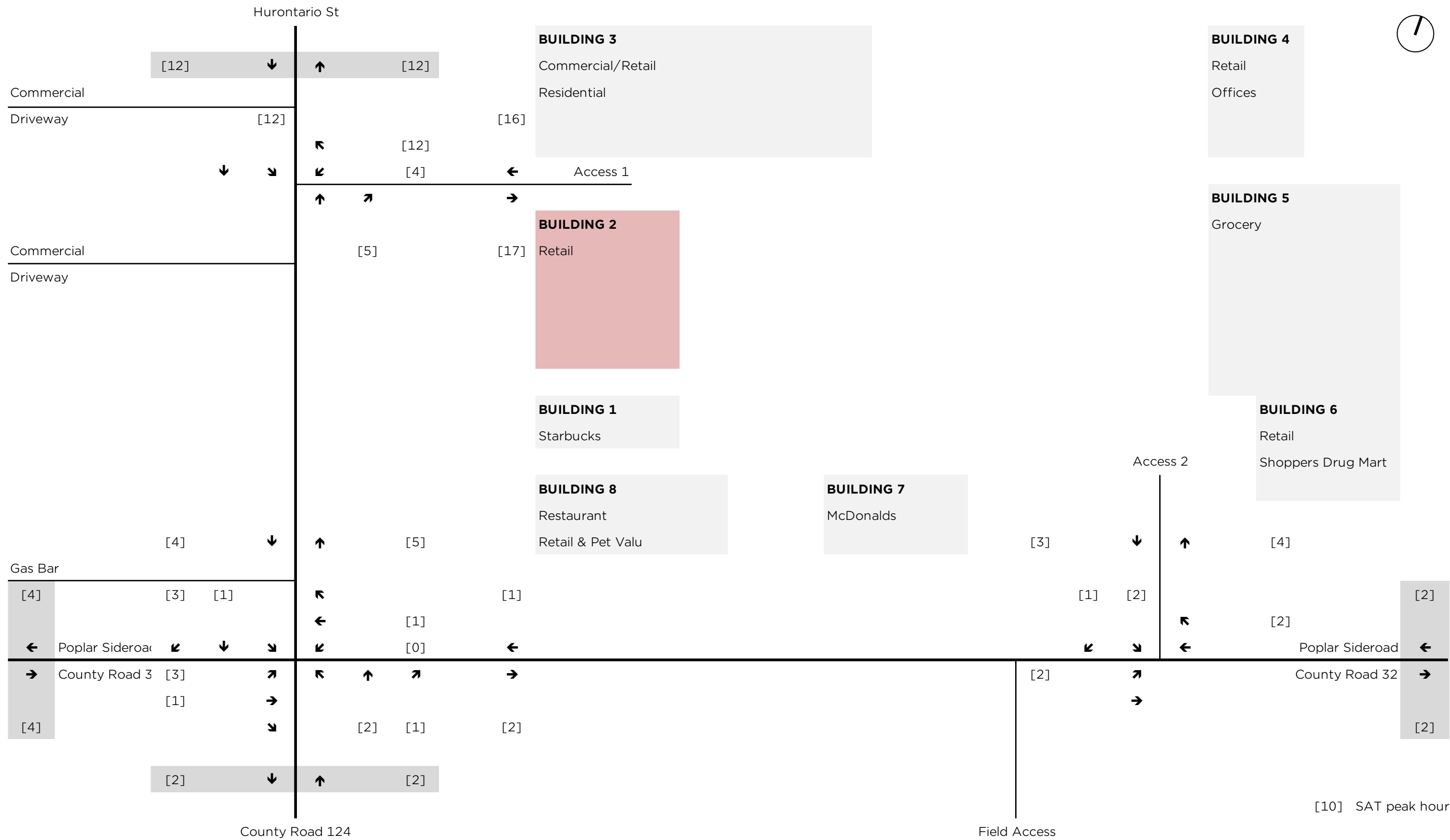


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J2B: Site Traffic – Building 1, Starbucks Saturday Pass-by Trips



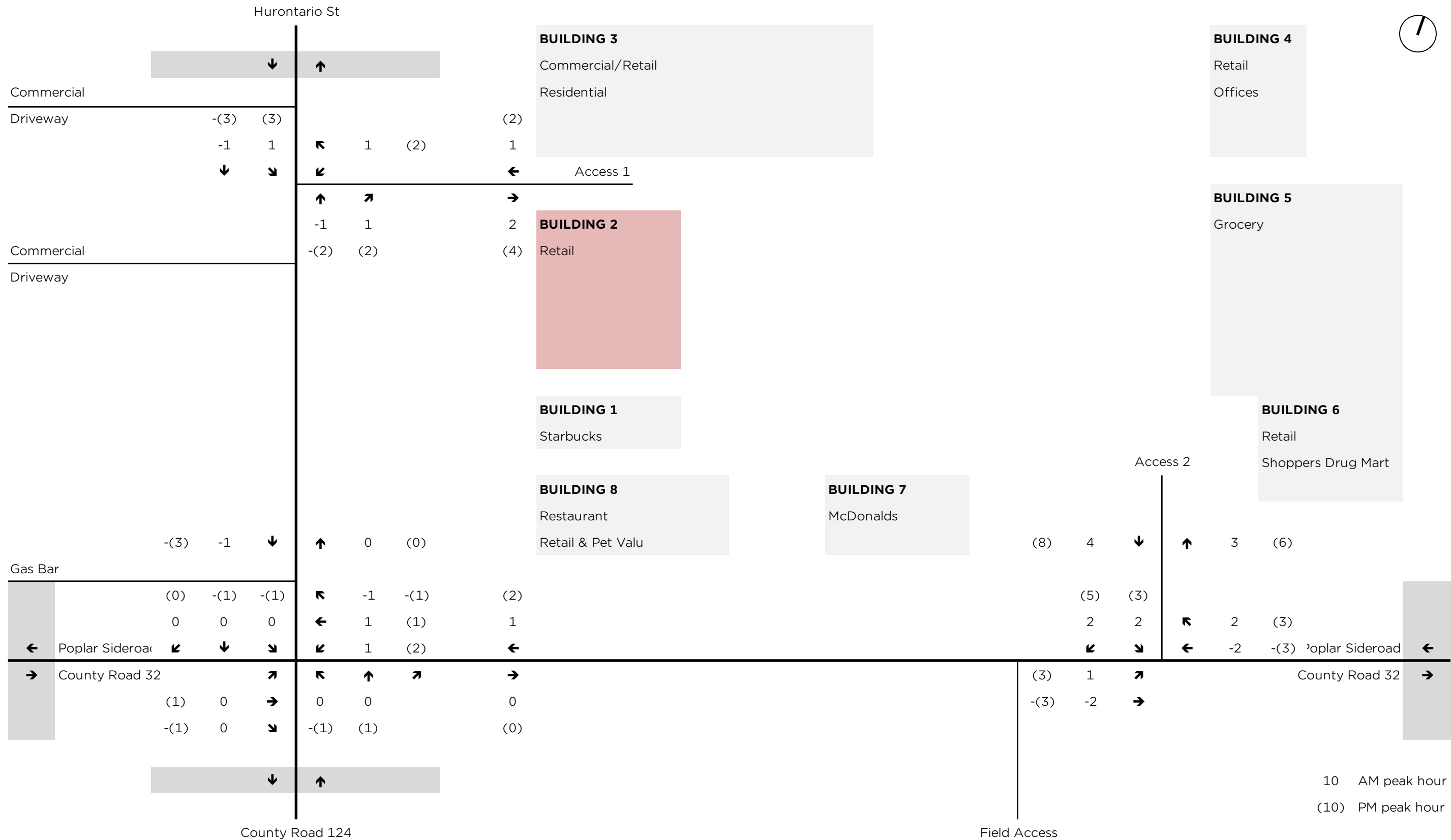


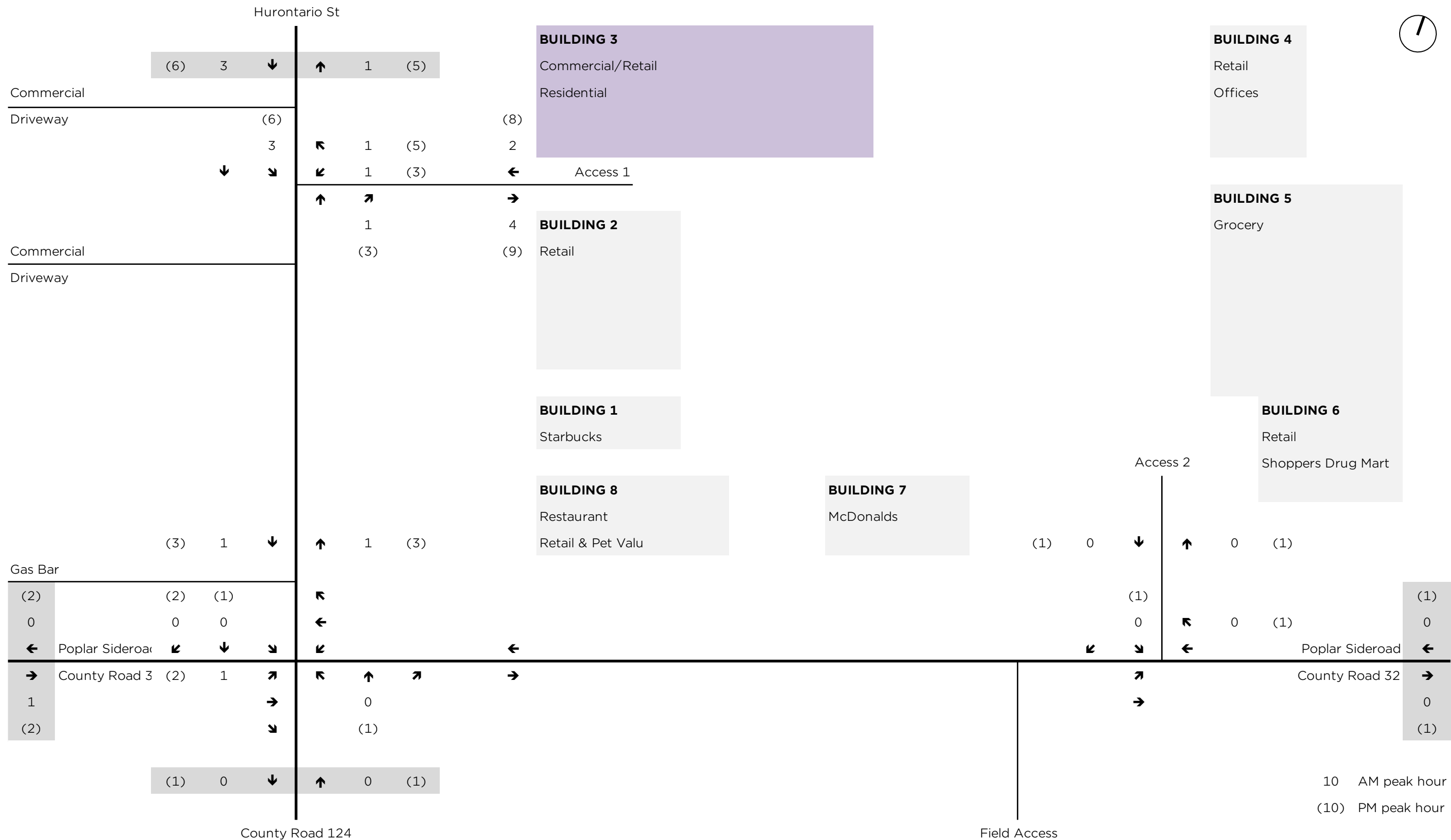


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J3B: Site Traffic – Building 2, Retail New Saturday Trips



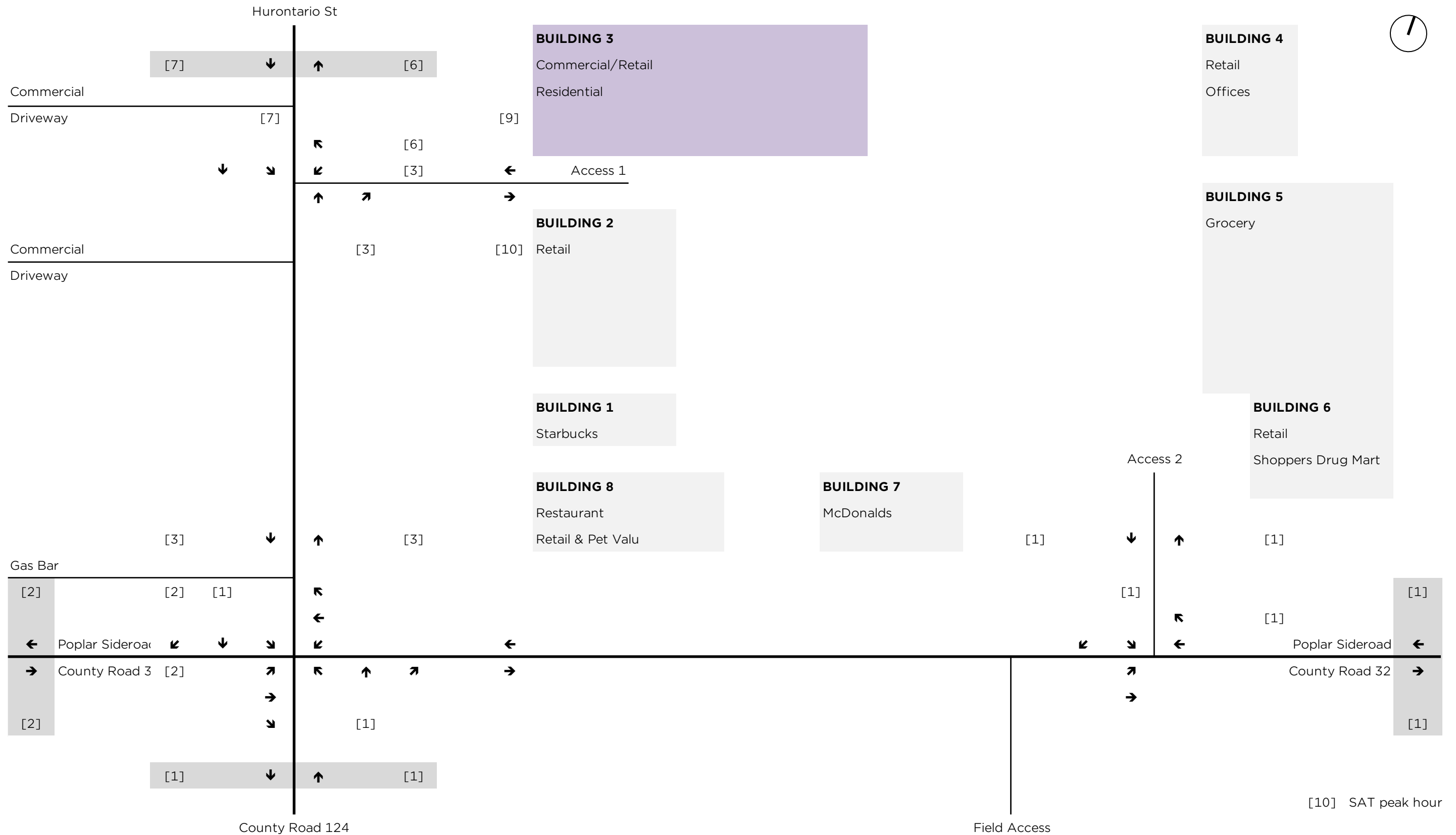




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J5A: Site Traffic – Building 3, Retail New Weekday Trips

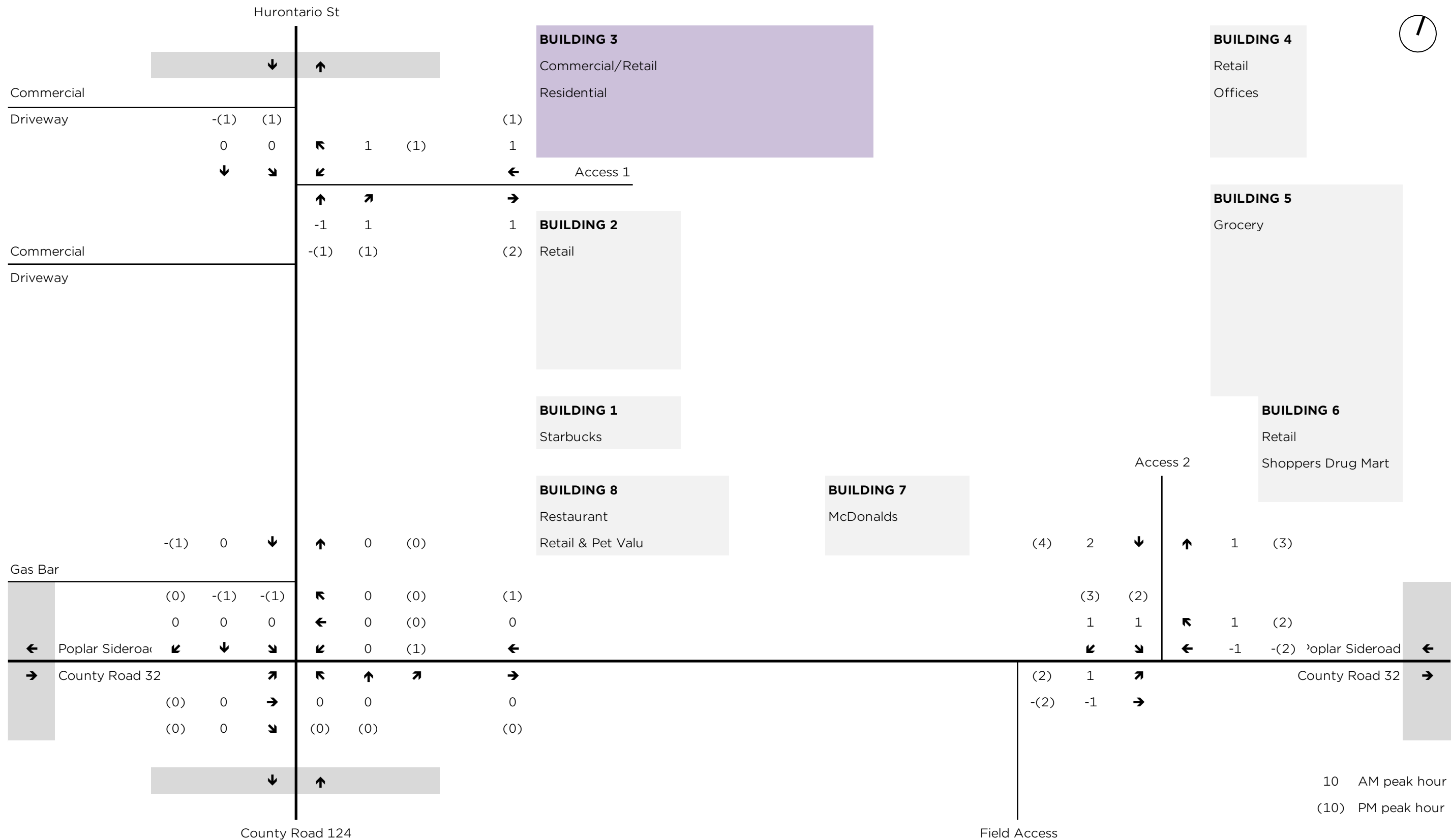




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J5B: Site Traffic – Building 3, Retail New Saturday Trips

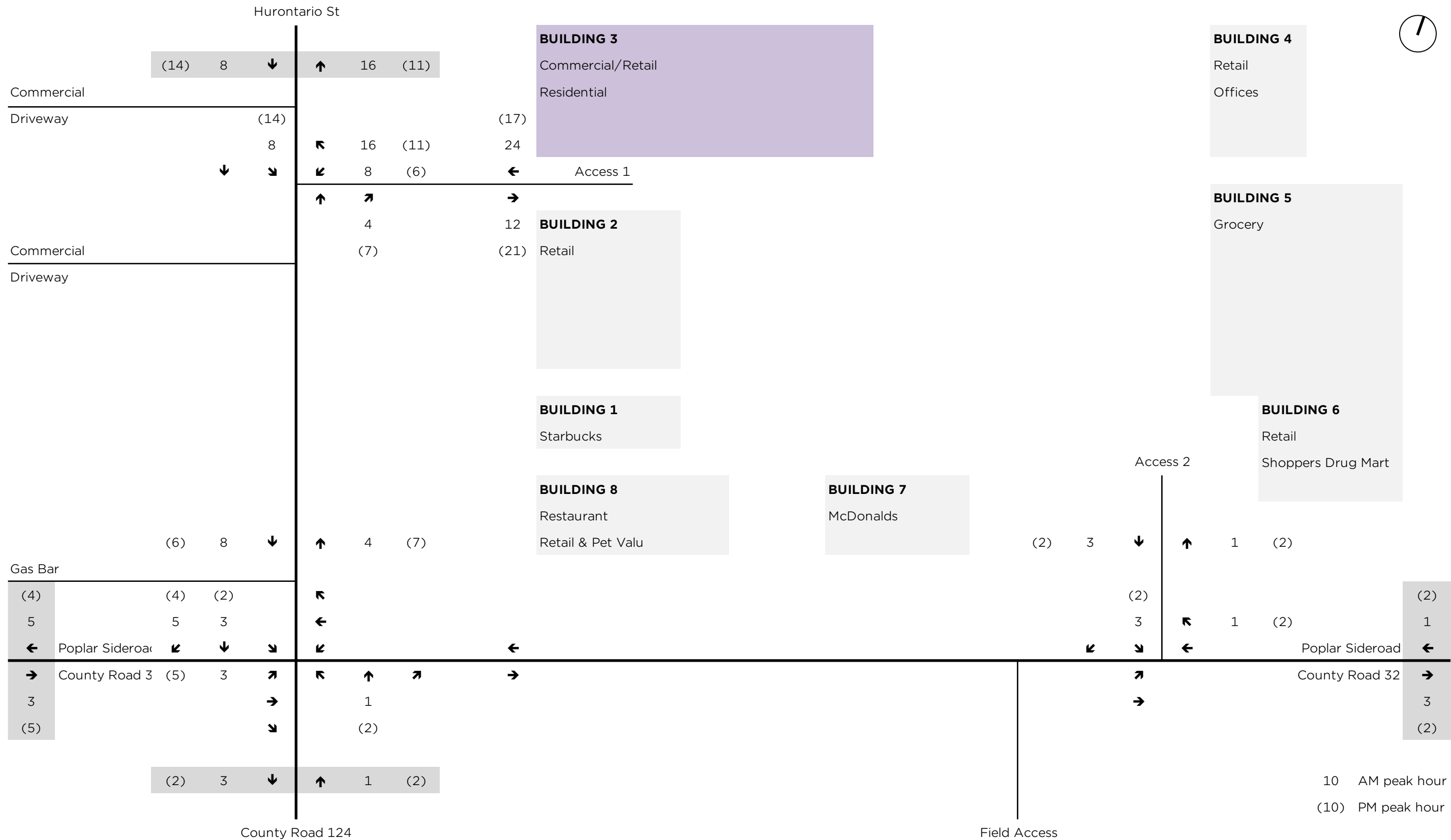




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J6A: Site Traffic – Building 3, Retail Weekday Pass-by Trips

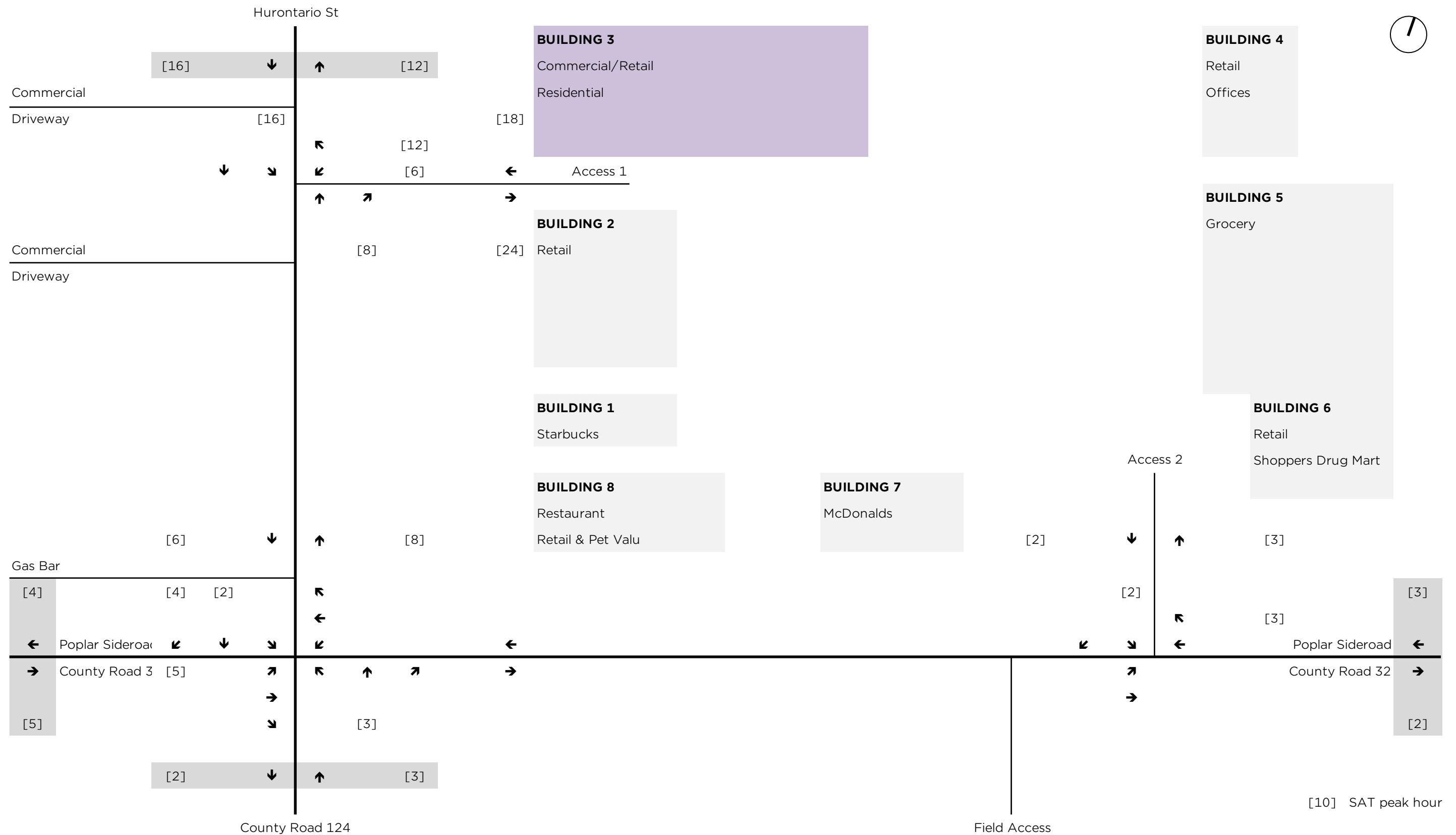




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J7A: Site Traffic - Building 3, Residential New Weekday Trips

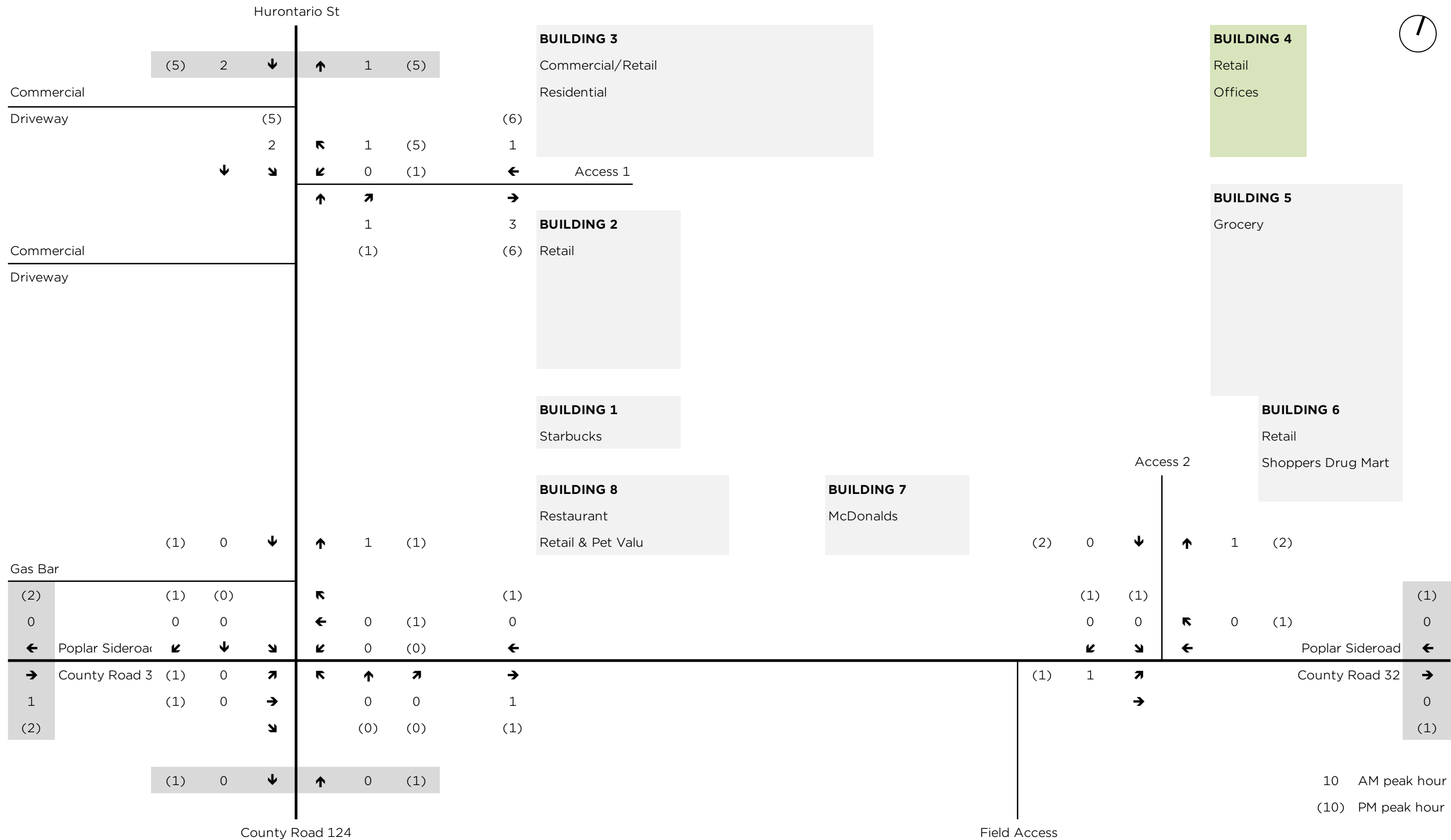




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J7B: Site Traffic – Building 3, Residential New Saturday Trips

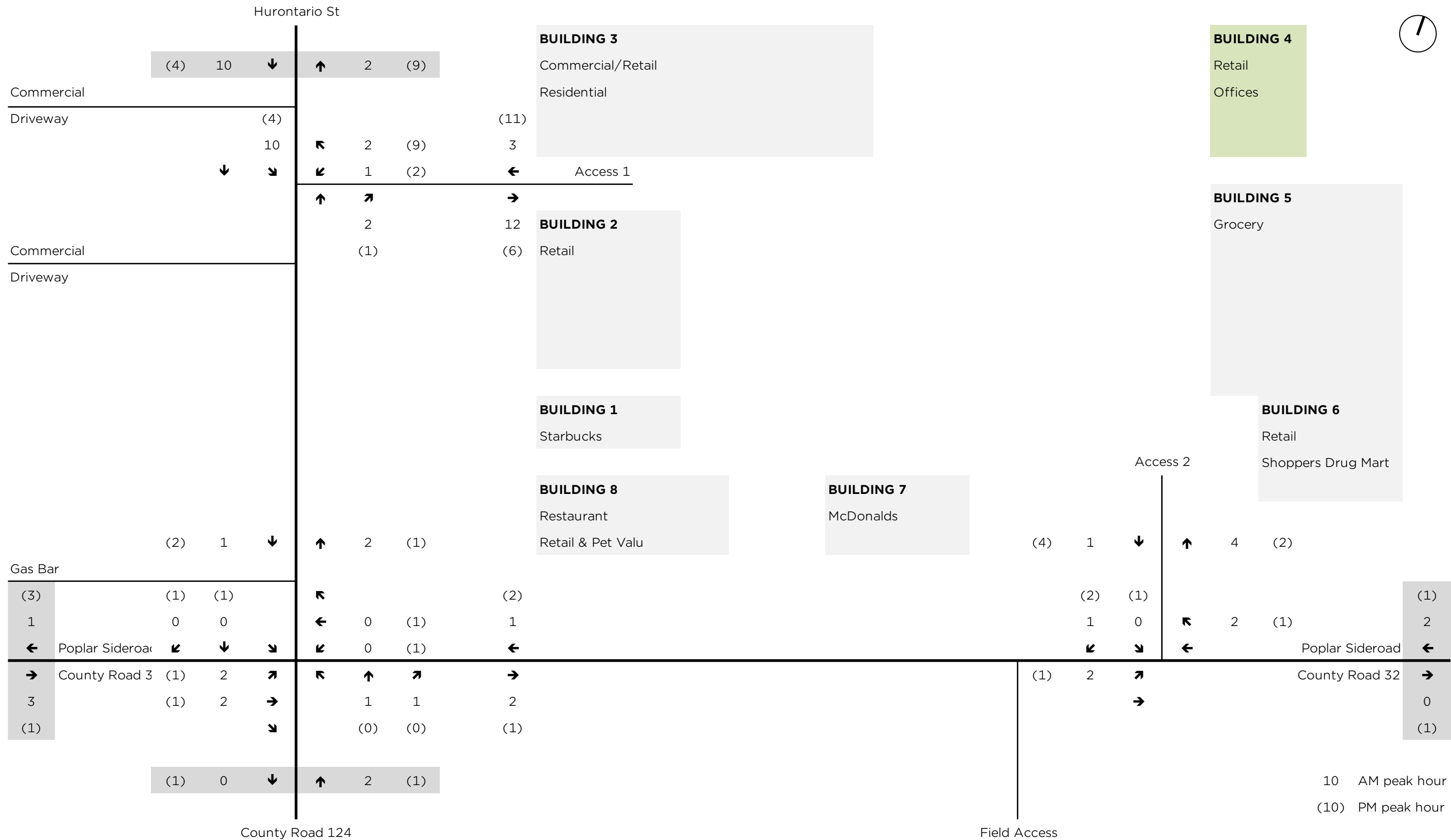




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J8A: Site Traffic - Building 4, Retail New Weekday Trips

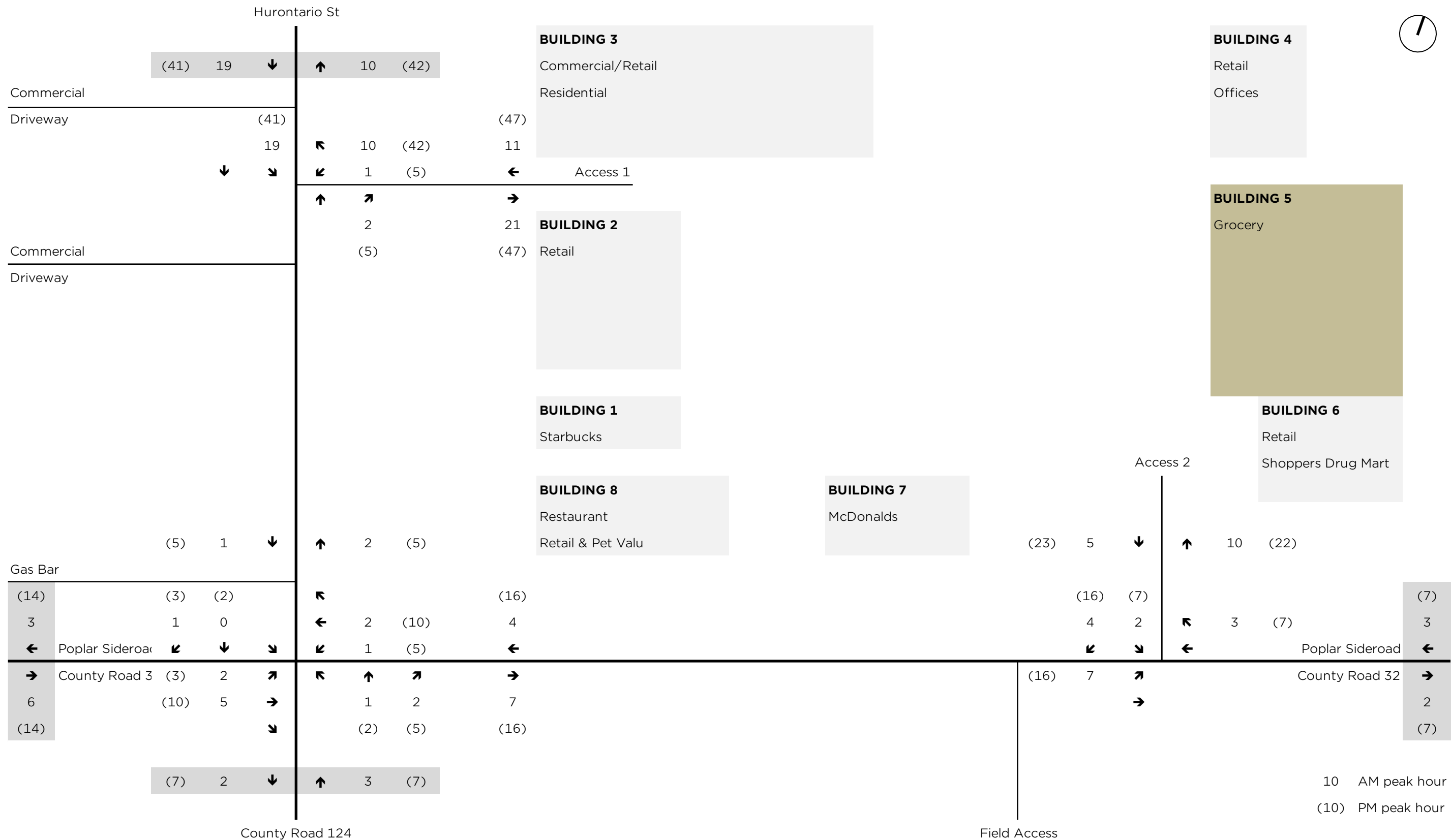




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J10: Site Traffic - Building 4, Office New Weekday Trips

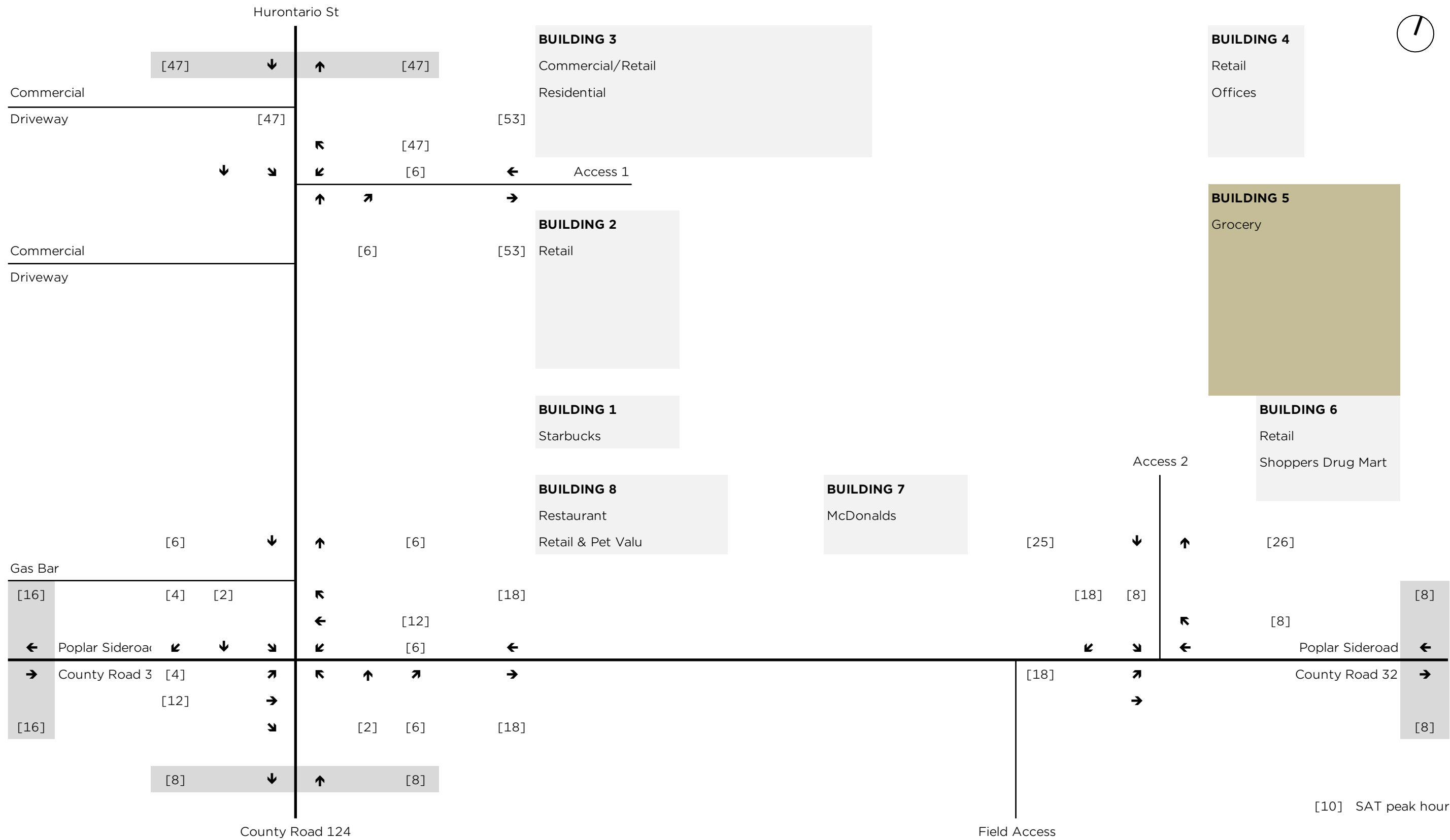




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J11A: Site Traffic - Building 5, Supermarket New Weekday Trips

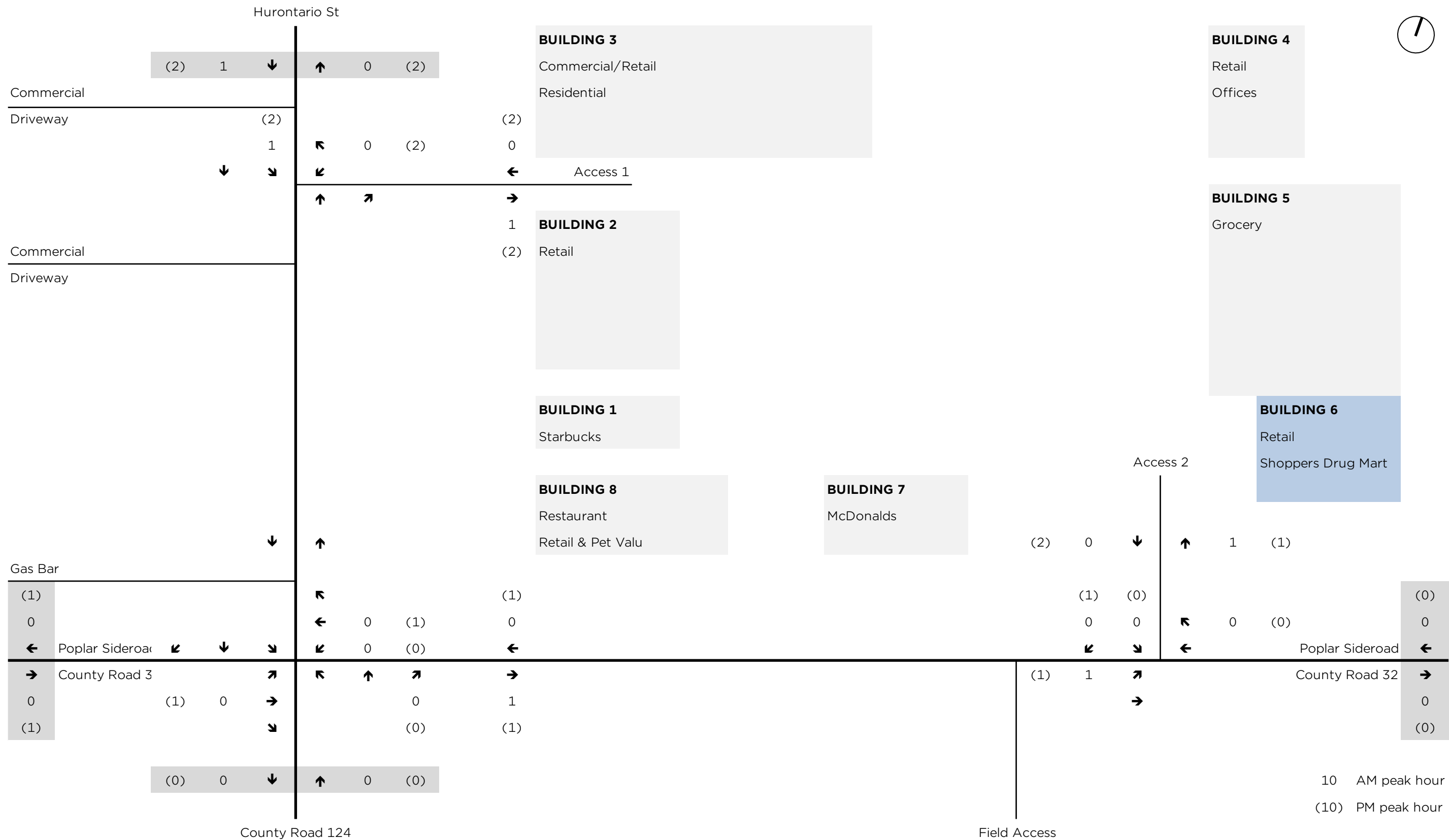




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J11B: Site Traffic – Building 5, Supermarket New Saturday Trips

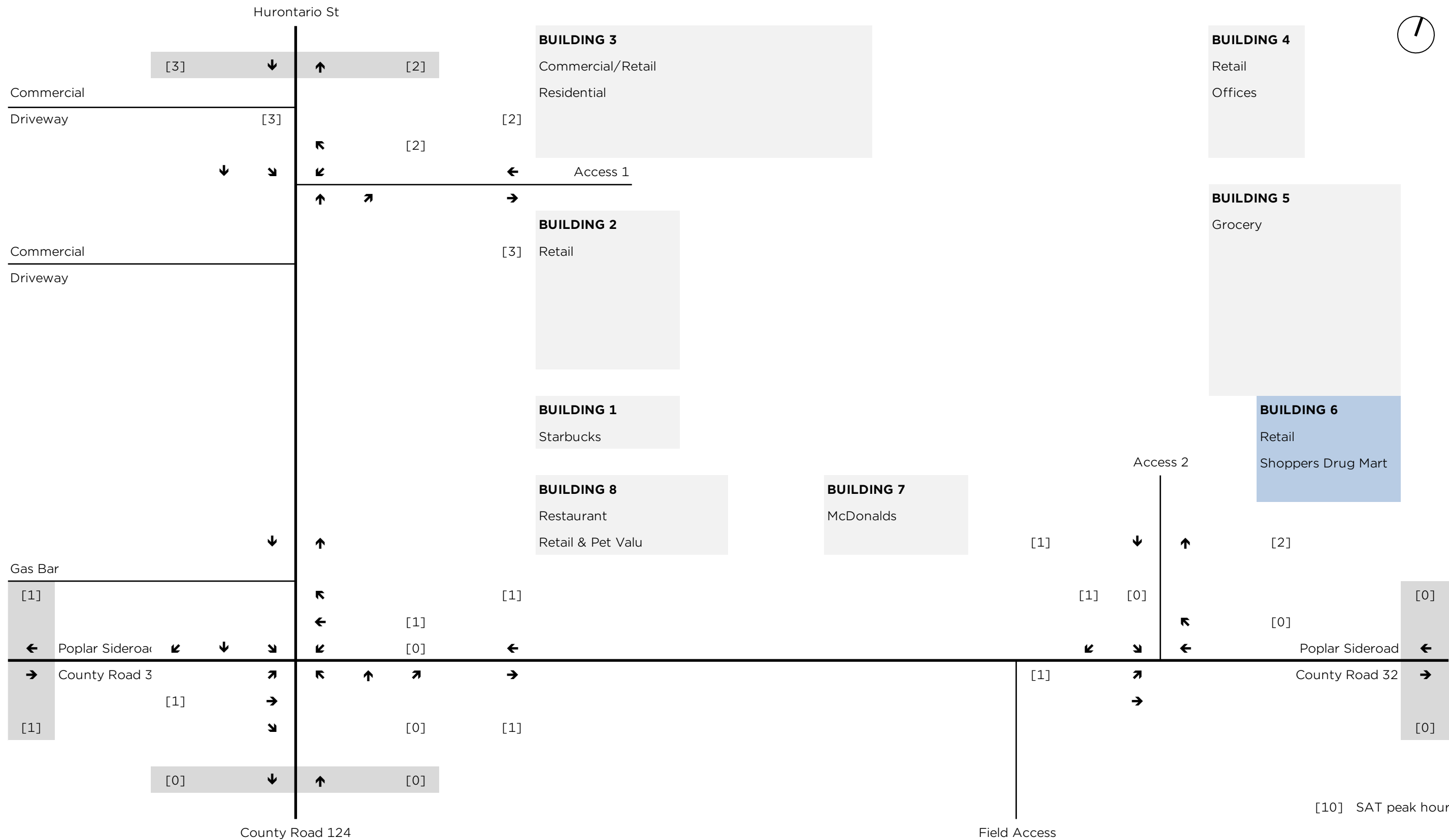




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J13A: Site Traffic - Building 6, Retail New Weekday Trips

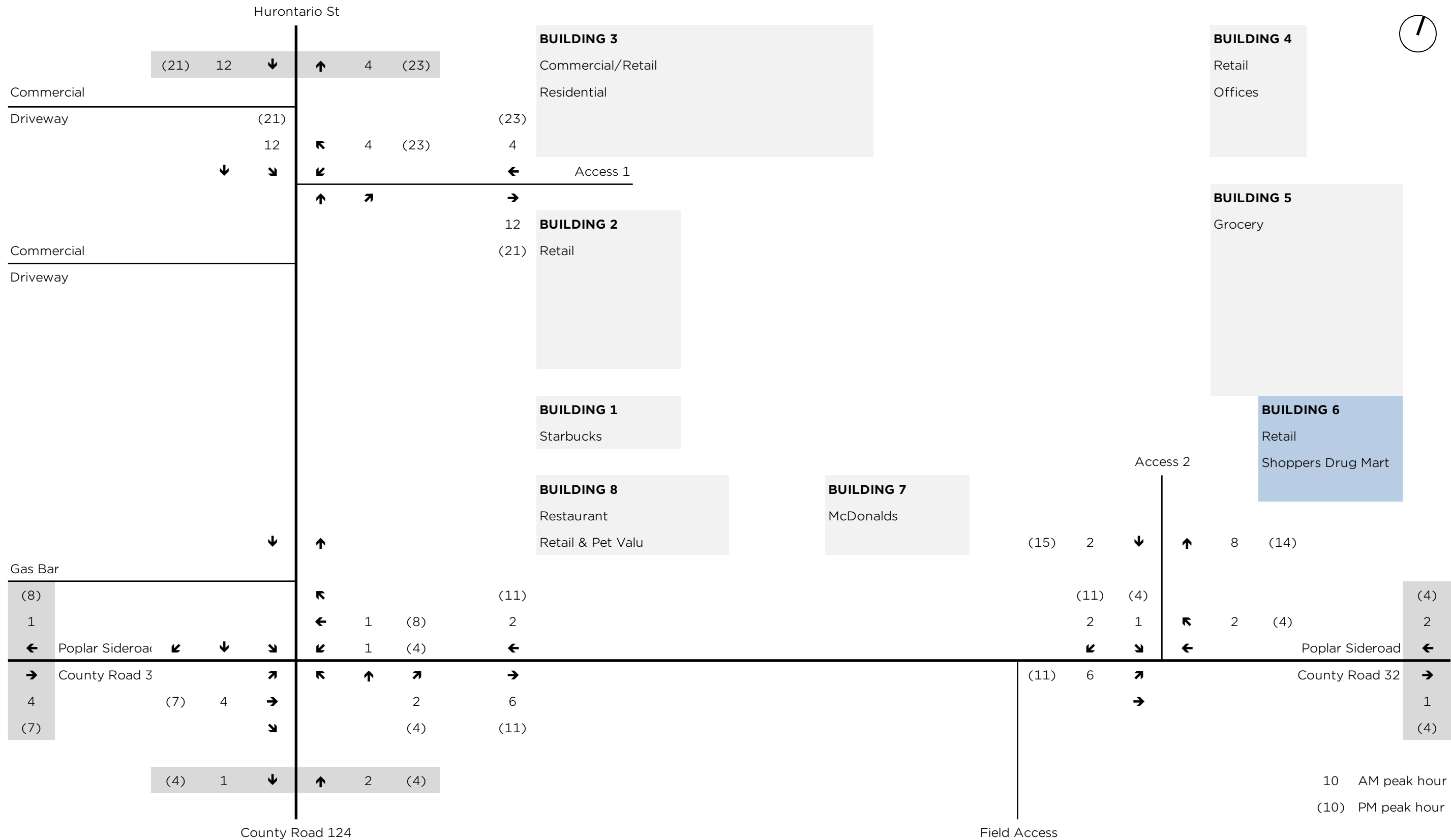




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J13B: Site Traffic - Building 6, Retail New Saturday Trips

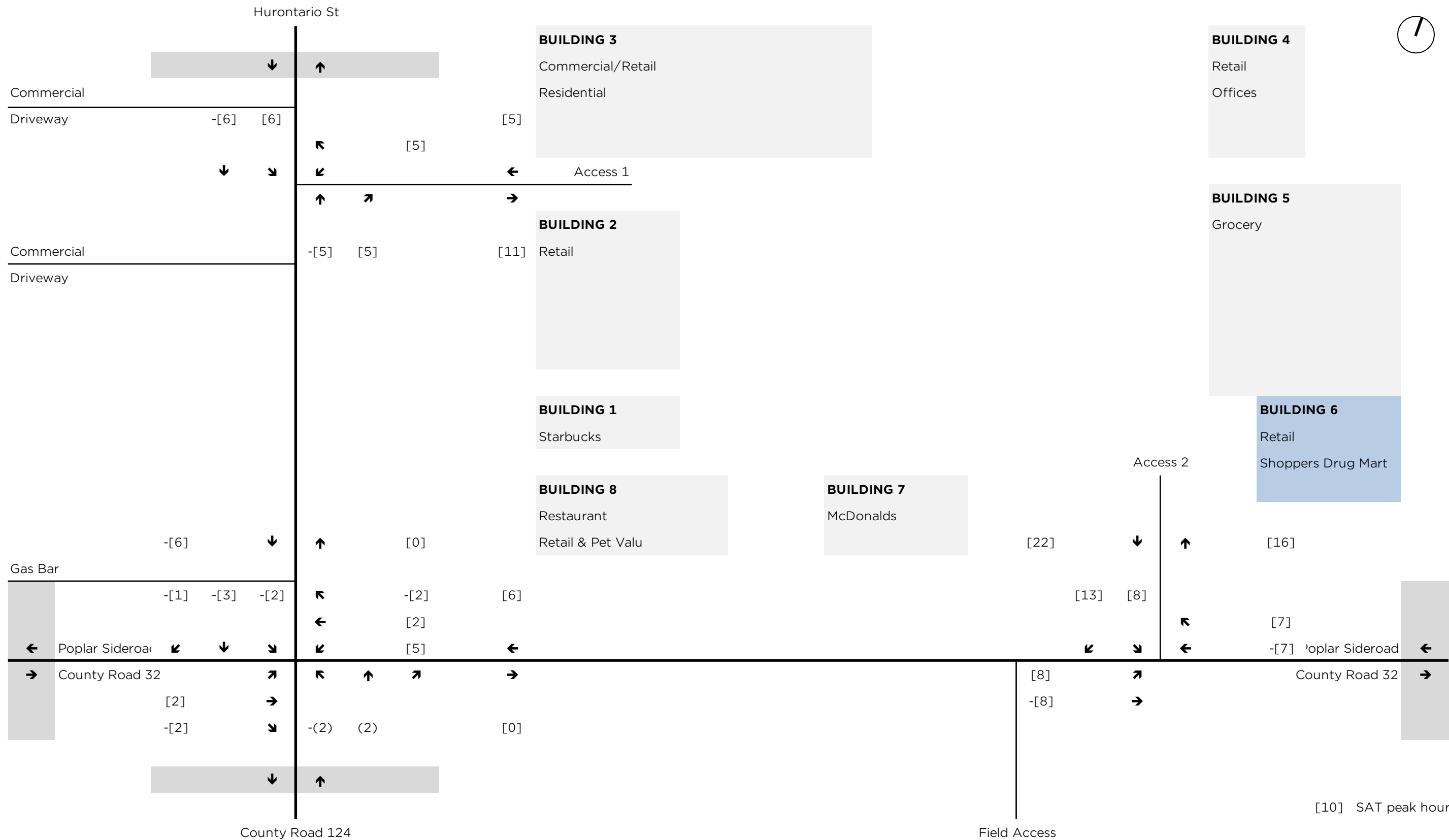




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J15A: Site Traffic - Building 6, Shoppers Drug Mart New Weekday Trips

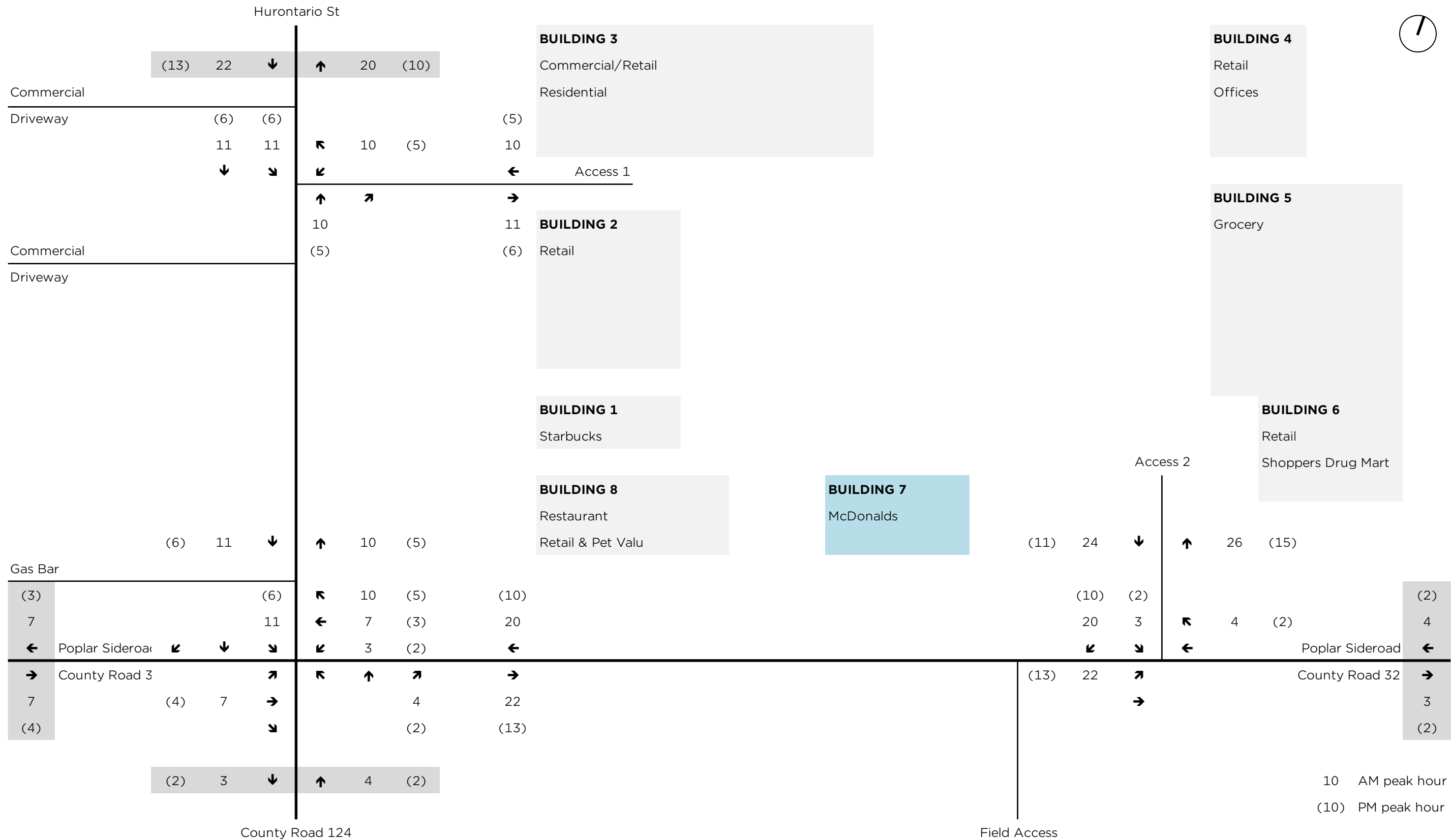




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J16B: Site Traffic - Building 6, Shoppers Drug Mart Saturday Pass-by Trips

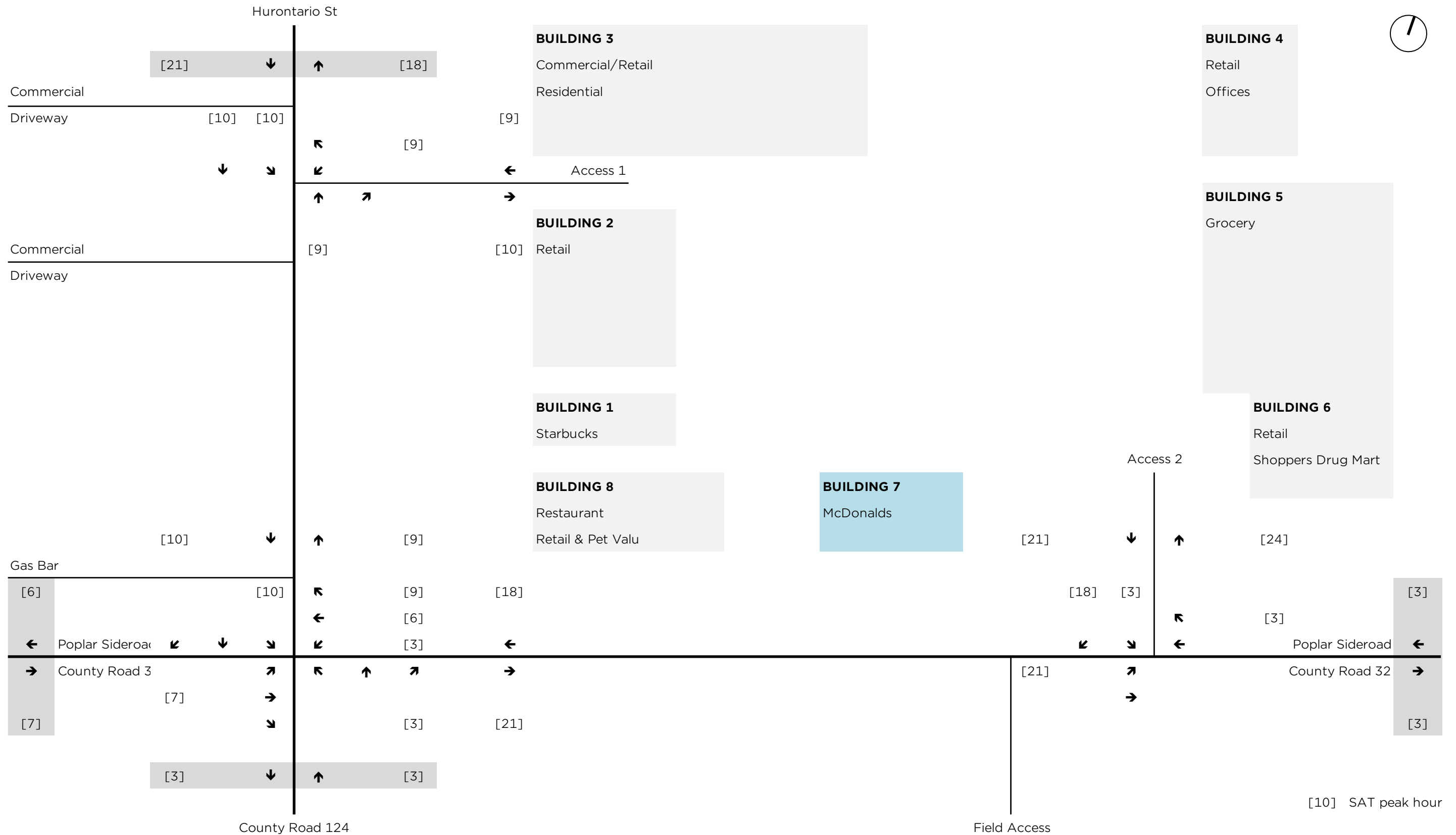




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J17A: Site Traffic - Building 7, McDonalds New Weekday Trips

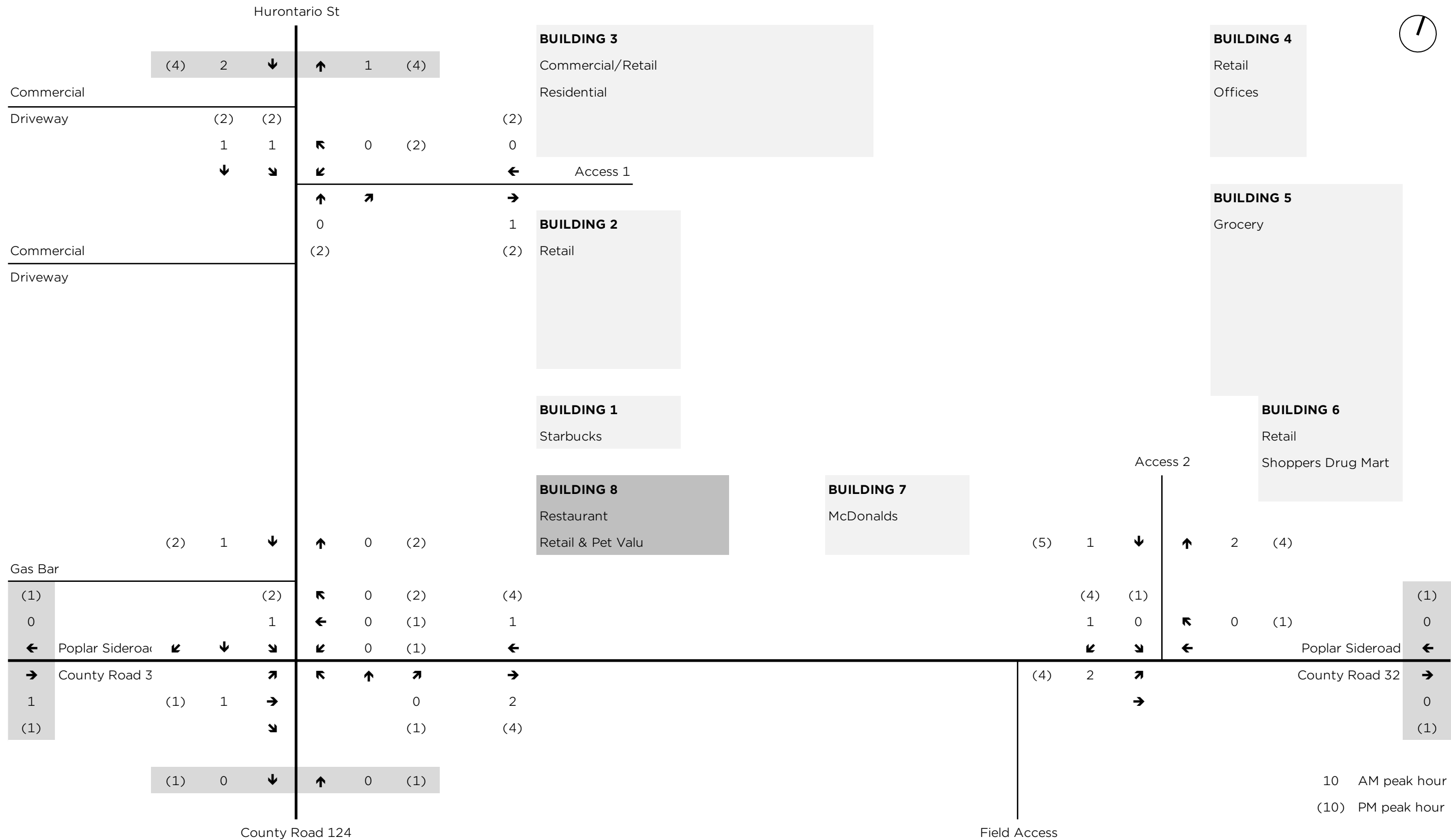




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J17B: Site Traffic - Building 7, McDonalds New Saturday Trips

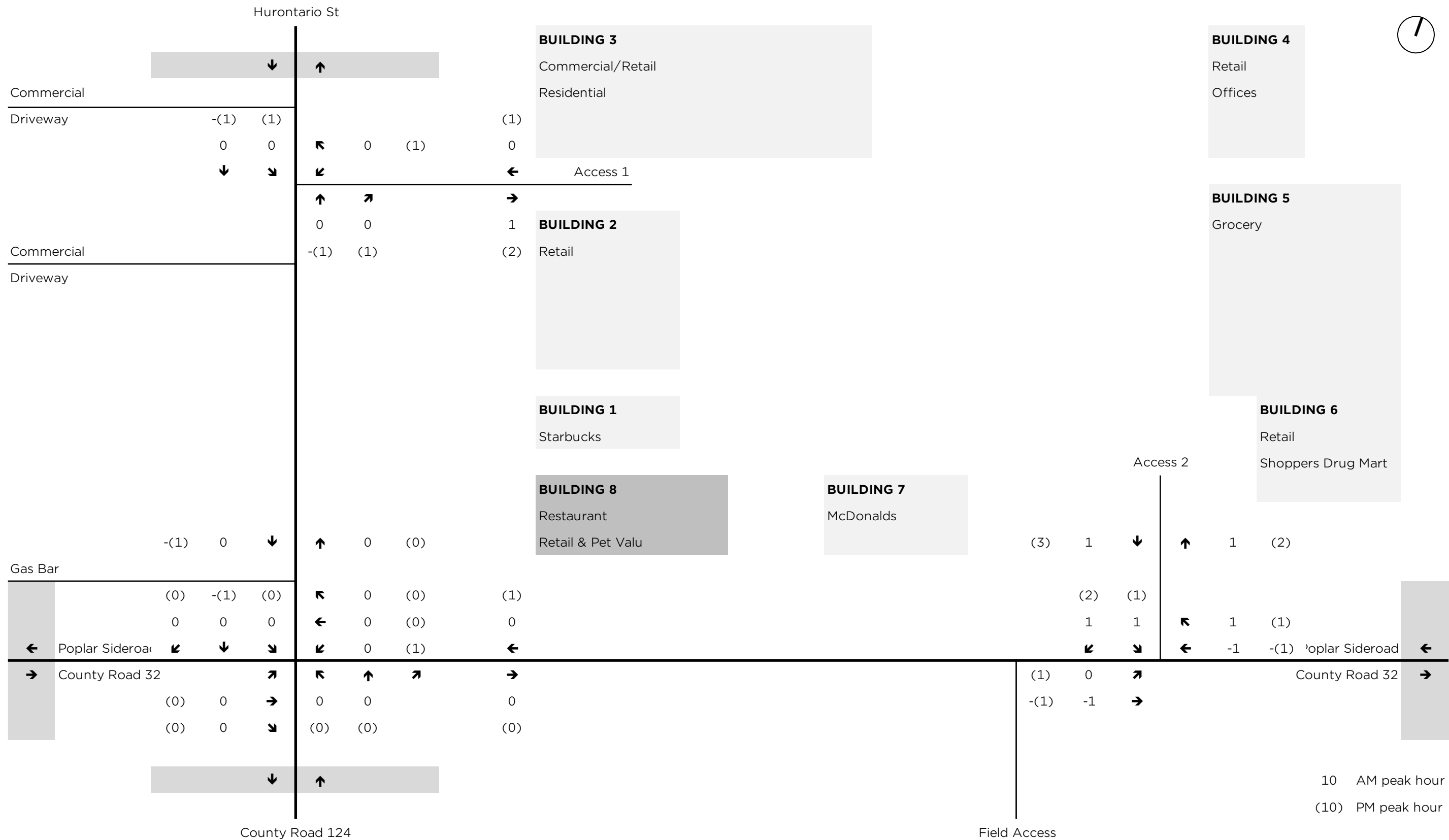




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J19A: Site Traffic - Building 8, Retail New Weekday Trips

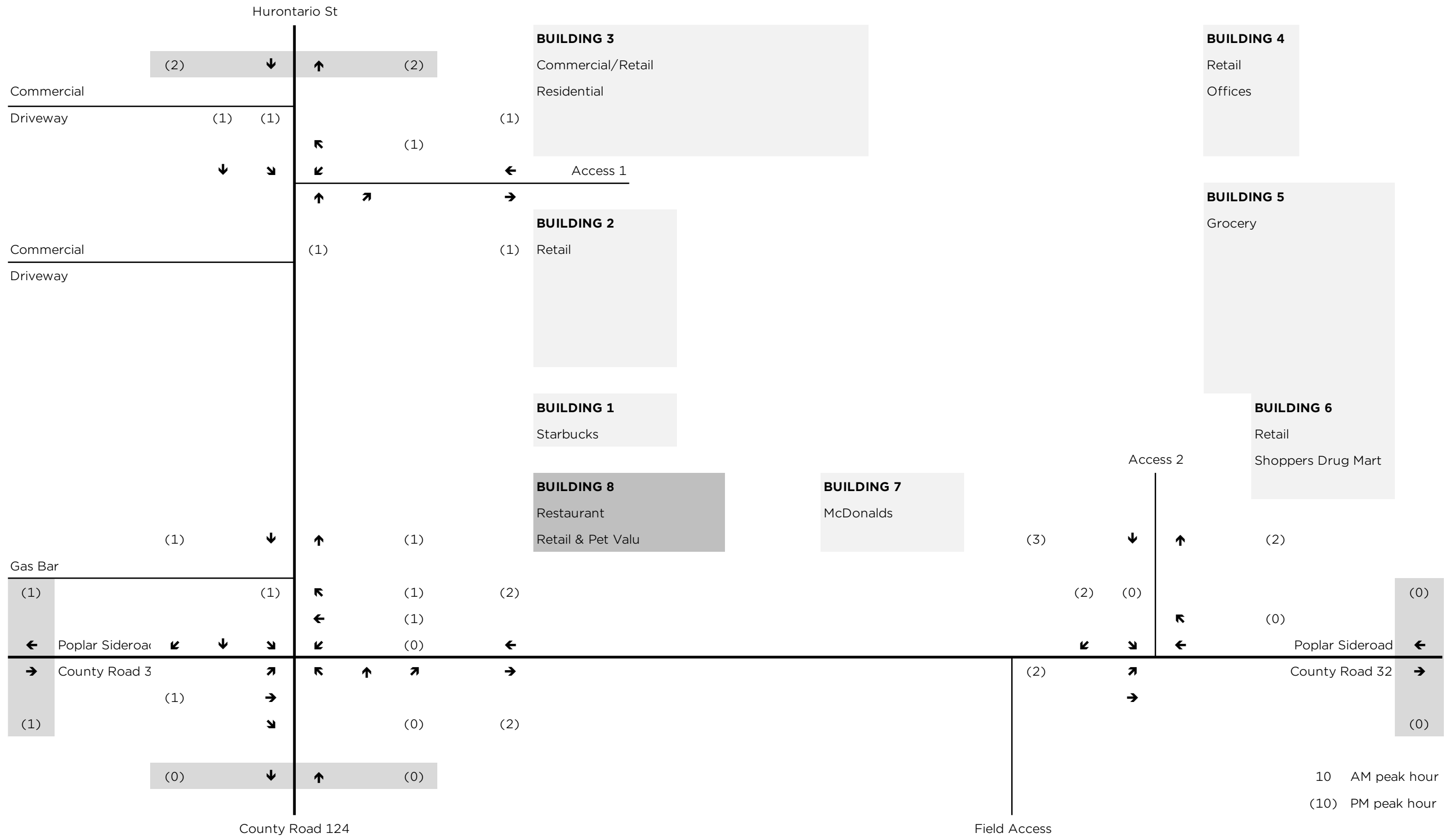




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J20A: Site Traffic – Building 8, Retail Weekday Pass-by Trips

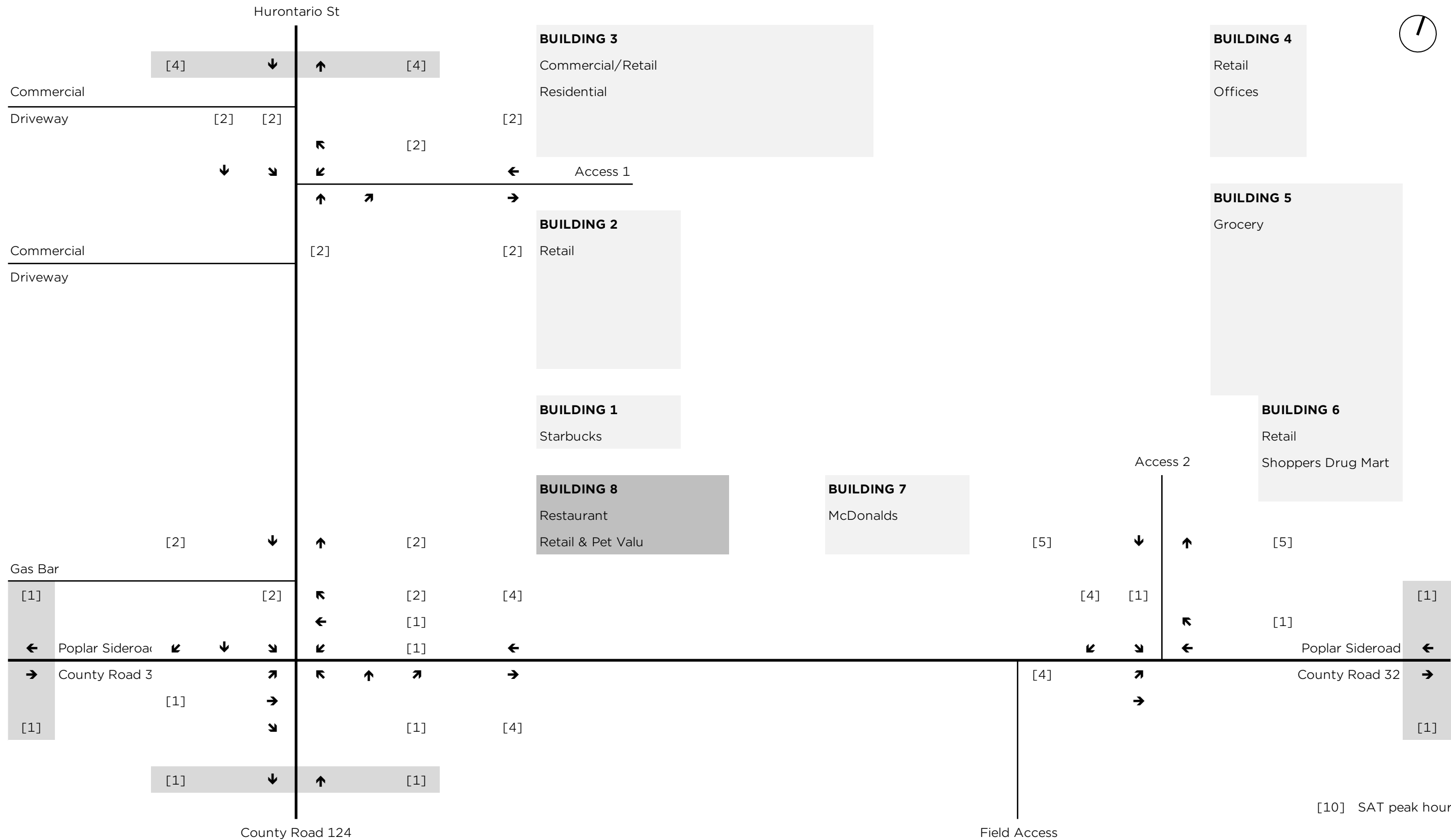




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J21A: Site Traffic - Building 8, Pet Valu New Weekday Trips

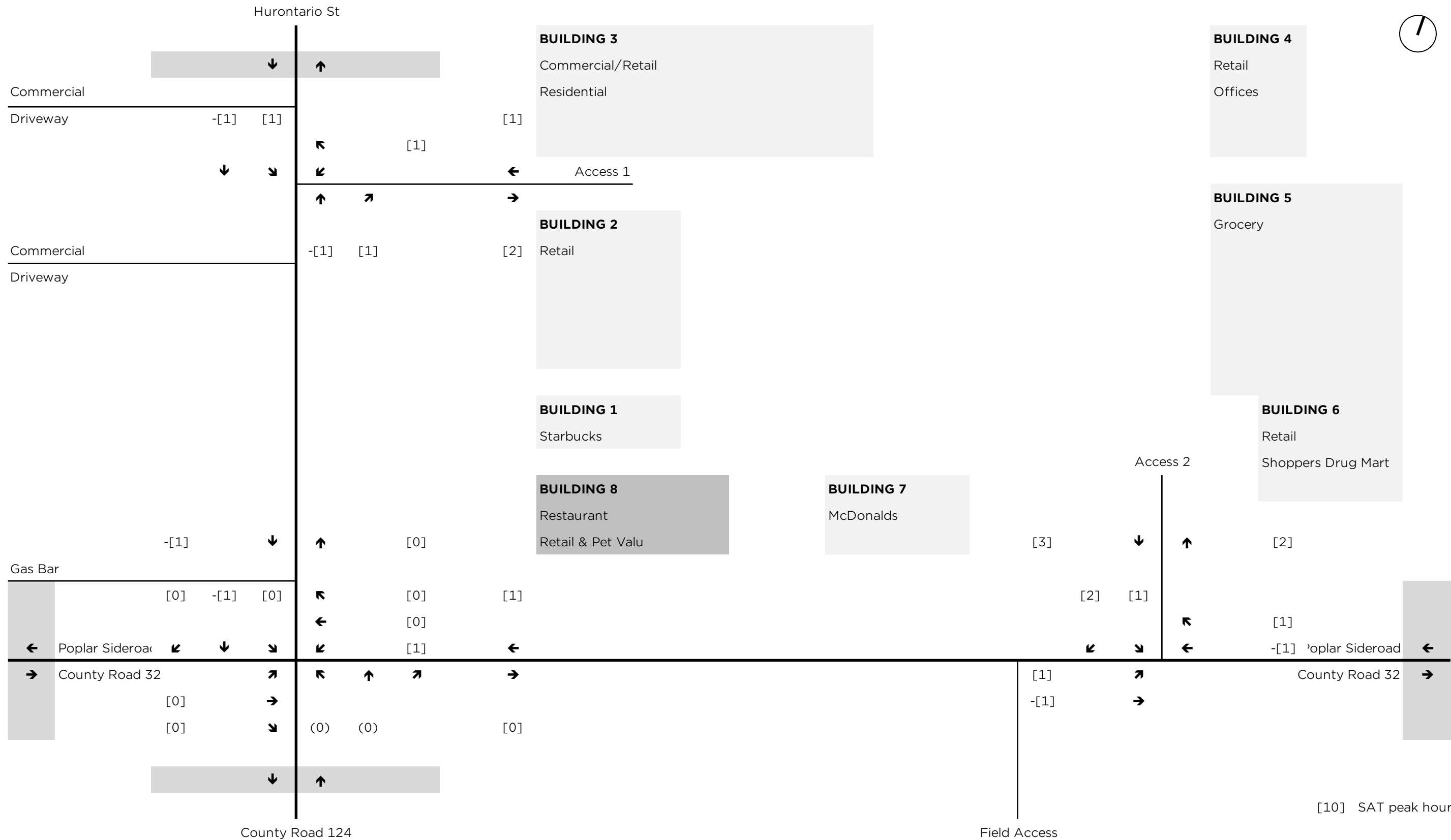




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J21B: Site Traffic - Building 8, Pet Valu New Saturday Trips

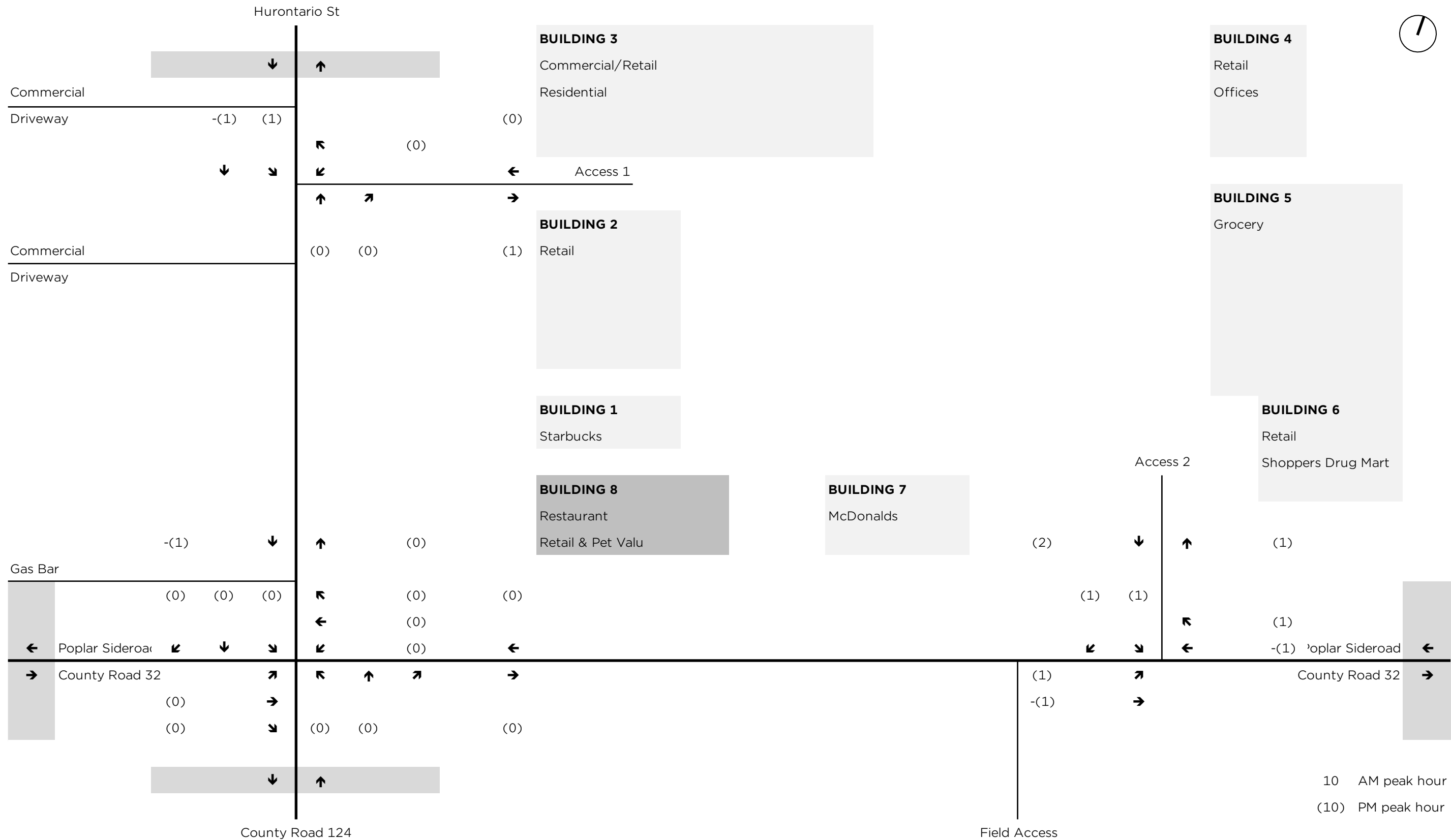




THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

Figure J22B: Site Traffic – Building 8, Pet Valu Saturday Pass-by Trips



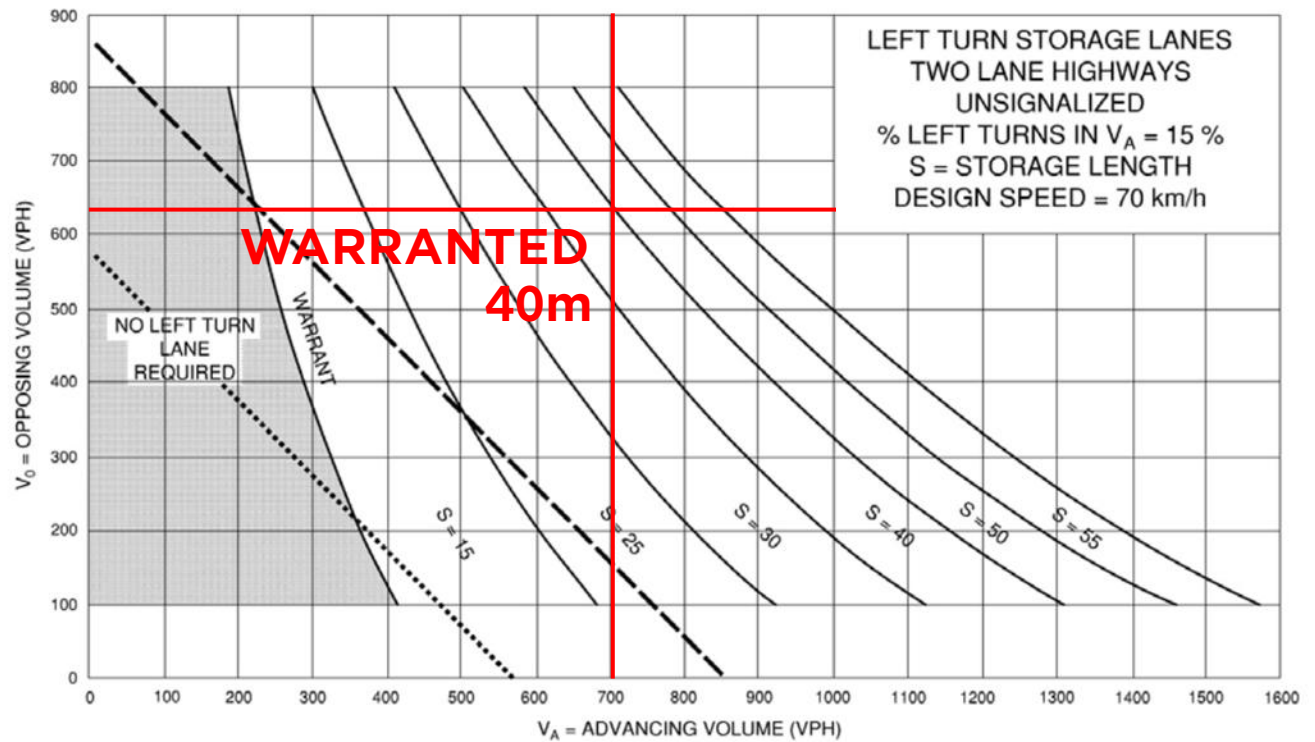


THE GATEWAY CENTRE - TRANSPORTATION IMPACT STUDY

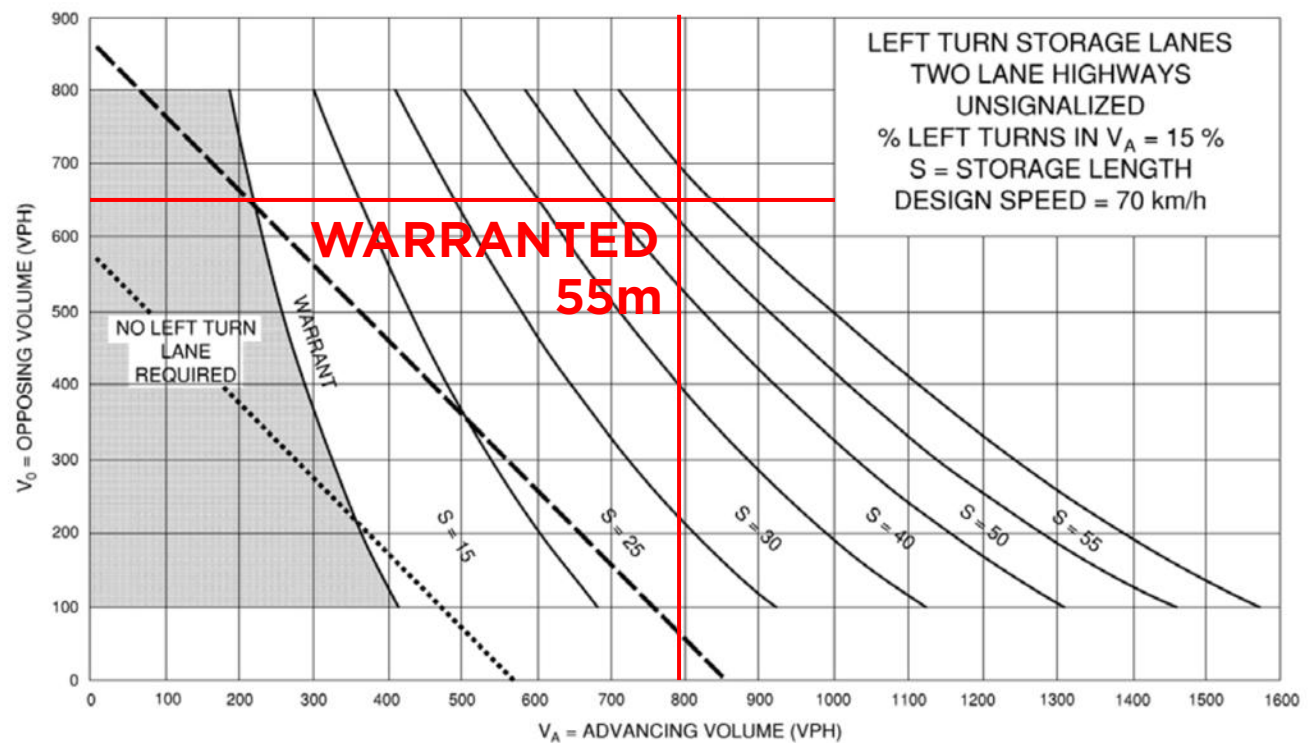
Figure J24A: Site Traffic – Building 8, Restaurant Weekday Pass-by Trips



Appendix K: Left Turn Lane Nomographs



Weekday AM Peak Hour

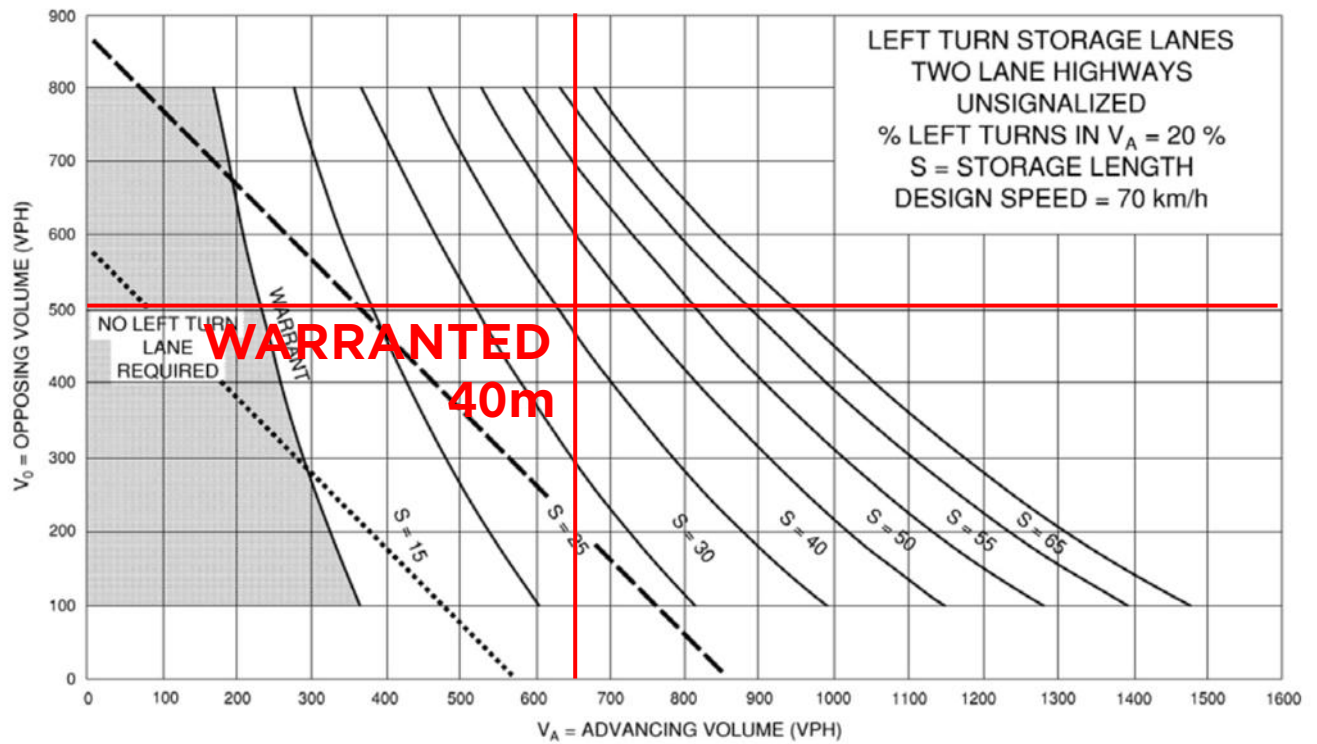


Weekday PM Peak Hour

THE GATEWAY CENTRE TIS

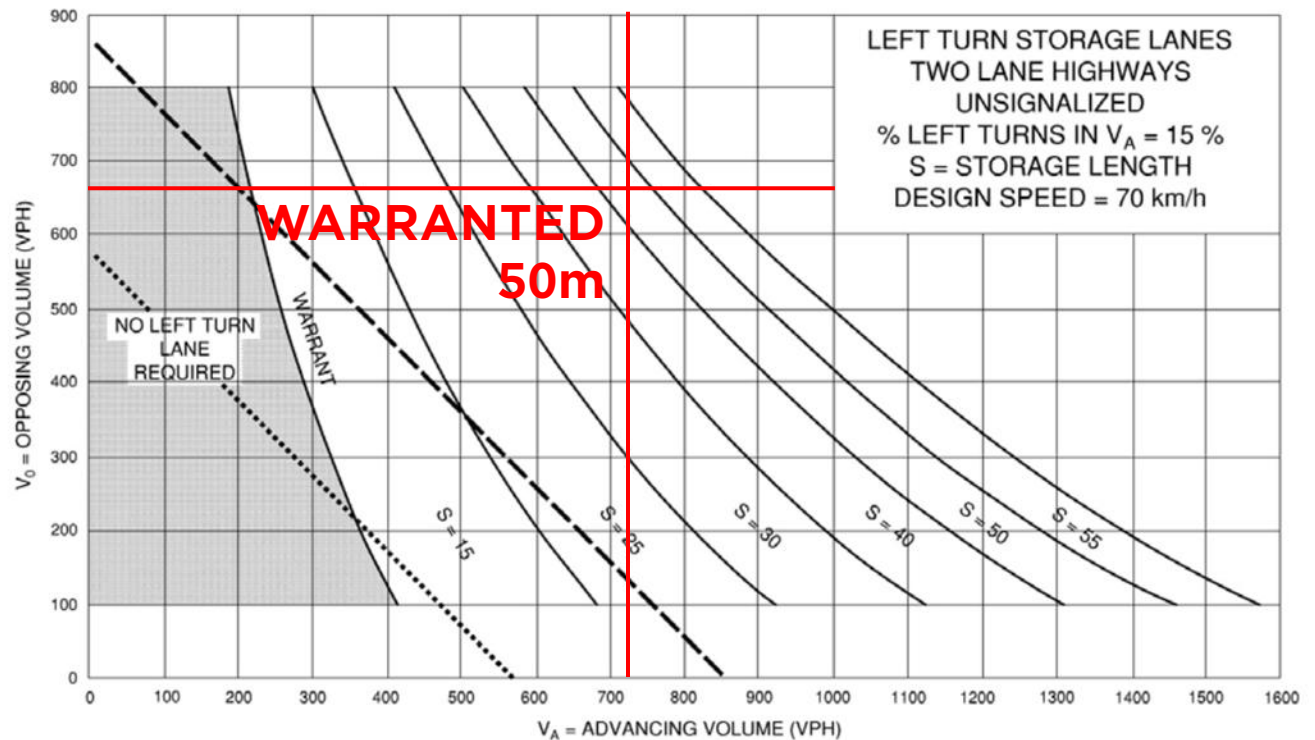
Figure K1: Access 2 – 2028 Total Conditions



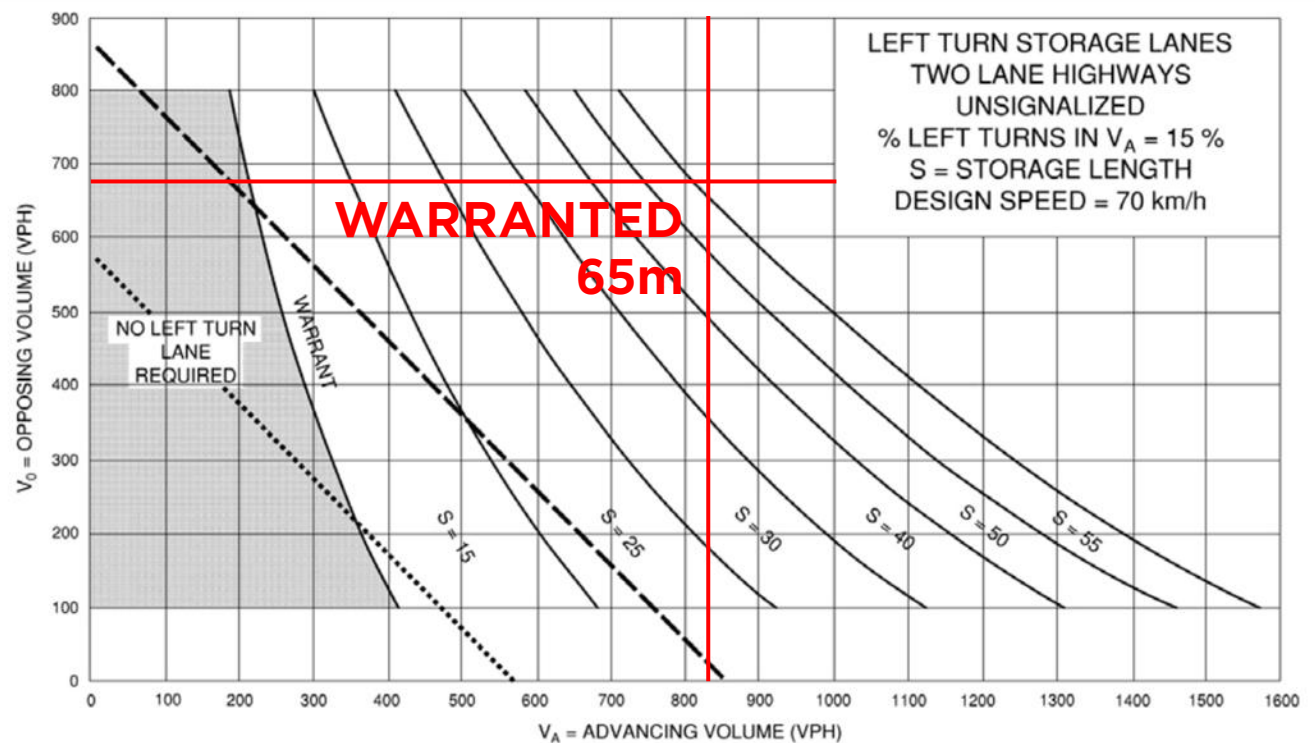


Saturday Peak Hour





Weekday AM Peak Hour

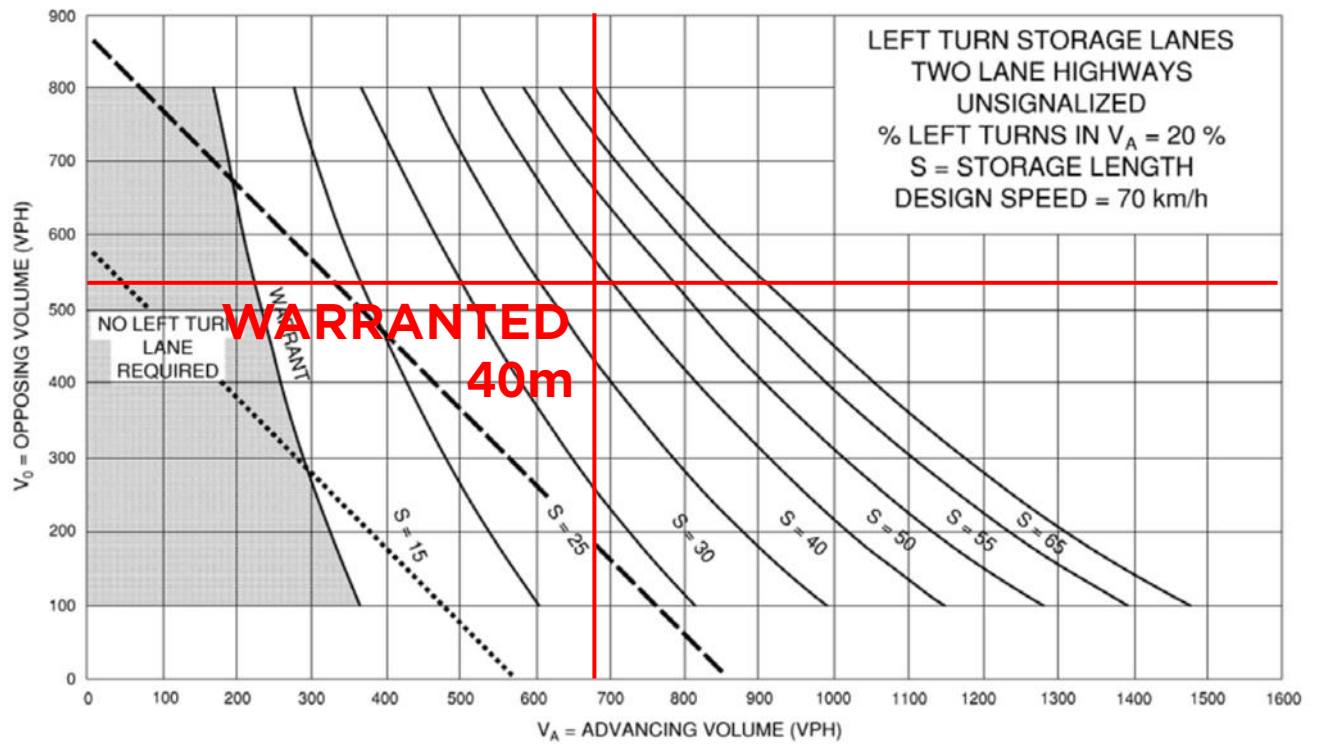


Weekday PM Peak Hour

THE GATEWAY CENTRE TIS

Figure K3: Access 2 – 2030 Total Conditions



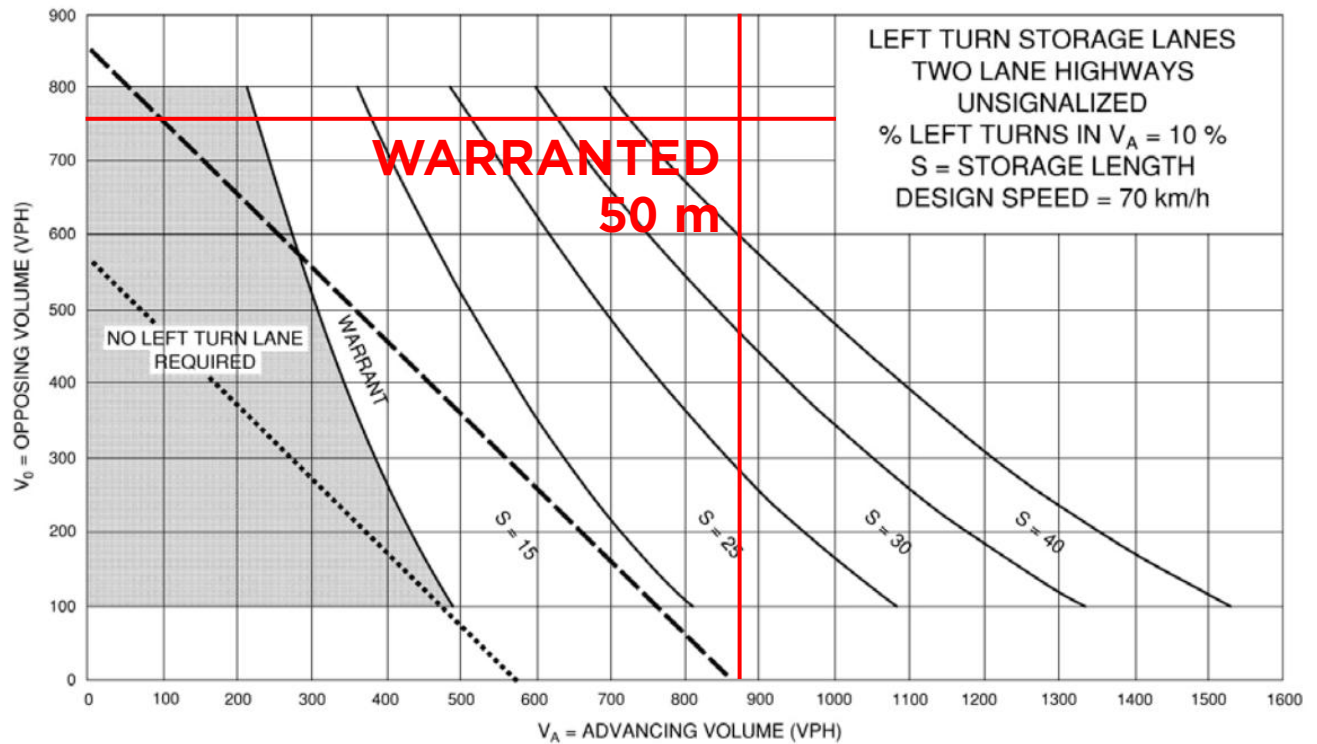


Saturday Peak Hour

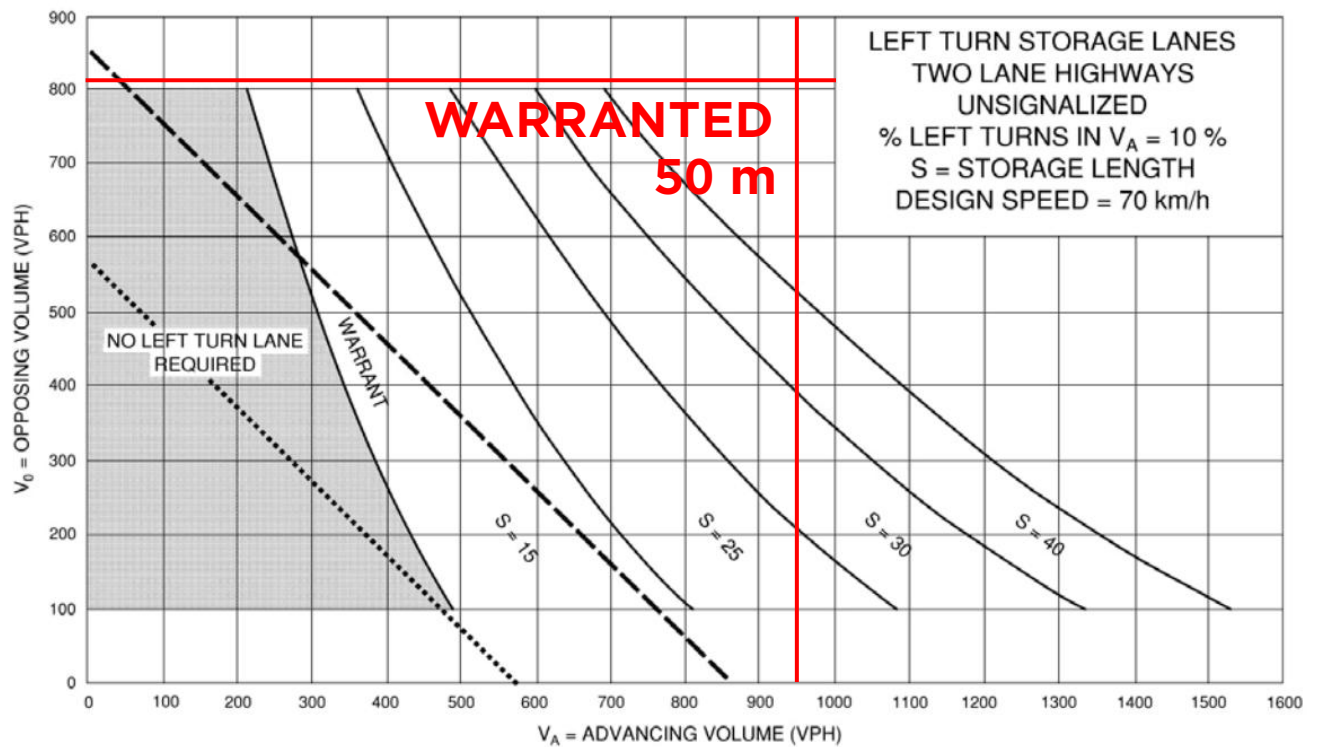
THE GATEWAY CENTRE TIS

Figure K4: Access 2 - 2030 Total Conditions





Weekday AM Peak Hour

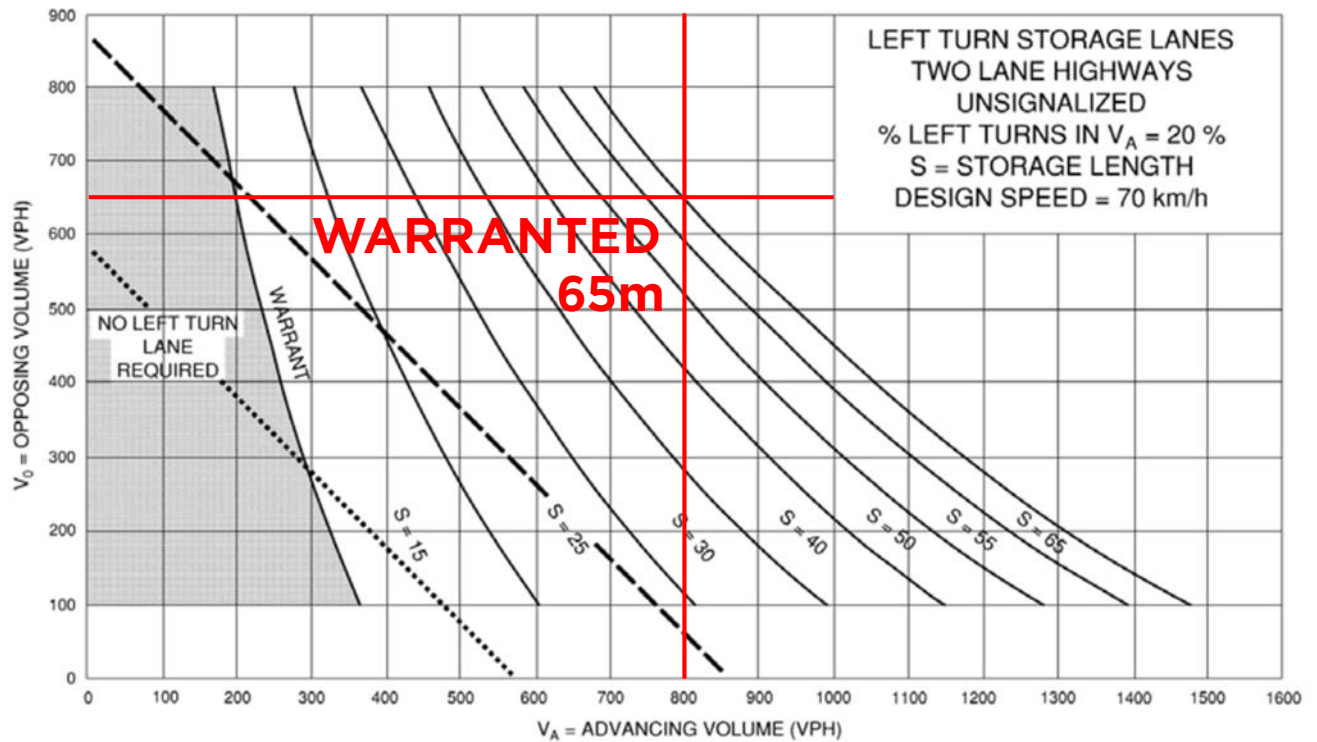


Weekday PM Peak Hour

THE GATEWAY CENTRE TIS

Figure K5: Access 2 - 2035 Total Conditions



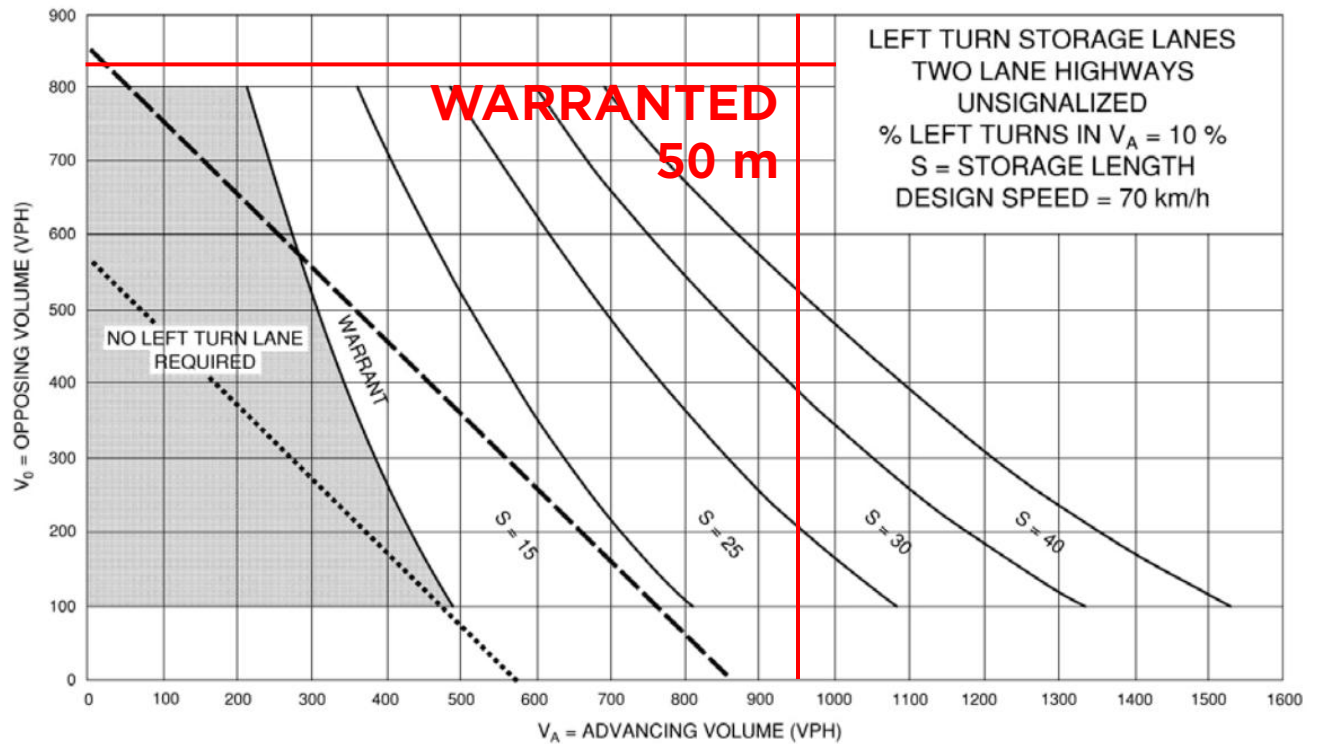


Saturday Peak Hour

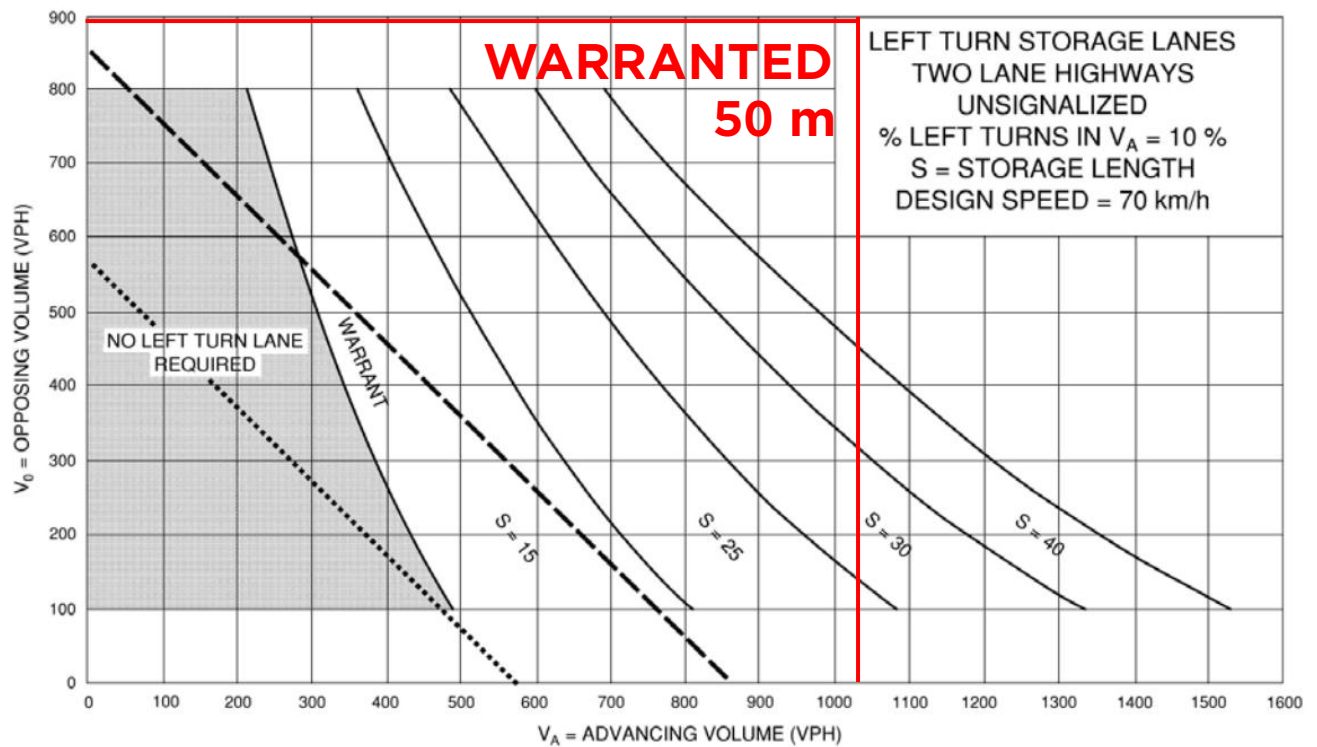
THE GATEWAY CENTRE TIS

Figure K6: Access 2 – 2035 Total Conditions





Weekday AM Peak Hour

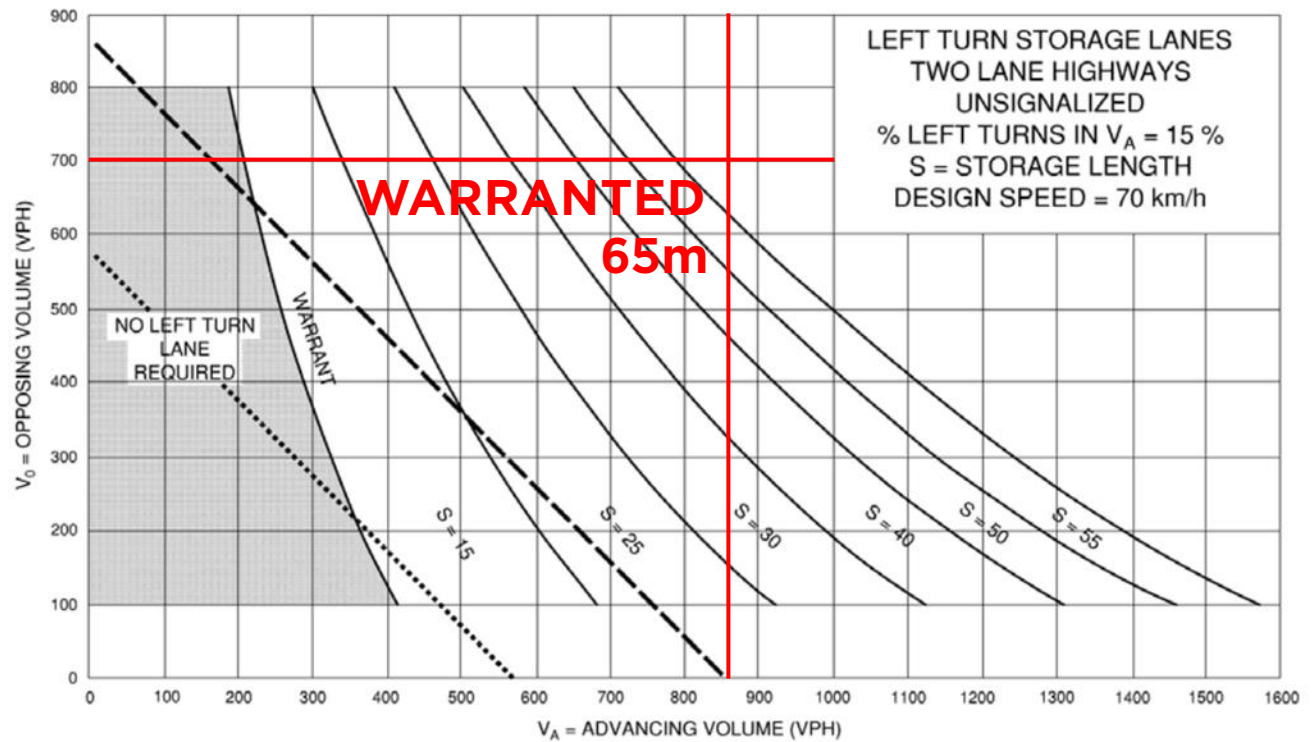


Weekday PM Peak Hour

THE GATEWAY CENTRE TIS

Figure K7: Access 2 – 2040 Total Conditions





Saturday Peak Hour

THE GATEWAY CENTRE TIS

Figure K8: Access 2 - 2040 Total Conditions



Appendix L: Future Total Intersection Operations

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2028 Total Conditions

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	410	110	85	395	195	160	220	105	185	135	35
Future Volume (vph)	75	410	110	85	395	195	160	220	105	185	135	35
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1789		1659	1847	1512	1755	1847	1570	1659	1790	
Flt Permitted	0.30	1.00		0.13	1.00	1.00	0.52	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	548	1789		232	1847	1512	967	1847	1570	1049	1790	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	87	477	128	99	459	227	186	256	122	215	157	41
RTOR Reduction (vph)	0	11	0	0	0	145	0	0	74	0	11	0
Lane Group Flow (vph)	87	594	0	99	459	82	186	256	48	215	187	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	35.5	30.2		35.5	30.2	30.2	33.0	33.0	33.0	22.9	22.9	
Effective Green, g (s)	35.5	30.2		35.5	30.2	30.2	33.0	33.0	33.0	22.9	22.9	
Actuated g/C Ratio	0.43	0.36		0.43	0.36	0.36	0.40	0.40	0.40	0.27	0.27	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	309	647		189	668	546	449	729	620	287	490	
v/s Ratio Prot	0.02	c0.33		c0.03	0.25		c0.04	0.14			0.10	
v/s Ratio Perm	0.10			0.19		0.05	0.13		0.03	c0.20		
v/c Ratio	0.28	0.92		0.52	0.69	0.15	0.41	0.35	0.08	0.75	0.38	
Uniform Delay, d1	15.5	25.5		17.7	22.6	18.0	17.2	17.7	15.8	27.7	24.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	18.0		2.6	2.9	0.1	0.6	0.3	0.1	10.2	0.5	
Delay (s)	16.0	43.4		20.3	25.6	18.1	17.8	18.0	15.8	37.9	25.1	
Level of Service	B	D		C	C	B	B	B	B	D	C	
Approach Delay (s)		40.0			22.8			17.5			31.8	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.9			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			83.5			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			85.8%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2028 Total Conditions
Weekday AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	10	90	445	45	105	345
Future Volume (Veh/h)	10	90	445	45	105	345
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	98	484	49	114	375
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1112	508			533	
vC1, stage 1 conf vol	508					
vC2, stage 2 conf vol	603					
vCu, unblocked vol	1076	418			444	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	97	83			89	
cM capacity (veh/h)	411	582			1022	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	109	533	114	375		
Volume Left	11	0	114	0		
Volume Right	98	49	0	0		
cSH	559	1700	1022	1700		
Volume to Capacity	0.20	0.31	0.11	0.22		
Queue Length 95th (m)	5.5	0.0	2.9	0.0		
Control Delay (s)	13.0	0.0	9.0	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.0	0.0	2.1			
Approach LOS	B					
Intersection Summary						
Average Delay		2.2				
Intersection Capacity Utilization		48.1%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2028 Total Conditions

Weekday AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	95	605	570	65	60	105
Future Volume (Veh/h)	95	605	570	65	60	105
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	103	658	620	71	65	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage veh		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.70	
vC, conflicting volume	691				1484	620
vC1, stage 1 conf vol					620	
vC2, stage 2 conf vol					864	
vCu, unblocked vol	691				1477	620
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	89				78	77
cM capacity (veh/h)	904				292	488
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	103	658	620	71	179	
Volume Left	103	0	0	0	65	
Volume Right	0	0	0	71	114	
cSH	904	1700	1700	1700	392	
Volume to Capacity	0.11	0.39	0.36	0.04	0.46	
Queue Length 95th (m)	2.9	0.0	0.0	0.0	17.6	
Control Delay (s)	9.5	0.0	0.0	0.0	21.7	
Lane LOS	A				C	
Approach Delay (s)	1.3		0.0		21.7	
Approach LOS					C	
Intersection Summary						
Average Delay			3.0			
Intersection Capacity Utilization			55.0%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2028 Total Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	505	145	120	405	180	125	190	75	210	260	50
Future Volume (vph)	55	505	145	120	405	180	125	190	75	210	260	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1820		1789	1883	1601	1789	1883	1601	1789	1838	
Flt Permitted	0.39	1.00		0.10	1.00	1.00	0.28	1.00	1.00	0.63	1.00	
Satd. Flow (perm)	727	1820		187	1883	1601	520	1883	1601	1186	1838	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	59	543	156	129	435	194	134	204	81	226	280	54
RTOR Reduction (vph)	0	11	0	0	0	110	0	0	53	0	7	0
Lane Group Flow (vph)	59	688	0	129	435	84	134	204	28	226	327	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	44.1	38.7		47.3	40.3	40.3	32.9	32.9	32.9	22.9	22.9	
Effective Green, g (s)	44.1	38.7		47.3	40.3	40.3	32.9	32.9	32.9	22.9	22.9	
Actuated g/C Ratio	0.47	0.41		0.51	0.43	0.43	0.35	0.35	0.35	0.24	0.24	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	403	752		214	810	689	277	661	562	290	449	
v/s Ratio Prot	0.01	c0.38		c0.05	0.23		c0.04	0.11			0.18	
v/s Ratio Perm	0.06			0.26		0.05	0.13		0.02	c0.19		
v/c Ratio	0.15	0.92		0.60	0.54	0.12	0.48	0.31	0.05	0.78	0.73	
Uniform Delay, d1	14.0	25.9		18.3	19.7	16.0	22.3	22.1	20.0	33.0	32.5	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	15.7		4.7	0.7	0.1	1.3	0.3	0.0	12.4	5.8	
Delay (s)	14.2	41.6		23.0	20.4	16.1	23.7	22.3	20.1	45.4	38.3	
Level of Service	B	D		C	C	B	C	C	C	D	D	
Approach Delay (s)		39.5			19.8			22.3			41.2	
Approach LOS		D			B			C			D	
Intersection Summary												
HCM 2000 Control Delay			31.0			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			93.6			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			93.7%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2028 Total Conditions

Weekday PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	15	125	385	40	135	505
Future Volume (Veh/h)	15	125	385	40	135	505
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	136	418	43	147	549
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	1282	440			461	
vC1, stage 1 conf vol	440					
vC2, stage 2 conf vol	843					
vCu, unblocked vol	1265	356			379	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	95	79			87	
cM capacity (veh/h)	333	638			1093	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	152	461	147	549		
Volume Left	16	0	147	0		
Volume Right	136	43	0	0		
cSH	582	1700	1093	1700		
Volume to Capacity	0.26	0.27	0.13	0.32		
Queue Length 95th (m)	7.9	0.0	3.5	0.0		
Control Delay (s)	13.4	0.0	8.8	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.4	0.0	1.9			
Approach LOS	B					
Intersection Summary						
Average Delay		2.5				
Intersection Capacity Utilization		48.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2028 Total Conditions

Weekday PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	105	685	580	65	70	125
Future Volume (Veh/h)	105	685	580	65	70	125
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	114	745	630	71	76	136
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.60	
vC, conflicting volume	701				1603	630
vC1, stage 1 conf vol					630	
vC2, stage 2 conf vol					973	
vCu, unblocked vol	701				1672	630
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	87				69	72
cM capacity (veh/h)	896				245	482
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	114	745	630	71	212	
Volume Left	114	0	0	0	76	
Volume Right	0	0	0	71	136	
cSH	896	1700	1700	1700	357	
Volume to Capacity	0.13	0.44	0.37	0.04	0.59	
Queue Length 95th (m)	3.3	0.0	0.0	0.0	27.7	
Control Delay (s)	9.6	0.0	0.0	0.0	28.7	
Lane LOS	A				D	
Approach Delay (s)	1.3		0.0		28.7	
Approach LOS					D	
Intersection Summary						
Average Delay			4.1			
Intersection Capacity Utilization			57.9%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2028 Total Conditions

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	465	105	85	415	105	115	215	65	120	195	40
Future Volume (vph)	45	465	105	85	415	105	115	215	65	120	195	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1831		1789	1883	1601	1789	1883	1601	1789	1835	
Flt Permitted	0.38	1.00		0.17	1.00	1.00	0.46	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	720	1831		314	1883	1601	872	1883	1601	1170	1835	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	46	474	107	87	423	107	117	219	66	122	199	41
RTOR Reduction (vph)	0	9	0	0	0	66	0	0	41	0	9	0
Lane Group Flow (vph)	46	572	0	87	423	41	117	219	25	122	231	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	32.4	28.6		35.0	29.9	29.9	29.0	29.0	29.0	20.9	20.9	
Effective Green, g (s)	32.4	28.6		35.0	29.9	29.9	29.0	29.0	29.0	20.9	20.9	
Actuated g/C Ratio	0.42	0.37		0.45	0.38	0.38	0.37	0.37	0.37	0.27	0.27	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	352	673		238	724	616	385	702	597	314	493	
v/s Ratio Prot	0.01	c0.31		c0.02	0.22		0.02	c0.12			c0.13	
v/s Ratio Perm	0.05			0.14		0.03	0.09		0.02	0.10		
v/c Ratio	0.13	0.85		0.37	0.58	0.07	0.30	0.31	0.04	0.39	0.47	
Uniform Delay, d1	13.9	22.6		14.8	19.0	15.1	16.6	17.3	15.5	23.2	23.8	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	10.0		1.0	1.2	0.0	0.4	0.3	0.0	0.8	0.7	
Delay (s)	14.1	32.6		15.8	20.2	15.1	17.0	17.5	15.5	24.0	24.5	
Level of Service	B	C		B	C	B	B	B	B	C	C	
Approach Delay (s)		31.3			18.7			17.1			24.3	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay	23.3			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.63											
Actuated Cycle Length (s)	77.7			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	88.4%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2028 Total Conditions
Saturday Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	170	300	65	175	335
Future Volume (Veh/h)	20	170	300	65	175	335
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	185	326	71	190	364
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.93	0.93			0.93	
vC, conflicting volume	1106	362			397	
vC1, stage 1 conf vol	362					
vC2, stage 2 conf vol	744					
vCu, unblocked vol	1074	271			310	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	74			84	
cM capacity (veh/h)	364	711			1159	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	207	397	190	364		
Volume Left	22	0	190	0		
Volume Right	185	71	0	0		
cSH	646	1700	1159	1700		
Volume to Capacity	0.32	0.23	0.16	0.21		
Queue Length 95th (m)	10.5	0.0	4.4	0.0		
Control Delay (s)	13.2	0.0	8.7	0.0		
Lane LOS	B		A			
Approach Delay (s)	13.2	0.0	3.0			
Approach LOS	B					
Intersection Summary						
Average Delay			3.8			
Intersection Capacity Utilization			51.0%		ICU Level of Service	A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2028 Total Conditions
Saturday Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	145	505	420	85	95	185
Future Volume (Veh/h)	145	505	420	85	95	185
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	158	549	457	92	103	201
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.79	
vC, conflicting volume	549				1322	457
vC1, stage 1 conf vol					457	
vC2, stage 2 conf vol					865	
vCu, unblocked vol	549				1274	457
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	85				66	67
cM capacity (veh/h)	1021				301	604
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	158	549	457	92	304	
Volume Left	158	0	0	0	103	
Volume Right	0	0	0	92	201	
cSH	1021	1700	1700	1700	450	
Volume to Capacity	0.15	0.32	0.27	0.05	0.67	
Queue Length 95th (m)	4.2	0.0	0.0	0.0	37.3	
Control Delay (s)	9.2	0.0	0.0	0.0	28.0	
Lane LOS	A				D	
Approach Delay (s)	2.0		0.0		28.0	
Approach LOS					D	
Intersection Summary						
Average Delay			6.4			
Intersection Capacity Utilization			56.8%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2030 Total Conditions

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	430	115	90	415	200	170	230	105	190	145	45
Future Volume (vph)	80	430	115	90	415	200	170	230	105	190	145	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1789		1659	1847	1512	1755	1847	1570	1659	1782	
Flt Permitted	0.29	1.00		0.13	1.00	1.00	0.48	1.00	1.00	0.59	1.00	
Satd. Flow (perm)	530	1789		226	1847	1512	892	1847	1570	1039	1782	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	93	500	134	105	483	233	198	267	122	221	169	52
RTOR Reduction (vph)	0	10	0	0	0	135	0	0	75	0	11	0
Lane Group Flow (vph)	93	624	0	105	483	98	198	267	47	221	210	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	39.7	34.4		39.7	34.4	34.4	34.7	34.7	34.7	24.5	24.5	
Effective Green, g (s)	39.7	34.4		39.7	34.4	34.4	34.7	34.7	34.7	24.5	24.5	
Actuated g/C Ratio	0.44	0.38		0.44	0.38	0.38	0.39	0.39	0.39	0.27	0.27	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	307	688		185	710	581	415	716	609	284	488	
v/s Ratio Prot	0.02	c0.35		c0.03	0.26		c0.04	0.14			0.12	
v/s Ratio Perm	0.12			0.22		0.06	0.15		0.03	c0.21		
v/c Ratio	0.30	0.91		0.57	0.68	0.17	0.48	0.37	0.08	0.78	0.43	
Uniform Delay, d1	15.8	26.0		18.5	22.9	18.1	19.1	19.6	17.3	29.9	26.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.6	15.6		4.0	2.7	0.1	0.9	0.3	0.1	12.6	0.6	
Delay (s)	16.4	41.6		22.4	25.6	18.2	20.0	19.9	17.3	42.5	27.3	
Level of Service	B	D		C	C	B	B	B	B	D	C	
Approach Delay (s)		38.4			23.1			19.4			34.9	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			28.6			HCM 2000 Level of Service			C			
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			89.4			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			87.1%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2030 Total Conditions
Weekday AM Peak

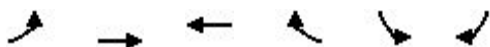
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	115	455	55	130	360
Future Volume (Veh/h)	20	115	455	55	130	360
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	125	495	60	141	391
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.91	0.91			0.91	
vC, conflicting volume	1198	525			555	
vC1, stage 1 conf vol	525					
vC2, stage 2 conf vol	673					
vCu, unblocked vol	1167	425			458	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	94	78			86	
cM capacity (veh/h)	375	571			1000	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	147	555	141	391		
Volume Left	22	0	141	0		
Volume Right	125	60	0	0		
cSH	529	1700	1000	1700		
Volume to Capacity	0.28	0.33	0.14	0.23		
Queue Length 95th (m)	8.6	0.0	3.7	0.0		
Control Delay (s)	14.4	0.0	9.2	0.0		
Lane LOS	B		A			
Approach Delay (s)	14.4	0.0	2.4			
Approach LOS	B					
Intersection Summary						
Average Delay		2.8				
Intersection Capacity Utilization		52.7%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2030 Total Conditions

Weekday AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	625	600	70	65	105
Future Volume (Veh/h)	100	625	600	70	65	105
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	679	652	76	71	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage veh		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.67	
vC, conflicting volume	728				1549	652
vC1, stage 1 conf vol					652	
vC2, stage 2 conf vol					897	
vCu, unblocked vol	728				1573	652
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	88				74	76
cM capacity (veh/h)	876				273	468
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	109	679	652	76	185	
Volume Left	109	0	0	0	71	
Volume Right	0	0	0	76	114	
cSH	876	1700	1700	1700	367	
Volume to Capacity	0.12	0.40	0.38	0.04	0.50	
Queue Length 95th (m)	3.2	0.0	0.0	0.0	20.7	
Control Delay (s)	9.7	0.0	0.0	0.0	24.3	
Lane LOS	A				C	
Approach Delay (s)	1.3		0.0		24.3	
Approach LOS					C	
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			57.2%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2030 Total Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	535	155	130	430	185	130	205	80	220	275	60
Future Volume (vph)	65	535	155	130	430	185	130	205	80	220	275	60
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1820		1789	1883	1601	1789	1883	1601	1789	1833	
Flt Permitted	0.36	1.00		0.09	1.00	1.00	0.23	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	685	1820		176	1883	1601	426	1883	1601	1169	1833	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	70	575	167	140	462	199	140	220	86	237	296	65
RTOR Reduction (vph)	0	10	0	0	0	111	0	0	56	0	8	0
Lane Group Flow (vph)	70	732	0	140	462	88	140	220	30	237	353	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	46.8	41.3		49.8	42.8	42.8	33.3	33.3	33.3	23.3	23.3	
Effective Green, g (s)	46.8	41.3		49.8	42.8	42.8	33.3	33.3	33.3	23.3	23.3	
Actuated g/C Ratio	0.48	0.43		0.52	0.44	0.44	0.34	0.34	0.34	0.24	0.24	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	394	778		207	834	709	245	649	551	281	442	
v/s Ratio Prot	0.01	c0.40		c0.05	0.25		c0.04	0.12			0.19	
v/s Ratio Perm	0.08			0.30		0.06	0.16		0.02	c0.20		
v/c Ratio	0.18	0.94		0.68	0.55	0.12	0.57	0.34	0.05	0.84	0.80	
Uniform Delay, d1	14.0	26.5		19.5	19.9	15.9	23.9	23.5	21.1	34.9	34.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	19.2		8.4	0.8	0.1	3.2	0.3	0.0	20.0	9.7	
Delay (s)	14.3	45.7		28.0	20.7	15.9	27.1	23.8	21.2	54.9	44.1	
Level of Service	B	D		C	C	B	C	C	C	D	D	
Approach Delay (s)		43.0			20.8			24.3			48.4	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay	34.4			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.85											
Actuated Cycle Length (s)	96.6			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	96.5%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2030 Total Conditions

Weekday PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	160	405	50	170	530
Future Volume (Veh/h)	25	160	405	50	170	530
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	174	440	54	185	576
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1413	467			494	
vC1, stage 1 conf vol	467					
vC2, stage 2 conf vol	946					
vCu, unblocked vol	1405	374			403	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	91	72			83	
cM capacity (veh/h)	287	617			1060	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	201	494	185	576		
Volume Left	27	0	185	0		
Volume Right	174	54	0	0		
cSH	534	1700	1060	1700		
Volume to Capacity	0.38	0.29	0.17	0.34		
Queue Length 95th (m)	13.2	0.0	4.8	0.0		
Control Delay (s)	15.8	0.0	9.1	0.0		
Lane LOS	C		A			
Approach Delay (s)	15.8	0.0	2.2			
Approach LOS	C					
Intersection Summary						
Average Delay		3.3				
Intersection Capacity Utilization		55.0%		ICU Level of Service	B	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2030 Total Conditions
Weekday PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	725	610	70	80	135
Future Volume (Veh/h)	110	725	610	70	80	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	788	663	76	87	147
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.56	
vC, conflicting volume	739				1691	663
vC1, stage 1 conf vol					663	
vC2, stage 2 conf vol					1028	
vCu, unblocked vol	739				1841	663
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				60	68
cM capacity (veh/h)	867				219	461
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	120	788	663	76	234	
Volume Left	120	0	0	0	87	
Volume Right	0	0	0	76	147	
cSH	867	1700	1700	1700	326	
Volume to Capacity	0.14	0.46	0.39	0.04	0.72	
Queue Length 95th (m)	3.6	0.0	0.0	0.0	39.7	
Control Delay (s)	9.8	0.0	0.0	0.0	39.6	
Lane LOS	A				E	
Approach Delay (s)	1.3		0.0		39.6	
Approach LOS					E	
Intersection Summary						
Average Delay			5.6			
Intersection Capacity Utilization			60.9%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2030 Total Conditions

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	485	115	90	435	110	120	225	70	125	210	50
Future Volume (vph)	55	485	115	90	435	110	120	225	70	125	210	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1829		1789	1883	1601	1789	1883	1601	1789	1829	
Flt Permitted	0.37	1.00		0.16	1.00	1.00	0.42	1.00	1.00	0.62	1.00	
Satd. Flow (perm)	704	1829		301	1883	1601	782	1883	1601	1159	1829	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	56	495	117	92	444	112	122	230	71	128	214	51
RTOR Reduction (vph)	0	9	0	0	0	66	0	0	45	0	9	0
Lane Group Flow (vph)	56	603	0	92	444	46	122	230	26	128	256	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	36.0	32.3		39.0	33.8	33.8	29.9	29.9	29.9	21.7	21.7	
Effective Green, g (s)	36.0	32.3		39.0	33.8	33.8	29.9	29.9	29.9	21.7	21.7	
Actuated g/C Ratio	0.44	0.39		0.47	0.41	0.41	0.36	0.36	0.36	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	356	716		236	772	656	347	683	580	305	481	
v/s Ratio Prot	0.01	c0.33		c0.02	0.24		0.02	c0.12			c0.14	
v/s Ratio Perm	0.06			0.16		0.03	0.11		0.02	0.11		
v/c Ratio	0.16	0.84		0.39	0.58	0.07	0.35	0.34	0.04	0.42	0.53	
Uniform Delay, d1	13.9	22.7		15.2	18.8	14.8	18.3	19.1	17.0	25.1	26.0	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	8.9		1.1	1.0	0.0	0.6	0.3	0.0	0.9	1.1	
Delay (s)	14.2	31.6		16.2	19.8	14.8	18.9	19.3	17.0	26.1	27.1	
Level of Service	B	C		B	B	B	B	B	B	C	C	
Approach Delay (s)		30.1			18.4			18.8			26.8	
Approach LOS		C			B			B			C	
Intersection Summary												
HCM 2000 Control Delay	23.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.66											
Actuated Cycle Length (s)	82.4			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	90.0%			ICU Level of Service			E					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2030 Total Conditions
Saturday Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	195	310	80	210	355
Future Volume (Veh/h)	30	195	310	80	210	355
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	212	337	87	228	386
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.92	0.92			0.92	
vC, conflicting volume	1222	380			424	
vC1, stage 1 conf vol	380					
vC2, stage 2 conf vol	842					
vCu, unblocked vol	1198	280			327	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	70			80	
cM capacity (veh/h)	315	696			1131	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	245	424	228	386		
Volume Left	33	0	228	0		
Volume Right	212	87	0	0		
cSH	599	1700	1131	1700		
Volume to Capacity	0.41	0.25	0.20	0.23		
Queue Length 95th (m)	15.1	0.0	5.7	0.0		
Control Delay (s)	15.1	0.0	9.0	0.0		
Lane LOS	C		A			
Approach Delay (s)	15.1	0.0	3.3			
Approach LOS	C					
Intersection Summary						
Average Delay			4.5			
Intersection Capacity Utilization			56.5%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2030 Total Conditions
Saturday Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	530	440	95	105	195
Future Volume (Veh/h)	150	530	440	95	105	195
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	576	478	103	114	212
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage veh		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.77	
vC, conflicting volume	581				1380	478
vC1, stage 1 conf vol					478	
vC2, stage 2 conf vol					902	
vCu, unblocked vol	581				1344	478
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				60	64
cM capacity (veh/h)	993				282	587
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	163	576	478	103	326	
Volume Left	163	0	0	0	114	
Volume Right	0	0	0	103	212	
cSH	993	1700	1700	1700	426	
Volume to Capacity	0.16	0.34	0.28	0.06	0.76	
Queue Length 95th (m)	4.5	0.0	0.0	0.0	48.9	
Control Delay (s)	9.3	0.0	0.0	0.0	36.1	
Lane LOS	A				E	
Approach Delay (s)	2.1		0.0		36.1	
Approach LOS					E	
Intersection Summary						
Average Delay			8.1			
Intersection Capacity Utilization			59.3%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2035 Total Conditions

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	520	130	95	470	235	185	255	125	235	160	45
Future Volume (vph)	90	520	130	95	470	235	185	255	125	235	160	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1792		1659	1847	1512	1755	1847	1570	1659	1787	
Flt Permitted	0.24	1.00		0.09	1.00	1.00	0.45	1.00	1.00	0.58	1.00	
Satd. Flow (perm)	447	1792		155	1847	1512	835	1847	1570	1011	1787	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	105	605	151	110	547	273	215	297	145	273	186	52
RTOR Reduction (vph)	0	8	0	0	0	122	0	0	90	0	9	0
Lane Group Flow (vph)	105	748	0	110	547	151	215	297	55	273	229	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	52.1	45.1		52.1	45.1	45.1	40.7	40.7	40.7	30.7	30.7	
Effective Green, g (s)	52.1	45.1		52.1	45.1	45.1	40.7	40.7	40.7	30.7	30.7	
Actuated g/C Ratio	0.48	0.42		0.48	0.42	0.42	0.38	0.38	0.38	0.28	0.28	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	300	749		172	772	632	374	697	592	287	508	
v/s Ratio Prot	0.02	c0.42		c0.04	0.30		c0.04	0.16			0.13	
v/s Ratio Perm	0.15			0.27		0.10	0.18		0.03	c0.27		
v/c Ratio	0.35	1.00		0.64	0.71	0.24	0.57	0.43	0.09	0.95	0.45	
Uniform Delay, d1	17.7	31.3		23.3	25.9	20.3	26.1	24.9	21.6	37.8	31.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	32.3		7.6	3.0	0.2	2.1	0.4	0.1	39.9	0.6	
Delay (s)	18.4	63.6		30.9	28.9	20.5	28.2	25.3	21.7	77.7	32.3	
Level of Service	B	E		C	C	C	C	C	C	E	C	
Approach Delay (s)		58.1			26.7			25.5			56.6	
Approach LOS		E			C			C			E	
Intersection Summary												
HCM 2000 Control Delay			40.7			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.92									
Actuated Cycle Length (s)			107.8			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			92.8%			ICU Level of Service			F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2035 Total Conditions

Weekday AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	115	525	55	130	420
Future Volume (Veh/h)	20	115	525	55	130	420
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	125	571	60	141	457
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.88	0.88			0.88	
vC, conflicting volume	1340	601			631	
vC1, stage 1 conf vol	601					
vC2, stage 2 conf vol	739					
vCu, unblocked vol	1318	475			509	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	76			85	
cM capacity (veh/h)	337	517			926	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	147	631	141	457		
Volume Left	22	0	141	0		
Volume Right	125	60	0	0		
cSH	479	1700	926	1700		
Volume to Capacity	0.31	0.37	0.15	0.27		
Queue Length 95th (m)	9.8	0.0	4.1	0.0		
Control Delay (s)	15.8	0.0	9.6	0.0		
Lane LOS	C		A			
Approach Delay (s)	15.8	0.0	2.3			
Approach LOS	C					
Intersection Summary						
Average Delay		2.7				
Intersection Capacity Utilization		56.4%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2035 Total Conditions

Weekday AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	780	695	70	65	105
Future Volume (Veh/h)	100	780	695	70	65	105
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	848	755	76	71	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage (veh)		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.53	
vC, conflicting volume	831				1821	755
vC1, stage 1 conf vol					755	
vC2, stage 2 conf vol					1066	
vCu, unblocked vol	831				2111	755
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				64	72
cM capacity (veh/h)	801				199	409
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	109	848	755	76	185	
Volume Left	109	0	0	0	71	
Volume Right	0	0	0	76	114	
cSH	801	1700	1700	1700	291	
Volume to Capacity	0.14	0.50	0.44	0.04	0.64	
Queue Length 95th (m)	3.6	0.0	0.0	0.0	30.6	
Control Delay (s)	10.2	0.0	0.0	0.0	36.8	
Lane LOS	B				E	
Approach Delay (s)	1.2		0.0		36.8	
Approach LOS					E	
Intersection Summary						
Average Delay			4.0			
Intersection Capacity Utilization			62.2%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2035 Total Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	605	170	145	510	225	145	225	90	255	305	65
Future Volume (vph)	70	605	170	145	510	225	145	225	90	255	305	65
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1821		1789	1883	1601	1789	1883	1601	1789	1834	
Flt Permitted	0.30	1.00		0.08	1.00	1.00	0.18	1.00	1.00	0.61	1.00	
Satd. Flow (perm)	558	1821		141	1883	1601	342	1883	1601	1146	1834	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	75	651	183	156	548	242	156	242	97	274	328	70
RTOR Reduction (vph)	0	9	0	0	0	99	0	0	64	0	7	0
Lane Group Flow (vph)	75	825	0	156	548	143	156	242	33	274	391	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	57.3	51.8		60.3	53.3	53.3	38.7	38.7	38.7	28.7	28.7	
Effective Green, g (s)	57.3	51.8		60.3	53.3	53.3	38.7	38.7	38.7	28.7	28.7	
Actuated g/C Ratio	0.51	0.46		0.54	0.47	0.47	0.34	0.34	0.34	0.26	0.26	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	344	838		178	892	758	207	647	550	292	467	
v/s Ratio Prot	0.01	c0.45		c0.05	0.29		c0.05	0.13			0.21	
v/s Ratio Perm	0.10			0.41		0.09	0.21		0.02	c0.24		
v/c Ratio	0.22	0.98		0.88	0.61	0.19	0.75	0.37	0.06	0.94	0.84	
Uniform Delay, d1	15.8	30.0		27.3	22.0	17.1	28.9	27.8	24.7	41.0	39.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	27.2		34.9	1.3	0.1	14.4	0.4	0.0	36.2	12.4	
Delay (s)	16.1	57.1		62.2	23.2	17.2	43.3	28.1	24.8	77.2	52.1	
Level of Service	B	E		E	C	B	D	C	C	E	D	
Approach Delay (s)		53.7			28.1			32.3			62.3	
Approach LOS		D			C			C			E	
Intersection Summary												
HCM 2000 Control Delay	44.1			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.95											
Actuated Cycle Length (s)	112.5			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	101.9%			ICU Level of Service			G					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2035 Total Conditions
Weekday PM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	160	470	50	170	600
Future Volume (Veh/h)	25	160	470	50	170	600
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	174	511	54	185	652
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1560	538			565	
vC1, stage 1 conf vol	538					
vC2, stage 2 conf vol	1022					
vCu, unblocked vol	1566	436			466	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	90	69			81	
cM capacity (veh/h)	258	561			991	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	201	565	185	652		
Volume Left	27	0	185	0		
Volume Right	174	54	0	0		
cSH	484	1700	991	1700		
Volume to Capacity	0.42	0.33	0.19	0.38		
Queue Length 95th (m)	15.3	0.0	5.2	0.0		
Control Delay (s)	17.6	0.0	9.5	0.0		
Lane LOS	C		A			
Approach Delay (s)	17.6	0.0	2.1			
Approach LOS	C					
Intersection Summary						
Average Delay		3.3				
Intersection Capacity Utilization		58.5%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2035 Total Conditions

Weekday PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	840	745	70	80	135
Future Volume (Veh/h)	110	840	745	70	80	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	913	810	76	87	147
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.46	
vC, conflicting volume	886				1963	810
vC1, stage 1 conf vol					810	
vC2, stage 2 conf vol					1153	
vCu, unblocked vol	886				2496	810
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	84				46	61
cM capacity (veh/h)	764				161	380
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	120	913	810	76	234	
Volume Left	120	0	0	0	87	
Volume Right	0	0	0	76	147	
cSH	764	1700	1700	1700	252	
Volume to Capacity	0.16	0.54	0.48	0.04	0.93	
Queue Length 95th (m)	4.2	0.0	0.0	0.0	63.0	
Control Delay (s)	10.6	0.0	0.0	0.0	81.8	
Lane LOS	B				F	
Approach Delay (s)	1.2		0.0		81.8	
Approach LOS					F	
Intersection Summary						
Average Delay			9.5			
Intersection Capacity Utilization			68.0%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2035 Total Conditions

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	565	125	100	510	140	135	245	80	155	230	50
Future Volume (vph)	55	565	125	100	510	140	135	245	80	155	230	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Lane Util. Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	0.97		1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1832		1789	1883	1601	1789	1883	1601	1789	1833	
Flt Permitted	0.29	1.00		0.12	1.00	1.00	0.34	1.00	1.00	0.60	1.00	
Satd. Flow (perm)	547	1832		227	1883	1601	649	1883	1601	1138	1833	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	56	577	128	102	520	143	138	250	82	158	235	51
RTOR Reduction (vph)	0	7	0	0	0	71	0	0	53	0	8	0
Lane Group Flow (vph)	56	698	0	102	520	72	138	250	29	158	278	0
Turn Type	pm+pt	NA		pm+pt	NA	Perm	pm+pt	NA	Perm	Perm	NA	
Protected Phases	7	4		3	8		5	2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	45.4	40.1		45.4	40.1	40.1	32.4	32.4	32.4	22.2	22.2	
Effective Green, g (s)	45.4	40.1		45.4	40.1	40.1	32.4	32.4	32.4	22.2	22.2	
Actuated g/C Ratio	0.49	0.43		0.49	0.43	0.43	0.35	0.35	0.35	0.24	0.24	
Clearance Time (s)	3.0	6.0		3.0	6.0	6.0	3.0	6.0	6.0	6.0	6.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	338	791		200	813	691	315	657	558	272	438	
v/s Ratio Prot	0.01	c0.38		c0.03	0.28		c0.03	0.13			c0.15	
v/s Ratio Perm	0.07			0.22		0.04	0.12		0.02	0.14		
v/c Ratio	0.17	0.88		0.51	0.64	0.10	0.44	0.38	0.05	0.58	0.64	
Uniform Delay, d1	13.9	24.2		17.7	20.7	15.7	22.0	22.7	20.0	31.2	31.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.2	11.3		2.2	1.7	0.1	1.0	0.4	0.0	3.1	3.0	
Delay (s)	14.1	35.5		19.9	22.3	15.7	22.9	23.0	20.1	34.3	34.7	
Level of Service	B	D		B	C	B	C	C	C	C	C	
Approach Delay (s)		33.9			20.8			22.5			34.6	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay	27.7			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.74											
Actuated Cycle Length (s)	92.8			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	94.8%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2035 Total Conditions
Saturday Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	195	360	80	210	405
Future Volume (Veh/h)	30	195	360	80	210	405
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	212	391	87	228	440
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.90	0.90			0.90	
vC, conflicting volume	1330	434			478	
vC1, stage 1 conf vol	434					
vC2, stage 2 conf vol	896					
vCu, unblocked vol	1312	320			368	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	67			79	
cM capacity (veh/h)	291	651			1075	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	245	478	228	440		
Volume Left	33	0	228	0		
Volume Right	212	87	0	0		
cSH	558	1700	1075	1700		
Volume to Capacity	0.44	0.28	0.21	0.26		
Queue Length 95th (m)	16.9	0.0	6.1	0.0		
Control Delay (s)	16.4	0.0	9.2	0.0		
Lane LOS	C		A			
Approach Delay (s)	16.4	0.0	3.2			
Approach LOS	C					
Intersection Summary						
Average Delay			4.4			
Intersection Capacity Utilization			59.1%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2035 Total Conditions
Saturday Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	650	555	95	105	195
Future Volume (Veh/h)	150	650	555	95	105	195
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	707	603	103	114	212
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage veh		2	2			
Upstream signal (m)		182				
pX, platoon unblocked					0.66	
vC, conflicting volume	706				1636	603
vC1, stage 1 conf vol					603	
vC2, stage 2 conf vol					1033	
vCu, unblocked vol	706				1706	603
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	82				48	58
cM capacity (veh/h)	892				218	499
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1	
Volume Total	163	707	603	103	326	
Volume Left	163	0	0	0	114	
Volume Right	0	0	0	103	212	
cSH	892	1700	1700	1700	344	
Volume to Capacity	0.18	0.42	0.35	0.06	0.95	
Queue Length 95th (m)	5.1	0.0	0.0	0.0	76.1	
Control Delay (s)	9.9	0.0	0.0	0.0	71.8	
Lane LOS	A				F	
Approach Delay (s)	1.9		0.0		71.8	
Approach LOS					F	
Intersection Summary						
Average Delay			13.2			
Intersection Capacity Utilization			65.3%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Total Conditions

Weekday AM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	565	140	100	510	255	205	275	135	255	175	50
Future Volume (vph)	95	565	140	100	510	255	205	275	135	255	175	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1755	1847	1570	1659	1847	1512	1755	1847	1570	1659	1786	
Flt Permitted	0.17	1.00	1.00	0.11	1.00	1.00	0.55	1.00	1.00	0.26	1.00	
Satd. Flow (perm)	316	1847	1570	187	1847	1512	1016	1847	1570	448	1786	
Peak-hour factor, PHF	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Adj. Flow (vph)	110	657	163	116	593	297	238	320	157	297	203	58
RTOR Reduction (vph)	0	0	72	0	0	126	0	0	122	0	9	0
Lane Group Flow (vph)	110	657	91	116	593	171	238	320	35	297	252	0
Heavy Vehicles (%)	4%	4%	4%	10%	4%	8%	4%	4%	4%	10%	4%	4%
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	46.6	39.5	39.5	46.6	39.5	39.5	31.6	22.5	22.5	39.3	27.2	
Effective Green, g (s)	46.6	39.5	39.5	46.6	39.5	39.5	31.6	22.5	22.5	39.3	27.2	
Actuated g/C Ratio	0.46	0.39	0.39	0.46	0.39	0.39	0.31	0.22	0.22	0.39	0.27	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	247	723	614	189	723	591	384	411	350	340	481	
v/s Ratio Prot	0.03	c0.36		c0.04	0.32		0.06	0.17		c0.12	0.14	
v/s Ratio Perm	0.17		0.06	0.24		0.11	0.14		0.02	c0.22		
v/c Ratio	0.45	0.91	0.15	0.61	0.82	0.29	0.62	0.78	0.10	0.87	0.52	
Uniform Delay, d1	18.9	29.0	19.8	20.8	27.5	21.1	27.9	36.9	31.2	24.3	31.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	1.3	15.2	0.1	5.8	7.4	0.3	3.0	9.0	0.1	21.1	1.0	
Delay (s)	20.2	44.2	19.9	26.6	34.9	21.3	30.9	45.9	31.3	45.4	32.4	
Level of Service	C	D	B	C	C	C	C	D	C	D	C	
Approach Delay (s)		37.1			30.0			37.7			39.3	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			35.4			HCM 2000 Level of Service				D		
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			100.9			Sum of lost time (s)			18.0			
Intersection Capacity Utilization			83.0%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2040 Total Conditions
Weekday AM Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	20	115	570	55	130	460
Future Volume (Veh/h)	20	115	570	55	130	460
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	125	620	60	141	500
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.83	0.83			0.83	
vC, conflicting volume	1432	650			680	
vC1, stage 1 conf vol	650					
vC2, stage 2 conf vol	782					
vCu, unblocked vol	1418	476			512	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	93	74			84	
cM capacity (veh/h)	314	489			874	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	147	680	141	500		
Volume Left	22	0	141	0		
Volume Right	125	60	0	0		
cSH	451	1700	874	1700		
Volume to Capacity	0.33	0.40	0.16	0.29		
Queue Length 95th (m)	10.6	0.0	4.4	0.0		
Control Delay (s)	16.8	0.0	9.9	0.0		
Lane LOS	C		A			
Approach Delay (s)	16.8	0.0	2.2			
Approach LOS	C					
Intersection Summary						
Average Delay		2.6				
Intersection Capacity Utilization		58.7%		ICU Level of Service	B	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2040 Total Conditions

Weekday AM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	100	855	760	70	65	105
Future Volume (Veh/h)	100	855	760	70	65	105
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	109	929	826	76	71	114
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage veh		2	2			
Upstream signal (m)		160				
pX, platoon unblocked					0.54	
vC, conflicting volume	902				2011	864
vC1, stage 1 conf vol					864	
vC2, stage 2 conf vol					1147	
vCu, unblocked vol	902				2446	864
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	86				58	68
cM capacity (veh/h)	754				168	354
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	109	929	902	185		
Volume Left	109	0	0	71		
Volume Right	0	0	76	114		
cSH	754	1700	1700	249		
Volume to Capacity	0.14	0.55	0.53	0.74		
Queue Length 95th (m)	3.8	0.0	0.0	39.9		
Control Delay (s)	10.6	0.0	0.0	52.2		
Lane LOS	B			F		
Approach Delay (s)	1.1		0.0	52.2		
Approach LOS				F		
Intersection Summary						
Average Delay			5.1			
Intersection Capacity Utilization			69.8%		ICU Level of Service	C
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Total Conditions

Weekday PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	75	655	185	150	555	250	160	245	95	280	335	70
Future Volume (vph)	75	655	185	150	555	250	160	245	95	280	335	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1835	
Flt Permitted	0.21	1.00	1.00	0.09	1.00	1.00	0.23	1.00	1.00	0.35	1.00	
Satd. Flow (perm)	394	1883	1601	172	1883	1601	431	1883	1601	658	1835	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	81	704	199	161	597	269	172	263	102	301	360	75
RTOR Reduction (vph)	0	0	71	0	0	109	0	0	79	0	7	0
Lane Group Flow (vph)	81	704	128	161	597	160	172	263	23	301	428	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	47.4	42.0	42.0	50.8	43.7	43.7	31.1	23.0	23.0	39.4	28.3	
Effective Green, g (s)	47.4	42.0	42.0	50.8	43.7	43.7	31.1	23.0	23.0	39.4	28.3	
Actuated g/C Ratio	0.46	0.41	0.41	0.49	0.42	0.42	0.30	0.22	0.22	0.38	0.27	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	253	764	649	195	795	675	235	418	355	396	501	
v/s Ratio Prot	0.02	c0.37		c0.06	0.32		0.06	0.14		c0.10	c0.23	
v/s Ratio Perm	0.13		0.08	0.35		0.10	0.16		0.01	0.19		
v/c Ratio	0.32	0.92	0.20	0.83	0.75	0.24	0.73	0.63	0.06	0.76	0.85	
Uniform Delay, d1	18.5	29.2	19.9	22.1	25.3	19.2	29.0	36.4	31.8	24.6	35.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	16.4	0.2	23.9	4.0	0.2	11.1	3.0	0.1	8.3	13.3	
Delay (s)	19.2	45.6	20.0	45.9	29.3	19.4	40.1	39.4	31.8	33.0	48.9	
Level of Service	B	D	C	D	C	B	D	D	C	C	D	
Approach Delay (s)		38.3			29.3			38.2			42.4	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay	36.4			HCM 2000 Level of Service			D					
HCM 2000 Volume to Capacity ratio	0.90											
Actuated Cycle Length (s)	103.5			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	91.6%			ICU Level of Service			F					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2040 Total Conditions
Weekday PM Peak

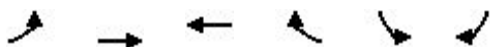
						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	25	160	520	50	170	660
Future Volume (Veh/h)	25	160	520	50	170	660
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	174	565	54	185	717
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1679	592			619	
vC1, stage 1 conf vol	592					
vC2, stage 2 conf vol	1087					
vCu, unblocked vol	1705	460			491	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	89	67			80	
cM capacity (veh/h)	235	525			936	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	201	619	185	717		
Volume Left	27	0	185	0		
Volume Right	174	54	0	0		
cSH	450	1700	936	1700		
Volume to Capacity	0.45	0.36	0.20	0.42		
Queue Length 95th (m)	17.1	0.0	5.6	0.0		
Control Delay (s)	19.3	0.0	9.8	0.0		
Lane LOS	C		A			
Approach Delay (s)	19.3	0.0	2.0			
Approach LOS	C					
Intersection Summary						
Average Delay		3.3				
Intersection Capacity Utilization		61.1%		ICU Level of Service		B
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2040 Total Conditions

Weekday PM Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	110	920	820	70	80	135
Future Volume (Veh/h)	110	920	820	70	80	135
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	120	1000	891	76	87	147
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TWLT			
Median storage veh		2	2			
Upstream signal (m)		160				
pX, platoon unblocked					0.51	
vC, conflicting volume	967				2169	929
vC1, stage 1 conf vol					929	
vC2, stage 2 conf vol					1240	
vCu, unblocked vol	967				2822	929
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	83				36	55
cM capacity (veh/h)	712				135	324
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	120	1000	967	234		
Volume Left	120	0	0	87		
Volume Right	0	0	76	147		
cSH	712	1700	1700	213		
Volume to Capacity	0.17	0.59	0.57	1.10		
Queue Length 95th (m)	4.6	0.0	0.0	81.8		
Control Delay (s)	11.1	0.0	0.0	137.8		
Lane LOS	B			F		
Approach Delay (s)	1.2		0.0	137.8		
Approach LOS				F		
Intersection Summary						
Average Delay			14.5			
Intersection Capacity Utilization			76.2%		ICU Level of Service	D
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

1: CR 124/Hurontario St & Poplar S/R

2040 Total Conditions

Saturday Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	60	610	140	100	550	150	145	270	80	170	255	55
Future Volume (vph)	60	610	140	100	550	150	145	270	80	170	255	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	1789	1883	1601	1789	1883	1601	1789	1883	1601	1789	1833	
Flt Permitted	0.20	1.00	1.00	0.14	1.00	1.00	0.44	1.00	1.00	0.36	1.00	
Satd. Flow (perm)	382	1883	1601	264	1883	1601	831	1883	1601	679	1833	
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	61	622	143	102	561	153	148	276	82	173	260	56
RTOR Reduction (vph)	0	0	73	0	0	73	0	0	62	0	7	0
Lane Group Flow (vph)	61	622	70	102	561	80	148	276	20	173	309	0
Turn Type	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	7	4		3	8		5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		
Actuated Green, G (s)	40.7	35.4	35.4	40.7	35.4	35.4	29.9	21.9	21.9	36.2	25.2	
Effective Green, g (s)	40.7	35.4	35.4	40.7	35.4	35.4	29.9	21.9	21.9	36.2	25.2	
Actuated g/C Ratio	0.44	0.39	0.39	0.44	0.39	0.39	0.33	0.24	0.24	0.39	0.27	
Clearance Time (s)	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	6.0	3.0	6.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	250	725	616	204	725	616	353	448	381	403	502	
v/s Ratio Prot	0.01	c0.33		c0.03	0.30		0.04	0.15		c0.05	c0.17	
v/s Ratio Perm	0.09		0.04	0.19		0.05	0.10		0.01	0.12		
v/c Ratio	0.24	0.86	0.11	0.50	0.77	0.13	0.42	0.62	0.05	0.43	0.62	
Uniform Delay, d1	17.0	25.9	18.2	18.7	24.7	18.3	23.0	31.2	27.0	19.3	29.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.5	9.9	0.1	1.9	5.2	0.1	0.8	2.5	0.1	0.7	2.2	
Delay (s)	17.5	35.8	18.2	20.6	29.9	18.4	23.8	33.8	27.0	20.0	31.4	
Level of Service	B	D	B	C	C	B	C	C	C	C	C	
Approach Delay (s)		31.4			26.6			29.7			27.3	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay	28.8			HCM 2000 Level of Service			C					
HCM 2000 Volume to Capacity ratio	0.72											
Actuated Cycle Length (s)	91.9			Sum of lost time (s)			18.0					
Intersection Capacity Utilization	80.7%			ICU Level of Service			D					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

2: Hurontario St & Access 1

2040 Total Conditions
Saturday Peak

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	30	195	400	80	210	450
Future Volume (Veh/h)	30	195	400	80	210	450
Sign Control	Stop		Free		Free	Free
Grade	0%		0%			0%
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	33	212	435	87	228	489
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			TWLT		TWLT	
Median storage veh			2		2	
Upstream signal (m)			148			
pX, platoon unblocked	0.87	0.87			0.87	
vC, conflicting volume	1424	478			522	
vC1, stage 1 conf vol	478					
vC2, stage 2 conf vol	945					
vCu, unblocked vol	1412	325			375	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)	5.4					
tF (s)	3.5	3.3			2.2	
p0 queue free %	88	66			78	
cM capacity (veh/h)	271	623			1029	
Direction, Lane #	WB 1	NB 1	SB 1	SB 2		
Volume Total	245	522	228	489		
Volume Left	33	0	228	0		
Volume Right	212	87	0	0		
cSH	530	1700	1029	1700		
Volume to Capacity	0.46	0.31	0.22	0.29		
Queue Length 95th (m)	18.4	0.0	6.4	0.0		
Control Delay (s)	17.5	0.0	9.5	0.0		
Lane LOS	C		A			
Approach Delay (s)	17.5	0.0	3.0			
Approach LOS	C					
Intersection Summary						
Average Delay			4.3			
Intersection Capacity Utilization			61.2%		ICU Level of Service	B
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: Poplar S/R & Access 2

2040 Total Conditions
Saturday Peak



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	150	710	605	95	105	195
Future Volume (Veh/h)	150	710	605	95	105	195
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	163	772	658	103	114	212
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLT	TL			
Median storage (veh)		2	2			
Upstream signal (m)		160				
pX, platoon unblocked					0.66	
vC, conflicting volume	761				1808	710
vC1, stage 1 conf vol					710	
vC2, stage 2 conf vol					1098	
vCu, unblocked vol	761				1968	710
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	81				40	51
cM capacity (veh/h)	851				191	434
Direction, Lane #	EB 1	EB 2	WB 1	SB 1		
Volume Total	163	772	761	326		
Volume Left	163	0	0	114		
Volume Right	0	0	103	212		
cSH	851	1700	1700	301		
Volume to Capacity	0.19	0.45	0.45	1.08		
Queue Length 95th (m)	5.4	0.0	0.0	97.0		
Control Delay (s)	10.2	0.0	0.0	114.8		
Lane LOS	B			F		
Approach Delay (s)	1.8		0.0	114.8		
Approach LOS				F		
Intersection Summary						
Average Delay			19.3			
Intersection Capacity Utilization			73.7%		ICU Level of Service	D
Analysis Period (min)			15			

Appendix M: Future Total Queue Operations

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	36.8	134.4	88.0	62.0	112.7	83.7	83.8	96.9	37.6	69.8	120.1
Average Queue (m)	15.2	70.2	16.8	19.4	63.7	25.5	34.6	47.0	15.6	46.0	49.2
95th Queue (m)	29.2	109.6	52.3	42.1	100.0	59.4	63.4	80.4	30.6	72.8	94.1
Link Distance (m)		215.5			140.4			193.3			121.8
Upstream Blk Time (%)											1
Queuing Penalty (veh)											3
Storage Bay Dist (m)	60.0		50.0	65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		18			15	0	2	4		54	36
Queuing Penalty (veh)		43			53	2	10	14		121	91

Intersection: 2: Hurontario St & Access 1

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (m)	33.1	8.6	24.2	33.4
Average Queue (m)	14.3	0.6	10.9	2.7
95th Queue (m)	26.0	4.3	21.1	18.4
Link Distance (m)	34.2	121.8		83.9
Upstream Blk Time (%)	0			
Queuing Penalty (veh)	0			
Storage Bay Dist (m)			10.0	
Storage Blk Time (%)			13	1
Queuing Penalty (veh)			59	1

Intersection: 3: Poplar S/R & Access 2

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	18.2	33.4	7.2	43.1
Average Queue (m)	9.9	2.0	0.5	32.3
95th Queue (m)	17.8	17.3	3.3	46.3
Link Distance (m)		140.4	88.9	32.1
Upstream Blk Time (%)				60
Queuing Penalty (veh)				0
Storage Bay Dist (m)	10.0			
Storage Blk Time (%)	14	0		
Queuing Penalty (veh)	122	0		

Network Summary

Network wide Queuing Penalty: 518

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	136.7	209.8	105.0	67.7	116.8	89.3	93.2	90.6	31.8	69.9	125.8
Average Queue (m)	23.0	119.6	42.3	29.6	65.6	21.6	39.9	46.0	10.6	63.4	103.4
95th Queue (m)	87.9	206.7	106.7	56.1	104.0	52.8	82.7	81.2	24.1	84.9	149.2
Link Distance (m)		215.5			140.4			193.3			121.8
Upstream Blk Time (%)		5									15
Queuing Penalty (veh)		0									106
Storage Bay Dist (m)	60.0		50.0	65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		36	0	2	15	0	12	3		65	63
Queuing Penalty (veh)		94	0	19	60	0	39	8		262	175

Intersection: 2: Hurontario St & Access 1

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (m)	44.8	6.9	28.2	92.0
Average Queue (m)	27.8	0.5	16.0	36.8
95th Queue (m)	46.9	3.7	30.9	101.8
Link Distance (m)	34.2	121.8		83.9
Upstream Blk Time (%)	38			11
Queuing Penalty (veh)	0			0
Storage Bay Dist (m)			10.0	
Storage Blk Time (%)			15	20
Queuing Penalty (veh)			102	33

Intersection: 3: Poplar S/R & Access 2

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	19.6	95.1	8.7	47.2
Average Queue (m)	11.8	8.6	0.6	37.2
95th Queue (m)	19.0	46.9	4.0	43.4
Link Distance (m)		140.4	88.9	32.1
Upstream Blk Time (%)		0		99
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)	10.0			
Storage Blk Time (%)	21	0		
Queuing Penalty (veh)	189	0		

Network Summary

Network wide Queuing Penalty: 1088

Intersection: 1: CR 124/Hurontario St & Poplar S/R

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	R	L	T	R	L	T	R	L	TR
Maximum Queue (m)	20.6	122.2	73.4	33.3	111.4	45.9	52.9	81.3	28.5	69.8	91.1
Average Queue (m)	9.7	71.3	15.9	16.4	57.8	11.5	23.5	40.0	9.7	26.4	46.0
95th Queue (m)	18.4	106.7	47.6	29.1	97.1	28.2	43.0	69.5	22.0	53.3	78.3
Link Distance (m)		215.5			140.4			193.3			121.8
Upstream Blk Time (%)											
Queuing Penalty (veh)											
Storage Bay Dist (m)	60.0		50.0	65.0		50.0	60.0		60.0	20.0	
Storage Blk Time (%)		19			12		0	3		17	37
Queuing Penalty (veh)		38			29		1	6		53	63

Intersection: 2: Hurontario St & Access 1

Movement	WB	NB	SB	SB
Directions Served	LR	TR	L	T
Maximum Queue (m)	39.2	8.9	29.5	49.2
Average Queue (m)	22.6	0.7	15.0	5.4
95th Queue (m)	37.9	4.6	26.6	30.7
Link Distance (m)	34.2	121.8		83.9
Upstream Blk Time (%)	4			0
Queuing Penalty (veh)	0			0
Storage Bay Dist (m)			10.0	
Storage Blk Time (%)			18	
Queuing Penalty (veh)			80	

Intersection: 3: Poplar S/R & Access 2

Movement	EB	EB	WB	SB
Directions Served	L	T	TR	LR
Maximum Queue (m)	19.5	70.1	8.5	46.8
Average Queue (m)	12.1	6.3	0.8	38.0
95th Queue (m)	20.1	38.0	4.5	43.0
Link Distance (m)		140.4	88.9	32.1
Upstream Blk Time (%)		0		99
Queuing Penalty (veh)		0		0
Storage Bay Dist (m)	10.0			
Storage Blk Time (%)	18	0		
Queuing Penalty (veh)	131	0		

Network Summary

Network wide Queuing Penalty: 401

Appendix N: Drive-Thru Operations

INPUT DATA		McDonalds order board		SAT
total inbound peak hour trips	T =	114	vehicles per hour (vph)	
% of trips to use drive-thru	DT =	60%	vehicles per hour (vph)	
arrival rate	λ =	68	vehicles per hour (vph)	
service time	t =	30	seconds	
length of vehicle	L =	6.5	metres	
available queue storage	S =	40	metres	6 vehicles
service rate	μ =	120	vehicles per hour (vph)	
arrival rate + service rate	r =	0.57	note: if r>1, queues will grow indefinitely	

QUEUE CALCULATIONS				
Average vehicles in system (in queue + in service)	$E(n) = \frac{\lambda}{\mu - \lambda} =$	1.3	vehicles	(8.6 metres)
Average vehicles in queue (not including in service)	$E(m) = \frac{\lambda^2}{\mu(\mu - \lambda)} =$	0.8	vehicles	(4.9 metres)
95 th percentile vehicles in system (in queue + in service)	$S^{95} =$	5.0	vehicles	(32.5 metres)
95 th percentile vehicles in queue (not including in service)	$Q^{95} =$	4.0	vehicles	(26 metres)
Average time in system (in queue + in service time)	$E(v) = \frac{1}{\mu - \lambda} =$	70	seconds	(1.2 minutes)
Average time in queue (not including in service time)	$E(n) = \frac{\lambda}{\mu(\mu - \lambda)} =$	40	seconds	(0.7 minutes)

CONCLUSIONS				
There will be 0 vehicles in the overall system (vehicles in service + in queue)		43%	of the time	
The available storage length of	40 metres	will accommodate queues	98%	of the time
The average queue of	1 vehicle	CAN be accommodated given the available storage.		
The 95 th percentile queue of	4 vehicles	CAN be accommodated given the available storage.		

Notes

1. There is only a single service provider.
2. Service is provided on a first come, first serve basis (ie. first-into the queue = first-out of the queue).
3. Vehicle arrivals have a Poisson distribution.
4. Service times are exponentially distributed.
5. Length of vehicle considers bumper to bumper length (ie. vehicle + space between vehicles).
6. 95th percentile queue refers to queue length that will accommodate the queues 95% of the time.

INPUT DATA			McDonalds pmt window	SAT
total inbound peak hour trips	T	=	114	vehicles per hour (vph)
% of trips to use drive-thru	DT	=	60%	vehicles per hour (vph)
arrival rate	λ	=	68	vehicles per hour (vph)
service time	t	=	20	seconds
length of vehicle	L	=	6.5	metres
available queue storage	S	=	36	metres
				5 vehicles
service rate	μ	=	180	vehicles per hour (vph)
arrival rate + service rate	r	=	0.38	note: if $r > 1$, queues will grow indefinitely

QUEUE CALCULATIONS				
Average vehicles in system (in queue + in service)	$E(n) = \frac{\lambda}{\mu - \lambda}$	=	0.6	vehicles (4 metres)
Average vehicles in queue (not including in service)	$E(m) = \frac{\lambda^2}{\mu(\mu - \lambda)}$	=	0.2	vehicles (1.5 metres)
95 th percentile vehicles in system (in queue + in service)	S^{95}	=	3.0	vehicles (19.5 metres)
95 th percentile vehicles in queue (not including in service)	Q^{95}	=	2.0	vehicles (13 metres)
Average time in system (in queue + in service time)	$E(v) = \frac{1}{\mu - \lambda}$	=	32	seconds (0.5 minutes)
Average time in queue (not including in service time)	$E(n) = \frac{\lambda}{\mu(\mu - \lambda)}$	=	12	seconds (0.2 minutes)

CONCLUSIONS				
There will be 0 vehicles in the overall system (vehicles in service + in queue)			62%	of the time
The available storage length of 36 metres		will accommodate queues	100%	of the time
The average queue of 0 vehicle		CAN be accommodated given the available storage.		
The 95 th percentile queue of 2 vehicles		CAN be accommodated given the available storage.		

Notes

1. There is only a single service provider.
2. Service is provided on a first come, first serve basis (ie. first-into the queue = first-out of the queue).
3. Vehicle arrivals have a Poisson distribution.
4. Service times are exponentially distributed.
5. Length of vehicle considers bumper to bumper length (ie. vehicle + space between vehicles).
6. 95th percentile queue refers to queue length that will accommodate the queues 95% of the time.

INPUT DATA			McDonalds pick-up window	SAT
total inbound peak hour trips	T =	114	vehicles per hour (vph)	
% of trips to use drive-thru	DT =	60%	vehicles per hour (vph)	
arrival rate	λ =	68	vehicles per hour (vph)	
service time	t =	30	seconds	
length of vehicle	L =	6.5	metres	
available queue storage	S =	22	metres	3 vehicles
service rate	μ =	120	vehicles per hour (vph)	
arrival rate + service rate	r =	0.57	note: if $r > 1$, queues will grow indefinitely	

QUEUE CALCULATIONS				
Average vehicles in system (in queue + in service)	$E(n) = \frac{\lambda}{\mu - \lambda} =$	1.3	vehicles	(8.6 metres)
Average vehicles in queue (not including in service)	$E(m) = \frac{\lambda^2}{\mu(\mu - \lambda)} =$	0.8	vehicles	(4.9 metres)
95 th percentile vehicles in system (in queue + in service)	$S^{95} =$	5.0	vehicles	(32.5 metres)
95 th percentile vehicles in queue (not including in service)	$Q^{95} =$	4.0	vehicles	(26 metres)
Average time in system (in queue + in service time)	$E(v) = \frac{1}{\mu - \lambda} =$	70	seconds	(1.2 minutes)
Average time in queue (not including in service time)	$E(n) = \frac{\lambda}{\mu(\mu - \lambda)} =$	40	seconds	(0.7 minutes)

CONCLUSIONS					
There will be 0 vehicles in the overall system (vehicles in service + in queue)				43%	of the time
The available storage length of	22	metres	will accommodate queues	89%	of the time
The average queue of	1	vehicle	CAN be accommodated given the available storage.		
The 95 th percentile queue of	4	vehicles	CANNOT be accommodated given the available storage.		

Notes

1. There is only a single service provider.
2. Service is provided on a first come, first serve basis (ie. first-into the queue = first-out of the queue).
3. Vehicle arrivals have a Poisson distribution.
4. Service times are exponentially distributed.
5. Length of vehicle considers bumper to bumper length (ie. vehicle + space between vehicles).
6. 95th percentile queue refers to queue length that will accommodate the queues 95% of the time.

INPUT DATA		Starbucks order board		SAT
total inbound peak hour trips	T =	107	vehicles per hour (vph)	
% of trips to use drive-thru	DT =	70%	vehicles per hour (vph)	
arrival rate	λ =	75	vehicles per hour (vph)	
service time	t =	30	seconds	
length of vehicle	L =	6.5	metres	
available queue storage	S =	28	metres	4 vehicles
service rate	μ =	120	vehicles per hour (vph)	
arrival rate ÷ service rate	r =	0.62	note: if r>1, queues will grow indefinitely	

QUEUE CALCULATIONS				
Average vehicles in system (in queue + in service)	$E(n) = \frac{\lambda}{\mu - \lambda} =$	1.6	vehicles	(10.7 metres)
Average vehicles in queue (not including in service)	$E(m) = \frac{\lambda^2}{\mu(\mu - \lambda)} =$	1.0	vehicles	(6.7 metres)
95 th percentile vehicles in system (in queue + in service)	$S^{95} =$	6.0	vehicles	(39 metres)
95 th percentile vehicles in queue (not including in service)	$Q^{95} =$	5.0	vehicles	(32.5 metres)
Average time in system (in queue + in service time)	$E(v) = \frac{1}{\mu - \lambda} =$	79	seconds	(1.3 minutes)
Average time in queue (not including in service time)	$E(n) = \frac{\lambda}{\mu(\mu - \lambda)} =$	49	seconds	(0.8 minutes)

CONCLUSIONS				
There will be 0 vehicles in the overall system (vehicles in service + in queue)		38%	of the time	
The available storage length of	28 metres	will accommodate queues	91%	of the time
The average queue of	1 vehicle	CAN be accommodated given the available storage.		
The 95 th percentile queue of	5 vehicles	CANNOT be accommodated given the available storage.		

Notes

1. There is only a single service provider.
2. Service is provided on a first come, first serve basis (ie. first-into the queue = first-out of the queue).
3. Vehicle arrivals have a Poisson distribution.
4. Service times are exponentially distributed.
5. Length of vehicle considers bumper to bumper length (ie. vehicle + space between vehicles).
6. 95th percentile queue refers to queue length that will accommodate the queues 95% of the time.

INPUT DATA		Starbucks pmt/pick-up window		SAT
total inbound peak hour trips	T =	107	vehicles per hour (vph)	
% of trips to use drive-thru	DT =	70%	vehicles per hour (vph)	
arrival rate	λ =	75	vehicles per hour (vph)	
service time	t =	30	seconds	
length of vehicle	L =	6.5	metres	
available queue storage	S =	52	metres	8 vehicles
service rate	μ =	120	vehicles per hour (vph)	
arrival rate + service rate	r =	0.62	note: if $r > 1$, queues will grow indefinitely	

QUEUE CALCULATIONS				
Average vehicles in system (in queue + in service)	$E(n) = \frac{\lambda}{\mu - \lambda} =$	1.6	vehicles	(10.7 metres)
Average vehicles in queue (not including in service)	$E(m) = \frac{\lambda^2}{\mu(\mu - \lambda)} =$	1.0	vehicles	(6.7 metres)
95 th percentile vehicles in system (in queue + in service)	$S^{95} =$	6.0	vehicles	(39 metres)
95 th percentile vehicles in queue (not including in service)	$Q^{95} =$	5.0	vehicles	(32.5 metres)
Average time in system (in queue + in service time)	$E(v) = \frac{1}{\mu - \lambda} =$	79	seconds	(1.3 minutes)
Average time in queue (not including in service time)	$E(n) = \frac{\lambda}{\mu(\mu - \lambda)} =$	49	seconds	(0.8 minutes)

CONCLUSIONS				
There will be 0 vehicles in the overall system (vehicles in service + in queue)		38%	of the time	
The available storage length of	52 metres	will accommodate queues	99%	of the time
The average queue of	1 vehicle	CAN be accommodated given the available storage.		
The 95 th percentile queue of	5 vehicles	CAN be accommodated given the available storage.		

Notes

1. There is only a single service provider.
2. Service is provided on a first come, first serve basis (ie. first-into the queue = first-out of the queue).
3. Vehicle arrivals have a Poisson distribution.
4. Service times are exponentially distributed.
5. Length of vehicle considers bumper to bumper length (ie. vehicle + space between vehicles).
6. 95th percentile queue refers to queue length that will accommodate the queues 95% of the time.