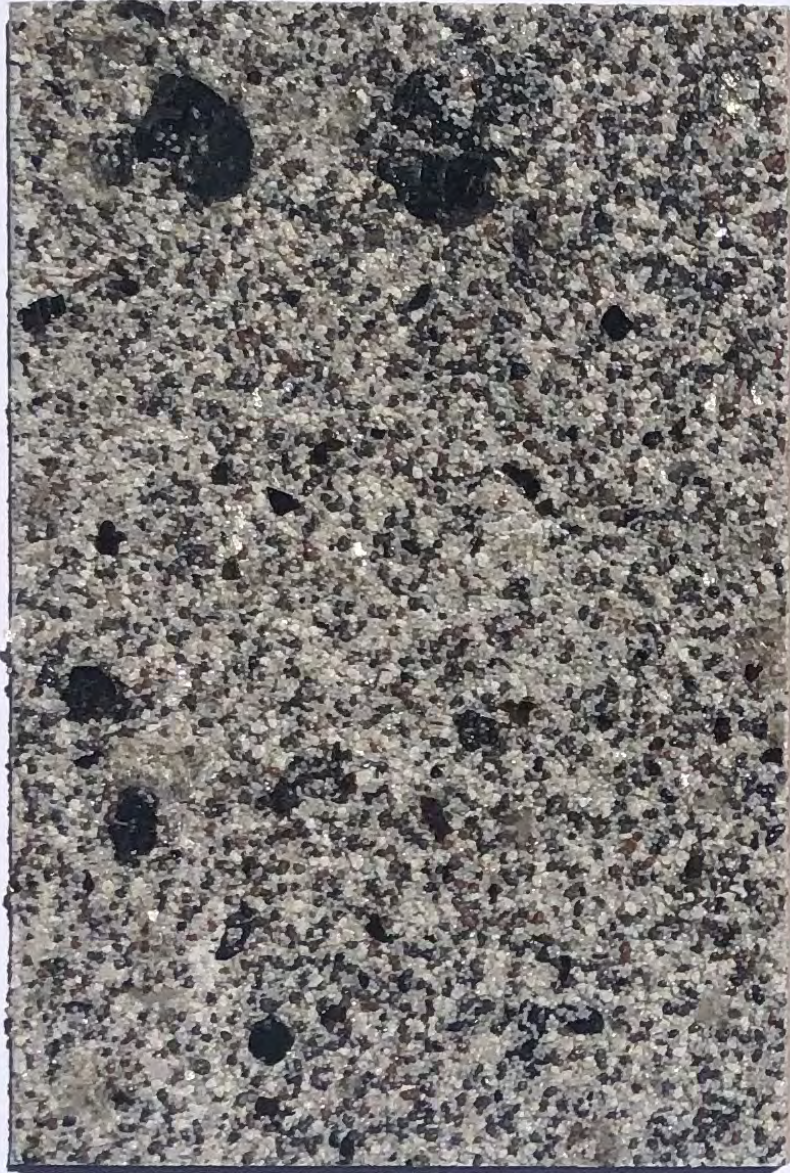




Archaeological Resources
Airport Vicinity Development Checklist
Parking Study
Trip Generation Comparison
Parking Master Plan



E01

PRODUCT: EIFS
MANUFACTURER: DRYVIT
FINISH: #200 GIBRALTAR TERRANEO



M01

PRODUCT: METAL PANEL
MANUFACTURER: PURE + FREEFORM
FINISH: #MK-019



M02

PRODUCT: METAL PANEL
MANUFACTURER: MORIN
FINISH: BONE WHITE

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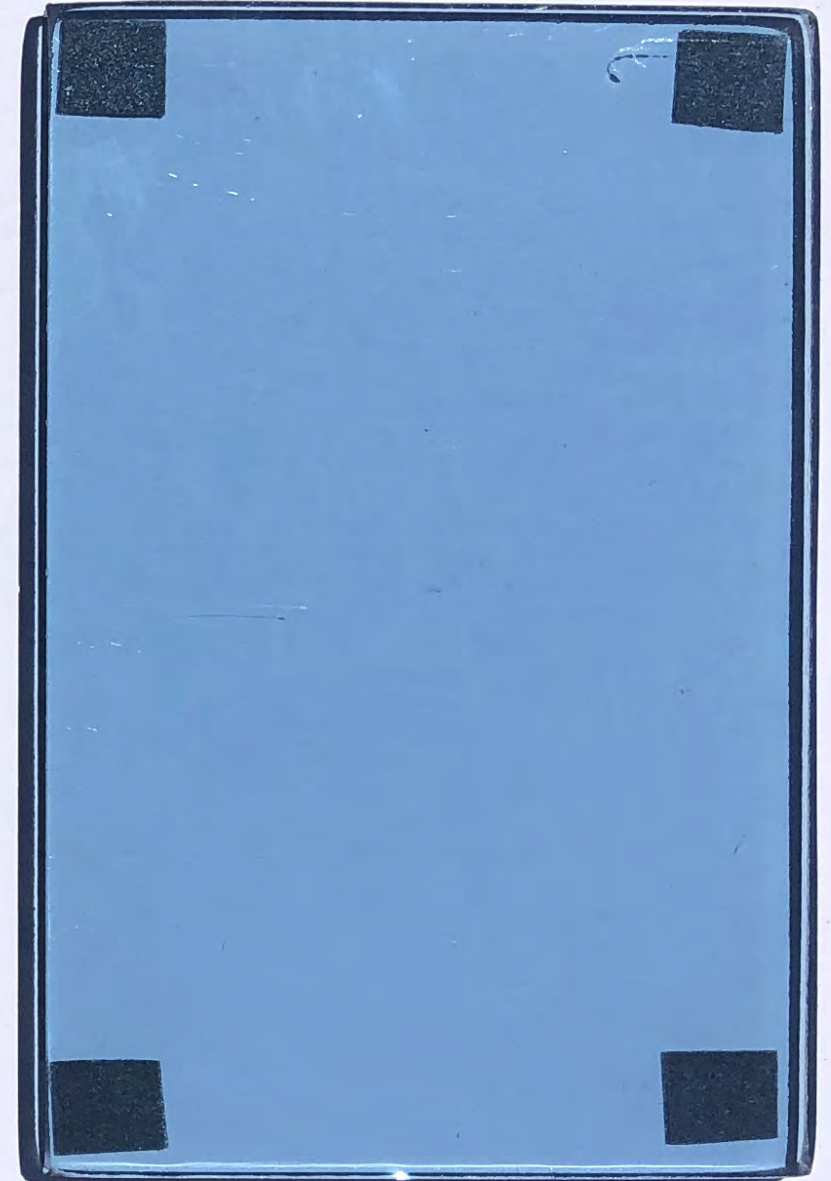
GL01

PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VE3-2M, 1" INSULATING
REFLECTIVITY: 6% EXTERIOR, 9% INTERIOR, 12% SOLAR



GL01S

PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH:VE3-2M, 1" INSULATING WITH V175 HIGH OPACITY
WHITE CERAMIC FRIT ON #4 SURFACE



GL02

PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VUE 1-40
REFLECTIVITY: 15% EXTERIOR & INTERIOR, 27% SOLAR



NORTHWEST VIEW



EXTERIOR MULLION
 MANUFACTURER: ARCADIA
 FINISH: AB-7 STD. DARK BRONZE



EXTERIOR MULLION
 MANUFACTURER: ARCADIA
 FINISH: #11/CLEAR AC-2



PT01
 PRODUCT: PAINT
 MANUFACTURER: SHERWIN WILLIAMS
 FINISH: SW 7069 IRON ORE



GL02S
 PRODUCT: GLASS SPANDREL
 MANUFACTURER: VIRACON
 FINISH: VUE1-40, 1" INSULATING, WITH V933 WARM GRAY #4



EXTERIOR ELEVATION - WEST

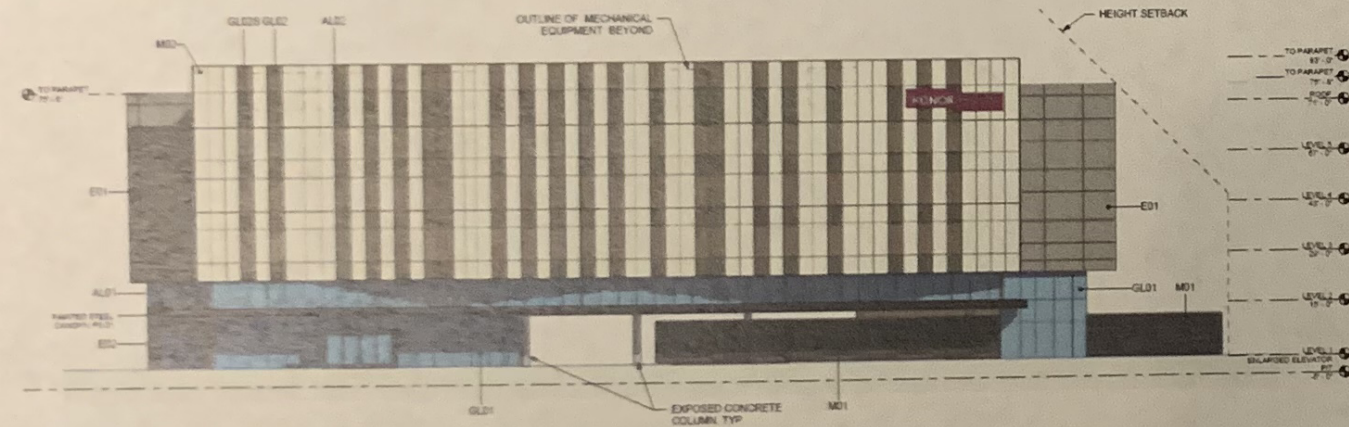
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 04.19.19

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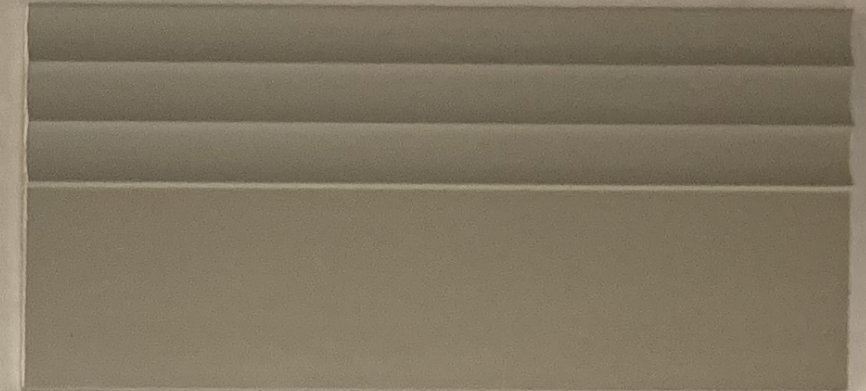
NORTHWEST VIEW



EXTERIOR ELEVATION - WEST



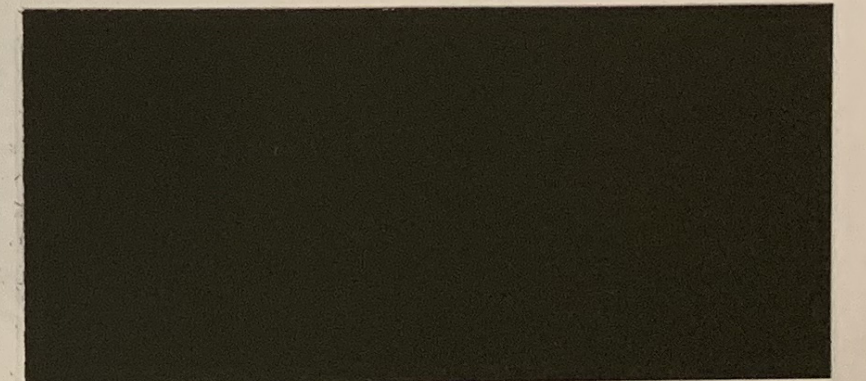
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MANUFACTURER: OLDCASTLE
FINISH: BLACK CANYON**



**AL01
PRODUCT: MULLION
MANUFACTURER: ARCADIA
FINISH: #11/CLEAR AC-2**



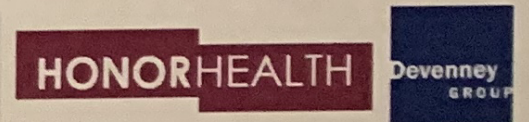
**AL02
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MANUFACTURER: ARCADIA
FINISH: AB-7 STD. DARK BRONZE**



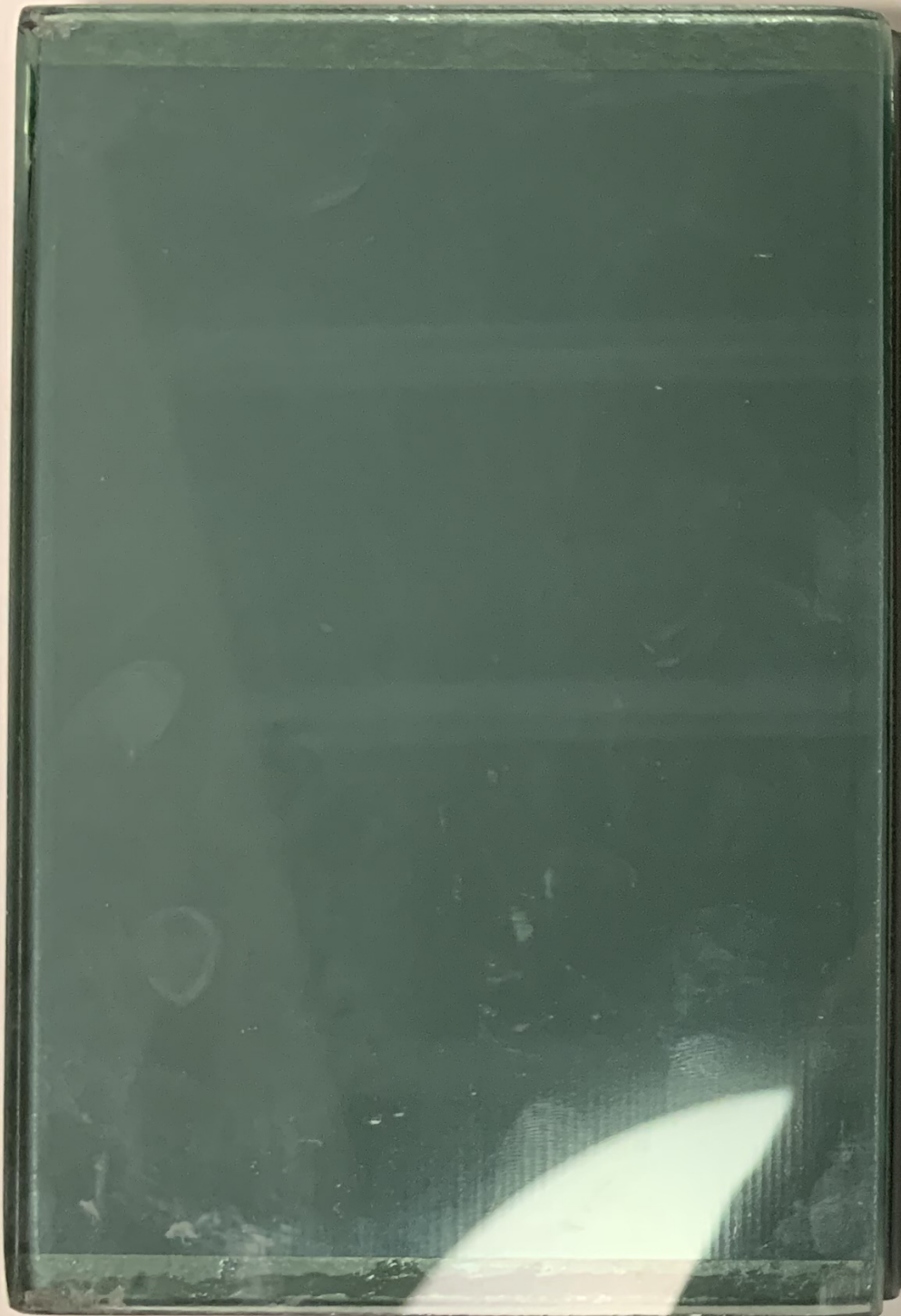
**PT01
PRODUCT: PAINT
MANUFACTURER: SHERWIN WILLIAMS
FINISH: SW 7069 IRON ORE**

HONORHEALTH OSBORN
7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
08.19.19

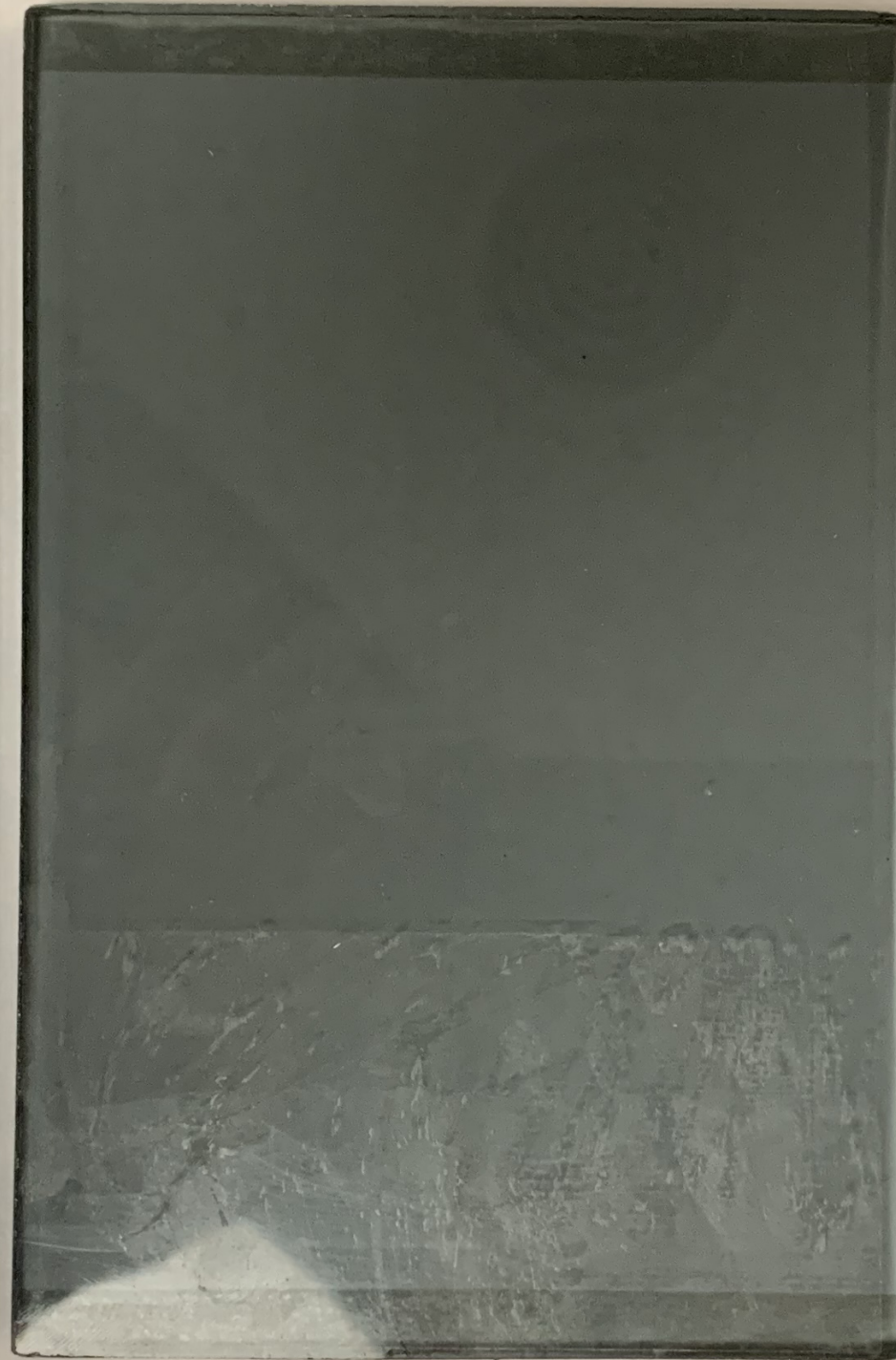
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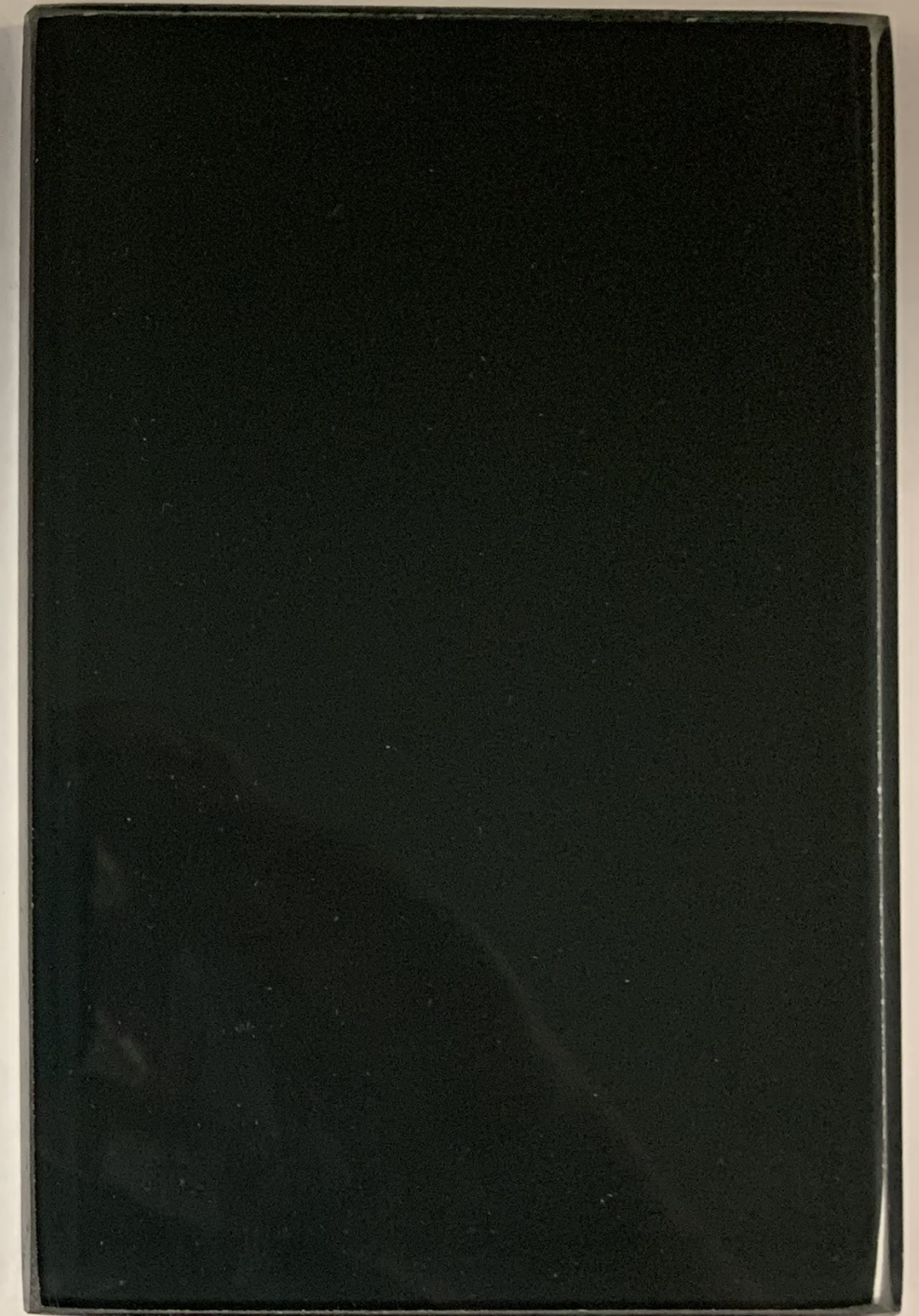
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GL01SA
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: VUE1-40, 1" INSULATING, WITH V948
 MEDIUM GREY FRIT ON #4 SURFACE



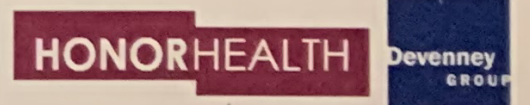
GL02
PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VRE4-54, 1" INSULATING
REFLECTIVITY: 14% EXTERIOR, 15 INTERIOR, 18% SOLAR



GL02S
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: 1/4" BRONZE MONOLITHIC HS, WITH V903
 SUBDUED GREY FRIT ON #2 SURFACE

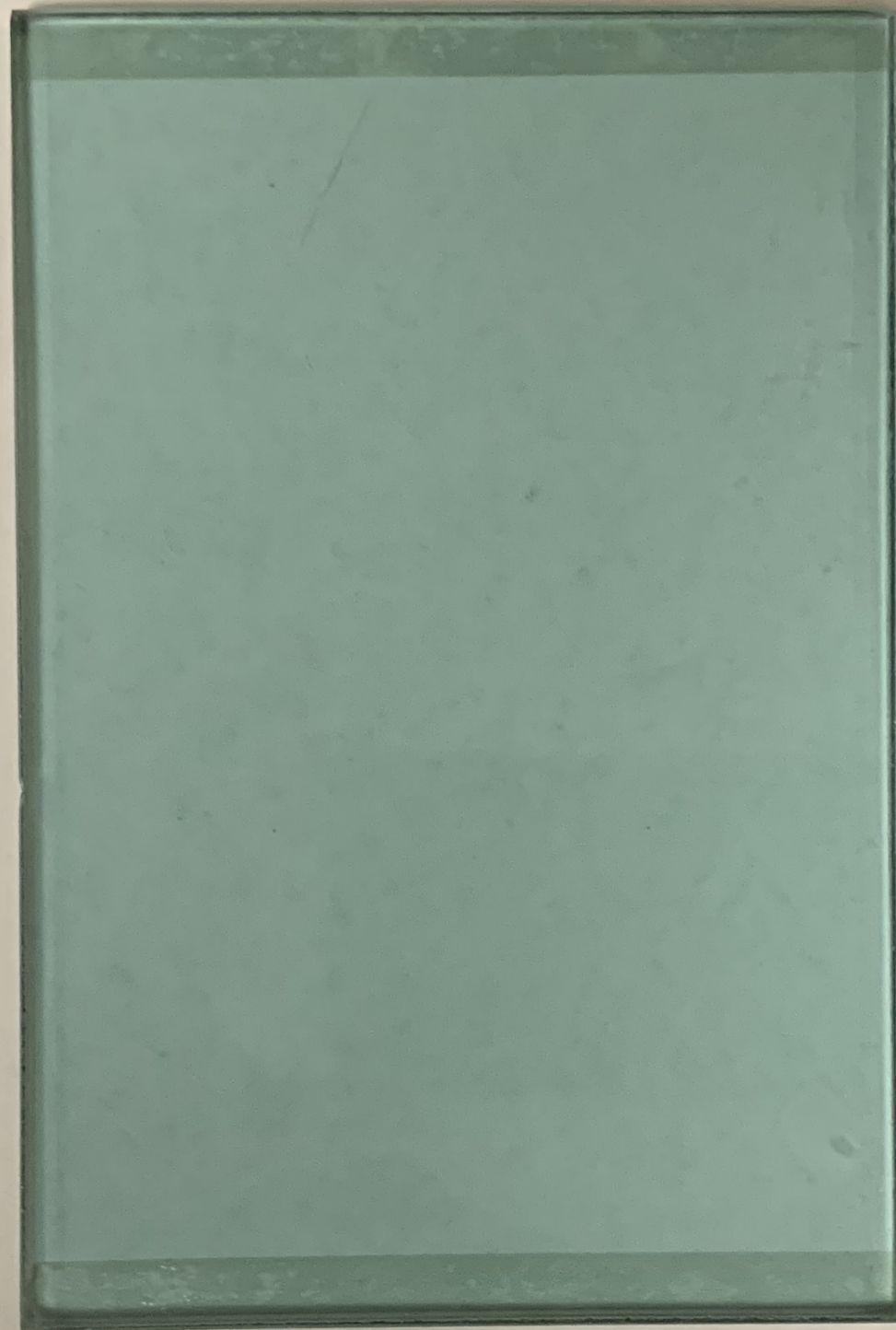
HONORHEALTH OSBORN
 7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
 08.19.19

NEUROSCIENCE INSTITUTE





M03
PRODUCT: METAL PANEL
MANUFACTURER: MORIN
FINISH: SANDSTONE



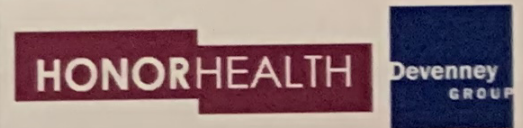
GL01
PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VUE1-40, 1" INSULATING
REFLECTIVITY: 15% EXTERIOR & INTERIOR, 27% SOLAR

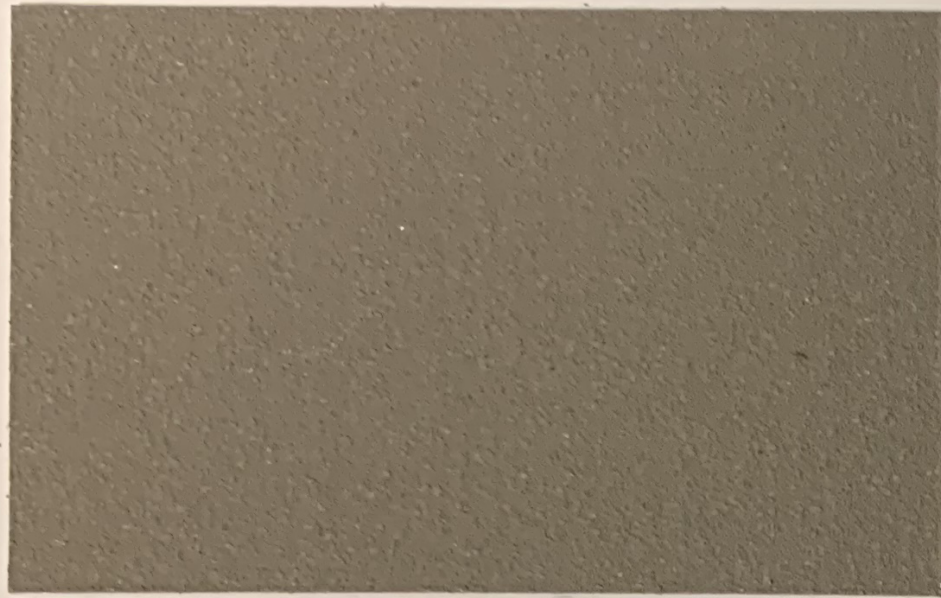


GL01S
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: 1/4" PACIFICA-27, WITH V948 MEDIUM GREY FRIT ON #2 SURFACE

HONORHEALTH OSBORN
 7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
 08.19.19

NEUROSCIENCE INSTITUTE





E01

PRODUCT: EIFS
MANUFACTURER: DRYVIT
FINISH: #616 KINGS GREY



M01

PRODUCT: METAL PANEL
MANUFACTURER: PURE + FREEFORM
FINISH: #MK-019 COSMOS



M02

PRODUCT: METAL PANEL
MANUFACTURER: REYNOBOND
FINISH: FRISCO WHITE



E02

PRODUCT: EIFS
MANUFACTURER: DRYVIT
FINISH: SW MANOR HOUSE

HONORHEALTH OSBORN
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08.19.19

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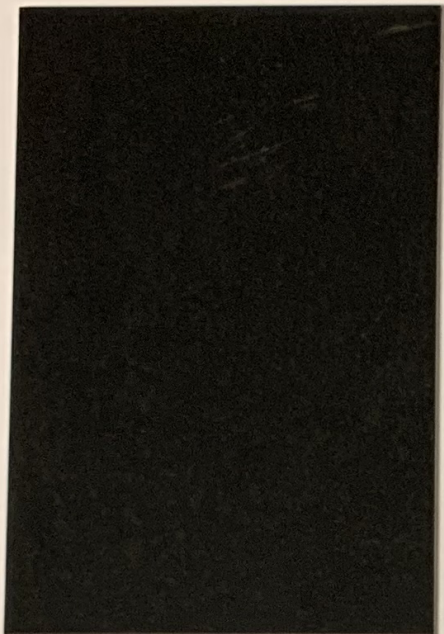
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E01
PRODUCT: EIFS
MANUFACTURER: DRYVIT
FINISH: #616 KINGS GREY



E02
PRODUCT: EIFS
MANUFACTURER: DRYVIT
FINISH: SW MANOR HOUSE



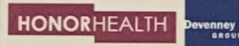
M01
PRODUCT: METAL PANEL
MANUFACTURER: PURE + FREEFORM
FINISH: #MK-019 COSMOS



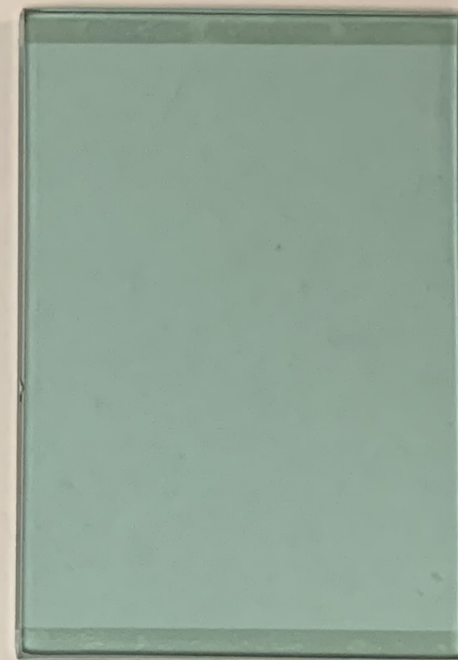
M02
PRODUCT: METAL PANEL
MANUFACTURER: REYNOBOND
FINISH: FRISCO WHITE

HONORHEALTH OSBORN
7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
08.19.19

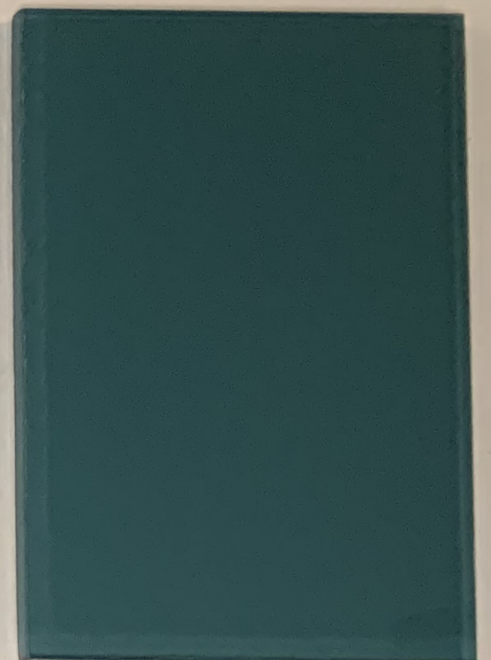
NEUROSCIENCE INSTITUTE



M03
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MANUFACTURER: MORIN
FINISH: SANDSTONE



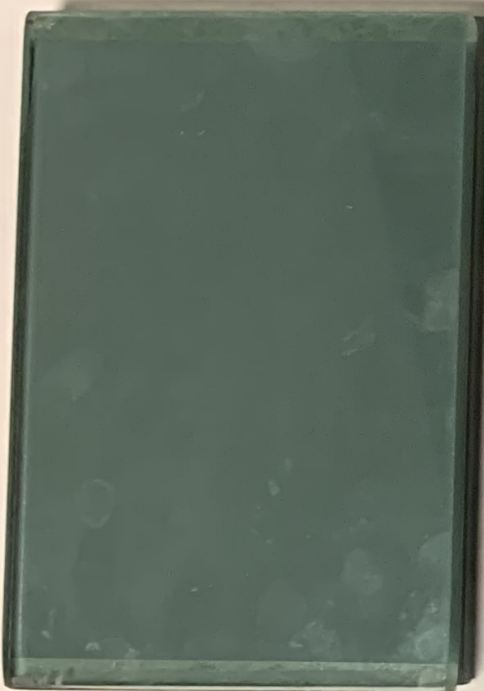
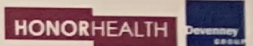
GL01
PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VUE1-40, 1" INSULATING
REFLECTIVITY: 15% EXTERIOR & INTERIOR, 27% SOLAR



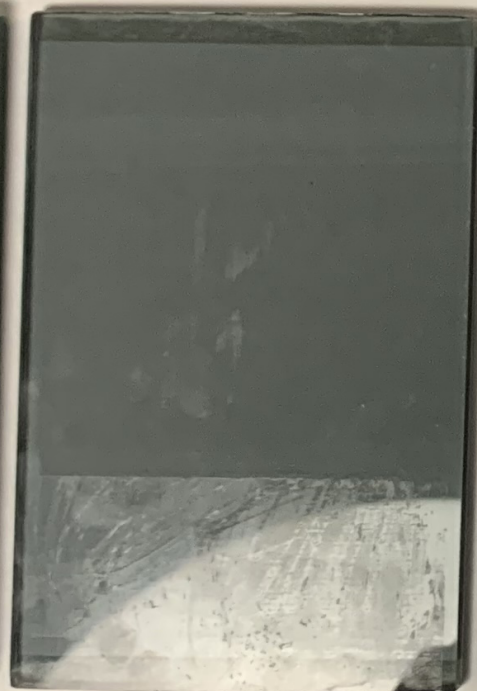
GL01S
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: 1/4" PACIFICA-27, WITH V948 MEDIUM
GREY FRIT ON #2 SURFACE

HONORHEALTH OSBORN
7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
08.19.19

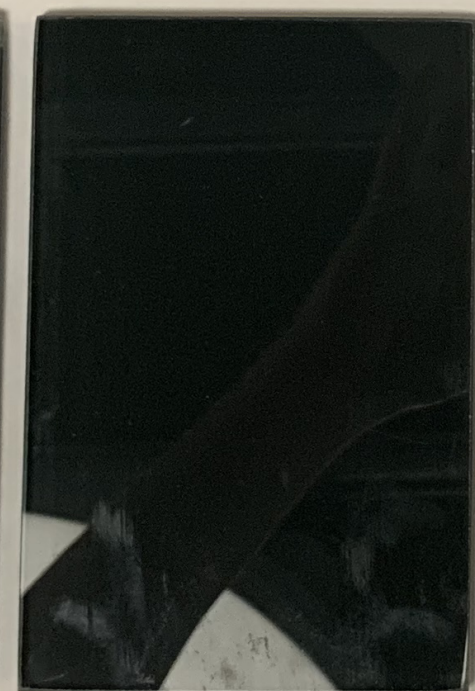
NEUROSCIENCE INSTITUTE



GL01SA
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: VUE1-40, 1" INSULATING, WITH V948
MEDIUM GREY FRIT ON #4 SURFACE



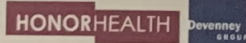
GL02
PRODUCT: GLASS
MANUFACTURER: VIRACON
FINISH: VRE4-54, 1" INSULATING
REFLECTIVITY: 14% EXTERIOR, 15% INTERIOR, 18% SOLAR



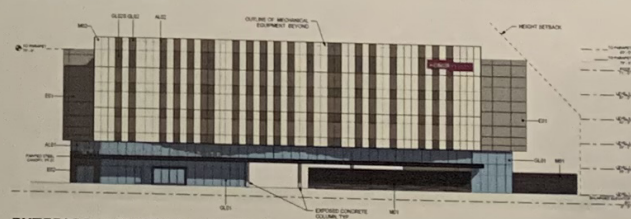
GL02S
PRODUCT: SPANDREL GLASS
MANUFACTURER: VIRACON
FINISH: 1/4" BRONZE MONOLITHIC HS, WITH V903
SUBDUED GREY FRIT ON #2 SURFACE

HONORHEALTH OSBORN
7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
08.19.19

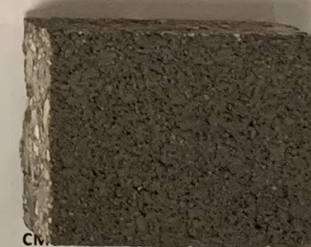
NEUROSCIENCE INSTITUTE



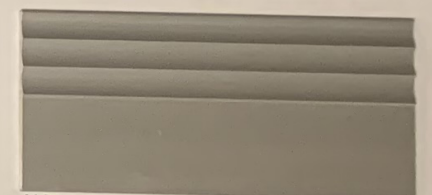
NORTHWEST VIEW



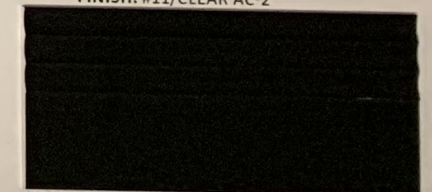
EXTERIOR ELEVATION - WEST



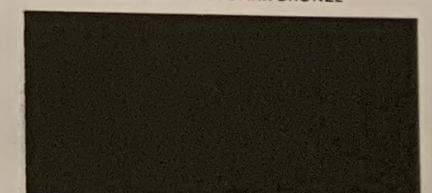
CM
PRODUCT: CMU
MANUFACTURER: OLDCASTLE
FINISH: BLACK CANYON



AL01
PRODUCT: MULLION
MANUFACTURER: ARCADIA
FINISH: #11/CLEAR AC-2



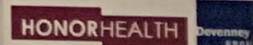
AL02
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MANUFACTURER: ARCADIA
FINISH: AB-7 STD. DARK BRONZE

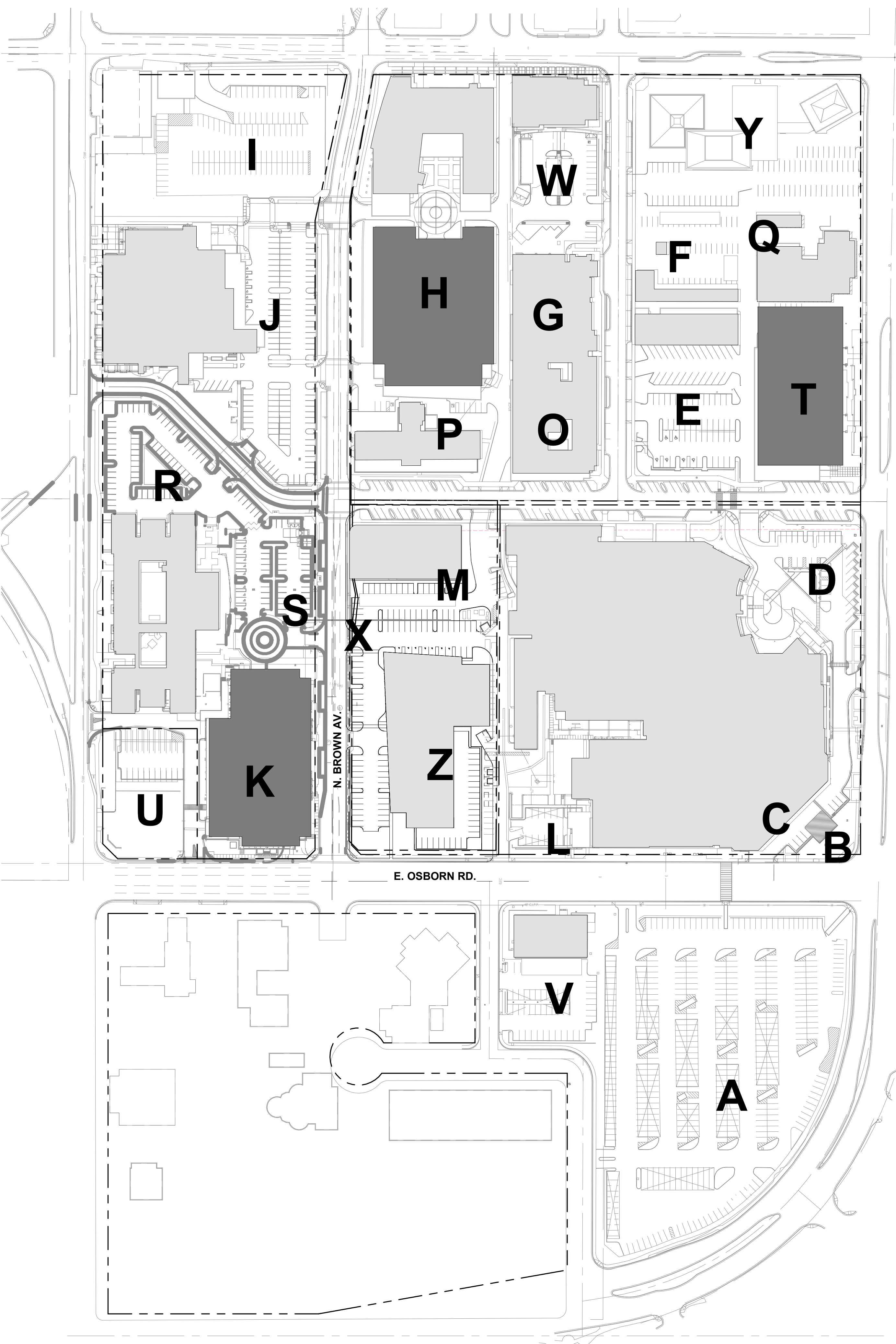


PT01
PRODUCT: PAINT
MANUFACTURER: SHERWIN WILLIAMS
FINISH: SW 7069 IRON ORE

HONORHEALTH OSBORN
7400 E. OSBORN RD., SCOTTSDALE, AZ 85251
08.19.19

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PARKING MASTER PLAN

BUILDING NUMBER	BUILDING	BUILDING TYPE	SQUARE FOOTAGE	NO. BEDS	CODE PARKING FACTOR	CODE PARKING REQUIREMENT	PARKING PROVIDED
A	SOUTH PARKING LOT						420
B	HOSPITAL - ED ONLY						80
C	HOSPITAL - ED DEPARTMENT - EMERGENCY ONLY						
D	HOSPITAL - LOT	Hospital	348,596	320	1 SP./BED	320	31
E	4TH ST/WELLS FARGO LOT	Medical Office/Outpatient	8,540		1 SP./250 SF	35	71
F	3634 Building/US WEST LOT	Medical Office/Outpatient	12,560		1 SP./250 SF	51	31
G	BIRTHING SUITES LOT	Hospital	34,800	17	1 SP./BED	17	12
H	TCMP PARKING STRUCTURE	Medical Office/Outpatient	61,200		1 SP./250 SF	245	347
I	BROWN AVE. AND SECOND ST LOT						102
J	GREENBAUM SURGERY CENTER	Medical Office/Outpatient	63,600	26	1 SP./BED	26	119
K	SCOTTSDALE MEDICAL CENTER GARAGE						402
L	RADIOLOGY LOT						12
M	7301 BUILDING	Medical Office/Outpatient	11,576		1 SP./BED	47	0
N	4TH AND WELLS FARGO STREETS						84
O	WELLS FARGO BUILDING	Medical Office/Outpatient	22,400		1 SP./250 SF	90	10
P	7300 BUILDING	Medical Office/Outpatient	26,100		1 SP./250 SF	105	12
Q	3634 CIVIC CENTER BUILDING	Medical Office/Outpatient	12,560		1 SP./250 SF	51	20
R	HONORHEALTH CENTER						68
S	HONORHEALTH CENTER	Medical Office/Outpatient	90,300		1 SP./250 SF	362	45
T	PATIENT/VISITOR GARAGE						388
U	VACANT LOT						25
V	7351 E OSBORN RD BUILDING	Medical Office/Outpatient	13,800		1 SP./250 SF	56	54
W	RADIATION ONCOLOGY	Medical Office/Outpatient	5,800		1 SP./250 SF	24	30
X	BROWN AVE. (PUBLIC)						0
Y	NORTH WELLS FARGO AVE						63
Z	NEUROSCIENCE INSTITUTE	Medical Office/Outpatient	116,000		1 SP./250 SF	464	160
TOTAL (SPACES):						1893	2586



Devenney Group Ltd., Architects
 201 W. Indian School Road
 Phoenix, Arizona 85013
 T: 602.943.8950
 F: 602.943.7645
 www.devenneygroup.com

Consultant:

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**NEUROSCIENCE
INSTITUTE**

HONORHEALTH

 7242 E OSBORN RD,
 SCOTTSDALE, AZ 85251

AUTHORITY HAVING JURISDICTION:
CITY OF SCOTTSDALE

AUTHORITY HAVING JURISDICTION'S PROJECT NO.:

FACILITY NUMBER:

AGENCY APPROVALS:

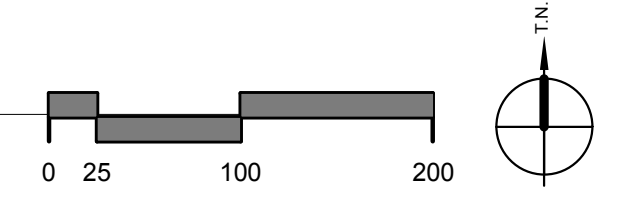
REVISIONS		
REV #	DESCRIPTION	DATE

DATE: 04/18/2019
 SCALE: 1" = 100'-0"
 DRAWN: Author
 REVIEWED: Checker
 JOB NUMBER:

PARKING MASTER PLAN

DRB_34

1 Parking Diagram
 1" = 100'-0"



BIM 360/OSBORN NSI/HO-NSI-AR-CS.MXD 4/19/2019 1:32:23 PM



Honor Health Medical Center Expansion

Traffic Impact and Mitigation Analysis

7400 East Osborn Road
Scottsdale, Arizona

August 2019
Project No. 19-0520

Prepared For:
Devenney Group Ltd., Architects
201 W. Indian School Rd.
Phoenix, Arizona 85013



For Submittal to:
City of Scottsdale

Prepared By:



10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
480-659-4250

HONOR HEALTH MEDICAL CENTER EXPANSION TRAFFIC IMPACT AND MITIGATION ANALYSIS

**7400 East Osborn Road
Scottsdale, Arizona**

Prepared for:
Devenney Group Ltd., Architects
201 W Indian School Road
Phoenix, Arizona 85013

For Submittal to:
City of Scottsdale

Prepared By:



CivTech Inc.

10605 North Hayden Road
Suite 140
Scottsdale, Arizona 85260
Office: (480) 659-4250
Fax: (480) 659-0566



August 2019

CivTech Project No. 19-0520

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EXECUTIVE SUMMARY

Honor Health Scottsdale is an existing medical office park located near Scottsdale Road and Osborn Road. This proposed expansion will include a single medical office building to be located on an existing parking lot. The proposed medical office building will be approximately 117,000 square feet (SF) and located on the northeast corner of Brown Avenue and Osborn Road. Two of the existing access points, the southernmost access on Brown Avenue and the eastern access on Osborn Road, to this current parking lot will be removed upon buildout of the new medical building.

The following conclusions have been documented in this study:

- The results of the existing conditions analysis indicates that all study intersections operate with overall acceptable levels of service (LOS D or better). One intersection has an approach operating below acceptable thresholds.
 - The intersection of **Miller Road and Osborn Road** currently experiences delay on the eastbound approach during the PM peak hour only. The delay is due to the high number of eastbound left turning vehicles and no dedicated eastbound left turn phase. However, the threshold for an acceptable level of service is 55 seconds of delay per vehicle and the eastbound approach of this intersection experiences approximately 59.2 seconds of delay per vehicle. Since the delay is only slightly higher than the threshold for an acceptable level of service, no mitigation is recommended at this time.
- The proposed development is estimated to generate approximately 4,370 external weekday daily trips with 255 trips occurring during the AM peak hour (199 in/56 out), and 395 trips occurring during the PM peak hour (111 in/284 out).
- The results of the opening year 2020 Synchro analysis indicate that all intersections within the study area are expected to operate with overall acceptable levels of service LOS D or better. The following intersection is expected to have one or approach operating at LOS E.
 - The signalized intersection of **Miller Road and Osborn Road** is expected to experience delay on the eastbound approach during the PM peak hour only with or without the addition of site traffic. In order to mitigate this delay, it is recommended that the eastbound/westbound phase be extended from 40 seconds to 43 seconds in order to decrease the delay from 70.1 seconds per vehicle to 54.2 seconds per vehicle.
- The recommended storage lengths are provided for study horizon year 2020 using the total traffic projections and can be found in **Table 7**.
- The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right turning movements from the development. Fixed objects within the safety triangle cannot be taller than 2.5-feet measured from the adjacent roadway surface (edge of pavement); vegetation should be trimmed to 2.5-feet tall measured from the adjacent roadway surface. Trees placed within the sight triangle shall have canopies no lower than eight (8) feet. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*.

INTRODUCTION

The Honor Health expansion includes a proposed five-story, 117,000 square foot (SF) medical office building at 7400 E Osborn Road in the City of Scottsdale, Arizona. The project will redevelop an existing parking lot that currently services the surrounding Honor Health medical buildings. The project is expected to be constructed in a single phase with an opening year of 2020. The vicinity of the site is shown in **Figure 1**.

STUDY REQUIREMENTS

This study analyzes the traffic impact due to the proposed medical office building on the surrounding street network. The study has been prepared in conformance with the City of Scottsdale *Design Standards and Policies Manual*, Chapter 5, Transportation Impact Studies, 2018. The specific objectives of the study are:

- To determine the existing site generated trips through trip generation rate calculations.
- To determine whether the planned street system in the vicinity of the site is adequate to accommodate the increased traffic that results from the proposed development.
- To determine if existing crash data suggests improvements require to increase safety.
- To recommend additional street improvements or traffic control devices, where necessary, to mitigate the additional site-generated traffic.

STUDY AREA

The study area has been defined as including the following intersections:

- Brown Avenue & 4th Street
- Existing Driveway & 4th Street
- Drinkwater Boulevard & 4th Street
- Scottsdale Road & Osborn Road
- Brown Avenue & Osborn Road
- Drinkwater Boulevard & Osborn Road
- Miller Road & Osborn Road
- Hayden Road & Osborn Road
- 74th Street & Drinkwater Boulevard

HORIZON YEARS

This study has been conducted to conform to the *Design Standards and Policies Manual (DS&PM), Chapter 5, Transportation Impact Studies*, prepared by the City of Scottsdale in 2018. For a Category 2 TIMA, the existing year and the opening year will be analyzed. The existing year is 2019 and the opening horizon year for this development will be 2020.

The study intersections and the site accesses will be analyzed for AM and PM peak hours to determine the recommended intersection lane configuration, intersection stop control, turn lane storage requirements, and roadway typical sections for the development.

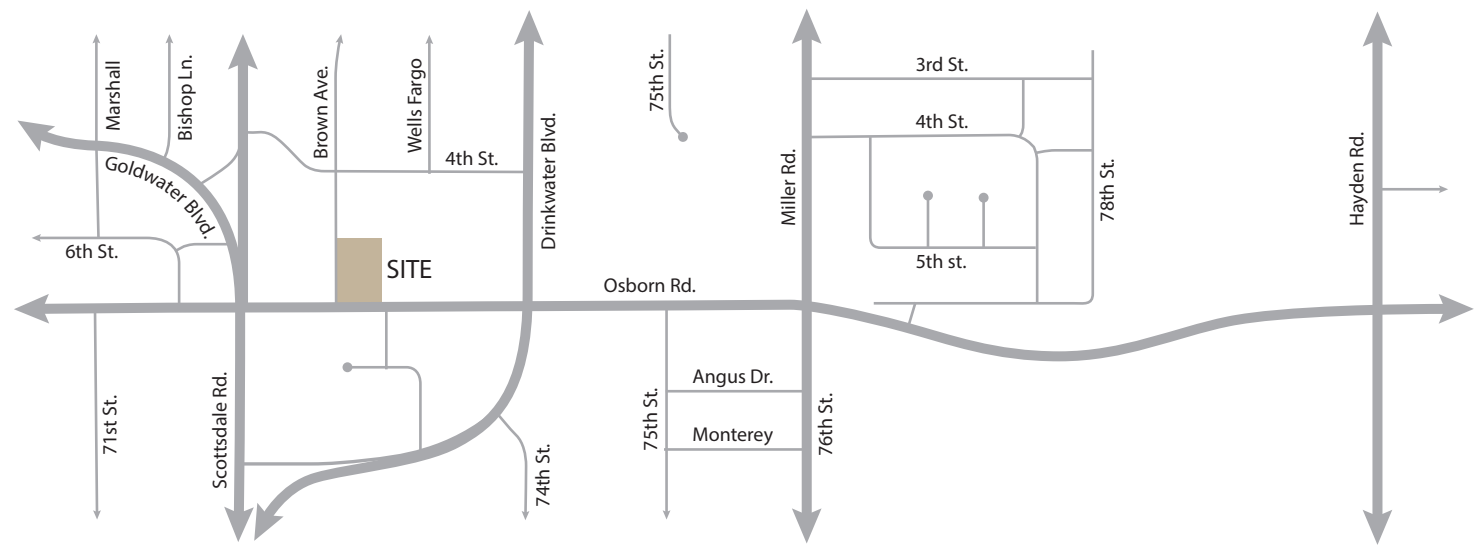
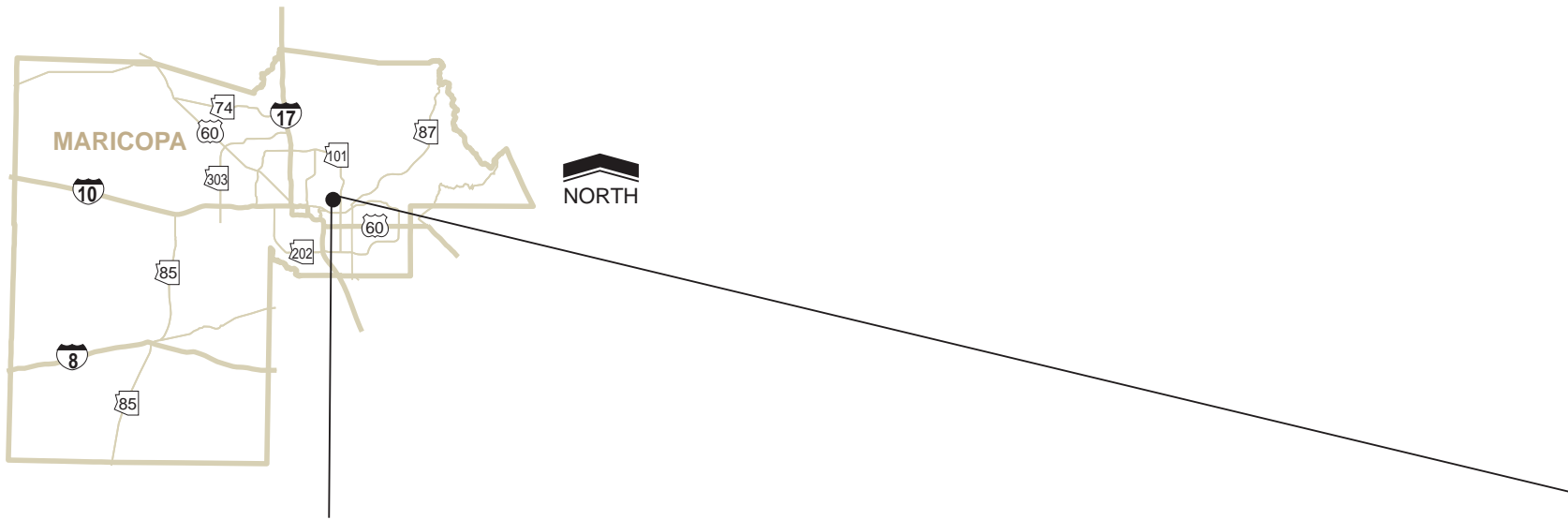


Figure 1: Vicinity Map

EXISTING CONDITIONS

EXISTING LAND USE

The site of the proposed Honor Health expansion is currently a parking lot servicing the surrounding Honor Health medical buildings.

SURROUNDING LAND USE

Surrounding the site on the north, east and west sides are existing medical buildings. South of the site, south of Osborn Road, is a BBVA Compass Bank and some additional medical buildings. East of the medical offices is the Scottsdale Stadium, home to the San Francisco Giants spring training games.

EXISTING ROADWAY NETWORK

The existing roadway network within the study area includes the following:

Scottsdale Road is a north-south, six-lane major arterial north of Camelback Road with three lanes in each direction and raised medians. South of Camelback Road and north of Stetson Drive/Drinkwater Boulevard, there are two southbound through lanes and three northbound through lanes with raised medians. South of Stetson Drive/Goldwater Boulevard and north of Goldwater Boulevard, Scottsdale Road has two lanes in each direction with raised medians. Where Goldwater Boulevard and Scottsdale Road merge north of Osborn Road, Scottsdale Road has three southbound through lanes and two northbound through lanes with a raised median. This stays consistent south of Osborn Road. Scottsdale Road begins to the north at Carefree Highway (SR 74) and Tom Darlington Drive continuing south to the Red Mountain Freeway (Loop 202). South of the Loop 202 Scottsdale Road becomes Rural Road. Within the vicinity of the study area Scottsdale Road provides access to all major east-west arterials. The posted speed limit on Scottsdale Road south of the site is 40 miles per hour (mph). The posted speed limit within the vicinity of the site is 25 mph. The proposed site is located in Old Town Scottsdale, which is a very popular tourism destination, meaning that the speed limit is slower than on a typical section of road.

Osborn Road is an east-west five-lane road classified as a major collector by the City of Scottsdale within the vicinity of the site. There are two lanes in each traveling direction and a continuous two-way-left-turn lane (TWLTL) along the stretch of road within the vicinity of the site. This segment of Osborn Road begins at the intersection with 64th Street and continues east until transitioning into 87th Place just east of 87th Street. The posted speed limit is 35 mph.

Drinkwater Boulevard is a north-south five-lane major arterial road within the vicinity of the site. There are three lanes in the northbound direction, two lanes in the southbound direction and raised medians along portions of the road. The road begins at the intersection with Scottsdale Road, just south of the intersection of Scottsdale Road and Camelback Road, diverging east off of Scottsdale Road. Drinkwater Boulevard rejoins Scottsdale Road at the intersection with Earll Drive, just south of the intersection of Scottsdale Road and Osborn Road. The road provides access to major and minor arterial roads west of the site and also provides direct access to major landmarks in Scottsdale such as the Scottsdale Stadium and the Civic Center. The posted speed limit is 35 mph.

Miller Road is a north-south three-lane major collector within the vicinity of the site. There is one lane and a bicycle lane in each traveling direction, separated by a center TWLTL. Miller Road begins to the north, just north of Chaparral Road and continues south until transitioning into Playa Del North Drive just south of the Loop 202, Red Mountain Freeway portion. The posted speed limit is 35 mph.

Hayden Road is a north-south seven-lane major arterial roadway within the vicinity of the site. North of Thomas Road and south of Indian School Road, there are three lanes in each direction of travel separated by a TWLTL. South of Thomas Road and north of Indian School Road, the TWLTL transitions into a raised median. Hayden Road begins as McClintock Drive in the City of Tempe, south of McKellips Road, and continues north until terminating at the intersection with Frank Lloyd Wright Boulevard. The posted speed limit is 45 mph.

Brown Avenue is a north-south local roadway bordering the site to the west. There is one lane in each direction of travel. Brown Avenue begins at the intersection with Osborn Road and continues north until terminating at the intersection with Indian School Road. The posted speed limit is 25 mph.

4th Street is an east-west local roadway bordering the site to the north. There is one lane in each direction of travel and some on-street parking east of Brown Avenue. 4th Street begins at the intersection with Scottsdale Road and continues east until terminating at the intersection with Drinkwater Boulevard. The posted speed limit is 25 mph.

74th Street is a north-south local roadway with one lane in each direction of travel separated by a TWLTL. There is on-street parking along the entire length of road south of the curve, which connects 74th Street to Drinkwater Boulevard. 74th Street begins at the intersection with Drinkwater Boulevard and continues south until terminating at the intersection with Thomas Road. The posted speed limit is 30 mph.

EXISTING INTERSECTION CONFIGURATION

The intersection of **Brown Avenue and 4th Street** is a four-legged unsignalized intersection within the vicinity of the site with stop signs on all approaches of the intersection. All approaches consist of a single shared left-turn/through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Existing Driveway and 4th Street** is a four-legged unsignalized intersection within the vicinity of the site. The northbound and southbound approaches are both existing driveways and controlled by stop signs. The eastbound and westbound approaches are free flowing. All approaches consist of a single shared left-turn/through/right-turn lane. There are pedestrian crosswalks on all legs of the intersection.

The intersection of **Drinkwater Boulevard & 4th Street** is a three-legged unsignalized intersection with stop sign control on the eastbound approach. The northbound approach consists of one (1) dedicated left-turn lane and three (3) through lanes. The southbound approach consists of one (1) through lane and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) shared left-turn/right-turn lane. There is a pedestrian cross walk across the west leg of the intersection only.

The intersection of **Scottsdale Road and Osborn Road** is a four-legged signalized intersection with permissive-protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The southbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Brown Avenue and Osborn Road** is a four-legged unsignalized intersection within the vicinity of the site with stop signs on the northbound and southbound approaches. The northbound approach is a driveway for the BBVA Compass Bank and consists of one (1) shared left-turn/through/right-turn lane. The eastbound and westbound approaches each consist of one (1) dedicated left-turn lane, provided from the center TWLTL, one (1) through lane and one (1) shared through/right-turn lane. The southbound approach consists of a shared left-turn/through lane and one (1) dedicated right turn lane. There are pedestrian crosswalks across the north and south legs of the intersection.

The intersection of **Drinkwater Boulevard and Osborn Road** is a four-legged signalized intersection with permissive phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The southbound, eastbound, and westbound approaches each consist of one (1) dedicated left turn lane, one (1) through lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Miller Road and Osborn Road** is a four-legged signalized intersection with permissive phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) shared through/right-turn lane and a bicycle lane. The eastbound and westbound approaches each consist of one (1) dedicated left-turn lane, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. The southbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Hayden Road and Osborn Road** is a four-legged signalized intersection with permissive-protected phasing on the northbound and southbound approaches and permissive phasing on the eastbound and westbound approaches. The northbound and southbound approaches each consist of one (1) dedicated left-turn lane, two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) dedicated right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) shared through/right-turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Drinkwater Boulevard and 74th Street** is a three-legged unsignalized intersection with a stop sign control on the westbound approach. Drinkwater Boulevard will be considered the north-south street for this intersection. The northbound approach consists of two (2) through lanes and one (1) shared through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane and one (1) dedicated right-turn lane. The southbound approach consists

of one (1) dedicated left-turn lane and two (2) through lanes. There is a pedestrian crosswalk across the east leg of the intersection.

The intersection of **Brown Avenue and North Driveway** is a four-legged unsignalized intersection with stop sign controls on the eastbound and westbound approaches. All approaches consist of one shared left-turn/through/right-turn lane. The eastbound approach is a driveway into the public parking structure located west of the site and the westbound approach is one of the existing driveways to the parking lot currently occupying the site.

The intersection of **Brown Avenue and South Driveway** is a three-legged unsignalized intersection with stop sign control on the westbound approach. The northbound approach consists of one shared through/right-turn lane. The westbound approach consists of one shared left-turn/right-turn lane and is an existing driveway for the parking lot currently occupying the site. The southbound approach consists of one shared left-turn/through lanes.

The existing intersection lane configurations and traffic control is illustrated in **Figure 2**.

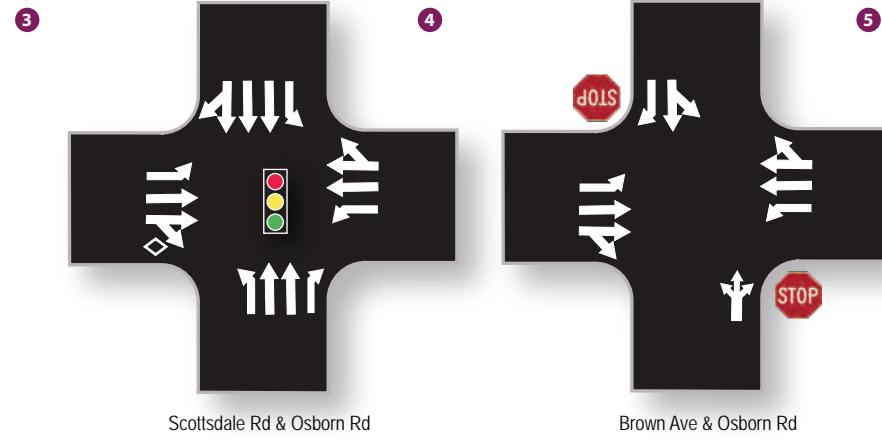
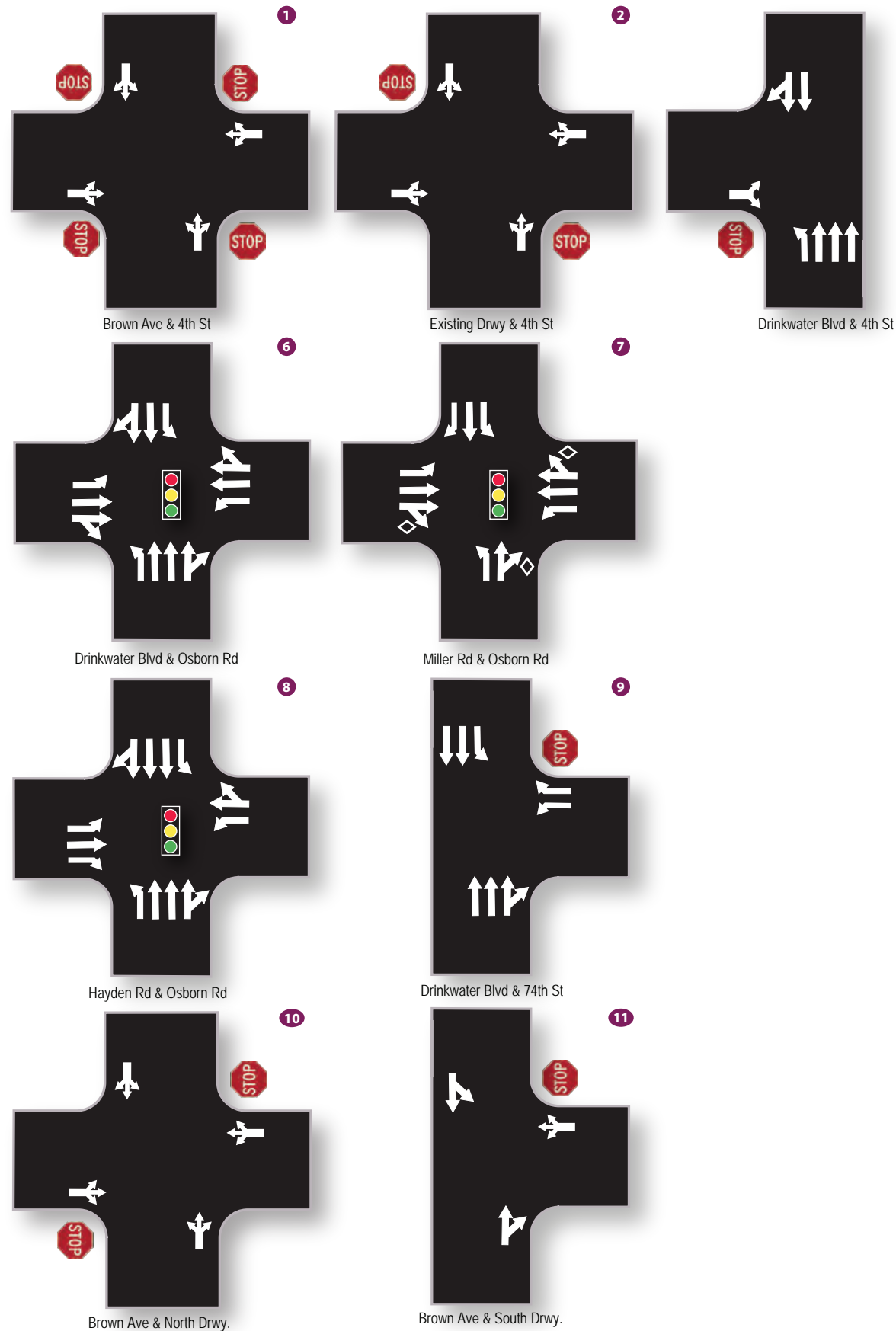
EXISTING TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at seven (7) study intersections within the project vicinity. Peak hour volume turning movement counts were performed from 7:00-9:00 AM and 4:00-6:00 PM on Tuesday, March 28, 2019. Peak hour turning movement counts were conducted at the following study intersections:

- Brown Avenue & 4th Street
- Existing Driveway & 4th Street
- Drinkwater Boulevard & 4th Street
- Scottsdale Road & Osborn Road
- Brown Avenue & Osborn Road
- Drinkwater Boulevard & Osborn Road
- Miller Road & Osborn Road
- Hayden Road & Osborn Road
- 74th Street & Drinkwater Boulevard

The City of Scottsdale recommends a seasonal adjustment factor based on the month the counts were taken in order to get a more accurate representation of traffic in the area. There are a high number of seasonal visitors during winter and spring months, so they recommend a reduction in the number of existing vehicles to obtain a more accurate representation of typical traffic. In order to remain conservative, a reduction in traffic will not be taken for this area and the existing traffic counts will be kept as is. Additionally there are two existing driveways on Brown Avenue that will remain open upon buildout of this site, both of which did not have traffic counts recorded.

The existing traffic volumes for this study are presented in **Figure 3** for the weekday AM and PM peak hours. Traffic volume data obtained for this study have been included in **Appendix B**.



LEGEND

	Thru or Turning Movement		Traffic Signal		NORTH
	Two-Way Left Turn-Lane		Stop Sign		
	Roundabout		Speed Limit		
	Bike Lane				
	Raised Median				

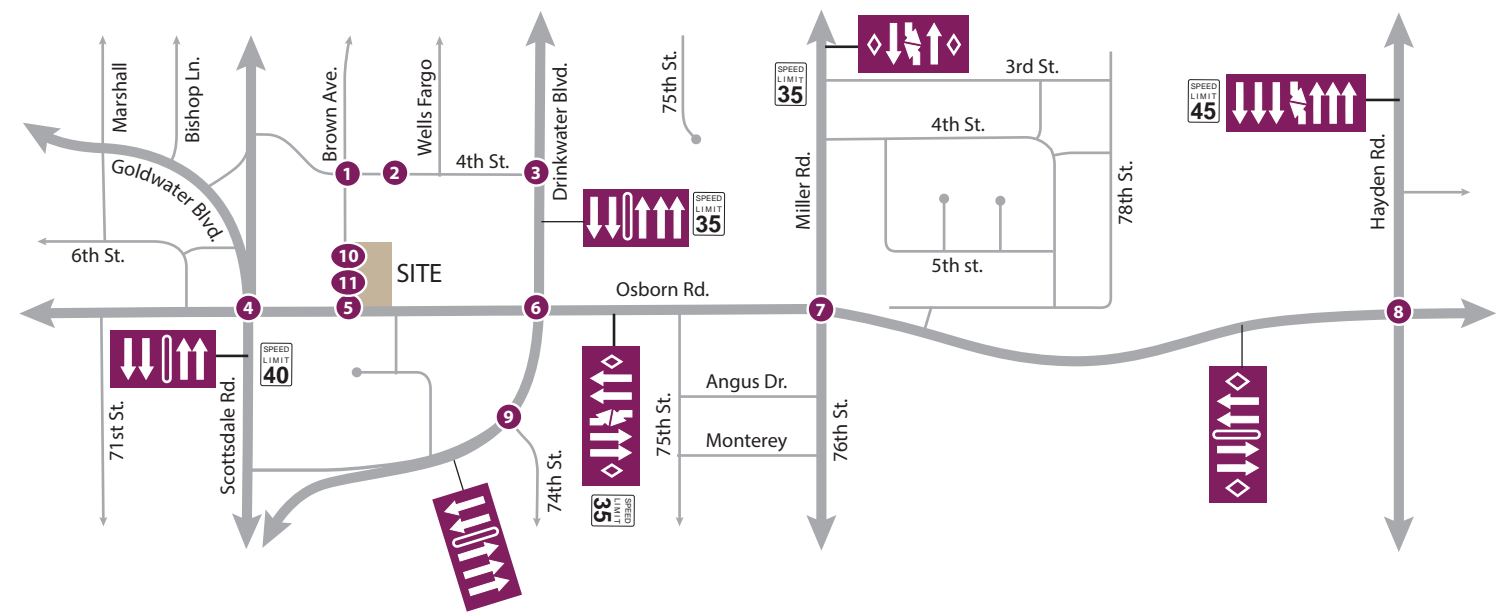
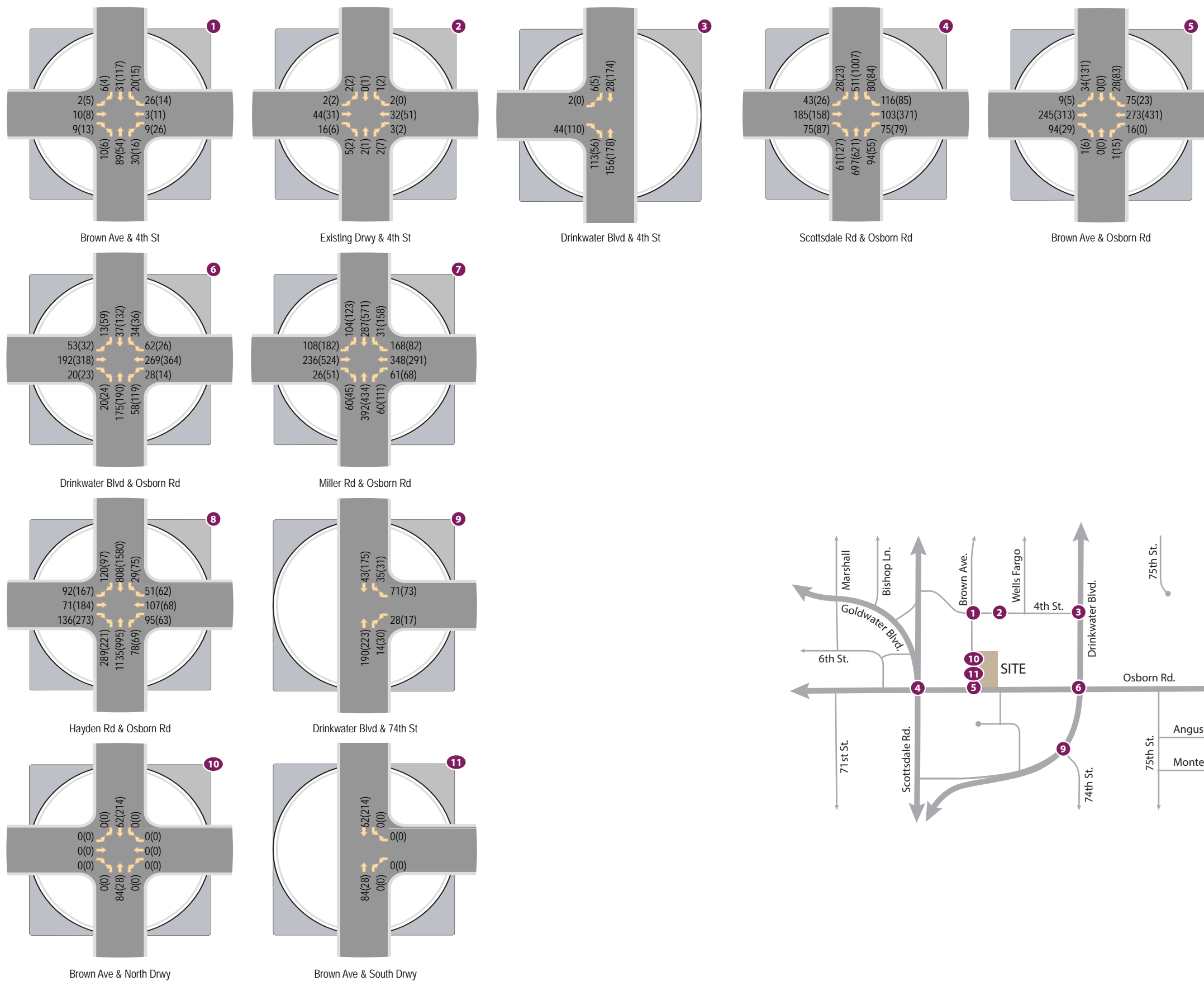


Figure 2: Existing Lane Configurations and Traffic Controls



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

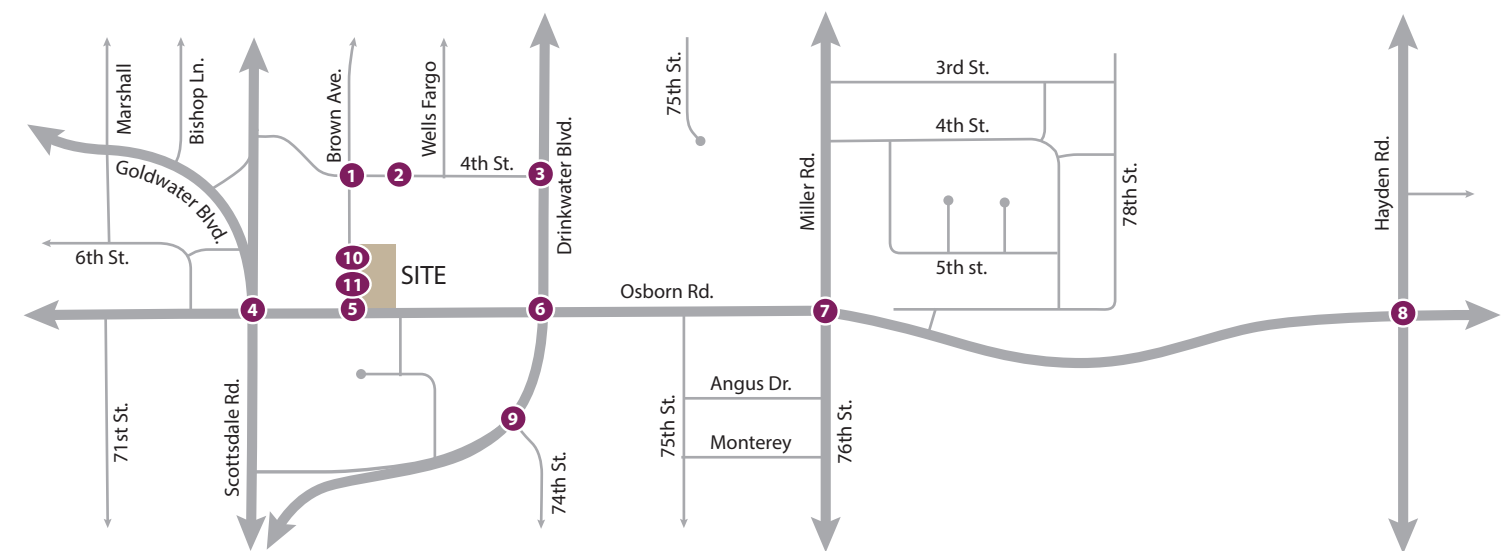


Figure 3: Existing Traffic Volumes

EXISTING CAPACITY ANALYSIS

Peak hour capacity analyses have been conducted for the study intersections based on existing intersection configurations and traffic volumes. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM), Special Report 209*, and Updated 2016 and using Synchro software, version 10.0 under the HCM 6th edition methodology.

The concept of level of service (LOS) uses qualitative measures that characterize operational conditions within the traffic stream. The individual levels of service are described by factors that include speed, travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Six levels of service are defined for each type of facility for which analysis procedures are available. They are given letter designations A through F, with LOS A representing the best operating conditions and LOS F the worst. Each level of service represents a range of operating conditions. Levels of service for intersections are defined in terms of delay ranges. **Table 1** lists the level of service criteria for signalized and unsignalized intersections, respectively.

Table 1 – Level of Service Criteria for Controlled Intersections

Level-of-Service	Unsignalized Control Delay (sec/veh)	Signalized Control Delay (sec/veh)
A	≤ 10	≤ 10
B	> 10-20	> 10-15
C	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80 (or v/c > 1)	> 50 (or v/c > 1)

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual 2017

Synchro 10.0 software calculates the LOS per the HCM 2016 methodology. The 2016 HCM documents the signalized LOS calculation methodology which takes into account lane geometry, traffic volumes and cycle length/phasing to compute LOS. Synchro analysis worksheets report individual movement delay/LOS and overall delay/LOS for signalized intersections; unsignalized intersection worksheets report the worst-case delay/LOS and the average overall intersection delay. Signal timing for the four existing signalized intersections were obtained from the City of Scottsdale. Results of the existing level of service analyses are shown in **Table 2** for both AM and PM peak hours. The existing signal timing sheets and the existing conditions analysis worksheets have been included in **Appendix C**.

Table 2 – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
1	Brown Avenue & 4 th Street	All-way stop	NB	A	A
			SB	A	A
			EB	A	A
			WB	A	A
			Overall	A	A
2	Existing Driveway & 4 th Street	2-way stop (NB/SB)	NB Shared	A	A
			SB Shared	A	A
			EB Left	A	A
			EB Thru	A	A
			WB Left	A	A
			WB Thru	A	A
3	Drinkwater Boulevard & 4 th Street	1-way stop (EB)	NB Left	A	A
			EB Shared	A	A
			Overall	A	A
4	Scottsdale Road & Osborn Road	Signal	NB	C	C
			SB	C	D
			EB	D	C
			WB	C	C
			Overall	C	C
5	Brown Avenue & Osborn Road	2-way stop (NB/SB)	NB Shared	B	A
			SB Left/Thru	B	B
			SB Right	A	A
			EB Left	A	A
			WB Left	A	A
6	Drinkwater Boulevard & Osborn Road	Signal	NB	C	A
			SB	C	A
			EB	C	D
			WB	C	D
			Overall	C	C
7	Miller Road & Osborn Road	Signal	NB	B	B
			SB	B	B
			EB	D	E
			WB	D	D
			Overall	C	C
8	Hayden Road & Osborn Road	Signal	NB	B	B
			SB	B	B
			EB	D	D
			WB	D	D
			Overall	B	C
9	Drinkwater Boulevard & 74 th Street	1-way stop (WB)	SB Left	A	A
			WB Left	B	B
			WB Right	B	B
10	Brown Avenue & North Driveway	2-way stop (EB/WB)	NB Left	A	A
			SB Left	A	A
			EB Shared	A	A
			WB Shared	A	A
11	Brown Avenue & South Driveway	1-way stop (WB)	SB Left	A	A
			WB Shared	A	A

The results of the existing conditions analysis summarized in **Table 2** indicates that all study intersections operate with overall acceptable levels of service (LOS D or better). The intersection of **Miller Road and Osborn Road** currently experiences delay on the eastbound approach during the PM peak hour only. The delay is due to the high number of eastbound left turning vehicles and no dedicated eastbound left turn phase. However, the threshold for an acceptable level of service is 55 seconds of delay per vehicle and the eastbound approach of this intersection experiences approximately 59.2 seconds of delay per vehicle. Since the delay is only slightly higher than the threshold for an acceptable level of service, no mitigation is recommended at this time, but may be needed in the future if the delay increases.

CRASH ANALYSIS

Crash data for all study intersections was obtained from the City of Scottsdale. Crashes were documented for the past four (4) years from 2015 to 2018. A total of 272 crashes were documented during this period, with the majority occurring at the intersection of Hayden Road and Osborn Road. Of all the incidents reported, none resulted in a fatal injury, five (5) involved pedestrians and two (2) involved bicyclists. The crash listings can be found in **Appendix D**. A summary of the crash data is provided in **Table 3**.

Table 3 – Crash Data Summary

Intersection	Total	2018	2017	2016	2015	
Brown Ave & 4th St	4	2	0	1	1	
Drinkwater Blvd & 4th St	4	0	0	3	1	
Brown Ave & Osborn Rd	2	1	0	0	1	
Drinkwater Blvd & Osborn Rd	42	10	9	12	11	
Hayden Rd & Osborn Rd	105	17	26	24	38	
Miller Rd & Osborn Rd	40	9	12	10	9	
Scottsdale Rd & Osborn Rd	75	16	19	19	21	
Totals	272	55	66	69	82	
Intersection	Angle	Left Turn	Rear End	Head On	Sideswipe	Other
Brown Ave & 4th St	2	0	0	0	1	1
Drinkwater Blvd & 4th St	0	1	1	1	1	0
Brown Ave & Osborn Rd	1	0	0	0	0	1
Drinkwater Blvd & Osborn Rd	23	4	9	0	4	2
Hayden Rd & Osborn Rd	30	16	30	2	9	18
Miller Rd & Osborn Rd	14	2	21	1	2	0
Scottsdale Rd & Osborn Rd	20	15	18	2	14	6
Totals	90	38	79	6	31	28
Intersection	Injury	Fatality	DUI	Pedestrian	Bicycle	
Brown Ave & 4th St	0	0	0	0	0	
Drinkwater Blvd & 4th St	2	0	0	1	0	
Brown Ave & Osborn Rd	0	0	0	0	0	
Drinkwater Blvd & Osborn Rd	19	0	3	1	0	
Hayden Rd & Osborn Rd	53	0	0	1	1	
Miller Rd & Osborn Rd	14	0	2	2	1	
Scottsdale Rd & Osborn Rd	26	0	1	0	0	
Totals	114	0	6	5	2	

As summarized in **Table 3**, the total number of crashes occurring at Hayden Road and Osborn Road, as well as overall number of crashes within the study area, have decreased between 2015 and 2018.

PROPOSED DEVELOPMENT

SITE LOCATION

The proposed site will be located at 7400 E Osborn Road in the City of Scottsdale Arizona. The site is currently occupied by a parking lot which services the surrounding Honor Health medical buildings. The proposed site will consist of 117,000 SF of medical office building on an approximately 3.04-acre lot.

SITE ACCESS

The proposed development will provide approximately 161 parking spaces, 55 below grade and 106 on the surface, however, it is assumed that many visitors will also be utilizing the parking garage directly west of the site. There are two driveways that will provide access to the on-site parking lot and the parking garage.

- *Intersection 2* is located approximately 235 feet east of the intersection of Brown Avenue and 4th Street. This access point currently provides full access to the parcel directly north of the proposed site, but will provide full access to the site upon full buildout of the project.
- The *north access (Intersection 10)* is currently located approximately 390 feet north of the intersection of Brown Avenue and Osborn Road along Brown Avenue. Upon completion of this expansion, this intersection will be shifted approximately 10 feet to the north in order to align with the parking garage entrance west of Brown Avenue. This driveway currently provides full access, and will upon buildout, to both the existing parking lot and parking garage.
- The *south access (Intersection 11)* is located approximately 200 feet north of the intersection of Brown Avenue and Osborn Road along Brown Avenue. This driveway currently provides full access to the existing parking lot and will be rebuilt with the same configuration upon buildout of the proposed site.

The proposed site plan with access is provided in **Figure 4**.

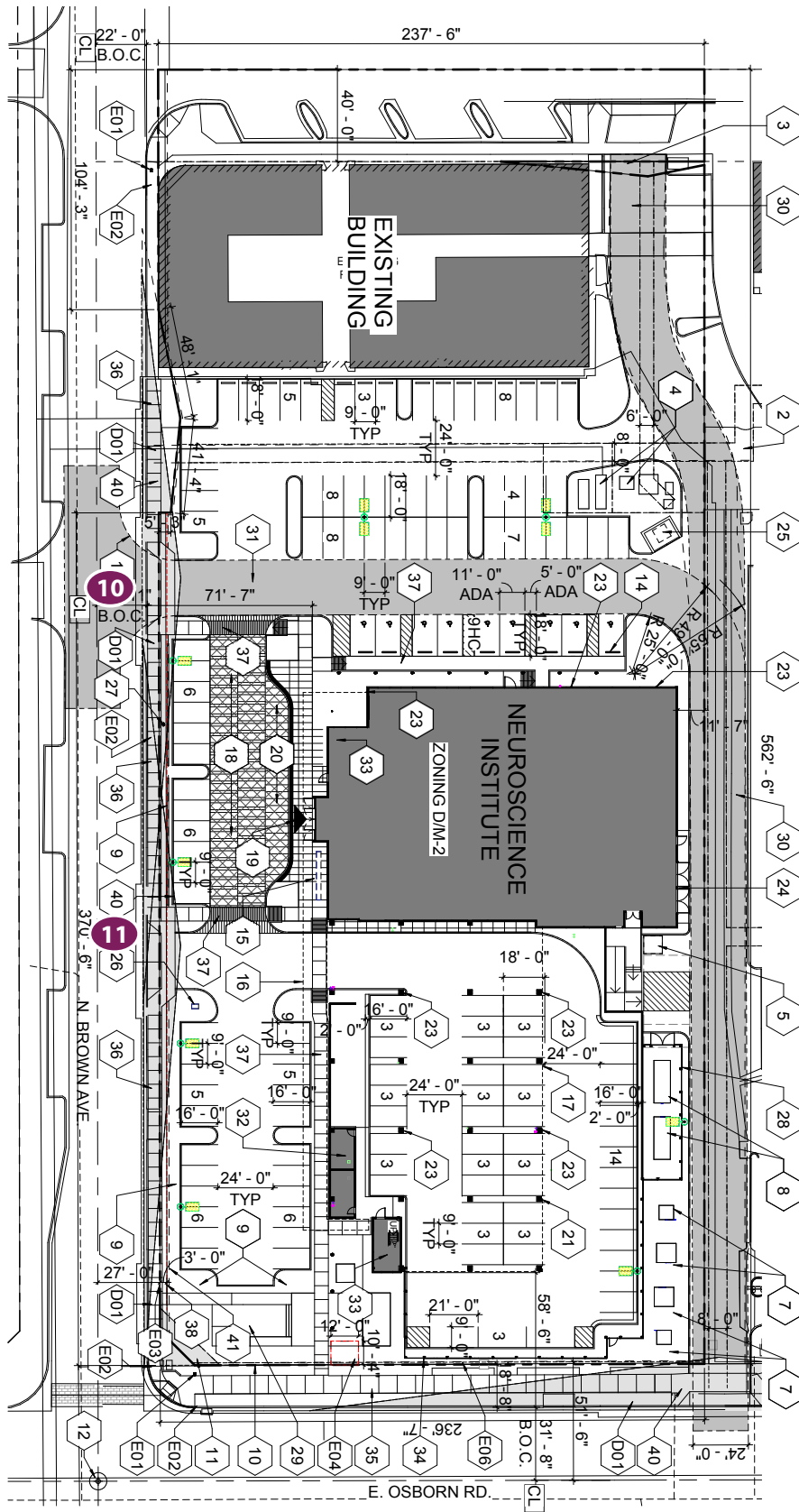


Figure 4: Site Plan and Access

TRIP GENERATION COMPARISON

The potential trip generation for the proposed development was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual, 10th Edition* and *Trip Generation Handbook, 3rd Edition*. The ITE *Trip Generation Manual* contains data collected by various transportation professionals for a wide range of different land uses. The data are summarized in the report and average rates and equations have been established that correlate the relationship between an independent variable that describes the development size and generated trips for each categorized land use. The report provides information for daily and peak hour trips.

The proposed development will consist of approximately 117,000 SF of medical office building. The land use code (LUC) used for a medical office building is 720. The trip generation for the proposed medical office building is summarized in **Table 4**. Detailed trip generation calculations are provided in **Appendix E**.

Table 4 – Trip Generation Summary

Proposed Use	ITE LUC	Size Units	Weekday Trips						
			Daily	AM		PM			
			Total	In	Out	Total	In	Out	Total
Medical Office Building	720	117,000 square feet	4,370	199	56	255	111	284	395
Subtotals			4,370	199	56	255	111	284	395

As summarized in **Table 3**, the proposed development is estimated to generate approximately 4,370 external weekday daily trips with 255 trips occurring during the AM peak hour (199 in/56 out), and 395 trips occurring during the PM peak hour (111 in/284 out).

VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

A single trip distribution pattern was assumed for the proposed development. It is expected that the proposed development will generate trips based on future population. Future total population, as predicted by the 2020/2030 socio-economic data compiled by the Maricopa Association of Governments (MAG), was used as a basis to estimate trip distribution within a 10 mile radius. The resulting trip distribution percentages for the study area are shown in **Table 5**. The trip distribution calculations are included in **Appendix F**.

Table 5 – Site Trip Distribution

Direction (To/From)	Percentage
North on Scottsdale Road (north of 4 th Street)	10%
South on Scottsdale Road (south of Drinkwater Boulevard)	25%
North on Brown Avenue (north of 4 th Street)	3%
South on 74 th Street (south of Drinkwater Boulevard)	4%
North on Drinkwater Boulevard (north of 4 th Street)	11%
North on Miller Road (north of Osborn Road)	5%
South on Miller Road (south of Osborn Road)	5%
North on Hayden Road (north of Osborn Road)	5%
South on Hayden Road (south of Osborn Road)	15%
East on Osborn Road (east of Hayden Road)	5%
West on Osborn Road (west of Scottsdale Road)	12%
Total	100%

Figure 5 illustrates the trip distribution percentages noted in **Table 5** on the roadway network within the study area. The percentages presented in **Figure 5** were applied to the site trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area. **Figure 6** presents the resulting site trip assignment for the proposed development.

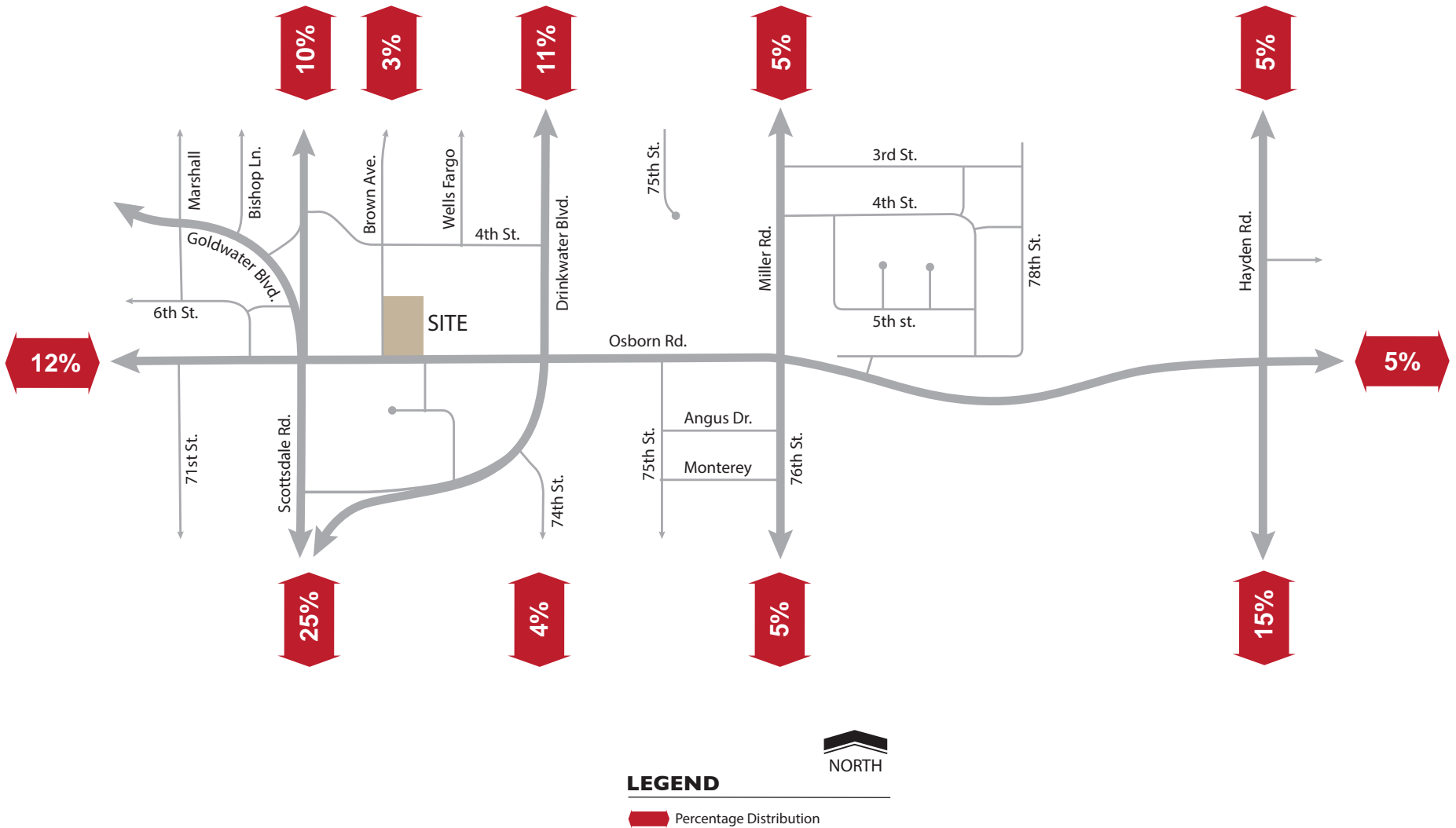
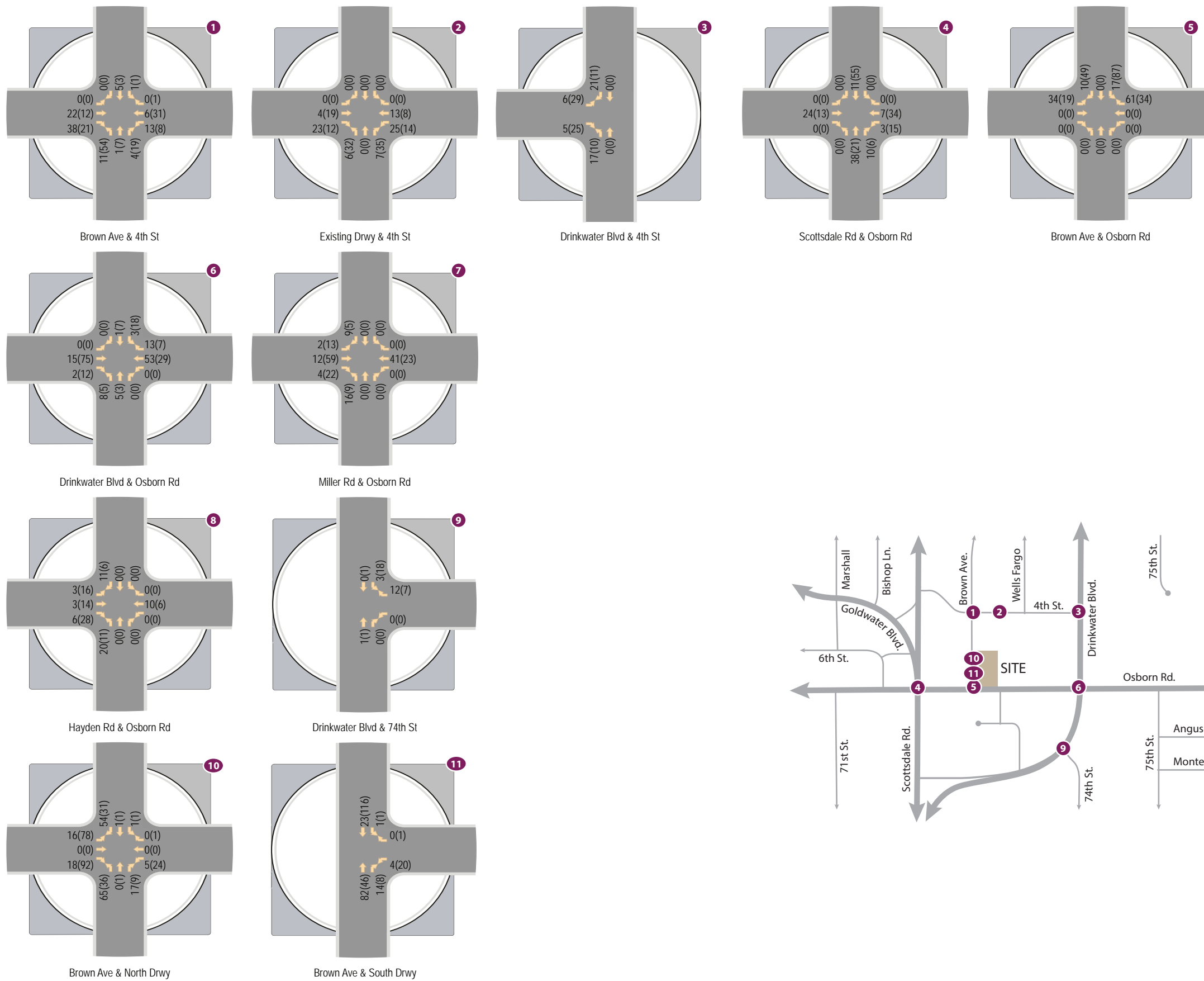


Figure 5: Trip Distribution



LEGEND

XX(X) - AM(PM) Peak Hour Traffic Volumes

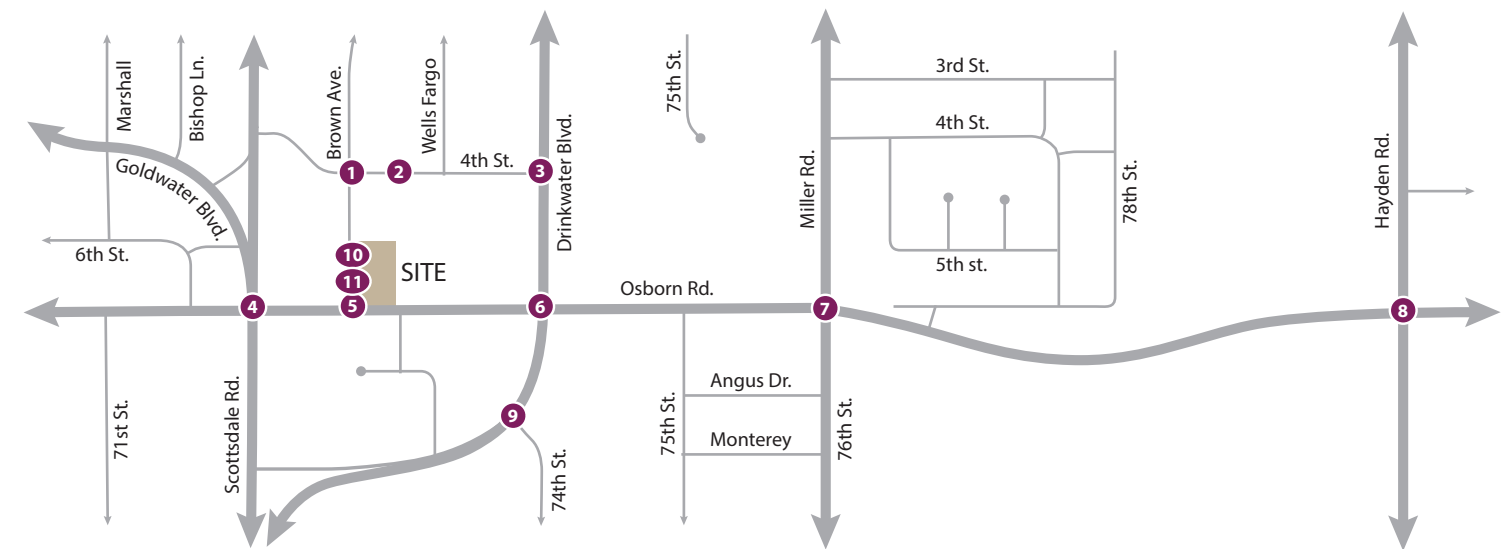


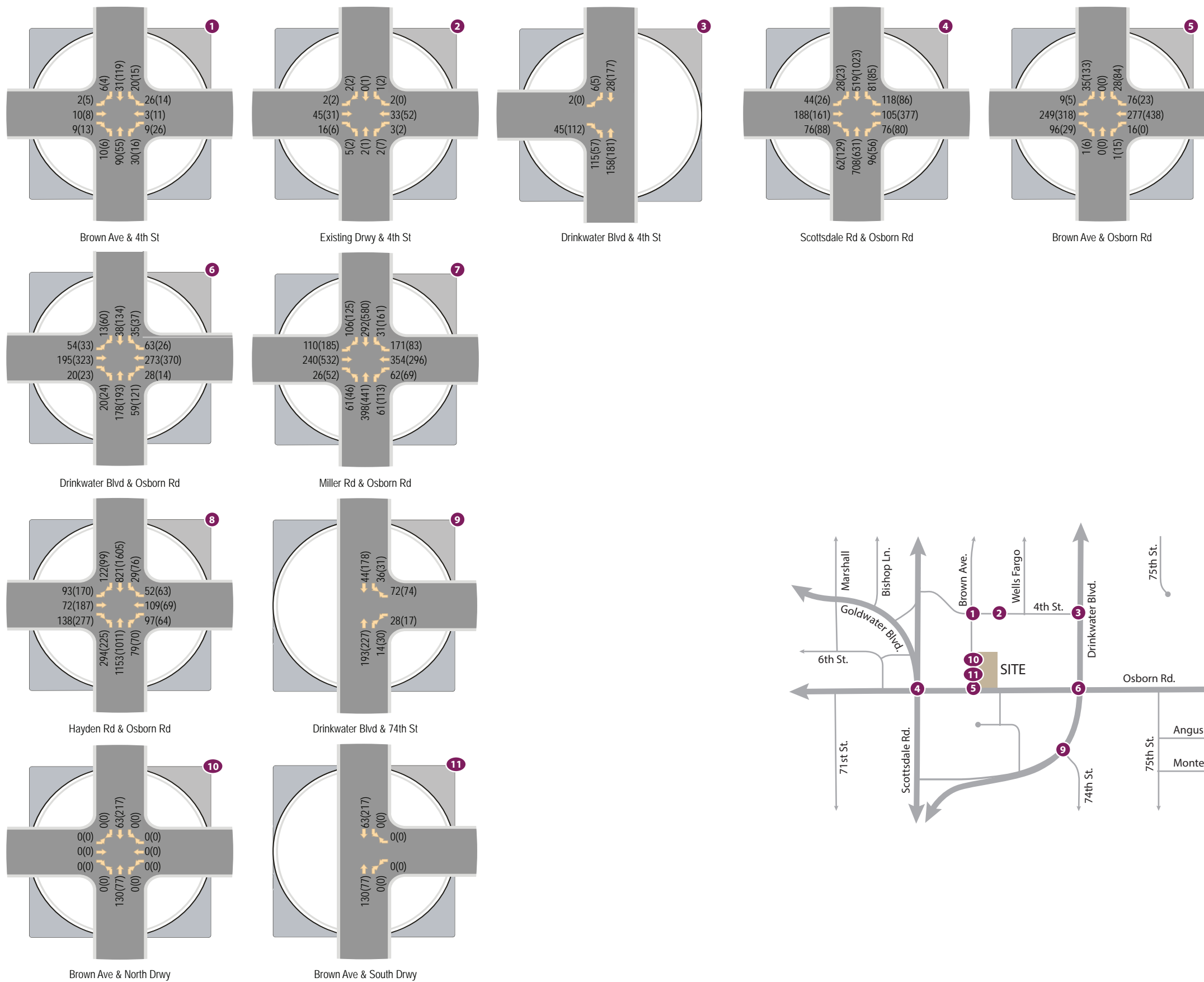
Figure 6: Site Generated Traffic Volumes

FUTURE BACKGROUND TRAFFIC

CivTech applied an expansion factor to the existing traffic counts conducted for this study to obtain the background traffic volumes along the adjacent roadway network. In reviewing the City of Scottsdale historic traffic count maps, a regional growth rate of 1.6% per year was found near the intersection of Drinkwater Boulevard and Osborn Road. This growth rate was converted to an expansion factor of 1.016 for the opening year 2020. **Figure 7** presents the background volumes for the opening year 2020. Background volume calculation worksheets are included in **Appendix G**.

TOTAL TRAFFIC

Total traffic was determined by adding the site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the opening year of 2020 are shown in **Figure 8**.

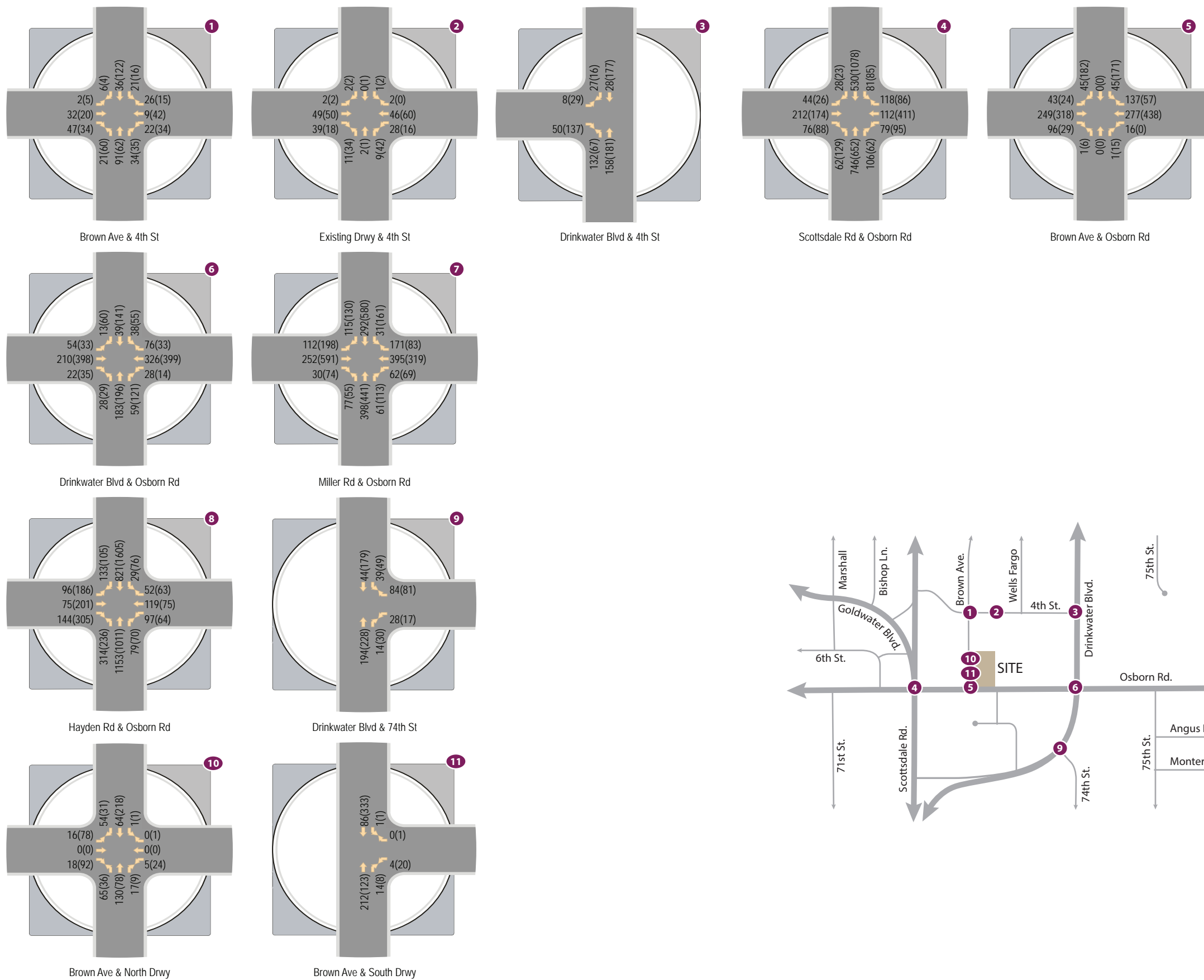


LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes



Figure 7: 2020 Background Traffic Volumes



LEGEND

XX(XX) - AM(PM) Peak Hour Traffic Volumes

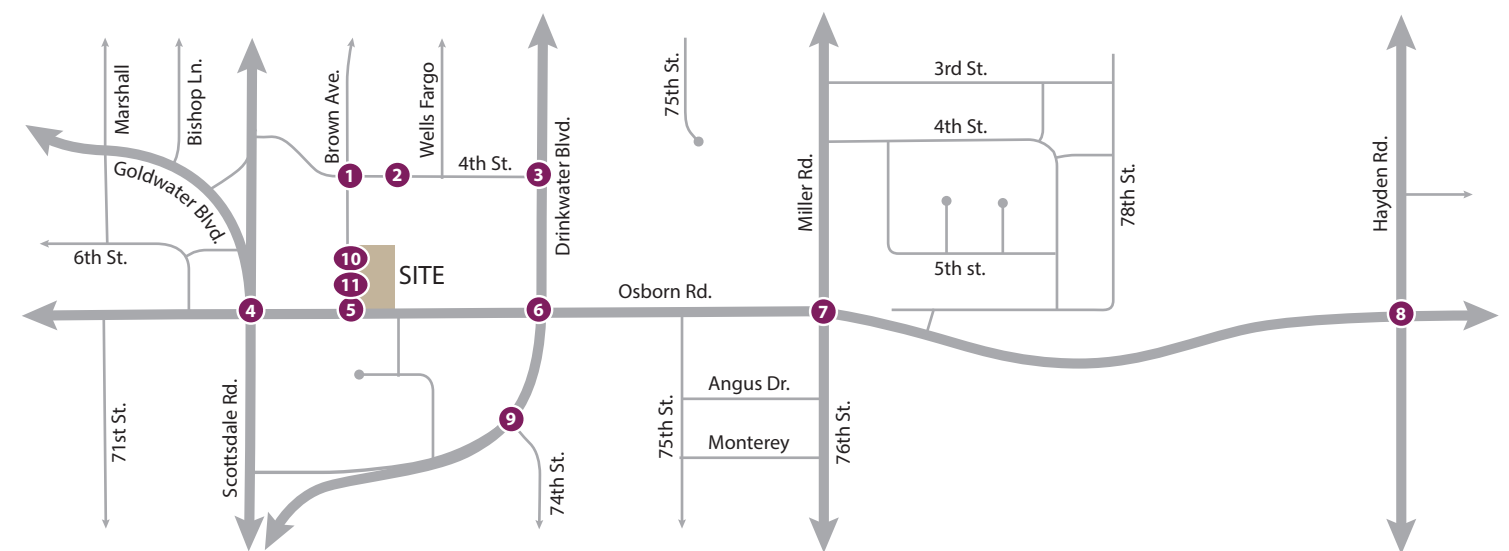


Figure 8: 2020 Total Traffic Volumes

TRAFFIC AND IMPROVEMENT ANALYSIS

The overall intersection and approach levels of service are summarized in **Table 6** for the 2020 total traffic conditions. Detailed analysis worksheets for the 2020 opening year can be found in **Appendix H**.

Table 6 – 2020 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)
1	Brown Avenue & 4 th Street	All-way stop	NB	A(A)	A(A)
			SB	A(A)	A(A)
			EB	A(A)	A(A)
			WB	A(A)	A(A)
			Overall	A(A)	A(A)
2	Existing Driveway & 4 th Street	2-way stop (NB/SB)	NB Shared	A(A)	A(B)
			SB Shared	A(A)	A(A)
			EB Left	A(A)	A(A)
			EB Thru	A(A)	A(A)
			WB Left	A(A)	A(A)
			WB Thru	A(A)	A(A)
3	Drinkwater Boulevard & 4 th Street	1-way stop (EB)	NB Left	A(A)	A(A)
			EB Shared	A(A)	A(B)
			Overall	A(A)	A(B)
4	Scottsdale Road & Osborn Road	Signal	NB	C(C)	C(C)
			SB	C(D)	C(D)
			EB	D(C)	D(C)
			WB	C(C)	D(C)
			Overall	C(C)	C(C)
5	Brown Avenue & Osborn Road	2-way stop (NB/SB)	NB Shared	B(A)	B(A)
			SB Left/Thru	B(B)	B(B)
			SB Right	A(A)	A(B)
			EB Left	A(A)	A(A)
			WB Left	A(A)	A(A)
6	Drinkwater Boulevard & Osborn Road	Signal	NB	C(A)	C(A)
			SB	C(A)	C(A)
			EB	C(D)	C(D)
			WB	C(D)	C(D)
			Overall	C(C)	C(C)
7	Miller Road & Osborn Road	Signal	NB	B(B)	B(B)
			SB	B(B)	B(B)
			EB	D(E)	D(E)
			WB	D(D)	D(D)
			Overall	C(D)	C(D)
8	Hayden Road & Osborn Road	Signal	NB	B(B)	B(B)
			SB	B(B)	B(B)
			EB	D(D)	D(D)
			WB	D(D)	D(D)
			Overall	B(C)	B(C)

Table 6 (continued) – 2020 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)
9	Drinkwater Boulevard & 74 th Street	1-way stop (WB)	SB Left WB Left WB Right	A(A) B(B) B(B)	A(A) B(B) B(B)
10	Brown Avenue & North Driveway	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A(A) A(A) A(A) A(A)	A(A) A(A) B(B) B(B)
11	Brown Avenue & South Driveway	1-way stop (WB)	SB Left WB Shared	A(A) A(A)	A(A) B(B)

The results of the Synchro analysis summarized in **Table 6** indicate that all intersections within the study area are expected to operate with overall acceptable levels of service LOS D or better. The following intersection is expected to have one approach operating at LOS E.

The signalized intersection of **Miller Road and Osborn Road** is expected to experience delay on the eastbound approach during the PM peak hour only. In order to mitigate this delay, it is recommended that the eastbound/westbound phase be extended from 40 seconds to 43 seconds in order to decrease the delay from 70.1 seconds per vehicle to 54.2 seconds per vehicle.

TURN LANE WARRANTING AND QUEUE LENGTH ANALYSIS

RIGHT-TURN DECELERATION LANES

Right turn auxiliary lanes are required at all street intersections on major arterials per the City of Scottsdale *DS&PM* section 5-3.206 and could be required on minor arterials or collectors. The standard storage length for a deceleration lane is 150 feet, with a 100-foot minimum length.

Brown Avenue and 4th Street are not classified as a major arterials, additionally, the anticipated levels of service at all site driveways are adequate. Right turn deceleration lanes are not warranted at any of the three site access point.

LEFT-TURN DECELERATION LANES

Left-turn lanes are required at all street intersections on major collectors and arterials per the City of Scottsdale *Design Standards and Policy Manual (DS&PM)*. Dual left turn lanes should be considered at intersections in which the peak hour turning volume exceeds 300 vehicles, the opposing volume exceeds 1,000 vehicles per hour or the delay of the left-turns exceeds 45 seconds per section 5-3.123 of the *DS&PM*.

Brown Avenue and 4th Street are not anticipated to exceed 1,000 vehicles per hour during either peak hour. Additionally, the levels of service at all access points are adequate and are anticipated to experience delays lower than 45 seconds per vehicle. Left turn deceleration lanes are not warranted at this time.

QUEUE STORAGE

Adequate turn storage should be supplied on any approach where turn lanes are permitted and/or warranted. A queuing analysis was performed for all warranted/recommended and existing intersection turn lanes where site traffic is expected as well as left turn lanes adjacent to the site. According to the methodology documented in *A Policy on Geometric Design of Highways and Streets* (the AASHTO "Green Book"), the storage length for a turn lane is typically estimated as the length required to hold the average number of arriving vehicles per two minutes, where unsignalized, or per one-and-a half signal cycles, where signalized.¹ The formulas used for the calculations are shown below.

For signalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [1.5 \times (\text{veh/hr})/(\text{cycles/hr})] \times 25 \text{ feet}$$

For unsignalized intersections, the storage length is determined by the following formula:

$$\text{Storage Length} = [(\text{veh/hr})/(30 \text{ periods/hr})] \times 25 \text{ feet}$$

The total projected traffic volumes were utilized for the calculations. From this, the resulting turn lane storage for turn movements using AASHTO guidelines were calculated and are summarized in **Table 7**. Calculations for the AASHTO queue storage length recommendations and the 95th percentile HCM 2016 queue storage length recommendations are provided in **Appendix I**. The 95th percentile HCM 2016 queue storage lengths are given in vehicles and multiplied by 25 feet per vehicle to determine the storage length.

Table 7 – Queue Storage Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO	HCM ⁽²⁾	Recommended
3	Drinkwater Boulevard & 4 th Street	1-way stop (EB)	NB Left	75'	125'	<25'	75'
4	Scottsdale Road & Osborn Road	Signal	NB Left	195'	225'	85'	195'
			SB Left	150'	150'	60'	150'
			EB Left	60'	75'	50'	60'
			WB Left	140'	175'	80'	140'
			NB Right	195'	200'	35'	195'
5	Brown Avenue & Osborn Road	2-way stop (NB/SB)	EB Left	TWLTL	50'	<25'	TWLTL
			WB Left	TWLTL	25'	<25'	TWLTL
			SB Right	60'	175'	25'	60'
6	Drinkwater Boulevard & Osborn Road	Signal	NB Left	150'	50'	40'	150'
			SB Left	105'	100'	45'	105'
			EB Left	135'	100'	65'	135'
			WB Left	100'	50'	35'	100'

(1) Measured from beginning of stop bar

(2) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.

¹ The American Association of Highway and Transportation Officials on pages 714-715 of its publication, *Geometric Design of Highways and Streets* ("AASHTO Green Book"), indicates that storage length for a turn lane, exclusive of taper, "should usually be based on one and one-half to two times the average number of vehicles that would store per cycle" at a signalized intersection.

Table 8 (continued) – Queue Storage Lengths

ID	Intersection	Intersection Control	Movement	Queue Storage			
				Existing ⁽¹⁾	AASHTO	HCM ⁽²⁾	Recommended
7	Miller Road & Osborn Road	Signal	NB Left	160'	150'	65'	160'
			SB Left	140'	275'	145'	140'
			EB Left	110'	350'	310'	⁽³⁾ 260'
			WB Left	125'	125'	130'	125'
			SB Right	140'	225'	40'	140'
8	Hayden Road & Osborn Road	Signal	NB Left	165'	525'	340'	340'
			SB Left	140'	150'	40'	140'
			EB Left	155'	325'	210'	155'
			WB Left	90'	175'	125'	⁽⁴⁾ 90'
			EB Right	155'	525'	220'	225'
9	74 th Street & Drinkwater Boulevard	1-way stop (WB)	SB Left	75'	50'	<25'	75'
			WB Left	110'	25'	<25'	110'

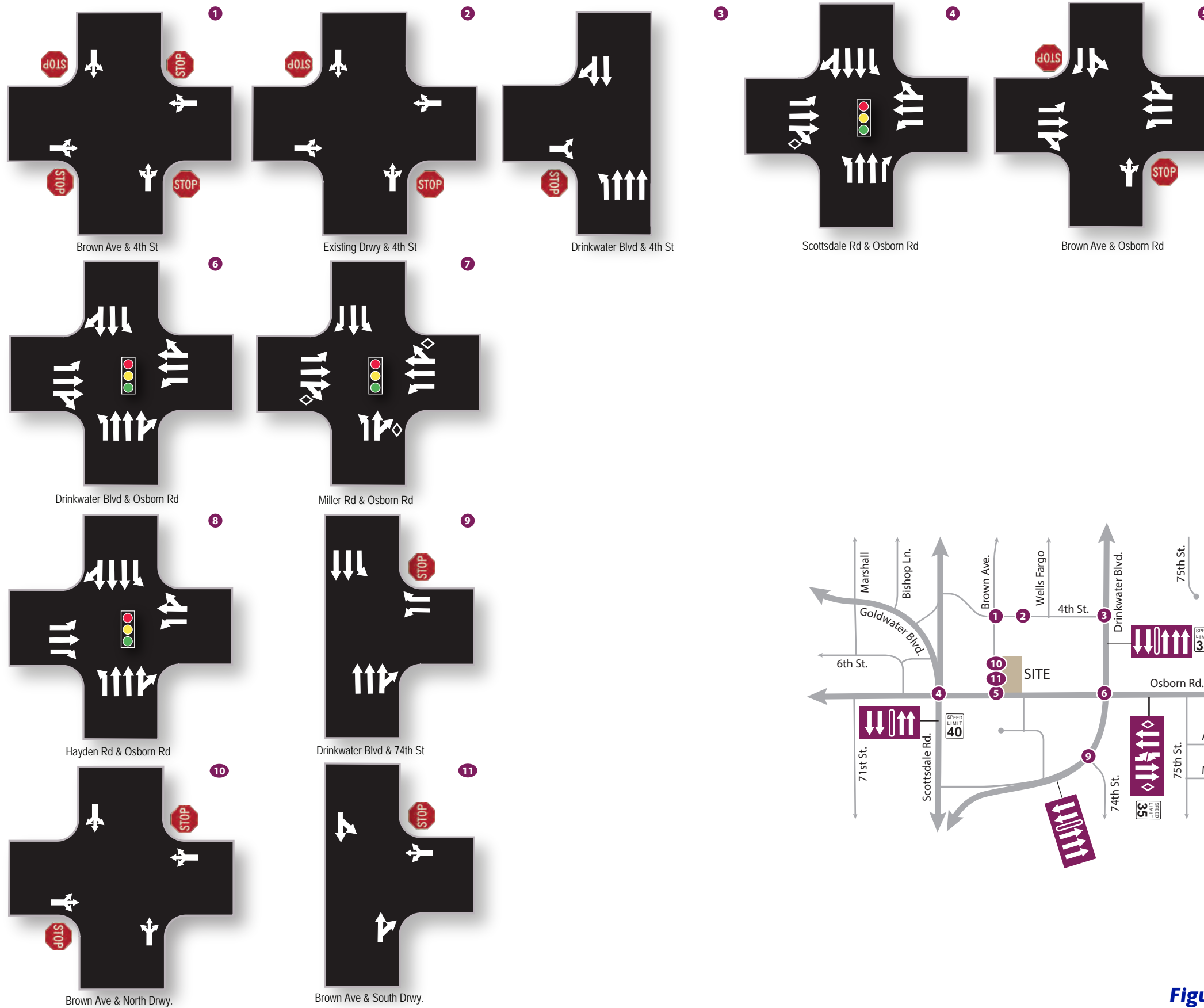
(1) Measured from beginning of stop bar

(2) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.

(3) Existing back-to-back left turn lanes prohibit a turn lane longer than recommended

(4) Not the responsibility of the developer

The recommended storage lengths in are provided for study horizon year 2020 using the total traffic projections. Proposed lane configurations are shown in **Figure 9**.



LEGEND

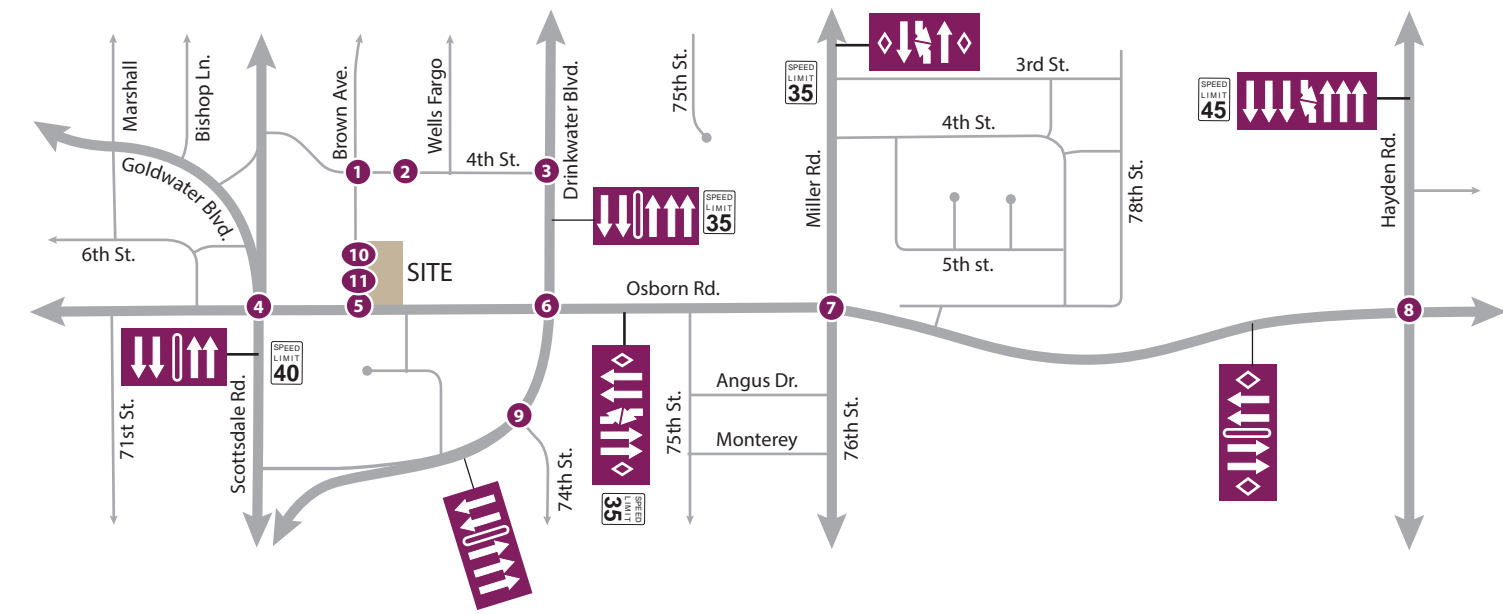


Figure 9: Proposed Lane Configurations and Traffic Controls

SIGHT DISTANCE ANALYSIS

Adequate sight distance must be provided at the intersections to allow safe turning movements into and out of the development. A sight triangle is the area encompassed by the line of sight from a stopped vehicle on the minor roadway to the approaching vehicle on the major roadway: there must be sufficient unobstructed sight distance along both approaches of a street or driveway intersection and across their included corners to allow operators of vehicles to see each other in time to prevent a collision. There must also be sufficient sight distance along the major street to allow a driver intending to turn left into the site to see an oncoming vehicle in the opposing direction.

Sight distance is largely based on the design speed of the roadway. Per the *City of Scottsdale Design Standards and Policies Manual, dated 2018* intersection sight distance should adhere to *Appendix 5-3B. Sight Distance tables in Appendix 5-3B* present the required sight distance for varying roadway widths and design speeds for passenger cars, single unit trucks and combination trucks. Typically, the posted speed limit is less than the design speed of a roadway.

The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right turning movements from the development. Fixed objects within the safety triangle cannot be taller than 2.5-feet measured from the adjacent roadway surface (edge of pavement); vegetation should be trimmed to 2.5-feet tall measured from the adjacent roadway surface. Trees placed within the sight triangle shall have canopies no lower than eight (8) feet. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*. Excerpts from the *City of Scottsdale Design Standards and Policies Manual* and tables have been included in **Appendix J**.

CONCLUSIONS

The following conclusions have been documented in this study:

- The results of the existing conditions analysis indicates that all study intersections operate with overall acceptable levels of service (LOS D or better). One intersection has an approach operating below acceptable thresholds.
 - The intersection of **Miller Road and Osborn Road** currently experiences delay on the eastbound approach during the PM peak hour only. The delay is due to the high number of eastbound left turning vehicles and no dedicated eastbound left turn phase. However, the threshold for an acceptable level of service is 55 seconds of delay per vehicle and the eastbound approach of this intersection experiences approximately 59.2 seconds of delay per vehicle. Since the delay is only slightly higher than the threshold for an acceptable level of service, no mitigation is recommended at this time.
- The proposed development is estimated to generate approximately 4,370 external weekday daily trips with 255 trips occurring during the AM peak hour (199 in/56 out), and 395 trips occurring during the PM peak hour (111 in/284 out).
- The results of the opening year 2020 Synchro analysis indicate that all intersections within the study area are expected to operate with overall acceptable levels of service LOS D or better. The following intersection is expected to have one or approach operating at LOS E.
 - The signalized intersection of **Miller Road and Osborn Road** is expected to experience delay on the eastbound approach during the PM peak hour only with or without the addition of site traffic. In order to mitigate this delay, it is recommended that the eastbound/westbound phase be extended from 40 seconds to 43 seconds in order to decrease the delay from 70.1 seconds per vehicle to 54.2 seconds per vehicle.
- The recommended storage lengths are provided for study horizon year 2020 using the total traffic projections and can be found in **Table 7**.
- The contractor should ensure that adequate sight distance is provided at all site access points to allow safe left and right turning movements from the development. Fixed objects within the safety triangle cannot be taller than 2.5-feet measured from the adjacent roadway surface (edge of pavement); vegetation should be trimmed to 2.5-feet tall measured from the adjacent roadway surface. Trees placed within the sight triangle shall have canopies no lower than eight (8) feet. It is recommended that sight triangles be designed at all site access driveways to provide the required sight distance shown in *Appendix 5-3B* within the *City of Scottsdale Design Standards and Policies Manual*.

LIST OF REFERENCES

Highway Capacity Manual. Transportation Research Board, Washington, D.C., 2000.

Manual on Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2009.

Trip Generation Manual, 9th Edition, Institute of Transportation Engineers, Washington, D.C., 2012.

Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2014.

Design Standards & Policies Manual, Geometrics, City of Scottsdale, Arizona, 2018.

TECHNICAL APPENDICES

- APPENDIX A: REVIEW COMMENTS AND RESPONSES (RESERVED)**
- APPENDIX B: EXISTING TRAFFIC COUNTS**
- APPENDIX C: EXISTING PEAK HOUR ANALYSIS AND SIGNAL TIMING**
- APPENDIX D: CRASH ANALYSIS**
- APPENDIX E: TRIP GENERATION**
- APPENDIX F: TRIP DISTRIBUTION**
- APPENDIX G: BACKGROUND TRAFFIC CALCULATIONS**
- APPENDIX H: 2020 PEAK HOUR ANALYSIS**
- APPENDIX I: QUEUE STORAGE ANALYSIS**
- APPENDIX J: SIGHT DISTANCE STANDARDS**

APPENDIX A

REVIEW COMMENTS AND RESPONSES (Reserved)

APPENDIX B

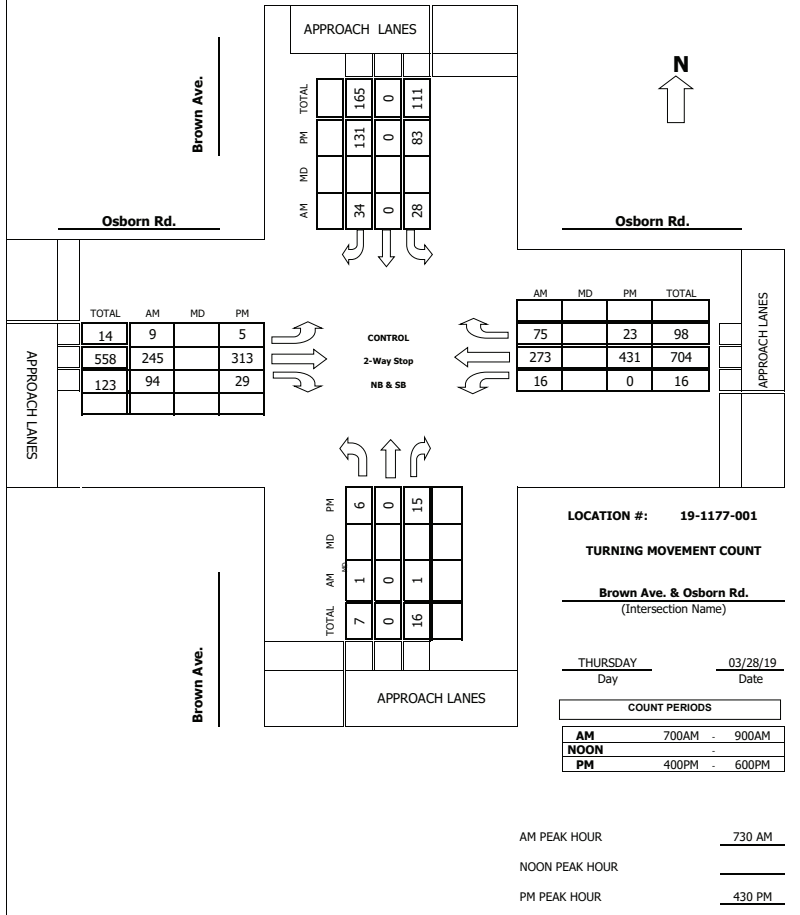
EXISTING TRAFFIC COUNTS

Intersection Turning Movement
Prepared by:



Project #: **19-1177-001**

TMC SUMMARY OF Brown Ave. & Osborn Rd.



Intersection Turning Movement
Prepared by:



N-S STREET: **Brown Ave.** DATE: **03/28/19** LOCATION: **Scottsdale**
E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT#: **19-1177-001**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM	0	1	0	0	1	0	0	2	0	0	2	0	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	6	0	3	0	43	8	0	49	17	
7:15 AM	0	0	0	4	0	11	1	59	18	0	54	18	
7:30 AM	0	0	0	11	0	8	2	56	23	5	75	23	
7:45 AM	0	0	1	5	0	10	4	75	32	4	67	21	
8:00 AM	0	0	0	5	0	7	3	48	19	4	66	9	
8:15 AM	1	0	0	7	0	9	0	66	20	3	65	22	
8:30 AM	0	0	0	10	0	7	1	62	23	3	67	13	
8:45 AM	1	0	2	9	1	12	2	64	11	2	61	15	
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	2	0	3	57	1	67	13	473	154	21	504	138	1433
Approach %	40.00	0.00	60.00	45.60	0.80	53.60	2.03	73.91	24.06	3.17	76.02	20.81	
App/Depart	5	/	151	125	/	176	640	/	533	663	/	573	

AM Peak Hr Begins at: 730 AM

PEAK

Volumes	1	0	1	28	0	34	9	245	94	16	273	75	776
Approach %	50.00	0.00	50.00	45.16	0.00	54.84	2.59	70.40	27.01	4.40	75.00	20.60	

PEAK HR.

FACTOR:	0.500	0.816	0.784	0.883	0.886
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CONTROL: 2-Way Stop (NB & SB)
COMMENT 1: South leg is a driveway
GPS: 33.487656, -111.924758

Intersection Turning Movement



N-S STREET: **Brown Ave.** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT# **19-1177-001**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	0	4	26	0	32	2	79	11	0	93	12	260
4:15 PM	2	1	3	20	0	33	1	59	12	1	104	4	240
4:30 PM	1	0	3	24	0	42	0	67	8	0	106	8	259
4:45 PM	3	0	3	12	0	21	2	80	6	0	102	2	231
5:00 PM	2	0	7	28	0	38	3	60	6	0	124	6	274
5:15 PM	0	0	2	19	0	30	0	106	9	0	99	7	272
5:30 PM	2	0	0	21	0	17	0	73	10	0	100	5	228
5:45 PM	4	0	1	15	0	17	0	78	5	0	81	17	218
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	15	1	23	165	0	230	8	602	67	1	809	61	1982
Approach %	38.46	2.56	58.97	41.77	0.00	58.23	1.18	88.92	9.90	0.11	92.88	7.00	
App/Depart	39	/	70	395	/	68	677	/	790	871	/	1054	

PM Peak Hr Begins at: 430 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	6	0	15	83	0	131	5	313	29	0	431	23	1036
Approach %	28.57	0.00	71.43	38.79	0.00	61.21	1.44	90.20	8.36	0.00	94.93	5.07	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.583		0.811		0.754		0.873		0.945			

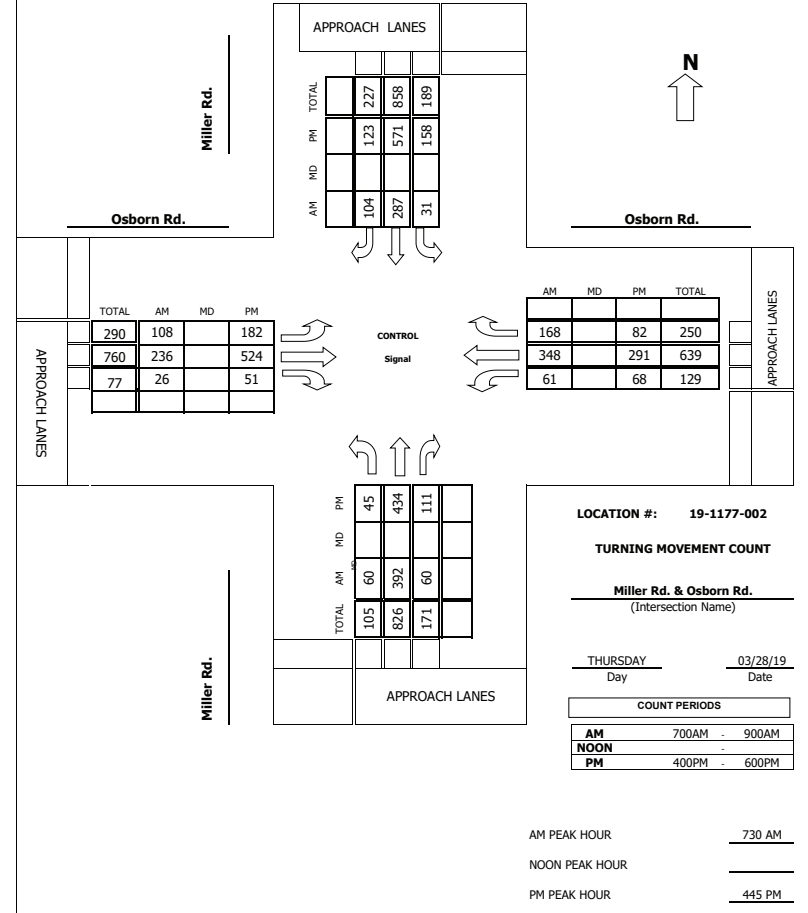
CONTROL: **2-Way Stop (NB & SB)**
 COMMENT 1: **South leg is a driveway**
 GPS: **33.487656, -111.924758**

Intersection Turning Movement Prepared by:



Project #: **19-1177-002**

TMC SUMMARY OF Miller Rd. & Osborn Rd.



Intersection Turning Movement
Prepared by:



N-S STREET: Miller Rd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: Osborn Rd. DAY: THURSDAY PROJECT#: 19-1177-002

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	9	85	5	5	71	21	23	38	9	10	52	29	357
7:15 AM	3	80	7	7	67	22	19	44	8	12	79	34	382
7:30 AM	14	95	13	7	62	31	29	59	7	18	83	35	453
7:45 AM	15	99	9	10	90	28	29	60	10	20	93	58	521
8:00 AM	18	104	15	7	81	22	30	64	4	10	100	39	494
8:15 AM	13	94	23	7	54	23	20	53	5	13	72	36	413
8:30 AM	14	97	6	10	77	24	20	66	9	25	69	29	446
8:45 AM	17	106	9	9	75	28	17	49	13	13	62	27	425
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	103	760	87	62	577	199	187	433	65	121	610	287	3491
Approach %	10.84	80.00	9.16	7.40	68.85	23.75	27.30	63.21	9.49	11.89	59.92	28.19	
App/Depart	950	/	1234	838	/	763	685	/	582	1018	/	912	

AM Peak Hr Begins at: 730 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	60	392	60	31	287	104	108	236	26	61	348	168	1881
Approach %	11.72	76.56	11.72	7.35	68.01	24.64	29.19	63.78	7.03	10.57	60.31	29.12	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.934		0.824		0.934		0.844		0.903			

CONTROL: Signal
 COMMENT 1: 33.487645, -111.917511
 GPS:

Intersection Turning Movement



N-S STREET: Miller Rd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: Osborn Rd. DAY: THURSDAY PROJECT#: 19-1177-002

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	13	126	31	24	127	33	67	112	17	20	61	25	656
4:15 PM	9	104	21	33	108	44	36	90	15	20	69	19	568
4:30 PM	14	110	27	31	118	30	48	129	22	13	67	18	627
4:45 PM	11	111	35	32	122	34	42	93	8	18	65	24	595
5:00 PM	15	95	28	42	144	22	54	189	17	13	83	20	722
5:15 PM	9	108	26	49	147	38	47	121	16	14	77	18	670
5:30 PM	10	120	22	35	158	29	39	121	10	23	66	20	653
5:45 PM	10	104	14	21	142	25	38	89	9	19	61	23	555
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	91	878	204	267	1066	255	371	944	114	140	549	167	5046
Approach %	7.76	74.85	17.39	16.81	67.13	16.06	25.96	66.06	7.98	16.36	64.14	19.51	
App/Depart	1173	/	1416	1588	/	1320	1429	/	1415	856	/	895	

PM Peak Hr Begins at: 445 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	45	434	111	158	571	123	182	524	51	68	291	82	2640
Approach %	7.63	73.56	18.81	18.54	67.02	14.44	24.04	69.22	6.74	15.42	65.99	18.59	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.939		0.910		0.728		0.950		0.914			

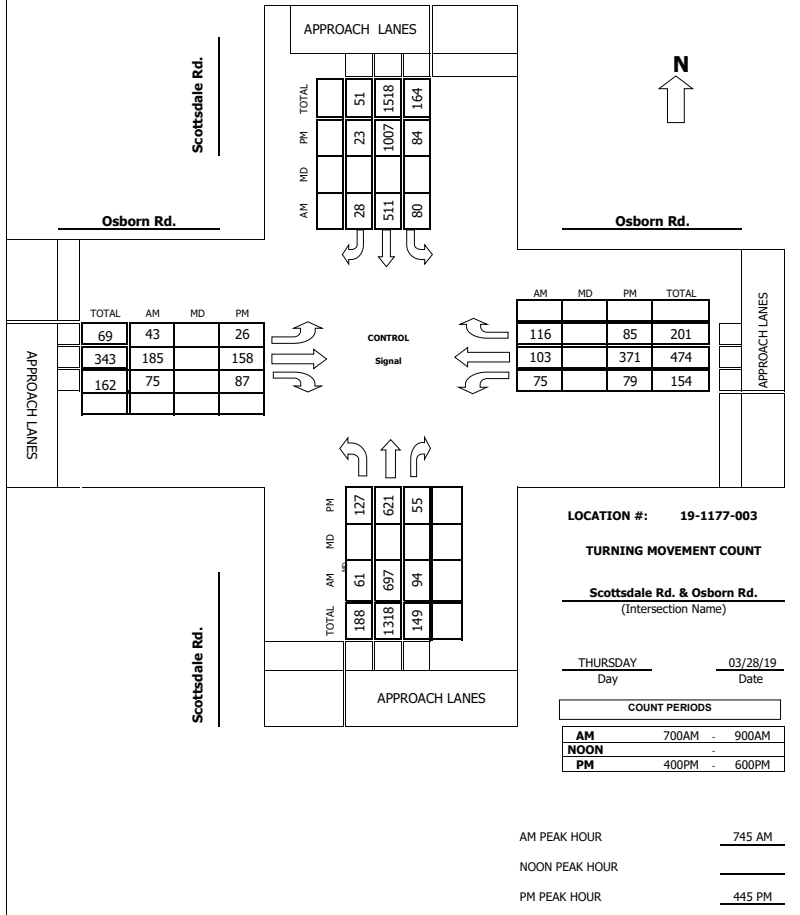
CONTROL: Signal
 COMMENT 1: 33.487645, -111.917511
 GPS:

Intersection Turning Movement
Prepared by:



Project #: **19-1177-003**

TMC SUMMARY OF Scottsdale Rd. & Osborn Rd.



Intersection Turning Movement
Prepared by:



N-S STREET: **Scottsdale Rd.** DATE: **03/28/19** LOCATION: **Scottsdale**
E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT# **19-1177-003**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	10	122	19	19	89	5	7	23	17	17	22	21	371
7:15 AM	14	141	16	21	99	2	4	43	19	21	24	25	429
7:30 AM	15	154	20	24	103	3	8	39	16	25	29	32	468
7:45 AM	13	181	21	25	133	6	11	66	13	21	26	30	546
8:00 AM	19	188	28	20	131	9	10	36	20	20	25	33	539
8:15 AM	16	174	24	18	125	5	14	41	21	16	28	29	511
8:30 AM	13	154	21	17	122	8	8	42	21	18	24	24	472
8:45 AM	18	158	19	18	14	5	5	41	19	17	29	28	371
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	118	1272	168	162	816	43	67	331	146	155	207	222	3707
Approach %	7.57	81.64	10.78	15.87	79.92	4.21	12.32	60.85	26.84	26.54	35.45	38.01	
App/Depart	1558	/	1561	1021	/	1117	544	/	661	584	/	368	

AM Peak Hr Begins at: 745 AM

PEAK

Volumes	61	697	94	80	511	28	43	185	75	75	103	116	2068
Approach %	7.16	81.81	11.03	12.92	82.55	4.52	14.19	61.06	24.75	25.51	35.03	39.46	

PEAK HR. FACTOR:

	0.906	0.944	0.842	0.942	0.947
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CONTROL: **Signal**
COMMENT 1:
GPS: **33.487645, -111.926173**

Intersection Turning Movement



N-S STREET: **Scottsdale Rd.** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT# **19-1177-003**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	17	122	14	20	202	5	7	40	19	44	55	24	569
4:15 PM	19	147	15	21	255	5	4	44	16	42	50	28	646
4:30 PM	22	154	13	25	245	2	8	45	13	41	54	21	643
4:45 PM	20	151	16	24	258	3	5	41	22	24	87	24	675
5:00 PM	24	155	15	26	252	6	9	24	20	20	89	20	660
5:15 PM	41	154	14	20	256	9	6	45	24	18	96	22	705
5:30 PM	42	161	10	14	241	5	6	48	21	17	99	19	683
5:45 PM	29	133	11	16	219	8	8	43	19	18	60	19	583
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	214	1177	108	166	1928	43	53	330	154	224	590	177	5164
Approach %	14.28	78.52	7.20	7.77	90.22	2.01	9.87	61.45	28.68	22.60	59.54	17.86	
App/Depart	1499	/	1407	2137	/	2306	537	/	604	991	/	847	

PM Peak Hr Begins at: 445 PM

PEAK	Volumes	Approach %
PEAK	127 621 55 84 1007 23 26 158 87 79 371 85 2723	15.82 77.33 6.85 7.54 90.39 2.06 9.59 58.30 32.10 14.77 69.35 15.89

PEAK HR. FACTOR:	0.942	0.977	0.903	0.983	0.966
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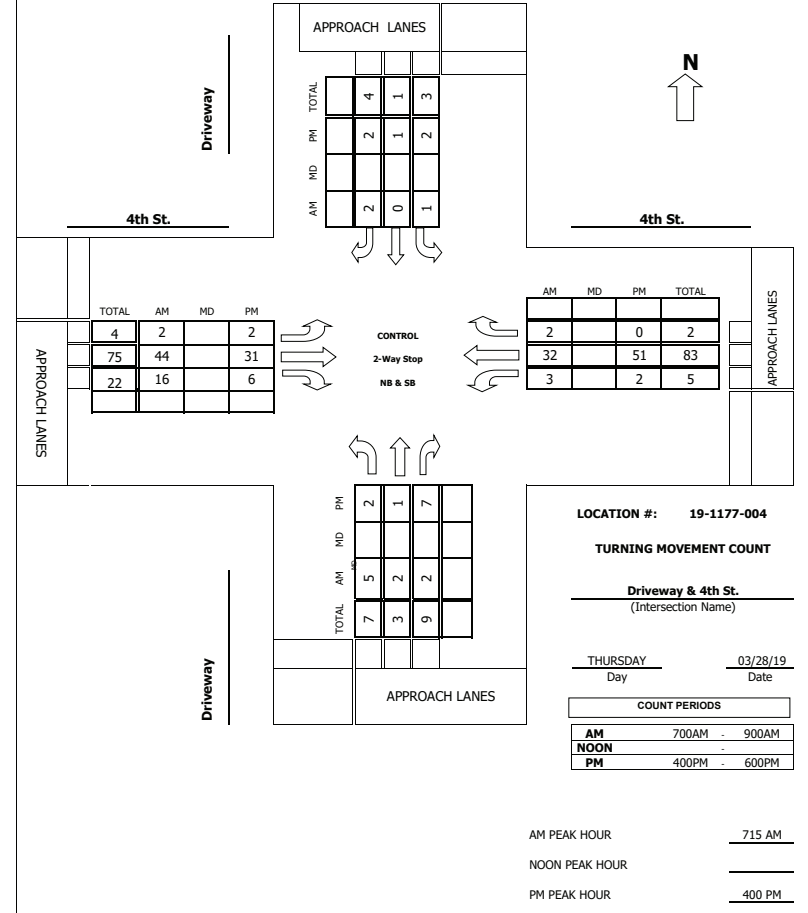
CONTROL: **Signal**
 COMMENT 1: **0**
 GPS: **33.487645, -111.926173**

Intersection Turning Movement Prepared by:



Project #: **19-1177-004**

TMC SUMMARY OF Driveway & 4th St.



Intersection Turning Movement
Prepared by:



N-S STREET: **Driveway** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **4th St.** DAY: **THURSDAY** PROJECT# **19-1177-004**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	1	1	1	1	0	0	4	4	2	7	1	23
7:15 AM	0	1	0	1	0	0	1	11	5	0	8	0	27
7:30 AM	1	0	0	0	0	1	0	10	3	2	6	1	24
7:45 AM	0	0	1	0	0	0	0	12	5	1	10	0	29
8:00 AM	4	1	1	0	0	1	1	11	3	0	8	1	31
8:15 AM	0	0	2	0	2	0	0	9	3	0	4	0	20
8:30 AM	0	2	1	1	0	0	0	6	3	0	6	0	19
8:45 AM	1	1	0	0	1	0	0	4	0	2	4	1	14
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	7	6	6	3	4	2	2	67	26	7	53	4	187
Approach %	36.84	31.58	31.58	33.33	44.44	22.22	2.11	70.53	27.37	10.94	82.81	6.25	
App/Depart	19	/	12	9	/	37	95	/	76	64	/	62	

AM Peak Hr Begins at: 715 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	5	2	2	1	0	2	2	44	16	3	32	2	111
Approach %	55.56	22.22	22.22	33.33	0.00	66.67	3.23	70.97	25.81	8.11	86.49	5.41	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.375			0.750			0.912			0.841		0.895

CONTROL: **2-Way Stop (NB & SB)**
 COMMENT 1:
 GPS: **33.489338, -111.923977**

Intersection Turning Movement



N-S STREET: **Driveway** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **4th St.** DAY: **THURSDAY** PROJECT# **19-1177-004**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	0	4	1	0	0	0	7	3	2	11	0	30
4:15 PM	0	0	2	0	0	1	0	13	1	0	13	0	30
4:30 PM	0	1	0	1	0	1	1	6	1	0	12	0	23
4:45 PM	0	0	1	0	1	0	1	5	1	0	15	0	24
5:00 PM	0	0	1	0	0	1	0	11	0	0	13	0	26
5:15 PM	1	0	0	0	0	0	0	6	3	0	8	0	18
5:30 PM	0	1	0	1	0	0	0	4	3	0	8	1	18
5:45 PM	0	0	1	0	1	1	0	6	1	0	8	0	18
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	3	2	9	3	2	4	2	58	13	2	88	1	187
Approach %	21.43	14.29	64.29	33.33	22.22	44.44	2.74	79.45	17.81	2.20	96.70	1.10	
App/Depart	14	/	5	9	/	17	73	/	70	91	/	95	

PM Peak Hr Begins at: 400 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	2	1	7	2	1	2	2	31	6	2	51	0	107
Approach %	20.00	10.00	70.00	40.00	20.00	40.00	5.13	79.49	15.38	3.77	96.23	0.00	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.417			0.625			0.696			0.883		0.892

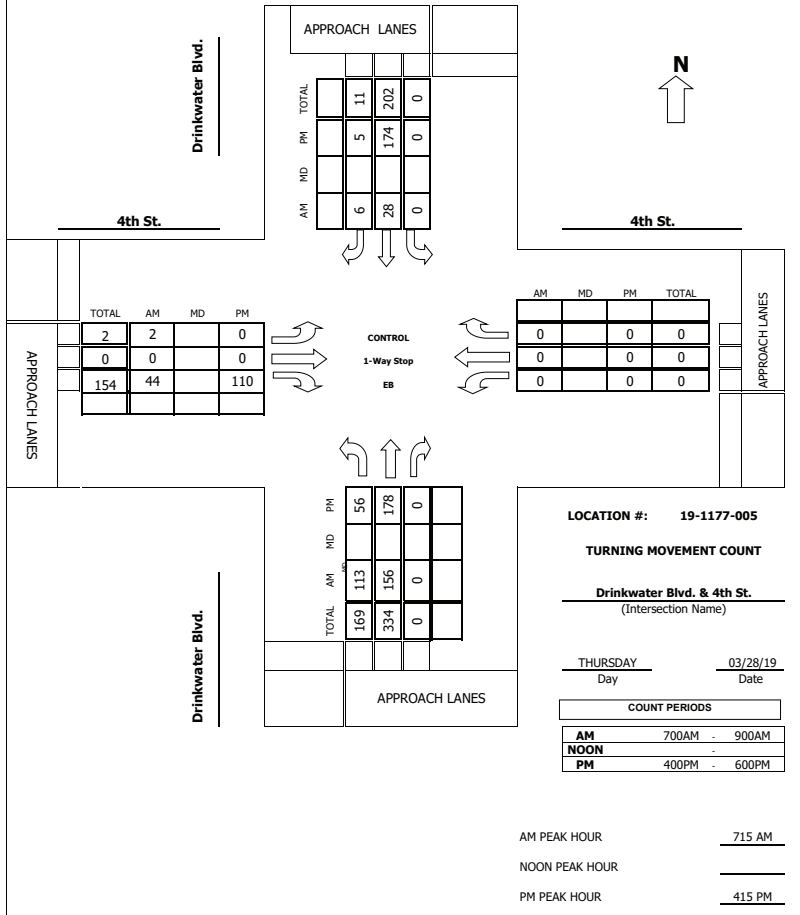
CONTROL: **2-Way Stop (NB & SB)**
 COMMENT 1:
 GPS: **33.489338, -111.923977**

Intersection Turning Movement
Prepared by:



Project #: **19-1177-005**

TMC SUMMARY OF Drinkwater Blvd. & 4th St.



Intersection Turning Movement
Prepared by:



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
E-W STREET: 4th St. DAY: THURSDAY PROJECT#: 19-1177-005

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM	1	3	0	0	2	0	0	1	0	0	0	0	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	23	25	0	0	3	0	0	0	6	0	0	57	
7:15 AM	34	26	0	0	6	2	1	0	10	0	0	79	
7:30 AM	35	37	0	0	6	0	0	0	11	0	0	89	
7:45 AM	26	49	0	0	4	1	0	0	15	0	0	95	
8:00 AM	18	44	0	0	12	3	1	0	8	0	0	86	
8:15 AM	22	30	0	0	3	0	0	0	7	0	0	62	
8:30 AM	20	35	0	0	9	1	0	0	8	0	0	73	
8:45 AM	15	36	0	0	4	3	0	0	9	0	0	67	
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	193	282	0	0	47	10	2	0	74	0	0	0	608
Approach %	40.63	59.37	0.00	0.00	82.46	17.54	2.63	0.00	97.37	####	####	####	
App/Depart	475	/	284	57	/	121	76	/	0	0	/	203	

AM Peak Hr Begins at: 715 AM

PEAK

Volumes	113	156	0	0	28	6	2	0	44	0	0	0	349
Approach %	42.01	57.99	0.00	0.00	82.35	17.65	4.35	0.00	95.65	####	####	####	

PEAK HR. FACTOR:

	0.897	0.567	0.767	0.000	0.918
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CONTROL: 1-Way Stop (EB)
COMMENT 1: 33.489332, -111.921848
GPS:

Intersection Turning Movement



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: 4th St. DAY: THURSDAY PROJECT#: 19-1177-005

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	16	34	0	0	25	0	0	0	30	0	0	0	105
4:15 PM	12	30	0	0	44	1	0	0	36	0	0	0	123
4:30 PM	21	41	0	0	30	1	0	0	33	0	0	0	126
4:45 PM	11	53	0	0	56	1	0	0	26	0	0	0	147
5:00 PM	12	54	0	0	44	2	0	0	15	0	0	0	127
5:15 PM	14	39	0	0	32	0	0	0	18	0	0	0	103
5:30 PM	17	46	0	0	17	0	1	0	12	0	0	0	93
5:45 PM	10	39	0	0	16	1	2	0	18	0	0	0	86
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	113	336	0	0	264	6	3	0	188	0	0	0	910
Approach %	25.17	74.83	0.00	0.00	97.78	2.22	1.57	0.00	98.43	###	###	###	
App/Depart	449	/	339	270	/	452	191	/	0	0	/	119	

PM Peak Hr Begins at: 415 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	56	178	0	0	174	5	0	0	110	0	0	0	523
Approach %	23.93	76.07	0.00	0.00	97.21	2.79	0.00	0.00	100.00	###	###	###	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.886			0.785				0.764			0.000	0.889

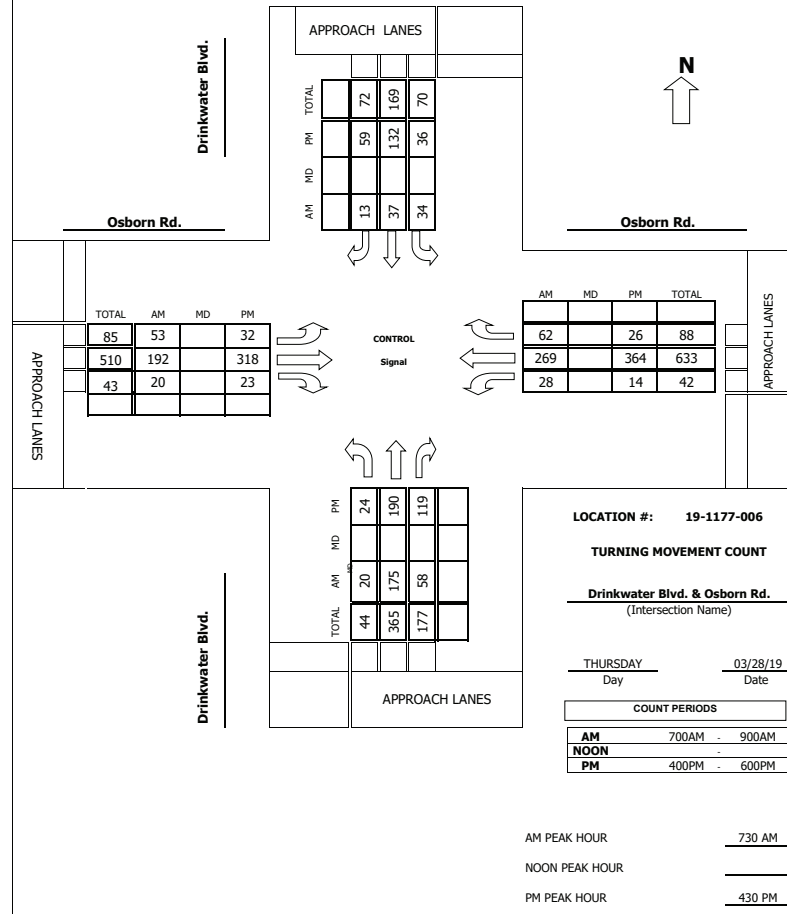
CONTROL: 1-Way Stop (EB)
 COMMENT 1: 0
 GPS: 33.489332, -111.921848

Intersection Turning Movement Prepared by:



Project #: 19-1177-006

TMC SUMMARY OF Drinkwater Blvd. & Osborn Rd.



Intersection Turning Movement
Prepared by:



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: Osborn Rd. DAY: THURSDAY PROJECT#: 19-1177-006

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	33	8	5	5	7	8	29	8	5	50	16	178
7:15 AM	2	30	11	4	8	5	11	41	5	3	54	13	187
7:30 AM	5	35	10	7	9	2	10	43	9	6	74	18	228
7:45 AM	2	54	14	10	11	6	14	45	6	9	69	17	257
8:00 AM	8	41	18	11	10	3	16	50	3	5	66	15	246
8:15 AM	5	45	16	6	7	2	13	54	2	8	60	12	230
8:30 AM	9	41	13	3	9	2	19	41	5	4	65	13	224
8:45 AM	9	43	18	1	9	4	17	43	5	7	58	19	233
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	44	322	108	47	68	31	108	346	43	47	496	123	1783
Approach %	9.28	67.93	22.78	32.19	46.58	21.23	21.73	69.62	8.65	7.06	74.47	18.47	
App/Depart	474	/	553	146	/	158	497	/	501	666	/	571	

AM Peak Hr Begins at: 730 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	20	175	58	34	37	13	53	192	20	28	269	62	961
Approach %	7.91	69.17	22.92	40.48	44.05	15.48	20.00	72.45	7.55	7.80	74.93	17.27	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.904		0.778		0.960		0.916		0.935			

CONTROL: Signal
 COMMENT 1: 33.487652, -111.921881

Intersection Turning Movement



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: Osborn Rd. DAY: THURSDAY PROJECT#: 19-1177-006

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3	28	28	19	36	12	7	78	5	2	78	13	309
4:15 PM	2	24	24	13	55	12	11	80	8	3	80	9	321
4:30 PM	5	41	29	11	41	16	10	74	5	6	85	6	329
4:45 PM	8	45	30	10	42	13	8	76	9	2	89	8	340
5:00 PM	7	50	32	7	29	16	5	69	6	5	103	5	334
5:15 PM	4	54	28	8	20	14	9	99	3	1	87	7	334
5:30 PM	8	41	24	9	24	10	6	87	2	4	74	4	293
5:45 PM	5	43	21	9	24	11	8	74	5	1	76	8	285
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	42	326	216	86	271	104	64	637	43	24	672	60	2545
Approach %	7.19	55.82	36.99	18.66	58.79	22.56	8.60	85.62	5.78	3.17	88.89	7.94	
App/Depart	584	/	450	461	/	338	744	/	939	756	/	818	

PM Peak Hr Begins at: 430 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	24	190	119	36	132	59	32	318	23	14	364	26	1337
Approach %	7.21	57.06	35.74	15.86	58.15	25.99	8.58	85.25	6.17	3.47	90.10	6.44	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.935		0.835		0.840		0.894		0.983			

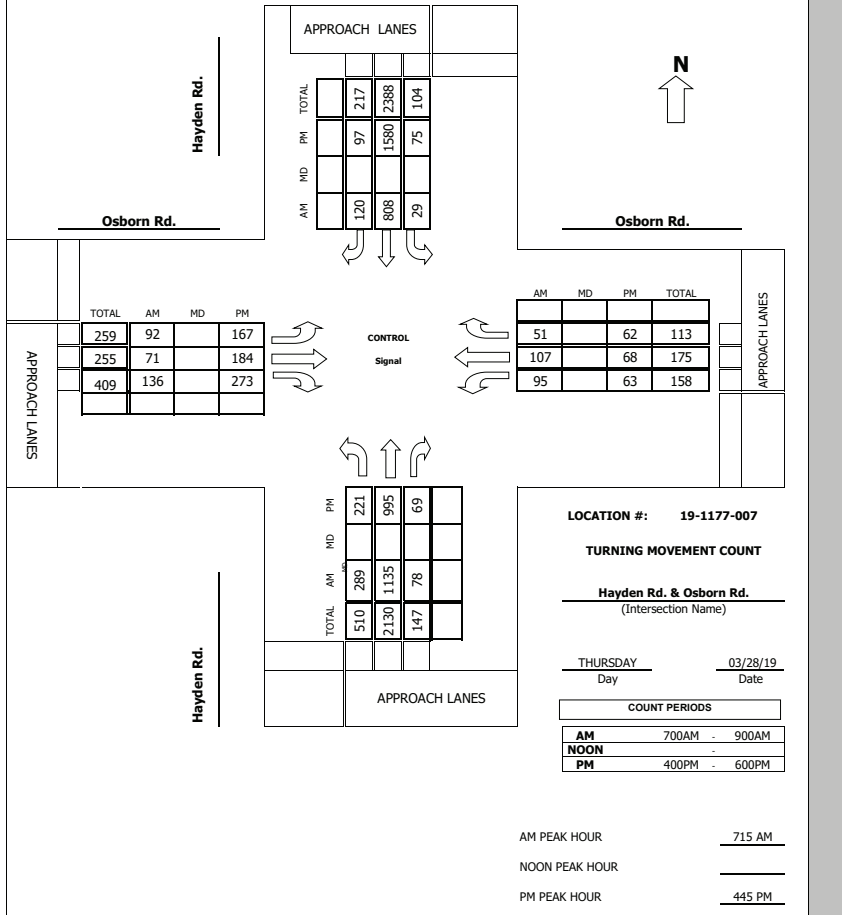
CONTROL: Signal
 COMMENT 1: 33.487652, -111.921881

Intersection Turning Movement
Prepared by:



Project #: **19-1177-007**

TMC SUMMARY OF Hayden Rd. & Osborn Rd.



Intersection Turning Movement
Prepared by:



N-S STREET: **Hayden Rd.** DATE: **03/28/19** LOCATION: **Scottsdale**
E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT# **19-1177-007**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
	1	3	0	1	3	0	1	1	1	1	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	55	274	19	4	199	24	17	13	28	24	19	17	693
7:15 AM	74	289	16	7	196	25	18	16	24	25	22	16	728
7:30 AM	78	285	13	8	200	32	20	14	41	20	20	14	745
7:45 AM	63	276	25	8	208	30	24	21	42	26	24	10	757
8:00 AM	74	285	24	6	204	33	30	20	29	24	41	11	781
8:15 AM	69	258	21	9	161	29	31	22	30	20	42	13	705
8:30 AM	50	222	19	5	154	24	33	16	32	22	29	16	622
8:45 AM	43	199	16	8	174	28	30	19	25	19	30	19	610
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	506	2088	153	55	1496	225	203	141	251	180	227	116	5641
Approach %	18.42	76.01	5.57	3.10	84.23	12.67	34.12	23.70	42.18	34.42	43.40	22.18	
App/Depart	2747	/	2407	1776	/	1927	595	/	349	523	/	958	

AM Peak Hr Begins at: 715 AM

PEAK

Volumes	289	1135	78	29	808	120	92	71	136	95	107	51	3011
Approach %	19.24	75.57	5.19	3.03	84.43	12.54	30.77	23.75	45.48	37.55	42.29	20.16	

PEAK HR. FACTOR:

	0.980	0.973	0.859	0.832	0.964
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CONTROL: **Signal**
COMMENT 1:
GPS: 33.487633, -111.908942

Intersection Turning Movement



N-S STREET: **Hayden Rd.** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **Osborn Rd.** DAY: **THURSDAY** PROJECT# **19-1177-007**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM	1	3	0	1	3	0	1	1	1	1	1	0	
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	41	219	19	13	333	32	28	43	74	13	28	16	859
4:15 PM	42	255	20	16	305	30	24	33	78	16	24	18	861
4:30 PM	45	263	24	14	341	29	41	39	80	15	21	14	926
4:45 PM	50	252	21	21	422	24	42	50	58	17	19	15	991
5:00 PM	46	258	19	20	396	28	43	44	69	17	16	13	969
5:15 PM	60	241	16	16	388	21	43	40	76	13	13	16	943
5:30 PM	65	244	13	18	374	24	39	50	70	16	20	18	951
5:45 PM	52	285	18	17	325	28	33	40	64	19	21	17	919
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	401	2017	150	135	2884	216	293	339	569	126	162	127	7419
Approach %	15.62	78.54	5.84	4.17	89.15	6.68	24.40	28.23	47.38	30.36	39.04	30.60	
App/Depart	2568	/	2437	3235	/	3579	1201	/	624	415	/	779	

PM Peak Hr Begins at: 445 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	221	995	69	75	1580	97	167	184	273	63	68	62	3854
Approach %	17.20	77.43	5.37	4.28	90.18	5.54	26.76	29.49	43.75	32.64	35.23	32.12	

PEAK HR. FACTOR:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
		0.995		0.938		0.981		0.894		0.972			

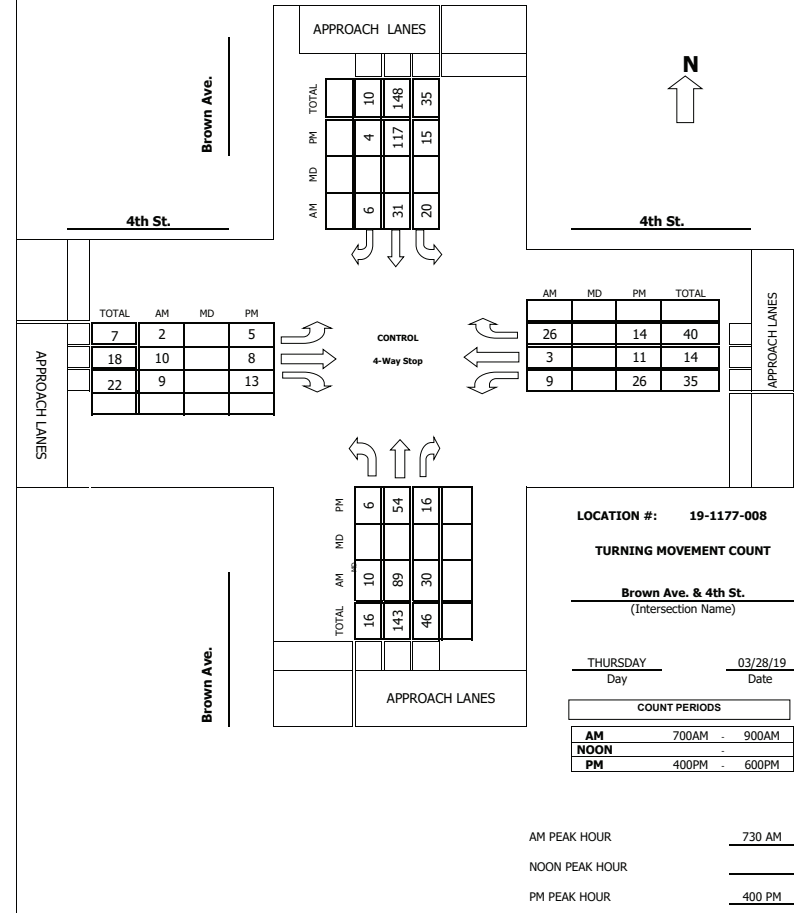
CONTROL: **Signal**
 COMMENT 1: **0**
 GPS: **33.487633, -111.908942**

Intersection Turning Movement Prepared by:



Project #: **19-1177-008**

TMC SUMMARY OF Brown Ave. & 4th St.



Intersection Turning Movement

Prepared by:



N-S STREET: **Brown Ave.** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **4th St.** DAY: **THURSDAY** PROJECT# **19-1177-008**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	8	6	0	10	1	0	3	0	1	1	4	35
7:15 AM	2	13	8	4	8	1	0	4	1	0	0	2	43
7:30 AM	2	29	7	3	8	3	0	4	3	3	1	4	67
7:45 AM	0	27	12	7	6	0	0	3	2	1	1	9	68
8:00 AM	5	14	5	5	4	2	0	2	1	3	1	8	50
8:15 AM	3	19	6	5	13	1	2	1	3	2	0	5	60
8:30 AM	2	19	3	5	11	0	2	1	2	3	1	3	52
8:45 AM	6	18	1	1	8	2	1	1	1	2	0	3	44
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	21	147	48	30	68	10	5	19	13	15	5	38	419
Approach %	9.72	68.06	22.22	27.78	62.96	9.26	13.51	51.35	35.14	25.86	8.62	65.52	
App/Depart	216	/	190	108	/	96	37	/	97	58	/	36	

AM Peak Hr Begins at: 730 AM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	10	89	30	20	31	6	2	10	9	9	3	26	245
Approach %	7.75	68.99	23.26	35.09	54.39	10.53	9.52	47.62	42.86	23.68	7.89	68.42	

PEAK HR. FACTOR: | 0.827 | 0.750 | 0.750 | 0.792 | 0.901 |

CONTROL: 4-Way Stop
 COMMENT 1:
 GPS: 33.489342, -111.924728

Intersection Turning Movement



N-S STREET: **Brown Ave.** DATE: **03/28/19** LOCATION: **Scottsdale**
 E-W STREET: **4th St.** DAY: **THURSDAY** PROJECT# **19-1177-008**

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	20	7	2	36	0	1	3	6	5	2	4	87
4:15 PM	0	12	3	8	31	2	0	2	6	9	4	0	77
4:30 PM	3	17	3	3	30	1	1	1	1	8	1	4	73
4:45 PM	2	5	3	2	20	1	3	2	0	4	4	6	52
5:00 PM	1	9	6	3	35	0	1	1	2	11	1	5	75
5:15 PM	1	18	4	4	28	1	1	1	10	5	0	2	75
5:30 PM	0	8	4	3	17	1	2	1	3	2	1	6	48
5:45 PM	1	5	5	0	15	0	1	0	0	4	1	4	36
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	9	94	35	25	212	6	10	11	28	48	14	31	523
Approach %	6.52	68.12	25.36	10.29	87.24	2.47	20.41	22.45	57.14	51.61	15.05	33.33	
App/Depart	138	/	135	243	/	288	49	/	71	93	/	29	

PM Peak Hr Begins at: 400 PM

PEAK	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	6	54	16	15	117	4	5	8	13	26	11	14	289
Approach %	7.89	71.05	21.05	11.03	86.03	2.94	19.23	30.77	50.00	50.98	21.57	27.45	

PEAK HR. FACTOR: | 0.679 | 0.829 | 0.650 | 0.911 | 0.830 |

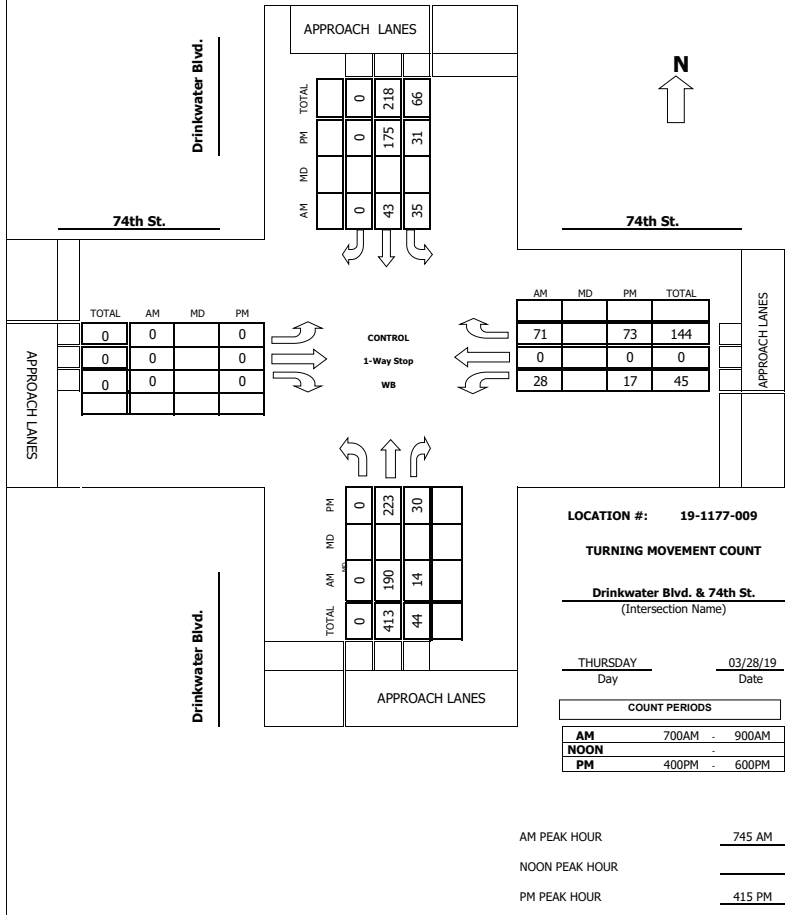
CONTROL: 4-Way Stop
 COMMENT 1:
 GPS: 33.489342, -111.924728

Intersection Turning Movement
Prepared by:



Project #: **19-1177-009**

TMC SUMMARY OF Drinkwater Blvd. & 74th St.



Intersection Turning Movement
Prepared by:



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
E-W STREET: 74th St. DAY: THURSDAY PROJECT#: 19-1177-009

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
6:00 AM	0	3	0	1	2	0	0	0	0	1	0	1	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	30	3	8	9	0	0	0	0	5	0	14	69
7:15 AM	0	33	2	5	11	0	0	0	0	5	0	15	71
7:30 AM	0	43	4	6	15	0	0	0	0	2	0	8	78
7:45 AM	0	45	4	12	13	0	0	0	0	7	0	16	97
8:00 AM	0	50	3	9	9	0	0	0	0	8	0	13	92
8:15 AM	0	54	4	4	11	0	0	0	0	8	0	14	95
8:30 AM	0	41	3	10	10	0	0	0	0	5	0	28	97
8:45 AM	0	39	5	11	12	0	0	0	0	12	0	13	92
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	335	28	65	90	0	0	0	0	52	0	121	691
Approach %	0.00	92.29	7.71	41.94	58.06	0.00	####	####	####	30.06	0.00	69.94	
App/Depart	363	/	456	155	/	142	0	/	93	173	/	0	

AM Peak Hr Begins at: 745 AM

PEAK

Volumes	0	190	14	35	43	0	0	0	0	28	0	71	381
Approach %	0.00	93.14	6.86	44.87	55.13	0.00	####	####	####	28.28	0.00	71.72	

PEAK HR. FACTOR:

	0.879		0.780		0.000		0.750		0.982
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CONTROL: 1-Way Stop (WB)
COMMENT 1:
GPS: 33.486267, -111.922294

Intersection Turning Movement



N-S STREET: Drinkwater Blvd. DATE: 03/28/19 LOCATION: Scottsdale
 E-W STREET: 74th St. DAY: THURSDAY PROJECT#: 19-1177-009

LANES:	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			TOTAL
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	
1:00 PM	0	3	0	1	2	0	0	0	0	1	0	1	
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	43	1	15	20	0	0	0	0	7	0	16	102
4:15 PM	0	36	9	6	50	0	0	0	0	4	0	20	125
4:30 PM	0	55	9	12	43	0	0	0	0	3	0	19	141
4:45 PM	0	59	7	6	43	0	0	0	0	3	0	19	137
5:00 PM	0	73	5	7	39	0	0	0	0	7	0	15	146
5:15 PM	0	75	5	11	20	0	0	0	0	3	0	8	122
5:30 PM	0	69	4	9	24	0	0	0	0	5	0	10	121
5:45 PM	0	52	5	5	19	0	0	0	0	3	0	17	101
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	462	45	71	258	0	0	0	0	35	0	124	995
Approach %	0.00	91.12	8.88	21.58	78.42	0.00	####	####	####	22.01	0.00	77.99	
App/Depart	507	/	586	329	/	293	0	/	116	159	/	0	

PM Peak Hr Begins at: 415 PM

PEAK

Volumes	0	223	30	31	175	0	0	0	0	17	0	73	549
Approach %	0.00	88.14	11.86	15.05	84.95	0.00	####	####	####	18.89	0.00	81.11	

PEAK HR. FACTOR: 0.811 | 0.920 | 0.000 | 0.938 | 0.940

CONTROL: 1-Way Stop (WB)
 COMMENT 1: 0
 GPS: 33.486267, -111.922294

APPENDIX C

EXISTING PEAK HOUR ANALYSIS AND SIGNAL TIMING

Existing AM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.7											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	10	9	9	3	26	10	89	30	20	31	6
Future Vol, veh/h	2	10	9	9	3	26	10	89	30	20	31	6
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.83	0.83	0.83	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	13	12	11	4	33	12	107	36	27	41	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	7.4			7.3			7.9			7.7		
HCM LOS	A			A			A			A		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	8%	10%	24%	35%								
Vol Thru, %	69%	48%	8%	54%								
Vol Right, %	23%	43%	68%	11%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	129	21	38	57								
LT Vol	10	2	9	20								
Through Vol	89	10	3	31								
RT Vol	30	9	26	6								
Lane Flow Rate	155	28	48	76								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.173	0.033	0.055	0.089								
Departure Headway (Hd)	4.001	4.249	4.103	4.193								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	889	847	878	846								
Service Time	2.059	2.251	2.104	2.263								
HCM Lane V/C Ratio	0.174	0.033	0.055	0.09								
HCM Control Delay	7.9	7.4	7.3	7.7								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.6	0.1	0.2	0.3								

Existing AM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	44	16	3	32	2	5	2	2	1	0	2
Future Vol, veh/h	2	44	16	3	32	2	5	2	2	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	84	84	84	38	38	38	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	48	18	4	38	2	13	5	5	1	0	3
Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	40	0	0	66	0	0	110	109	57	113	117	39
Stage 1	-	-	-	-	-	-	61	61	-	47	47	-
Stage 2	-	-	-	-	-	-	49	48	-	66	70	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1570	-	-	1536	-	-	868	781	1009	864	773	1033
Stage 1	-	-	-	-	-	-	950	844	-	967	856	-
Stage 2	-	-	-	-	-	-	964	855	-	945	837	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1570	-	-	1536	-	-	863	778	1009	853	770	1033
Mov Cap-2 Maneuver	-	-	-	-	-	-	863	778	-	853	770	-
Stage 1	-	-	-	-	-	-	949	843	-	966	853	-
Stage 2	-	-	-	-	-	-	959	852	-	933	836	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			0.6			9.3			8.7		
HCM LOS							A			A		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	870	1570	-	-	1536	-	-	965				
HCM Lane V/C Ratio	0.027	0.001	-	-	0.002	-	-	0.004				
HCM Control Delay (s)	9.3	7.3	0	-	7.3	0	-	8.7				
HCM Lane LOS	A	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0				

Existing AM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

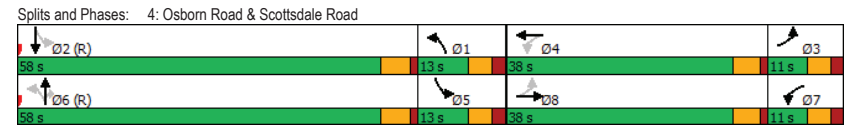
Intersection						
Int Delay, s/veh	3.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔↔↔		↔↔	
Traffic Vol, veh/h	2	44	113	156	28	6
Future Vol, veh/h	2	44	113	156	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	70	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	77	77	90	90	57	57
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	57	126	173	49	11
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	376	30	60	0	-	0
Stage 1	55	-	-	-	-	-
Stage 2	321	-	-	-	-	-
Critical Hdwy	6.29	6.94	4.14	-	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-	-
Follow-up Hdwy	3.67	3.32	2.22	-	-	-
Pot Cap-1 Maneuver	687	1038	1542	-	-	-
Stage 1	923	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Platoon blocked, %	1	-	-	-	-	-
Mov Cap-1 Maneuver	631	1038	1542	-	-	-
Mov Cap-2 Maneuver	569	-	-	-	-	-
Stage 1	847	-	-	-	-	-
Stage 2	749	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	8.8	3.2	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1542	-	1002	-	-	
HCM Lane V/C Ratio	0.081	-	0.06	-	-	
HCM Control Delay (s)	7.5	-	8.8	-	-	
HCM Lane LOS	A	-	A	-	-	
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-	

Existing AM
4: Osborn Road & Scottsdale Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔↔	↔	↔↔	↔	↔	↔↔↔
Traffic Volume (vph)	43	185	75	103	61	697	94	80	511
Future Volume (vph)	43	185	75	103	61	697	94	80	511
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	11.0	38.0	11.0	38.0	13.0	58.0	58.0	13.0	58.0
Total Split (%)	9.2%	31.7%	9.2%	31.7%	10.8%	48.3%	48.3%	10.8%	48.3%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	42.2	37.4	42.2	37.4	60.2	55.4	55.4	60.2	55.4
Actuated g/C Ratio	0.35	0.31	0.35	0.31	0.50	0.46	0.46	0.50	0.46
v/c Ratio	0.13	0.27	0.23	0.20	0.17	0.45	0.14	0.30	0.23
Control Delay	25.7	27.2	27.5	15.2	16.1	23.5	3.0	19.9	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	27.2	27.5	15.2	16.1	23.5	3.0	19.9	20.0
LOS	C	C	C	B	B	C	A	B	B
Approach Delay	27.0		18.3		20.7		19.9		
Approach LOS	C		B		C		B		

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 6 (5%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 21.1
 Intersection Capacity Utilization 52.3%
 Intersection LOS: C
 ICU Level of Service A
 Analysis Period (min) 15



Existing AM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	43	185	75	75	103	116	61	697	94	80	511	28
Future Volume (veh/h)	43	185	75	75	103	116	61	697	94	80	511	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	51	220	59	80	110	49	67	766	65	85	544	14
Peak Hour Factor	0.84	0.84	0.84	0.94	0.94	0.94	0.91	0.91	0.91	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	404	804	211	348	702	297	481	1640	658	363	2362	61
Arrive On Green	0.04	0.27	0.27	0.04	0.27	0.27	0.07	0.44	0.44	0.07	0.44	0.44
Sat Flow, veh/h	1688	2932	768	1688	2561	1083	1688	3741	1502	1688	5389	138
Grp Volume(v), veh/h	51	138	141	80	79	80	67	766	65	85	361	197
Grp Sat Flow(s), veh/h/ln	1688	1870	1830	1688	1870	1774	1688	1870	1502	1688	1792	1944
Q Serve(g_s), s	0.0	7.0	7.2	0.0	3.8	4.1	0.0	17.4	3.0	0.0	7.6	7.6
Cycle Q Clear(g_c), s	0.0	7.0	7.2	0.0	3.8	4.1	0.0	17.4	3.0	0.0	7.6	7.6
Prop In Lane	1.00		0.42	1.00		0.61	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	404	513	502	348	513	486	481	1640	658	363	1571	852
V/C Ratio(X)	0.13	0.27	0.28	0.23	0.15	0.17	0.14	0.47	0.10	0.23	0.23	0.23
Avail Cap(c_a), veh/h	419	513	502	363	513	486	481	1640	658	363	1571	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.7	34.1	34.2	36.3	33.0	33.1	20.1	23.8	19.8	28.1	21.0	21.1
Incr Delay (d2), s/veh	0.1	1.3	1.4	0.1	0.6	0.7	0.0	1.0	0.3	0.1	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	3.4	3.4	1.9	1.8	1.9	1.1	7.8	1.1	1.8	3.2	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.7	35.4	35.6	36.4	33.6	33.8	20.2	24.8	20.1	28.2	21.4	21.7
LnGrp LOS	C	D	D	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		330			239			898			643	
Approach Delay, s/veh		35.1			34.6			24.1			22.4	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	58.0	10.0	38.0	14.0	58.0	10.0	38.0				
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1				
Max Green Setting (Gmax), s	7.4	52.6	* 5.7	* 33	7.4	52.6	* 5.7	* 33				
Max Q Clear Time (g_c+I1), s	2.0	9.6	2.0	6.1	2.0	19.4	2.0	9.2				
Green Ext Time (p_c), s	0.0	2.5	0.0	0.6	0.0	4.0	0.0	1.0				

Intersection Summary												
HCM 6th Ctrl Delay	26.5											
HCM 6th LOS	C											

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing AM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Vol, veh/h	9	245	94	16	273	75	1	0	1	28	0	34
Future Vol, veh/h	9	245	94	16	273	75	1	0	1	28	0	34
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	88	88	88	50	50	50	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	314	121	18	310	85	2	0	2	34	0	41

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	395	0	0	435
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	1311	-	-	1246
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	1	-	-	1
Mov Cap-1 Maneuver	1311	-	-	1246
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	10.2	10.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	692	1311	-	-	1246	-	-	560	987
HCM Lane V/C Ratio	0.006	0.009	-	-	0.015	-	-	0.061	0.042
HCM Control Delay (s)	10.2	7.8	-	-	7.9	-	-	11.8	8.8
HCM Lane LOS	B	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2	0.1

Notes
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Existing AM
6: Osborn Road & Drinkwater Boulevard

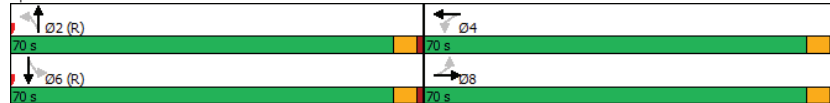
Honor Health
Timings

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	53	192	28	269	20	175	34	37
Future Volume (vph)	53	192	28	269	20	175	34	37
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		2		6	
Permitted Phases	8		4		2		6	
Detector Phase	8		4		2		6	
Switch Phase	8		4		2		6	
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2
Total Split (%)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
v/c Ratio	0.13	0.13	0.06	0.21	0.04	0.11	0.09	0.04
Control Delay	22.7	20.6	21.4	21.1	20.9	15.9	21.9	15.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.7	20.6	21.4	21.1	20.9	15.9	21.9	15.5
LOS	C	C	C	C	C	B	C	B
Approach Delay	21.0		21.1		16.3		18.1	
Approach LOS	C		C		B		B	

Intersection Summary

Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 14 (10%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.21	
Intersection Signal Delay: 19.5	Intersection LOS: B
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Osborn Road & Drinkwater Boulevard



Existing AM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↕	↔	↕	↕	↔	↕	↔
Traffic Volume (veh/h)	53	192	20	28	269	62	20	175	58	34	37	13
Future Volume (veh/h)	53	192	20	28	269	62	20	175	58	34	37	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	55	200	11	30	292	45	22	194	47	44	47	11
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	456	1669	91	530	1506	230	630	2022	464	522	1403	317
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	988	3606	197	1109	3254	496	1274	4369	1003	1079	3031	685
Grp Volume(v), veh/h	55	103	108	30	166	171	22	157	84	44	28	30
Grp Sat Flow(s),veh/h/ln	988	1870	1933	1109	1870	1880	1274	1792	1788	1079	1870	1845
Q Serve(g_s), s	4.9	4.4	4.4	2.2	7.3	7.5	1.3	3.5	3.7	3.4	1.2	1.2
Cycle Q Clear(g_c), s	12.4	4.4	4.4	6.7	7.3	7.5	2.6	3.5	3.7	7.1	1.2	1.2
Prop In Lane	1.00	1.00	1.00	1.00	0.26	1.00	0.56	1.00	1.00	1.00	1.00	0.37
Lane Grp Cap(c), veh/h	456	866	895	530	866	870	630	1659	828	522	866	854
V/C Ratio(X)	0.12	0.12	0.12	0.06	0.19	0.20	0.03	0.09	0.10	0.08	0.03	0.03
Avail Cap(c_a), veh/h	456	866	895	530	866	870	630	1659	828	522	866	854
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.9	21.4	21.4	23.3	22.2	22.2	21.2	21.1	21.2	23.2	20.5	20.5
Incr Delay (d2), s/veh	0.5	0.3	0.3	0.2	0.4	0.4	0.1	0.1	0.2	0.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	2.0	2.1	0.6	3.4	3.5	0.4	1.5	1.6	0.9	0.5	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.4	21.7	21.7	23.5	22.6	22.6	21.3	21.2	21.4	23.5	20.6	20.6
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h	266		367			263			102			
Approach Delay, s/veh	22.6		22.7			21.3			21.8			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	2		4			6			8			
Phs Duration (G+Y+Rc), s	70.0		70.0			70.0			70.0			
Change Period (Y+Rc), s	* 5.2		* 5.2			* 5.2			* 5.2			
Max Green Setting (Gmax), s	* 65		* 65			* 65			* 65			
Max Q Clear Time (g_c+I1), s	5.7		9.5			9.1			14.4			
Green Ext Time (p_c), s	0.3		0.3			0.1			0.2			

Intersection Summary

HCM 6th Ctrl Delay	22.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing AM
7: Osborn Road & Miller Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕	↔	
Traffic Volume (vph)	108	236	61	348	60	392	31	287	104	
Future Volume (vph)	108	236	61	348	60	392	31	287	104	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	8		4		6		2		2	
Permitted Phases	8		4		6		2		2	
Detector Phase	8		4		6		2		2	
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2	
Total Split (s)	50.0	50.0	50.0	50.0	70.0	70.0	70.0	70.0	70.0	
Total Split (%)	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	30.5	30.5	30.5	30.5	79.1	79.1	79.1	79.1	79.1	
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.66	0.66	0.66	0.66	0.66	
v/c Ratio	1.17	0.30	0.31	0.64	0.11	0.38	0.08	0.27	0.12	
Control Delay	182.0	33.7	36.4	36.8	10.9	12.0	11.0	10.9	2.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	182.0	33.7	36.4	36.8	10.9	12.0	11.0	10.9	2.4	
LOS	F	C	D	D	B	B	B	B	A	
Approach Delay	76.9		36.7		11.9		8.8			
Approach LOS	E		D		B		A			

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 31.1	Intersection LOS: C
Intersection Capacity Utilization 69.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Osborn Road & Miller Road



Existing AM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	↔
Traffic Volume (veh/h)	108	236	26	61	348	168	60	392	60	31	287	104
Future Volume (veh/h)	108	236	26	61	348	168	60	392	60	31	287	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	116	254	17	73	414	99	65	422	38	38	350	78
Peak Hour Factor	0.93	0.93	0.93	0.84	0.84	0.84	0.93	0.93	0.93	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	1041	69	310	877	208	550	1105	100	504	1223	932
Arrive On Green	0.29	0.29	0.29	0.10	0.10	0.10	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	841	3560	237	1050	3000	711	909	1780	160	883	1969	1502
Grp Volume(v), veh/h	116	133	138	73	257	256	65	0	460	38	350	78
Grp Sat Flow(s),veh/h/ln	841	1870	1926	1050	1870	1841	909	0	1940	883	1969	1502
Q Serve(g_s), s	16.1	6.5	6.6	7.9	15.6	15.8	4.3	0.0	14.1	2.7	9.8	2.5
Cycle Q Clear(g_c), s	32.0	6.5	6.6	14.4	15.6	15.8	14.1	0.0	14.1	16.8	9.8	2.5
Prop In Lane	1.00		0.12	1.00		0.39	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	195	547	563	310	547	538	550	0	1205	504	1223	932
V/C Ratio(X)	0.60	0.24	0.25	0.24	0.47	0.48	0.12	0.00	0.38	0.08	0.29	0.08
Avail Cap(c_a), veh/h	263	698	719	395	698	687	550	0	1205	504	1223	932
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.69	0.69	0.69	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	49.1	32.3	32.4	48.0	45.4	45.5	13.7	0.0	11.3	15.5	10.5	9.1
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.1	0.2	0.2	0.4	0.0	0.9	0.3	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	3.0	3.1	2.2	7.9	7.9	0.9	0.0	6.2	0.6	4.3	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.1	32.4	32.5	48.1	45.6	45.7	14.2	0.0	12.2	15.8	11.1	9.3
LnGrp LOS	D	C	C	D	D	D	B	A	B	B	B	A
Approach Vol, veh/h	387			586			525			466		
Approach Delay, s/veh	37.7			45.9			12.5			11.2		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	79.7		40.3		79.7		40.3					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 65		* 45		* 65		* 45					
Max Q Clear Time (g_c+I1), s	18.8		17.8		16.1		34.0					
Green Ext Time (p_c), s	0.4		2.3		0.6		1.1					

Intersection Summary	
HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

Notes

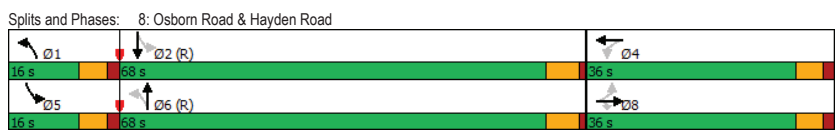
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing AM
8: Osborn Road & Hayden Road

Honor Health
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	↔	↗	↘	↔	↗	↔	↗	↔	↗	
Traffic Volume (vph)	92	71	136	95	107	289	1135	29	808	
Future Volume (vph)	92	71	136	95	107	289	1135	29	808	
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	
Protected Phases	8		8		4		6		2	
Permitted Phases	8		8		4		6		2	
Detector Phase	8	8	8	4	4	1	6	5	2	
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0	
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7	
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9	
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	None	
Act Effct Green (s)	17.2	17.2	17.2	17.2	17.2	91.2	84.7	79.9	74.8	
Actuated g/C Ratio	0.14	0.14	0.14	0.14	0.14	0.76	0.71	0.67	0.62	
v/c Ratio	1.06	0.30	0.45	0.64	0.67	0.67	0.33	0.10	0.29	
Control Delay	158.4	49.6	28.2	63.2	54.1	12.9	8.4	6.4	11.4	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	158.4	49.6	28.2	63.2	54.1	12.9	8.4	6.4	11.4	
LOS	F	D	C	E	D	B	A	A	B	
Approach Delay	73.3			57.5			9.2		11.3	
Approach LOS	E			E			A		B	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	80
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.06
Intersection Signal Delay:	21.5
Intersection Capacity Utilization:	67.7%
ICU Level of Service C	
Intersection LOS:	C
Analysis Period (min):	15



Existing AM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↗	↘	↔	↗	↘	↔	↗	↘	↔	↗	↘
Traffic Volume (veh/h)	92	71	136	95	107	51	289	1135	78	29	808	120
Future Volume (veh/h)	92	71	136	95	107	51	289	1135	78	29	808	120
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	107	83	94	114	129	37	295	1158	54	30	833	52
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.98	0.98	0.98	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	371	283	230	277	80	500	3369	157	340	3014	188
Arrive On Green	0.06	0.06	0.06	0.19	0.19	0.19	0.08	0.64	0.64	0.03	0.58	0.58
Sat Flow, veh/h	1155	1969	1502	1144	1471	422	1688	5263	245	1688	5172	322
Grp Volume(v), veh/h	107	83	94	114	129	0	166	295	788	424	30	576
Grp Sat Flow(s),veh/h/ln	1155	1969	1502	1144	1471	0	1893	1688	1792	1925	1688	1792
Q Serve(g_s), s	11.0	4.8	7.2	11.3	0.0	9.4	8.1	12.2	12.2	0.8	9.6	9.6
Cycle Q Clear(g_c), s	20.4	4.8	7.2	16.1	0.0	9.4	8.1	12.2	12.2	0.8	9.6	9.6
Prop In Lane	1.00	1.00	1.00	1.00	0.22	1.00	0.13	1.00	1.00	1.00	1.00	0.17
Lane Grp Cap(c), veh/h	188	371	283	230	0	357	500	2294	1232	340	2088	1114
V/C Ratio(X)	0.57	0.22	0.33	0.50	0.00	0.47	0.59	0.34	0.34	0.09	0.28	0.28
Avail Cap(c_a), veh/h	262	497	379	303	0	478	502	2294	1232	439	2088	1114
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	47.9	49.0	48.3	0.0	43.3	8.4	10.0	10.0	9.5	12.4	12.5
Incr Delay (d2), s/veh	1.0	0.1	0.2	0.6	0.0	0.4	1.2	0.4	0.8	0.0	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.4	2.8	3.3	0.0	4.4	2.9	4.7	5.2	0.3	3.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.9	48.0	49.3	49.0	0.0	43.7	9.7	10.4	10.7	9.5	12.8	13.1
LnGrp LOS	E	D	D	D	A	D	A	B	B	A	B	B
Approach Vol, veh/h	284			280			1507		915			
Approach Delay, s/veh	53.3			45.8			10.3		12.8			
Approach LOS	D			D			B		B			

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	15.9	75.8	28.3	9.0	82.7	28.3
Change Period (Y+Rc), s	* 5.8	* 5.9	* 5.7	* 5.8	* 5.9	* 5.7
Max Green Setting (Gmax), s	* 10	* 62	* 30	* 10	* 62	* 30
Max Q Clear Time (g_c+1), s	10.1	11.6	18.1	2.8	14.2	22.4
Green Ext Time (p_c), s	0.0	2.3	0.4	0.0	3.4	0.2

Intersection Summary	
HCM 6th Ctrl Delay	18.5
HCM 6th LOS	B

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing AM
9: Drinkwater Boulevard & 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔↔↔	↔↔↔	↔	↔	↔
Traffic Vol, veh/h	28	71	190	14	35	43
Future Vol, veh/h	28	71	190	14	35	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	88	88	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	95	216	16	45	55
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	342	116	0	0	232	0
Stage 1	224	-	-	-	-	-
Stage 2	118	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	639	777	-	-	903	-
Stage 1	726	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	607	777	-	-	903	-
Mov Cap-2 Maneuver	607	-	-	-	-	-
Stage 1	690	-	-	-	-	-
Stage 2	860	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.6	0	4.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	607	777	903	-
HCM Lane V/C Ratio	-	-	0.062	0.122	0.05	-
HCM Control Delay (s)	-	-	11.3	10.3	9.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.4	0.2	-

Existing AM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	0	0	0	0	0	0	84	0	0	62	0
Future Vol, veh/h	0	0	0	0	0	0	0	84	0	0	62	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	93	0	0	69	0
Major/Minor	Minor2	Minor1	Major1	Major2								
Conflicting Flow All	162	162	69	162	162	93	69	0	0	93	0	0
Stage 1	69	69	-	93	93	-	-	-	-	-	-	-
Stage 2	93	93	-	69	69	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	803	730	994	803	730	964	1532	-	-	1501	-	-
Stage 1	941	837	-	914	818	-	-	-	-	-	-	-
Stage 2	914	818	-	941	837	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	803	730	994	803	730	964	1532	-	-	1501	-	-
Mov Cap-2 Maneuver	803	730	-	803	730	-	-	-	-	-	-	-
Stage 1	941	837	-	914	818	-	-	-	-	-	-	-
Stage 2	914	818	-	941	837	-	-	-	-	-	-	-
Approach	EB	WB	NB	SB								
HCM Control Delay, s	0	0	0	0								
HCM LOS	A	A										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1532	-	-	-	-	1501	-	-				
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-				
HCM Control Delay (s)	0	-	-	0	0	0	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-				

Existing AM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔			↔
Traffic Vol, veh/h	0	0	84	0	0	62
Future Vol, veh/h	0	0	84	0	0	62
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	93	0	0	69

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	162	93	0 0 93 0
Stage 1	93	-	- - - -
Stage 2	69	-	- - - -
Critical Hdwy	6.42	6.22	- - 4.12 -
Critical Hdwy Stg 1	5.42	-	- - - -
Critical Hdwy Stg 2	5.42	-	- - - -
Follow-up Hdwy	3.518	3.318	- - 2.218 -
Pot Cap-1 Maneuver	829	964	- - 1501 -
Stage 1	931	-	- - - -
Stage 2	954	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	829	964	- - 1501 -
Mov Cap-2 Maneuver	829	-	- - - -
Stage 1	931	-	- - - -
Stage 2	954	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	1501	-
HCM Lane V/C Ratio	-	-	-	-
HCM Control Delay (s)	-	-	0	0
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	-

Existing PM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	8											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	5	8	13	26	11	14	6	54	16	15	117	4
Future Vol, veh/h	5	8	13	26	11	14	6	54	16	15	117	4
Peak Hour Factor	0.65	0.65	0.65	0.91	0.91	0.91	0.68	0.68	0.68	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	12	20	29	12	15	9	79	24	18	141	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.6	7.9	7.9	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	19%	51%	11%
Vol Thru, %	71%	31%	22%	86%
Vol Right, %	21%	50%	27%	3%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	76	26	51	136
LT Vol	6	5	26	15
Through Vol	54	8	11	117
RT Vol	16	13	14	4
Lane Flow Rate	112	40	56	164
Geometry Grp	1	1	1	1
Degree of Util (X)	0.131	0.048	0.07	0.191
Departure Headway (Hd)	4.222	4.347	4.526	4.192
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	854	827	795	842
Service Time	2.222	2.355	2.533	2.284
HCM Lane V/C Ratio	0.131	0.048	0.07	0.195
HCM Control Delay	7.9	7.6	7.9	8.3
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.5	0.2	0.2	0.7

Existing PM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	2	31	6	2	51	0	2	1	7	2	1	2
Future Vol, veh/h	2	31	6	2	51	0	2	1	7	2	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	88	88	88	42	42	42	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	44	9	2	58	0	5	2	17	3	2	3

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	58	0	0	53
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1546	-	-	1553
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1546	-	-	1553
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	8.9	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	951	1546	-	-	1553	-	-	878
HCM Lane V/C Ratio	0.025	0.002	-	-	0.001	-	-	0.009
HCM Control Delay (s)	8.9	7.3	0	-	7.3	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Existing PM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↕		↕	↕	↕	↕
Traffic Vol, veh/h	0	110	56	178	174	5
Future Vol, veh/h	0	110	56	178	174	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	70	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	145	63	200	220	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	429	113	226
Stage 1	223	-	-
Stage 2	206	-	-
Critical Hdwy	6.29	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	2.22
Pot Cap-1 Maneuver	654	918	1340
Stage 1	764	-	-
Stage 2	877	-	-
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	623	918	1340
Mov Cap-2 Maneuver	631	-	-
Stage 1	728	-	-
Stage 2	877	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1340	-	918	-	-
HCM Lane V/C Ratio	0.047	-	0.158	-	-
HCM Control Delay (s)	7.8	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.1	-	0.6	-	-

Existing PM
4: Osborn Road & Scottsdale Road

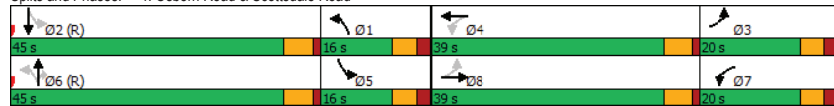
Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	26	158	79	371	127	621	55	84	1007
Future Volume (vph)	26	158	79	371	127	621	55	84	1007
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	20.0	39.0	20.0	39.0	16.0	45.0	45.0	16.0	45.0
Total Split (%)	16.7%	32.5%	16.7%	32.5%	13.3%	37.5%	37.5%	13.3%	37.5%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	42.2	37.4	43.2	39.4	59.2	53.5	53.5	58.1	51.4
Actuated g/C Ratio	0.35	0.31	0.36	0.33	0.49	0.45	0.45	0.48	0.43
v/c Ratio	0.10	0.24	0.21	0.39	0.56	0.40	0.08	0.26	0.46
Control Delay	25.5	21.8	13.4	19.8	35.7	24.5	0.2	19.0	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	21.8	13.4	19.8	35.7	24.5	0.2	19.0	25.6
LOS	C	C	B	B	D	C	A	B	C
Approach Delay		22.1		18.8		24.6			25.1
Approach LOS		C		B		C			C

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.56
 Intersection Signal Delay: 23.4
 Intersection Capacity Utilization 60.7%
 Analysis Period (min) 15

Splits and Phases: 4: Osborn Road & Scottsdale Road



Existing PM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	158	87	79	371	85	127	621	55	84	1007	23
Future Volume (veh/h)	26	158	87	79	371	85	127	621	55	84	1007	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	29	176	69	81	379	36	135	661	22	86	1028	8
Peak Hour Factor	0.90	0.90	0.90	0.98	0.98	0.98	0.94	0.94	0.94	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	750	283	372	976	92	438	1234	496	481	1815	14
Arrive On Green	0.04	0.28	0.28	0.08	0.56	0.56	0.17	0.33	0.33	0.17	0.33	0.33
Sat Flow, veh/h	1688	2655	1003	1688	3454	326	1688	3741	1502	1688	5502	43
Grp Volume(v), veh/h	29	122	123	81	204	211	135	661	22	86	669	367
Grp Sat Flow(s),veh/h/ln	1688	1870	1788	1688	1870	1910	1688	1870	1502	1688	1792	1961
Q Serve(g_s), s	0.0	6.0	6.4	0.0	7.3	7.4	0.0	17.3	1.2	0.0	18.5	18.5
Cycle Q Clear(g_c), s	0.0	6.0	6.4	0.0	7.3	7.4	0.0	17.3	1.2	0.0	18.5	18.5
Prop In Lane	1.00		0.56	1.00		0.17	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	329	528	505	372	528	540	438	1234	496	481	1182	647
V/C Ratio(X)	0.09	0.23	0.24	0.22	0.39	0.39	0.31	0.54	0.04	0.18	0.57	0.57
Avail Cap(c_a), veh/h	470	528	505	513	528	540	438	1234	496	481	1182	647
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	33.0	33.2	33.2	20.3	20.3	34.2	32.7	27.3	28.2	33.1	33.1
Incr Delay (d2), s/veh	0.0	1.0	1.1	0.1	2.1	2.1	0.1	1.7	0.2	0.1	2.0	3.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.9	2.9	1.8	3.1	3.2	3.4	8.1	0.5	1.8	8.3	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	34.1	34.3	33.3	22.4	22.5	34.3	34.4	27.5	28.3	35.1	36.7
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	D	D
Approach Vol, veh/h		274			496			818			1122	
Approach Delay, s/veh		34.2			24.2			34.2			35.1	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	45.0	10.0	39.0	26.0	45.0	10.0	39.0
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1
Max Green Setting (Gmax), s	10.4	39.6	* 15	* 34	10.4	39.6	* 15	* 34
Max Q Clear Time (g_c+1), s	2.0	20.5	2.0	9.4	2.0	19.3	2.0	8.4
Green Ext Time (p_c), s	0.1	4.6	0.0	1.6	0.1	3.1	0.1	0.9

Intersection Summary

HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing PM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗		↖ ↗		↖ ↗		↖ ↗		↖ ↗		↖ ↗	
Traffic Vol, veh/h	5	313	29	0	431	23	6	0	15	83	0	131
Future Vol, veh/h	5	313	29	0	431	23	6	0	15	83	0	131
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	1	-	-	1
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0
Peak Hour Factor	75	75	75	87	87	87	58	58	58	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	417	39	0	495	26	10	0	26	102	0	162

Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	521	0	0	456	0	0	699	972	228	731	978	261
Stage 1	-	-	-	-	-	-	451	451	-	508	508	-
Stage 2	-	-	-	-	-	-	248	521	-	223	470	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	1288	-	-	1267	-	-	*696	404	*971	*652	400	*919
Stage 1	-	-	-	-	-	-	*743	687	-	*797	714	-
Stage 2	-	-	-	-	-	-	*867	703	-	*916	673	-
Platoon blocked, %	1	-	-	1	-	-	1	1	1	1	1	1
Mov Cap-1 Maneuver	1288	-	-	1267	-	-	*571	402	*971	*632	398	*919
Mov Cap-2 Maneuver	-	-	-	-	-	-	*590	498	-	*667	497	-
Stage 1	-	-	-	-	-	-	*740	684	-	*793	714	-
Stage 2	-	-	-	-	-	-	*714	703	-	*886	669	-

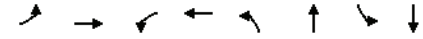
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	9.6	10.4
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	820	1288	-	-	1267	-	-	667	919
HCM Lane V/C Ratio	0.044	0.005	-	-	-	-	-	0.154	0.176
HCM Control Delay (s)	9.6	7.8	-	-	0	-	-	11.4	9.8
HCM Lane LOS	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.5	0.6

Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s *: Computation Not Defined **: All major volume in platoon

Existing PM
6: Osborn Road & Drinkwater Boulevard

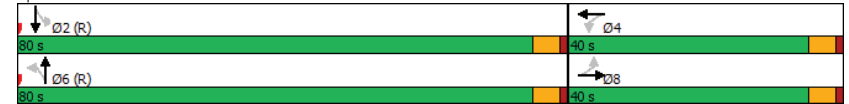
Honor Health
Timings



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗	↖ ↗
Traffic Volume (vph)	32	318	14	364	24	190	36	132
Future Volume (vph)	32	318	14	364	24	190	36	132
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		6		2	
Permitted Phases	8		4		6		2	
Detector Phase	8	8	4	4	6	6	2	2
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.2	36.2	36.2	36.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	18.7	18.7	18.7	18.7	90.9	90.9	90.9	90.9
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.76	0.76	0.76	0.76
v/c Ratio	0.58	0.70	0.21	0.75	0.03	0.09	0.06	0.08
Control Delay	85.3	58.5	41.4	47.8	4.5	2.6	4.7	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.3	58.5	41.4	47.8	4.5	2.6	4.7	3.0
LOS	F	E	D	D	A	A	A	A
Approach Delay	60.8		47.6		2.7		3.3	
Approach LOS	E		D		A		A	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 96 (80%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.75
 Intersection Signal Delay: 33.1
 Intersection Capacity Utilization 50.2%
 Intersection LOS: C
 ICU Level of Service A
 Analysis Period (min) 15

Splits and Phases: 6: Osborn Road & Drinkwater Boulevard



Existing PM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	32	318	23	14	364	26	24	190	119	36	132	59
Future Volume (veh/h)	32	318	23	14	364	26	24	190	119	36	132	59
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	38	379	15	16	409	7	26	202	111	43	157	64
Peak Hour Factor	0.84	0.84	0.84	0.89	0.89	0.89	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	124	645	25	130	662	11	851	2642	1230	786	1937	758
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.74	0.74	0.74	0.74	0.74	0.74
Sat Flow, veh/h	919	3668	145	938	3763	64	1099	3583	1668	1010	2626	1028
Grp Volume(v), veh/h	38	193	201	16	203	213	26	202	111	43	110	111
Grp Sat Flow(s), veh/h/ln	919	1870	1943	938	1870	1957	1099	1792	1668	1010	1870	1784
Q Serve(g_s), s	4.9	12.1	12.1	2.0	12.7	12.8	0.8	1.9	2.2	1.5	2.0	2.1
Cycle Q Clear(g_c), s	17.7	12.1	12.1	14.1	12.7	12.8	2.9	1.9	2.2	3.7	2.0	2.1
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		0.58
Lane Grp Cap(c), veh/h	124	329	342	130	329	344	851	2643	1230	786	1379	1315
V/C Ratio(X)	0.31	0.59	0.59	0.12	0.62	0.62	0.03	0.08	0.09	0.05	0.08	0.08
Avail Cap(c_a), veh/h	229	542	563	237	542	568	851	2643	1230	786	1379	1315
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.2	52.3	52.3	59.2	52.6	52.6	4.8	4.4	4.4	5.0	4.4	4.4
Incr Delay (d2), s/veh	0.5	0.6	0.6	0.2	0.7	0.7	0.1	0.1	0.1	0.1	0.1	0.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.2	6.1	6.4	0.5	6.5	6.8	0.2	0.6	0.7	0.3	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	61.7	52.9	52.9	59.3	53.3	53.2	4.9	4.4	4.6	5.1	4.5	4.5
LnGrp LOS	E	D	D	E	D	D	A	A	A	A	A	A
Approach Vol, veh/h	432			432			339			264		
Approach Delay, s/veh	53.7			53.5			4.5			4.6		
Approach LOS	D			D			A			A		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	93.7		26.3		93.7		26.3					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 75		* 35		* 75		* 35					
Max Q Clear Time (g_c+I1), s	5.7		16.1		4.9		19.7					
Green Ext Time (p_c), s	0.3		1.5		0.4		1.4					
Intersection Summary												
HCM 6th Ctrl Delay				33.4								
HCM 6th LOS				C								
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Existing PM
7: Osborn Road & Miller Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR	
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕	↔	
Traffic Volume (vph)	182	524	68	291	45	434	158	571	123	
Future Volume (vph)	182	524	68	291	45	434	158	571	123	
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm	
Protected Phases	8		4		6		2		2	
Permitted Phases	8		4		6		2		2	
Detector Phase	8		4		6		2		2	
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0	
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2	
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0	80.0	
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max	
Act Effct Green (s)	34.8	34.8	34.8	34.8	74.8	74.8	74.8	74.8	74.8	
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.62	0.62	0.62	0.62	0.62	
v/c Ratio	1.13	0.74	0.96	0.37	0.14	0.49	0.45	0.51	0.14	
Control Delay	136.0	38.9	130.9	32.0	10.6	13.4	16.6	14.4	2.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	136.0	38.9	130.9	32.0	10.6	13.4	16.6	14.4	2.7	
LOS	F	D	F	C	B	B	B	B	A	
Approach Delay	62.2		47.3		13.2		13.1			
Approach LOS	E		D		B		B			
Intersection Summary										
Cycle Length: 120										
Actuated Cycle Length: 120										
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBT, Start of Green										
Natural Cycle: 60										
Control Type: Actuated-Coordinated										
Maximum v/c Ratio: 1.13										
Intersection Signal Delay: 34.9										
Intersection Capacity Utilization 75.8%										
ICU Level of Service D										
Analysis Period (min) 15										
Splits and Phases: 7: Osborn Road & Miller Road										

Existing PM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	182	524	51	68	291	82	45	434	111	158	571	123
Future Volume (veh/h)	182	524	51	68	291	82	45	434	111	158	571	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	249	718	56	72	306	-3	48	462	91	174	627	91
Peak Hour Factor	0.73	0.73	0.73	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	279	1020	79	121	1085	0	371	996	196	441	1227	936
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.00	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	1020	3516	274	660	3839	0	695	1598	315	810	1969	1502
Grp Volume(v), veh/h	249	382	392	72	303	0	48	0	553	174	627	91
Grp Sat Flow(s), veh/h/ln	1020	1870	1919	660	1870	0	695	0	1912	810	1969	1502
Q Serve(g_s), s	25.8	23.8	23.8	11.0	9.0	0.0	4.9	0.0	18.4	17.4	21.1	2.9
Cycle Q Clear(g_c), s	34.8	23.8	23.8	34.8	9.0	0.0	26.0	0.0	18.4	35.8	21.1	2.9
Prop In Lane	1.00		0.14	1.00		0.00	1.00		0.16	1.00		1.00
Lane Grp Cap(c), veh/h	279	542	557	121	1085	0	371	0	1192	441	1227	936
V/C Ratio(X)	0.89	0.70	0.70	0.60	0.28	0.00	0.13	0.00	0.46	0.39	0.51	0.10
Avail Cap(c_a), veh/h	279	542	557	121	1085	0	371	0	1192	441	1227	936
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.73	0.73	0.73	0.75	0.75	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.3	49.3	49.3	67.0	42.6	0.0	19.7	0.0	12.0	21.5	12.5	9.1
Incr Delay (d2), s/veh	21.7	2.6	2.5	4.2	0.0	0.0	0.7	0.0	1.3	2.6	1.5	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	9.7	12.3	12.7	2.5	4.5	0.0	0.9	0.0	7.9	3.6	9.4	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	82.0	51.8	51.8	71.2	42.6	0.0	20.4	0.0	13.3	24.1	14.0	9.3
LnGrp LOS	F	D	D	E	D	A	C	A	B	C	B	A
Approach Vol, veh/h	1023			375			601			892		
Approach Delay, s/veh	59.2			48.1			13.8			15.5		
Approach LOS	E			D			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	80.0		40.0		80.0		40.0					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 75		* 35		* 75		* 35					
Max Q Clear Time (g_c+I1), s	37.8		36.8		28.0		36.8					
Green Ext Time (p_c), s	0.9		0.0		0.7		0.0					
Intersection Summary												
HCM 6th Ctrl Delay	34.8											
HCM 6th LOS	C											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												

Existing PM
8: Osborn Road & Hayden Road

Honor Health
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	↔	↕	↔	↔	↕	↔	↕	↔	↕	
Traffic Volume (vph)	167	184	273	63	68	221	995	75	1580	
Future Volume (vph)	167	184	273	63	68	221	995	75	1580	
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	
Protected Phases	8									
Permitted Phases	8		4		6		2			
Detector Phase	8	8	8	4	4	1	6	5	2	
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0	
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7	
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9	
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	22.1	22.1	22.1	22.1	22.1	85.9	77.0	70.3	64.5	
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.18	0.72	0.64	0.59	0.54	
v/c Ratio	0.91	0.52	0.68	0.46	0.40	0.76	0.31	0.25	0.62	
Control Delay	80.8	41.7	29.9	51.4	33.4	45.6	11.2	9.1	20.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	80.8	41.7	29.9	51.4	33.4	45.6	11.2	9.1	20.8	
LOS	F	D	C	D	C	D	B	A	C	
Approach Delay	47.0		39.3		17.1		20.3			
Approach LOS	D		D		B			C		
Intersection Summary										
Cycle Length: 120										
Actuated Cycle Length: 120										
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green										
Natural Cycle: 90										
Control Type: Actuated-Coordinated										
Maximum v/c Ratio: 0.91										
Intersection Signal Delay: 24.6					Intersection LOS: C					
Intersection Capacity Utilization 80.0%					ICU Level of Service D					
Analysis Period (min) 15										
Splits and Phases: 8: Osborn Road & Hayden Road										

Existing PM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	167	184	273	63	68	62	221	995	69	75	1580	97
Future Volume (veh/h)	167	184	273	63	68	62	221	995	69	75	1580	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	170	188	223	71	76	48	221	995	44	80	1681	29
Peak Hour Factor	0.98	0.98	0.98	0.89	0.89	0.89	1.00	1.00	1.00	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	253	427	326	176	245	155	281	3162	140	386	3084	53
Arrive On Green	0.07	0.07	0.07	0.22	0.22	0.22	0.07	0.60	0.60	0.04	0.57	0.57
Sat Flow, veh/h	1200	1969	1502	924	1128	712	1688	5277	233	1688	5441	94
Grp Volume(v), veh/h	170	188	223	71	0	124	221	675	364	80	1107	603
Grp Sat Flow(s),veh/h/ln	1200	1969	1502	924	0	1841	1688	1792	1927	1688	1792	1952
Q Serve(g_s), s	16.9	11.0	17.4	8.7	0.0	6.8	6.5	11.2	11.2	2.4	23.2	23.3
Cycle Q Clear(g_c), s	23.7	11.0	17.4	19.7	0.0	6.8	6.5	11.2	11.2	2.4	23.2	23.3
Prop In Lane	1.00		1.00	1.00		0.39	1.00		0.12	1.00		0.05
Lane Grp Cap(c), veh/h	253	427	326	176	0	400	281	2147	1154	386	2031	1106
V/C Ratio(X)	0.67	0.44	0.68	0.40	0.00	0.31	0.79	0.31	0.32	0.21	0.55	0.55
Avail Cap(c_a), veh/h	295	497	379	209	0	465	304	2147	1154	464	2031	1106
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.67	0.67	0.67	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	48.7	51.7	49.7	0.0	39.4	18.1	11.9	11.9	10.1	16.3	16.3
Incr Delay (d2), s/veh	2.1	0.2	1.9	0.6	0.0	0.2	10.5	0.4	0.7	0.1	1.1	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	5.8	7.2	2.0	0.0	3.1	4.4	4.5	4.9	0.9	9.5	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.1	48.9	53.6	50.3	0.0	39.6	28.6	12.3	12.6	10.2	17.4	18.2
LnGrp LOS	E	D	D	D	A	D	C	B	B	B	B	B
Approach Vol, veh/h		581			195			1260			1790	
Approach Delay, s/veh		54.0			43.5			15.2			17.3	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.3	73.9		31.7	10.5	77.8		31.7				
Change Period (Y+Rc), s	* 5.8	* 5.9		* 5.7	* 5.8	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 62		* 30	* 10	* 62		* 30				
Max Q Clear Time (g_c+I1), s	8.5	25.3		21.7	4.4	13.2		25.7				
Green Ext Time (p_c), s	0.0	5.5		0.2	0.0	2.8		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		23.5
HCM 6th LOS		C

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Existing PM
9: 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	17	73	223	30	31	175
Future Vol, veh/h	17	73	223	30	31	175
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	78	275	37	34	190

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	457	156	0
Stage 1	294	-	-
Stage 2	163	-	-
Critical Hdwy	6.29	7.14	-
Critical Hdwy Stg 1	6.64	-	-
Critical Hdwy Stg 2	5.84	-	-
Follow-up Hdwy	3.67	3.92	-
Pot Cap-1 Maneuver	552	733	-
Stage 1	660	-	-
Stage 2	817	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	529	733	-
Mov Cap-2 Maneuver	529	-	-
Stage 1	633	-	-
Stage 2	817	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBL	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	529	733	829	-
HCM Lane V/C Ratio	-	-	0.034	0.106	0.041	-
HCM Control Delay (s)	-	-	12	10.5	9.5	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.1	-

Existing PM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↕			↕			↕			↕		
Traffic Vol, veh/h	0	0	0	0	0	0	0	28	0	0	214	0
Future Vol, veh/h	0	0	0	0	0	0	0	28	0	0	214	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	31	0	0	238	0

Major/Minor	Minor2	Minor1	Major1	Major2								
Conflicting Flow All	269	269	238	269	269	31	238	0	0	31	0	0
Stage 1	238	238	-	31	31	-	-	-	-	-	-	-
Stage 2	31	31	-	238	238	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	684	637	801	684	637	1043	1329	-	-	1582	-	-
Stage 1	765	708	-	986	869	-	-	-	-	-	-	-
Stage 2	986	869	-	765	708	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	684	637	801	684	637	1043	1329	-	-	1582	-	-
Mov Cap-2 Maneuver	684	637	-	684	637	-	-	-	-	-	-	-
Stage 1	765	708	-	986	869	-	-	-	-	-	-	-
Stage 2	986	869	-	765	708	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1329	-	-	-	-	1582	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Existing PM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↕		↕		↕	
Traffic Vol, veh/h	0	0	28	0	0	214
Future Vol, veh/h	0	0	28	0	0	214
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	31	0	0	238

Major/Minor	Minor1	Major1	Major2				
Conflicting Flow All	269	31	0	0	31	0	
Stage 1	31	-	-	-	-	-	
Stage 2	238	-	-	-	-	-	
Critical Hdwy	6.42	6.22	-	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	-	2.218	-	
Pot Cap-1 Maneuver	720	1043	-	-	1582	-	
Stage 1	992	-	-	-	-	-	
Stage 2	802	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	
Mov Cap-1 Maneuver	720	1043	-	-	1582	-	
Mov Cap-2 Maneuver	720	-	-	-	-	-	
Stage 1	992	-	-	-	-	-	
Stage 2	802	-	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1582	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

APPENDIX D

CRASH ANALYSIS

Intersection	Total	2018	2017	2016	2015	Injury	Fatality	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	Angle	Left Turn	Rear End	Head On	Sideswipe	Other	DUI	Pedestrian	Bicycle
Brown Ave & 4th St	4	2	0	1	1	0	0	2	0	0	0	1	1	50%	0%	0%	0%	25%	25%	0	0	0
Drinkwater Blvd & 4th St	4	0	0	3	1	2	0	0	1	1	1	1	0	0%	25%	25%	25%	25%	0%	0	1	0
Brown Ave & Osborn Rd	2	1	0	0	1	0	0	1	0	0	0	0	1	50%	0%	0%	0%	0%	50%	0	0	0
Drinkwater Blvd & Osborn Rd	42	10	9	12	11	19	0	23	4	9	0	4	2	55%	10%	21%	0%	10%	5%	3	1	0
Hayden Rd & Osborn Rd	105	17	26	24	38	53	0	30	16	30	2	9	18	29%	15%	29%	2%	9%	17%	0	1	1
Miller Rd & Osborn Rd	40	9	12	10	9	14	0	14	2	21	1	2	0	35%	5%	53%	3%	5%	0%	2	2	1
Scottsdale Rd & Osborn Rd	75	16	19	19	21	26	0	20	15	18	2	14	6	27%	20%	24%	3%	19%	8%	1	0	0
Totals	272	55	66	69	82	114	0	90	38	79	6	31	28	2.45	0.7	1.5	0.3	0.9	1	6	5	2

APPENDIX E

TRIP GENERATION

Honor Health

Proposed

CIVTECH INC.

August 2019

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual*, 10th Edition and methodology described *Generation Handbook*, 3rd Edition. These references will be referred to as *Manual and Handbook*, respectively. The *Manual* contains data collected by various transportation pr wide range of different land uses, with each land use category represented by a land use code (LUC). Average rates and equations have been established that correlate the relat an independent variable that describes the development size and generated trips for each categorized LUC in various settings and time periods. The *Handbook* indicates an est: methodology for how to use data contained within the Manual when to use the fitted curve instead of the average rate and when to adjustments to the volume of trips are appropr do so. The methodology steps are represented visually in boxes in Figure 3.1. This worksheet applies calculations for each box if applicable.

Box 1 - Define Study Site Land Use Type & Site Characteristics, Box 2 - Define Site Context and Box 3 - Define Analysis Objectives Types of Trips & Time Period

The analyst is to pick an appropriate LUC(s) based on the subject's zoning/land use(s)/future land use(s). The size of the land use(s) is described in reference to an independent specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Context assessment is to "simply determine whether the study sites is in a multimodal setting" and "could have persons accessing the site by walking, bicycling, or riding transit." assessment is used in Box 4. The *Manual* separates data into 4 setting categories - **Rural, General Urban/Suburban, Dense Multi-Urban Use and Center City Core**. This wor the following abbreviations, respectively: **R, G, D, and C**. The *Manual* does not have data for all settings of all land use codes. The "General Urban/Suburban" setting is used b: This tool will focus on vehicular trips for a 24-hour period on a typical weekday as well as its AM peak hour and PM peak hour. Other time period(s) may be of interest.

Land Use Types and Size

Proposed Use	Amount Units	ITE LUC	ITE Land Use Name
Medical, dental or health office buildings and clinics	116.000 1,000 square feet	720	Medical-Dental Office Building

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Determine Equation)

Vehicle trips are estimated using rates/equations applicable to each LUC. When the appropriate graph has a fitted curve, the *Handbook* has a process (Figure 4.2) to determine versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement make adjustments when appropriate to best project (example 1: study site is expected to operate differently than data in the applicable land use code - such as restaurant that is morning or in the evening; example 2: LUC data in a localized area fails to be represented by the typically selected fitted curve/weighted average rate - a small shop/LUC 820, AI skewed by the high y-intercept).

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve **Type: Equation Used [Equated Rate]**)

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Medical, dental or health office buildings and clinics	FC: T=38.42*X-87.62 [37.66]	FC: LN(T)=0.89*LN(X)+1.31 [2.20]	FC: T=3.39*X+2.02 [3.41]	

Box 5/Box 9 - Estimate Baseline Trips/Estimate Vehicular Trips (Apply Equations and in/out Distributions)

Baseline Vehicular Trips

Proposed Use	ADT				AM Peak Hour				PM Peak Hour				(not used)
	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
Medical, dental or health office buildings and clinics	50%	2,185	2,185	4,370	78%	199	56	255	28%	111	284	395	
Totals		2,185	2,185	4,370		199	56	255		111	284	395	



APPENDIX F

TRIP DISTRIBUTION

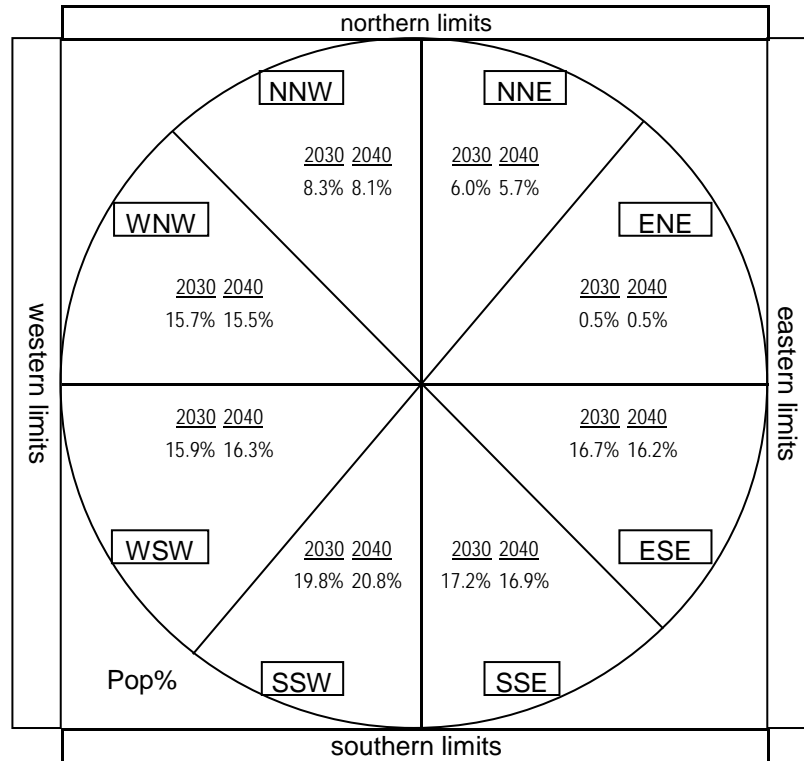
Quadrant	2030		2040	
	Population	Percent	Population	Percent
North Northwest	100,394	8.3%	104,943	8.1%
North Northeast	72,664	6.0%	74,089	5.7%
North	173,057	14.3%	179,032	13.8%
East Northeast	5,685	0.5%	5,996	0.5%
East Southeast	201,105	16.7%	209,932	16.2%
East	206,790	17.2%	215,928	16.7%
South Southeast	207,056	17.2%	218,728	16.9%
South Southwest	238,710	19.8%	268,437	20.8%
South	445,767	37.0%	487,165	37.7%
West Southwest	191,502	15.9%	210,489	16.3%
West Northwest	189,695	15.7%	200,154	15.5%
West	381,197	31.6%	410,642	31.8%
Totals	1,206,812	100.1%	1,292,767	100.0%

Radius

Population radius: 10 miles

Select Analysis Year (2020, 2030, 2040,2050)

2030



APPENDIX G

BACKGROUND TRAFFIC CALCULATIONS

Location of counts: Drinkwater Blvd and Osborn Rd

Source(s): City of Scottsdale 2014 and 2016 Average Daily Segment Traffic Volumes NB at Drinkwater Blvd and Osborn Rd

	Year	Volume
Start	2014	12,400
End	2016	12,800
AAGR		1.6%
Exp Factor		1.032

Growth Rate Used 1.6%
 Per-Year Multiplier 1.016

Year	Expansion Factor(s)
2019	1.000
2020	1.016 Opening
2021	1.032
2022	1.049
2023	1.066
2024	1.083
2025	1.100
2026	1.118
2027	1.135
2028	1.154
2029	1.172
2030	1.191
2031	1.210
2032	1.229
2033	1.249
2034	1.269
2035	1.289
2036	1.310
2037	1.331
2038	1.352
2039	1.374
2040	1.396
2041	1.418
2042	1.441
2043	1.464
2044	1.487
2045	1.511
2046	1.535
2047	1.560
2048	1.585
2049	1.610
2050	1.636
2051	1.662

APPENDIX H

2020 PEAK HOUR ANALYSIS

Background AM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	7.7											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	10	9	9	3	26	10	90	30	20	31	6
Future Vol, veh/h	2	10	9	9	3	26	10	90	30	20	31	6
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.83	0.83	0.83	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	13	12	11	4	33	12	108	36	27	41	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.4	7.3	7.9	7.7
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	8%	10%	24%	35%
Vol Thru, %	69%	48%	8%	54%
Vol Right, %	23%	43%	68%	11%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	130	21	38	57
LT Vol	10	2	9	20
Through Vol	90	10	3	31
RT Vol	30	9	26	6
Lane Flow Rate	157	28	48	76
Geometry Grp	1	1	1	1
Degree of Util (X)	0.174	0.033	0.055	0.089
Departure Headway (Hd)	4.002	4.251	4.105	4.194
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	890	847	877	845
Service Time	2.06	2.253	2.106	2.264
HCM Lane V/C Ratio	0.176	0.033	0.055	0.09
HCM Control Delay	7.9	7.4	7.3	7.7
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.1	0.2	0.3

Background AM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.1											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	45	16	3	33	2	5	2	2	1	0	2
Future Vol, veh/h	2	45	16	3	33	2	5	2	2	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	84	84	84	38	38	38	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	49	18	4	39	2	13	5	5	1	0	3

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	41	0	0	67
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1568	-	-	1535
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1568	-	-	1535
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.6	9.3	8.8
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	868	1568	-	-	1535	-	-	963
HCM Lane V/C Ratio	0.027	0.001	-	-	0.002	-	-	0.004
HCM Control Delay (s)	9.3	7.3	0	-	7.4	0	-	8.8
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Background AM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔↔↔	↔↔↔	↔↔	↔↔
Traffic Vol, veh/h	2	45	115	158	28	6
Future Vol, veh/h	2	45	115	158	28	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	70	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	77	77	90	90	57	57
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	58	128	176	49	11

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	381	30	60
Stage 1	55	-	-
Stage 2	326	-	-
Critical Hdwy	6.29	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	2.22
Pot Cap-1 Maneuver	682	1038	1542
Stage 1	923	-	-
Stage 2	744	-	-
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	626	1038	1542
Mov Cap-2 Maneuver	562	-	-
Stage 1	846	-	-
Stage 2	744	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	3.2	0
HCM LOS	A		

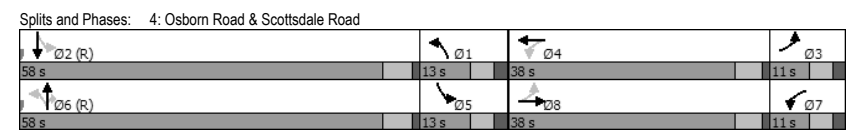
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1542	-	1002	-	-
HCM Lane V/C Ratio	0.083	-	0.061	-	-
HCM Control Delay (s)	7.5	-	8.8	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.2	-	-

Background AM
4: Osborn Road & Scottsdale Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔↔	↔	↔↔	↔	↔	↔↔
Traffic Volume (vph)	44	188	76	105	62	708	96	81	519
Future Volume (vph)	44	188	76	105	62	708	96	81	519
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	11.0	38.0	11.0	38.0	13.0	58.0	58.0	13.0	58.0
Total Split (%)	9.2%	31.7%	9.2%	31.7%	10.8%	48.3%	48.3%	10.8%	48.3%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	42.2	37.4	42.2	37.4	60.2	55.4	55.4	60.2	55.4
Actuated g/C Ratio	0.35	0.31	0.35	0.31	0.50	0.46	0.46	0.50	0.46
v/c Ratio	0.13	0.27	0.23	0.21	0.17	0.45	0.14	0.31	0.24
Control Delay	25.8	27.3	27.6	15.2	16.2	23.6	3.1	20.2	20.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.8	27.3	27.6	15.2	16.2	23.6	3.1	20.2	20.0
LOS	C	C	C	B	B	C	A	C	B
Approach Delay		27.1		18.3		20.8			20.0
Approach LOS		C		B		C			C

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 6 (5%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.45
 Intersection Signal Delay: 21.2
 Intersection Capacity Utilization 52.9%
 Intersection LOS: C
 ICU Level of Service A
 Analysis Period (min) 15



Background AM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (veh/h)	44	188	76	76	105	118	62	708	96	81	519	28
Future Volume (veh/h)	44	188	76	76	105	118	62	708	96	81	519	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	52	224	60	81	112	52	68	778	67	86	552	14
Peak Hour Factor	0.84	0.84	0.84	0.94	0.94	0.94	0.91	0.91	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	402	804	211	346	693	305	478	1640	658	358	2363	60
Arrive On Green	0.04	0.27	0.27	0.04	0.27	0.27	0.07	0.44	0.44	0.07	0.44	0.44
Sat Flow, veh/h	1688	2933	768	1688	2527	1112	1688	3741	1502	1688	5391	136
Grp Volume(v), veh/h	52	141	143	81	81	83	68	778	67	86	366	200
Grp Sat Flow(s), veh/h/ln	1688	1870	1831	1688	1870	1769	1688	1870	1502	1688	1792	1944
Q Serve(g_s), s	0.0	7.1	7.4	0.0	4.0	4.3	0.0	17.7	3.1	0.0	7.7	7.7
Cycle Q Clear(g_c), s	0.0	7.1	7.4	0.0	4.0	4.3	0.0	17.7	3.1	0.0	7.7	7.7
Prop In Lane	1.00		0.42	1.00		0.63	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	402	513	502	346	513	485	478	1640	658	358	1571	852
V/C Ratio(X)	0.13	0.27	0.28	0.23	0.16	0.17	0.14	0.47	0.10	0.24	0.23	0.23
Avail Cap(c_a), veh/h	416	513	502	361	513	485	478	1640	658	358	1571	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	34.2	34.3	36.5	33.0	33.2	20.2	23.9	19.8	28.5	21.1	21.1
Incr Delay (d2), s/veh	0.1	1.3	1.4	0.1	0.7	0.8	0.1	1.0	0.3	0.1	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.4	3.5	2.0	1.9	1.9	1.2	8.0	1.2	1.9	3.3	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.9	35.5	35.7	36.6	33.7	33.9	20.3	24.9	20.1	28.6	21.4	21.7
LnGrp LOS	C	D	D	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		336			245			913			652	
Approach Delay, s/veh		35.2			34.7			24.2			22.5	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	58.0	10.0	38.0	14.0	58.0	10.0	38.0				
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1				
Max Green Setting (Gmax), s	7.4	52.6	* 5.7	* 33	7.4	52.6	* 5.7	* 33				
Max Q Clear Time (g_c+I1), s	2.0	9.7	2.0	6.3	2.0	19.7	2.0	9.4				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.6	0.0	4.1	0.0	1.0				

Intersection Summary												
HCM 6th Ctrl Delay	26.6											
HCM 6th LOS	C											

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background AM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Vol, veh/h	9	249	96	16	277	76	1	0	1	28	0	35
Future Vol, veh/h	9	249	96	16	277	76	1	0	1	28	0	35
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	88	88	88	50	50	50	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	319	123	18	315	86	2	0	2	34	0	43

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	401	0	0	442
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	1304	-	-	1238
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	1	-	-	1
Mov Cap-1 Maneuver	1304	-	-	1238
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	0.3	10.3	10.2
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	688	1304	-	-	1238	-	-	556	987
HCM Lane V/C Ratio	0.006	0.009	-	-	0.015	-	-	0.061	0.043
HCM Control Delay (s)	10.3	7.8	-	-	8	-	-	11.9	8.8
HCM Lane LOS	B	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0	-	-	0	-	-	0.2	0.1

Notes
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Background AM
6: Osborn Road & Drinkwater Boulevard

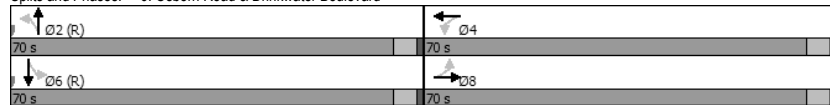
Honor Health
Timings

	↖	→	↗	↖	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖↗	↖	↖↗
Traffic Volume (vph)	54	195	28	273	20	178	35	38
Future Volume (vph)	54	195	28	273	20	178	35	38
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		2		6	
Permitted Phases	8		4		2		6	
Detector Phase	8		4		2		6	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
v/c Ratio	0.14	0.13	0.06	0.22	0.04	0.11	0.09	0.04
Control Delay	22.8	20.8	21.4	21.1	20.9	15.9	22.0	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	20.8	21.4	21.1	20.9	15.9	22.0	15.6
LOS	C	C	C	C	C	B	C	B
Approach Delay	21.2		21.2		16.3		18.2	
Approach LOS	C		C		B		B	

Intersection Summary

Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 14 (10%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.22	
Intersection Signal Delay: 19.6	Intersection LOS: B
Intersection Capacity Utilization 51.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Osborn Road & Drinkwater Boulevard



Background AM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	↖	↖	↑	↗	↓	↖			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	
Traffic Volume (veh/h)	54	195	20	28	273	63	20	178	59	35	38	13
Future Volume (veh/h)	54	195	20	28	273	63	20	178	59	35	38	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	56	203	11	30	297	46	22	198	49	45	49	11
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	453	1671	90	528	1505	231	629	2013	472	519	1415	307
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	983	3610	195	1106	3251	498	1272	4349	1019	1073	3056	664
Grp Volume(v), veh/h	56	105	109	30	169	174	22	161	86	45	29	31
Grp Sat Flow(s),veh/h/ln	983	1870	1934	1106	1870	1879	1272	1792	1785	1073	1870	1849
Q Serve(g_s), s	5.0	4.5	4.5	2.2	7.5	7.7	1.3	3.5	3.8	3.5	1.2	1.3
Cycle Q Clear(g_c), s	12.7	4.5	4.5	6.7	7.5	7.7	2.6	3.5	3.8	7.3	1.2	1.3
Prop In Lane	1.00		0.10	1.00		0.27	1.00		0.57	1.00		0.36
Lane Grp Cap(c), veh/h	453	866	895	528	866	870	629	1659	826	519	866	856
V/C Ratio(X)	0.12	0.12	0.12	0.06	0.20	0.20	0.03	0.10	0.10	0.09	0.03	0.04
Avail Cap(c_a), veh/h	453	866	895	528	866	870	629	1659	826	519	866	856
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.85	0.85	0.85	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	26.0	21.4	21.4	23.3	22.2	22.3	21.3	21.1	21.2	23.3	20.5	20.5
Incr Delay (d2), s/veh	0.6	0.3	0.3	0.2	0.4	0.4	0.1	0.1	0.3	0.3	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.1	2.2	0.6	3.5	3.5	0.4	1.5	1.7	0.9	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.6	21.7	21.7	23.5	22.6	22.7	21.4	21.3	21.5	23.6	20.6	20.6
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h	270			373			269			105		
Approach Delay, s/veh	22.7			22.7			21.3			21.9		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	2			4			6			8		
Phs Duration (G+Y+Rc), s	70.0			70.0			70.0			70.0		
Change Period (Y+Rc), s	* 5.2			* 5.2			* 5.2			* 5.2		
Max Green Setting (Gmax), s	* 65			* 65			* 65			* 65		
Max Q Clear Time (g_c+I1), s	5.8			9.7			9.3			14.7		
Green Ext Time (p_c), s	0.3			0.4			0.1			0.2		

Intersection Summary

HCM 6th Ctrl Delay	22.3
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background AM
7: Osborn Road & Miller Road

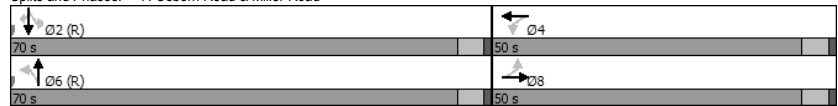
Honor Health
Timings

	↖	→	↗	↙	↘	↑	↓	↖	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖	↖	↖	↖
Traffic Volume (vph)	110	240	62	354	61	398	31	292	106
Future Volume (vph)	110	240	62	354	61	398	31	292	106
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	8		4		6		2		2
Permitted Phases	8		4		6		2		2
Detector Phase	8	8	4	4	6	6	2	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	50.0	50.0	50.0	50.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	31.2	31.2	31.2	31.2	78.4	78.4	78.4	78.4	78.4
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.65	0.65	0.65	0.65	0.65
v/c Ratio	1.18	0.30	0.31	0.64	0.11	0.39	0.08	0.28	0.13
Control Delay	184.0	33.3	35.9	36.4	11.1	12.4	11.3	11.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	184.0	33.3	35.9	36.4	11.1	12.4	11.3	11.2	2.4
LOS	F	C	D	D	B	B	B	B	A
Approach Delay	77.3		36.3		12.2		9.1		
Approach LOS	E		D		B		A		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.18	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 70.0%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Osborn Road & Miller Road



Background AM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	↙	↘	↑	↓	↖	↗			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖↗	↖	↖	↖	↖	↖	↖	↖
Traffic Volume (veh/h)	110	240	26	62	354	171	61	398	61	31	292	106
Future Volume (veh/h)	110	240	26	62	354	171	61	398	61	31	292	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	118	258	17	74	421	103	66	428	39	38	356	80
Peak Hour Factor	0.93	0.93	0.93	0.84	0.84	0.84	0.93	0.93	0.93	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	1064	70	315	892	216	538	1093	100	492	1210	923
Arrive On Green	0.30	0.30	0.30	0.10	0.10	0.10	0.61	0.61	0.61	0.61	0.61	0.61
Sat Flow, veh/h	832	3564	233	1046	2985	724	903	1778	162	877	1969	1502
Grp Volume(v), veh/h	118	135	140	74	262	262	66	0	467	38	356	80
Grp Sat Flow(s),veh/h/ln	832	1870	1927	1046	1870	1839	903	0	1940	877	1969	1502
Q Serve(g, s)	16.6	6.5	6.6	8.0	15.9	16.2	4.5	0.0	14.7	2.8	10.2	2.6
Cycle Q Clear(g_c), s	32.7	6.5	6.6	14.6	15.9	16.2	14.7	0.0	14.7	17.4	10.2	2.6
Prop In Lane	1.00		0.12	1.00		0.39	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	197	559	575	315	559	549	538	0	1192	492	1210	923
V/C Ratio(X)	0.60	0.24	0.24	0.24	0.47	0.48	0.12	0.00	0.39	0.08	0.29	0.09
Avail Cap(c_a), veh/h	259	698	719	393	698	686	538	0	1192	492	1210	923
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.68	0.68	0.68	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.9	31.8	31.8	47.6	45.1	45.2	14.3	0.0	11.7	16.2	10.9	9.4
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.1	0.2	0.2	0.5	0.0	1.0	0.3	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	3.0	3.1	2.3	8.0	8.0	1.0	0.0	6.4	0.6	4.5	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	31.9	31.9	47.7	45.3	45.4	14.8	0.0	12.7	16.5	11.5	9.6
LnGrp LOS	D	C	C	D	D	D	B	A	B	B	B	A
Approach Vol, veh/h	393			598			533			474		
Approach Delay, s/veh	37.3			45.6			13.0			11.6		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	79.0		41.0		79.0		41.0					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 65		* 45		* 65		* 45					
Max Q Clear Time (g_c+1), s	19.4		18.2		16.7		34.7					
Green Ext Time (p_c), s	0.4		2.3		0.6		1.1					

Intersection Summary

HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background AM
8: Osborn Road & Hayden Road

Honor Health
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT			
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗			
Traffic Volume (vph)	93	72	138	97	109	294	1153	29	821			
Future Volume (vph)	93	72	138	97	109	294	1153	29	821			
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA			
Protected Phases	8		8		4		6		2			
Permitted Phases	8		8		4		6		2			
Detector Phase	8		8		4		6		2			
Switch Phase	8		8		4		6		2			
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0			
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9			
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0			
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%			
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7			
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2			
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9			
Lead/Lag						Lead	Lag	Lead	Lag			
Lead-Lag Optimize?						Yes	Yes	Yes	Yes			
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max			
Act Effct Green (s)	17.6	17.6	17.6	17.6	17.6	90.9	84.3	79.3	74.2			
Actuated g/C Ratio	0.15	0.15	0.15	0.15	0.15	0.76	0.70	0.66	0.62			
v/c Ratio	1.07	0.29	0.45	0.65	0.67	0.69	0.34	0.10	0.30			
Control Delay	158.3	49.2	28.0	63.2	54.0	13.7	8.5	6.6	11.7			
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
Total Delay	158.3	49.2	28.0	63.2	54.0	13.7	8.5	6.6	11.7			
LOS	F	D	C	E	D	B	A	A	B			
Approach Delay	73.0			57.5			9.5			11.6		
Approach LOS	E			E			A			B		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 80	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.07	
Intersection Signal Delay: 21.7	Intersection LOS: C
Intersection Capacity Utilization 68.4%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Osborn Road & Hayden Road

↖ Ø1	↑ Ø2 (R)	↗ Ø4
16 s	68 s	36 s
↖ Ø5	↑ Ø6 (R)	↗ Ø8
16 s	68 s	36 s

Background AM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑	↗	↖	↑	↗	↖	↑	↗	↖	↑	↗
Traffic Volume (veh/h)	93	72	138	97	109	52	294	1153	79	29	821	122
Future Volume (veh/h)	93	72	138	97	109	52	294	1153	79	29	821	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	108	84	96	117	131	39	300	1177	55	30	846	54
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.98	0.98	0.98	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	377	288	232	279	83	494	3353	157	333	2988	190
Arrive On Green	0.06	0.06	0.06	0.19	0.19	0.19	0.09	0.64	0.64	0.03	0.58	0.58
Sat Flow, veh/h	1151	1969	1502	1141	1457	434	1688	5262	246	1688	5164	329
Grp Volume(v), veh/h	108	84	96	117	0	170	300	801	431	30	586	314
Grp Sat Flow(s),veh/h/ln	1151	1969	1502	1141	0	1891	1688	1792	1925	1688	1792	1910
Q Serve(g_s), s	11.2	4.9	7.3	11.6	0.0	9.6	8.3	12.5	12.6	0.9	9.9	9.9
Cycle Q Clear(g_c), s	20.8	4.9	7.3	16.5	0.0	9.6	8.3	12.5	12.6	0.9	9.9	9.9
Prop In Lane	1.00	1.00	1.00	1.00	0.23	1.00	0.13	1.00	1.00	1.00	1.00	0.17
Lane Grp Cap(c), veh/h	188	377	288	232	0	362	494	2283	1226	333	2073	1105
V/C Ratio(X)	0.57	0.22	0.33	0.50	0.00	0.47	0.61	0.35	0.35	0.09	0.28	0.28
Avail Cap(c_a), veh/h	259	497	379	302	0	477	494	2283	1226	432	2073	1105
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	59.9	47.7	48.9	48.2	0.0	43.1	8.7	10.2	10.2	9.7	12.7	12.8
Incr Delay (d2), s/veh	1.0	0.1	0.2	0.6	0.0	0.4	1.5	0.4	0.8	0.0	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.5	2.5	2.9	3.4	0.0	4.5	3.0	4.9	5.4	0.3	4.0	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.9	47.8	49.1	48.8	0.0	43.4	10.2	10.6	11.0	9.7	13.1	13.4
LnGrp LOS	E	D	D	D	A	D	B	B	B	A	B	B
Approach Vol, veh/h	288			287			1532			930		
Approach Delay, s/veh	53.2			45.6			10.6			13.1		
Approach LOS	D			D			B			B		

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	16.0	75.3	28.7	9.0	82.4	28.7
Change Period (Y+Rc), s	* 5.8	* 5.9	* 5.7	* 5.8	* 5.9	* 5.7
Max Green Setting (Gmax), s	* 10	* 62	* 30	* 10	* 62	* 30
Max Q Clear Time (g_c+1), s	10.3	11.9	18.5	2.9	14.6	22.8
Green Ext Time (p_c), s	0.0	2.4	0.4	0.0	3.5	0.2

Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background AM
9: Drinkwater Boulevard & 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3.9					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	28	72	193	14	36	44
Future Vol, veh/h	28	72	193	14	36	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	88	88	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	96	219	16	46	56
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	347	118	0	0	235	0
Stage 1	227	-	-	-	-	-
Stage 2	120	-	-	-	-	-
Critical Hdwy	6.29	7.14	-	-	5.34	-
Critical Hdwy Stg 1	6.64	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.67	3.92	-	-	3.12	-
Pot Cap-1 Maneuver	635	774	-	-	900	-
Stage 1	723	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	603	774	-	-	900	-
Mov Cap-2 Maneuver	603	-	-	-	-	-
Stage 1	686	-	-	-	-	-
Stage 2	858	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.6	0	4.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	603	774	900	-
HCM Lane V/C Ratio	-	-	0.062	0.124	0.051	-
HCM Control Delay (s)	-	-	11.4	10.3	9.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.4	0.2	-

Background AM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	0	0	0	0	0	0	0	130	0	0	63	0
Future Vol, veh/h	0	0	0	0	0	0	0	130	0	0	63	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	144	0	0	70	0
Major/Minor	Minor2	Minor1	Major1	Major2								
Conflicting Flow All	214	214	70	214	214	144	70	0	0	144	0	0
Stage 1	70	70	-	144	144	-	-	-	-	-	-	-
Stage 2	144	144	-	70	70	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	743	684	993	743	684	903	1531	-	-	1438	-	-
Stage 1	940	837	-	859	778	-	-	-	-	-	-	-
Stage 2	859	778	-	940	837	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	743	684	993	743	684	903	1531	-	-	1438	-	-
Mov Cap-2 Maneuver	743	684	-	743	684	-	-	-	-	-	-	-
Stage 1	940	837	-	859	778	-	-	-	-	-	-	-
Stage 2	859	778	-	940	837	-	-	-	-	-	-	-
Approach	EB	WB	NB	SB								
HCM Control Delay, s	0	0	0	0								
HCM LOS	A	A										
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR				
Capacity (veh/h)	1531	-	-	-	-	1438	-	-				
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-				
HCM Control Delay (s)	0	-	-	0	0	0	-	-				
HCM Lane LOS	A	-	-	A	A	A	-	-				
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-				

Background AM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑			↓
Traffic Vol, veh/h	0	0	130	0	0	63
Future Vol, veh/h	0	0	130	0	0	63
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	144	0	0	70
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	214	144	0	144	0	
Stage 1	144	-	-	-	-	
Stage 2	70	-	-	-	-	
Critical Hdwy	6.42	6.22	-	4.12	-	
Critical Hdwy Stg 1	5.42	-	-	-	-	
Critical Hdwy Stg 2	5.42	-	-	-	-	
Follow-up Hdwy	3.518	3.318	-	2.218	-	
Pot Cap-1 Maneuver	774	903	-	1438	-	
Stage 1	883	-	-	-	-	
Stage 2	953	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	
Mov Cap-1 Maneuver	774	903	-	1438	-	
Mov Cap-2 Maneuver	774	-	-	-	-	
Stage 1	883	-	-	-	-	
Stage 2	953	-	-	-	-	
Approach	WB	NB	SB			
HCM Control Delay, s	0	0	0			
HCM LOS	A					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	-	1438	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-	-
HCM Lane LOS	-	-	A	A	-	-
HCM 95th %tile Q(veh)	-	-	-	0	-	-

Background PM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	8											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	5	8	13	26	11	14	6	55	16	15	119	4
Future Vol, veh/h	5	8	13	26	11	14	6	55	16	15	119	4
Peak Hour Factor	0.65	0.65	0.65	0.91	0.91	0.91	0.68	0.68	0.68	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	12	20	29	12	15	9	81	24	18	143	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	7.6	7.9	7.9	8.3								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	8%	19%	51%	11%								
Vol Thru, %	71%	31%	22%	86%								
Vol Right, %	21%	50%	27%	3%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	77	26	51	138								
LT Vol	6	5	26	15								
Through Vol	55	8	11	119								
RT Vol	16	13	14	4								
Lane Flow Rate	113	40	56	166								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.133	0.048	0.071	0.194								
Departure Headway (Hd)	4.228	4.357	4.536	4.194								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	853	825	794	843								
Service Time	2.228	2.365	2.542	2.287								
HCM Lane V/C Ratio	0.132	0.048	0.071	0.197								
HCM Control Delay	7.9	7.6	7.9	8.3								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	0.5	0.2	0.2	0.7								

Background PM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	31	6	2	52	0	2	1	7	2	1	2
Future Vol, veh/h	2	31	6	2	52	0	2	1	7	2	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	88	88	88	42	42	42	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	44	9	2	59	0	5	2	17	3	2	3

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	59	0	0	53
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1545	-	-	1553
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1545	-	-	1553
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	8.9	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	951	1545	-	-	1553	-	-	876
HCM Lane V/C Ratio	0.025	0.002	-	-	0.001	-	-	0.009
HCM Control Delay (s)	8.9	7.3	0	-	7.3	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0

Background PM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔		↔	↔	↔	↔
Traffic Vol, veh/h	0	112	57	181	177	5
Future Vol, veh/h	0	112	57	181	177	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	70	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	147	64	203	224	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	436	115	230
Stage 1	227	-	-
Stage 2	209	-	-
Critical Hdwy	6.29	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	2.22
Pot Cap-1 Maneuver	648	916	1335
Stage 1	760	-	-
Stage 2	874	-	-
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	617	916	1335
Mov Cap-2 Maneuver	626	-	-
Stage 1	724	-	-
Stage 2	874	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.7	1.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1335	-	916	-	-
HCM Lane V/C Ratio	0.048	-	0.161	-	-
HCM Control Delay (s)	7.8	-	9.7	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.2	-	0.6	-	-

Background PM
4: Osborn Road & Scottsdale Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖↗	↖	↖↗	↖↗
Traffic Volume (vph)	26	161	80	377	129	631	56	85	1023
Future Volume (vph)	26	161	80	377	129	631	56	85	1023
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	20.0	39.0	20.0	39.0	16.0	45.0	45.0	16.0	45.0
Total Split (%)	16.7%	32.5%	16.7%	32.5%	13.3%	37.5%	37.5%	13.3%	37.5%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	42.0	37.2	43.1	39.3	58.3	51.4	51.4	58.3	51.4
Actuated g/C Ratio	0.35	0.31	0.36	0.33	0.49	0.43	0.43	0.49	0.43
v/c Ratio	0.11	0.24	0.22	0.39	0.58	0.42	0.08	0.27	0.47
Control Delay	25.7	22.1	13.6	20.2	37.2	25.5	0.2	19.1	25.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.7	22.1	13.6	20.2	37.2	25.5	0.2	19.1	25.8
LOS	C	C	B	C	D	C	A	B	C
Approach Delay		22.5		19.2		25.6			25.3
Approach LOS		C		B		C			C

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.58	
Intersection Signal Delay: 23.9	Intersection LOS: C
Intersection Capacity Utilization 61.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Osborn Road & Scottsdale Road

↖ 45 s	↖ 16 s	↖ 39 s	↖ 20 s
↖ 45 s	↖ 16 s	↖ 39 s	↖ 20 s

Background PM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖↗	↖	↖↗	↖↗	↖↗	↖↗	↖↗	↖↗
Traffic Volume (veh/h)	26	161	88	80	377	86	129	631	56	85	1023	23
Future Volume (veh/h)	26	161	88	80	377	86	129	631	56	85	1023	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	29	179	70	82	385	37	137	671	23	87	1044	8
Peak Hour Factor	0.90	0.90	0.90	0.98	0.98	0.98	0.94	0.94	0.94	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	326	751	283	371	975	93	435	1234	496	478	1816	14
Arrive On Green	0.04	0.28	0.28	0.08	0.56	0.56	0.17	0.33	0.33	0.17	0.33	0.33
Sat Flow, veh/h	1688	2657	1002	1688	3450	330	1688	3741	1502	1688	5502	42
Grp Volume(v), veh/h	29	124	125	82	208	214	137	671	23	87	680	372
Grp Sat Flow(s),veh/h/ln	1688	1870	1788	1688	1870	1909	1688	1870	1502	1688	1792	1961
Q Serve(g_s), s	0.0	6.1	6.5	0.0	7.5	7.5	0.0	17.6	1.3	0.0	18.8	18.8
Cycle Q Clear(g_c), s	0.0	6.1	6.5	0.0	7.5	7.5	0.0	17.6	1.3	0.0	18.8	18.8
Prop In Lane	1.00		0.56	1.00		0.17	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	326	528	505	371	528	539	435	1234	496	478	1182	647
V/C Ratio(X)	0.09	0.23	0.25	0.22	0.39	0.40	0.31	0.54	0.05	0.18	0.57	0.58
Avail Cap(c_a), veh/h	467	528	505	512	528	539	435	1234	496	478	1182	647
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.1	33.1	33.2	33.3	20.3	20.4	34.6	32.8	27.4	28.6	33.2	33.2
Incr Delay (d2), s/veh	0.0	1.0	1.2	0.1	2.2	2.2	0.2	1.7	0.2	0.1	2.0	3.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	2.9	3.0	1.8	3.2	3.3	3.4	8.2	2.5	1.9	8.5	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.1	34.1	34.4	33.4	22.5	22.5	34.8	34.5	27.5	28.6	35.3	36.9
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	D	D
Approach Vol, veh/h		278			504			831			1139	
Approach Delay, s/veh		34.2			24.3			34.4			35.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	26.0	45.0	10.0	39.0	26.0	45.0	10.0	39.0
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1
Max Green Setting (Gmax), s	10.4	39.6	* 15	* 34	10.4	39.6	* 15	* 34
Max Q Clear Time (g_c+1), s	2.0	20.8	2.0	9.5	2.0	19.6	2.0	8.5
Green Ext Time (p_c), s	0.1	4.7	0.0	1.6	0.1	3.1	0.1	0.9

Intersection Summary

HCM 6th Ctrl Delay	32.9
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background PM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖ ↗		↖ ↗		↖ ↗		↖ ↗		↖ ↗		↖ ↗	
Traffic Vol, veh/h	5	318	29	0	438	23	6	0	15	84	0	133
Future Vol, veh/h	5	318	29	0	438	23	6	0	15	84	0	133
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	87	87	87	58	58	58	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	424	39	0	503	26	10	0	26	104	0	164

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	529	0	463	0
Stage 1	-	-	-	458
Stage 2	-	-	-	252
Critical Hdwy	4.14	-	4.14	-
Critical Hdwy Stg 1	-	-	-	6.54
Critical Hdwy Stg 2	-	-	-	6.54
Follow-up Hdwy	2.22	-	2.22	-
Pot Cap-1 Maneuver	1277	-	1258	-
Stage 1	-	-	-	*735
Stage 2	-	-	-	*867
Platoon blocked, %	1	-	1	-
Mov Cap-1 Maneuver	1277	-	1258	-
Mov Cap-2 Maneuver	-	-	-	*582
Stage 1	-	-	-	*732
Stage 2	-	-	-	*712

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0	9.6	10.5
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	815	1277	-	-	1258	-	-	658	919
HCM Lane V/C Ratio	0.044	0.005	-	-	-	-	-	0.158	0.179
HCM Control Delay (s)	9.6	7.8	-	-	0	-	-	11.5	9.8
HCM Lane LOS	A	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.6	0.6

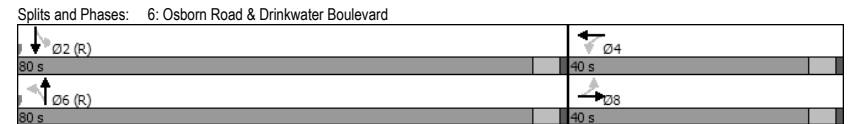
Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s *: Computation Not Defined **: All major volume in platoon

Background PM
6: Osborn Road & Drinkwater Boulevard

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖ ↗		↖ ↗		↖ ↗		↖ ↗	
Traffic Volume (vph)	33	323	14	370	24	193	37	134
Future Volume (vph)	33	323	14	370	24	193	37	134
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		6		2	
Permitted Phases	8		4		6		2	
Detector Phase	8		4		6		2	
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.2	36.2	36.2	36.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.0	19.0	19.0	19.0	90.6	90.6	90.6	90.6
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.76	0.76	0.76	0.76
v/c Ratio	0.59	0.70	0.21	0.76	0.03	0.09	0.06	0.09
Control Delay	87.4	58.6	41.0	47.9	4.6	2.6	4.8	3.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	87.4	58.6	41.0	47.9	4.6	2.6	4.8	3.0
LOS	F	E	D	D	A	A	A	A
Approach Delay	61.1		47.7		2.8		3.3	
Approach LOS	E		D		A		A	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 96 (80%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.76
 Intersection Signal Delay: 33.2 Intersection LOS: C
 Intersection Capacity Utilization 50.3% ICU Level of Service A
 Analysis Period (min) 15



Background PM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	33	323	23	14	370	26	24	193	121	37	134	60
Future Volume (veh/h)	33	323	23	14	370	26	24	193	121	37	134	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	39	385	15	16	416	7	26	205	113	44	160	65
Peak Hour Factor	0.84	0.84	0.84	0.89	0.89	0.89	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	125	657	26	131	674	11	844	2631	1225	779	1930	753
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.73	0.73	0.73	0.73	0.73	0.73
Sat Flow, veh/h	913	3671	143	933	3764	63	1095	3583	1668	1006	2629	1026
Grp Volume(v), veh/h	39	196	204	16	206	217	26	205	113	44	112	113
Grp Sat Flow(s),veh/h/ln	913	1870	1943	933	1870	1957	1095	1792	1668	1006	1870	1784
Q Serve(g_s), s	5.1	12.2	12.3	2.0	12.9	13.0	0.8	1.9	2.3	1.6	2.0	2.2
Cycle Q Clear(g_c), s	18.0	12.2	12.3	14.3	12.9	13.0	3.0	1.9	2.3	3.9	2.0	2.2
Prop In Lane	1.00		0.07	1.00		0.03	1.00		1.00	1.00		0.57
Lane Grp Cap(c), veh/h	125	335	348	131	335	351	844	2631	1225	779	1373	1310
V/C Ratio(X)	0.31	0.58	0.59	0.12	0.62	0.62	0.03	0.08	0.09	0.06	0.08	0.09
Avail Cap(c_a), veh/h	226	542	564	235	542	568	844	2631	1225	779	1373	1310
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.3	52.1	52.1	59.1	52.4	52.4	4.9	4.5	4.5	5.1	4.5	4.5
Incr Delay (d2), s/veh	0.5	0.6	0.6	0.1	0.7	0.6	0.1	0.1	0.1	0.1	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	6.2	6.5	0.5	6.6	6.9	0.2	0.7	0.8	0.3	0.8	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.8	52.7	52.7	59.3	53.1	53.1	5.0	4.6	4.7	5.2	4.6	4.7
LnGrp LOS	E	D	D	E	D	D	A	A	A	A	A	A
Approach Vol, veh/h		439			439			344			269	
Approach Delay, s/veh		53.5			53.3			4.6			4.7	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		93.3		26.7		93.3		26.7				
Change Period (Y+Rc), s		* 5.2		* 5.2		* 5.2		* 5.2				
Max Green Setting (Gmax), s		* 75		* 35		* 75		* 35				
Max Q Clear Time (g_c+I1), s		5.9		16.3		5.0		20.0				
Green Ext Time (p_c), s		0.3		1.6		0.4		1.5				

Intersection Summary		
HCM 6th Ctrl Delay		33.4
HCM 6th LOS		C

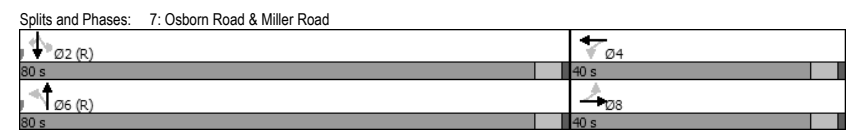
Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background PM
7: Osborn Road & Miller Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕	↔
Traffic Volume (vph)	185	532	69	296	46	441	161	580	125
Future Volume (vph)	185	532	69	296	46	441	161	580	125
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		8		4		6		2	
Permitted Phases	8		4		6		2		2
Detector Phase	8	8	4	4	6	6	2	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.8	34.8	34.8	34.8	74.8	74.8	74.8	74.8	74.8
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.62	0.62	0.62	0.62	0.62
v/c Ratio	1.16	0.75	1.03	0.37	0.14	0.49	0.47	0.52	0.14
Control Delay	147.5	39.3	150.9	32.3	10.7	13.6	17.1	14.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	147.5	39.3	150.9	32.3	10.7	13.6	17.1	14.5	2.8
LOS	F	D	F	C	B	B	B	B	A
Approach Delay		65.3		50.7		13.3		13.3	
Approach LOS		E		D		B		B	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.16
Intersection Signal Delay:	36.5
Intersection Capacity Utilization:	76.7%
ICU Level of Service:	D
Analysis Period (min):	15



Background PM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	185	532	52	69	296	83	46	441	113	161	580	125
Future Volume (veh/h)	185	532	52	69	296	83	46	441	113	161	580	125
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	253	729	57	73	312	-2	49	469	93	177	637	93
Peak Hour Factor	0.73	0.73	0.73	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	276	1019	80	118	1085	0	365	995	197	435	1227	936
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.00	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	1013	3515	275	652	3839	0	687	1595	316	803	1969	1502
Grp Volume(v), veh/h	253	388	398	73	310	0	49	0	562	177	637	93
Grp Sat Flow(s), veh/h/ln	1013	1870	1919	652	1870	0	687	0	1912	803	1969	1502
Q Serve(g_s), s	25.6	24.1	24.2	10.6	9.2	0.0	5.1	0.0	18.8	18.1	21.6	3.0
Cycle Q Clear(g_c), s	34.8	24.1	24.2	34.8	9.2	0.0	26.7	0.0	18.8	36.9	21.6	3.0
Prop In Lane	1.00	0.14	1.00	0.00	1.00	0.00	0.17	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	276	542	557	118	1085	0	365	0	1192	435	1227	936
V/C Ratio(X)	0.92	0.71	0.72	0.62	0.29	0.00	0.13	0.00	0.47	0.41	0.52	0.10
Avail Cap(c_a), veh/h	276	542	557	118	1085	0	365	0	1192	435	1227	936
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.72	0.72	0.72	0.74	0.74	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.8	49.4	49.5	67.5	42.7	0.0	20.0	0.0	12.1	21.9	12.6	9.1
Incr Delay (d2), s/veh	26.1	2.8	2.7	5.4	0.0	0.0	0.8	0.0	1.3	2.8	1.6	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	10.2	12.6	12.9	2.5	4.6	0.0	0.9	0.0	8.1	3.7	9.6	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	86.8	52.2	52.2	72.8	42.7	0.0	20.8	0.0	13.4	24.7	14.2	9.3
LnGrp LOS	F	D	D	E	D	A	C	A	B	C	B	A
Approach Vol, veh/h		1039			383			611			907	
Approach Delay, s/veh		60.6			48.5			14.0			15.7	
Approach LOS		E			D			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		40.0		80.0		40.0				
Change Period (Y+Rc), s		* 5.2		* 5.2		* 5.2		* 5.2				
Max Green Setting (Gmax), s		* 75		* 35		* 75		* 35				
Max Q Clear Time (g_c+I1), s		38.9		36.8		28.7		36.8				
Green Ext Time (p_c), s		0.9		0.0		0.8		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	35.5
HCM 6th LOS	D

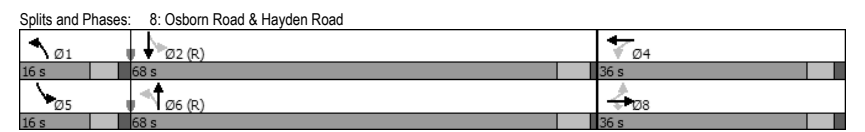
Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background PM
8: Osborn Road & Hayden Road

Honor Health
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	170	187	277	64	69	225	1011	76	1605
Future Volume (vph)	170	187	277	64	69	225	1011	76	1605
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		8				4	1	6	5
Permitted Phases	8		8	4		6		2	
Detector Phase	8	8	8	4	4	1	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	22.4	22.4	22.4	22.4	22.4	85.5	76.6	69.5	63.7
Actuated g/C Ratio	0.19	0.19	0.19	0.19	0.19	0.71	0.64	0.58	0.53
v/c Ratio	0.93	0.52	0.69	0.46	0.40	0.77	0.32	0.26	0.64
Control Delay	82.1	41.4	30.0	51.3	33.5	48.6	11.4	9.4	21.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.1	41.4	30.0	51.3	33.5	48.6	11.4	9.4	21.5
LOS	F	D	C	D	C	D	B	A	C
Approach Delay		47.3			39.3		17.8		21.0
Approach LOS		D			D		B		C

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 25.1
Intersection Capacity Utilization 81.0%
ICU Level of Service D
Analysis Period (min) 15



Background PM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↗	↔	↖	↘	↔	↑	↗	↔	↑	↘
Traffic Volume (veh/h)	170	187	277	64	69	63	225	1011	70	76	1605	99
Future Volume (veh/h)	170	187	277	64	69	63	225	1011	70	76	1605	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	173	191	227	72	78	49	225	1011	45	81	1707	31
Peak Hour Factor	0.98	0.98	0.98	0.89	0.89	0.89	1.00	1.00	1.00	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	255	435	332	178	250	157	278	3140	140	378	3051	55
Arrive On Green	0.07	0.07	0.07	0.22	0.22	0.22	0.07	0.60	0.60	0.04	0.56	0.56
Sat Flow, veh/h	1197	1969	1502	918	1131	710	1688	5275	235	1688	5436	99
Grp Volume(v), veh/h	173	191	227	72	0	127	225	686	370	81	1125	613
Grp Sat Flow(s),veh/h/ln	1197	1969	1502	918	0	1841	1688	1792	1927	1688	1792	1951
Q Serve(g_s), s	17.2	11.1	17.7	8.9	0.0	6.9	6.7	11.5	11.5	2.4	24.1	24.1
Cycle Q Clear(g_c), s	24.2	11.1	17.7	20.1	0.0	6.9	6.7	11.5	11.5	2.4	24.1	24.1
Prop In Lane	1.00		1.00	1.00		0.39	1.00		0.12	1.00		0.05
Lane Grp Cap(c), veh/h	255	435	332	178	0	407	278	2133	1147	378	2011	1095
V/C Ratio(X)	0.68	0.44	0.68	0.41	0.00	0.31	0.81	0.32	0.32	0.21	0.56	0.56
Avail Cap(c_a), veh/h	293	497	379	206	0	465	298	2133	1147	456	2011	1095
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.66	0.66	0.66	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	58.0	48.5	51.5	49.5	0.0	39.1	19.1	12.2	12.2	10.4	16.8	16.8
Incr Delay (d2), s/veh	2.4	0.2	2.0	0.6	0.0	0.2	13.1	0.4	0.7	0.1	1.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	5.9	7.3	2.1	0.0	3.2	4.6	4.6	5.1	0.9	9.9	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.3	48.7	53.5	50.1	0.0	39.3	32.2	12.6	12.9	10.5	18.0	18.9
LnGrp LOS	E	D	D	D	A	D	C	B	B	B	B	B
Approach Vol, veh/h		591			199			1281			1819	
Approach Delay, s/veh		54.0			43.2			16.1			17.9	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	73.3		32.2	10.5	77.3		32.2				
Change Period (Y+Rc), s	* 5.8	* 5.9		* 5.7	* 5.8	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 62		* 30	* 10	* 62		* 30				
Max Q Clear Time (g_c+I1), s	8.7	26.1		22.1	4.4	13.5		26.2				
Green Ext Time (p_c), s	0.0	5.7		0.2	0.0	2.9		0.4				

Intersection Summary		
HCM 6th Ctrl Delay		24.1
HCM 6th LOS		C

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Background PM
9: 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.1					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	17	74	227	30	31	178
Future Vol, veh/h	17	74	227	30	31	178
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	79	280	37	34	193

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	464	159	0 0 317 0
Stage 1	299	-	- - - -
Stage 2	165	-	- - - -
Critical Hdwy	6.29	7.14	- - 5.34 -
Critical Hdwy Stg 1	6.64	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.67	3.92	- - 3.12 -
Pot Cap-1 Maneuver	547	730	- - 825 -
Stage 1	656	-	- - - -
Stage 2	815	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	525	730	- - 825 -
Mov Cap-2 Maneuver	525	-	- - - -
Stage 1	629	-	- - - -
Stage 2	815	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	10.8	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBL	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	525	730	825	-
HCM Lane V/C Ratio	-	-	0.034	0.108	0.041	-
HCM Control Delay (s)	-	-	12.1	10.5	9.5	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.1	-

Background PM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	0											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	0	0	0	0	0	0	0	77	0	0	217	0
Future Vol, veh/h	0	0	0	0	0	0	0	77	0	0	217	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	0	0	0	0	86	0	0	241	0

Major/Minor	Minor2	Minor1	Major1	Major2								
Conflicting Flow All	327	327	241	327	327	86	241	0	0	86	0	0
Stage 1	241	241	-	86	86	-	-	-	-	-	-	-
Stage 2	86	86	-	241	241	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	626	591	798	626	591	973	1326	-	-	1510	-	-
Stage 1	762	706	-	922	824	-	-	-	-	-	-	-
Stage 2	922	824	-	762	706	-	-	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	626	591	798	626	591	973	1326	-	-	1510	-	-
Mov Cap-2 Maneuver	626	591	-	626	591	-	-	-	-	-	-	-
Stage 1	762	706	-	922	824	-	-	-	-	-	-	-
Stage 2	922	824	-	762	706	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0	0	0
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1326	-	-	-	-	1510	-	-
HCM Lane V/C Ratio	-	-	-	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	0	0	-	-
HCM Lane LOS	A	-	-	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	-	-	0	-	-

Background PM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	0	0	77	0	0	217
Future Vol, veh/h	0	0	77	0	0	217
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	86	0	0	241

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	327	86	0	0	86	0
Stage 1	86	-	-	-	-	-
Stage 2	241	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	667	973	-	-	1510	-
Stage 1	937	-	-	-	-	-
Stage 2	799	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	667	973	-	-	1510	-
Mov Cap-2 Maneuver	667	-	-	-	-	-
Stage 1	937	-	-	-	-	-
Stage 2	799	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1510	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Total AM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	8.2											
Intersection LOS	A											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	32	47	22	9	26	21	91	34	21	36	6
Future Vol, veh/h	2	32	47	22	9	26	21	91	34	21	36	6
Peak Hour Factor	0.75	0.75	0.75	0.79	0.79	0.79	0.83	0.83	0.83	0.75	0.75	0.75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	43	63	28	11	33	25	110	41	28	48	8
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	1	1	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	1	1
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	1	1
HCM Control Delay	7.9	7.9	8.5	8.1
HCM LOS	A	A	A	A

Lane	NBLn1	EBLn1	WBLn1	SBLn1
Vol Left, %	14%	2%	39%	33%
Vol Thru, %	62%	40%	16%	57%
Vol Right, %	23%	58%	46%	10%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	146	81	57	63
LT Vol	21	2	22	21
Through Vol	91	32	9	36
RT Vol	34	47	26	6
Lane Flow Rate	176	108	72	84
Geometry Grp	1	1	1	1
Degree of Util (X)	0.211	0.128	0.089	0.106
Departure Headway (Hd)	4.321	4.263	4.447	4.538
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	832	842	807	791
Service Time	2.34	2.283	2.469	2.559
HCM Lane V/C Ratio	0.212	0.128	0.089	0.106
HCM Control Delay	8.5	7.9	7.9	8.1
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.8	0.4	0.3	0.4

Total AM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	3.5											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	2	49	39	28	46	2	11	2	9	1	0	2
Future Vol, veh/h	2	49	39	28	46	2	11	2	9	1	0	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	84	84	84	38	38	38	75	75	75
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	2	54	43	33	55	2	29	5	24	1	0	3

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	57	0	0	97
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1547	-	-	1496
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1547	-	-	1496
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	2.7	9.8	9.1
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	815	1547	-	-	1496	-	-	883
HCM Lane V/C Ratio	0.071	0.001	-	-	0.022	-	-	0.005
HCM Control Delay (s)	9.8	7.3	0	-	7.5	0	-	9.1
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.2	0	-	-	0.1	-	-	0

Total AM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection							
Int Delay, s/veh	3.7						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	↔		↔↔↔		↔↔		
Traffic Vol, veh/h	8	50	132	158	28	27	
Future Vol, veh/h	8	50	132	158	28	27	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	70	-	-	-	
Veh in Median Storage, #	1	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	77	77	90	90	57	57	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	10	65	147	176	49	47	

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	437	48	96	0	- 0
Stage 1	73	-	-	-	-
Stage 2	364	-	-	-	-
Critical Hdwy	6.29	6.94	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-
Follow-up Hdwy	3.67	3.32	2.22	-	-
Pot Cap-1 Maneuver	635	1011	1496	-	-
Stage 1	904	-	-	-	-
Stage 2	711	-	-	-	-
Platoon blocked, %	1	-	-	-	-
Mov Cap-1 Maneuver	572	1011	1496	-	-
Mov Cap-2 Maneuver	515	-	-	-	-
Stage 1	815	-	-	-	-
Stage 2	711	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	9.4	3.5	0
HCM LOS	A		

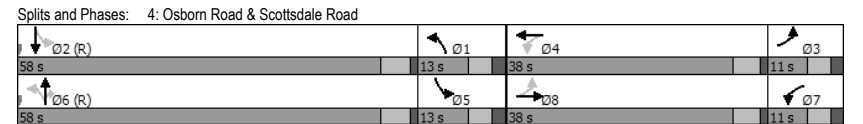
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1496	-	892	-	-
HCM Lane V/C Ratio	0.098	-	0.084	-	-
HCM Control Delay (s)	7.7	-	9.4	-	-
HCM Lane LOS	A	-	A	-	-
HCM 95th %tile Q(veh)	0.3	-	0.3	-	-

Total AM
4: Osborn Road & Scottsdale Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT	
Lane Configurations	↔		↔↔		↔↔		↔↔		↔↔	
Traffic Volume (vph)	44	212	79	112	62	746	106	81	530	
Future Volume (vph)	44	212	79	112	62	746	106	81	530	
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA	
Protected Phases	3	8	7	4	1	6		5	2	
Permitted Phases	8		4		6		6	2		
Detector Phase	3	8	7	4	1	6	6	5	2	
Switch Phase										
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0	
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4	
Total Split (s)	11.0	38.0	11.0	38.0	13.0	58.0	58.0	13.0	58.0	
Total Split (%)	9.2%	31.7%	9.2%	31.7%	10.8%	48.3%	48.3%	10.8%	48.3%	
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4	
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4	
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max	
Act Effct Green (s)	42.2	37.4	42.2	37.4	60.2	55.4	55.4	60.2	55.4	
Actuated g/C Ratio	0.35	0.31	0.35	0.31	0.50	0.46	0.46	0.50	0.46	
v/c Ratio	0.13	0.30	0.25	0.21	0.18	0.48	0.15	0.32	0.24	
Control Delay	25.9	28.9	28.1	15.6	16.3	24.0	3.9	21.1	20.1	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	25.9	28.9	28.1	15.6	16.3	24.0	3.9	21.1	20.1	
LOS	C	C	C	B	B	C	A	C	C	
Approach Delay	28.5		18.8		21.1		20.2			
Approach LOS	C		B		C		C			

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 6 (5%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.48
 Intersection Signal Delay: 21.8
 Intersection Capacity Utilization 54.7%
 Intersection LOS: C
 ICU Level of Service A
 Analysis Period (min) 15



Total AM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (veh/h)	44	212	76	79	112	118	62	746	106	81	530	28
Future Volume (veh/h)	44	212	76	79	112	118	62	746	106	81	530	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	52	252	60	84	119	52	68	820	78	86	564	14
Peak Hour Factor	0.84	0.84	0.84	0.94	0.94	0.94	0.91	0.91	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	399	825	193	335	706	294	473	1640	658	343	2365	59
Arrive On Green	0.04	0.27	0.27	0.04	0.27	0.27	0.07	0.44	0.44	0.07	0.44	0.44
Sat Flow, veh/h	1688	3009	703	1688	2575	1071	1688	3741	1502	1688	5394	134
Grp Volume(v), veh/h	52	155	157	84	85	86	68	820	78	86	374	204
Grp Sat Flow(s), veh/h/ln	1688	1870	1842	1688	1870	1776	1688	1870	1502	1688	1792	1945
Q Serve(g_s), s	0.0	7.9	8.1	0.0	4.1	4.4	0.0	18.9	3.7	0.0	7.9	7.9
Cycle Q Clear(g_c), s	0.0	7.9	8.1	0.0	4.1	4.4	0.0	18.9	3.7	0.0	7.9	7.9
Prop In Lane	1.00		0.38	1.00		0.60	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	399	513	505	335	513	487	473	1640	658	343	1571	852
V/C Ratio(X)	0.13	0.30	0.31	0.25	0.17	0.18	0.14	0.50	0.12	0.25	0.24	0.24
Avail Cap(c_a), veh/h	413	513	505	349	513	487	473	1640	658	343	1571	852
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.9	34.5	34.6	37.2	33.1	33.2	20.4	24.2	20.0	29.6	21.1	21.1
Incr Delay (d2), s/veh	0.1	1.5	1.6	0.1	0.7	0.8	0.1	1.1	0.4	0.1	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.8	3.9	2.1	2.0	2.0	1.2	8.6	1.4	1.9	3.4	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.0	36.0	36.2	37.4	33.8	34.0	20.4	25.3	20.3	29.8	21.5	21.8
LnGrp LOS	C	D	D	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		364			255			966			664	
Approach Delay, s/veh		35.6			35.1			24.6			22.7	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.0	58.0	10.0	38.0	14.0	58.0	10.0	38.0				
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1				
Max Green Setting (Gmax), s	7.4	52.6	* 5.7	* 33	7.4	52.6	* 5.7	* 33				
Max Q Clear Time (g_c+I1), s	2.0	9.9	2.0	6.4	2.0	20.9	2.0	10.1				
Green Ext Time (p_c), s	0.0	2.6	0.0	0.6	0.0	4.4	0.0	1.2				

Intersection Summary												
HCM 6th Ctrl Delay	27.0											
HCM 6th LOS	C											

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total AM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Vol, veh/h	43	249	96	16	277	137	1	0	1	45	0	45
Future Vol, veh/h	43	249	96	16	277	137	1	0	1	45	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	78	78	78	88	88	88	50	50	50	82	82	82
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	55	319	123	18	315	156	2	0	2	55	0	55

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	471	0	0	442
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	1222	-	-	1238
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	1	-	-	1
Mov Cap-1 Maneuver	1222	-	-	1238
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.9	0.3	10.8	11.1
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	625	1222	-	-	1238	-	-	489	987
HCM Lane V/C Ratio	0.006	0.045	-	-	0.015	-	-	0.112	0.056
HCM Control Delay (s)	10.8	8.1	-	-	8	-	-	13.3	8.9
HCM Lane LOS	B	A	-	-	A	-	-	B	A
HCM 95th %tile Q(veh)	0	0.1	-	-	0	-	-	0.4	0.2

Notes
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total AM
6: Osborn Road & Drinkwater Boulevard

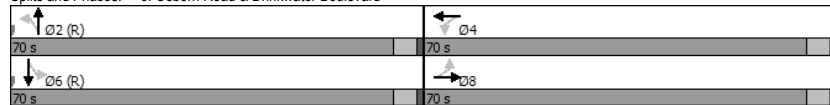
Honor Health
Timings

	↖	→	↗	↖	↖	↑	↗	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖↗	↖	↖↗
Traffic Volume (vph)	54	210	28	326	28	183	38	39
Future Volume (vph)	54	210	28	326	28	183	38	39
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		2		6	
Permitted Phases	8		4		2		6	
Detector Phase	8		4		2		6	
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	30.2	30.2	30.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	Max	Max	Max	Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	64.8	64.8	64.8	64.8	64.8	64.8	64.8	64.8
Actuated g/C Ratio	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
v/c Ratio	0.15	0.14	0.06	0.26	0.05	0.11	0.10	0.04
Control Delay	23.2	20.9	21.4	21.9	21.2	16.0	22.1	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	20.9	21.4	21.9	21.2	16.0	22.1	15.6
LOS	C	C	C	C	C	B	C	B
Approach Delay	21.3		21.9		16.6		18.4	
Approach LOS	C		C		B		B	

Intersection Summary

Cycle Length: 140	
Actuated Cycle Length: 140	
Offset: 14 (10%), Referenced to phase 2:NBT and 6:SBTL, Start of Green	
Natural Cycle: 65	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.26	
Intersection Signal Delay: 20.0	Intersection LOS: C
Intersection Capacity Utilization 53.2%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Osborn Road & Drinkwater Boulevard



Total AM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	↖	↖	↑	↗	↖	↖	↓	↗	↖
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗		↖	↖↗	
Traffic Volume (veh/h)	54	210	22	28	326	76	28	183	59	38	39	13
Future Volume (veh/h)	54	210	22	28	326	76	28	183	59	38	39	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	56	219	13	30	354	61	31	203	49	49	50	11
Peak Hour Factor	0.96	0.96	0.96	0.92	0.92	0.92	0.90	0.90	0.90	0.78	0.78	0.78
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	415	1661	98	517	1479	252	628	2023	463	516	1420	302
Arrive On Green	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	920	3589	212	1088	3196	545	1271	4371	1001	1068	3068	653
Grp Volume(v), veh/h	56	114	118	30	206	209	31	164	88	49	30	31
Grp Sat Flow(s),veh/h/ln	920	1870	1931	1088	1870	1871	1271	1792	1789	1068	1870	1851
Q Serve(g_s), s	5.5	4.9	4.9	2.3	9.3	9.5	1.9	3.6	3.9	3.8	1.2	1.3
Cycle Q Clear(g_c), s	15.0	4.9	4.9	7.2	9.3	9.5	3.2	3.6	3.9	7.7	1.2	1.3
Prop In Lane	1.00		0.11	1.00		0.29	1.00		0.56	1.00		0.35
Lane Grp Cap(c), veh/h	415	866	894	517	866	866	628	1659	828	516	866	857
V/C Ratio(X)	0.13	0.13	0.13	0.06	0.24	0.24	0.05	0.10	0.11	0.09	0.03	0.04
Avail Cap(c_a), veh/h	415	866	894	517	866	866	628	1659	828	516	866	857
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	21.5	21.5	23.6	22.7	22.7	21.4	21.2	21.2	23.4	20.5	20.5
Incr Delay (d2), s/veh	0.7	0.3	0.3	0.2	0.5	0.6	0.1	0.1	0.3	0.4	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	2.2	2.3	0.6	4.3	4.4	0.6	1.6	1.7	1.0	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.9	21.8	21.8	23.8	23.2	23.3	21.6	21.3	21.5	23.8	20.6	20.6
LnGrp LOS	C	C	C	C	C	C	C	C	C	C	C	C
Approach Vol, veh/h	288			445			283			110		
Approach Delay, s/veh	23.0			23.3			21.4			22.0		
Approach LOS	C			C			C			C		

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	70.0	70.0	70.0	70.0
Change Period (Y+Rc), s	* 5.2	* 5.2	* 5.2	* 5.2
Max Green Setting (Gmax), s	* 65	* 65	* 65	* 65
Max Q Clear Time (g_c+1), s	5.9	11.5	9.7	17.0
Green Ext Time (p_c), s	0.3	0.4	0.1	0.3

Intersection Summary

HCM 6th Ctrl Delay	22.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total AM
7: Osborn Road & Miller Road

Honor Health
Timings

	↖	→	↗	↙	↘	↖	↗	↙	↘
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖	↖	↖	↖
Traffic Volume (vph)	112	252	62	395	77	398	31	292	115
Future Volume (vph)	112	252	62	395	77	398	31	292	115
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	8		4		6		2		2
Permitted Phases	8		4		6		2		2
Detector Phase	8	8	4	4	6	6	2	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	50.0	50.0	50.0	50.0	70.0	70.0	70.0	70.0	70.0
Total Split (%)	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	33.9	33.9	33.9	33.9	75.7	75.7	75.7	75.7	75.7
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.63	0.63	0.63	0.63	0.63
v/c Ratio	1.15	0.29	0.29	0.64	0.15	0.41	0.08	0.29	0.14
Control Delay	173.1	31.4	33.4	36.0	12.3	13.7	12.3	12.4	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	173.1	31.4	33.4	36.0	12.3	13.7	12.3	12.4	2.5
LOS	F	C	C	D	B	B	B	B	A
Approach Delay	71.6		35.8		13.5		9.8		
Approach LOS	E		D		B		A		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.15	
Intersection Signal Delay: 30.7	Intersection LOS: C
Intersection Capacity Utilization 71.2%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 7: Osborn Road & Miller Road

↘ Ø2 (R)	↖ Ø4
70 s	50 s
↖ Ø6 (R)	↘ Ø8
70 s	50 s

Total AM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	↙	↘	↖	↗	↙	↘			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖
Traffic Volume (veh/h)	112	252	30	62	395	171	77	398	61	31	292	115
Future Volume (veh/h)	112	252	30	62	395	171	77	398	61	31	292	115
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	120	271	21	74	470	103	83	428	39	38	356	91
Peak Hour Factor	0.93	0.93	0.93	0.84	0.84	0.84	0.93	0.93	0.93	0.82	0.82	0.82
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	197	1121	86	329	972	212	512	1058	96	469	1171	893
Arrive On Green	0.32	0.32	0.32	0.11	0.11	0.11	0.59	0.59	0.59	0.59	0.59	0.59
Sat Flow, veh/h	795	3519	271	1030	3054	665	893	1778	162	877	1969	1502
Grp Volume(v), veh/h	120	143	149	74	287	286	83	0	467	38	356	91
Grp Sat Flow(s),veh/h/ln	795	1870	1920	1030	1870	1849	893	0	1940	877	1969	1502
Q Serve(g, s)	17.6	6.8	6.9	8.1	17.3	17.5	6.1	0.0	15.4	2.9	10.7	3.1
Cycle Q Clear(g_c), s	35.2	6.8	6.9	14.9	17.3	17.5	16.8	0.0	15.4	18.3	10.7	3.1
Prop In Lane	1.00		0.14	1.00		0.36	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	197	596	611	329	596	589	512	0	1154	469	1171	893
V/C Ratio(X)	0.61	0.24	0.24	0.22	0.48	0.49	0.16	0.00	0.40	0.08	0.30	0.10
Avail Cap(c_a), veh/h	241	698	717	386	698	690	512	0	1154	469	1171	893
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.64	0.64	0.64	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	30.2	30.2	46.5	44.4	44.4	16.2	0.0	13.0	17.9	12.0	10.5
Incr Delay (d2), s/veh	1.1	0.1	0.1	0.1	0.1	0.1	0.7	0.0	1.1	0.3	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.6	3.1	3.2	2.2	8.7	8.7	1.3	0.0	6.9	0.6	4.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.5	30.3	30.3	46.6	44.5	44.6	16.9	0.0	14.0	18.2	12.7	10.7
LnGrp LOS	D	C	C	D	D	D	B	A	B	B	B	B
Approach Vol, veh/h	412			647			550			485		
Approach Delay, s/veh	35.9			44.8			14.5			12.7		
Approach LOS	D			D			B			B		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	76.6		43.4		76.6		43.4					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 65		* 45		* 65		* 45					
Max Q Clear Time (g_c+1), s	20.3		19.5		18.8		37.2					
Green Ext Time (p_c), s	0.4		2.6		0.6		1.0					

Intersection Summary

HCM 6th Ctrl Delay	27.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total AM
8: Osborn Road & Hayden Road

Honor Health
Timings

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↑	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	96	75	144	97	119	314	1153	29	821
Future Volume (vph)	96	75	144	97	119	314	1153	29	821
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		8				4	1	6	5
Permitted Phases	8		8	4		6		2	
Detector Phase	8	8	8	4	4	1	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	18.7	18.7	18.7	18.7	18.7	89.8	83.2	77.0	71.9
Actuated g/C Ratio	0.16	0.16	0.16	0.16	0.16	0.75	0.69	0.64	0.60
v/c Ratio	1.08	0.29	0.45	0.61	0.67	0.73	0.34	0.10	0.31
Control Delay	160.4	48.1	27.4	59.2	53.4	17.4	9.1	7.0	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	160.4	48.1	27.4	59.2	53.4	17.4	9.1	7.0	12.7
LOS	F	D	C	E	D	B	A	A	B
Approach Delay		73.0			55.5		10.8		12.6
Approach LOS		E			E		B		B

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 30 (25%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.08	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 70.3%	ICU Level of Service C
Analysis Period (min) 15	

Splits and Phases: 8: Osborn Road & Hayden Road

Ø1	Ø2 (R)	Ø4
16 s	68 s	36 s
Ø5	Ø6 (R)	Ø8
16 s	68 s	36 s

Total AM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	96	75	144	97	119	52	314	1153	79	29	821	133
Future Volume (veh/h)	96	75	144	97	119	52	314	1153	79	29	821	133
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	112	87	103	117	143	39	320	1177	55	30	846	65
Peak Hour Factor	0.86	0.86	0.86	0.83	0.83	0.83	0.98	0.98	0.98	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	396	302	240	299	82	484	3303	154	327	2898	222
Arrive On Green	0.07	0.07	0.07	0.20	0.20	0.20	0.09	0.63	0.63	0.03	0.57	0.57
Sat Flow, veh/h	1139	1969	1502	1130	1489	406	1688	5262	246	1688	5092	390
Grp Volume(v), veh/h	112	87	103	117	0	182	320	801	431	30	594	317
Grp Sat Flow(s),veh/h/ln	1139	1969	1502	1130	0	1896	1688	1792	1925	1688	1792	1899
Q Serve(g_s), s	11.7	5.0	7.9	11.6	0.0	10.2	9.2	12.9	12.9	0.9	10.3	10.3
Cycle Q Clear(g_c), s	21.9	5.0	7.9	16.7	0.0	10.2	9.2	12.9	12.9	0.9	10.3	10.3
Prop In Lane	1.00		1.00	1.00		0.21	1.00		0.13	1.00		0.21
Lane Grp Cap(c), veh/h	192	396	302	240	0	381	484	2249	1208	327	2039	1080
V/C Ratio(X)	0.58	0.22	0.34	0.49	0.00	0.48	0.66	0.36	0.36	0.09	0.29	0.29
Avail Cap(c_a), veh/h	251	497	379	298	0	479	484	2249	1208	426	2039	1080
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.97	0.97	0.97	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.1	47.1	48.4	47.3	0.0	42.4	9.4	10.7	10.7	10.2	13.4	13.4
Incr Delay (d2), s/veh	1.0	0.1	0.2	0.6	0.0	0.3	2.7	0.4	0.8	0.0	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.6	3.1	3.3	0.0	4.8	3.5	5.0	5.6	0.3	4.2	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	47.2	48.7	47.9	0.0	42.7	12.1	11.2	11.5	10.2	13.7	14.1
LnGrp LOS	E	D	D	D	A	D	B	B	B	B	B	B
Approach Vol, veh/h		302			299		1552				941	
Approach Delay, s/veh		52.8			44.7		11.5				13.7	
Approach LOS		D			D		B				B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.0	74.2		29.8	9.0	81.2		29.8				
Change Period (Y+Rc), s	* 5.8	* 5.9		* 5.7	* 5.8	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 62		* 30	* 10	* 62		* 30				
Max Q Clear Time (g_c+1), s	11.2	12.3		18.7	2.9	14.9		23.9				
Green Ext Time (p_c), s	0.0	2.4		0.4	0.0	3.5		0.2				

Intersection Summary

HCM 6th Ctrl Delay	19.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total AM
9: Drinkwater Boulevard & 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	4.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	28	84	194	14	39	44
Future Vol, veh/h	28	84	194	14	39	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	88	88	78	78
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	37	112	220	16	50	56

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	356	118	0 0 236 0
Stage 1	228	-	- - - -
Stage 2	128	-	- - - -
Critical Hdwy	6.29	7.14	- - 5.34 -
Critical Hdwy Stg 1	6.64	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.67	3.92	- - 3.12 -
Pot Cap-1 Maneuver	628	774	- - 899 -
Stage 1	722	-	- - - -
Stage 2	850	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	593	774	- - 899 -
Mov Cap-2 Maneuver	593	-	- - - -
Stage 1	682	-	- - - -
Stage 2	850	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	4.3
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	593	774	899	-
HCM Lane V/C Ratio	-	-	0.063	0.145	0.056	-
HCM Control Delay (s)	-	-	11.5	10.4	9.2	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.2	0.5	0.2	-

Total AM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	16	0	18	5	0	0	65	130	17	1	64	54
Future Vol, veh/h	16	0	18	5	0	0	65	130	17	1	64	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	-	-	-	-	-	-	-	-	-	-
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	20	6	0	0	72	144	19	1	71	60

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	401	410	101 411	431 154 131 0 0 163 0 0
Stage 1	103	103	- 298 298	- - - - - - - -
Stage 2	298	307	- 113 133	- - - - - - - -
Critical Hdwy	7.12	6.52	6.22 7.12 6.52	6.22 4.12 - - 4.12 - -
Critical Hdwy Stg 1	6.12	5.52	- 6.12 5.52	- - - - - - - -
Critical Hdwy Stg 2	6.12	5.52	- 6.12 5.52	- - - - - - - -
Follow-up Hdwy	3.518	4.018	3.318 3.518	4.018 3.318 2.218 - - 2.218 - -
Pot Cap-1 Maneuver	560	531	954 551 517	892 1454 - - 1416 - -
Stage 1	903	810	- 711 667	- - - - - - - -
Stage 2	711	661	- 892 786	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	536	501	954 516 488	892 1454 - - 1416 - -
Mov Cap-2 Maneuver	536	501	- 516 488	- - - - - - - -
Stage 1	853	809	- 672 630	- - - - - - - -
Stage 2	672	625	- 872 785	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.5	12.1	2.3	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1454	-	-	698	516	1416	-	-
HCM Lane V/C Ratio	0.05	-	-	0.054	0.011	0.001	-	-
HCM Control Delay (s)	7.6	0	-	10.5	12.1	7.5	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.2	0	0	-	-

Total AM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.2					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑			↓
Traffic Vol, veh/h	4	0	212	14	1	86
Future Vol, veh/h	4	0	212	14	1	86
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	0	236	16	1	96
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	342	244	0	0	252	0
Stage 1	244	-	-	-	-	-
Stage 2	98	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	654	795	-	-	1313	-
Stage 1	797	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	653	795	-	-	1313	-
Mov Cap-2 Maneuver	653	-	-	-	-	-
Stage 1	796	-	-	-	-	-
Stage 2	926	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	10.6	0	0.1			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT	
Capacity (veh/h)	-	-	653	1313	-	-
HCM Lane V/C Ratio	-	-	0.007	0.001	-	-
HCM Control Delay (s)	-	-	10.6	7.7	0	-
HCM Lane LOS	-	-	B	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-	-

Total PM
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	9											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↕			↕			↕	
Traffic Vol, veh/h	5	20	34	34	42	15	60	62	35	16	122	4
Future Vol, veh/h	5	20	34	34	42	15	60	62	35	16	122	4
Peak Hour Factor	0.65	0.65	0.65	0.91	0.91	0.91	0.68	0.68	0.68	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	31	52	37	46	16	88	91	51	19	147	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB	WB	NB	SB								
Opposing Approach	WB	EB	SB	NB								
Opposing Lanes	1	1	1	1								
Conflicting Approach Left	SB	NB	EB	WB								
Conflicting Lanes Left	1	1	1	1								
Conflicting Approach Right	NB	SB	WB	EB								
Conflicting Lanes Right	1	1	1	1								
HCM Control Delay	8.3	8.8	9.4	9								
HCM LOS	A	A	A	A								
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	38%	8%	37%	11%								
Vol Thru, %	39%	34%	46%	86%								
Vol Right, %	22%	58%	16%	3%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	157	59	91	142								
LT Vol	60	5	34	16								
Through Vol	62	20	42	122								
RT Vol	35	34	15	4								
Lane Flow Rate	231	91	100	171								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.291	0.118	0.138	0.222								
Departure Headway (Hd)	4.539	4.667	4.953	4.666								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	790	764	721	766								
Service Time	2.58	2.717	3.003	2.71								
HCM Lane V/C Ratio	0.292	0.119	0.139	0.223								
HCM Control Delay	9.4	8.3	8.8	9								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	1.2	0.4	0.5	0.8								

Total PM
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Vol, veh/h	2	50	18	16	60	0	34	1	42	2	1	2
Future Vol, veh/h	2	50	18	16	60	0	34	1	42	2	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	88	88	88	42	42	42	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	71	26	18	68	0	81	2	100	3	2	3

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	68	0	0	97
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.12	-	-	4.12
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.218	-	-	2.218
Pot Cap-1 Maneuver	1533	-	-	1496
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	-	-	-	-
Mov Cap-1 Maneuver	1533	-	-	1496
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.2	1.6	10.3	9.9
HCM LOS			B	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	857	1533	-	-	1496	-	-	750
HCM Lane V/C Ratio	0.214	0.002	-	-	0.012	-	-	0.011
HCM Control Delay (s)	10.3	7.4	0	-	7.4	0	-	9.9
HCM Lane LOS	B	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0

Total PM
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	29	137	67	181	177	16
Future Vol, veh/h	29	137	67	181	177	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	70	-	-	-
Veh in Median Storage, #	1	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	76	76	89	89	79	79
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	38	180	75	203	224	20

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	465	122	244
Stage 1	234	-	-
Stage 2	231	-	-
Critical Hdwy	6.29	6.94	4.14
Critical Hdwy Stg 1	5.84	-	-
Critical Hdwy Stg 2	6.04	-	-
Follow-up Hdwy	3.67	3.32	2.22
Pot Cap-1 Maneuver	624	906	1319
Stage 1	754	-	-
Stage 2	851	-	-
Platoon blocked, %	1	-	-
Mov Cap-1 Maneuver	588	906	1319
Mov Cap-2 Maneuver	605	-	-
Stage 1	711	-	-
Stage 2	851	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	2.1	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1319	-	834	-	-
HCM Lane V/C Ratio	0.057	-	0.262	-	-
HCM Control Delay (s)	7.9	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	-	-

Total PM
4: Osborn Road & Scottsdale Road

Honor Health
Timings

	↖	→	↗	←	↙	↑	↘	↕	↓
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖↗	↖	↖↗	↖↗
Traffic Volume (vph)	26	174	95	411	129	652	62	85	1078
Future Volume (vph)	26	174	95	411	129	652	62	85	1078
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	20.0	39.0	20.0	39.0	16.0	45.0	45.0	16.0	45.0
Total Split (%)	16.7%	32.5%	16.7%	32.5%	13.3%	37.5%	37.5%	13.3%	37.5%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	41.6	36.8	43.7	40.9	56.6	49.3	49.3	56.6	49.3
Actuated g/C Ratio	0.35	0.31	0.36	0.34	0.47	0.41	0.41	0.47	0.41
v/c Ratio	0.11	0.26	0.26	0.40	0.63	0.45	0.10	0.28	0.51
Control Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
LOS	C	C	B	C	D	C	A	B	C
Approach Delay	24.3		22.0		27.3		26.8		
Approach LOS	C		C		C		C		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBT, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.63	
Intersection Signal Delay: 25.7	Intersection LOS: C
Intersection Capacity Utilization 63.2%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 4: Osborn Road & Scottsdale Road

↙ Ø2 (R)	↖ Ø1	↗ Ø4	↘ Ø3
45 s	16 s	39 s	20 s
↕ Ø6 (R)	↖ Ø5	↗ Ø8	↘ Ø7
45 s	16 s	39 s	20 s

Total PM
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	←	↙	↑	↘	↕	↓	↖		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖↗	↖↗	↖↗	↖↗	
Traffic Volume (veh/h)	26	174	88	95	411	86	129	652	62	85	1078	23
Future Volume (veh/h)	26	174	88	95	411	86	129	652	62	85	1078	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	29	193	70	97	419	37	137	694	29	87	1100	8
Peak Hour Factor	0.90	0.90	0.90	0.98	0.98	0.98	0.94	0.94	0.94	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	767	269	366	983	86	424	1234	496	468	1817	13
Arrive On Green	0.04	0.28	0.28	0.08	0.56	0.56	0.17	0.33	0.33	0.17	0.33	0.33
Sat Flow, veh/h	1688	2715	953	1688	3478	306	1688	3741	1502	1688	5505	40
Grp Volume(v), veh/h	29	131	132	97	224	232	137	694	29	87	716	392
Grp Sat Flow(s),veh/h/ln	1688	1870	1797	1688	1870	1914	1688	1870	1502	1688	1792	1962
Q Serve(g_s), s	0.0	6.5	6.8	0.0	8.2	8.3	0.0	18.3	1.6	0.0	20.1	20.1
Cycle Q Clear(g_c), s	0.0	6.5	6.8	0.0	8.2	8.3	0.0	18.3	1.6	0.0	20.1	20.1
Prop In Lane	1.00		0.53	1.00		0.16	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	316	528	508	366	528	541	424	1234	496	468	1182	647
V/C Ratio(X)	0.09	0.25	0.26	0.26	0.42	0.43	0.32	0.56	0.06	0.19	0.61	0.61
Avail Cap(c_a), veh/h	456	528	508	505	528	541	424	1234	496	468	1182	647
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	33.2	33.3	34.0	20.5	20.5	35.8	33.1	27.5	29.3	33.7	33.7
Incr Delay (d2), s/veh	0.0	1.1	1.2	0.1	2.5	2.5	0.2	1.9	0.2	0.1	2.3	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.1	3.2	2.2	3.5	3.6	3.4	8.6	0.6	1.9	9.1	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	34.3	34.6	34.1	23.0	23.0	36.0	34.9	27.7	29.4	36.0	37.8
LnGrp LOS	C	C	C	C	C	C	D	C	C	C	D	D
Approach Vol, veh/h	292		553		860			1195				
Approach Delay, s/veh	34.5		25.0		34.9			36.1				
Approach LOS	C		C		C			D				

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.9	45.0	10.1	39.0	25.9	45.0	10.1	39.0
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1
Max Green Setting (Gmax), s	10.4	39.6	* 15	* 34	10.4	39.6	* 15	* 34
Max Q Clear Time (g_c+I1), s	2.0	22.1	2.0	10.3	2.0	20.3	2.0	8.8
Green Ext Time (p_c), s	0.1	4.9	0.0	1.7	0.1	3.2	0.1	1.0

Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Vol, veh/h	24	318	29	0	438	57	6	0	15	171	0	182
Future Vol, veh/h	24	318	29	0	438	57	6	0	15	171	0	182
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	87	87	87	58	58	58	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	424	39	0	503	66	10	0	26	211	0	225

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	569	0	463	0
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	4.14	-
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	2.22	-
Pot Cap-1 Maneuver	1227	-	1258	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	1	-	1	-
Mov Cap-1 Maneuver	1227	-	1258	-
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	9.9	12.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	766	1227	-	-	1258	-	-	602	919
HCM Lane V/C Ratio	0.047	0.026	-	-	-	-	-	0.351	0.244
HCM Control Delay (s)	9.9	8	-	-	0	-	-	14.2	10.2
HCM Lane LOS	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	1.6	1

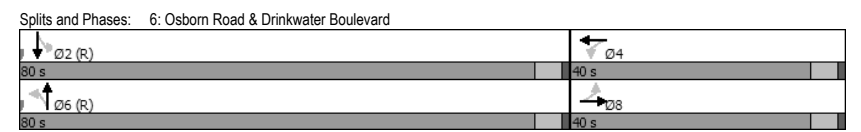
Notes
 -: Volume exceeds capacity \$: Delay exceeds 300s *: Computation Not Defined **: All major volume in platoon

Total PM
6: Osborn Road & Drinkwater Boulevard

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	33	398	14	399	29	196	55	141
Future Volume (vph)	33	398	14	399	29	196	55	141
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		6		2	
Permitted Phases	8		4		6		2	
Detector Phase	8		4		6		2	
Switch Phase								
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.2	36.2	36.2	36.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.4	21.4	21.4	21.4	88.2	88.2	88.2	88.2
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.74	0.74	0.74	0.74
v/c Ratio	0.54	0.78	0.26	0.73	0.04	0.09	0.09	0.09
Control Delay	77.5	59.8	45.1	45.2	5.4	3.2	5.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.5	59.8	45.1	45.2	5.4	3.2	5.7	3.6
LOS	E	E	D	D	A	A	A	A
Approach Delay	61.0		45.2		3.4		4.1	
Approach LOS	E		D		A		A	

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 96 (80%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
 Natural Cycle: 70
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.78
 Intersection Signal Delay: 34.1 Intersection LOS: C
 Intersection Capacity Utilization 51.3% ICU Level of Service A
 Analysis Period (min) 15



Total PM
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	33	398	35	14	399	33	29	196	121	55	141	60
Future Volume (veh/h)	33	398	35	14	399	33	29	196	121	55	141	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	39	474	30	16	448	15	31	209	113	65	168	65
Peak Hour Factor	0.84	0.84	0.84	0.89	0.89	0.89	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	693	44	114	717	24	821	2577	1200	760	1918	715
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	880	3573	226	848	3693	123	1087	3583	1668	1002	2667	994
Grp Volume(v), veh/h	39	248	256	16	227	236	31	209	113	65	116	117
Grp Sat Flow(s),veh/h/ln	880	1870	1928	848	1870	1947	1087	1792	1668	1002	1870	1790
Q Serve(g_s), s	5.3	15.5	15.6	2.2	14.2	14.2	1.1	2.1	2.4	2.5	2.2	2.4
Cycle Q Clear(g_c), s	19.5	15.5	15.6	17.9	14.2	14.2	3.4	2.1	2.4	5.0	2.2	2.4
Prop In Lane	1.00		0.12	1.00		0.06	1.00		1.00	1.00		0.56
Lane Grp Cap(c), veh/h	127	363	374	114	363	378	821	2577	1200	760	1345	1288
V/C Ratio(X)	0.31	0.68	0.69	0.14	0.62	0.63	0.04	0.08	0.09	0.09	0.09	0.09
Avail Cap(c_a), veh/h	211	542	559	195	542	565	821	2577	1200	760	1345	1288
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.4	52.5	52.6	61.3	51.9	51.9	5.6	5.0	5.1	5.8	5.0	5.1
Incr Delay (d2), s/veh	0.5	0.8	0.8	0.2	0.6	0.6	0.1	0.1	0.2	0.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.9	8.2	0.5	7.2	7.5	0.2	0.7	0.8	0.5	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	53.4	53.4	61.5	52.5	52.5	5.7	5.1	5.2	6.0	5.2	5.2
LnGrp LOS	E	D	D	E	D	D	A	A	A	A	A	A
Approach Vol, veh/h		543			479			353			298	
Approach Delay, s/veh		54.0			52.8			5.2			5.4	
Approach LOS		D			D			A			A	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		91.5		28.5		91.5		28.5				
Change Period (Y+Rc), s		* 5.2		* 5.2		* 5.2		* 5.2				
Max Green Setting (Gmax), s		* 75		* 35		* 75		* 35				
Max Q Clear Time (g_c+I1), s		7.0		19.9		5.4		21.5				
Green Ext Time (p_c), s		0.3		1.6		0.4		1.8				

Intersection Summary		
HCM 6th Ctrl Delay		34.7
HCM 6th LOS		C

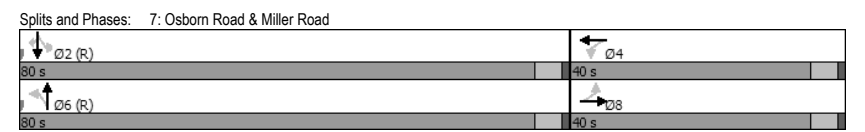
Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM
7: Osborn Road & Miller Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕	↔
Traffic Volume (vph)	198	591	69	319	55	441	161	580	130
Future Volume (vph)	198	591	69	319	55	441	161	580	130
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases		8		4		6		2	
Permitted Phases	8		4		6		2		2
Detector Phase	8	8	4	4	6	6	2	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	34.8	34.8	34.8	34.8	74.8	74.8	74.8	74.8	74.8
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.62	0.62	0.62	0.62	0.62
v/c Ratio	1.31	0.85	1.26	0.40	0.17	0.49	0.47	0.52	0.15
Control Delay	202.3	43.7	228.9	32.8	11.1	13.6	17.1	14.5	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.3	43.7	228.9	32.8	11.1	13.6	17.1	14.5	2.8
LOS	F	D	F	C	B	B	B	B	A
Approach Delay		80.0		61.7		13.3		13.2	
Approach LOS		F		E		B		B	

Intersection Summary	
Cycle Length:	120
Actuated Cycle Length:	120
Offset:	29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle:	60
Control Type:	Actuated-Coordinated
Maximum v/c Ratio:	1.31
Intersection Signal Delay:	44.6
Intersection Capacity Utilization:	78.9%
Analysis Period (min):	15
Intersection LOS:	D
ICU Level of Service:	D



Total PM
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	198	591	74	69	319	83	55	441	113	161	580	130
Future Volume (veh/h)	198	591	74	69	319	83	55	441	113	161	580	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	271	810	87	73	336	-2	59	469	93	177	637	99
Peak Hour Factor	0.73	0.73	0.73	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	265	988	106	93	1085	0	363	995	197	435	1227	936
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.00	0.62	0.62	0.62	0.62	0.62	0.62
Sat Flow, veh/h	991	3407	366	588	3839	0	684	1595	316	803	1969	1502
Grp Volume(v), veh/h	271	445	452	73	334	0	59	0	562	177	637	99
Grp Sat Flow(s), veh/h/ln	991	1870	1903	588	1870	0	684	0	1912	803	1969	1502
Q Serve(g_s), s	24.8	28.0	28.0	6.8	10.0	0.0	6.3	0.0	18.8	18.1	21.6	3.2
Cycle Q Clear(g_c), s	34.8	28.0	28.0	34.8	10.0	0.0	27.9	0.0	18.8	36.9	21.6	3.2
Prop In Lane	1.00		0.19	1.00		0.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	265	542	552	93	1085	0	363	0	1192	435	1227	936
V/C Ratio(X)	1.02	0.82	0.82	0.78	0.31	0.00	0.16	0.00	0.47	0.41	0.52	0.11
Avail Cap(c_a), veh/h	265	542	552	93	1085	0	363	0	1192	435	1227	936
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	0.70	0.70	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	62.1	51.2	51.2	70.1	43.0	0.0	20.4	0.0	12.1	21.9	12.6	9.1
Incr Delay (d2), s/veh	50.5	6.1	6.0	23.4	0.0	0.0	1.0	0.0	1.3	2.8	1.6	0.2
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	12.3	15.0	15.3	3.0	5.0	0.0	1.1	0.0	8.1	3.7	9.6	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	112.5	57.3	57.2	93.5	43.1	0.0	21.3	0.0	13.4	24.7	14.2	9.3
LnGrp LOS	F	E	E	F	D	A	C	A	B	C	B	A
Approach Vol, veh/h		1168			407			621			913	
Approach Delay, s/veh		70.1			52.1			14.2			15.7	
Approach LOS		E			D			B			B	
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		80.0		40.0		80.0		40.0				
Change Period (Y+Rc), s		* 5.2		* 5.2		* 5.2		* 5.2				
Max Green Setting (Gmax), s		* 75		* 35		* 75		* 35				
Max Q Clear Time (g_c+I1), s		38.9		36.8		29.9		36.8				
Green Ext Time (p_c), s		0.9		0.0		0.8		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	40.6
HCM 6th LOS	D

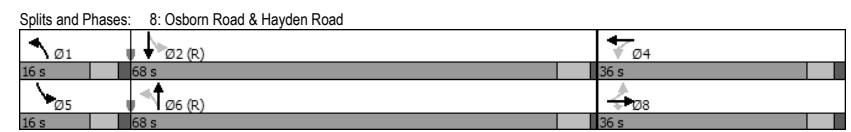
Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM
8: Osborn Road & Hayden Road

Honor Health
Timings

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	186	201	305	64	75	236	1011	76	1605
Future Volume (vph)	186	201	305	64	75	236	1011	76	1605
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA
Protected Phases		8				4	1	6	5
Permitted Phases	8		8	4		6		2	
Detector Phase	8	8	8	4	4	1	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max
Act Effct Green (s)	24.4	24.4	24.4	24.4	24.4	83.1	74.5	68.0	62.1
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.69	0.62	0.57	0.52
v/c Ratio	0.93	0.51	0.71	0.44	0.39	0.84	0.33	0.26	0.66
Control Delay	77.8	39.6	30.7	48.5	33.4	58.4	12.3	9.8	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.8	39.6	30.7	48.5	33.4	58.4	12.3	9.8	22.5
LOS	E	D	C	D	C	E	B	A	C
Approach Delay		46.0			38.2		20.6		22.0
Approach LOS		D			D		C		C

Intersection Summary
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.93
Intersection Signal Delay: 26.5
Intersection Capacity Utilization 83.0%
ICU Level of Service E
Analysis Period (min) 15



Total PM
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↗	↖	↔	↖	↔	↗	↖	↔	↗	↖
Traffic Volume (veh/h)	186	201	305	64	75	63	236	1011	70	76	1605	105
Future Volume (veh/h)	186	201	305	64	75	63	236	1011	70	76	1605	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	190	205	255	72	84	49	236	1011	45	81	1707	38
Peak Hour Factor	0.98	0.98	0.98	0.89	0.89	0.89	1.00	1.00	1.00	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	466	355	181	276	161	277	3057	136	368	2925	65
Arrive On Green	0.08	0.08	0.08	0.24	0.24	0.24	0.08	0.58	0.58	0.04	0.54	0.54
Sat Flow, veh/h	1191	1969	1502	883	1166	680	1688	5275	235	1688	5410	120
Grp Volume(v), veh/h	190	205	255	72	0	133	236	686	370	81	1130	615
Grp Sat Flow(s),veh/h/ln	1191	1969	1502	883	0	1846	1688	1792	1927	1688	1792	1947
Q Serve(g_s), s	19.0	11.9	19.9	9.2	0.0	7.1	7.3	12.0	12.0	2.5	25.4	25.4
Cycle Q Clear(g_c), s	26.1	11.9	19.9	21.1	0.0	7.1	7.3	12.0	12.0	2.5	25.4	25.4
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.12	1.00		0.06
Lane Grp Cap(c), veh/h	271	466	355	181	0	437	277	2076	1116	368	1937	1053
V/C Ratio(X)	0.70	0.44	0.72	0.40	0.00	0.30	0.85	0.33	0.33	0.22	0.58	0.58
Avail Cap(c_a), veh/h	290	497	379	195	0	466	289	2076	1116	446	1937	1053
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.52	0.52	0.52	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	47.7	51.4	48.6	0.0	37.7	20.6	13.1	13.1	11.4	18.5	18.5
Incr Delay (d2), s/veh	2.9	0.1	2.6	0.5	0.0	0.1	19.1	0.4	0.8	0.1	1.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.3	6.3	8.3	2.1	0.0	3.3	5.1	4.9	5.3	1.0	10.6	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	47.8	54.0	49.2	0.0	37.8	39.7	13.6	13.9	11.5	19.8	20.9
LnGrp LOS	E	D	D	D	A	D	D	B	B	B	B	C
Approach Vol, veh/h		650			205			1292			1826	
Approach Delay, s/veh		54.0			41.8			18.4			19.8	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.1	70.8		34.1	10.5	75.4		34.1				
Change Period (Y+Rc), s	* 5.8	* 5.9		* 5.7	* 5.8	* 5.9		* 5.7				
Max Green Setting (Gmax), s	* 10	* 62		* 30	* 10	* 62		* 30				
Max Q Clear Time (g_c+I1), s	9.3	27.4		23.1	4.5	14.0		28.1				
Green Ext Time (p_c), s	0.0	5.7		0.2	0.0	2.9		0.3				

Intersection Summary		
HCM 6th Ctrl Delay	26.1	
HCM 6th LOS	C	

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM
9: 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	17	81	228	30	49	179
Future Vol, veh/h	17	81	228	30	49	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	86	281	37	53	195

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	504	159	0 0 318 0
Stage 1	300	-	- - - -
Stage 2	204	-	- - - -
Critical Hdwy	6.29	7.14	- - 5.34 -
Critical Hdwy Stg 1	6.64	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.67	3.92	- - 3.12 -
Pot Cap-1 Maneuver	520	730	- - 824 -
Stage 1	655	-	- - - -
Stage 2	780	-	- - - -
Platoon blocked, %			- - - -
Mov Cap-1 Maneuver	487	730	- - 824 -
Mov Cap-2 Maneuver	487	-	- - - -
Stage 1	613	-	- - - -
Stage 2	780	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	11	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBL	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	487	730	824	-
HCM Lane V/C Ratio	-	-	0.037	0.118	0.065	-
HCM Control Delay (s)	-	-	12.7	10.6	9.7	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.2	-

Total PM
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	78	0	92	24	0	1	36	78	9	1	218	31
Future Vol, veh/h	78	0	92	24	0	1	36	78	9	1	218	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	0	102	27	0	1	40	87	10	1	242	34

Major/Minor	Minor2	Minor1	Major1	Major2									
Conflicting Flow All	434	438	259	484	450	92	276	0	0	97	0	0	
Stage 1	261	261	-	172	172	-	-	-	-	-	-	-	
Stage 2	173	177	-	312	278	-	-	-	-	-	-	-	
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	532	512	780	493	504	965	1287	-	-	1496	-	-	
Stage 1	744	692	-	830	756	-	-	-	-	-	-	-	
Stage 2	829	753	-	699	680	-	-	-	-	-	-	-	
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-	
Mov Cap-1 Maneuver	518	495	780	417	487	965	1287	-	-	1496	-	-	
Mov Cap-2 Maneuver	518	495	-	417	487	-	-	-	-	-	-	-	
Stage 1	719	691	-	803	731	-	-	-	-	-	-	-	
Stage 2	801	728	-	607	679	-	-	-	-	-	-	-	

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	14	2.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1287	-	-	633	427	1496	-	-
HCM Lane V/C Ratio	0.031	-	-	0.298	0.065	0.001	-	-
HCM Control Delay (s)	7.9	0	-	13.1	14	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.2	0	-	-

Total PM
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↔		↔	↔
Traffic Vol, veh/h	20	1	123	8	1	333
Future Vol, veh/h	20	1	123	8	1	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	1	137	9	1	370

Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	514	142	0	0	146	0
Stage 1	142	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	521	906	-	-	1436	-
Stage 1	885	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	520	906	-	-	1436	-
Mov Cap-2 Maneuver	520	-	-	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	697	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	531	1436	-
HCM Lane V/C Ratio	-	-	0.044	0.001	-
HCM Control Delay (s)	-	-	12.1	7.5	0
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Total PM Mitigated
1: Brown Avenue & 4th Street

Honor Health
HCM 6th AWSC

Intersection												
Intersection Delay, s/veh	9											
Intersection LOS	A											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Vol, veh/h	5	20	34	34	42	15	60	62	35	16	122	4
Future Vol, veh/h	5	20	34	34	42	15	60	62	35	16	122	4
Peak Hour Factor	0.65	0.65	0.65	0.91	0.91	0.91	0.68	0.68	0.68	0.83	0.83	0.83
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	31	52	37	46	16	88	91	51	19	147	5
Number of Lanes	0	1	0	0	1	0	0	1	0	0	1	0
Approach	EB			WB			NB			SB		
Opposing Approach	WB			EB			SB			NB		
Opposing Lanes	1			1			1			1		
Conflicting Approach Left	SB			NB			EB			WB		
Conflicting Lanes Left	1			1			1			1		
Conflicting Approach Right	NB			SB			WB			EB		
Conflicting Lanes Right	1			1			1			1		
HCM Control Delay	8.3			8.8			9.4			9		
HCM LOS	A			A			A			A		
Lane	NBLn1	EBLn1	WBLn1	SBLn1								
Vol Left, %	38%	8%	37%	11%								
Vol Thru, %	39%	34%	46%	86%								
Vol Right, %	22%	58%	16%	3%								
Sign Control	Stop	Stop	Stop	Stop								
Traffic Vol by Lane	157	59	91	142								
LT Vol	60	5	34	16								
Through Vol	62	20	42	122								
RT Vol	35	34	15	4								
Lane Flow Rate	231	91	100	171								
Geometry Grp	1	1	1	1								
Degree of Util (X)	0.291	0.118	0.138	0.222								
Departure Headway (Hd)	4.539	4.667	4.953	4.666								
Convergence, Y/N	Yes	Yes	Yes	Yes								
Cap	790	764	721	766								
Service Time	2.58	2.717	3.003	2.71								
HCM Lane V/C Ratio	0.292	0.119	0.139	0.223								
HCM Control Delay	9.4	8.3	8.8	9								
HCM Lane LOS	A	A	A	A								
HCM 95th-tile Q	1.2	0.4	0.5	0.8								

Total PM Mitigated
2: 4th Street

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔		↔		↔		↔		↔		↔	
Traffic Vol, veh/h	2	50	18	16	60	0	34	1	42	2	1	2
Future Vol, veh/h	2	50	18	16	60	0	34	1	42	2	1	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	70	70	70	88	88	88	42	42	42	63	63	63
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	71	26	18	68	0	81	2	100	3	2	3
Major/Minor	Major1		Major2		Minor1		Minor2					
Conflicting Flow All	68	0	0	97	0	0	197	194	84	245	207	68
Stage 1	-	-	-	-	-	-	90	90	-	104	104	-
Stage 2	-	-	-	-	-	-	107	104	-	141	103	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1533	-	-	1496	-	-	762	701	975	709	690	995
Stage 1	-	-	-	-	-	-	917	820	-	902	809	-
Stage 2	-	-	-	-	-	-	898	809	-	862	810	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1533	-	-	1496	-	-	750	690	975	627	680	995
Mov Cap-2 Maneuver	-	-	-	-	-	-	750	690	-	627	680	-
Stage 1	-	-	-	-	-	-	915	818	-	900	798	-
Stage 2	-	-	-	-	-	-	882	798	-	770	808	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.2			1.6			10.3			9.9		
HCM LOS							B			A		
Minor Lane/Major Mvmt	NBLn1	EBLn1	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	857	1533	-	-	1496	-	-	750				
HCM Lane V/C Ratio	0.214	0.002	-	-	0.012	-	-	0.011				
HCM Control Delay (s)	10.3	7.4	0	-	7.4	0	-	9.9				
HCM Lane LOS	B	A	A	-	A	A	-	A				
HCM 95th %tile Q(veh)	0.8	0	-	-	0	-	-	0				

Total PM Mitigated
3: Drinkwater Boulevard & 4th Street

Honor Health
HCM 6th TWSC

Intersection							
Int Delay, s/veh	4						
Movement	EBL	EBR	NBL	NBT	SBT	SBR	
Lane Configurations	↔		↔↔↔	↔↔↔	↔↔		
Traffic Vol, veh/h	29	137	67	181	177	16	
Future Vol, veh/h	29	137	67	181	177	16	
Conflicting Peds, #/hr	0	0	0	0	0	0	
Sign Control	Stop	Stop	Free	Free	Free	Free	
RT Channelized	-	None	-	None	-	None	
Storage Length	0	-	70	-	-	-	
Veh in Median Storage, #	1	-	-	0	0	-	
Grade, %	0	-	-	0	0	-	
Peak Hour Factor	76	76	89	89	79	79	
Heavy Vehicles, %	2	2	2	2	2	2	
Mvmt Flow	38	180	75	203	224	20	

Major/Minor	Minor2	Major1	Major2		
Conflicting Flow All	465	122	244	0	- 0
Stage 1	234	-	-	-	-
Stage 2	231	-	-	-	-
Critical Hdwy	6.29	6.94	4.14	-	-
Critical Hdwy Stg 1	5.84	-	-	-	-
Critical Hdwy Stg 2	6.04	-	-	-	-
Follow-up Hdwy	3.67	3.32	2.22	-	-
Pot Cap-1 Maneuver	624	906	1319	-	-
Stage 1	754	-	-	-	-
Stage 2	851	-	-	-	-
Platoon blocked, %	1	-	-	-	-
Mov Cap-1 Maneuver	588	906	1319	-	-
Mov Cap-2 Maneuver	605	-	-	-	-
Stage 1	711	-	-	-	-
Stage 2	851	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.8	2.1	0
HCM LOS	B		

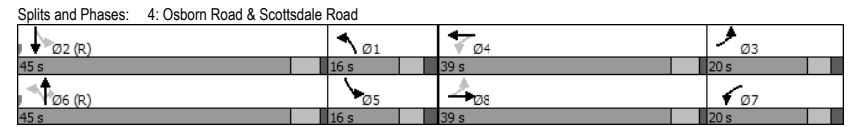
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1319	-	834	-	-
HCM Lane V/C Ratio	0.057	-	0.262	-	-
HCM Control Delay (s)	7.9	-	10.8	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.2	-	1.1	-	-

Total PM Mitigated
4: Osborn Road & Scottsdale Road

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔↔	↔	↔↔	↔	↔↔	↔	↔	↔↔↔
Traffic Volume (vph)	26	174	95	411	129	652	62	85	1078
Future Volume (vph)	26	174	95	411	129	652	62	85	1078
Turn Type	pm+pt	NA	pm+pt	NA	pm+pt	NA	Perm	pm+pt	NA
Protected Phases	3	8	7	4	1	6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	3	8	7	4	1	6	6	5	2
Switch Phase									
Minimum Initial (s)	5.0	7.0	5.0	7.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	10.3	33.1	10.3	36.1	10.6	31.4	31.4	10.6	30.4
Total Split (s)	20.0	39.0	20.0	39.0	16.0	45.0	45.0	16.0	45.0
Total Split (%)	16.7%	32.5%	16.7%	32.5%	13.3%	37.5%	37.5%	13.3%	37.5%
Yellow Time (s)	3.3	4.0	3.3	4.0	3.6	4.4	4.4	3.6	4.4
All-Red Time (s)	2.0	1.1	2.0	1.1	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.1	5.3	5.1	5.6	5.4	5.4	5.6	5.4
Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	None	Max	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	41.6	36.8	43.7	40.9	56.6	49.3	49.3	56.6	49.3
Actuated g/C Ratio	0.35	0.31	0.36	0.34	0.47	0.41	0.41	0.47	0.41
v/c Ratio	0.11	0.26	0.26	0.40	0.63	0.45	0.10	0.28	0.51
Control Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
LOS	C	C	B	C	D	C	A	B	C
Approach Delay		24.3		22.0		27.3			26.8
Approach LOS		C		C		C			C

Intersection Summary
 Cycle Length: 120
 Actuated Cycle Length: 120
 Offset: 4 (3%), Referenced to phase 2:SBTL and 6:NBT, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.63
 Intersection Signal Delay: 25.7
 Intersection Capacity Utilization 63.2%
 Intersection LOS: C
 ICU Level of Service B
 Analysis Period (min) 15



Total PM Mitigated
4: Osborn Road & Scottsdale Road

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Volume (veh/h)	26	174	88	95	411	86	129	652	62	85	1078	23
Future Volume (veh/h)	26	174	88	95	411	86	129	652	62	85	1078	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No		No		No		No		No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	29	193	70	97	419	37	137	694	29	87	1100	8
Peak Hour Factor	0.90	0.90	0.90	0.98	0.98	0.98	0.94	0.94	0.94	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	767	269	366	983	86	424	1234	496	468	1817	13
Arrive On Green	0.04	0.28	0.28	0.08	0.56	0.56	0.17	0.33	0.33	0.17	0.33	0.33
Sat Flow, veh/h	1688	2715	953	1688	3478	306	1688	3741	1502	1688	5505	40
Grp Volume(v), veh/h	29	131	132	97	224	232	137	694	29	87	716	392
Grp Sat Flow(s), veh/h/ln	1688	1870	1797	1688	1870	1914	1688	1870	1502	1688	1792	1962
Q Serve(g_s), s	0.0	6.5	6.8	0.0	8.2	8.3	0.0	18.3	1.6	0.0	20.1	20.1
Cycle Q Clear(g_c), s	0.0	6.5	6.8	0.0	8.2	8.3	0.0	18.3	1.6	0.0	20.1	20.1
Prop In Lane	1.00		0.53	1.00		0.16	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	316	528	508	366	528	541	424	1234	496	468	1182	647
V/C Ratio(X)	0.09	0.25	0.26	0.26	0.42	0.43	0.32	0.56	0.06	0.19	0.61	0.61
Avail Cap(c_a), veh/h	456	528	508	505	528	541	424	1234	496	468	1182	647
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.6	33.2	33.3	34.0	20.5	20.5	35.8	33.1	27.5	29.3	33.7	33.7
Incr Delay (d2), s/veh	0.0	1.1	1.2	0.1	2.5	2.5	0.2	1.9	0.2	0.1	2.3	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	3.1	3.2	2.2	3.5	3.6	3.4	8.6	0.6	1.9	9.1	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	34.3	34.6	34.1	23.0	23.0	36.0	34.9	27.7	29.4	36.0	37.8
LnGrp LOS	C	C	C	C	C	C	D	C	C	C	D	D
Approach Vol, veh/h		292			553			860			1195	
Approach Delay, s/veh		34.5			25.0			34.9			36.1	
Approach LOS		C			C			C			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	25.9	45.0	10.1	39.0	25.9	45.0	10.1	39.0				
Change Period (Y+Rc), s	5.6	5.4	* 5.3	* 5.1	5.6	5.4	* 5.3	* 5.1				
Max Green Setting (Gmax), s	10.4	39.6	* 15	* 34	10.4	39.6	* 15	* 34				
Max Q Clear Time (g_c+I1), s	2.0	22.1	2.0	10.3	2.0	20.3	2.0	8.8				
Green Ext Time (p_c), s	0.1	4.9	0.0	1.7	0.1	3.2	0.1	1.0				

Intersection Summary												
HCM 6th Ctrl Delay	33.4											
HCM 6th LOS	C											

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM Mitigated
5: Osborn Road & Brown Avenue

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	3.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕	↔	↔	↕	↔	↔	↕	↔	↔	↕	↔
Traffic Vol, veh/h	24	318	29	0	438	57	6	0	15	171	0	182
Future Vol, veh/h	24	318	29	0	438	57	6	0	15	171	0	182
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	25	-	-	25	-	-	-	-	-	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	-	1	-	-	1
Grade, %	-	0	-	-	0	-	-	-	0	-	-	0
Peak Hour Factor	75	75	75	87	87	87	58	58	58	81	81	81
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	32	424	39	0	503	66	10	0	26	211	0	225

Major/Minor	Major1	Major2	Minor1	Minor2
Conflicting Flow All	569	0	0	463
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Critical Hdwy	4.14	-	-	4.14
Critical Hdwy Stg 1	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	2.22	-	-	2.22
Pot Cap-1 Maneuver	1227	-	-	1258
Stage 1	-	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %	1	-	-	1
Mov Cap-1 Maneuver	1227	-	-	1258
Mov Cap-2 Maneuver	-	-	-	-
Stage 1	-	-	-	-
Stage 2	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	0	9.9	12.1
HCM LOS			A	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	766	1227	-	-	1258	-	-	602	919
HCM Lane V/C Ratio	0.047	0.026	-	-	-	-	-	0.351	0.244
HCM Control Delay (s)	9.9	8	-	-	0	-	-	14.2	10.2
HCM Lane LOS	A	A	-	-	A	-	-	B	B
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	1.6	1

Notes
-: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Total PM Mitigated
6: Osborn Road & Drinkwater Boulevard

Honor Health
Timings

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↕	↔	↕	↔	↕	↔	↕
Traffic Volume (vph)	33	398	14	399	29	196	55	141
Future Volume (vph)	33	398	14	399	29	196	55	141
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	8		4		6		2	
Permitted Phases	8		4		6		2	
Detector Phase	8		4		6		2	
Switch Phase	8		4		6		2	
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0
Minimum Split (s)	36.2	36.2	36.2	36.2	30.2	30.2	30.2	30.2
Total Split (s)	40.0	40.0	40.0	40.0	80.0	80.0	80.0	80.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	66.7%	66.7%	66.7%	66.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	21.4	21.4	21.4	21.4	88.2	88.2	88.2	88.2
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.74	0.74	0.74	0.74
v/c Ratio	0.54	0.78	0.26	0.73	0.04	0.09	0.09	0.09
Control Delay	77.5	59.8	46.4	46.5	5.4	3.2	5.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.5	59.8	46.4	46.5	5.4	3.2	5.7	3.6
LOS	E	E	D	D	A	A	A	A
Approach Delay	61.0		46.5		3.4		4.1	
Approach LOS	E		D		A		A	

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 96 (80%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 70	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.78	
Intersection Signal Delay: 34.5	Intersection LOS: C
Intersection Capacity Utilization 51.3%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 6: Osborn Road & Drinkwater Boulevard

↕ 80 s	↔ 40 s
↕ 80 s	↔ 40 s

Total PM Mitigated
6: Osborn Road & Drinkwater Boulevard

Honor Health
HCM 6th Signalized Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↕		↔	↕		↔	↕		↔	↕	
Traffic Volume (veh/h)	33	398	35	14	399	33	29	196	121	55	141	60
Future Volume (veh/h)	33	398	35	14	399	33	29	196	121	55	141	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	39	474	30	16	448	15	31	209	113	65	168	65
Peak Hour Factor	0.84	0.84	0.84	0.89	0.89	0.89	0.94	0.94	0.94	0.84	0.84	0.84
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	127	693	44	114	717	24	821	2577	1200	760	1918	715
Arrive On Green	0.06	0.06	0.06	0.06	0.06	0.06	0.72	0.72	0.72	0.72	0.72	0.72
Sat Flow, veh/h	880	3573	226	848	3693	123	1087	3583	1668	1002	2667	994
Grp Volume(v), veh/h	39	248	256	16	227	236	31	209	113	65	116	117
Grp Sat Flow(s),veh/h/ln	880	1870	1928	848	1870	1947	1087	1792	1668	1002	1870	1790
Q Serve(g_s), s	5.3	15.5	15.6	2.2	14.2	14.2	1.1	2.1	2.4	2.5	2.2	2.4
Cycle Q Clear(g_c), s	19.5	15.5	15.6	17.9	14.2	14.2	3.4	2.1	2.4	5.0	2.2	2.4
Prop In Lane	1.00	1.00	0.12	1.00	1.00	0.06	1.00	1.00	1.00	1.00	1.00	0.56
Lane Grp Cap(c), veh/h	127	363	374	114	363	378	821	2577	1200	760	1345	1288
V/C Ratio(X)	0.31	0.68	0.69	0.14	0.62	0.63	0.04	0.08	0.09	0.09	0.09	0.09
Avail Cap(c_a), veh/h	211	542	559	195	542	565	821	2577	1200	760	1345	1288
HCM Platoon Ratio	0.33	0.33	0.33	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.4	52.5	52.6	61.3	51.9	51.9	5.6	5.0	5.1	5.8	5.0	5.1
Incr Delay (d2), s/veh	0.5	0.8	0.8	0.2	0.6	0.6	0.1	0.1	0.2	0.2	0.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	7.9	8.2	0.5	7.2	7.5	0.2	0.7	0.8	0.5	0.8	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.9	53.4	53.4	61.5	52.5	52.5	5.7	5.1	5.2	6.0	5.2	5.2
LnGrp LOS	E	D	D	E	D	D	A	A	A	A	A	A
Approach Vol, veh/h	543			479			353			298		
Approach Delay, s/veh	54.0			52.8			5.2			5.4		
Approach LOS	D			D			A			A		
Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	91.5		28.5		91.5		28.5					
Change Period (Y+Rc), s	* 5.2		* 5.2		* 5.2		* 5.2					
Max Green Setting (Gmax), s	* 75		* 35		* 75		* 35					
Max Q Clear Time (g_c+1), s	7.0		19.9		5.4		21.5					
Green Ext Time (p_c), s	0.3		1.6		0.4		1.8					

Intersection Summary

HCM 6th Ctrl Delay	34.7
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM Mitigated
7: Osborn Road & Miller Road

Honor Health
Timings

	↖	→	↗	↖	↖	↑	↘	↓	↗
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↖	↖↗	↖	↖↗	↖	↖	↖	↖	↖
Traffic Volume (vph)	198	591	69	319	55	441	161	580	130
Future Volume (vph)	198	591	69	319	55	441	161	580	130
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA	Perm
Protected Phases	8		4		6		2		2
Permitted Phases	8		4		6		2		2
Detector Phase	8	8	4	4	6	6	2	2	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	25.2	25.2	25.2	25.2	30.2	30.2	30.2	30.2	30.2
Total Split (s)	43.0	43.0	43.0	43.0	77.0	77.0	77.0	77.0	77.0
Total Split (%)	35.8%	35.8%	35.8%	35.8%	64.2%	64.2%	64.2%	64.2%	64.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2	5.2
Lead/Lag									
Lead-Lag Optimize?									
Recall Mode	None	None	None	None	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	37.8	37.8	37.8	37.8	71.8	71.8	71.8	71.8	71.8
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.60	0.60	0.60	0.60	0.60
v/c Ratio	1.17	0.78	1.22	0.37	0.19	0.51	0.51	0.54	0.15
Control Delay	146.3	37.5	212.1	30.1	12.8	15.4	20.3	16.5	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	146.3	37.5	212.1	30.1	12.8	15.4	20.3	16.5	3.4
LOS	F	D	F	C	B	B	C	B	A
Approach Delay	62.4		56.9		15.2		15.3		
Approach LOS	E		E		B		B		

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 60	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.22	
Intersection Signal Delay: 38.5	Intersection LOS: D
Intersection Capacity Utilization 78.9%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 7: Osborn Road & Miller Road

↓ Ø2 (R)	↖ Ø4
77 s	43 s
↑ Ø6 (R)	↗ Ø8
77 s	43 s

Total PM Mitigated
7: Osborn Road & Miller Road

Honor Health
HCM 6th Signalized Intersection Summary

	↖	→	↗	↖	↖	↑	↘	↓	↗			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↖↗		↖	↖↗		↖	↖	↖	↖	↖	↖
Traffic Volume (veh/h)	198	591	74	69	319	83	55	441	113	161	580	130
Future Volume (veh/h)	198	591	74	69	319	83	55	441	113	161	580	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	271	810	87	73	336	-2	59	469	93	177	637	99
Peak Hour Factor	0.73	0.73	0.73	0.95	0.95	0.95	0.94	0.94	0.94	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	291	1073	115	114	1178	0	338	955	189	406	1178	898
Arrive On Green	0.21	0.21	0.21	0.10	0.10	0.00	0.60	0.60	0.60	0.60	0.60	0.60
Sat Flow, veh/h	991	3407	366	588	3839	0	684	1595	316	803	1969	1502
Grp Volume(v), veh/h	271	445	452	73	334	0	59	0	562	177	637	99
Grp Sat Flow(s),veh/h/ln	991	1870	1903	588	1870	0	684	0	1912	803	1969	1502
Q Serve(g_s), s	27.9	26.8	26.8	11.0	9.9	0.0	6.7	0.0	20.1	19.3	23.1	3.4
Cycle Q Clear(g_c), s	37.8	26.8	26.8	37.8	9.9	0.0	29.8	0.0	20.1	39.4	23.1	3.4
Prop In Lane	1.00		0.19	1.00		0.00	1.00		0.17	1.00		1.00
Lane Grp Cap(c), veh/h	291	589	599	114	1178	0	338	0	1144	406	1178	898
V/C Ratio(X)	0.93	0.75	0.75	0.64	0.28	0.00	0.17	0.00	0.49	0.44	0.54	0.11
Avail Cap(c_a), veh/h	291	589	599	114	1178	0	338	0	1144	406	1178	898
HCM Platoon Ratio	0.67	0.67	0.67	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.65	0.65	0.65	0.70	0.70	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	54.4	43.0	43.0	68.6	41.3	0.0	23.2	0.0	13.7	24.9	14.3	10.4
Incr Delay (d2), s/veh	26.2	3.3	3.2	6.4	0.0	0.0	1.1	0.0	1.5	3.4	1.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	13.4	13.6	2.6	4.9	0.0	1.2	0.0	8.8	4.0	10.5	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	80.6	46.2	46.2	75.0	41.3	0.0	24.3	0.0	15.2	28.3	16.1	10.6
LnGrp LOS	F	D	D	E	D	A	C	A	B	C	B	B
Approach Vol, veh/h	1168			407			621			913		
Approach Delay, s/veh	54.2			47.3			16.1			17.9		
Approach LOS	D			D			B			B		

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	77.0	43.0	77.0	43.0
Change Period (Y+Rc), s	* 5.2	* 5.2	* 5.2	* 5.2
Max Green Setting (Gmax), s	* 72	* 38	* 72	* 38
Max Q Clear Time (g_c+1), s	41.4	39.8	31.8	39.8
Green Ext Time (p_c), s	0.9	0.0	0.8	0.0

Intersection Summary

HCM 6th Ctrl Delay	35.0
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM Mitigated
8: Osborn Road & Hayden Road

Honor Health
Timings

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	
Lane Configurations	↔	↑	↔	↔	↔	↔	↔	↔	↔	
Traffic Volume (vph)	186	201	305	64	75	236	1011	76	1605	
Future Volume (vph)	186	201	305	64	75	236	1011	76	1605	
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	
Protected Phases	8		8		4		6		2	
Permitted Phases	8		8		4		6		2	
Detector Phase	8		8		4		6		2	
Switch Phase										
Minimum Initial (s)	7.0	7.0	7.0	7.0	7.0	5.0	10.0	5.0	10.0	
Minimum Split (s)	35.7	35.7	35.7	35.7	35.7	10.8	30.9	10.8	30.9	
Total Split (s)	36.0	36.0	36.0	36.0	36.0	16.0	68.0	16.0	68.0	
Total Split (%)	30.0%	30.0%	30.0%	30.0%	30.0%	13.3%	56.7%	13.3%	56.7%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.7	4.0	4.7	
All-Red Time (s)	1.7	1.7	1.7	1.7	1.7	1.8	1.2	1.8	1.2	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.7	5.7	5.7	5.7	5.7	5.8	5.9	5.8	5.9	
Lead/Lag						Lead	Lag	Lead	Lag	
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	
Act Effct Green (s)	24.4	24.4	24.4	24.4	24.4	83.1	74.5	68.0	62.1	
Actuated g/C Ratio	0.20	0.20	0.20	0.20	0.20	0.69	0.62	0.57	0.52	
v/c Ratio	0.93	0.51	0.71	0.44	0.39	0.84	0.33	0.26	0.66	
Control Delay	81.1	41.5	32.2	48.5	33.4	58.4	12.3	9.8	22.5	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	81.1	41.5	32.2	48.5	33.4	58.4	12.3	9.8	22.5	
LOS	F	D	C	D	C	E	B	A	C	
Approach Delay	48.1				38.2		20.6		22.0	
Approach LOS	D				D		C		C	

Intersection Summary

Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 29 (24%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.93	
Intersection Signal Delay: 26.9	Intersection LOS: C
Intersection Capacity Utilization 83.0%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 8: Osborn Road & Hayden Road

↔ Ø1	↑ Ø2 (R)	↔ Ø4
16 s	68 s	36 s
↔ Ø5	↑ Ø6 (R)	↔ Ø8
16 s	68 s	36 s

Total PM Mitigated
8: Osborn Road & Hayden Road

Honor Health
HCM 6th Signalized Intersection Summary

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↑	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	186	201	305	64	75	63	236	1011	70	76	1605	105
Future Volume (veh/h)	186	201	305	64	75	63	236	1011	70	76	1605	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	190	205	255	72	84	49	236	1011	45	81	1707	38
Peak Hour Factor	0.98	0.98	0.98	0.89	0.89	0.89	1.00	1.00	1.00	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	466	355	181	276	161	277	3057	136	368	2925	65
Arrive On Green	0.08	0.08	0.08	0.24	0.24	0.24	0.08	0.58	0.58	0.04	0.54	0.54
Sat Flow, veh/h	1191	1969	1502	883	1166	680	1688	5275	235	1688	5410	120
Grp Volume(v), veh/h	190	205	255	72	0	133	236	686	370	81	1130	615
Grp Sat Flow(s),veh/h/ln	1191	1969	1502	883	0	1846	1688	1792	1927	1688	1792	1947
Q Serve(g_s), s	19.0	11.9	19.9	9.2	0.0	7.1	7.3	12.0	12.0	2.5	25.4	25.4
Cycle Q Clear(g_c), s	26.1	11.9	19.9	21.1	0.0	7.1	7.3	12.0	12.0	2.5	25.4	25.4
Prop In Lane	1.00		1.00	1.00		0.37	1.00		0.12	1.00		0.06
Lane Grp Cap(c), veh/h	271	466	355	181	0	437	277	2076	1116	368	1937	1053
V/C Ratio(X)	0.70	0.44	0.72	0.40	0.00	0.30	0.85	0.33	0.33	0.22	0.58	0.58
Avail Cap(c_a), veh/h	290	497	379	195	0	466	289	2076	1116	446	1937	1053
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.59	0.59	0.59	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	57.8	47.7	51.4	48.6	0.0	37.7	20.6	13.1	13.1	11.4	18.5	18.5
Incr Delay (d2), s/veh	3.3	0.1	2.9	0.5	0.0	0.1	19.1	0.4	0.8	0.1	1.3	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	6.3	8.3	2.1	0.0	3.3	5.1	4.9	5.3	1.0	10.6	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	61.1	47.9	54.3	49.2	0.0	37.8	39.7	13.6	13.9	11.5	19.8	20.9
LnGrp LOS	E	D	D	D	A	D	D	B	B	B	B	C
Approach Vol, veh/h	650				205		1292				1826	
Approach Delay, s/veh	54.3				41.8		18.4				19.8	
Approach LOS	D				D		B				B	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	15.1	70.8	34.1		10.5	75.4	34.1					
Change Period (Y+Rc), s	* 5.8	* 5.9	* 5.7		* 5.8	* 5.9	* 5.7					
Max Green Setting (Gmax), s	* 10	* 62	* 30		* 10	* 62	* 30					
Max Q Clear Time (g_c+1), s	9.3	27.4	23.1		4.5	14.0	28.1					
Green Ext Time (p_c), s	0.0	5.7	0.2		0.0	2.9	0.3					

Intersection Summary

HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Total PM Mitigated
9: 74th Street

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	2.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Vol, veh/h	17	81	228	30	49	179
Future Vol, veh/h	17	81	228	30	49	179
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	0	-	-	70	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	94	94	81	81	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	18	86	281	37	53	195

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	504	159	0 0 318 0
Stage 1	300	-	- - - -
Stage 2	204	-	- - - -
Critical Hdwy	6.29	7.14	- - 5.34 -
Critical Hdwy Stg 1	6.64	-	- - - -
Critical Hdwy Stg 2	5.84	-	- - - -
Follow-up Hdwy	3.67	3.92	- - 3.12 -
Pot Cap-1 Maneuver	520	730	- - 824 -
Stage 1	655	-	- - - -
Stage 2	780	-	- - - -
Platoon blocked, %	-	-	- - - -
Mov Cap-1 Maneuver	487	730	- - 824 -
Mov Cap-2 Maneuver	487	-	- - - -
Stage 1	613	-	- - - -
Stage 2	780	-	- - - -

Approach	WB	NB	SB
HCM Control Delay, s	11	0	2.1
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	WBLn2	SBL	SBT
Capacity (veh/h)	-	-	487	730	824	-
HCM Lane V/C Ratio	-	-	0.037	0.118	0.065	-
HCM Control Delay (s)	-	-	12.7	10.6	9.7	-
HCM Lane LOS	-	-	B	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0.4	0.2	-

Total PM Mitigated
10: Brown Avenue & North Drwy

Honor Health
HCM 6th TWSC

Intersection												
Int Delay, s/veh	5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔			↔			↔			↔		
Traffic Vol, veh/h	78	0	92	24	0	1	36	78	9	1	218	31
Future Vol, veh/h	78	0	92	24	0	1	36	78	9	1	218	31
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	87	0	102	27	0	1	40	87	10	1	242	34

Major/Minor	Minor2	Minor1	Major1	Major2
Conflicting Flow All	434	438	259 484	450 92 276 0 0 97 0 0
Stage 1	261	261	- 172 172	- - - - - - - -
Stage 2	173	177	- 312 278	- - - - - - - -
Critical Hdwy	7.12	6.52	6.22 7.12 6.52	6.22 4.12 - - 4.12 - -
Critical Hdwy Stg 1	6.12	5.52	- 6.12 5.52	- - - - - - - -
Critical Hdwy Stg 2	6.12	5.52	- 6.12 5.52	- - - - - - - -
Follow-up Hdwy	3.518	4.018	3.318 3.518	4.018 3.318 2.218 - - 2.218 - -
Pot Cap-1 Maneuver	532	512	780 493	504 965 1287 - - 1496 - -
Stage 1	744	692	- 830 756	- - - - - - - -
Stage 2	829	753	- 699 680	- - - - - - - -
Platoon blocked, %	-	-	- - - -	- - - - - - - -
Mov Cap-1 Maneuver	518	495	780 417	487 965 1287 - - 1496 - -
Mov Cap-2 Maneuver	518	495	- 417 487	- - - - - - - -
Stage 1	719	691	- 803 731	- - - - - - - -
Stage 2	801	728	- 607 679	- - - - - - - -

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	14	2.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1287	-	-	633	427	1496	-	-
HCM Lane V/C Ratio	0.031	-	-	0.298	0.065	0.001	-	-
HCM Control Delay (s)	7.9	0	-	13.1	14	7.4	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	1.2	0.2	0	-	-

Total PM Mitigated
11: Brown Avenue & South Drwy

Honor Health
HCM 6th TWSC

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	↔		↑			↔
Traffic Vol, veh/h	20	1	123	8	1	333
Future Vol, veh/h	20	1	123	8	1	333
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	22	1	137	9	1	370
Major/Minor	Minor1	Major1	Major2			
Conflicting Flow All	514	142	0	0	146	0
Stage 1	142	-	-	-	-	-
Stage 2	372	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	521	906	-	-	1436	-
Stage 1	885	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	520	906	-	-	1436	-
Mov Cap-2 Maneuver	520	-	-	-	-	-
Stage 1	884	-	-	-	-	-
Stage 2	697	-	-	-	-	-
Approach	WB	NB	SB			
HCM Control Delay, s	12.1	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT		
Capacity (veh/h)	-	-	531	1436	-	
HCM Lane V/C Ratio	-	-	0.044	0.001	-	
HCM Control Delay (s)	-	-	12.1	7.5	0	
HCM Lane LOS	-	-	B	A	A	
HCM 95th %tile Q(veh)	-	-	0.1	0	-	

APPENDIX I

QUEUE STORAGE ANALYSIS

Total AM
4: Osborn Road & Scottsdale Road

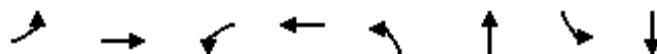
Honor Health
Queues



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	52	342	84	245	68	820	116	86	594
v/c Ratio	0.13	0.30	0.25	0.21	0.18	0.48	0.15	0.32	0.24
Control Delay	25.9	28.9	28.1	15.6	16.3	24.0	3.9	21.1	20.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.9	28.9	28.1	15.6	16.3	24.0	3.9	21.1	20.1
Queue Length 50th (ft)	26	94	42	35	25	233	0	32	101
Queue Length 95th (ft)	50	125	79	67	48	291	33	59	129
Internal Link Dist (ft)		132		344		782			948
Turn Bay Length (ft)	60		140		195		195	150	
Base Capacity (vph)	396	1144	345	1159	417	1718	755	299	2454
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.30	0.24	0.21	0.16	0.48	0.15	0.29	0.24
Intersection Summary									

Total AM
6: Osborn Road & Drinkwater Boulevard

Honor Health
Queues



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	56	242	30	437	31	269	49	67
v/c Ratio	0.15	0.14	0.06	0.26	0.05	0.11	0.10	0.04
Control Delay	23.2	20.9	21.4	21.9	21.2	16.0	22.1	15.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.2	20.9	21.4	21.9	21.2	16.0	22.1	15.6
Queue Length 50th (ft)	29	62	15	117	15	37	25	12
Queue Length 95th (ft)	59	90	35	155	35	56	43	22
Internal Link Dist (ft)		806		1249		420		293
Turn Bay Length (ft)	120		100		150		105	
Base Capacity (vph)	369	1705	487	1690	580	2421	473	1668
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.15	0.14	0.06	0.26	0.05	0.11	0.10	0.04
Intersection Summary								

Total AM
7: Osborn Road & Miller Road

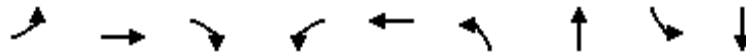


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	120	303	74	674	83	494	38	356	140
v/c Ratio	1.15	0.29	0.29	0.64	0.15	0.41	0.08	0.29	0.14
Control Delay	173.1	31.4	33.4	36.0	12.3	13.7	12.3	12.4	2.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	173.1	31.4	33.4	36.0	12.3	13.7	12.3	12.4	2.5
Queue Length 50th (ft)	~106	91	48	227	25	179	11	120	0
Queue Length 95th (ft)	#206	114	m69	242	61	311	29	189	23
Internal Link Dist (ft)		1249		2569		894		1147	
Turn Bay Length (ft)	105		120		160		140		140
Base Capacity (vph)	138	1376	338	1369	564	1216	455	1237	998
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.87	0.22	0.22	0.49	0.15	0.41	0.08	0.29	0.14

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Total AM
8: Osborn Road & Hayden Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	112	87	167	117	206	320	1258	30	983
v/c Ratio	1.08	0.29	0.45	0.61	0.67	0.73	0.34	0.10	0.31
Control Delay	160.4	48.1	27.4	59.2	53.4	17.4	9.1	7.0	12.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	160.4	48.1	27.4	59.2	53.4	17.4	9.1	7.0	12.7
Queue Length 50th (ft)	~100	69	66	86	139	66	145	5	127
Queue Length 95th (ft)	#164	108	100	124	181	#165	219	17	185
Internal Link Dist (ft)		2569			261		840		984
Turn Bay Length (ft)	150			90		165		140	
Base Capacity (vph)	169	495	503	312	485	441	3679	363	3154
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.66	0.18	0.33	0.38	0.42	0.73	0.34	0.08	0.31

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

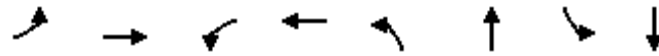
Total PM Mitigated
4: Osborn Road & Scottsdale Road

Honor Health
Queues



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	29	291	97	507	137	694	66	87	1123
v/c Ratio	0.11	0.26	0.26	0.40	0.63	0.45	0.10	0.28	0.51
Control Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	26.2	24.1	15.4	23.3	42.5	26.8	0.6	19.8	27.3
Queue Length 50th (ft)	14	64	24	88	54	201	0	33	233
Queue Length 95th (ft)	36	105	44	152	85	255	3	58	277
Internal Link Dist (ft)		132		344		782			948
Turn Bay Length (ft)	60		140		195		195	150	
Base Capacity (vph)	396	1136	511	1252	260	1530	685	347	2194
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.07	0.26	0.19	0.40	0.53	0.45	0.10	0.25	0.51
Intersection Summary									

Total PM Mitigated
6: Osborn Road & Drinkwater Boulevard



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	39	516	16	485	31	338	65	239
v/c Ratio	0.54	0.78	0.26	0.73	0.04	0.09	0.09	0.09
Control Delay	77.5	59.8	46.4	46.5	5.4	3.2	5.7	3.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	77.5	59.8	46.4	46.5	5.4	3.2	5.7	3.6
Queue Length 50th (ft)	29	206	12	201	6	14	12	16
Queue Length 95th (ft)	62	235	m33	248	17	28	29	30
Internal Link Dist (ft)		806		1249		420		293
Turn Bay Length (ft)	120		100		150		105	
Base Capacity (vph)	117	1073	100	1073	781	3742	700	2633
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.48	0.16	0.45	0.04	0.09	0.09	0.09

Intersection Summary

m Volume for 95th percentile queue is metered by upstream signal.

Total PM Mitigated
7: Osborn Road & Miller Road

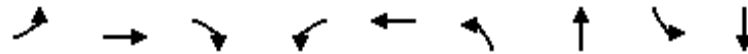


Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	271	911	73	423	59	589	177	637	143
v/c Ratio	1.17	0.78	1.22	0.37	0.19	0.51	0.51	0.54	0.15
Control Delay	146.3	37.5	212.1	30.1	12.8	15.4	20.3	16.5	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	146.3	37.5	212.1	30.1	12.8	15.4	20.3	16.5	3.4
Queue Length 50th (ft)	~254	362	~70	141	19	241	75	277	10
Queue Length 95th (ft)	#306	340	m#128	m177	43	335	145	378	37
Internal Link Dist (ft)		1249		2569		894		1147	
Turn Bay Length (ft)	105		120		160		140		140
Base Capacity (vph)	232	1161	60	1156	314	1144	348	1173	942
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.17	0.78	1.22	0.37	0.19	0.51	0.51	0.54	0.15

Intersection Summary

- ~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.

Total PM Mitigated
8: Osborn Road & Hayden Road



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	190	205	311	72	155	236	1081	81	1819
v/c Ratio	0.93	0.51	0.71	0.44	0.39	0.84	0.33	0.26	0.66
Control Delay	81.1	41.5	32.2	48.5	33.4	58.4	12.3	9.8	22.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	81.1	41.5	32.2	48.5	33.4	58.4	12.3	9.8	22.5
Queue Length 50th (ft)	155	156	164	48	80	132	144	18	362
Queue Length 95th (ft)	m#206	m204	m220	92	135	#340	199	40	415
Internal Link Dist (ft)		2569			261		840		984
Turn Bay Length (ft)	150			90		165		140	
Base Capacity (vph)	253	495	501	204	486	282	3295	373	2751
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.75	0.41	0.62	0.35	0.32	0.84	0.33	0.22	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

Signalized Intersection
2020

Average Vehicle Length (ft): 25
 Intersection Cycle Length (sec): 120

Cycles: 2

Equation Used: storage length = 2 x (vehicles/hour)/(cycles/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Scottsdale Rd & Osborn Rd	NB Left	62	0	129	9	0	225'
	SB Left	81	0	85	6	0	150'
	EB Left	44	0	26	3	0	75'
	WB Left	79	0	95	7	0	175'
	NB Right	106	0	62	8	0	200'
	SB Right	28	0	23	2	0	50'
	EB Right	76	0	88	6	0	150'
	WB Right	118	0	86	8	0	200'
Drinkwater Blvd & Osborn Rd	NB Left	28	0	29	2	0	50'
	SB Left	38	0	55	4	0	100'
	EB Left	54	0	33	4	0	100'
	WB Left	28	0	14	2	0	50'
	NB Right	59	0	121	9	0	225'
	SB Right	13	0	60	4	0	100'
	EB Right	22	0	35	3	0	75'
	WB Right	76	0	33	6	0	150'
Miller Rd & Osborn Rd	NB Left	77	0	55	6	0	150'
	SB Left	31	0	161	11	0	275'
	EB Left	112	0	198	14	0	350'
	WB Left	62	0	69	5	0	125'
	NB Right	61	0	113	8	0	200'
	SB Right	115	0	130	9	0	225'
	EB Right	30	0	74	5	0	125'
	WB Right	171	0	83	12	0	300'
Hayden Rd & Osborn Rd	NB Left	314	0	236	21	0	525'
	SB Left	29	0	76	6	0	150'
	EB Left	96	0	186	13	0	325'
	WB Left	97	0	64	7	0	175'
	NB Right	79	0	70	6	0	150'
	SB Right	133	0	105	9	0	225'
	EB Right	144	0	305	21	0	525'
	WB Right	52	0	63	5	0	125'

Unsignalized Intersection
2020

Average Vehicle Length (ft): 25

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Storage Length
Brown Ave & 4th St	NB Left	21	0	60	2	0	50'
	SB Left	21	0	16	1	0	25'
	EB Left	2	0	5	1	0	25'
	WB Left	22	0	34	2	0	50'
	NB Right	34	0	35	2	0	50'
	SB Right	6	0	4	1	0	25'
	EB Right	47	0	34	2	0	50'
	WB Right	26	0	15	1	0	25'
Existing Drwy & 4th St	NB Left	11	0	34	2	0	50'
	SB Left	1	0	2	1	0	25'
	EB Left	2	0	2	1	0	25'
	WB Left	28	0	16	1	0	25'
	NB Right	9	0	42	2	0	50'
	SB Right	2	0	2	1	0	25'
	EB Right	39	0	18	2	0	50'
	WB Right	2	0	0	1	0	25'
Drinkwater Blvd & 4th St	NB Left	132	0	67	5	0	125'
	SB Left	0	0	0	0	0	0'
	EB Left	8	0	29	1	0	25'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	27	0	16	1	0	25'
	EB Right	50	0	137	5	0	125'
	WB Right	0	0	0	0	0	0'
Brown Ave & Osborn Rd	NB Left	1	0	6	1	0	25'
	SB Left	45	0	171	6	0	150'
	EB Left	43	0	24	2	0	50'
	WB Left	16	0	0	1	0	25'
	NB Right	1	0	15	1	0	25'
	SB Right	45	0	182	7	0	175'
	EB Right	96	0	29	4	0	100'
	WB Right	137	0	57	5	0	125'
Drinkwater Blvd & 74th St	NB Left	0	0	0	0	0	0'
	SB Left	39	0	49	2	0	50'
	EB Left	0	0	0	0	0	0'
	WB Left	28	0	17	1	0	25'
	NB Right	14	0	30	1	0	25'
	SB Right	0	0	0	0	0	0'
	EB Right	0	0	0	0	0	0'
	WB Right	84	0	81	3	0	75'
Brown Ave & North Drwy	NB Left	65	0	36	3	0	75'
	SB Left	1	0	1	1	0	25'
	EB Left	16	0	78	3	0	75'
	WB Left	5	0	24	1	0	25'
	NB Right	17	0	9	1	0	25'
	SB Right	54	0	31	2	0	50'
	EB Right	18	0	92	4	0	100'
	WB Right	0	0	1	1	0	25'
	NB Left	0	0	0	0	0	0'

**Unsignalized Intersection
2020**

Average Vehicle Length (ft): 25

Equation Used: storage length = 2 x (vehicles/hour)/(60 minutes/hour) x average vehicle length

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Veh per 2 minutes	Trucks per 2 minutes	Storage Length
Brown Ave & South Drwy	SB Left	1	0	1	1	0	25'
	EB Left	0	0	0	0	0	0'
	WB Left	4	0	20	1	0	25'
	NB Right	14	0	8	1	0	25'
	SB Right	0	0	0	0	0	0'
	EB Right	0	0	0	0	0	0'
	WB Right	0	0	1	1	0	25'

APPENDIX J

SIGHT DISTANCE STANDARDS

SITE DISTANCE

SIX LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	304	340	403	440	476	513
30	364	408	483	527	572	616
35	425	476	564	615	667	718
40	486	544	644	703	762	821
45	546	612	725	791	857	923
50	607	680	805	879	952	1026
55	668	748	886	967	1048	1128

FOUR LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	285	322	377	414	451	487
30	342	386	453	497	541	585
35	399	451	528	579	631	682
40	456	515	603	662	721	780
45	513	579	679	745	811	877
50	570	644	754	827	901	974
55	627	708	829	910	991	1072

THREE LANE ROADWAY¹

SIGHT DISTANCE						
DESIGN SPEED	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	267	304	351	388	425	462
30	320	364	422	466	510	554
35	374	425	492	543	595	646
40	427	486	562	621	680	738
45	480	546	632	698	765	831
50	267	304	351	388	425	462
55	320	364	422	466	510	554

SITE DISTANCE

TWO LANE ROADWAY¹

DESIGN SPEED	SIGHT DISTANCE					
	PASSENGER CAR		SINGLE-UNIT TRUCK		COMBINATION TRUCK	
	TH	LT	TH	LT	TH	LT
25	239	276	313	350	386	423
30	287	331	375	419	464	508
35	335	386	438	489	541	592
40	383	441	500	559	618	677
45	430	497	563	629	695	761
50	478	552	625	699	772	846
55	526	607	688	769	849	930

Notes: ¹

Cross section assumed to include a 12' median/center lane and 6' bike lane

TH = Through Movement, LT = Turn Movement

All distances given in feet

Design speed by roadway classification is shown in Appendix 5-3A

For cross sections deviating from the tabulated configurations, refer to the AASHTO Geometric Design of Highways and Streets (current editions) for additional information