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16728 Highway 12

TRANSPORTATION IMPACT BRIEF

U-Haul Moving & Storage

Document Control

File:

324816

Date:



April 14,
2025

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Issue	Date	Description
1	September 24, 2024	Final Report
2	April 14, 2025	Final Report - Revised

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1 Introduction

Tatham Engineering Limited has been retained by U-Haul Moving and Storage to prepare a Traffic Impact Study in support of the proposed development to be located at 16728 Highway 12 in the Town of Midland. The location of the development site is illustrated in Figure 1.

1.1 REPORT OBJECTIVE

The objective of this report is to present the findings of the traffic impact study and address the requirements of the Town with respect to the potential impacts of the development on the area road network. Recognizing that the trip generation associated with the subject development will not be significant, the scope of this study has been limited to that of a brief. The report addresses the following:

- existing conditions, including a description of the study area road network, traffic volumes, and operations;
- details of the proposed development and anticipated trip generation; and
- future conditions, including transportation impacts associated with the proposed development.

1.2 REPORT STRUCTURE

The report is structured as follows:

- Chapter 1: introduction and study purpose
- Chapter 2: existing conditions, detailing the road system and corresponding traffic operations;
- Chapter 3: proposed development, access, parking and trip generation;
- Chapter 4: future traffic operations associated with the proposed development; and
- Chapter 5: summary of the report and key findings



2 Existing Conditions

This chapter will describe the current road network, traffic volumes and operations under existing conditions.

2.1 ROAD NETWORK

The road network to be addressed by this study consists of Prospect Boulevard, King Street and their respective intersection. Aerial imagery and photographs of the road system are provided in Figure 2 whereas additional details are provided below.

Prospect Boulevard

Prospect Boulevard has the following characteristics:

- 2-lane local road;
- oriented east-west;
- rural cross-section (gravel shoulders with open ditches); and
- speed limit of 50 km/hr and hence a design speed of 60 km/h (speed limit + 10 km/h).

King Street

King Street in the immediate area of the subject development has the following characteristics:

- 2-lane local road;
- oriented north-south;
- semi urban cross-section north of Prospect Boulevard (curb and gutter, open ditches, back of curb sidewalk on west side of road);
- rural cross section south of Prospect Boulevard (gravel shoulders and open ditches); and
- speed limit of 50 km/h and hence a design speed of 60 km/h.

Prospect Boulevard & King Street

The intersection of Prospect Boulevard and King Street is a 4-leg, unsignalized intersection with stop control on Prospect Boulevard (west leg) and Cranston Crescent (east leg). All approaches consist of a single shared left-through-right turn lane (i.e. there are no exclusive turn lanes provided).



2.2 ACTIVE TRANSPORTATION NETWORK

There are no pedestrian or cycling facilities located on Prospect Boulevard. As previously noted, there is a sidewalk on the west side of King Street between Prospect Boulevard and Highway 12. Pedestrian crossing facilities at the intersection of King Street with Highway 12 provide connection to the wider sidewalk network serving the Town. There is also a sidewalk on the east side of Jones Road to the west of the site, also connecting Prospect Boulevard to Highway 12.

2.3 TRANSIT NETWORK

Mid-Pen Transit provides transit service to the Towns of Midland and Penetanguishene, operating one route in each town with the Penetanguishene route connecting to Midland. As illustrated in Figure 3, the Midland Route travels along Prospect Boulevard across the frontage of the site. The bus provides hourly service and operates from 6:45AM to 5:45PM Monday to Friday, and from 8:45AM to 4:45PM on Saturdays. There is no service provided on Sunday. While there are no bus stops on Prospect Boulevard, the passengers can flag down the bus at any safe location along its route (as per information provided on the Town's website).

2.4 TRAFFIC VOLUMES

To determine existing traffic volumes on the study area road network, a traffic count was conducted at the intersection of Prospect Boulevard with King Street on Wednesday, August 21, 2024, from 7:00 to 9:00, 11:00 to 14:00 and 15:00 to 18:00. Detailed count sheets are provided in Appendix A. Given the time of year, the traffic counts are considered representative of summer conditions.

The weekday AM, mid-day and PM peak hour volumes are somewhat comparable, with the PM period reflecting the greatest volumes. For the purpose of this study, the AM and PM peak periods have been considered in the assessment in that they are typically the critical periods of traffic operations, corresponding to the start and end of the typical work day. The observed 2024 AM and PM peak hour traffic volumes are illustrated in Figure 3.

2.5 TRAFFIC OPERATIONS

The assessment of existing conditions provides the baseline from which the future traffic operations can be assessed. As the capacity, and hence operations, of a road system is effectively dictated by its intersections, the traffic assessment has focused on the operations of the study area intersection. The analysis is based on the following:

- the 2024 traffic volumes;
- the existing intersection configuration and control; and



- procedures outlined in the *2000 Highway Capacity Manual*¹ (using Synchro v.11 software).

The analysis considers the following metrics for each lane group at signalized intersections and for the critical movements at unsignalized intersections (namely the stop-controlled movements):

- average delay (measured in seconds);
- level of service (LOS); and
- volume to capacity (v/c) ratio.

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. Level of Service definitions are provided in Appendix B. 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 or greater indicates capacity has been reached.

To more accurately model existing traffic conditions, the peak hour factor and heavy vehicle percentages were calculated based on the 2024 traffic counts and input into the traffic model. Where the observed heavy vehicle percentage was less than the Synchro default value (2%), the default was applied.

Results of the operational assessment are summarized in Table 1 with detailed operations worksheets provided in Appendix C.

Table 1: Intersection Operations – 2024

INTERSECTION, MOVEMENT & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Prospect Blvd & King Street	EB LTR	stop	15	B	0.19	19	C	0.39
	WB LTR	stop	10	A	0.09	10	B	0.22
L - left	T - thru	R - right	LTR - left-thru-right	LT - left-thru	TR - thru-right	LR - left-right		

As indicated, the intersection of Prospect Boulevard with King Street currently provides good operations (LOS C or better) with minor delays and reserve capacity.

¹ *2000 Highway Capacity Manual*. Transportation Research Board. Washington DC, 2000.



2.6 NEED FOR IMPROVEMENTS

In context of the intersection operations, no improvements are required to accommodate the existing traffic volumes.



3 Proposed Development

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

3.1 LOCATION

The subject site is located at 16728 Highway 12 in the Town of Midland. The site encompasses approximately 2.4 hectares of land and is bounded by Highway 12 to the north, Prospect Boulevard to the south and commercial development to the east and west.

3.2 LAND USE

The proposed development will consist of two self-storage buildings (A & B) and an external storage unit area configured as four distinct groupings of storage units (C, D, E and F). Development will have an overall gross floor area (GFA) of 12,010 m² (129,275 ft²). The GFA of the self-storage buildings and external storage units is provided in Table 2.

Table 2: Development Details

STORAGE BUILDING	GROSS FLOOR AREA	
Building A – 3 storeys	10,044 m ²	108,113 ft ²
Building B – 1 storey	1,186 m ²	12,766 ft ²
Building C – 1 storey	193 m ²	2,077 ft ²
Building D – 1 storey	242 m ²	2,605 ft ²
Building E – 1 storey	193 m ²	2,077 ft ²
Building F – 1 storey	152 m ²	1,636 ft ²
Total	12,010 m²	129,275 ft²

It is noted that Building A will include a 232 m² (2,500 ft²) showroom that will showcase moving supplies and truck and trailer rentals. This is considered ancillary to the overall storage purpose of the site.

The site plan is provided in Figure 5.



3.3 ACCESS

3.3.1 Location & Configuration

Access to the site will be provided via a single access to Prospect Boulevard, located approximately 120 metres west of King Street and opposite the existing access to 611 Prospect Boulevard. The existing access to Highway 12 will be decommissioned and removed with restoration of the ditching. There is no proposed access onto Highway 12.

As per the Town's entrance permit by-law (By-law No. 99-176), a commercial access to a town road must have a minimum width of 7.0 metres. As per the site plan, the access has a width of approximately 12.2 metres, which is considered sufficient for accommodating the anticipated vehicle mix accessing the site (passenger cars, medium/heavy single unit moving trucks, waste collection vehicles, etc.).

3.3.2 Sight Line Assessment

A sight line assessment was conducted to establish the appropriateness of the available sight lines along Prospect Boulevard at the site access.

TAC Guidelines

The assessment has considered both minimum stopping sight distance and intersection sight distance, as defined below and dictated per the Transportation Association of Canada's (TAC) *Geometric Design Guide for Canadian Roads*²:

- the minimum stopping sight distance provides sufficient distance for an approaching motorist to observe a stationary hazard in the road and bring their vehicle to a complete stop prior to the hazard; and
- the 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.

The minimum stopping and intersection sight distance requirements for a design speed of 60 km/h (reflective of the 50 km/h assumed speed on Prospect Boulevard) are summarized in Table 3. The available sight distances at the access (as determined through field measurements) are also summarized in Table 3 and evident in Figure 6.

² *Geometric Design Guide for Canadian Roads*. Transportation Association of Canada. June 2017



Table 3: Site Access Sight Line Assessment

LOCATION	DESIGN SPEED	STOPPING SIGHT DISTANCE	INTERSECTION SIGHT DISTANCE		AVAILABLE SIGHTLINES TO/FROM	
			Left Turn	Right Turn	West	East
Site Access	60 km/h	85 m	130 m	110 m	130 m	80m

As indicated, the available sight lines to/from the west (130 metres) satisfy the intersection and minimum stopping sight distances for a 60 km/h design speed.

With respect to the sight lines to/from the east (80 metres), they are limited by the horizontal alignment of the road and thus do not satisfy the TAC recommended sight distances. Having said that, such is not considered critical in context of the following:

- vehicles approaching from the east will have navigated through the intersection at King Street and thus will be advancing at reduced speeds;
- the horizontal alignment of Prospect Boulevard, which limits sight lines, is also expected to yield reduced speeds given its degree of curvature; and
- vehicles approaching the site from the east will be traveling on an upgrade of approximately 5%, which assists in vehicle deceleration thus warranting a reduced stopping sight distance (as per the TAC guidelines, for a design speed of 60 km/h and a grade of 5%, the minimum stopping sight distance reduces to approximately 78 metres which is otherwise satisfied).

While it is acknowledged that the intersection sight distance to the east (110 metres) is not satisfied, it is noted that the intersection sight distance is not the critical condition and is intended to reduce the impact a vehicle entering the road from the access has on the operating speed of an oncoming vehicle. Given the low volumes on the Prospect Boulevard and the low volumes accessing the site, coupled with the reduced speeds anticipated on the westbound approach, the unmet intersection sight distance to the east is not considered problematic. The critical condition is the minimum stopping sight distance, which is satisfied for motorists traveling at the design speed of 60 km/h. Regardless, to further mitigate the sight distances, the following is recommended:

- implement “Driveway Ahead” signage to the east of the site to alert approaching motorists to the potential presence of turning traffic; and
- regular maintenance of the ROW across the frontage of the site to clear shrubs, trees and brush in order to maximize the available sight lines (development of the site will also result in the removal trees outside the ROW that will further enhance visibility).



Town of Midland By-Law

The Town's entrance permit by-law requires that a new access on a road with a posted speed limit of 50 km/h have minimum sight distances of 135 metres. The by-law describes the method in which the sight lines are to be established, which is consistent with that of the intersection sight distance rather than the minimum stopping sight distance. As noted in the sight line assessment above, the available sight distances do not satisfy the Town's requirements. Nonetheless, the sight lines are not considered problematic in that the intersection sight distance is considered conservative, and further recognizing that the minimum stopping sight distance is satisfied. Furthermore, the measures recommended above (i.e. driveway ahead signage and clearing of the ROW) will further mitigate sight line concerns.

3.4 VEHICLE CIRCULATION

The Town's *Zoning By-law* requires a minimum aisle width of 6.0 metres be provided in any aisle providing two-way traffic operations. As per the site plan, no aisle has a width less than 8.7 metres and thus satisfies the Town's *Zoning By-law*.

Recognizing that the site is a storage facility and has been designed to accommodate larger design vehicles, the internal layout as proposed is considered adequate for the manoeuvring needs of the anticipated vehicle mix.

3.5 PARKING

3.5.1 Standard Parking

The parking requirements have been determined based on the requirements set forth in the Town's *Zoning By-law* - storage units are required to provide 1 parking space per 300 m² GFA whereas retail areas are required to provide 5 parking spaces per 90 m² GFA.

The proposed development has approximately 11,778 m² of storage GFA and 232 m² of retail GFA (the aforementioned showroom). Therefore, the site is required to supply 40 parking spaces to support the storage uses ($11,778 \text{ m}^2 \div 300 = 40 \text{ spaces}$) and 13 parking spaces for the showroom ($232 \text{ m}^2 \div 90 \times 5 = 13$), for a total parking requirement of 53 parking spaces. As per the site plan a total of 65 spaces are provided.

3.5.2 Accessible Parking

Regarding provision of accessible parking, a site which is required to supply between 11 and 100 parking spaces (as identified above) must supply at least 1 accessible parking space. As per the site plan, a total of 2 accessible parking spaces are provided, therefore satisfying the Town's requirements.



3.6 SITE TRAFFIC

3.6.1 Trip Generation

The number of vehicle trips to be generated by the proposed development for the weekday AM and weekday PM peak hours has been determined based on type of use, development size and trip generation rates per the *ITE Trip Generation Manual, 11th Edition*. Based on the proposed development, trip rates for the *mini warehouse* (ITE land-use code 151) have been applied. The associated trip rates and estimated trip generation of the subject site are summarized in Table 4.

Table 4: Site Trips

LAND USE	VARIABLE/ SIZE	WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
		In	Out	Total	In	Out	Total
mini warehouse (ITE 151)	per 1000 ft2 GFA	0.05	0.04	0.09	0.07	0.08	0.15
	129,275 ft2	7	5	12	9	10	19

As indicated, the proposed development is expected to generate 12 trips during the weekday AM peak hour and 19 trips during the weekday PM peak hour.

3.6.2 Trip Distribution & Assignment

To ensure a conservative approach, it has been assumed that all site traffic will travel to/from the east along Prospect Boulevard and north along King Street to the wider road network. While it is recognized that some traffic will travel to/from the west along Prospect Boulevard to Jones Road and/or Beamish Road, the assignment of trips to both the east and west will only result in less impacts than are otherwise being considered by assigning all traffic in a single direction.

The resulting site generated volumes assigned to the adjacent road network are illustrated in Figure 7.



4 Future Conditions

This chapter will address the resulting impacts of the proposed development on the adjacent road network. The following areas will be addressed:

- operations of the key intersections; and
- potential improvements to the study area road network, if necessary.

For the purpose of this study, the assessment has considered horizon years of 2031 and 2036, which reflects 5 & 10-year horizons beyond build-out, which is assumed to be 2026.

4.1 ROAD NETWORK

There are no planned improvements to the area road network within the study horizon considered herein. As such, the road network described in Chapter 2 has been maintained.

4.2 TRAFFIC VOLUMES

Traffic volumes expected for the 2031 and 2036 horizon years have been determined based on the 2024 traffic volumes, historical and projected growth, and consideration for the subject development volumes.

4.2.1 Background Volumes

Population Growth

Based on 2016 and 2021 census data, the population of the Town of Midland increased from 23,791 persons in 2011 to 24,353 persons in 2016 and to 27,894 persons in 2021, translating to annual growth 0.5% and 2.8% over the respective 5-year periods, and 1.6% per annum between 2011 and 2021.

Based on the *Growth Forecasts and Land Needs Assessment*³ prepared for the County of Simcoe, the population of the town of Midland is projected to grow from 18,250 in 2021 to 24,290 in 2051, or 1.0% annually.

³ *Growth Forecasts and Land Needs Assessment*. Hemson Consulting Ltd. March 31, 2022.



Historical Volumes

Historical data on Highway 12 through the immediate area was reviewed to establish historical growth levels, the results of which are provided in Table 5 pertaining to Average Annual Daily Traffic (AADT) where available.

Table 5: Historical Traffic Volumes - Highway 12

ROAD SECTION	VOLUME	YEAR				ANNUAL GROWTH				
		2006	2011	2016	2019	2006-2011	2011-2016	2006-2016	2011-2019	2016-2019
Simcoe Road 37 to Midland W LTS	AADT	11100	10300	8500	7450	-1.5%	-3.8%	-2.6%	-4.0%	-4.3%
Midland W LTS to Highway 93	AADT	11600	13000	14500	15400	2.3%	2.2%	2.3%	2.1%	2.0%

In considering the volumes on Highway 12, annual growth rates range from -4.3% (i.e. decrease in volumes) to 2.3%, with an 8-year average of -4.0 to 2.1% growth.

Overall Background Growth

In considering both the historical and projected growth rates for this area, an annual background growth rate of 2.0% has been applied to the observed traffic volumes on the area road network.

Background Volumes

The resulting background traffic volumes for the 2031 and 2036 horizons, reflective of the existing volumes adjusted by the noted growth rates, are illustrated in Figure 8 and Figure 9.

4.2.2 Total Volumes

To assess the impacts of the proposed development traffic on the operations of the road network, the site generated traffic was combined with the background traffic volumes to establish the future total volumes. The resulting total traffic volumes for the 2031 and 2036 horizons are illustrated in Figure 10 and Figure 11, respectively.



4.3 TRAFFIC OPERATIONS

The operations of the study area intersection and site access were assessed under total conditions for the 2031 and 2036 horizons. Results of the operational analyses are summarized in Table 6 and Table 7 with detailed worksheets provided in Appendix D.

Table 6: Intersection Operations - 2031

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Prospect Blvd & King Street	EB LTR	stop	17	C	0.27	27	D	0.57
	WB LTR	stop	10	A	0.11	11	B	0.26
Prospect Blvd & Access	SB LR	stop	10	A	0.01	11	B	0.04
L - left T - thru R - right LTR - left-thru-right LT - left-thru TR - thru-right LR - left-right								

Table 7: Intersection Operations - 2036

INTERSECTION, MOVEMENTS & CONTROL			WEEKDAY AM PEAK HOUR			WEEKDAY PM PEAK HOUR		
			Delay	LOS	v/c	Delay	LOS	v/c
Prospect Blvd & King Street	EB LTR	stop	20	C	0.32	33	D	0.63
	WB LTR	stop	10	B	0.13	11	B	0.28
Prospect Blvd & Access	SB LR	stop	11	B	0.01	11	B	0.04
L - left T - thru R - right LTR - left-thru-right LT - left-thru TR - thru-right LR - left-right								

As indicated, the intersection of Prospect Boulevard with King Street is expected to continue to provide acceptable operations (LOS D or better) with minor delays and reserve capacity through the 2036 horizon. Similarly, the site access is expected to provide excellent operations (LOS B or better).

4.4 NEED FOR IMPROVEMENT

4.4.1 Intersection Operations

Given the reported operations at the study area intersection and site access, no improvements are required under future total conditions.



While it is acknowledged that site traffic will travel through the intersections of Highway 12 with King Street and Highway 12 with Jones Road, the limited volumes are not such that would have any material impact on the operations of the intersections. The peak directional volume to be generated by the site is 10 vehicles per hour or less. When distributed through the network and to the various turning movements at each intersection, the resulting volumes per movement are inconsequential with respect to operational impact. As such, the proposed development will not result in any measurable impact to MTO infrastructure or traffic operations.

4.4.2 Turn Lane Requirements

Given the limited volumes to be generated by the proposed development (7 to 9 inbound vehicles), exclusive turn lanes on Prospect Boulevard at the site access are not necessary to serve the site.



5 Summary

Proposed Development

This study has addressed the transportation impacts with the proposed storage facility to be located at 16728 Highway 12. Upon completion, the site is expected to generate 12 trips during the weekday AM peak hour and 19 trips during the weekday PM hour.

Sight Line Assessment

Sight lines at the proposed site access point were reviewed in context of TAC requirements for minimum stopping and intersection sight distances. While the intersection sight distance to/from the east was not satisfied, the TAC minimum stopping sight distance (considered the critical condition) was satisfied in both directions. Regardless, it is recommended that “Driveway Ahead” signage be placed on Prospect Boulevard to the east of the site access to alert approaching motorists to the potential presence of turning vehicles. It is also recommended that the ROW be cleared of trees and shrubs to ensure the available sight lines are maximized.

Transportation Impacts

The intersection operations of Prospect Boulevard with King Street and the operations at the site access were reviewed to determine the potential impacts associated with the subject development. The results of the operational analyses indicate that the study area intersection and the site access will provide good operations through 2036. Thus, no improvements are required to accommodate the subject development.

Overall, the subject site is not expected to have any material impact on the operations of the adjacent road network.

Turn Lane Requirements

Given the low volume of traffic accessing the site, exclusive turn lanes are not required to serve the site.





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Figure 1: Site Location





Source: opengis.simcoe.ca

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Figure 2A: Road Network





Looking north along King Street from Prospect Boulevard/Cranston Crescent



Looking south along King Street from Prospect Boulevard/Cranston Crescent



Looking east along Cranston Crescent from King Street



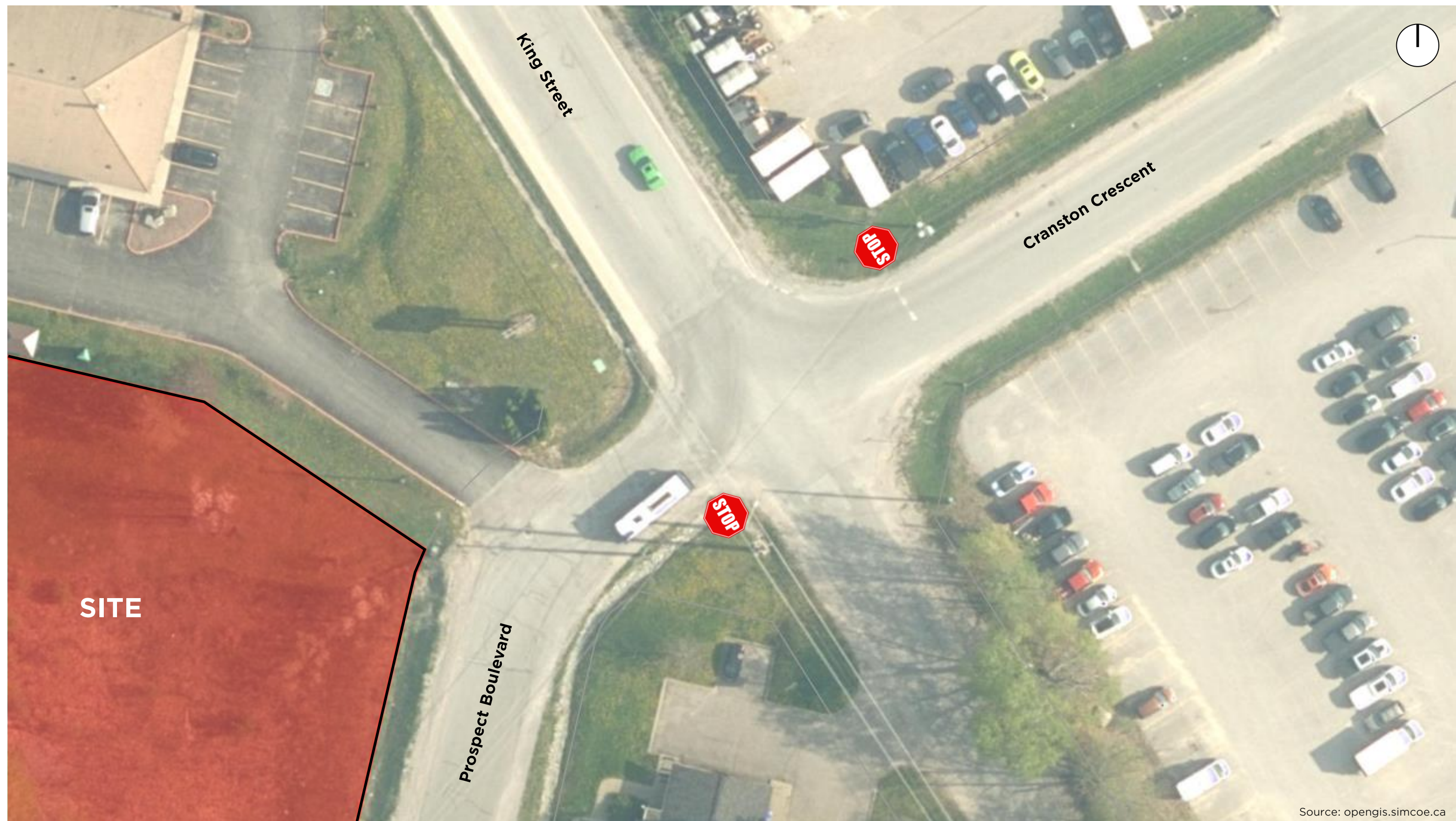
Looking west along Prospect Boulevard from King Street

Source: Google Streetview

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Figure 2B: Road Network



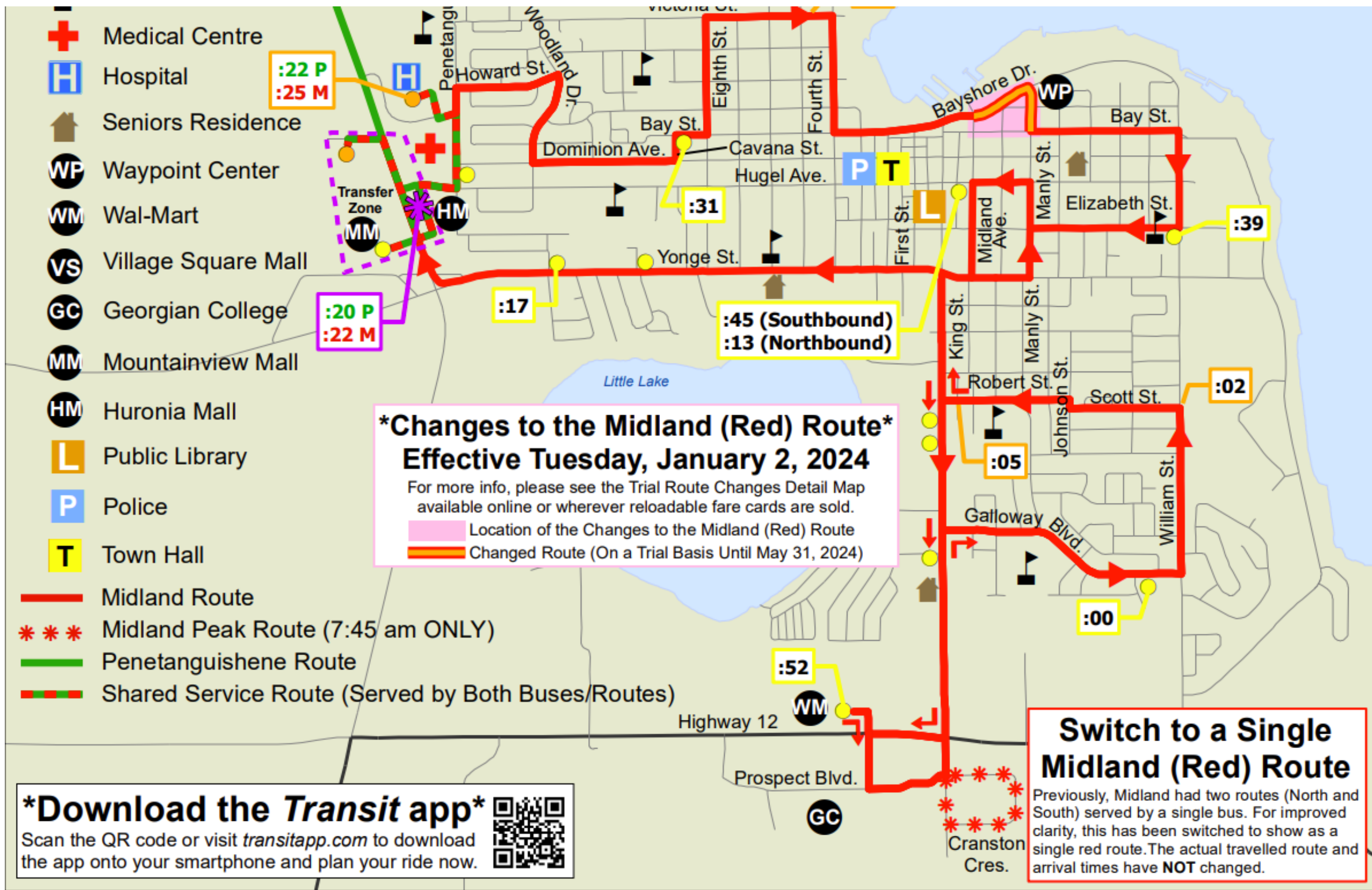


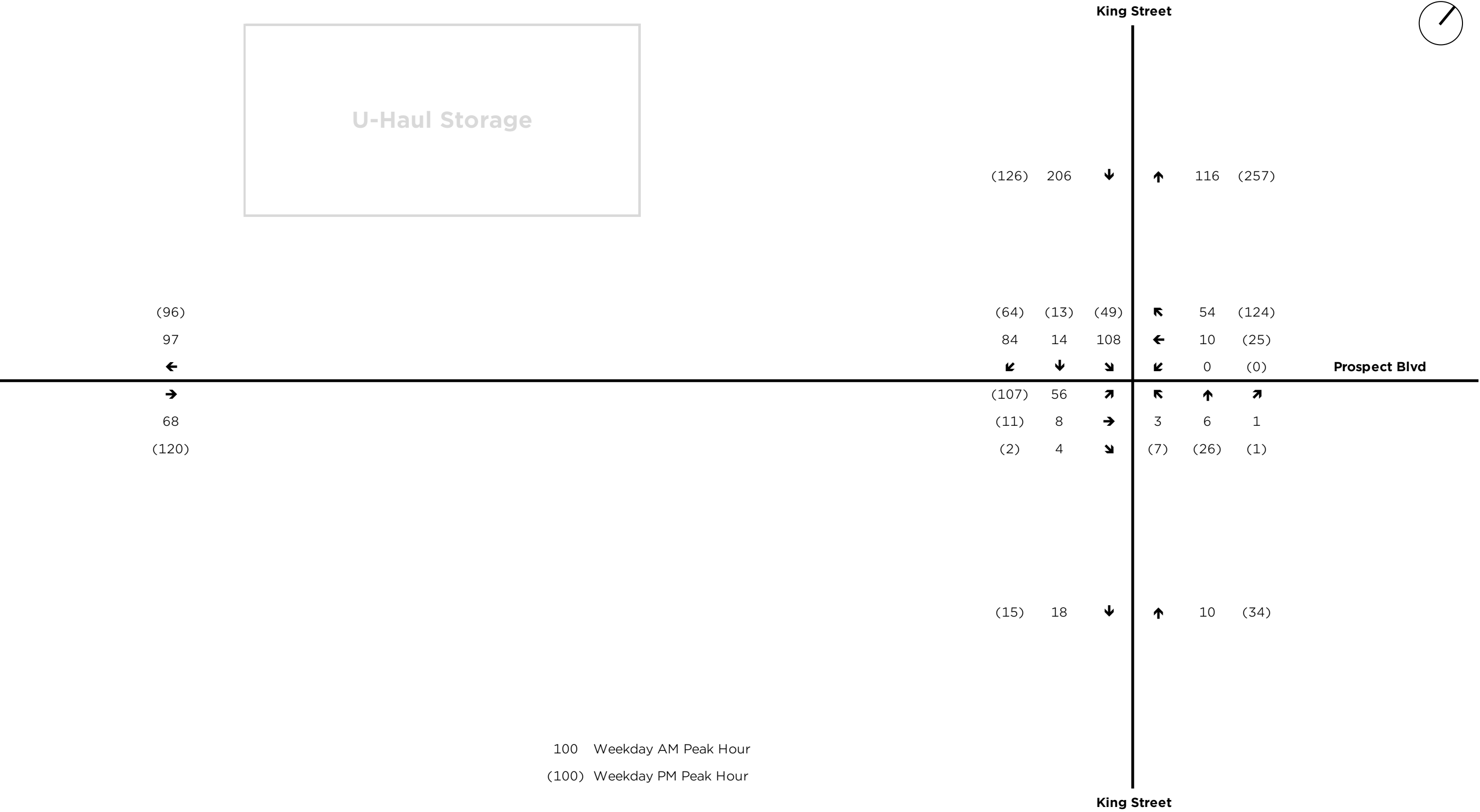
Source: opengis.simcoe.ca

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Figure 2C: Road Network







Zone Matrix		
ZBL 2004 - 90	Highway Commercial (HC) Zone	Proposed HC-## Zone
Lot Area (min)	3,000m ²	±23,487.3m ²
Lot Frontage (min)	30m	±89.6m
Lot Coverage (max)	50%	±22.6%
Front Yard (min)	7.5m	±14.0m
Setback from Highway 12 (min)	15.0m	±14.0m
Side Yard (min)	0.0m	±4.3m
Rear Yard (min)	7.5m (south)	±18.0m
Building Height (max)	11.0m	±15.1m
Parking Spaces (min)	53	
- Self Storage	40 (1 / 300m ² GFA)	53
- Retail	13 (5 / 90m ² GFA)	
Parking Space Dimension (min)	2.8m x 5.8m 3.0m x 6.0m (angled)	2.8m x 6.1m 3.6m x 9.1m (angled)
Barrier Free Parking	1	2
Barrier Free Parking Space Dimension (min)	3.4m x 5.8m	>3.4m x 5.8m
Loading Spaces (min)	2	>2
Loading Space Dimensions (min)	4.0m x 21.0m	>4.0m x 21.0m
Drive Aisle Width (min)	6.0m	8.7m



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Figure 5: Site Plan





Source: opengis.simcoe.ca

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Figure 6A: Site Access Sight Lines





Looking west along Prospect Boulevard from site access



Source: Google Streetview

Looking east along Prospect Boulevard from site access

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Figure 6B: Site Access Sight Lines





Looking west along Prospect Boulevard from King Street

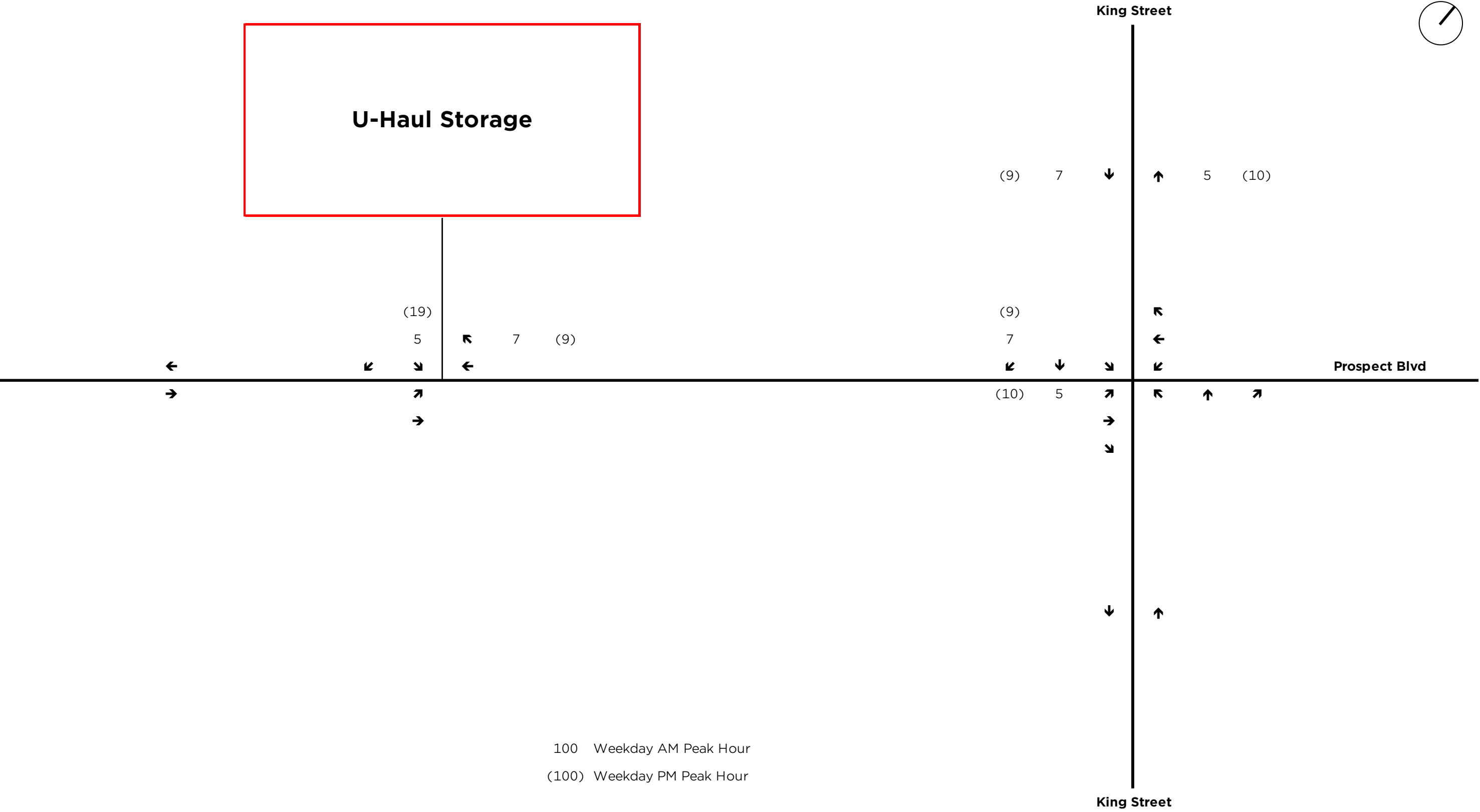


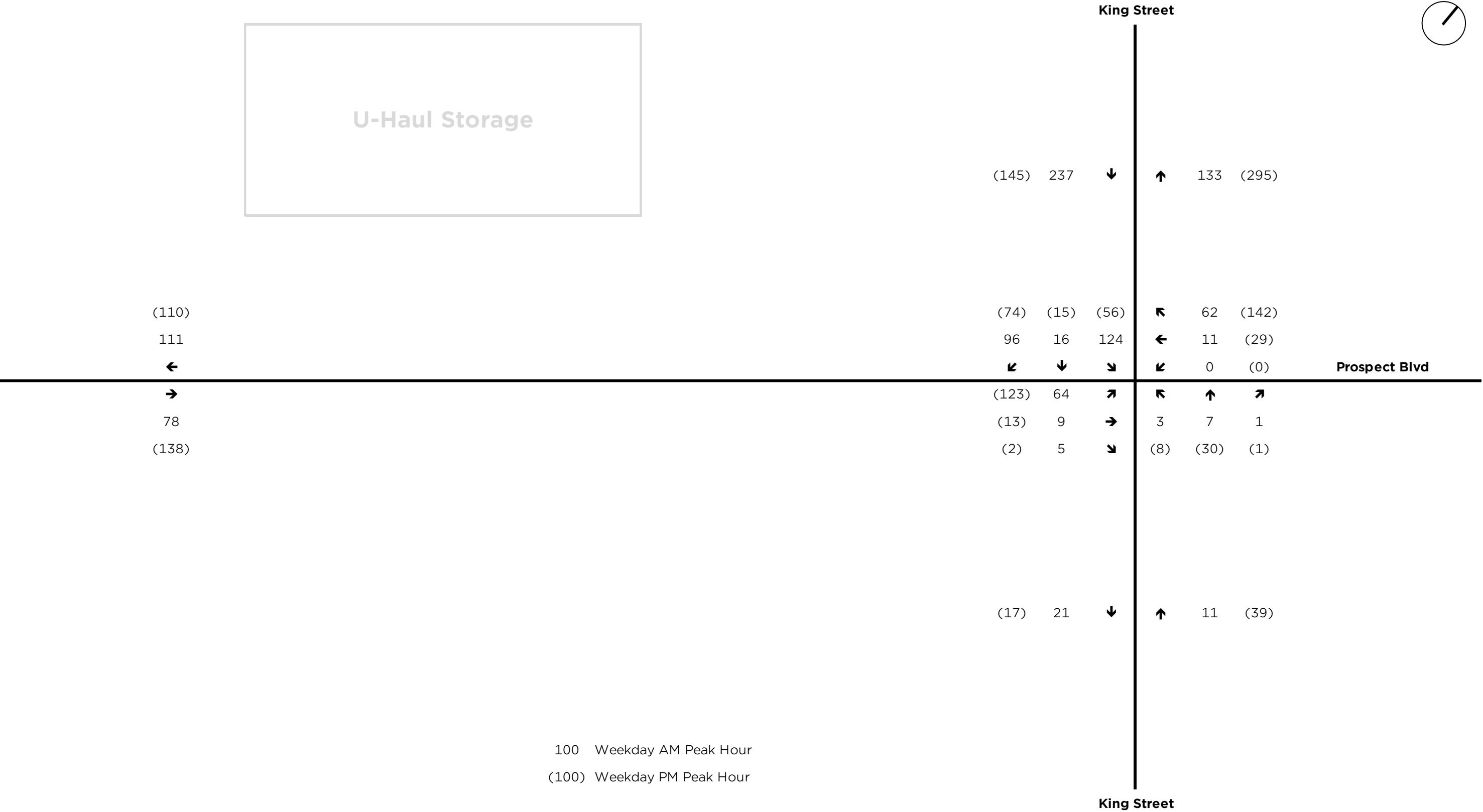
Looking east along Prospect Boulevard to the site access

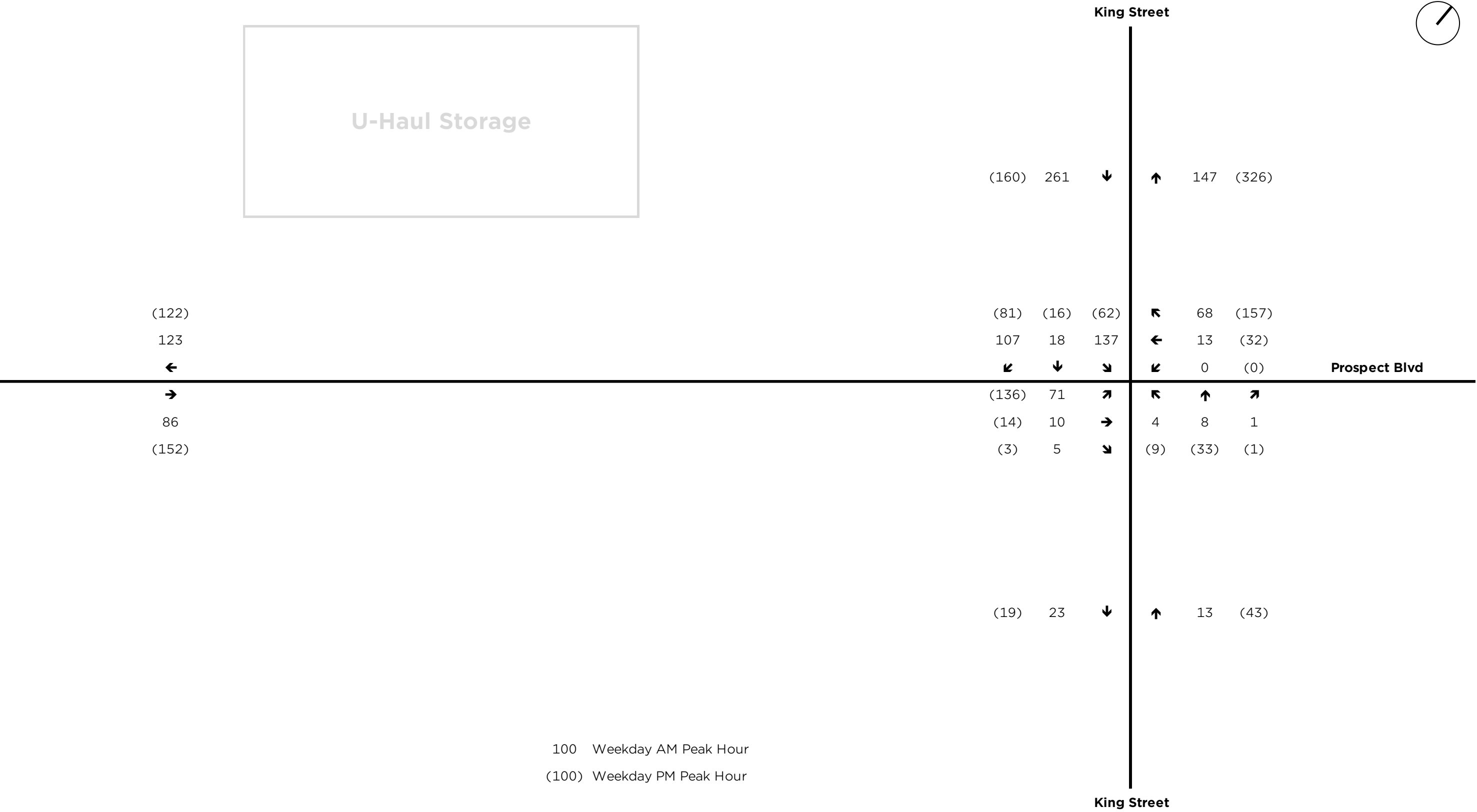
16728 HIGHWAY 12 - TRANSPORTATION IMPACT BRIEF

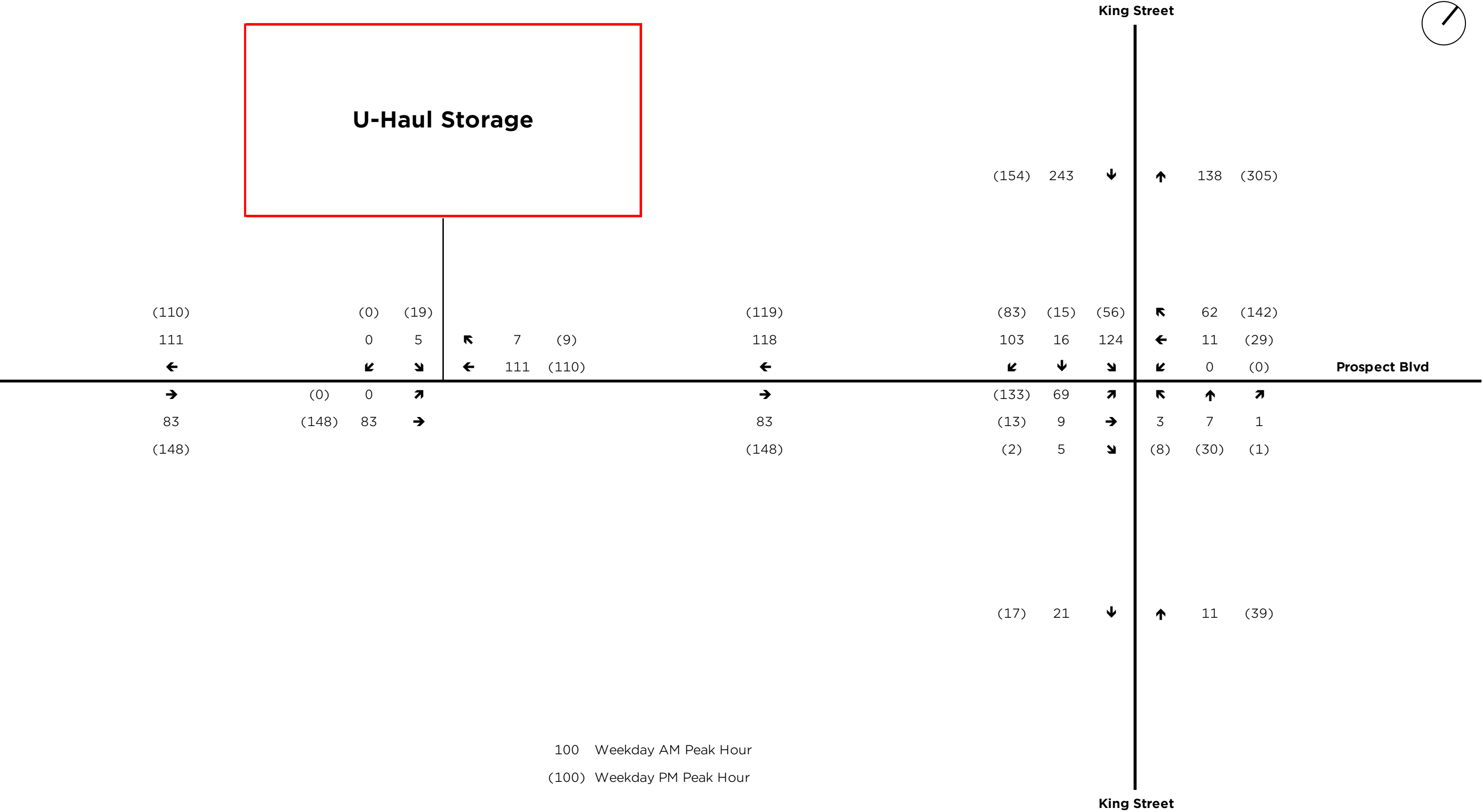
Figure 6C: Site Access Sight Lines

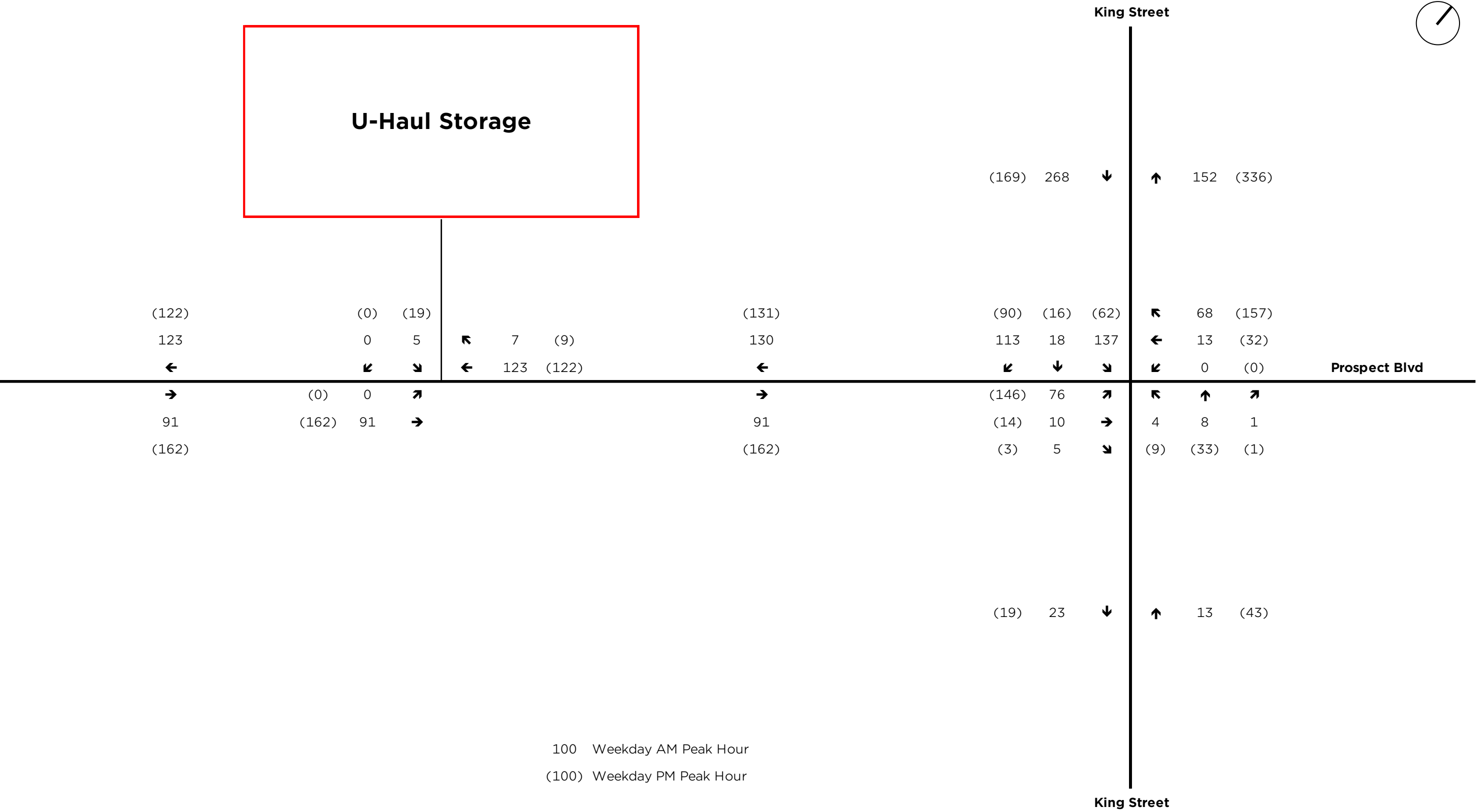












Appendix A: Traffic Counts

Accu-Traffic Inc.

Morning Peak Diagram		Specified Period From: 7:00:00 To: 9:00:00	One Hour Peak From: 8:00:00 To: 9:00:00
Municipality: Midland Site #: 2415100001 Intersection: King St & Prospect Blvd TFR File #: 1 Count date: 21-Aug-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **		Major Road: King St runs N/S	

North Leg Total: 322 North Entering: 206 North Peds: 1 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Buses</td> <td style="text-align: right;">0</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">5</td> <td style="text-align: right;">0</td> <td style="text-align: right;">7</td> <td style="text-align: right;">12</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">79</td> <td style="text-align: right;">14</td> <td style="text-align: right;">100</td> <td style="text-align: right;">193</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">84</td> <td style="text-align: right;">14</td> <td style="text-align: right;">108</td> <td></td> </tr> </table>	Buses	0	0	1	1	Trucks	5	0	7	12	Cars	79	14	100	193	Totals	84	14	108		<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Buses</td> <td style="text-align: right;">2</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">17</td> </tr> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">97</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">116</td> </tr> </table>	Buses	2	Trucks	17	Cars	97	Totals	116	East Leg Total: 181 East Entering: 64 East Peds: 1 Peds Cross:
Buses	0	0	1	1																											
Trucks	5	0	7	12																											
Cars	79	14	100	193																											
Totals	84	14	108																												
Buses	2																														
Trucks	17																														
Cars	97																														
Totals	116																														

Buses	Trucks	Cars	Totals
0	5	92	97

King St

Prospect Blvd

Cars	Trucks	Buses	Totals
46	8	0	54
10	0	0	10
0	0	0	0
56	8	0	

Buses	Trucks	Cars	Totals
1	8	47	56
0	0	8	8
0	0	4	4
1	8	59	

King St

King St

Cranston Cres

Cars	Trucks	Buses	Totals
109	7	1	117

Peds Cross: West Peds: 1 West Entering: 68 West Leg Total: 165	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">18</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Buses</td> <td style="text-align: right;">0</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">18</td> </tr> </table>	Cars	18	Trucks	0	Buses	0	Totals	18	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: right;">Cars</td> <td style="text-align: right;">3</td> <td style="text-align: right;">4</td> <td style="text-align: right;">1</td> <td style="text-align: right;">8</td> </tr> <tr> <td style="text-align: right;">Trucks</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Buses</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> <td style="text-align: right;">0</td> <td style="text-align: right;">1</td> </tr> <tr> <td style="text-align: right;">Totals</td> <td style="text-align: right;">3</td> <td style="text-align: right;">6</td> <td style="text-align: right;">1</td> <td></td> </tr> </table>	Cars	3	4	1	8	Trucks	0	1	0	1	Buses	0	1	0	1	Totals	3	6	1		Peds Cross: South Peds: 0 South Entering: 10 South Leg Total: 28
Cars	18																														
Trucks	0																														
Buses	0																														
Totals	18																														
Cars	3	4	1	8																											
Trucks	0	1	0	1																											
Buses	0	1	0	1																											
Totals	3	6	1																												

Comments

Accu-Traffic Inc.

Mid-day Peak Diagram

Specified Period

From: 11:00:00

To: 14:00:00

One Hour Peak

From: 12:00:00

To: 13:00:00

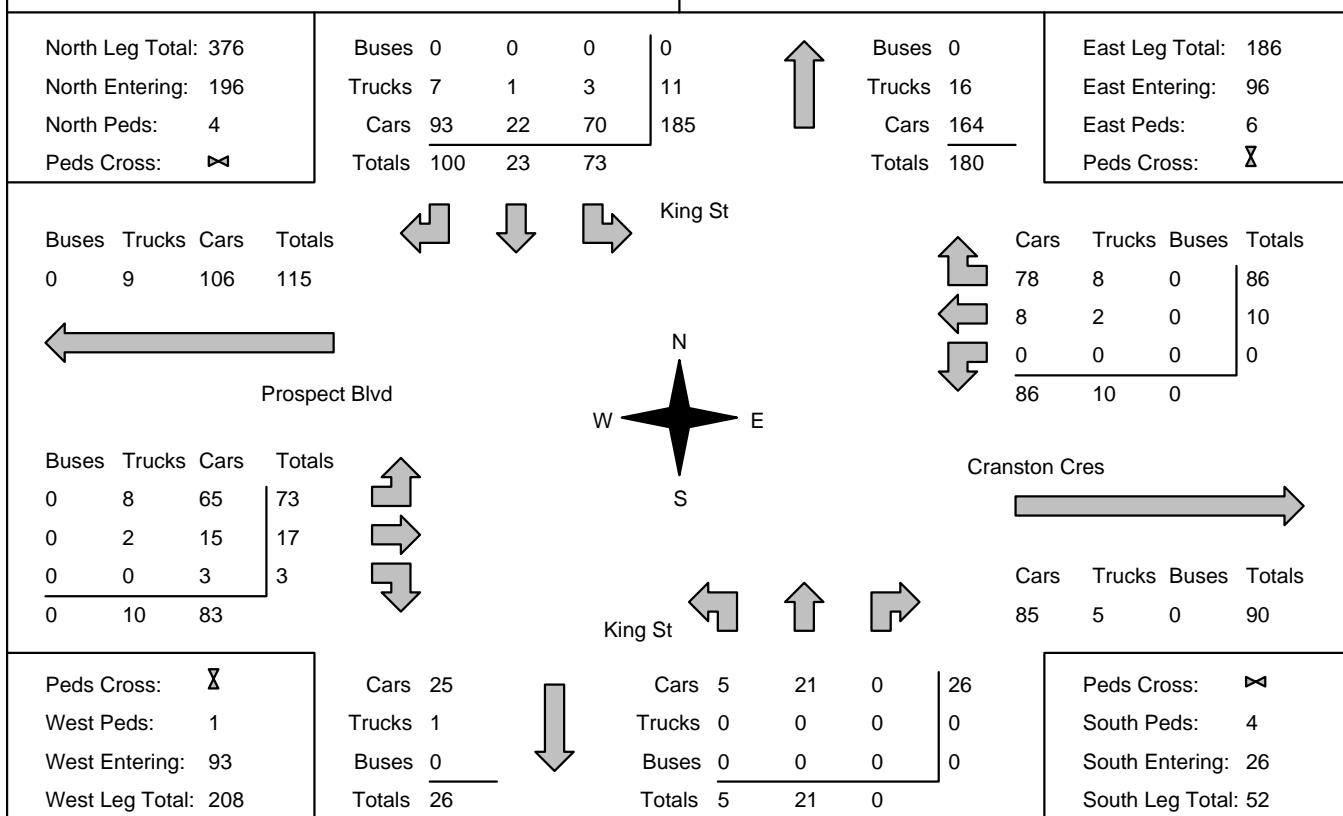
Municipality: Midland
Site #: 2415100001
Intersection: King St & Prospect Blvd
TFR File #: 1
Count date: 21-Aug-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

** Non-Signalized Intersection **

Major Road: King St runs N/S



Comments

Accu-Traffic Inc.

Afternoon Peak Diagram		Specified Period From: 15:00:00 To: 18:00:00	One Hour Peak From: 16:00:00 To: 17:00:00
Municipality: Midland Site #: 2415100001 Intersection: King St & Prospect Blvd TFR File #: 1 Count date: 21-Aug-24		Weather conditions: Person counted: Person prepared: Person checked:	
** Non-Signalized Intersection **		Major Road: King St runs N/S	

North Leg Total: 383 North Entering: 126 North Peds: 0 Peds Cross:	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Trucks</td><td>5</td><td>1</td><td>4</td><td>10</td></tr> <tr><td>Cars</td><td>59</td><td>12</td><td>45</td><td>116</td></tr> <tr><td>Totals</td><td>64</td><td>13</td><td>49</td><td></td></tr> </table>	Buses	0	0	0	0	Trucks	5	1	4	10	Cars	59	12	45	116	Totals	64	13	49			<table style="width: 100%; border-collapse: collapse;"> <tr><td>Buses</td><td>2</td></tr> <tr><td>Trucks</td><td>3</td></tr> <tr><td>Cars</td><td>252</td></tr> <tr><td>Totals</td><td>257</td></tr> </table>	Buses	2	Trucks	3	Cars	252	Totals	257	East Leg Total: 210 East Entering: 149 East Peds: 1 Peds Cross:
Buses	0	0	0	0																												
Trucks	5	1	4	10																												
Cars	59	12	45	116																												
Totals	64	13	49																													
Buses	2																															
Trucks	3																															
Cars	252																															
Totals	257																															

Buses	Trucks	Cars	Totals
0	5	91	96

Prospect Blvd

Buses	Trucks	Cars	Totals
2	3	102	107
0	0	11	11
0	0	2	2
2	3	115	

King St

King St

Cars	Trucks	Buses	Totals
124	0	0	124
25	0	0	25
0	0	0	0
149	0	0	

Cranston Cres

Cars	Trucks	Buses	Totals
57	4	0	61

Peds Cross: West Peds: 1 West Entering: 120 West Leg Total: 216	<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>14</td></tr> <tr><td>Trucks</td><td>1</td></tr> <tr><td>Buses</td><td>0</td></tr> <tr><td>Totals</td><td>15</td></tr> </table>	Cars	14	Trucks	1	Buses	0	Totals	15		<table style="width: 100%; border-collapse: collapse;"> <tr><td>Cars</td><td>7</td><td>26</td><td>1</td><td>34</td></tr> <tr><td>Trucks</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Buses</td><td>0</td><td>0</td><td>0</td><td>0</td></tr> <tr><td>Totals</td><td>7</td><td>26</td><td>1</td><td></td></tr> </table>	Cars	7	26	1	34	Trucks	0	0	0	0	Buses	0	0	0	0	Totals	7	26	1		Peds Cross: South Peds: 2 South Entering: 34 South Leg Total: 49
Cars	14																															
Trucks	1																															
Buses	0																															
Totals	15																															
Cars	7	26	1	34																												
Trucks	0	0	0	0																												
Buses	0	0	0	0																												
Totals	7	26	1																													

Comments

Accu-Traffic Inc.

Total Count Diagram

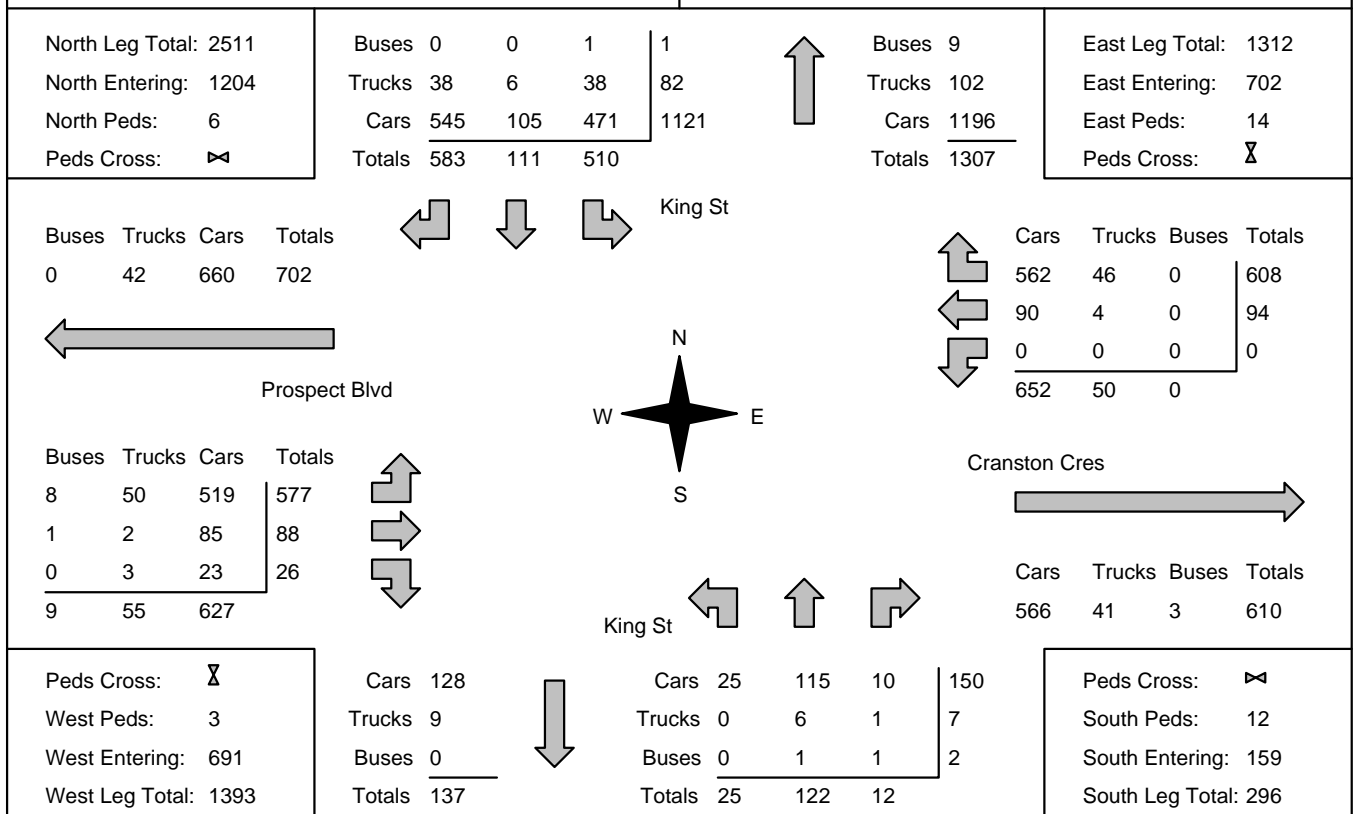
Municipality: Midland
Site #: 2415100001
Intersection: King St & Prospect Blvd
TFR File #: 1
Count date: 21-Aug-24

Weather conditions:

Person counted:
Person prepared:
Person checked:

**** Non-Signalized Intersection ****

Major Road: King St runs N/S



Comments

Accu-Traffic Inc.

Traffic Count Summary

Intersection: King St & Prospect Blvd					Count Date: 21-Aug-24		Municipality: Midland					
North Approach Totals						North/South Total Approaches	South Approach Totals					
Hour Ending	Includes Cars, Trucks, & Buses				Total Peds		Hour Ending	Includes Cars, Trucks, & Buses				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	87	20	72	179	0	183	8:00:00	0	4	0	4	0
9:00:00	108	14	84	206	1	216	9:00:00	3	6	1	10	0
11:00:00	0	0	0	0	0	0	11:00:00	0	0	0	0	0
12:00:00	61	11	57	129	0	145	12:00:00	3	11	2	16	0
13:00:00	73	23	100	196	4	222	13:00:00	5	21	0	26	4
14:00:00	66	10	79	155	0	178	14:00:00	2	18	3	23	4
15:00:00	0	0	0	0	0	0	15:00:00	0	0	0	0	0
16:00:00	47	11	69	127	1	156	16:00:00	2	25	2	29	2
17:00:00	49	13	64	126	0	160	17:00:00	7	26	1	34	2
18:00:00	19	9	58	86	0	103	18:00:00	3	11	3	17	0

Accu-Traffic Inc.

Count Date: 21-Aug-24 Site #: 2415100001

Interval Time	Passenger Cars - North Approach						Trucks - North Approach						Buses - 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	14	14	3	3	5	5	2	2	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	29	15	12	9	16	11	2	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	53	24	13	1	29	13	3	1	0	0	1	1	0	0	0	0	0	0	0	0
8:00:00	84	31	20	7	68	39	3	0	0	0	4	3	0	0	0	0	0	0	0	0
8:15:00	106	22	30	10	88	20	5	2	0	0	4	0	1	1	0	0	0	0	0	0
8:30:00	134	28	30	0	102	14	8	3	0	0	7	3	1	0	0	0	0	0	0	0
8:45:00	157	23	31	1	115	13	10	2	0	0	9	2	1	0	0	0	0	0	0	0
9:00:00	184	27	34	3	147	32	10	0	0	0	9	0	1	0	0	0	0	0	1	1
9:15:00	184	0	34	0	147	0	10	0	0	0	9	0	1	0	0	0	0	0	1	0
11:00:00	184	0	34	0	147	0	10	0	0	0	9	0	1	0	0	0	0	0	1	0
11:15:00	195	11	38	4	159	12	13	3	0	0	9	0	1	0	0	0	0	0	1	0
11:30:00	209	14	39	1	173	14	15	2	0	0	9	0	1	0	0	0	0	0	1	0
11:45:00	221	12	41	2	182	9	17	2	0	0	11	2	1	0	0	0	0	0	1	0
12:00:00	235	14	45	4	199	17	20	3	0	0	14	3	1	0	0	0	0	0	1	0
12:15:00	249	14	47	2	216	17	20	0	0	0	17	3	1	0	0	0	0	0	1	0
12:30:00	262	13	57	10	242	26	22	2	1	1	20	3	1	0	0	0	0	0	4	3
12:45:00	281	19	62	5	259	17	23	1	1	0	20	0	1	0	0	0	0	0	4	0
13:00:00	305	24	67	5	292	33	23	0	1	0	21	1	1	0	0	0	0	0	5	1
13:15:00	324	19	69	2	312	20	25	2	2	1	22	1	1	0	0	0	0	0	5	0
13:30:00	344	20	70	1	329	17	26	1	2	0	23	1	1	0	0	0	0	0	5	0
13:45:00	352	8	73	3	344	15	28	2	2	0	23	0	1	0	0	0	0	0	5	0
14:00:00	365	13	76	3	366	22	29	1	2	0	26	3	1	0	0	0	0	0	5	0
14:15:00	365	0	76	0	366	0	29	0	2	0	26	0	1	0	0	0	0	0	5	0
15:00:00	365	0	76	0	366	0	29	0	2	0	26	0	1	0	0	0	0	0	5	0
15:15:00	375	10	78	2	379	13	31	2	2	0	28	2	1	0	0	0	0	0	6	1
15:30:00	383	8	80	2	392	13	33	2	2	0	29	1	1	0	0	0	0	0	6	0
15:45:00	394	11	80	0	413	21	33	0	4	2	30	1	1	0	0	0	0	0	6	0
16:00:00	407	13	84	4	430	17	34	1	5	1	31	1	1	0	0	0	0	0	6	0
16:15:00	421	14	88	4	451	21	35	1	5	0	35	4	1	0	0	0	0	0	6	0
16:30:00	432	11	91	3	465	14	36	1	5	0	36	1	1	0	0	0	0	0	6	0
16:45:00	441	9	92	1	478	13	37	1	6	1	36	0	1	0	0	0	0	0	6	0
17:00:00	452	11	96	4	489	11	38	1	6	0	36	0	1	0	0	0	0	0	6	0
17:15:00	459	7	100	4	506	17	38	0	6	0	37	1	1	0	0	0	0	0	6	0
17:30:00	464	5	102	2	519	13	38	0	6	0	38	1	1	0	0	0	0	0	6	0
17:45:00	468	4	102	0	532	13	38	0	6	0	38	0	1	0	0	0	0	0	6	0
18:00:00	471	3	105	3	545	13	38	0	6	0	38	0	1	0	0	0	0	0	6	0
18:15:00	471	0	105	0	545	0	38	0	6	0	38	0	1	0	0	0	0	0	6	0
18:15:15	471	0	105	0	545	0	38	0	6	0	38	0	1	0	0	0	0	0	6	0

[illegible]

Accu-Traffic Inc.

Count Date: 21-Aug-24 Site #: 2415100001

Interval Time	Passenger Cars - South Approach						Trucks - South Approach						Buses - 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	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	0	0	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15:00	1	1	6	2	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0
8:30:00	1	0	6	0	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0
8:45:00	1	0	7	1	1	0	0	0	1	1	0	0	0	0	1	0	0	0	0	0
9:00:00	3	2	8	1	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
9:15:00	3	0	8	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
11:00:00	3	0	8	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
11:15:00	4	1	8	0	1	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
11:30:00	5	1	12	4	2	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
11:45:00	6	1	15	3	3	1	0	0	1	0	0	0	0	0	1	0	0	0	0	0
12:00:00	6	0	19	4	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
12:15:00	7	1	27	8	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
12:30:00	9	2	33	6	3	0	0	0	1	0	0	0	0	0	1	0	0	0	3	3
12:45:00	9	0	37	4	3	0	0	0	1	0	0	0	0	0	1	0	0	0	3	0
13:00:00	11	2	40	3	3	0	0	0	1	0	0	0	0	0	1	0	0	0	4	1
13:15:00	12	1	44	4	4	1	0	0	1	0	0	0	0	0	1	0	0	0	4	0
13:30:00	12	0	47	3	6	2	0	0	1	0	0	0	0	0	1	0	0	0	6	2
13:45:00	13	1	52	5	6	0	0	0	1	0	0	0	0	0	1	0	0	0	7	1
14:00:00	13	0	58	6	6	0	0	0	1	0	0	0	0	0	1	0	0	0	8	1
14:15:00	13	0	58	0	6	0	0	0	1	0	0	0	0	0	1	0	0	0	8	0
15:00:00	13	0	58	0	6	0	0	0	1	0	0	0	0	0	1	0	0	0	8	0
15:15:00	15	2	65	7	6	0	0	0	1	0	0	0	0	0	1	0	1	1	8	0
15:30:00	15	0	67	2	6	0	0	0	1	0	0	0	0	0	1	0	1	0	8	0
15:45:00	15	0	71	4	6	0	0	0	2	1	0	0	0	0	1	0	1	0	8	0
16:00:00	15	0	81	10	6	0	0	0	3	1	1	1	0	0	1	0	1	0	10	2
16:15:00	19	4	93	12	6	0	0	0	3	0	1	0	0	0	1	0	1	0	12	2
16:30:00	20	1	101	8	7	1	0	0	3	0	1	0	0	0	1	0	1	0	12	0
16:45:00	21	1	103	2	7	0	0	0	3	0	1	0	0	0	1	0	1	0	12	0
17:00:00	22	1	107	4	7	0	0	0	3	0	1	0	0	0	1	0	1	0	12	0
17:15:00	24	2	113	6	7	0	0	0	5	2	1	0	0	0	1	0	1	0	12	0
17:30:00	25	1	114	1	10	3	0	0	5	0	1	0	0	0	1	0	1	0	12	0
17:45:00	25	0	115	1	10	0	0	0	6	1	1	0	0	0	1	0	1	0	12	0
18:00:00	25	0	115	0	10	0	0	0	6	0	1	0	0	0	1	0	1	0	12	0
18:15:00	25	0	115	0	10	0	0	0	6	0	1	0	0	0	1	0	1	0	12	0
18:15:15	25	0	115	0	10	0	0	0	6	0	1	0	0	0	1	0	1	0	12	0

Accu-Traffic Inc.

Count Date: 21-Aug-24 Site #: 2415100001

Interval Time	Passenger Cars - West Approach						Trucks - West Approach						Buses - West Approach						Pedestrians	
	Left		Thru		Right		Left		Thru		Right		Left		Thru		Right		West 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	4	4	1	1	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0
7:30:00	7	3	1	0	0	0	4	1	0	0	0	0	0	0	0	0	0	0	0	0
7:45:00	12	5	6	5	0	0	5	1	0	0	0	0	0	0	0	0	0	0	0	0
8:00:00	20	8	9	3	0	0	8	3	0	0	0	0	0	0	1	1	0	0	0	0
8:15:00	29	9	12	3	1	1	11	3	0	0	0	0	0	0	1	0	0	0	1	1
8:30:00	41	12	14	2	1	0	11	0	0	0	0	0	0	0	1	0	0	0	1	0
8:45:00	50	9	16	2	2	1	14	3	0	0	0	0	0	0	1	0	0	0	1	0
9:00:00	67	17	17	1	4	2	16	2	0	0	0	0	1	1	1	0	0	0	1	0
9:15:00	67	0	17	0	4	0	16	0	0	0	0	0	1	0	1	0	0	0	1	0
11:00:00	67	0	17	0	4	0	16	0	0	0	0	0	1	0	1	0	0	0	1	0
11:15:00	86	19	20	3	6	2	25	9	0	0	0	0	1	0	1	0	0	0	1	0
11:30:00	101	15	21	1	7	1	25	0	0	0	1	1	1	0	1	0	0	0	1	0
11:45:00	117	16	23	2	7	0	25	0	0	0	1	0	1	0	1	0	0	0	1	0
12:00:00	134	17	27	4	10	3	27	2	0	0	2	1	2	1	1	0	0	0	1	0
12:15:00	159	25	32	5	10	0	30	3	1	1	2	0	2	0	1	0	0	0	1	0
12:30:00	172	13	33	1	13	3	35	5	1	0	2	0	2	0	1	0	0	0	1	0
12:45:00	183	11	38	5	13	0	35	0	1	0	2	0	2	0	1	0	0	0	1	0
13:00:00	199	16	42	4	13	0	35	0	2	1	2	0	2	0	1	0	0	0	2	1
13:15:00	221	22	48	6	13	0	38	3	2	0	2	0	3	1	1	0	0	0	2	0
13:30:00	243	22	51	3	18	5	39	1	2	0	2	0	3	0	1	0	0	0	2	0
13:45:00	262	19	55	4	18	0	42	3	2	0	2	0	3	0	1	0	0	0	2	0
14:00:00	280	18	59	4	19	1	43	1	2	0	3	1	4	1	1	0	0	0	2	0
14:15:00	280	0	59	0	19	0	43	0	2	0	3	0	4	0	1	0	0	0	2	0
15:00:00	280	0	59	0	19	0	43	0	2	0	3	0	4	0	1	0	0	0	2	0
15:15:00	303	23	61	2	19	0	46	3	2	0	3	0	4	0	1	0	0	0	2	0
15:30:00	317	14	63	2	19	0	46	0	2	0	3	0	4	0	1	0	0	0	2	0
15:45:00	331	14	65	2	20	1	46	0	2	0	3	0	4	0	1	0	0	0	2	0
16:00:00	344	13	66	1	21	1	47	1	2	0	3	0	5	1	1	0	0	0	2	0
16:15:00	373	29	68	2	23	2	47	0	2	0	3	0	6	1	1	0	0	0	2	0
16:30:00	388	15	72	4	23	0	50	3	2	0	3	0	6	0	1	0	0	0	3	1
16:45:00	425	37	75	3	23	0	50	0	2	0	3	0	6	0	1	0	0	0	3	0
17:00:00	446	21	77	2	23	0	50	0	2	0	3	0	7	1	1	0	0	0	3	0
17:15:00	477	31	80	3	23	0	50	0	2	0	3	0	7	0	1	0	0	0	3	0
17:30:00	495	18	81	1	23	0	50	0	2	0	3	0	7	0	1	0	0	0	3	0
17:45:00	509	14	83	2	23	0	50	0	2	0	3	0	7	0	1	0	0	0	3	0
18:00:00	519	10	85	2	23	0	50	0	2	0	3	0	8	1	1	0	0	0	3	0
18:15:00	519	0	85	0	23	0	50	0	2	0	3	0	8	0	1	0	0	0	3	0
18:15:15	519	0	85	0	23	0	50	0	2	0	3	0	8	0	1	0	0	0	3	0

Appendix B: LOS Definition

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 Operations

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

2024 Existing Conditions

AM Peak

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	8	4	0	10	54	3	6	1	108	14	84
Future Volume (Veh/h)	56	8	4	0	10	54	3	6	1	108	14	84
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	72	10	5	0	13	69	4	8	1	138	18	108
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	440	365	72	374	418	8	126				9	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	440	365	72	374	418	8	126				9	
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.4	4.1				4.2	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.4	2.2				2.3	
p0 queue free %	83	98	99	100	97	93	100				91	
cM capacity (veh/h)	429	513	990	532	478	1037	1460				1579	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	87	82	13	264								
Volume Left	72	0	4	138								
Volume Right	5	69	1	108								
cSH	452	875	1460	1579								
Volume to Capacity	0.19	0.09	0.00	0.09								
Queue Length 95th (m)	5.3	2.4	0.1	2.2								
Control Delay (s)	14.8	9.5	2.3	4.3								
Lane LOS	B	A	A	A								
Approach Delay (s)	14.8	9.5	2.3	4.3								
Approach LOS	B	A										
Intersection Summary												
Average Delay				7.2								
Intersection Capacity Utilization				35.6%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

2024 Existing Conditions

PM Peak

















												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	107	11	2	0	25	124	7	26	1	49	13	64
Future Volume (Veh/h)	107	11	2	0	25	124	7	26	1	49	13	64
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	147	15	3	0	34	170	10	36	1	67	18	88
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	440	253	62	263	296	36	106			37		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	440	253	62	263	296	36	106			37		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.3		
p0 queue free %	63	98	100	100	94	84	99			96		
cM capacity (veh/h)	402	618	1003	649	584	1036	1485			1536		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	165	204	47	173								
Volume Left	147	0	10	67								
Volume Right	3	170	1	88								
cSH	420	918	1485	1536								
Volume to Capacity	0.39	0.22	0.01	0.04								
Queue Length 95th (m)	14.0	6.5	0.2	1.0								
Control Delay (s)	19.0	10.0	1.6	3.1								
Lane LOS	C	B	A	A								
Approach Delay (s)	19.0	10.0	1.6	3.1								
Approach LOS	C	B										
Intersection Summary												
Average Delay				9.8								
Intersection Capacity Utilization				38.7%	ICU Level of Service				A			
Analysis Period (min)				15								

Appendix D: Future Operations

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

2031 Total Conditions
AM Peak




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	69	9	5	0	11	62	3	7	1	124	16	103
Future Volume (Veh/h)	69	9	5	0	11	62	3	7	1	124	16	103
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	88	12	6	0	14	79	4	9	1	159	21	132
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	508	423	87	434	488	10	153				10	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508	423	87	434	488	10	153				10	
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.4	4.1				4.2	
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.4	2.2				2.3	
p0 queue free %	77	97	99	100	97	92	100				90	
cM capacity (veh/h)	376	469	971	477	430	1035	1428				1577	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	106	93	14	312								
Volume Left	88	0	4	159								
Volume Right	6	79	1	132								
cSH	399	854	1428	1577								
Volume to Capacity	0.27	0.11	0.00	0.10								
Queue Length 95th (m)	8.0	2.8	0.1	2.6								
Control Delay (s)	17.3	9.7	2.2	4.3								
Lane LOS	C	A	A	A								
Approach Delay (s)	17.3	9.7	2.2	4.3								
Approach LOS	C	A										
Intersection Summary												
Average Delay				7.8								
Intersection Capacity Utilization				38.6%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

7: Prospect Blvd & Access

2031 Total Conditions
AM Peak



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	83	111	7	5	0
Future Volume (Veh/h)	0	83	111	7	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	106	142	9	6	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	151				252	146
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	151				252	146
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1430				736	901
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	106	151	6			
Volume Left	0	0	6			
Volume Right	0	9	0			
cSH	1430	1700	736			
Volume to Capacity	0.00	0.09	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	9.9			
Lane LOS			A			
Approach Delay (s)	0.0	0.0	9.9			
Approach LOS			A			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			16.3%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

2031 Total Conditions

PM Peak

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	133	13	2	0	29	142	8	30	1	56	16	83
Future Volume (Veh/h)	133	13	2	0	29	142	8	30	1	56	16	83
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	182	18	3	0	40	195	11	41	1	77	22	114
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	512	297	79	308	354	42	136	42				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	512	297	79	308	354	42	136	42				
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1	4.2				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.3				
p0 queue free %	47	97	100	100	93	81	99	95				
cM capacity (veh/h)	342	579	981	599	539	1029	1448	1529				
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	203	235	53	213								
Volume Left	182	0	11	77								
Volume Right	3	195	1	114								
cSH	359	891	1448	1529								
Volume to Capacity	0.57	0.26	0.01	0.05								
Queue Length 95th (m)	25.4	8.1	0.2	1.2								
Control Delay (s)	27.3	10.5	1.6	3.0								
Lane LOS	D	B	A	A								
Approach Delay (s)	27.3	10.5	1.6	3.0								
Approach LOS	D	B										
Intersection Summary												
Average Delay			12.4									
Intersection Capacity Utilization			44.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: Prospect Blvd & Access

2031 Total Conditions

PM Peak



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	0	148	110	9	19	0
Future Volume (Veh/h)	0	148	110	9	19	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.73	0.73	0.73	0.73	0.73	0.73
Hourly flow rate (vph)	0	203	151	12	26	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	163				360	157
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	163				360	157
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1416				639	889
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	203	163	26			
Volume Left	0	0	26			
Volume Right	0	12	0			
cSH	1416	1700	639			
Volume to Capacity	0.00	0.10	0.04			
Queue Length 95th (m)	0.0	0.0	1.0			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization			17.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

2036 Total Traffic
AM Peak Hour

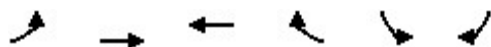
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	10	5	0	13	68	4	8	1	137	18	113
Future Volume (Veh/h)	76	10	5	0	13	68	4	8	1	137	18	113
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	97	13	6	0	17	87	5	10	1	176	23	145
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	564	468	96	480	540	10	168			11		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	564	468	96	480	540	10	168			11		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.4	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.4	2.2			2.3		
p0 queue free %	71	97	99	100	96	92	100			89		
cM capacity (veh/h)	336	436	961	439	397	1034	1410			1576		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	116	104	16	344								
Volume Left	97	0	5	176								
Volume Right	6	87	1	145								
cSH	358	819	1410	1576								
Volume to Capacity	0.32	0.13	0.00	0.11								
Queue Length 95th (m)	10.5	3.3	0.1	2.9								
Control Delay (s)	19.8	10.0	2.4	4.3								
Lane LOS	C	B	A	A								
Approach Delay (s)	19.8	10.0	2.4	4.3								
Approach LOS	C	B										
Intersection Summary												
Average Delay			8.4									
Intersection Capacity Utilization			40.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

2036 Total Traffic

AM Peak Hour

7: Prospect Blvd & Access



















Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↩	↩		↩	
Traffic Volume (veh/h)	0	91	123	7	5	0
Future Volume (Veh/h)	0	91	123	7	5	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	117	158	9	6	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	167				280	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	167				280	162
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	100
cM capacity (veh/h)	1411				710	882
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	117	167	6			
Volume Left	0	0	6			
Volume Right	0	9	0			
cSH	1411	1700	710			
Volume to Capacity	0.00	0.10	0.01			
Queue Length 95th (m)	0.0	0.0	0.2			
Control Delay (s)	0.0	0.0	10.1			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			16.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

3: King Street & Prospect Blvd

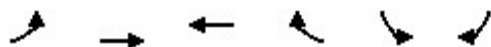
2036 Total Traffic
PM Peak Hour




												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	14	3	0	32	157	9	33	1	62	16	90
Future Volume (Veh/h)	146	14	3	0	32	157	9	33	1	62	16	90
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	187	18	4	0	41	201	12	42	1	79	21	115
Pedestrians												
Lane Width (m)												
Walking Speed (m/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (m)												
pX, platoon unblocked												
vC, conflicting volume	524	304	78	316	360	42	136			43		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	524	304	78	316	360	42	136			43		
tC, single (s)	7.3	6.5	6.2	7.1	6.5	6.4	4.1			4.2		
tC, 2 stage (s)												
tF (s)	3.6	4.0	3.3	3.5	4.0	3.4	2.2			2.3		
p0 queue free %	41	97	100	100	92	80	99			95		
cM capacity (veh/h)	317	573	982	591	533	992	1448			1534		
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	209	242	55	215								
Volume Left	187	0	12	79								
Volume Right	4	201	1	115								
cSH	334	866	1448	1534								
Volume to Capacity	0.63	0.28	0.01	0.05								
Queue Length 95th (m)	30.3	8.7	0.2	1.2								
Control Delay (s)	32.2	10.8	1.7	3.0								
Lane LOS	D	B	A	A								
Approach Delay (s)	32.2	10.8	1.7	3.0								
Approach LOS	D	B										
Intersection Summary												
Average Delay			14.0									
Intersection Capacity Utilization			46.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

7: Prospect Blvd & Access

2036 Total Traffic
PM Peak Hour



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	162	122	9	19	0
Future Volume (Veh/h)	0	162	122	9	19	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.78	0.78	0.78	0.78	0.78	0.78
Hourly flow rate (vph)	0	208	156	12	24	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume	168				370	162
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	168				370	162
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				96	100
cM capacity (veh/h)	1410				630	883
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	208	168	24			
Volume Left	0	0	24			
Volume Right	0	12	0			
cSH	1410	1700	630			
Volume to Capacity	0.00	0.10	0.04			
Queue Length 95th (m)	0.0	0.0	0.9			
Control Delay (s)	0.0	0.0	10.9			
Lane LOS			B			
Approach Delay (s)	0.0	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.7			
Intersection Capacity Utilization		18.5%		ICU Level of Service		A
Analysis Period (min)		15				