Archaeological Resources

Airport Vicinity Development Checklist

Parking Study

Trip Generation Comparison

Parking Master Plan

Flow Test Summary

Project Name:	EJFT 19040
Project Address:	6951 E 1st St, Scottsdale, AZ 85251
Date of Flow Test:	2019-02-15
Time of Flow Test:	8:30 AM
Data Reliable Until:	2019-08-15
Conducted By:	Eder Cueva & Tayler Lynch (EJ Flow Tests) 602.999.7637
Witnessed By:	Ray Padilla (City of Scottsdale) 602.541.0586
City Forces Contacted:	City of Scottsdale (602.541.0586)
Permit Number:	C57402

Raw Flow Test Data

Static Pressure:	80.0 PSI
Residual Pressure:	64.0 PSI
Flowing GPM:	1,986
GPM @ 20 PSI:	4,054

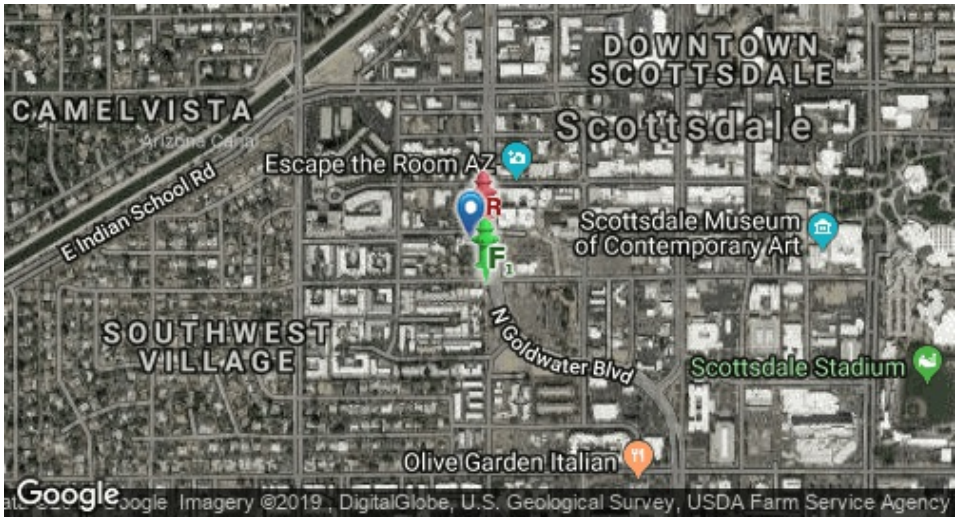
Data with a 10 % Safety Factor

Static Pressure:	72.0 PSI
Residual Pressure:	56.0 PSI
Flowing GPM:	1,986
GPM @ 20 PSI:	3,753

Hydrant F_1

Pitot Pressure (1):	31	PSI
Coefficient of Discharge (1):	0.9	
Hydrant Orifice Diameter (1):	4	inches

Additional Coefficient 0.83 on orifice #1



Project Site

Static-Residual Hydrant

Flow Hydrant

Distance Between F_1 and R
326 ft (measured linearly)

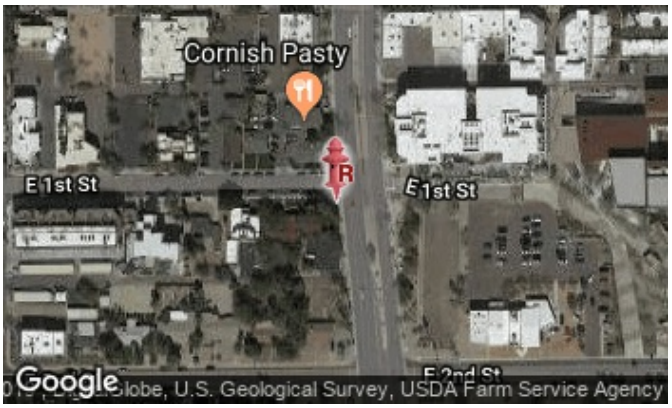
Static-Residual Elevation
1260 ft (above sea level)

Flow Hydrant (F_1) Elevation
1258 ft (above sea level)

Elevation & distance values are approximate

Flow Test Summary

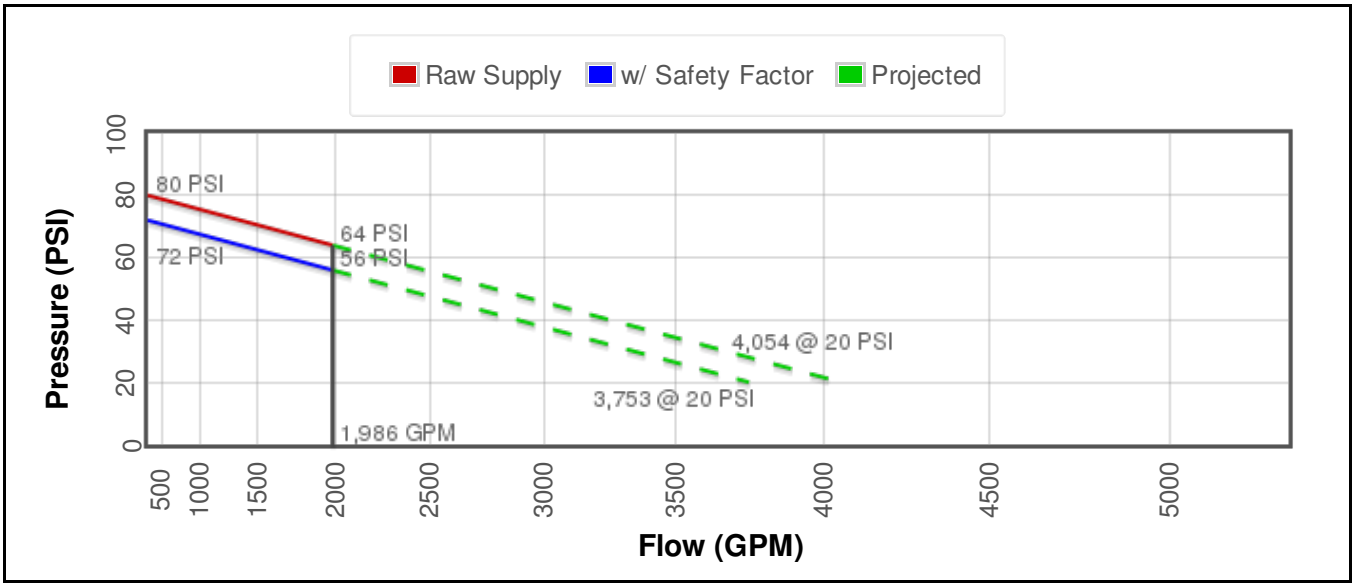
Static-Residual Hydrant



Flow Hydrant (only hydrant F1 shown for clarity)

Approximate Project Site

Water Supply Curve $N^{1.85}$ Graph



Winery Suites

Traffic Impact and Mitigation Analysis
2nd Submittal

Southwest Corner of Goldwater
Boulevard and 1st Street
in Scottsdale, Arizona

January 2019
Project No. 18-1290

Prepared For:
Horizon Pediatric Therapy, Inc.
551 South Higley Road
Mesa, Arizona 85206

For Submittal to:
City of Scottsdale

Prepared By:

CivTech

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

WINERY SUITES
TRAFFIC IMPACT AND MITIGATION ANALYSIS
2ND SUBMITTAL

Southwest corner of Goldwater Boulevard and 1st Street in Scottsdale, Arizona

Prepared for:

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Mesa, Arizona 85206

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10605 North Hayden Road, Suite 140
Scottsdale, Arizona 85260

Office: 480-659-4250 Fax: 480-659-0566
info@civtech.com

January 2019
CivTech Project No. 18-1290

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EXECUTIVE SUMMARY

The Winery Suites development is located on the southwest corner of Goldwater Boulevard and 1st Street in Scottsdale, Arizona. The proposed site currently consists of the LDV Wine Gallery and Tasting Room and Studio B Interior Design. These tenants have since moved to new locations and the current parcels are now occupied by three dwelling units with flexible leasing terms. The redevelopment will consist of approximately 1,500 square-feet of ground-floor retail space and 31 dwelling units with flexible leasing terms in a mid-rise building. The vicinity of the site is provided in **Figure 1**.

CivTech, Inc. was retained by Horizon Pediatric Therapy, Inc. to perform a traffic impact and mitigation analysis (TIMA) for the proposed redevelopment. The purpose of this assessment is to address the traffic and transportation impacts of the proposed development on the surrounding streets and intersections. The following conclusions have been documented in this study:

- The results of the existing conditions analysis indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersections of 69th Street & Indian School Rd, Goldwater Boulevard & Indian School Road and Goldwater Blvd & Main Street.
    - Currently, the unsignalized intersection of **69th Street and Indian School Road** operates poorly during both the AM and PM peak hours on the northbound and southbound approaches. This delay is due to the high wait times of vehicles making northbound left turns and southbound left turns because of the high volume of through traffic on Indian School Road during both peak hours. Extensive delay during either peak hour at minor roads or driveways that intersect major roads is expected.
    - The signalized intersection of **Goldwater Boulevard and Indian School Road** currently operates adequately in the AM peak hour, but has an overall intersection delay of 54 seconds in the PM peak hour. The threshold for an adequate level of service is 55 seconds, so it is very near to operating at a poor level of service.
    - The signalized intersection of **Goldwater Boulevard and Main Street** experiences delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a minor road, very few vehicles approach the intersection from the east or west, so when they do, there is substantial delay. As more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.
- The number of crashes reported at the intersection of Goldwater Boulevard and 1st Street does not rise to the level of warranting consideration of a traffic signal based solely on crash experience. CivTech estimates that the existing development could potentially generate 142 external weekday daily trips, 3 trips during the AM peak hour, and 14 trips during the PM peak hour.

- The proposed redevelopment is anticipated to generate 734 external weekday daily trips, 62 trips during the AM peak hour, and 61 trips during the PM peak hour.
    - As compared to the existing uses, the proposed redevelopment could generate an additional 592 external daily trips with 59 additional trips in the AM peak hour and an additional 47 trips in the PM peak hour.

- The results of the 2020 peak hour analysis shows that all intersections operate at a level of service LOS D or better with the exception of the following intersections.

    - The unsignalized intersection of **69th Street and Indian School Road** is expected to continue to operate poorly during both the AM and PM peak hour on the northbound and southbound approaches. Intersections with minor approaches perpendicular to major approaches are expected to operate with delay during certain times of the day when the major road is busy, usually during the peak hour. Due to the location of this intersection to surrounding major intersections and the offset of the driveway from 69th Street, a signal will not be installed at this intersection. If there is significant delay during either peak hour, vehicles will use another route. Mitigation for this intersection is not recommended at this time.

    - The signalized intersection of **Goldwater Boulevard and Indian School Road** is expected to continue to operate poorly during the PM peak hour during both the no-build and build scenarios. The overall intersection delay during both scenarios is expected to be approximately 56 seconds. The threshold for an acceptable level of service is 55 seconds. Since the overall delay is very close to an acceptable level of service, no mitigation measures are recommended at this time, however, they could become necessary in the future.

    - The signalized intersection of **Goldwater Boulevard and Main Street** is expected to experience delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a very small road, very few vehicles approach the intersection from the east or west, so when they do, there is significant delay. If more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.

- The existing storage lengths at the existing intersections are anticipated to accommodate the additional traffic generated by the proposed development with the exception of the northbound left turn lane at the intersection of Goldwater Boulevard and Indian School Road. No additional northbound left-turns are expected to be added from site generated traffic, meaning that the number of northbound left-turns is the same for the AM and PM peak hours for the no-build and build scenarios. Additional storage length calculations should be completed

prior to traffic signal installation, a change in intersection stop control or installation of raised medians.

- 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. 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 Winery Suites development is located on the southwest corner of Goldwater Boulevard and 1st Street in Scottsdale, Arizona. The development is proposed for two parcels of land, formerly zoned for residential use, totaling 0.62 gross acres. The two parcels are proposed for a mixed-use development with 34 dwelling units with flexible lease terms and approximately 1,500 square feet (SF) of retail space on the ground floor. Parking will be provided underground, with the entrance located in the alley bordering the site to the south, and there will be on-street parking provided in the alley as well. The vicinity of the site is provided in **Figure 1**.

Study Requirements

This study analyzes the traffic impact due to the proposed development on the surrounding street network. The study will be 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 recommend additional street improvements or traffic control devices, where necessary, to mitigate the additional site-generated traffic; and,
- Evaluate the internal site circulation and provide recommendations if necessary.

Study Area

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

- Goldwater Blvd & Alley
- Goldwater Blvd & 2nd St
- Goldwater Blvd & Indian School Rd
- Goldwater Blvd & Main St
- Goldwater Blvd & 1st St
- 69th St & Indian School Rd
- 69th St & Alley
- 69th St & 1st St
- 69th St & 2nd St

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. Since the owner is applying for a change in zoning, per the *DS&PM*, a Category 2 TIMA is required. For a Category 2 TIMA, the existing year and the opening year will be analyzed. The existing year is 2018 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.

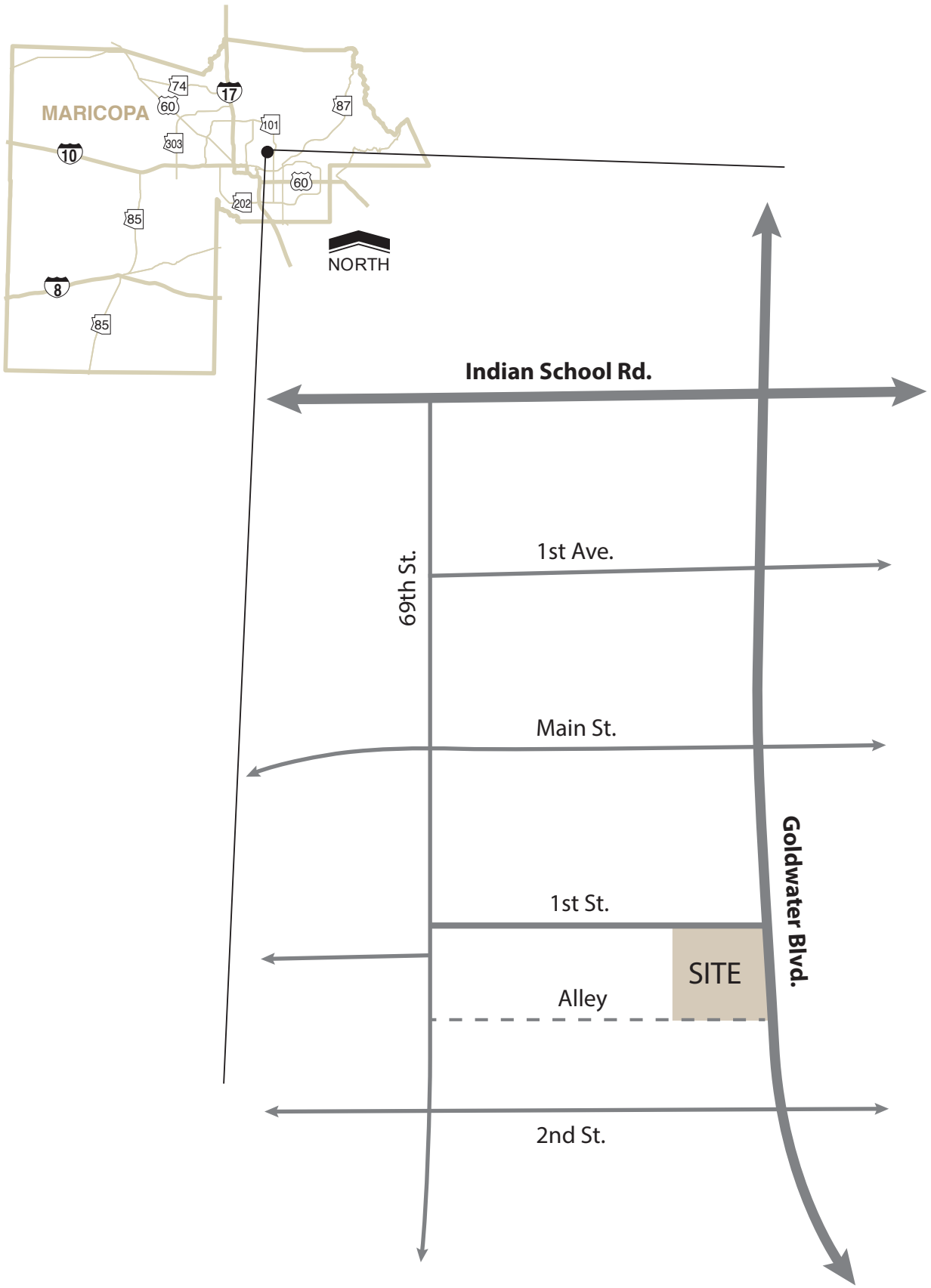


Figure 1: Vicinity Map

EXISTING CONDITIONS

LAND USE

The site of the proposed Winery Suites, according to the Maricopa County Assessor, was previously occupied by the LDV wine tasting room and Studio B Interior Design. Both of these businesses have since moved and the parcels are now occupied by a three dwelling units with flexible leasing terms.

SURROUNDING LAND USE

Surrounding the site on all sides are multi-family residential units and some small businesses. Northwest of the site is the Hotel Valley Ho. Directly east of the site is the La Loma bus station, a major hub for the Valley Metro Bus system. The site can be accessed by bus route 72. Indian School Road, north of the site, allows direct access to Pima Freeway (Loop 101).

ROADWAY NETWORK

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

Goldwater Boulevard is a north-south five-lane road within the vicinity of the site classified as a major arterial by the City of Scottsdale. There are three (3) lanes in the southbound direction, two (2) lanes in the northbound and raised medians along portions of the road. This road begins just south of Chaparral, breaking off from Scottsdale Road to the west, and rejoins Scottsdale Road at the intersection with Osborn Road. This road allows traffic to bypass Old Town Scottsdale and provides access to major and minor arterials to the west of the site. The posted speed limit is 35 mph.

69th Street is a north-south two-lane road bordering the proposed site to the west. There is one (1) lane in each travelling direction. 69th Street begins at the intersection with Indian School Road and continues south for approximately 0.35 miles before terminating at the intersection with 4th Street in a residential community south of the proposed site. There is no posted speed limit.

Indian School Road is an east-west four-lane road classified as a minor arterial by the City of Scottsdale. There are two (2) lanes in each travelling direction as well as a bicycle lane. Along portions of the road, within the vicinity of the site, there is either a two-way-left-turn lane or a raised median. Indian School Road begins in the Town of Goodyear and continues west until terminating just west of Mesa Drive, before intersection with SR 87. Indian School Road provides direct access to Pima Freeway (Loop 101). The posted speed limit is 35 mph within the vicinity of the site.

Main Street is an east-west two-lane road north of the proposed site. There is one (1) lane in each travelling direction and on-street parking alone both sides of the road for the entire length of roadway. Main Street begins at the Hotel Valley Ho, just west of the site, and continues east for approximately 0.5 miles before terminating at Brown Avenue. There is no posted speed limit.

1st Street is an east-west two-lane road north of the proposed site. There is one (1) lane in each travelling direction and on-street parking along both sides of the road for the entire length of roadway. 1st Street begins at the intersection with 68th Street and continues east until terminating at the bus station east of the site. There is no posted speed limit.

2nd Street is an east-west two-lane road within the vicinity of the site. There is one (1) lane in each travelling direction and on-street parking along both sides of the road for the entire length of roadway. This portion of 2nd Street begins east of the intersection with 68th Street in a residential neighborhood and continues east until terminating at the City of Scottsdale Civic Center. The posted speed limit is 25 mph.

Alley is an east-west road that connects 69th Street to Goldwater Boulevard. Currently, it provides access to the businesses and residential units on the site, and in the future it will provide access to the underground parking garage for residents of the proposed development.

INTERSECTION CONFIGURATION

The intersection of ***Goldwater Boulevard and Indian School Road*** is a signalized four-legged intersection with protected phasing on all approaches of the intersection. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of dual left-turn lanes, one (1) through lane, one (1) shared through/right-turn lane and one (1) bicycle 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 dual left-turn lanes, two (2) through lanes, a bicycle lane and a dedicated right-turn lane. There are pedestrian cross walks across all legs of the intersection.

The intersection of ***Goldwater Boulevard and Main Street*** is a signalized four-legged intersection with permissive phasing on all approaches and no right-turn-on-red on the eastbound and westbound approaches. The northbound approach consists of one (1) dedicated left-turn, one (1) through lane and one (1) shared through/right-turn lane. The eastbound and westbound approaches consist of one (1) shared left-turn/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. There are pedestrian cross walks across all legs of the intersection.

The intersection of ***Goldwater Boulevard and 1st Street*** is a two-way stop controlled intersection with stop signs on the eastbound and westbound approaches. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) shared left-turn/through lane and one (1) dedicated 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) shared left-turn/through/right-turn lane. There are pedestrian cross walks across the east and west legs of the intersection.

The intersection of ***Goldwater Boulevard and Alley*** is a three-legged unsignalized intersection with a stop sign on the eastbound approach. This access only allows right-turns into and out of the alley because of a raised median separating the northbound and southbound approaches. The northbound approach consists of two (2) through lanes. The southbound approach consists of two (2) through lanes and one (1) shared through/right-turn lane. The eastbound approach consists of one (1) right-turn lane.

The intersection of ***Goldwater Boulevard and 2nd Street*** is a two-way stop controlled intersection with stop signs on the eastbound and westbound approaches. The northbound approach consists of one (1) dedicated left-turn lane, one (1) through lane and one (1) shared through/right-turn lane. The westbound approach consists of one (1) shared left-turn/through/right-turn lane and a bicycle 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) shared left-turn/through/right-turn lane. There are pedestrian cross walks across the east and west legs of the intersection.

The intersection of ***69th Street and Indian School Road*** is a four-legged unsignalized intersection with stop signs on the northbound and southbound approaches. The southbound approach is an existing driveway that is approximately 50 feet offset from 69th Street to the west. The northbound approach consists of one (1) shared left-turn/through/right-turn lane. The westbound approach consists of one (1) dedicated left-turn lane, two (2) through lanes, one (1) shared through/right-turn lane and a bicycle lane. The southbound approach consists of one (1) shared left-turn/through/right-turn lane. The eastbound approach consists of one (1) dedicated left turn lane, one (1) lane that is indicated to turn into a left-turn lane at the intersection of Goldwater Boulevard and Indian School Road, one (1) through lane, one (1) shared through/right-turn lane and a bicycle lane. There are pedestrian cross walks across the north and south legs of the intersection.

The intersection of ***69th Street and 1st Street*** is a four-legged unsignalized intersection with stop signs on the eastbound and westbound approaches. The eastbound approach connects through to 68th Street, but is offset approximately 55 feet south of the westbound approach. The westbound approach is aligned with an existing driveway to the Hotel Valley Ho, however, this is not considered to be the eastbound approach. All approaches consist of one (1) shared left-turn/through/right-turn lane. There is a pedestrian cross walk across the east and west legs of the intersection.

The intersection of ***69th Street and Alley*** is a three-legged unsignalized intersection with a stop sign on the westbound approach. The northbound approach consists of one (1) shared through/right-turn lane. The westbound approach consists of one (1) shared left-turn/right-turn lane. The southbound approach consists of one (1) shared left-turn/through lane.

The intersection of ***69th Street and 2nd Street*** is a four-legged unsignalized intersection with stop signs on the northbound and southbound approaches. All approaches consist of one (1) shared left-turn/through/right-turn lane. There are pedestrian cross walks across the north and south legs of the intersection.

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

TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at the proposed 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, August 28, 2018 at the following intersections:

- Goldwater Blvd & Alley
- Goldwater Blvd & 2nd St
- Goldwater Blvd & Indian School Rd
- Goldwater Blvd & Main St
- Goldwater Blvd & 1st St
- 69th St & Indian School Rd
- 69th St & Alley
- 69th St & 1st St
- 69th St & 2nd St

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. Scottsdale is a popular area for tourism and traffic volumes are considerably lower during summer months. In order to get a better look at typical traffic, a seasonal adjustment factor is applied. For example, if counts were conducted in June, a 3% increase in traffic is added. Counts for this study were conducted on August 28, 2018. For the month of August, a 5% increase in traffic, or a factor of 1.05 is applied to the existing traffic counts.

The observed existing traffic volumes for this study are presented in **Figure 3** for the weekday AM and PM peak hours and the seasonally adjusted volumes are presented in **Figure 4**. Traffic volume data obtained for this study have been included in the **Appendix B**.

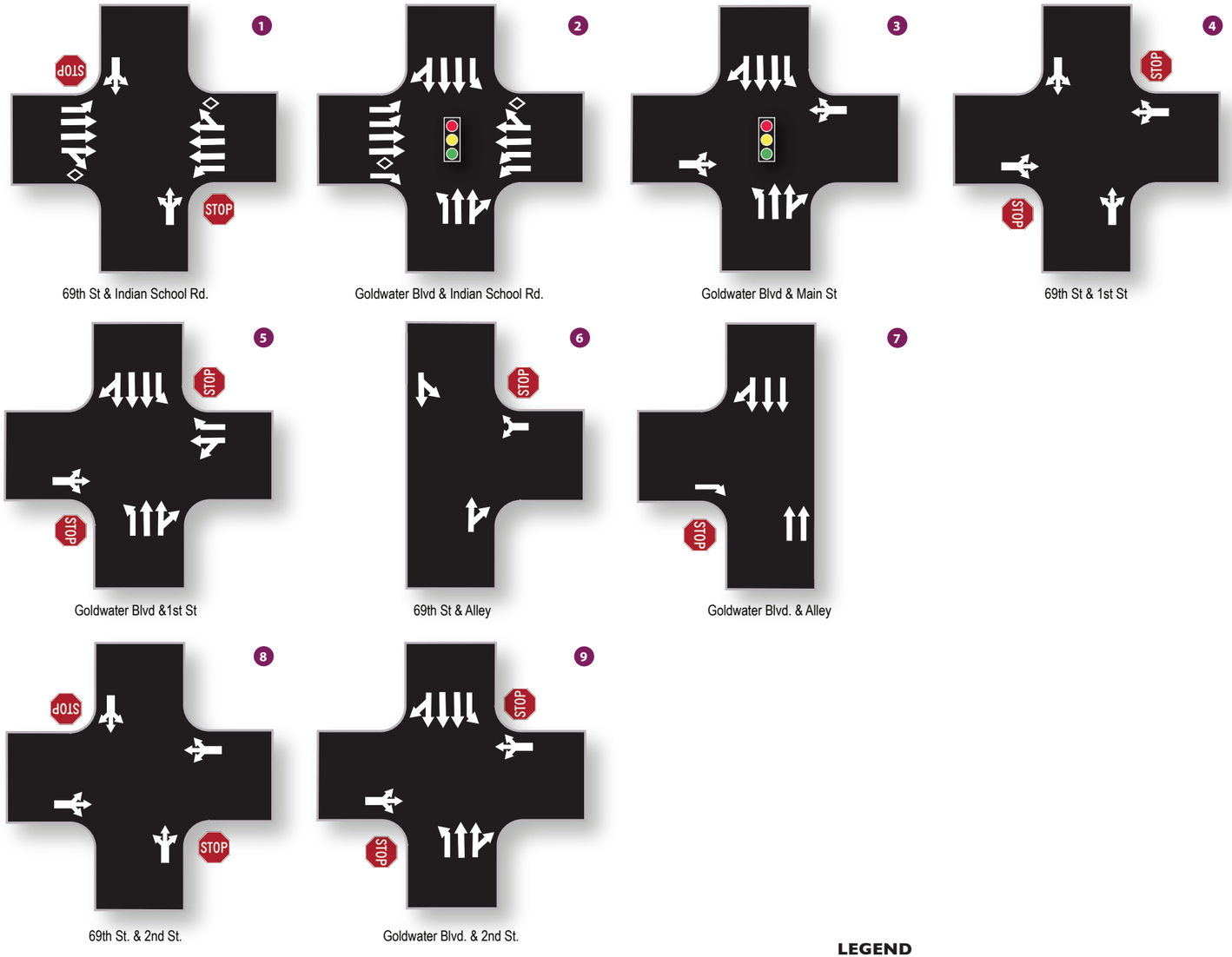
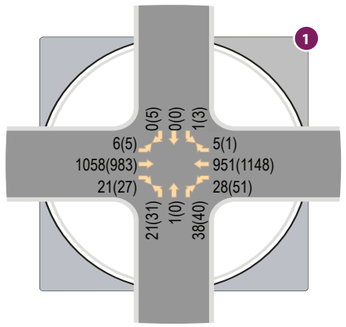
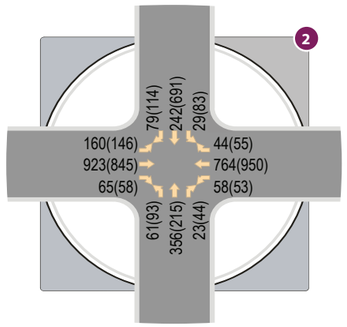


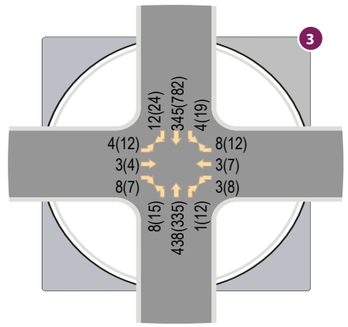
Figure 2: Existing Lane Configurations and Traffic Controls



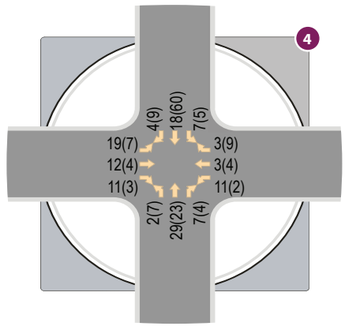
69th St & Indian School Rd.



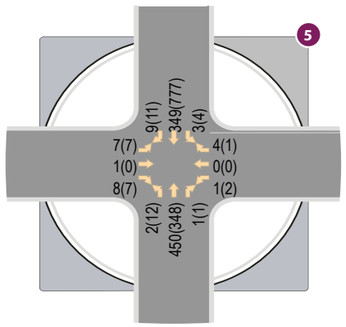
Goldwater Blvd & Indian School Rd.



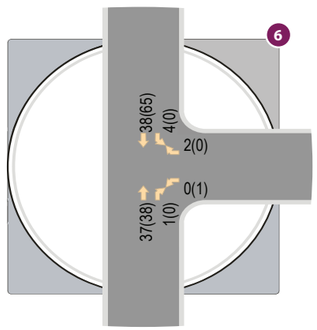
Goldwater Blvd & Main St



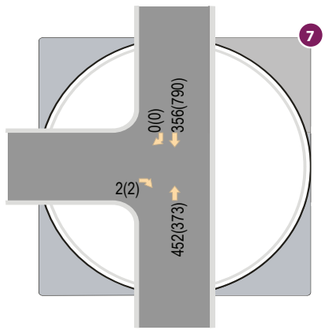
69th St & 1st St



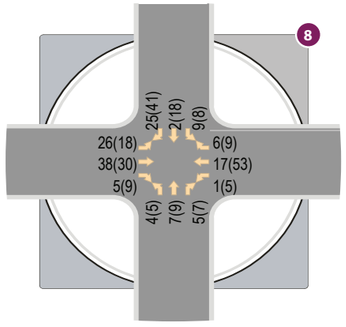
Goldwater Blvd &1st St



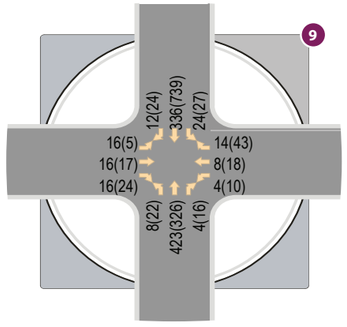
69th St & Alley



Goldwater Blvd. & Alley



69th St. & 2nd St.



Goldwater Blvd. & 2nd St.

Legend

NORTH

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

X,XXX - Average Daily Traffic Volumes

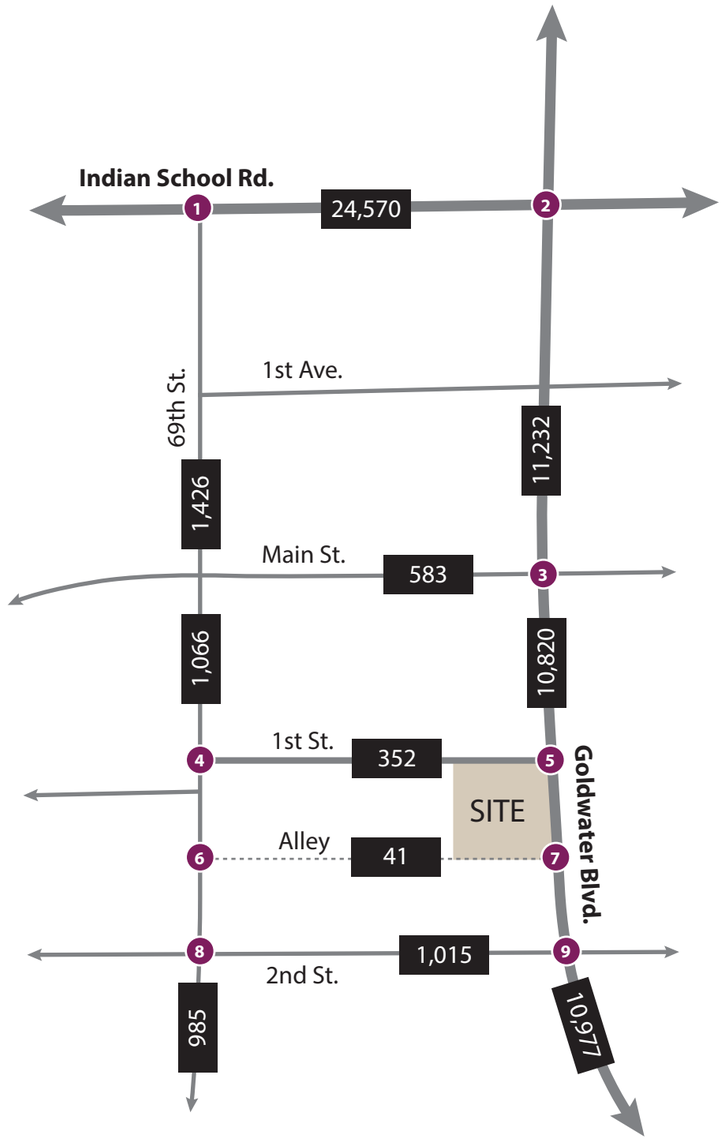
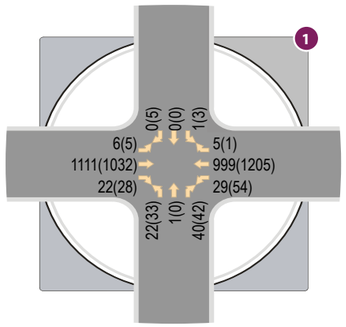
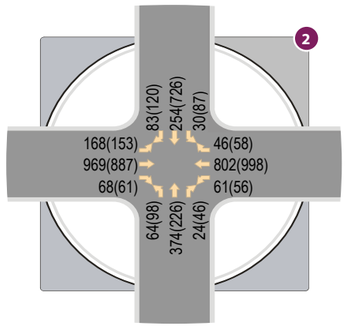


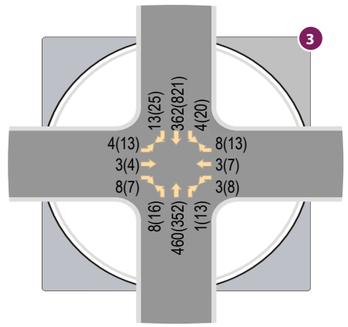
Figure 3: Observed Existing Traffic Volumes



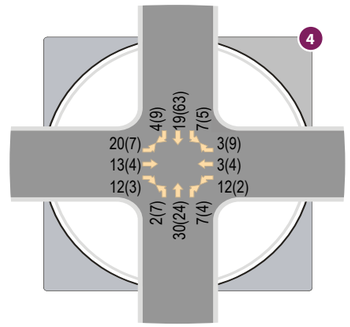
69th St & Indian School Rd.



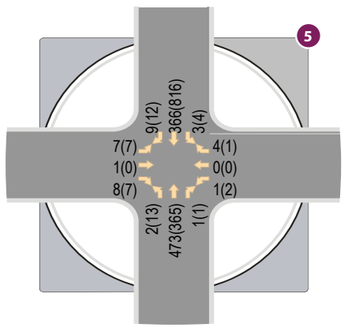
Goldwater Blvd & Indiand School Rd.



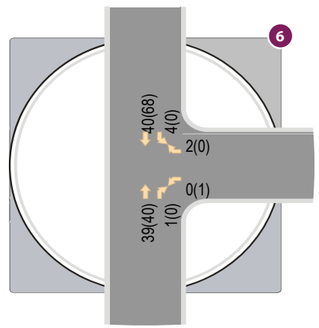
Goldwater Blvd & Main St



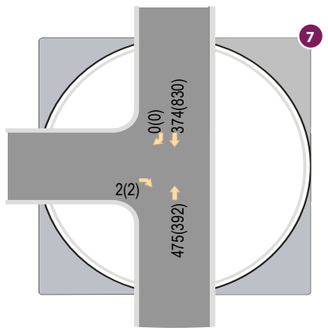
69th St & 1st St



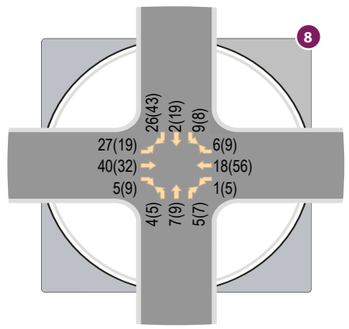
Goldwater Blvd &1st St



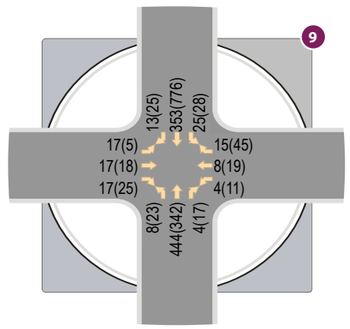
69th St & Alley



Goldwater Blvd. & Alley



69th St. & 2nd St.



Goldwater Blvd. & 2nd St.

Legend

NORTH

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

X,XXX - Average Daily Traffic Volumes

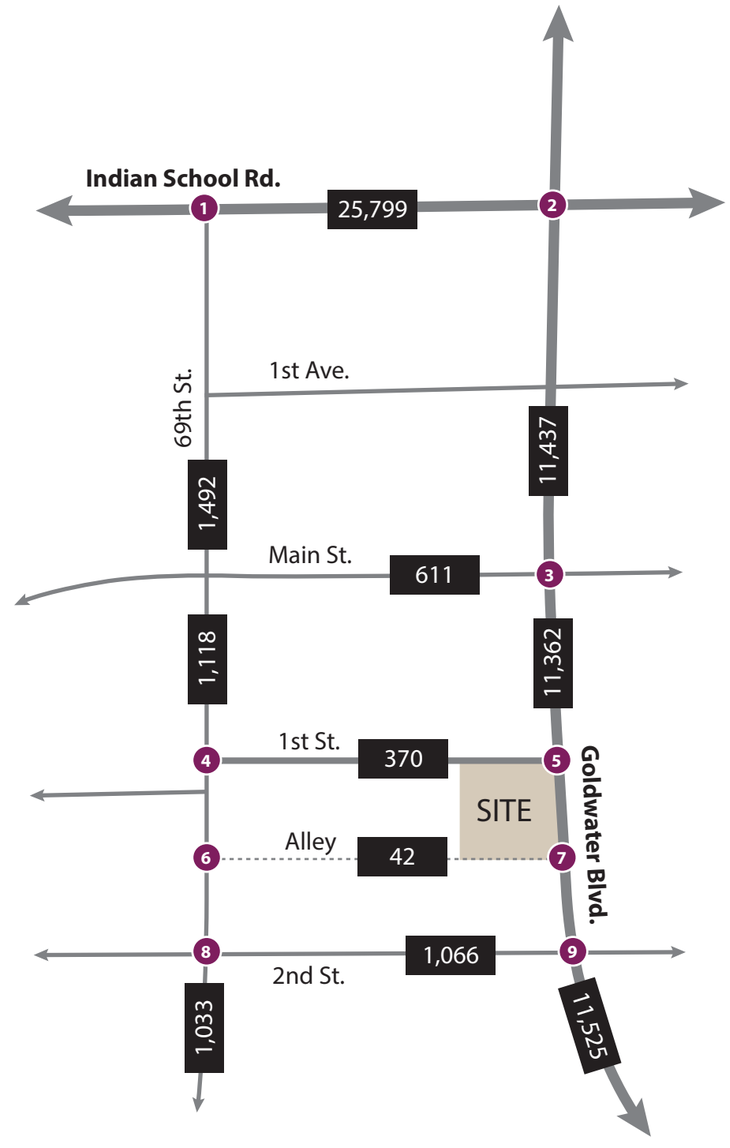


Figure 4: Seasonally Adjusted Traffic Volumes

CAPACITY ANALYSIS

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 within ranges of average control delay per vehicle, the number of seconds a vehicle can expect to wait due to the presence of a traffic control device. **Table 1Table 1** lists the level of service criteria for signalized and unsignalized intersections.

Table 1 – Intersection Level of Service Criteria

Level of Service	Control Delay (sec/veh)	
	Signalized	Unsignalized
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

Peak hour capacity analyses were conducted for the study intersections based on existing conditions and traffic volumes. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM) 6th Edition* and using Synchro traffic analysis software. Signal timing during both the AM and PM peak hour for the intersection of Goldwater Boulevard and Indian School Road was provided by the City of Scottsdale via Synchro models. Signal timing for the intersection of Goldwater Boulevard and Main Street was provided by the City of Scottsdale. Existing signal timing sheets for the intersection of Goldwater Boulevard and Main Street are provided in **Appendix C**.

Results of the existing level-of-service analyses are shown in **Table 2** for both peak hours. The analysis worksheets for the existing conditions have been included in the **Appendix D**.

Table 2: Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
1	69th St & Indian School Rd	2-way stop (NB/SB)	NB Shared SB Shared EB Left WB Left	E F C C	F E C C
2	Goldwater Blvd & Indian School Rd	Signal	NB SB EB WB	D E C D	E D D E
			Overall	**D**	**D**
3	Goldwater Blvd & Main St	Signal	NB SB EB WB	A A E E	A A E E
			Overall	**A**	**A**
4	69th St & 1st St	2-way stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	A A A A	A A A A
5	Goldwater Blvd & 1st St	2-way stop (EB/WB)	NB Left SB Left EB Shared WB left/thru	A A B C	B A C C
6	69th St & Alley	1-way stop (WB)	WB Shared SB Left	A A	A A
7	Goldwater Blvd & Alley	1-way stop (EB)	EB Right	B	B
8	69th St & 2nd St	2-way stop (NB/SB)	NB Shared SB Shared EB Shared WB Shared	A A A A	A A A A
9	Goldwater Blvd & 2nd St	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A A C B	B A D C

The results of the existing conditions analysis summarized in **Table 2** indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersections of 69th Street & Indian School Rd, Goldwater Boulevard & Indian School Road and Goldwater Blvd & Main Street.

The unsignalized intersection of **69th Street and Indian School Road** operates poorly during both the AM and PM peak hours on the northbound and southbound approaches. This delay is due to the high wait times of vehicles making northbound left turns and southbound left turns because of the high volume of through traffic on Indian School Road during both peak hours. Extensive delay during either peak hour at minor roads or driveways that intersect major roads is expected. This delay likely does not occur at all times throughout the day.

The signalized intersection of **Goldwater Boulevard and Indian School Road** operates adequately in the AM peak hour, but has an overall intersection delay of 54 seconds in the PM peak hour. The threshold for an adequate level of service is 55 seconds. So it is very near to operating at a poor level of service.

The signalized intersection of **Goldwater Boulevard and Main Street** experiences delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a minor road, very few vehicles approach the intersection from the east or west, so when they do, there is substantial delay. As more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.

CRASH ANALYSIS

Crash data for the intersection of Goldwater Boulevard and 1st Street was obtained from the City of Scottsdale. Crashes were documented for the past three (3) years from 2015 to 2017. Only five (5) accidents were reported at this intersection over the analysis period. Of all the incidents reported, none resulted in a fatal injury and only one (1) resulted in incapacitating injury for one (1) of the drivers. The crash listings can be found in **Appendix E**. A summary of the crash data is provided in **Table 3**.

Table 3: Crash Data Summary

Intersection	Total	2017	2016	2015	Injury	Fatality	Angle	Sideswipe	Angle percentage	Sideswipe percentage	Pedestrian	Bicycle
Goldwater Blvd & 1st St	5	2	2	1	3	0	3	2	60%	40%	0	1

A review of the results summarized in **Table 3** reveals that the number of crashes reported at the intersection of Goldwater Boulevard and 1st Street does not rise to the level of warranting consideration of a traffic signal based solely on crash experience.

PROPOSED DEVELOPMENT

SITE LOCATION

The proposed Winery Suites development will be located on the southwest corner of Goldwater Boulevard and 1st Street. The site will encompass 0.62 gross acres of land. Currently, the site consists of a professional office and the LDV wine tasting room, the redevelopment is proposed for a mixed-use development with 31 dwelling units and retail space.

SITE DENSITY

Winery Suites redevelopment will consist of a single mixed-use development with ground floor retail and 31 dwelling units with flexible leasing terms. The site will consist of approximately 1,500 square feet of retail on the ground level.

SITE ACCESS

Resident access to the site will be via an underground parking garage with the entrance located in the alley directly south of the site. There will also be on-street parking available in the alley and public parking in the surrounding area available to visitors.

Access A – is located on the south side of the site in the alley directly south of the proposed development. This will be a full movement access and the only access directly onto the site.

The proposed site plan with access is provided in **Figure 5**.

TRIP GENERATION

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 1,500 square feet of ground floor retail space and 26 multi-family dwelling units in a mid-rise building. Since this site is a redevelopment, the existing trips generated were compared to the estimated generated trips. The existing site consists of approximately 1,463 square feet of professional office space and a 1,533 square foot wine tasting room, according to the Maricopa County Assessor. The land use code (LUC) used for the existing office is 710 and the LUC used for the wine tasting room is 931 for a quality restaurant. Although the wine tasting room is not explicitly a quality restaurant, the amount of time that people stay at the establishment and the activities that occur are very similar, meaning that this LUC is an adequate representation of the wine tasting room. For the proposed development,

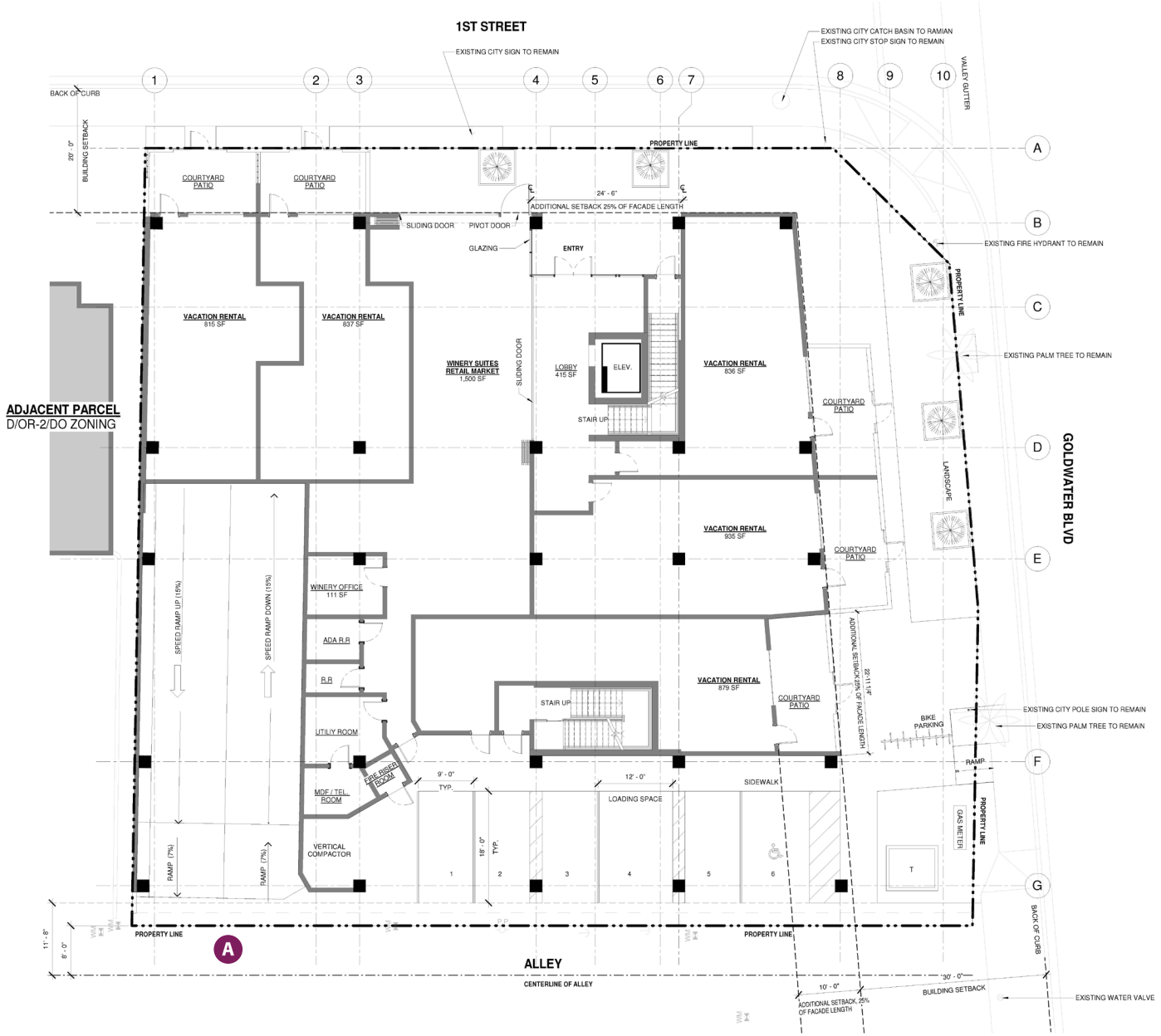


Figure 5: Site Plan and Access

there is a LUC for a mid-rise residential with first-floor commercial, however, since there are very few data points for this LUC and the retail space does not occupy the entire ground floor, it will not be used to analyze this development. The LUC used for the apartments is 221 for mid-rise multi-family and for the retail the LUC 820 was used.

The existing trip generation, using land uses and sizes from the Maricopa County Assessor website, is summarized in **Table 4**. The anticipated trip generation for the Winery Suites development is summarized in **Table 5**. Detailed trip generation calculations are provided in **Appendix F**.

Table 4: Existing Trip Generation

Proposed Use	ITE LUC	Size	Units	Weekday Trips						
				Daily	AM			PM		
				Total	In	Out	Total	In	Out	Total
General Office Building	710	1.463	1,000 square feet	14	2	0	2	0	2	2
Quality Restaurant	931	1.533	1,000 square feet	128	0	1	1	8	4	12
			Subtotals	142	2	1	3	8	6	14

The existing development generates 142 external weekday daily trips, 3 trips during the AM peak hour, and 14 trips during the PM peak hour.

Table 5: Proposed Trip Generation Summary

Proposed Use	ITE LUC	Size	Units	Weekday Trips						
				Daily	AM			PM		
				Total	In	Out	Total	In	Out	Total
Vacation Rental with Flexible Lease Terms	221	34	Rental Units	184	3	9	12	10	6	16
Shopping Center	820	1.500	1,000 square feet	56	1	0	1	3	3	6
			Subtotals	240	4	9	13	13	9	22
Difference From Existing to Proposed				***(98)***	***(2)***	***(8)***	***(10)***	***(5)***	***(3)***	***(8)***

The proposed redevelopment is anticipated to generate 734 external weekday daily trips, 62 trips during the AM peak hour, and 61 trips during the PM peak hour.

The proposed redevelopment is anticipated to generate an additional 592 external daily trips with 59 additional trips in the AM peak hour and an additional 47 trips in the PM peak hour when compared to the trips already generated by existing development.

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 employment within a 10-mile radius of the site. Future total employment and population within a 10-mile radius of the site, 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. The resulting trip distribution percentages for the study area are shown in **Table 6**. The trip distribution calculations are included in **Appendix G**.

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

Table 6: Site Trip Distribution

Direction (To/From)	Percentage
North on Goldwater Blvd (north of Indian School Rd)	9%
East on Indian School Rd (east of Goldwater Blvd)	14%
West on Indian School Rd (west of 69th St)	25%
East on Main St (east of Goldwater Blvd)	2%
East on 2nd St (east of Goldwater Blvd)	3%
West on 2nd St (west of 69th St)	12%
South on Goldwater Blvd (south of 2nd St)	35%
Total	100%

Figure 7 presents the resulting site trip assignment for the proposed development. It should be noted that with access to this site being provided from an alley and not from either of the two public streets through which the alley passes, there is a likelihood of some U-turns occurring at 2nd Street and 1st Street along Goldwater Boulevard. Since the proposed units are meant to be vacation rentals, drivers visiting this site are most likely not familiar with the area and could make U-turns at 2nd Street to head north on Goldwater Boulevard or make U-turns at 1st Street to access the site from Goldwater. These U-turns are not shown on the site trip assignment; until a vacationer becomes familiar with the area, there is always the likelihood that there could be a few U-turns generated by the site at these median breaks.

FUTURE BACKGROUND TRAFFIC

Per the *City of Scottsdale Design Standards & Policies Manual 2018*, for a redevelopment project, such as Winery Suites, the existing site generated volumes need to be subtracted from the existing adjusted traffic volumes to obtain the base traffic that would be present if the existing site were undeveloped. Peak hour site generated traffic volumes for the existing development are presented in **Figure 8**. These volumes were then subtracted from the existing adjusted volumes and the total is presented in **Figure 9**. The volumes presented in this figure represents the base volumes that are present with no development on the site.

CivTech then applied a growth rate to the base volumes to obtain the future background traffic volumes along the adjacent roadway network. In reviewing the City of Scottsdale Traffic Counts Map, a 1.7% average growth rate was found within the proposed study area. **Table 7** shows the expansion factor used for the proposed opening year 2020.

Table 7: Growth Rate Expansion Factors

Horizon Year	Expansion Factor
2020	1.034

Applying the growth rate to the 2018 base traffic volumes predicts the volume of traffic anticipated on the surrounding area roads without the addition of proposed site generated traffic or existing site generated traffic. This growth rate also assumes that the same percentage of overall traffic will remain pedestrians. This calculation assumes that no new roadway improvements are provided on the study area roadways and that the regional road network remains the same. Calculated background traffic for opening year 2020 is presented in **Figure 10**. Background and site traffic calculations worksheets are included in **Appendix H**.

TOTAL TRAFFIC

Total traffic was determined by adding the proposed site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the horizon year 2020 are shown in **Figure 11**.

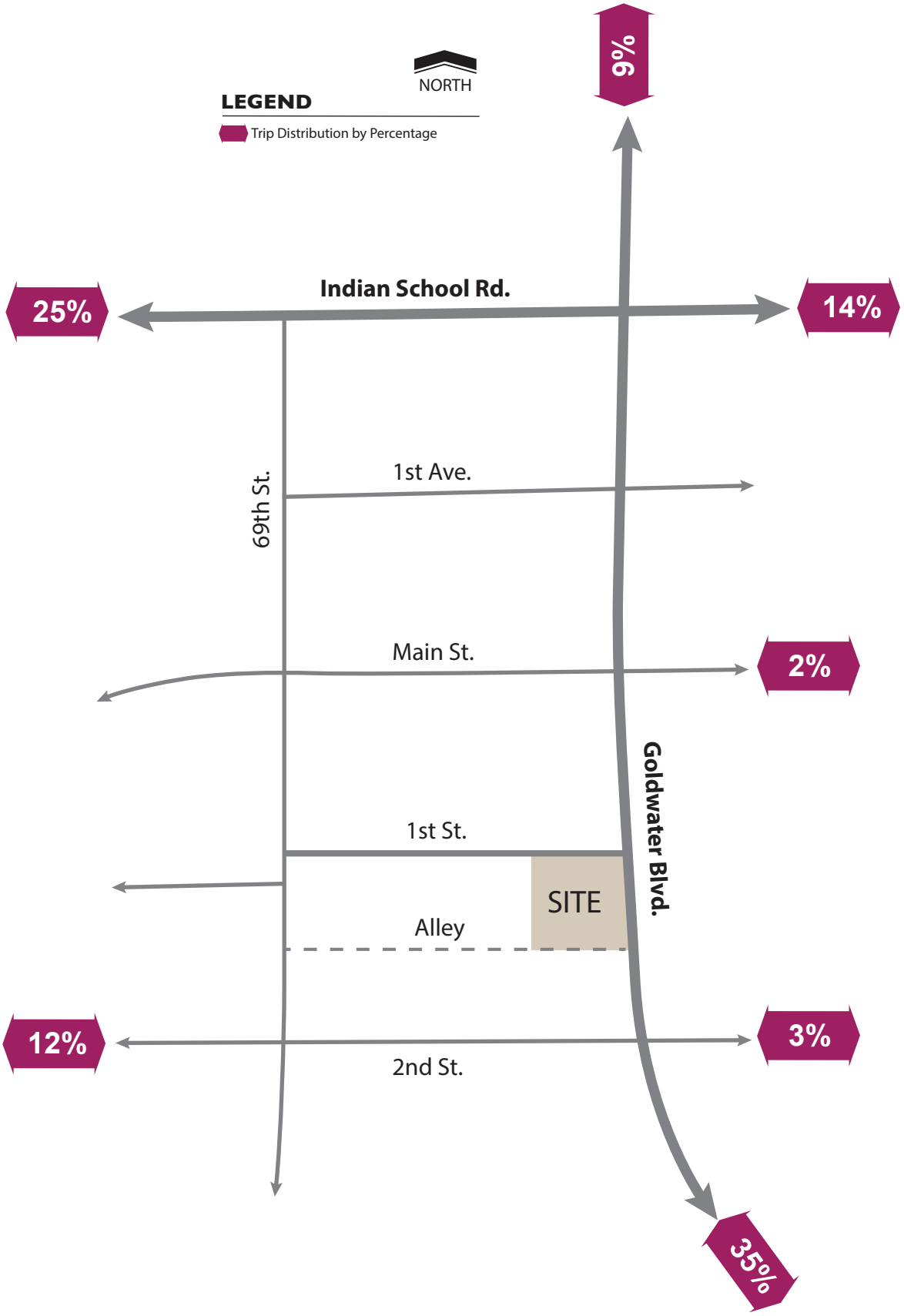


Figure 6: Trip Distribution

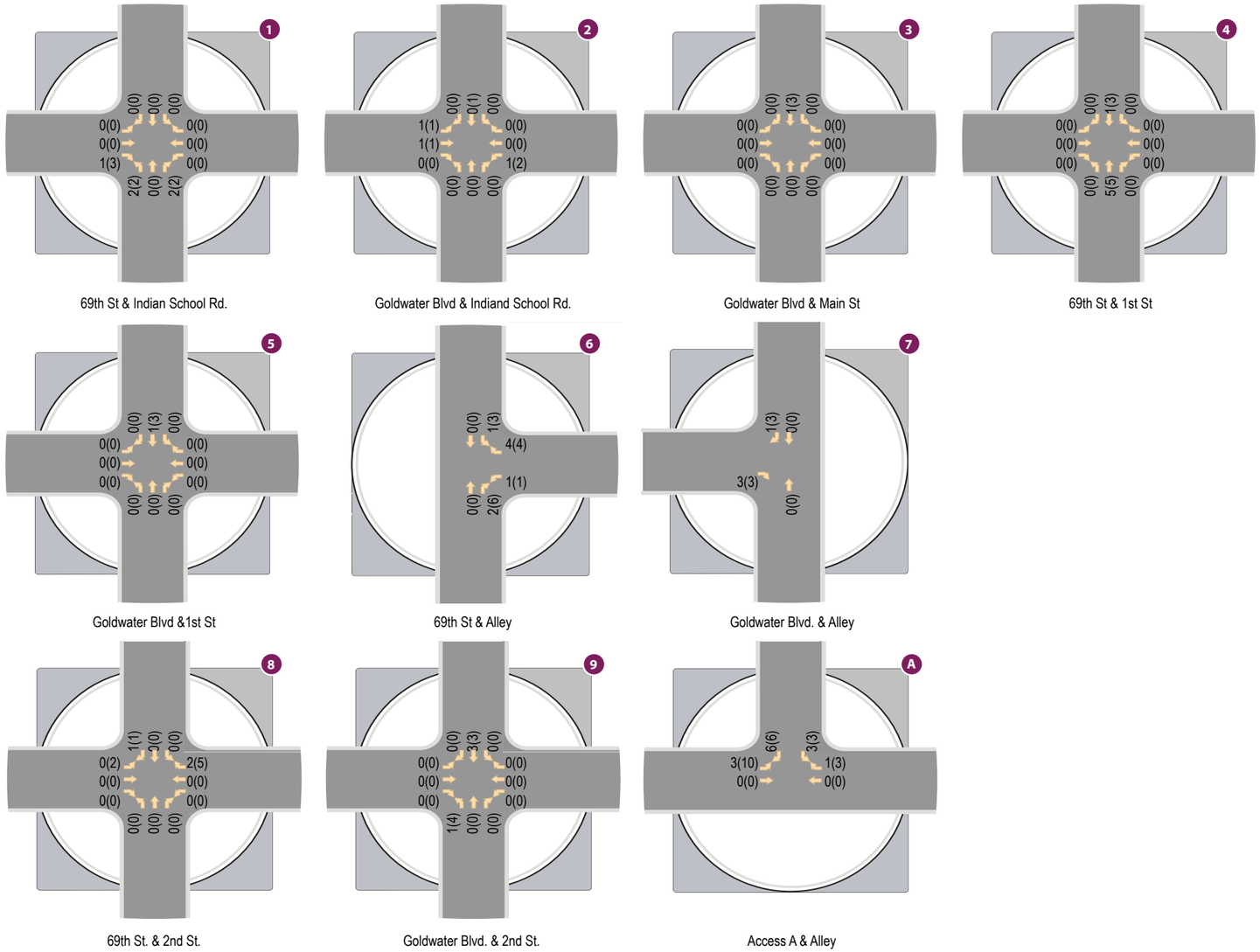
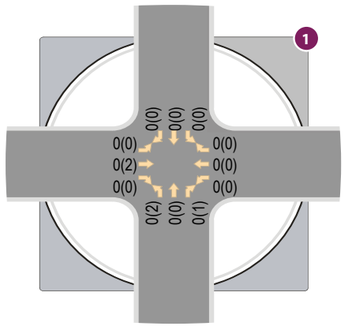
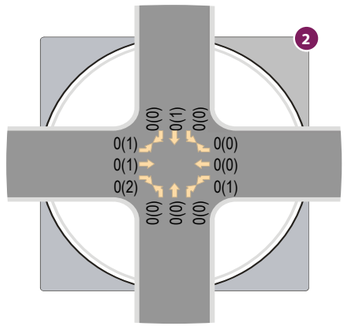


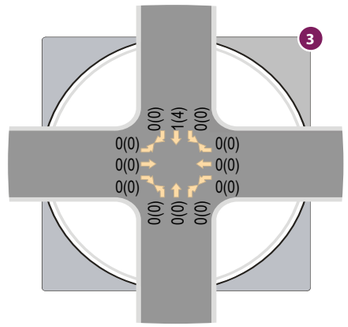
Figure 7: Site Traffic Volumes



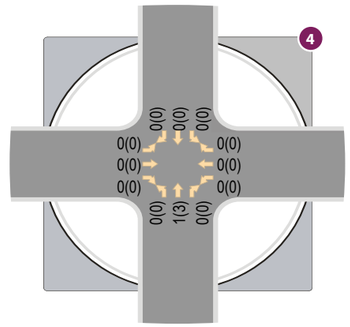
69th St & Indian School Rd.



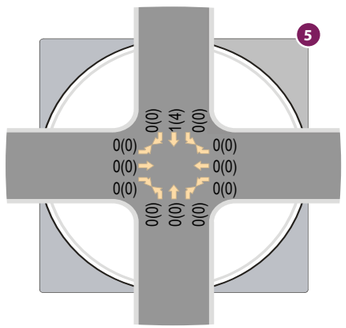
Goldwater Blvd & Indiand School Rd.



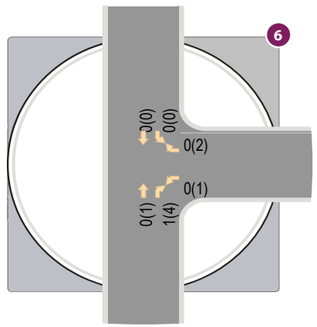
Goldwater Blvd & Main St



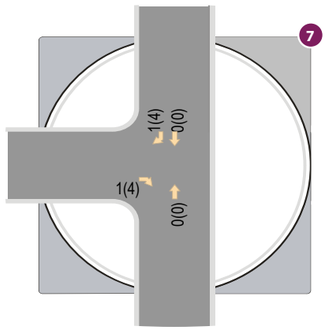
69th St & 1st St



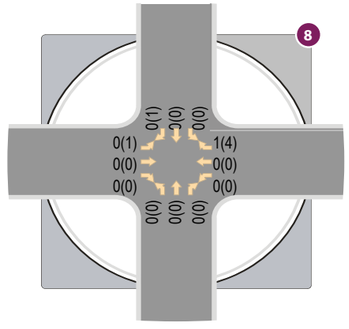
Goldwater Blvd &1st St



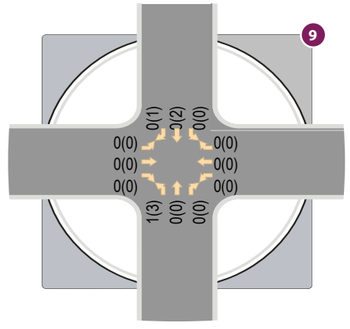
69th St & Alley



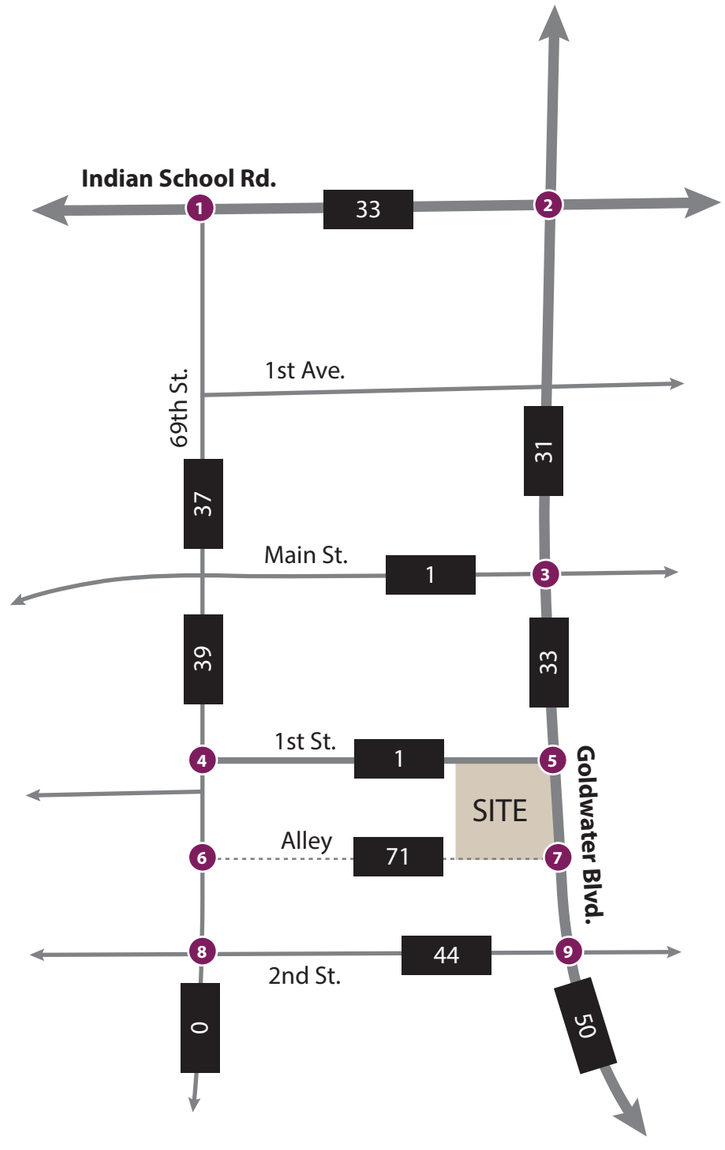
Goldwater Blvd. & Alley



69th St. & 2nd St.



Goldwater Blvd. & 2nd St.



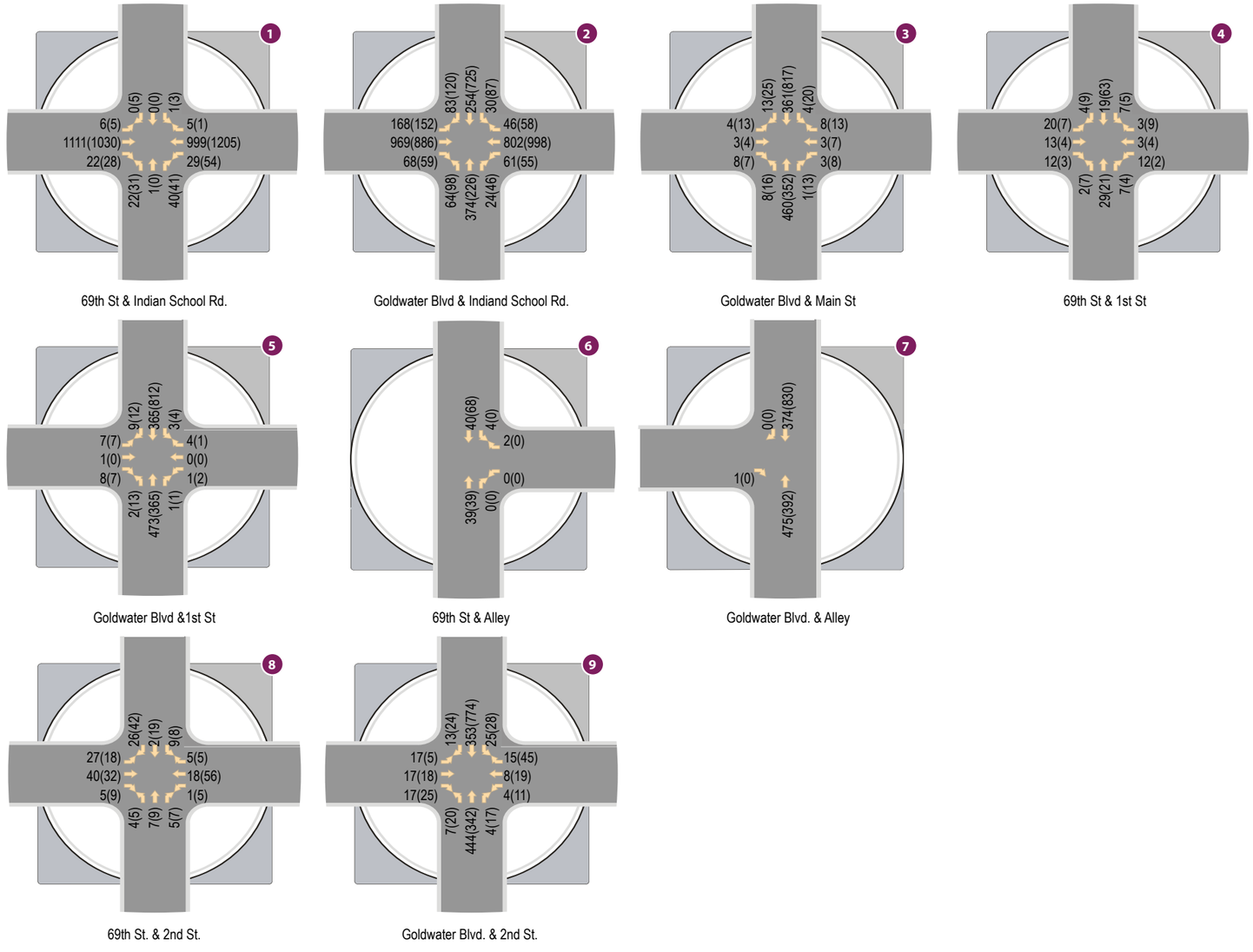
Legend

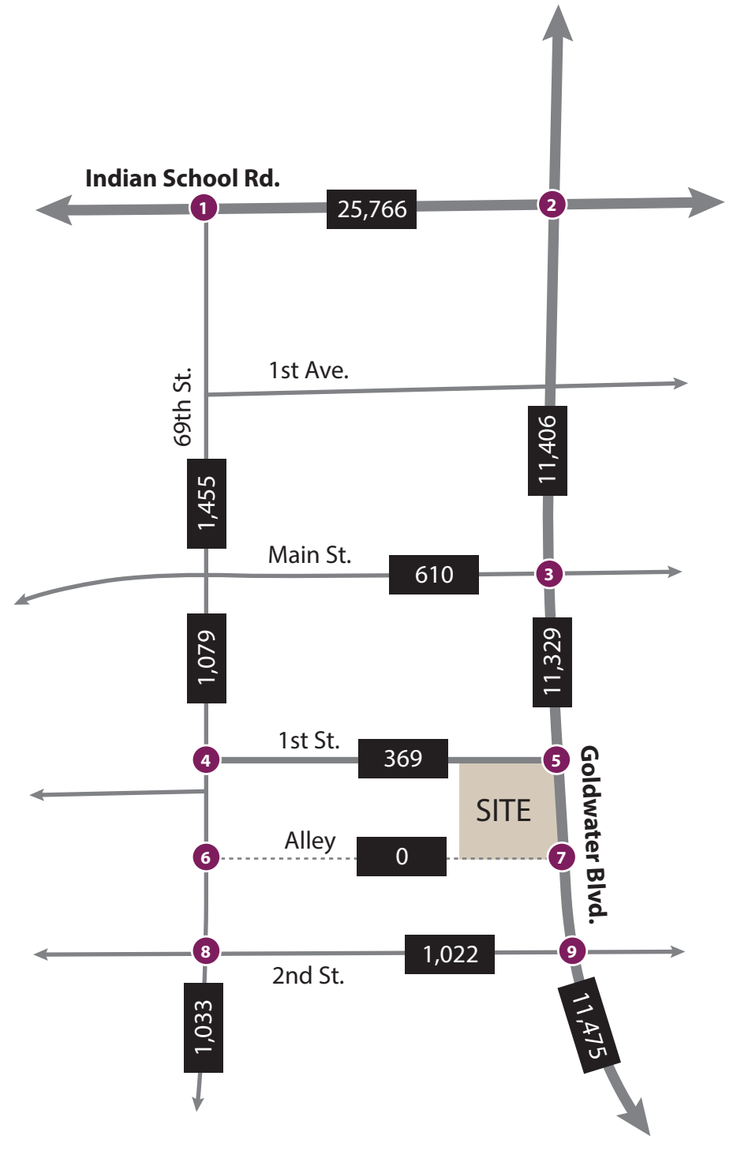
NORTH

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

X,XXX - Average Daily Traffic Volumes

Figure 8: Existing Site Traffic Volumes





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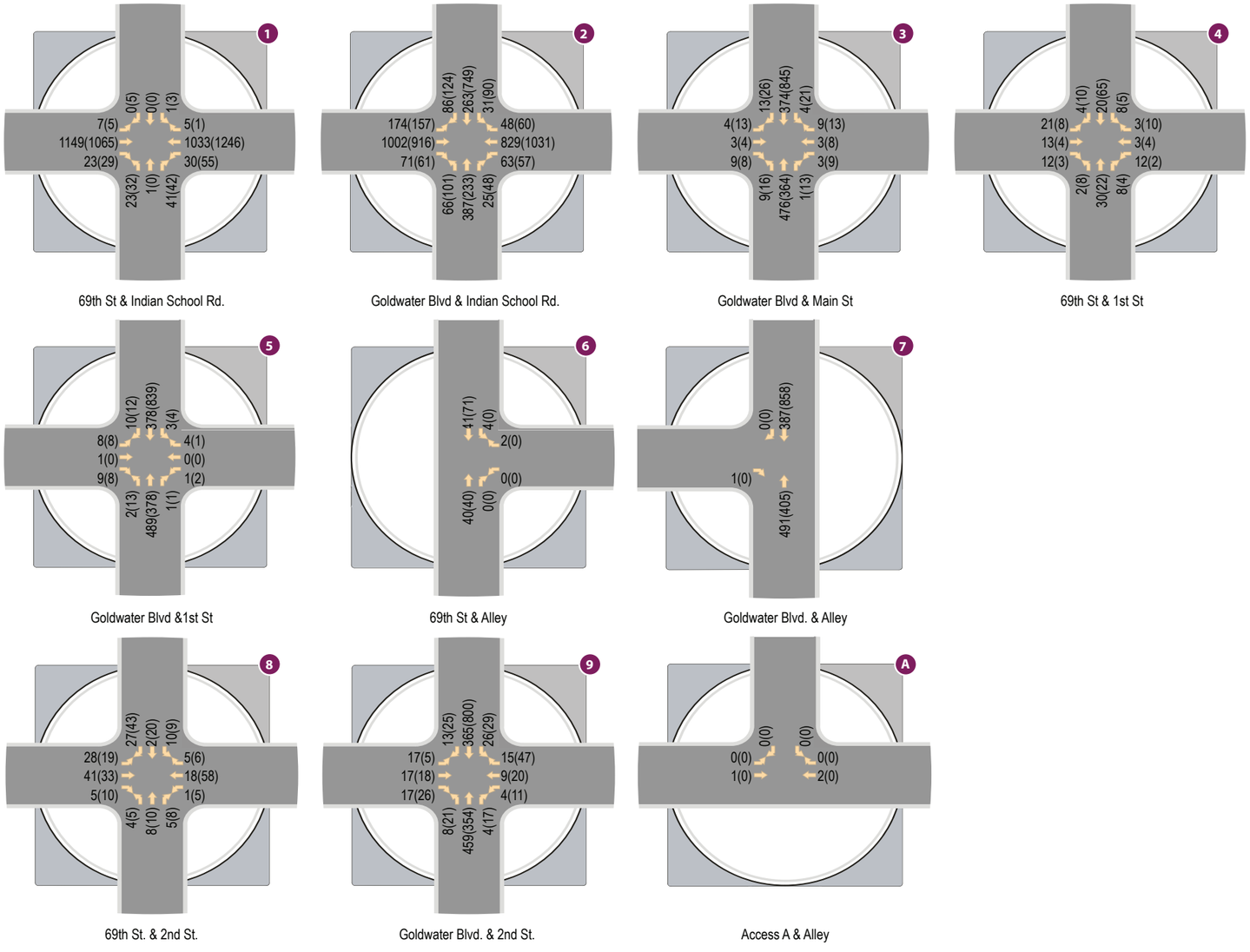
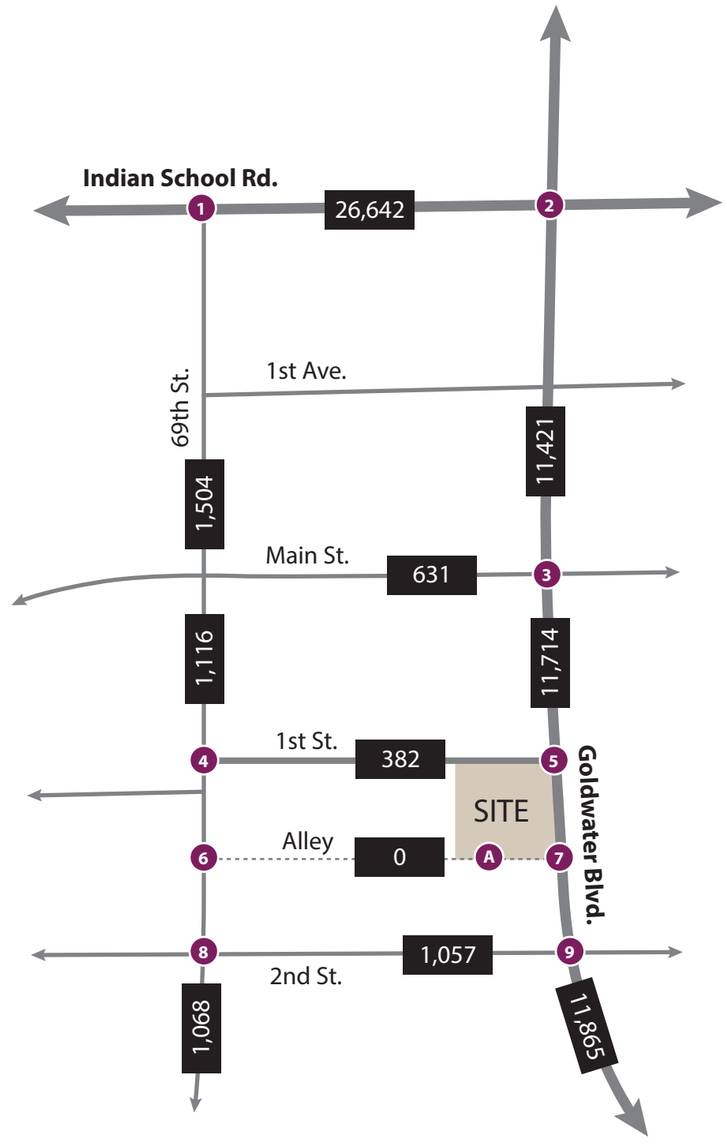
NORTH

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

X,XXX - Average Daily Traffic Volumes

Figure 9: Base Traffic Volumes





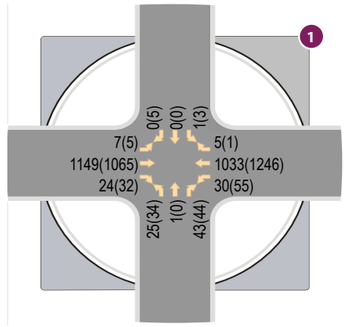
Legend

NORTH

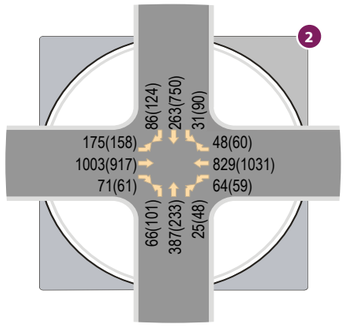
XX(XX) - AM(PM) Peak Hour Traffic Volumes

X,XXX - Average Daily Traffic Volumes

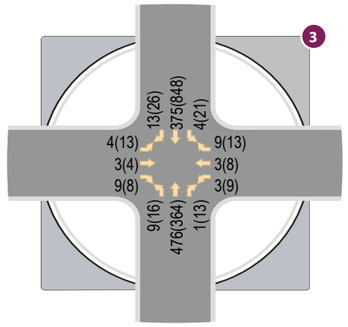
Figure 10: Background Traffic Volumes



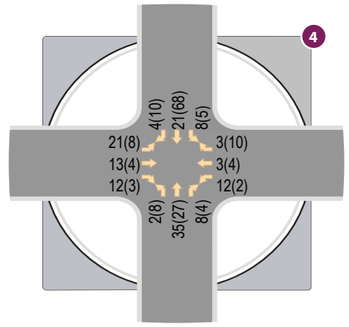
69th St & Indian School Rd.



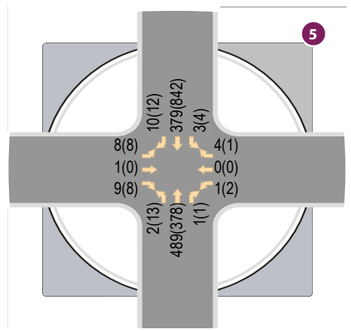
Goldwater Blvd & Indiand School Rd.



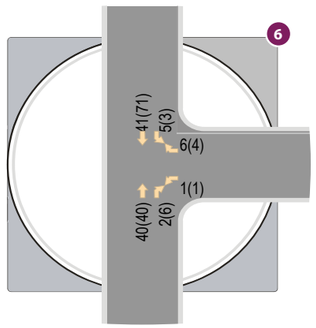
Goldwater Blvd & Main St



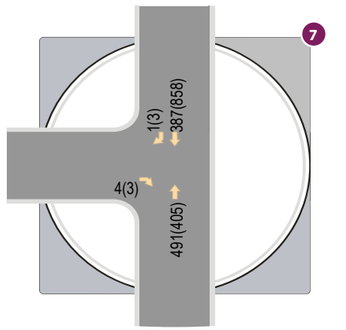
69th St & 1st St



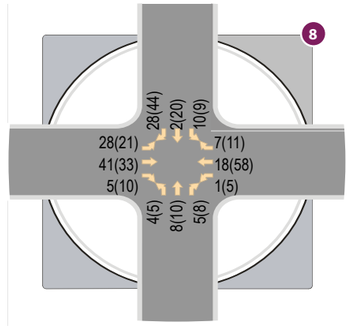
Goldwater Blvd &1st St



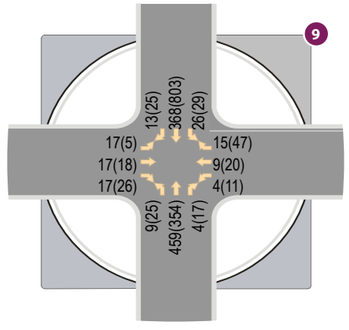
69th St & Alley



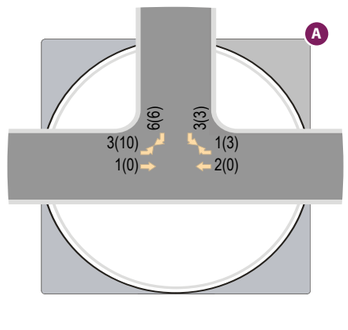
Goldwater Blvd. & Alley



69th St. & 2nd St.



Goldwater Blvd. & 2nd St.



Access A & Alley

Legend

NORTH

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

X,XXX - Average Daily Traffic Volumes

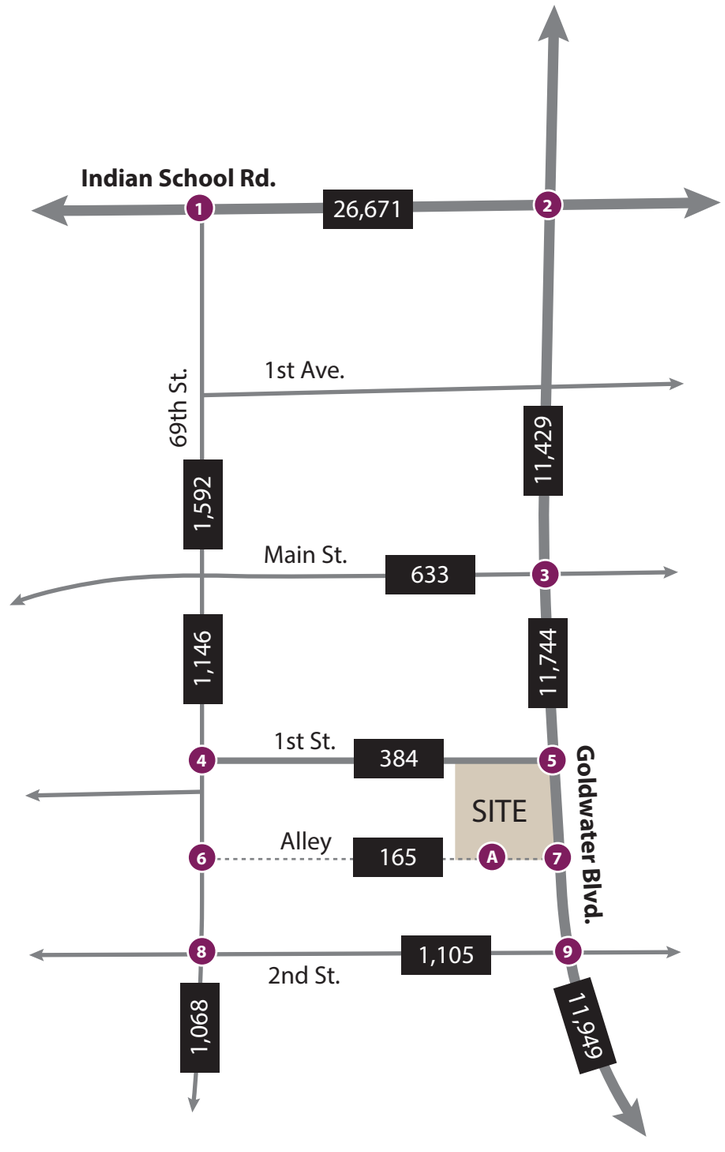


Figure 11: Total Traffic Volumes

TRAFFIC AND IMPROVEMENT ANALYSIS

INTERSECTION CAPACITY ANALYSIS

Future peak hour capacity analyses have been conducted for the study intersections. All intersections have been analyzed using the methodologies presented in the *Highway Capacity Manual (HCM),* and Synchro 10 as previously described.

Results of the peak hour level-of-service are summarized in **Table 8** for the 2020 opening year. Worksheets for both AM and PM peak hour analyses have been included within **Appendix I** for the 2020 opening year.

Table 8: 2020 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM(PM)	Build AM(PM)
1	69th St & Indian School Rd	2-way stop (NB/SB)	NB Shared SB Shared EB Left WB Left	F (F) F (E) C (C) C (C)	F (F) F (E) C (C) C (C)
2	Goldwater Blvd & Indian School Rd	Signal	NB SB EB WB	D (E) E (D) C (D) D (E)	D (E) E (D) C (D) D (E)
			Overall	**D (E)**	**D (E)**
3	Goldwater Blvd & Main St	Signal	NB SB EB WB	A (A) A (A) E (E) E (E)	A (A) A (A) E (E) E (E)
			Overall	**A (A)**	**A (A)**
4	69th St & 1st St	2-way stop (EB/WB)	NB Shared SB Shared EB Shared WB Shared	A (A) A (A) A (A) A (A)	A (A) A (A) A (A) A (A)
5	Goldwater Blvd & 1st St	2-way stop (EB/WB)	NB Left SB Left EB Shared WB left/thru	A (B) A (A) B (C) C (C)	A (B) A (A) B (C) C (C)
6	69th St & Alley	1-way stop (WB)	WB Shared SB Left	A (A) A (A)	A (A) A (A)
7	Goldwater Blvd & Alley	1-way stop (EB)	EB Right	B (A)	B (B)
8	69th St & 2nd St	2-way stop (NB/SB)	NB Shared SB Shared EB Shared WB Shared	A (A) A (A) A (A) A (A)	A (A) A (A) A (A) A (A)
9	Goldwater Blvd & 2nd St	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	A (B) A (A) C (D) C (C)	A (B) A (A) C (D) C (C)
A	Access A & Alley	1-way stop (SB)	SB Shared EB Left	- (-) - (-)	A (A) A (A)

The results of the 2020 peak hour analysis shows that all intersections operate at a level of service LOS D or better with the exception of the following intersections.

The unsignalized intersection of **69th Street and Indian School Road** is expected to continue to operate poorly during both the AM and PM peak hour on the northbound and southbound approaches. Intersections with minor approaches perpendicular to major approaches are expected to operate with delay during certain times of the day when the major road is busy, usually during the peak hour. Due to the location of this intersection to surrounding major intersections and the offset of the driveway from 69th Street, a signal will not be installed at this intersection. If there is significant delay during either peak hour, vehicles will use another route. Mitigation for this intersection is not recommended at this time.

The signalized intersection of **Goldwater Boulevard and Indian School Road** is expected to continue to operate poorly during the PM peak hour during both the no-build and build scenarios. The overall intersection delay during both scenarios is expected to be approximately 56 seconds. The threshold for an acceptable level of service is 55 seconds. Since the overall delay is very close to an acceptable level of service, no mitigation measures are recommended at this time, however, they could become necessary in the future.

The signalized intersection of **Goldwater Boulevard and Main Street** is expected to experience delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a minor road, very few vehicles approach the intersection from the east or west, so when they do, there is significant delay. If more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.

The proposed lane configurations and stop controls are presented in **Figure 12**.

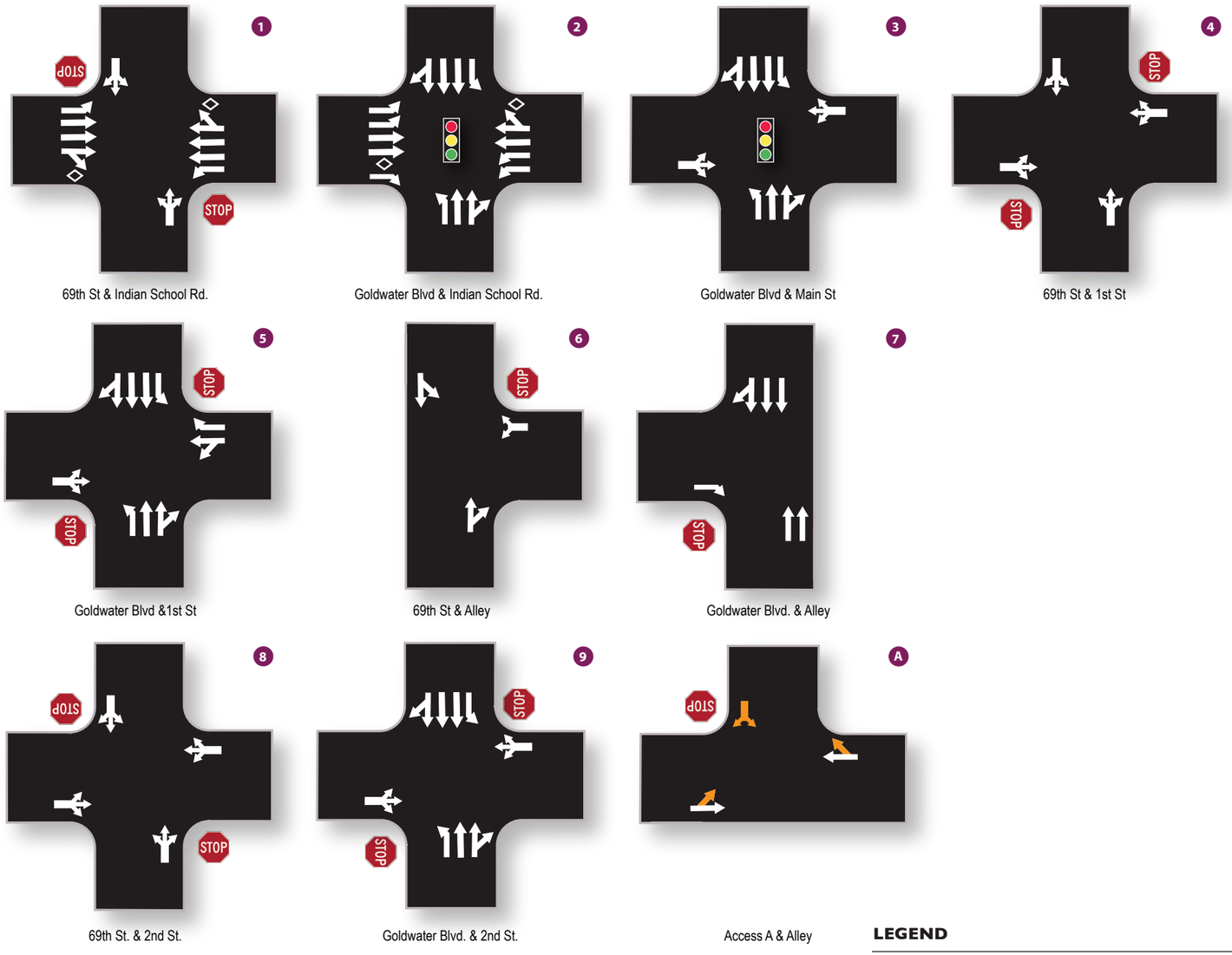
QUEUING ANALYSIS

The site access points were analyzed to determine the storage needed to accommodate the expected traffic volumes for the horizon year 2020 at the left and right turn lanes.

LEFT TURN STORAGE ANALYSIS

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*.

A queuing analysis for left turns was performed for all intersection turn lanes within the study area. The intersections were analyzed to determine the left turn storage needed to accommodate the expected traffic volumes for the horizon year 2020. The formulas used for the calculations are stated below. The resulting left turn lane storage requirements for the 2020 horizon year are summarized in **Table 9**.



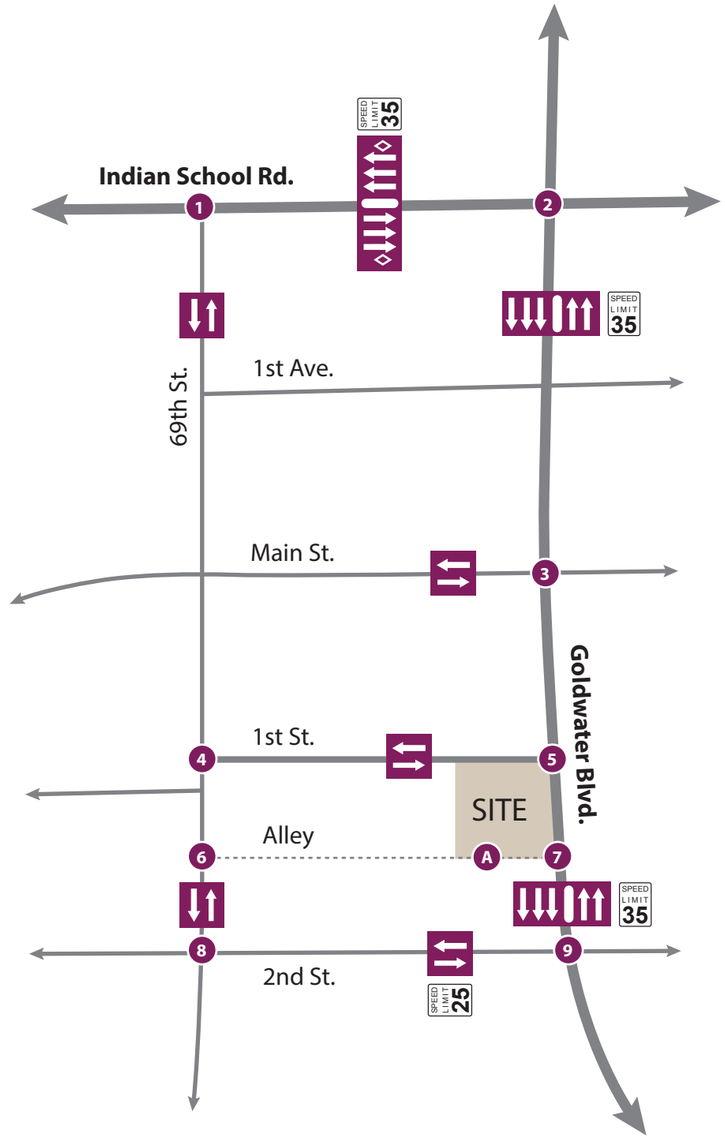


Figure 12: Proposed Lane Configurations and Traffic Controls

Two (2) methods were utilized to calculate the likely queue storage needed at the intersections for the 2032 horizon year. Synchro analysis software provided values for the 50th and 95th percentile queue storage. The 95th percentile has been reported herein. AASHTO also provides the following guidance:

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

Storage Length = [2 x (veh/hr)/(cycles/hr)] x 25 feet

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

Storage Length = [(veh/hr)/(30 periods/hr)] x 25 feet

Queue storage length recommendations at all study intersections herein are based on the 2020 projected traffic volumes.

RIGHT TURN AUXILIARY 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. The standard storage length for a deceleration lane is 150 feet, with a 100-foot minimum length.

DECELERATION LANES

Per the City of Scottsdale *DS&PM*, section 5-3.206, right turn deceleration lanes are generally deemed warranted at a driveway when the following three conditions are satisfied:

- *At least 5,000 vehicles per day are expected to use the adjacent street;*
- *The 85th percentile traffic speed on the adjacent street is 35 MPH or higher, or 45 MPH or higher for a one (1) lane per direction roadway;*
- *At least 30 vehicles will make right turns into a driveway during a peak hour.*

The main access to the site does not meet the requirements listed, meaning that a right turn deceleration lane at the access point to the site is not required, and according to the Synchro analysis performed, it operates at an acceptable level of service under the proposed lane configurations.

Table 9: Queue Length Analysis

ID	Intersection	Intersection Control	Approach	Existing Storage	Synchro 95th %-ile Q	Calculated Storage	Rec. Storage
1	69th St & Indian School Rd.	2-Way Stop (NB/SB)	EB Left	45'	<25'	25'	(1)45'
			WB Left	70'	<25'	50'	(1)70'
2	Goldwater Blvd & Indian School Rd.	Signalized	NB Left	105'	139'	175'	140'
			SB Left	180'	107'	150'	(1)180'
			EB Left	275'	67'	300'	(1) (2)275'
			WB Left	160'	25'	125'	(1) (2)160'
			EB Right	165'	<25'	125'	(1)165'
3	Goldwater Blvd & Main St	Signalized	NB Left	115'	<25'	50'	(1)115'
			SB Left	115'	<25'	50'	(1)115'
9	Goldwater Blvd. & 2nd St.	2-Way Stop (EB/WB)	NB Left	135'	<25'	50'	(1)135'
			SB Left	85'	<25'	25'	(1)85'

(1) Existing turn storage is adequate
(2) Dual left-turn lanes
(3) 50th percentile synchro recommended

As shown in **Table 9**, the existing storage lengths at the existing intersections are anticipated to accommodate the additional traffic generated by the proposed development with the exception of the northbound left turn lane at the intersection of Goldwater Boulevard and Indian School Road. No additional northbound left-turns are expected to be added from site generated traffic, meaning that the number of northbound left-turns is the same for the AM and PM peak hours for the no-build and build scenarios. Additional storage length calculations should be completed prior to traffic signal installation, a change in intersection stop control or installation of raised medians. Turn queue storage length calculations can be found in the **Appendix J**.

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* presents 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. There is no posted speed limit in the Alley. For the purpose of this study, a design speed of 30 mph was used for this road.

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 form 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 K**.

CONCLUSIONS

The following conclusions have been documented in this study.

- The results of the existing conditions analysis indicates that all study intersections operate with acceptable levels of service (LOS D or better), with the exception of the intersections of 69th Street & Indian School Rd, Goldwater Boulevard & Indian School Road and Goldwater Blvd & Main Street.
    - Currently, the unsignalized intersection of **69th Street and Indian School Road** operates poorly during both the AM and PM peak hours on the northbound and southbound approaches. This delay is due to the high wait times of vehicles making northbound left turns and southbound left turns because of the high volume of through traffic on Indian School Road during both peak hours. Extensive delay during either peak hour at minor roads or driveways that intersect major roads is expected.
    - The signalized intersection of **Goldwater Boulevard and Indian School Road** currently operates adequately in the AM peak hour, but has an overall intersection delay of 54 seconds in the PM peak hour. The threshold for an adequate level of service is 55 seconds, so it is very near to operating at a poor level of service.
    - The signalized intersection of **Goldwater Boulevard and Main Street** experiences delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a minor road, very few vehicles approach the intersection from the east or west, so when they do, there is substantial delay. As more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.
- The number of crashes reported at the intersection of Goldwater Boulevard and 1st Street does not rise to the level of warranting consideration of a traffic signal based solely on crash experience. CivTech estimates that the existing development could potentially generate 142 external weekday daily trips, 3 trips during the AM peak hour, and 14 trips during the PM peak hour.
- The proposed redevelopment is anticipated to generate 734 external weekday daily trips, 62 trips during the AM peak hour, and 61 trips during the PM peak hour.
    - As compared to the existing uses, the proposed redevelopment could generate an additional 592 external daily trips with 59 additional trips in the AM peak hour and an additional 47 trips in the PM peak hour.
- The results of the 2020 peak hour analysis shows that all intersections operate at a level of service LOS D or better with the exception of the following intersections.

- The unsignalized intersection of **69th Street and Indian School Road** is expected to continue to operate poorly during both the AM and PM peak hour on the northbound and southbound approaches. Intersections with minor approaches perpendicular to major approaches are expected to operate with delay during certain times of the day when the major road is busy, usually during the peak hour. Due to the location of this intersection to surrounding major intersections and the offset of the driveway from 69th Street, a signal will not be installed at this intersection. If there is significant delay during either peak hour, vehicles will use another route. Mitigation for this intersection is not recommended at this time.

- The signalized intersection of **Goldwater Boulevard and Indian School Road** is expected to continue to operate poorly during the PM peak hour during both the no-build and build scenarios. The overall intersection delay during both scenarios is expected to be approximately 56 seconds. The threshold for an acceptable level of service is 55 seconds. Since the overall delay is very close to an acceptable level of service, no mitigation measures are recommended at this time, however, they could become necessary in the future.

- The signalized intersection of **Goldwater Boulevard and Main Street** is expected to experience delay on the eastbound and westbound approaches of the intersection during both the AM and PM peak hours. This delay is present because the signal operates under actuated-coordinated phasing, meaning that the eastbound and westbound green phases are only triggered when a vehicle approaches. Since Main Street is a very small road, very few vehicles approach the intersection from the east or west, so when they do, there is significant delay. If more traffic uses this road in the future, the eastbound and westbound delay is likely to decrease.

- The existing storage lengths at the existing intersections are anticipated to accommodate the additional traffic generated by the proposed development with the exception of the northbound left turn lane at the intersection of Goldwater Boulevard and Indian School Road. No additional northbound left-turns are expected to be added from site generated traffic, meaning that the number of northbound left-turns is the same for the AM and PM peak hours for the no-build and build scenarios. Additional storage length calculations should be completed prior to traffic signal installation, a change in intersection stop control or installation of raised medians.

- 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. 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

A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, Washington, D.C., 2011.

ADOT Traffic Engineering Guidelines and Processes, Arizona Department of Transportation, 2015.

Highway Capacity Manual. Transportation Research Board, National Research Council, Washington, D.C., 2016.

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

Roadway Design Manual, Maricopa County Department of Transportation, Phoenix, Arizona, 2017.

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

Trip Generation 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2016.

Trip Generation Handbook, 3rd Edition, Institute of Transportation Engineers, Washington, D.C., 2012.

TECHNICAL APPENDICES

APPENDIX A

REVIEW COMMENTS AND RESPONSES

Disposition Codes: (1) Will Comply (2) Will Evaluate (3) Delete Comment (4) Defer to Consultant/Owner

Reviewer Name, Agency: **Greg Bloemberg, City of Scottsdale**

Item	Review Comment	(Code) & Response
1.	Please revise TIMA to include current traffic counts for link volumes along Goldwater Blvd, 69th Street, and 2nd Street.	(3) The original TIMA included average daily total (ADT) volumes on the vicinity maps included in each figure. These volumes were estimated using the peak hour turning movement counts. Including existing link volumes as the ADT volumes would not change the values substantially.
2.	The report should address site access as it related to the limited access at Goldwater Blvd. and the likelihood of generating U-turns at 2nd Street and 1st Street as drivers enter and exit the site. As these are rental units, there is a higher likelihood of drivers unfamiliar with local streets.	(1) Text has been added to the report indicating that U-turns are likely to occur at 1st Street and 2nd Street along Goldwater due to the nature of the proposed site and the out of town visitors that the site will attract.

Reviewed Date: 01/08/201
CivTech Received Date: 01/24/201
CivTech Entered Date: 01/28/201
CivTech Response Date: 01/29/201

APPENDIX B

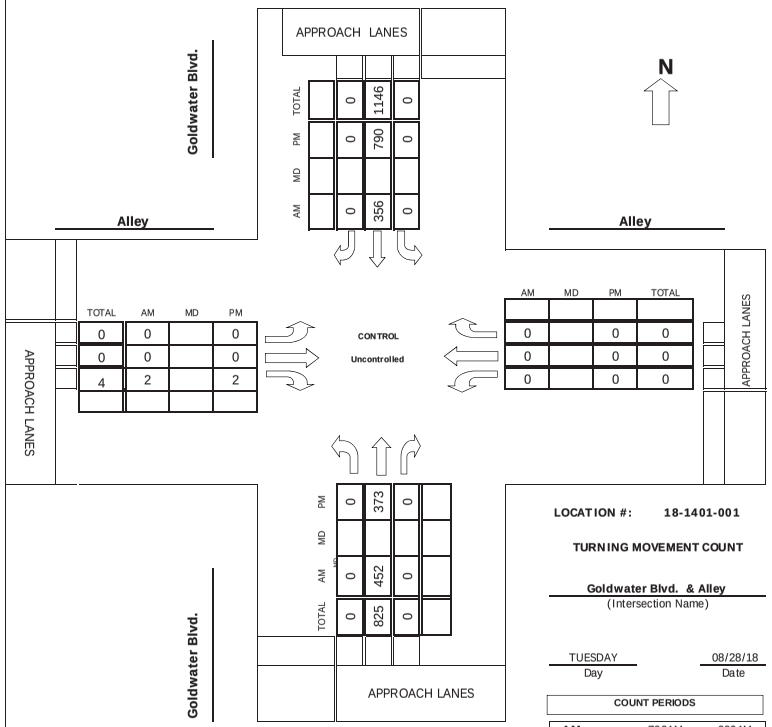
EXISTING TRAFFIC COUNTS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-001

TMC SUMMARY OF Goldwater Blvd. & Alley



LOCATION #: 18-1401-001

TURNING MOVEMENT COUNT

Goldwater Blvd. & Alley
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

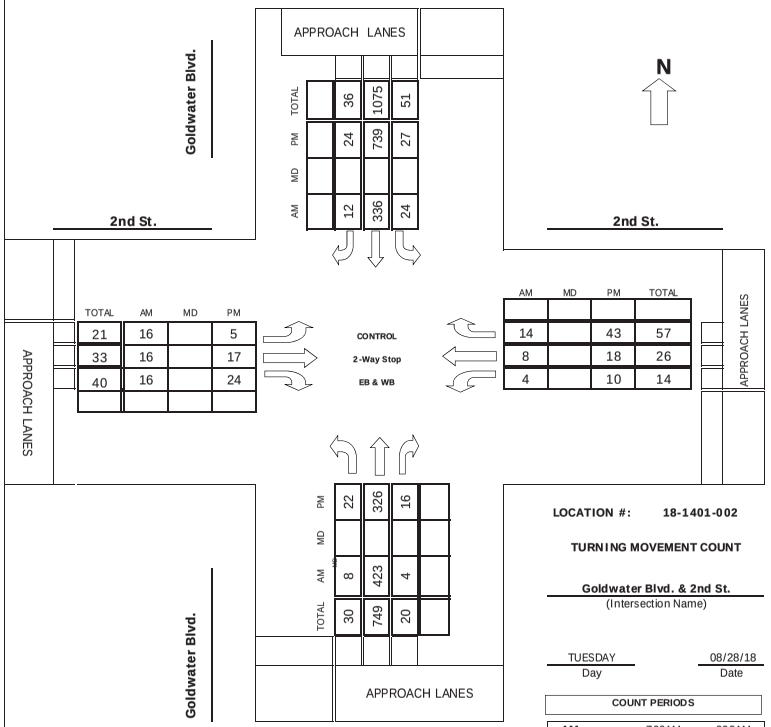
PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-002

TMC SUMMARY OF Goldwater Blvd. & 2nd St.



LOCATION #: 18-1401-002

TURNING MOVEMENT COUNT

Goldwater Blvd. & 2nd St.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

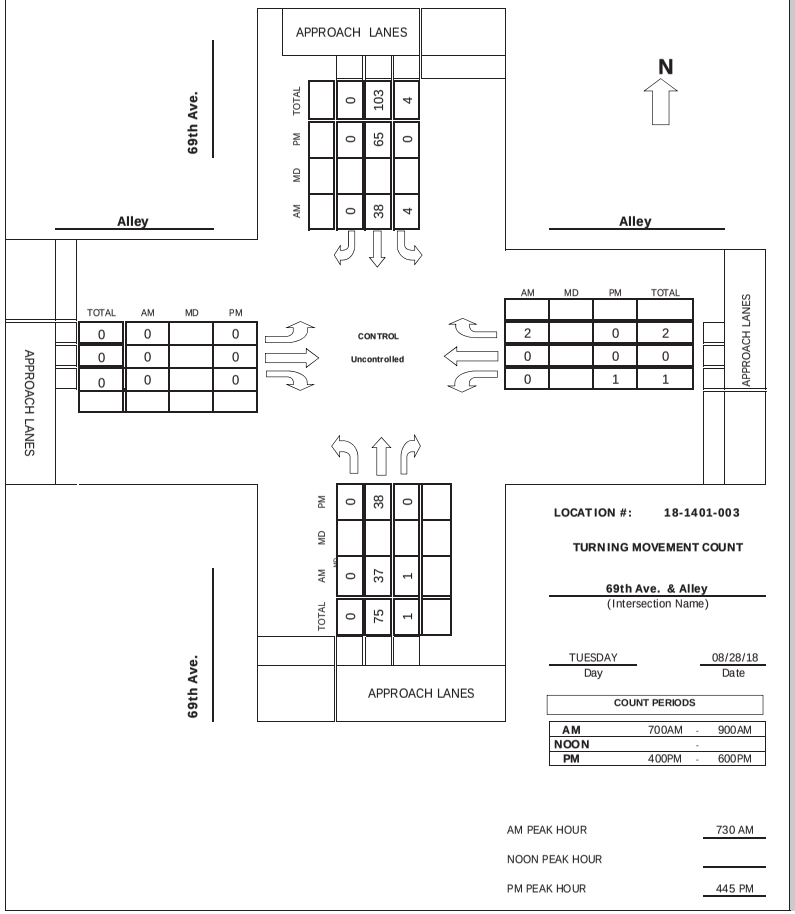
PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-003

TMC SUMMARY OF 69th Ave. & Alley



LOCATION #: 18-1401-003

TURNING MOVEMENT COUNT

69th Ave. & Alley
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

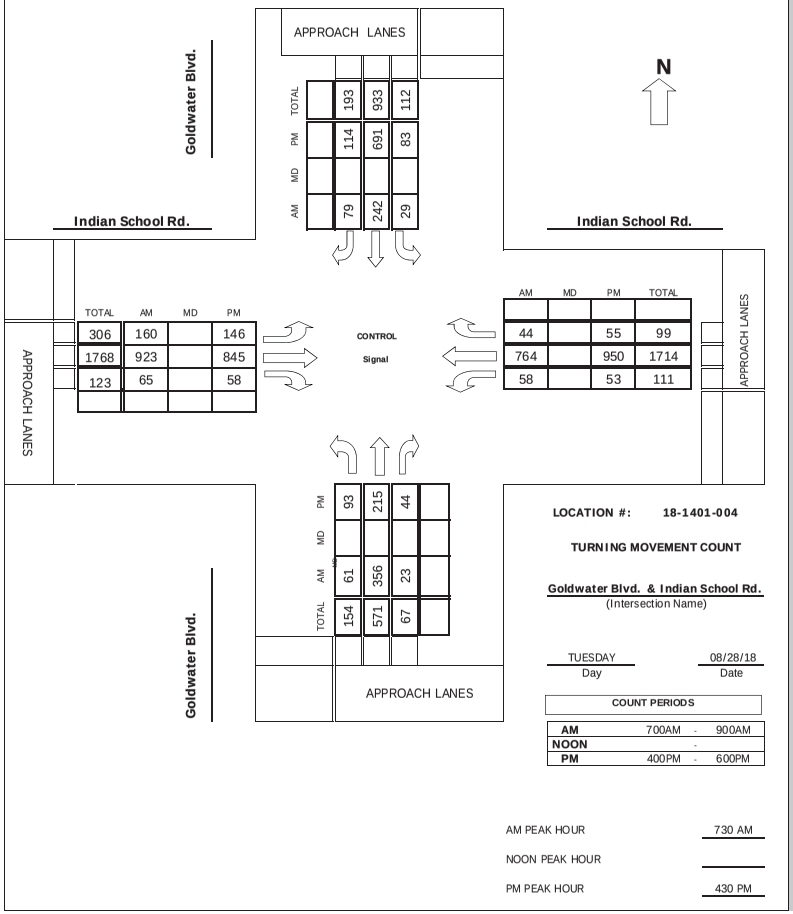
AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-004

TMC SUMMARY OF Goldwater Blvd. & Indian School Rd.



LOCATION #: 18-1401-004

TURNING MOVEMENT COUNT

Goldwater Blvd. & Indian School Rd.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

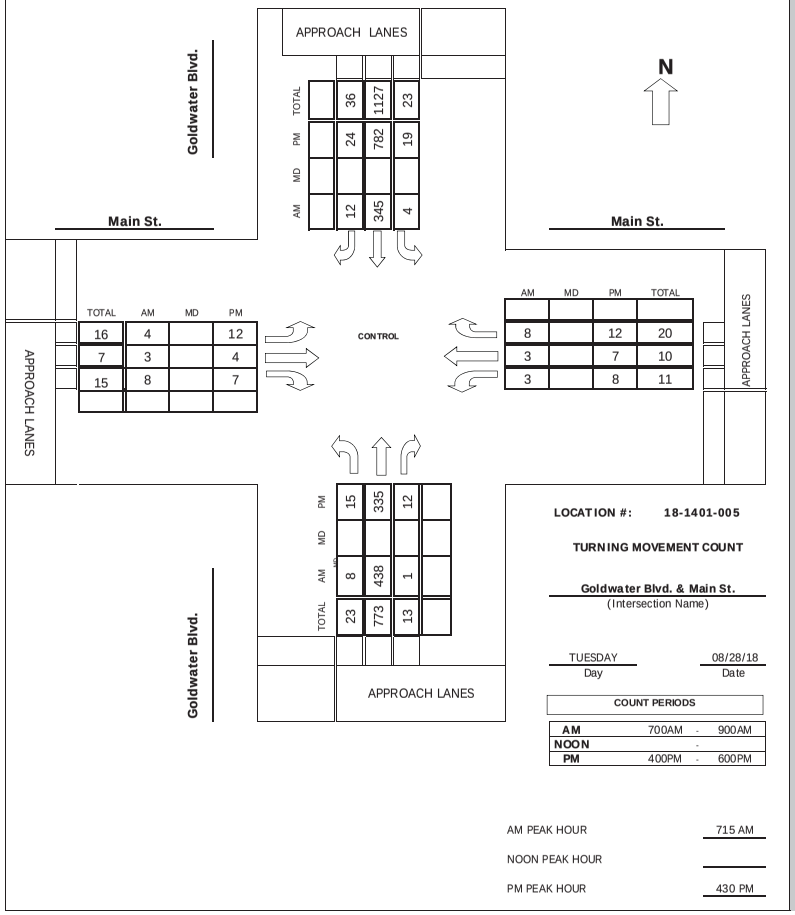
AM PEAK HOUR	730 AM
NOON PEAK HOUR	
PM PEAK HOUR	430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-005

TMC SUMMARY OF Goldwater Blvd. & Main St.



LOCATION #: 18-1401-005

TURNING MOVEMENT COUNT

Goldwater Blvd. & Main St.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

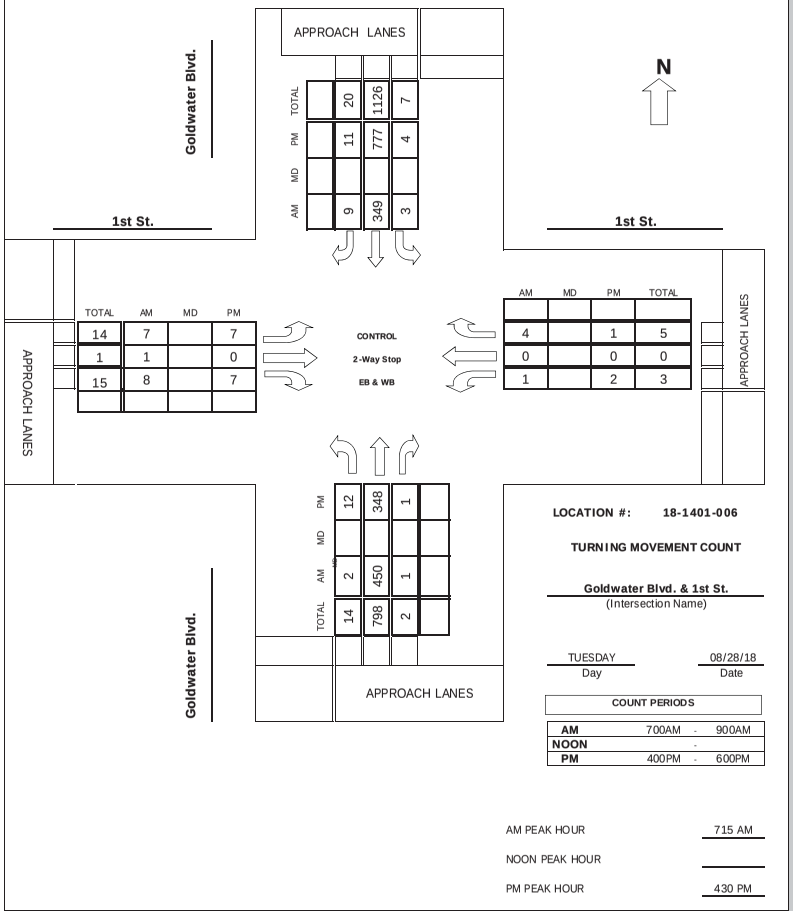
PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-006

TMC SUMMARY OF Goldwater Blvd. & 1st St.



LOCATION #: 18-1401-006

TURNING MOVEMENT COUNT

Goldwater Blvd. & 1st St.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

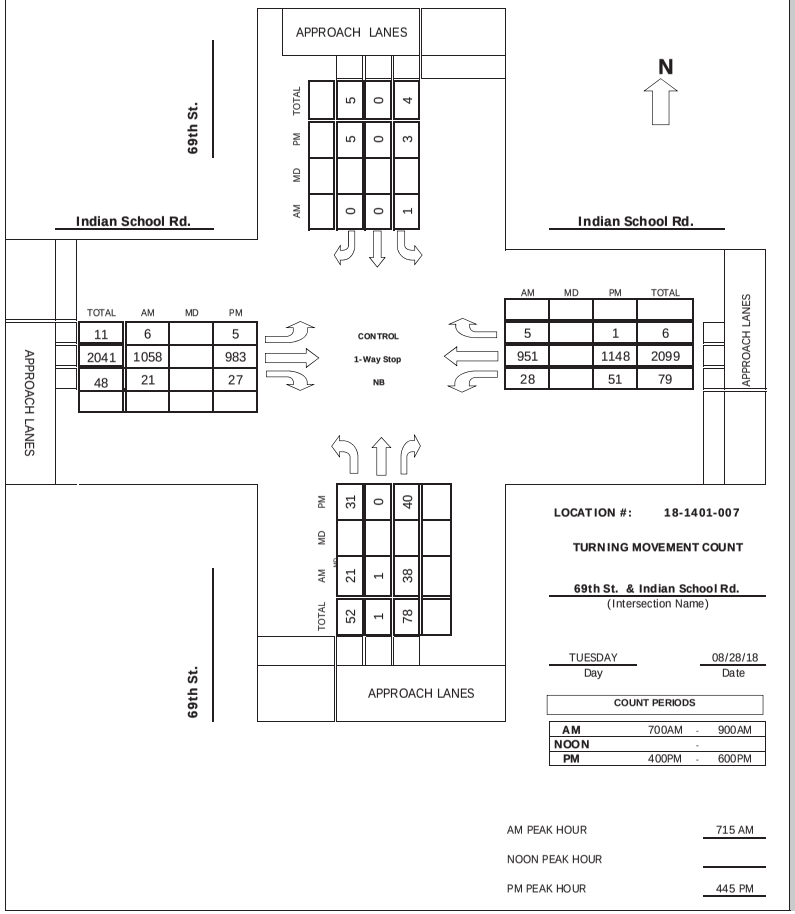
PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-007

TMC SUMMARY OF 69th St. & Indian School Rd.



LOCATION #: 18-1401-007

TURNING MOVEMENT COUNT

69th St. & Indian School Rd.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

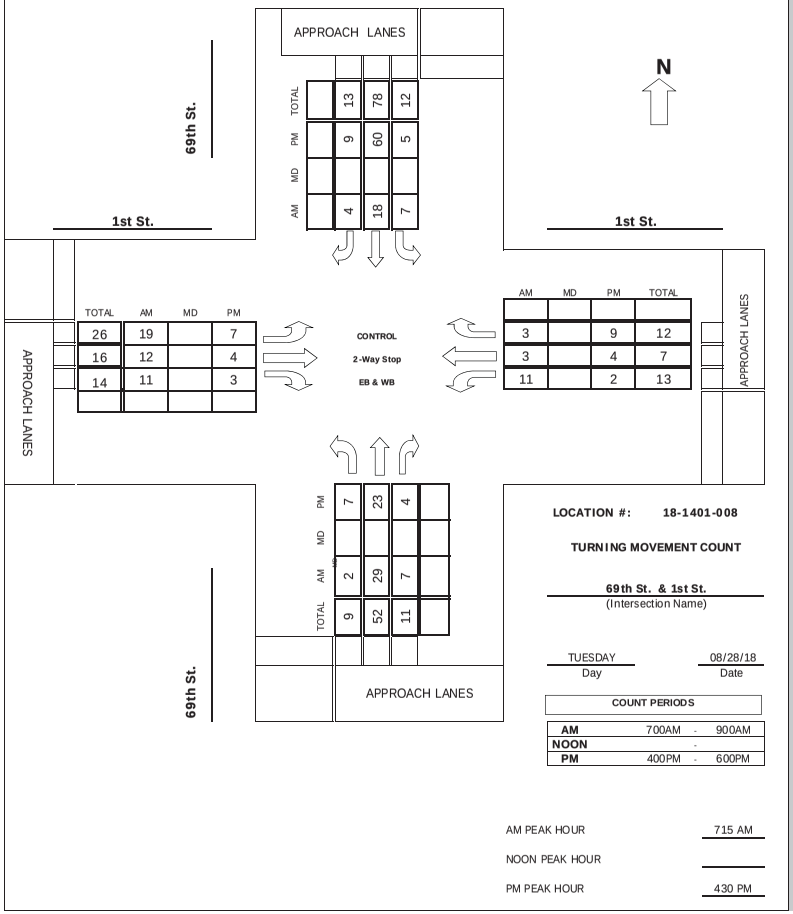
PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-008

TMC SUMMARY OF 69th St. & 1st St.



LOCATION #: 18-1401-008

TURNING MOVEMENT COUNT

69th St. & 1st St.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 715 AM

NOON PEAK HOUR

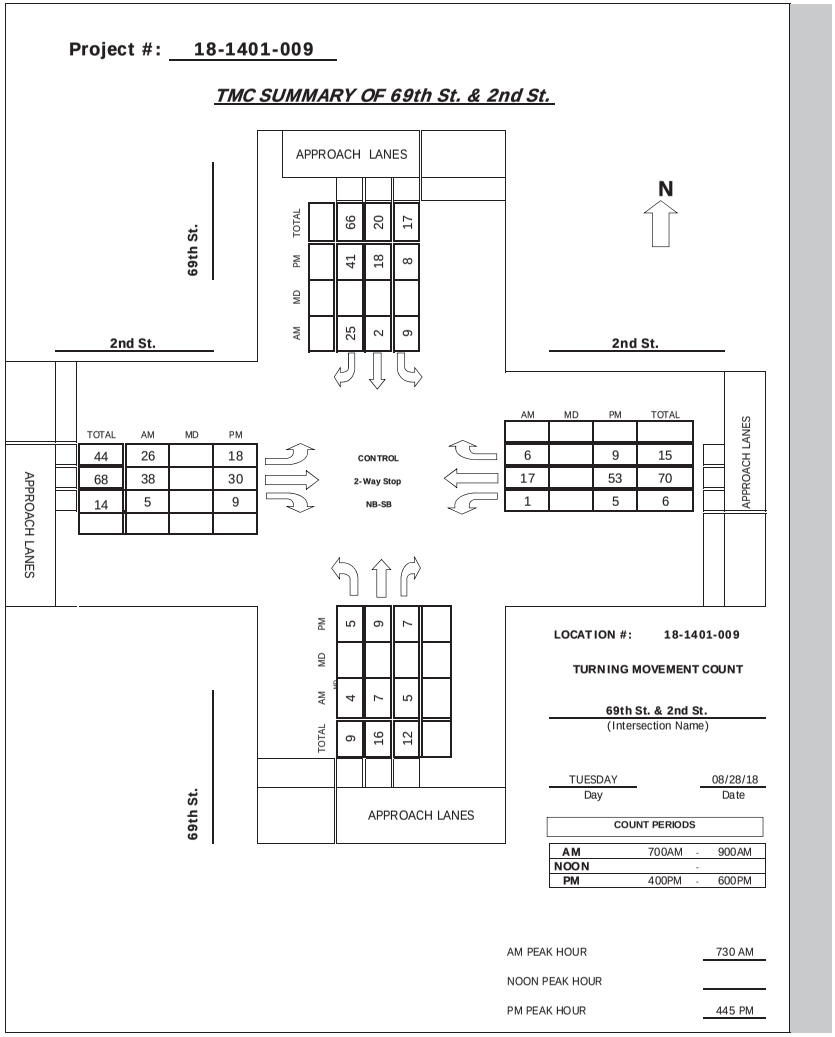
PM PEAK HOUR 430 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 18-1401-009

TMC SUMMARY OF 69th St. & 2nd St.



LOCATION #: 18-1401-009

TURNING MOVEMENT COUNT

69th St. & 2nd St.
(Intersection Name)

TUESDAY (Day) 08/28/18 (Date)

COUNT PERIODS			
AM	700AM	-	900AM
NOON		-	
PM	400PM	-	600PM

AM PEAK HOUR 730 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

APPENDIX C

EXISTING SIGNAL TIMING SHEETS

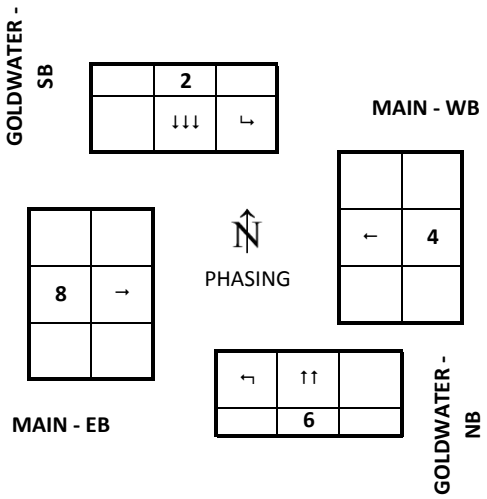
GOLDWATER & MAIN

System # 195

BASIC TIMING PLAN

Section #	I.P. Address	Date Designed
	MM1-5-1	
	172.17.11.95	12/12/2016

TIMING PLAN - MM-2-1									
	Phase		2		4		6		8
	Movement		SBT		WBT		NBT		EBT
	NOTES								
	MIN GRN		10		7		10		7
	BK MGRN								
	CS MGRN								
	DLY GRN								
	WALK		7		8		7		8
	WALK2								
	WLK MAX								
	PED CLR/FDW		12		21		9		21
	PD CLR2								
	PC MAX								
	PED CO								
	VEH EXT				2				2
	VH EXT2								
	MAX 1		70		35		70		35
	MAX 2		90		50		90		50
	MAX 3								
	DYM MAX								
	DYM STP								
	YELLOW		4.0		3.3		4		3.3
	RED CLR		1.2		1.5		1.2		1.5
	RED MAX								
	RED RVT		2		2		2		2
	ACT B4								
	SEC/ACT								
	MAX INT								
	TIME B4								
	CARS WT								
	STPTDUC								
	TTREDUC								
	MIN GAP								
RECALLS - MM-2-8	LOCK DET								
	VEH RECALL		X				X		
	PED RECALL								
	MAX RECALL								
	SOFT RECALL								
	NO REST								
	ADD INIT CAL								



PHASING SEQUENCES				
TOD: MORNING				
R1	2		4	
R2	6		8	
		B		B
Use Timing plan:				
TOD: MIDDAY				
R1	2		4	
R2	6		8	
		B		B
Use Timing plan:				
TOD: EVENING				
R1	2		4	
R2	6		8	
		B		B
Use Timing plan:				
TOD: WEEKEND				
R1	2		4	
R2	6		8	
		B		B
Use Timing plan:				
FREE				
R1	2		4	
R2	6		8	
		B		B
Use Timing plan: 254				

NOTES

EXPIRES XX/XX/XXXX

APPENDIX D

EXISTING PEAK HOUR ANALYSIS

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	1111	22	29	999	5	22	1	40	1	0	0
Future Vol, veh/h	6	1111	22	29	999	5	22	1	40	1	0	0
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	1208	24	32	1086	5	24	1	43	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1091	0	0	1232	0	0	1732	2389	616	1651	2399	546
Stage 1	-	-	-	-	-	-	1234	1234	-	1153	1153	-
Stage 2	-	-	-	-	-	-	498	1155	-	498	1246	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	354	-	-	302	-	-	93	33	372	104	33	413
Stage 1	-	-	-	-	-	-	137	247	-	156	270	-
Stage 2	-	-	-	-	-	-	478	269	-	478	244	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	354	-	-	302	-	-	84	29	372	81	29	413
Mov Cap-2 Maneuver	-	-	-	-	-	-	84	29	-	81	29	-
Stage 1	-	-	-	-	-	-	134	242	-	153	241	-
Stage 2	-	-	-	-	-	-	427	240	-	412	239	-

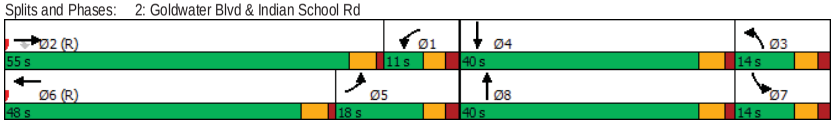
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	45	50
HCM LOS			E	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	156	354	-	-	302	-	-	81
HCM Lane V/C Ratio	0.439	0.018	-	-	0.104	-	-	0.013
HCM Control Delay (s)	45	15.4	-	-	18.3	-	-	50
HCM Lane LOS	E	C	-	-	C	-	-	F
HCM 95th %tile Q(veh)	2	0.1	-	-	0.3	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	168	969	68	61	802	64	374	30	254
Future Volume (vph)	168	969	68	61	802	64	374	30	254
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	7.0	5.0	7.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	55.0	55.0	11.0	48.0	14.0	40.0	14.0	40.0
Total Split (%)	15.0%	45.8%	45.8%	9.2%	40.0%	11.7%	33.3%	11.7%	33.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	11.7	73.9	73.9	5.6	65.7	12.2	18.9	7.0	11.6
Actuated g/C Ratio	0.10	0.62	0.62	0.05	0.55	0.10	0.16	0.06	0.10
v/c Ratio	0.58	0.46	0.08	0.44	0.45	0.41	0.74	0.34	0.65
Control Delay	59.2	15.2	0.8	65.0	18.9	55.8	55.5	63.0	48.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	15.2	0.8	65.0	18.9	55.8	55.5	63.0	48.2
LOS	E	B	A	E	B	E	E	E	D
Approach Delay		20.5			22.0		55.6		49.4
Approach LOS		C			C		E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.74		
Intersection Signal Delay: 30.1	Intersection LOS: C	
Intersection Capacity Utilization 61.7%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	969	68	61	802	46	64	374	24	30	254	83
Future Volume (veh/h)	168	969	68	61	802	46	64	374	24	30	254	83
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	183	1053	74	66	872	50	70	407	26	33	276	90
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	996	1559	626	805	1289	74	117	484	31	47	384	118
Arrive On Green	0.30	0.42	0.42	0.25	0.36	0.36	0.07	0.14	0.14	0.03	0.09	0.09
Sat Flow, veh/h	3274	3741	1502	3274	3596	206	1688	3571	227	1688	4073	1253
Grp Volume(v), veh/h	183	1053	74	66	454	468	70	213	220	33	241	125
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1932	1688	1870	1928	1688	1792	1743
Q Serve(g_s), s	4.9	27.4	3.6	1.9	24.6	24.7	4.8	13.3	13.4	2.3	7.8	8.4
Cycle Q Clear(g_c), s	4.9	27.4	3.6	1.9	24.6	24.7	4.8	13.3	13.4	2.3	7.8	8.4
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.12	1.00		0.72
Lane Grp Cap(c), veh/h	996	1559	626	805	670	692	117	253	261	47	337	164
V/C Ratio(X)	0.18	0.68	0.12	0.08	0.68	0.68	0.60	0.84	0.84	0.70	0.71	0.76
Avail Cap(c_a), veh/h	996	1559	626	805	670	692	122	541	557	122	1036	504
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	30.8	28.4	21.5	34.8	32.6	32.6	54.2	50.6	50.6	57.8	52.8	53.0
Incr Delay (d2), s/veh	0.0	2.4	0.4	0.0	5.4	5.3	4.8	2.8	2.9	6.9	1.1	2.7
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	2.0	12.6	1.4	0.8	12.1	12.4	2.2	6.4	6.7	1.1	3.6	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	30.8	21.9	34.8	38.0	37.9	59.1	53.4	53.5	64.8	53.8	55.8
LnGrp LOS	C	C	C	C	D	D	E	D	D	E	D	E
Approach Vol, veh/h		1310			988			503			399	
Approach Delay, s/veh		30.3			37.7			54.3			55.4	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.8	55.0	13.6	16.6	41.8	48.0	8.6	21.6
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	5.7	* 50	* 8.7	* 35	12.7	* 43	* 8.7	* 35
Max Q Clear Time (g_c+I1), s	3.9	29.4	6.8	10.4	6.9	26.7	4.3	15.4
Green Ext Time (p_c), s	0.0	3.1	0.0	0.9	0.2	2.0	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	39.5
HCM 6th LOS	D

Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	3	3	3	8	460	4	362
Future Volume (vph)	4	3	3	3	8	460	4	362
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.2		7.2	133.0	133.0	133.0	133.0
Actuated g/C Ratio		0.05		0.05	0.95	0.95	0.95	0.95
v/c Ratio		0.19		0.18	0.01	0.14	0.01	0.08
Control Delay		69.0		68.4	1.0	0.7	1.0	0.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		69.0		68.4	1.0	0.7	1.0	0.6
LOS		E		E	A	A	A	A
Approach Delay		69.0		68.4		0.7		0.6
Approach LOS		E		E		A		A

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.19		
Intersection Signal Delay: 2.9	Intersection LOS: A	
Intersection Capacity Utilization 26.3%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 3: Main St & Goldwater Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	3	8	3	3	8	8	460	1	4	362	13
Future Volume (veh/h)	4	3	8	3	3	8	8	460	1	4	362	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	4	3	9	3	3	9	9	500	1	4	393	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	41	17	34	38	17	36	872	3422	7	797	4762	169
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89	0.89	0.89
Sat Flow, veh/h	267	480	960	204	483	1029	927	3830	8	850	5329	189
Grp Volume(v), veh/h	16	0	0	15	0	0	9	244	257	4	263	144
Grp Sat Flow(s),veh/h/ln	1707	0	0	1716	0	0	927	1870	1967	850	1792	1935
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.2	2.2	0.1	1.2	1.2
Cycle Q Clear(g_c), s	1.2	0.0	0.0	1.2	0.0	0.0	1.4	2.2	2.2	2.3	1.2	1.2
Prop In Lane	0.25		0.56	0.20		0.60	1.00		0.00	1.00		0.10
Lane Grp Cap(c), veh/h	92	0	0	91	0	0	872	1671	1758	797	3202	1729
V/C Ratio(X)	0.17	0.00	0.00	0.16	0.00	0.00	0.01	0.15	0.15	0.01	0.08	0.08
Avail Cap(c_a), veh/h	570	0	0	573	0	0	872	1671	1758	797	3202	1729
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	65.8	0.0	0.0	65.7	0.0	0.0	0.9	0.9	0.9	1.1	0.9	0.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.0	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	0.6	0.0	0.0	0.5	0.0	0.0	0.0	0.4	0.5	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.1	0.0	0.0	66.1	0.0	0.0	1.0	1.1	1.1	1.1	0.9	0.9
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		16			15			510			411	
Approach Delay, s/veh		66.1			66.1			1.1			0.9	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		130.3		9.7		130.3		9.7				
Change Period (Y+Rc), s		* 5.2		* 4.8		* 5.2		* 4.8				
Max Green Setting (Gmax), s		* 85		* 45		* 85		* 45				
Max Q Clear Time (g_c+I1), s		4.3		3.2		4.2		3.2				
Green Ext Time (p_c), s		0.5		0.0		0.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		3.1
HCM 6th LOS		A

Notes

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

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	13	12	12	3	3	2	30	7	7	19	4
Future Vol, veh/h	20	13	12	12	3	3	2	30	7	7	19	4
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	22	14	13	13	3	3	2	33	8	8	21	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	83	84	23	94	82	37	25	0	0	41	0	0
Stage 1	39	39	-	41	41	-	-	-	-	-	-	-
Stage 2	44	45	-	53	41	-	-	-	-	-	-	-
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	904	806	1054	889	808	1035	1589	-	-	1568	-	-
Stage 1	976	862	-	974	861	-	-	-	-	-	-	-
Stage 2	970	857	-	960	861	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	894	801	1054	862	803	1035	1589	-	-	1568	-	-
Mov Cap-2 Maneuver	894	801	-	862	803	-	-	-	-	-	-	-
Stage 1	975	858	-	973	860	-	-	-	-	-	-	-
Stage 2	962	856	-	928	857	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.2	9.2	0.4	1.7
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1589	-	-	900	876	1568	-	-
HCM Lane V/C Ratio	0.001	-	-	0.054	0.022	0.005	-	-
HCM Control Delay (s)	7.3	0	-	9.2	9.2	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1	8	1	0	4	2	473	1	3	366	9
Future Vol, veh/h	7	1	8	1	0	4	2	473	1	3	366	9
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	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1	9	1	0	4	2	514	1	3	398	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	670	928	204	685	933	258	408	0	0	515	0	0
Stage 1	409	409	-	519	519	-	-	-	-	-	-	-
Stage 2	261	519	-	166	414	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	369	266	683	360	265	741	748	-	-	1047	-	-
Stage 1	521	594	-	492	531	-	-	-	-	-	-	-
Stage 2	695	531	-	781	591	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	365	264	683	353	263	741	748	-	-	1047	-	-
Mov Cap-2 Maneuver	365	264	-	353	263	-	-	-	-	-	-	-
Stage 1	519	592	-	491	529	-	-	-	-	-	-	-
Stage 2	689	529	-	767	589	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	11	0	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	748	-	-	461	353	741	1047	-	-
HCM Lane V/C Ratio	0.003	-	-	0.038	0.003	0.006	0.003	-	-
HCM Control Delay (s)	9.8	-	-	13.1	15.2	9.9	8.4	-	-
HCM Lane LOS	A	-	-	B	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	39	1	4	40
Future Vol, veh/h	0	2	39	1	4	40
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	42	1	4	43

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	94	43	0	0	43	0
Stage 1	43	-	-	-	-	-
Stage 2	51	-	-	-	-	-
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	906	1027	-	-	1566	-
Stage 1	979	-	-	-	-	-
Stage 2	971	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	903	1027	-	-	1566	-
Mov Cap-2 Maneuver	903	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	971	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0.7
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1027	1566	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	0	475	374	0
Future Vol, veh/h	0	2	0	475	374	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	516	407	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	204	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	683	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	683	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	683	-	-
HCM Lane V/C Ratio	-	0.003	-	-
HCM Control Delay (s)	-	10.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	27	40	5	1	18	6	4	7	5	9	2	26
Future Vol, veh/h	27	40	5	1	18	6	4	7	5	9	2	26
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	43	5	1	20	7	4	8	5	10	2	28

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	27	0	0	48	0	0	145	133	46	136	132	24
Stage 1	-	-	-	-	-	-	104	104	-	26	26	-
Stage 2	-	-	-	-	-	-	41	29	-	110	106	-
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	1587	-	-	1559	-	-	824	758	1023	835	759	1052
Stage 1	-	-	-	-	-	-	902	809	-	992	874	-
Stage 2	-	-	-	-	-	-	974	871	-	895	807	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1587	-	-	1559	-	-	788	743	1023	812	744	1052
Mov Cap-2 Maneuver	-	-	-	-	-	-	788	743	-	812	744	-
Stage 1	-	-	-	-	-	-	885	794	-	973	873	-
Stage 2	-	-	-	-	-	-	945	870	-	865	792	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.7	0.3	9.5	8.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	825	1587	-	-	1559	-	-	961
HCM Lane V/C Ratio	0.021	0.018	-	-	0.001	-	-	0.042
HCM Control Delay (s)	9.5	7.3	0	-	7.3	0	-	8.9
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.1

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	17	17	17	4	8	15	8	444	4	25	353	13
Future Vol, veh/h	17	17	17	4	8	15	8	444	4	25	353	13
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	18	18	4	9	16	9	483	4	27	384	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	709	950	199	720	955	244	398	0	0	487	0	0
Stage 1	445	445	-	503	503	-	-	-	-	-	-	-
Stage 2	264	505	-	217	452	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	348	259	688	342	257	757	756	-	-	1072	-	-
Stage 1	492	573	-	503	540	-	-	-	-	-	-	-
Stage 2	693	539	-	728	569	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	322	249	688	305	247	757	756	-	-	1072	-	-
Mov Cap-2 Maneuver	322	249	-	305	247	-	-	-	-	-	-	-
Stage 1	486	559	-	497	534	-	-	-	-	-	-	-
Stage 2	659	533	-	668	555	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.2	14.4	0.2	0.5
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	756	-	-	350	413	1072	-	-
HCM Lane V/C Ratio	0.012	-	-	0.158	0.071	0.025	-	-
HCM Control Delay (s)	9.8	-	-	17.2	14.4	8.4	-	-
HCM Lane LOS	A	-	-	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.2	0.1	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1032	28	54	1205	1	33	0	42	3	0	5
Future Vol, veh/h	5	1032	28	54	1205	1	33	0	42	3	0	5
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1122	30	59	1310	1	36	0	46	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1311	0	0	1152	0	0	1789	2576	576	1888	2591	656
Stage 1	-	-	-	-	-	-	1147	1147	-	1429	1429	-
Stage 2	-	-	-	-	-	-	642	1429	-	459	1162	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	276	-	-	330	-	-	86	25	394	74	25	350
Stage 1	-	-	-	-	-	-	157	272	-	99	199	-
Stage 2	-	-	-	-	-	-	391	199	-	504	267	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	276	-	-	330	-	-	72	20	394	56	20	350
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	20	-	56	20	-
Stage 1	-	-	-	-	-	-	154	267	-	97	163	-
Stage 2	-	-	-	-	-	-	316	163	-	438	262	-

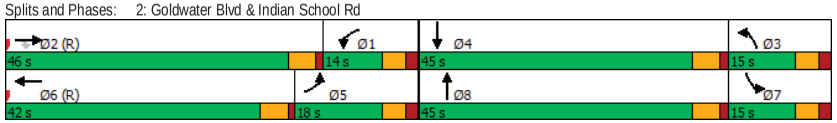
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.8	67.7	37.9
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	133	276	-	-	330	-	-	118
HCM Lane V/C Ratio	0.613	0.02	-	-	0.178	-	-	0.074
HCM Control Delay (s)	67.7	18.3	-	-	18.3	-	-	37.9
HCM Lane LOS	F	C	-	-	C	-	-	E
HCM 95th %tile Q(veh)	3.2	0.1	-	-	0.6	-	-	0.2

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	153	887	61	56	998	98	226	87	726
Future Volume (vph)	153	887	61	56	998	98	226	87	726
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	46.0	46.0	14.0	42.0	15.0	45.0	15.0	45.0
Total Split (%)	15.0%	38.3%	38.3%	11.7%	35.0%	12.5%	37.5%	12.5%	37.5%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	10.5	56.3	56.3	6.8	50.6	12.8	13.0	25.0	25.2
Actuated g/C Ratio	0.09	0.47	0.47	0.06	0.42	0.11	0.11	0.21	0.21
v/c Ratio	0.59	0.55	0.09	0.33	0.74	0.60	0.72	0.27	0.82
Control Delay	61.0	26.7	0.7	58.8	34.2	64.6	58.0	40.5	50.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.0	26.7	0.7	58.8	34.2	64.6	58.0	40.5	50.1
LOS	E	C	A	E	C	E	E	D	D
Approach Delay		30.0			35.5		59.7		49.2
Approach LOS		C			D		E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 70		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 40.0	Intersection LOS: D	
Intersection Capacity Utilization 71.6%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	153	887	61	56	998	58	98	226	46	87	726	120
Future Volume (veh/h)	153	887	61	56	998	58	98	226	46	87	726	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
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	166	964	66	61	1085	63	107	246	50	95	789	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	785	1278	513	676	1108	64	130	312	62	299	934	153
Arrive On Green	0.24	0.34	0.34	0.21	0.31	0.31	0.08	0.10	0.10	0.18	0.20	0.20
Sat Flow, veh/h	3274	3741	1502	3274	3593	209	1688	3106	621	1688	4654	761
Grp Volume(v), veh/h	166	964	66	61	565	583	107	146	150	95	606	313
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1931	1688	1870	1857	1688	1792	1832
Q Serve(g_s), s	4.9	27.4	3.6	1.8	35.9	35.9	7.5	9.2	9.5	5.9	19.5	19.8
Cycle Q Clear(g_c), s	4.9	27.4	3.6	1.8	35.9	35.9	7.5	9.2	9.5	5.9	19.5	19.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.33	1.00		0.42
Lane Grp Cap(c), veh/h	785	1278	513	676	577	595	130	188	187	299	719	368
V/C Ratio(X)	0.21	0.75	0.13	0.09	0.98	0.98	0.82	0.78	0.80	0.32	0.84	0.85
Avail Cap(c_a), veh/h	785	1278	513	676	577	595	136	619	614	299	1185	606
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	36.5	35.0	27.2	38.5	41.1	41.1	54.6	52.7	52.8	43.0	46.1	46.2
Incr Delay (d2), s/veh	0.0	4.2	0.5	0.0	32.7	32.2	28.7	2.6	3.0	0.2	1.3	2.9
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	2.0	13.1	1.4	0.7	21.5	22.2	4.2	4.4	4.6	2.5	8.8	9.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.6	39.2	27.7	38.5	73.8	73.3	83.3	55.3	55.8	43.3	47.5	49.2
LnGrp LOS	D	D	C	D	E	E	F	E	E	D	D	D
Approach Vol, veh/h		1196			1209			403			1014	
Approach Delay, s/veh		38.2			71.8			62.9			47.6	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.1	46.0	14.5	29.4	34.1	42.0	26.6	17.4
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	8.7	* 41	* 9.7	* 40	12.7	* 37	* 9.7	* 40
Max Q Clear Time (g_c+I1), s	3.8	29.4	9.5	21.8	6.9	37.9	7.9	11.5
Green Ext Time (p_c), s	0.0	2.4	0.0	2.3	0.1	0.0	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay		53.9
HCM 6th LOS		D

Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	13	4	8	7	16	352	20	821
Future Volume (vph)	13	4	8	7	16	352	20	821
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.4		7.4	129.4	129.4	129.4	129.4
Actuated g/C Ratio		0.05		0.05	0.92	0.92	0.92	0.92
v/c Ratio		0.27		0.31	0.03	0.12	0.03	0.19
Control Delay		55.4		49.6	1.3	0.9	1.1	1.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		55.4		49.6	1.3	0.9	1.1	1.0
LOS		E		D	A	A	A	A
Approach Delay		55.4		49.6		1.0		1.0
Approach LOS		E		D		A		A

Intersection Summary			
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.31			
Intersection Signal Delay: 3.1		Intersection LOS: A	
Intersection Capacity Utilization 31.7%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Main St & Goldwater Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	4	7	8	7	13	16	352	13	20	821	25
Future Volume (veh/h)	13	4	7	8	7	13	16	352	13	20	821	25
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	14	4	8	9	8	14	17	383	14	22	892	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	70	22	23	48	27	35	547	3254	119	866	4739	143
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.88	0.88	0.88	0.88	0.88	0.88
Sat Flow, veh/h	678	498	523	330	613	776	576	3681	134	935	5361	162
Grp Volume(v), veh/h	26	0	0	31	0	0	17	194	203	22	596	323
Grp Sat Flow(s),veh/h/ln	1698	0	0	1719	0	0	576	1870	1945	935	1792	1940
Q Serve(g_s), s	0.0	0.0	0.0	0.3	0.0	0.0	0.6	1.9	1.9	0.4	3.2	3.2
Cycle Q Clear(g_c), s	1.9	0.0	0.0	2.3	0.0	0.0	3.8	1.9	1.9	2.3	3.2	3.2
Prop In Lane	0.54		0.31	0.29		0.45	1.00		0.07	1.00		0.08
Lane Grp Cap(c), veh/h	115	0	0	110	0	0	547	1653	1719	866	3168	1715
V/C Ratio(X)	0.23	0.00	0.00	0.28	0.00	0.00	0.03	0.12	0.12	0.03	0.19	0.19
Avail Cap(c_a), veh/h	557	0	0	575	0	0	547	1653	1719	866	3168	1715
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.59	0.59	0.59
Uniform Delay (d), s/veh	64.8	0.0	0.0	65.0	0.0	0.0	1.4	1.1	1.1	1.2	1.1	1.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.5	0.0	0.0	0.1	0.1	0.1	0.0	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	0.9	0.0	0.0	1.1	0.0	0.0	0.1	0.4	0.4	0.1	0.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.2	0.0	0.0	65.5	0.0	0.0	1.5	1.2	1.2	1.2	1.2	1.3
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		26			31			414			941	
Approach Delay, s/veh		65.2			65.5			1.2			1.2	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		129.0		11.0		129.0		11.0				
Change Period (Y+Rc), s		* 5.2		* 4.8		* 5.2		* 4.8				
Max Green Setting (Gmax), s		* 85		* 45		* 85		* 45				
Max Q Clear Time (g_c+I1), s		5.2		4.3		5.8		3.9				
Green Ext Time (p_c), s		1.2		0.1		0.5		0.1				

Intersection Summary			
HCM 6th Ctrl Delay		3.8	
HCM 6th LOS		A	

Notes

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

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	7	4	3	2	4	9	7	24	4	5	63	9
Future Vol, veh/h	7	4	3	2	4	9	7	24	4	5	63	9
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	4	3	2	4	10	8	26	4	5	68	10

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	134	129	73	131	132	28	78	0	0	30	0	0
Stage 1	83	83	-	44	44	-	-	-	-	-	-	-
Stage 2	51	46	-	87	88	-	-	-	-	-	-	-
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	838	762	989	841	759	1047	1520	-	-	1583	-	-
Stage 1	925	826	-	970	858	-	-	-	-	-	-	-
Stage 2	962	857	-	921	822	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	821	756	989	829	753	1047	1520	-	-	1583	-	-
Mov Cap-2 Maneuver	821	756	-	829	753	-	-	-	-	-	-	-
Stage 1	920	824	-	965	854	-	-	-	-	-	-	-
Stage 2	943	853	-	910	820	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9	1.5	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1520	-	-	831	919	1583	-	-
HCM Lane V/C Ratio	0.005	-	-	0.018	0.018	0.003	-	-
HCM Control Delay (s)	7.4	0	-	9.4	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱	↰	↑↑↕		↰	↑↑↕	
Traffic Vol, veh/h	7	0	7	2	0	1	13	365	1	4	816	12
Future Vol, veh/h	7	0	7	2	0	1	13	365	1	4	816	12
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	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	0	8	2	0	1	14	397	1	4	887	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1129	1328	450	789	1334	199	900	0	0	398	0	0
Stage 1	902	902	-	426	426	-	-	-	-	-	-	-
Stage 2	227	426	-	363	908	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	184	154	476	309	153	809	437	-	-	1157	-	-
Stage 1	238	355	-	558	584	-	-	-	-	-	-	-
Stage 2	727	584	-	595	352	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	179	149	476	296	148	809	437	-	-	1157	-	-
Mov Cap-2 Maneuver	179	149	-	296	148	-	-	-	-	-	-	-
Stage 1	230	354	-	540	565	-	-	-	-	-	-	-
Stage 2	703	565	-	583	351	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.7	14.7	0.5	0
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	437	-	-	260	296	809	1157	-	-
HCM Lane V/C Ratio	0.032	-	-	0.059	0.007	0.001	0.004	-	-
HCM Control Delay (s)	13.5	-	-	19.7	17.3	9.5	8.1	-	-
HCM Lane LOS	B	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	0	40	0	0	68
Future Vol, veh/h	1	0	40	0	0	68
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1	0	43	0	0	74

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	117	43	0	0	43	0
Stage 1	43	-	-	-	-	-
Stage 2	74	-	-	-	-	-
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	879	1027	-	-	1566	-
Stage 1	979	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	879	1027	-	-	1566	-
Mov Cap-2 Maneuver	879	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	949	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.1	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	879	1566	-
HCM Lane V/C Ratio	-	-	0.001	-	-
HCM Control Delay (s)	-	-	9.1	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	2	0	392	830	0
Future Vol, veh/h	0	2	0	392	830	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	0	426	902	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	451	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	475	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	475	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	12.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	475	-	-
HCM Lane V/C Ratio	-	0.005	-	-
HCM Control Delay (s)	-	12.6	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	19	32	9	5	56	9	5	9	7	8	19	43
Future Vol, veh/h	19	32	9	5	56	9	5	9	7	8	19	43
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	35	10	5	61	10	5	10	8	9	21	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	71	0	0	45	0	0	192	163	40	167	163	66
Stage 1	-	-	-	-	-	-	82	82	-	76	76	-
Stage 2	-	-	-	-	-	-	110	81	-	91	87	-
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	1529	-	-	1563	-	-	768	729	1031	797	729	998
Stage 1	-	-	-	-	-	-	926	827	-	933	832	-
Stage 2	-	-	-	-	-	-	895	828	-	916	823	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1529	-	-	1563	-	-	707	717	1031	773	717	998
Mov Cap-2 Maneuver	-	-	-	-	-	-	707	717	-	773	717	-
Stage 1	-	-	-	-	-	-	913	815	-	920	830	-
Stage 2	-	-	-	-	-	-	829	826	-	886	811	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.5	9.7	9.5
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	795	1529	-	-	1563	-	-	876
HCM Lane V/C Ratio	0.029	0.014	-	-	0.003	-	-	0.087
HCM Control Delay (s)	9.7	7.4	0	-	7.3	0	-	9.5
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

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	18	25	11	19	45	23	342	17	28	776	25
Future Vol, veh/h	5	18	25	11	19	45	23	342	17	28	776	25
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	20	27	12	21	49	25	372	18	30	843	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1164	1357	435	838	1361	195	870	0	0	390	0	0
Stage 1	917	917	-	431	431	-	-	-	-	-	-	-
Stage 2	247	440	-	407	930	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	175	148	487	287	147	814	452	-	-	1165	-	-
Stage 1	233	349	-	554	581	-	-	-	-	-	-	-
Stage 2	708	576	-	559	344	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	137	136	487	227	135	814	452	-	-	1165	-	-
Mov Cap-2 Maneuver	137	136	-	227	135	-	-	-	-	-	-	-
Stage 1	220	340	-	524	549	-	-	-	-	-	-	-
Stage 2	605	544	-	485	335	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26.6	20.9	0.8	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	452	-	-	218	307	1165	-	-
HCM Lane V/C Ratio	0.055	-	-	0.239	0.266	0.026	-	-
HCM Control Delay (s)	13.4	-	-	26.6	20.9	8.2	-	-
HCM Lane LOS	B	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.9	1	0.1	-	-

APPENDIX E

CRASH DATA

REPORT #	YYMMDD	HHMM	NS ST	NS SF	EW ST	EW SF	DIR FROM	DIST FROM	AUX REF ST	DIR FROM AUX	DOB 1	DOB 2	INJ SEV 1	INJ SEV 2	PHYSICAL COND 1
17-15863	170717	1005	GOLDWATER	BL	1	ST	AT				2/7/1943	10/19/1965	4	1	0
17-22604	171012	1000	GOLDWATER	BL	1	ST	AT					3/17/1953	99	1	99
15-08797	150416	1254	GOLDWATER	BL	1	ST	W	126	INDIAN SCHOOL	S	4/16/1957	7/28/1981	1	1	0
16-02919	160205	2043	GOLDWATER	BL	1	ST	AT					6/29/1983	99	1	99
16-23376	161020	0901	GOLDWATER	BL	1	ST	W	101			2/2/1990	8/6/1984	1	1	0

KEY

INJURY SEVERITY:
1=NO INJURY, 2=POSSIBLE INJURY, 3=NON-INCAPACITATING INJURY, 4=INCAPACITATING INJURY, 5=FATAL INJURY, 99=NOT REPORTED / UNKNOWN

PHYSICAL CONDITION:
0=NO APPARENT INFLUENCE, 1=ILLNESS, 2=PHYSICAL IMPAIRMENT, 3=FELL ASLEEP / FATIGUED 4=ALCOHOL, 5=DRUGS, 6=MEDICATIONS, A=NO TEST GIVEN, B=TEST GIVEN, C=TEST REFUSED, D=TESTING UNKNOWN, 97=OTHER, 99=UNKNOWN

VIOLATION:
1=NO IMPROPER ACTION, 2=SPEED TOO FAST FOR CONDITIONS, 3=EXCEEDED LAWFUL SPEED 4=FOLLOWED TOO CLOSELY. 5=RAN STOP SIGN, 6=DISREGAREDED TRAFFIC SIGNAL7=MADE IMPROPER TURN, 8=DROVE/RODE IN OPPOSING TRAFFIC LANE, 9=KNOWINGLY OPERATED WITH FAULTY / MISSING EQUIPMENT, 10=REQUIRED MOTORCYCLE SAFETY EQUIPMENT NOT USED, 11=PASSED IN NO PASSING ZONE, 12=UNSAFE LANE CHANGE, 13=FAILED TO KEEP IN PROPER LANE, 14=DISREGARDED PAVEMENT MARKINGS, 15=OTHER UNSAFE PASSING, 16=INATTENTION/DISTRACTION, 17=DID NOT USE CROSSWALK, 18=WALKED ON WRONG SIDE OF ROAD, 19=ELECTRONIC COMMUNICATIONS DEVICE, 20=FAILED TO YIELD RIGHT OF WAY (added August 2014), 97=OTHER, 99 UNKNOWN

ACTION:
1=GOING STRAIGHT AHEAD, 2= SLOWING IN TRAFFICWAY, 3=STOPPED IN TRAFFICWAY, 4=MAKING LEFT TURN, 5=MAKING RIGHT TURN, 6=MAKING U-TURN, 7=OVERTAKING/PASSING, 8=CHANGING LANES, 9=NEGOTIATING A CURVE, 10=BACKING, 11=AVOIDING VEH/OBJ/PED/CYCLIST/ANIMAL, 12=ENTERING PARKING POSITION, 13=LEAVING PARKING POSITION, 14=PROPERLY PARKED, 15=IMPROPERLY PARKED, 16=DRIVERLESS MOVING VEHICLE, 17=CROSING ROAD, 18=WALKING WITH TRAFFIC, 19=WALKING AGAINST TRAFFIC, 20= STANDING, 21=LYING, 22=GETTING ON OR OFF VEHICLE, 23=WORKING ON/PUSHING VEHICLE, 24=WORKING ON ROAD, 97=OTHER, 99=UKNOWN

MANNER OF COLLISION:
1=SINGLE VEHICLE, 2=ANGLE (front to side, other than left turn), 3=LEFT TURN, 4=REAR END (front to rear), 5=HEAD-ON (front to front, other than left turn), 6=SIDE SWIPE (same direction), 7=SIDE SWIPE (opposite direction), 8=REAR-TO-SIDE, 9=REAR TO REAR, 97=OTHER, 99=UNKNOWN

PHYSICAL COND 2	VIOL 1	VIOL 2	ACTION 1	ACTION 2	TRAVEL DIR 1	TRAVEL DIR 2	MANNER	COMMENTS	DATE ENTERED	
0	13	1	17	1	NB	EB	2	CAR/BICYCLE	8/1/2017	
0	7	1	5	1	SB	SB	6	HIT AND RUN	10/24/2017	
0		1	13	1	EB	EB	2		42122	KAY
0	97	1	10	5	WB	WB	7	HIT AND RUN	42422	KAY
0	97	97	10	10	SB	NB	2		42676	KAY

APPENDIX F

TRIP GENERATION

Methodology Overview

This form facilitates trip generation estimation using data within the Institute of Transportation Engineer's (ITE) *Trip Generation Manual* , 10th Edition and methodology described within ITE's *Trip Generation Handbook* , 3rd Edition. These references will be referred to as *Manual and Handbook* , respectively. The *Manual* contains data collected by various transportation professionals for a 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 relationship between 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 established 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 appropriate and how to 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

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 variable(s) specific to (each) the land use (example: 1,000 square feet of building area is relatively common).

Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
General Office Building	1.463	1,000 square feet	710	General Office Building
Quality Restaurant	1.533	1,000 square feet	931	Quality Restaurant

Box 2 - Define Site Context

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."
This 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 worksheet uses the following abbreviations, respectively: ***R*** , ***G*** , ***D*** , and ***C*** . The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

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.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the *Box 5 through 8* approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

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 when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or 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 closed in the 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, AM peak hour is skewed by the high y-intercept).

Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C") Used in Analysis?

Proposed Use	ADT Equation [Equated Rate]	AM Equation [Equated Rate]	PM Equation [Equated Rate]	(not used)
General Office Building	WA: T=X*9.74 [9.74]	WA: T=X*1.16 [1.16]	FC: LN(T)=0.95*LN(X)+0.36 [1.41]	
Quality Restaurant	WA: T=X*83.84 [83.84]	WA: T=X*0.73 [0.73]	WA: T=X*7.8 [7.80]	

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

Baseline Vehicular Trips

	ADT				AM				PM				(not used)
Proposed Use	% In	In	Out	Total	% In	In	Out	Total	% In	In	Out	Total	
General Office Building	50%	7	7	14	86%	2	0	2	16%	0	2	2	
Quality Restaurant	50%	64	64	128	0%	0	1	1	67%	8	4	12	
Totals		**71**	**71**	**142**		**2**	**1**	**3**		**8**	**6**	**14**	

Methodology Overview

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Land Use Types and Size

Proposed Use	Amount	Units	ITE LUC	ITE Land Use Name
Apartments	26	Dwelling Units	221	Multifamily Housing (Mid-Rise)
Shopping Center	1.482	1,000 square feet	820	Shopping Center
High Turnover (Sit Down) Restaurant	5.454	1,000 square feet	932	High Turnover(Sit Down) Restaurant

Box 2 - Define Site Context

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."
This 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 worksheet uses the following abbreviations, respectively: ***R***, ***G***, ***D***, and ***C***. The *Manual* does not have data for all settings of all land use codes. See the table on the next page titled "Site Context and Time Periods" - if this table is not provided, the "General Urban/Suburban" setting is used by default.

Box 3 - Define Analysis Objectives Types of Trips & Time Period

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.

Winery Suites - Proposed
Proposed

Trip Generation
September 2018
Appendix D

Site Context and Time Periods - Actual Setting, Setting Data Available for LUC, Setting Used in Analyses

Proposed Use	Setting		ADT Available	ADT Used	AM Available	AM Used	PM Available	PM Used	(not used)	
Apartments	General Urban/Suburban	G	G D	G	G D	G	G D	G		
Shopping Center	General Urban/Suburban	G	G	G	G D	G	G D	G		
High Turnover (Sit Down) Restaurant	General Urban/Suburban	G	G	G	G	G	G	G		

If the desired setting is not available within the *Manual,* adjustments may be made in Boxes 6 through 8.

Box 4 - Is Study Site Multimodal?

Per the Handbook, "if the objective is to establish a local trip generation rate for a particular land use or study site, the simplified approach (Box 9) may be acceptable but the *Box 5 through 8* approach is required if the study site is located in an infill setting, contains a mix of uses on-site, or is near significant transit service."

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 when to use it versus using the weighted average rate or collecting local data. The methodology requires for engineering judgement in some circumstances and permits engineering judgement to override or 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 closed in the 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, AM peak hour is skewed by the high y-intercept).

Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C") Used in Analysis?

Proposed Use	ADT Equation [Equated Rate]	AM Equation [Equated Rate]	PM Equation [Equated Rate]	(not used)
Apartments	FC: T=5.45*X-1.75 [5.38]	FC: LN(T)=0.98*LN(X)-0.98 [0.35]	FC: LN(T)=0.96*LN(X)-0.63 [0.47]	
Shopping Center	WA: T=X*37.75 [37.75]	WA: T=X*0.94 [0.94]	WA: T=X*3.81 [3.81]	
High Turnover (Sit Down) Restaurant	WA: T=X*112.18 [112.18]	WA: T=X*9.94 [9.94]	WA: T=X*9.77 [9.77]	

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

Baseline Vehicular Trips

	ADT				AM				PM				(not used)
Proposed Use	**% In**	**In**	**Out**	**Total**	**% In**	**In**	**Out**	**Total**	**% In**	**In**	**Out**	**Total**	
Apartments	50%	70	70	140	26%	2	7	9	61%	7	5	12	
Shopping Center	50%	28	28	56	62%	1	0	1	48%	3	3	6	
High Turnover (Sit Down) Restaurant	50%	306	306	612	55%	30	24	54	62%	33	20	53	
Totals		**404**	**404**	**808**		**33**	**31**	**64**		**43**	**28**	**71**	

Box 6 - Convert Baseline Vehicle Trips to Person Trips

If no vehicle trip reductions are to be applied, this portion may be ignored. The *Handbook* states "There are not enough samples to derive precise percentages by mode...however, for all but on ...the motor vehicle percentage of total person trips is at least 96 percent." and "[vehicle occupancy for] many of the most commonly analyzed land use codes are not [available]." This form assumes that the total baseline vehicle trips for all land use codes accounts fo 90% of total person trips. Unless otherwise specified, this form later reverses the conversion in Box 8.

Box 7 - Estimate Internal Person Trips, External Walk/Bike Trips, Transit Person Trips, External Person Trips (Internal Capture)

Internal capture occurs for mixed-use developments when a portion of the trips generated by the site are expected to have the both the origin and destination within the site. Internal capture is not dependent on mode choice. The reduction is applied as a percent of vehicular trips removed from the baseline trips.

Adjustments for Internal Trips

	ADT				AM				PM				(not used)
Proposed Use	**Percent**	**In**	**Out**	**Total**	**Percent**	**In**	**Out**	**Total**	**Percent**	**In**	**Out**	**Total**	
Apartments	9%	7	7	14	3%	0	0	0	15%	2	0	2	
Shopping Center	9%	3	3	6	3%	0	0	0	15%	0	2	2	
High Turnover (Sit Down) Restaurant	9%	31	31	62	3%	0	2	2	15%	6	2	8	
Totals		**41**	**41**	**82**		**0**	**2**	**2**		**8**	**4**	**12**	

Box 8 - Convert Person Trips to Final Vehicle Trips

The vehicle occupancy and baseline alternate mode are now factored out from the external trips in vehicles, after any adjustments for internal capture and additional alternate mode from Box 7. In Box 6, vehicle trips were considered to account for 90% of total person trips. Alternate mode trips in addition to the baseline, if any, are accounted for in Box 7. It is estimated that vehilcle trips should be reduced by an additional 0% due to carpooling. The final external trips in vehicles is multiplied by 90%-0%= 90% to produce the external vehicle trips.

External Vehicular Trips

	ADT			AM				PM				(not used)
Proposed Use	**In**	**Out**	**Total**	**In**	**Out**	**Total**		**In**	**Out**	**Total**	
Apartments	64	64	128	2	7	9		5	5	10	
Shopping Center	25	25	50	1	0	1		3	2	5	
High Turnover (Sit Down) Restaurant	278	278	556	30	22	52		28	18	46	
Totals	**367**	**367**	**734**	**33**	**29**	**62**		**36**	**25**	**61**	

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Winery Suites	**Organization:**	CivTech Inc
Project Location:	Goldwater Blvd & 1st St	**Performed By:**	Briallen Rees
Scenario Description:		**Date:**	9/19/2018
Analysis Year:	2020	**Checked By:**	
Analysis Period:	AM Street Peak Hour	**Date:**	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				1	1	0
Restaurant				54	30	24
Cinema/Entertainment				0		
Residential				9	2	7
Hotel				0		
All Other Land Uses[2]				0		
				64	33	31

Table 2-A: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		0	0	0	0
Restaurant	0	0		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	1	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary

	Total	Entering	Exiting
All Person-Trips	64	33	31
Internal Capture Percentage	3%	3%	3%
External Vehicle-Trips[5]	62	32	30
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	0%	N/A
Restaurant	3%	0%
Cinema/Entertainment	N/A	N/A
Residential	0%	14%
Hotel	N/A	N/A

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

NCHRP 684 Internal Trip Capture Estimation Tool			
Project Name:	Winery Suites	**Organization:**	CivTech Inc
Project Location:	Goldwater Blvd & 1st St	**Performed By:**	Briallen Rees
Scenario Description:		**Date:**	9/19/2018
Analysis Year:	2020	**Checked By:**	
Analysis Period:	PM Street Peak Hour	**Date:**	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)

Land Use	Development Data (*For Information Only*)			Estimated Vehicle-Trips[3]		
	ITE LUCs[1]	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				6	3	3
Restaurant				53	33	20
Cinema/Entertainment				0		
Residential				12	7	5
Hotel				0		
All Other Land Uses[2]				0		
				71	43	28

Table 2-P: Mode Split and Vehicle Occupancy Estimates

Land Use	Entering Trips			Exiting Trips		
	Veh. Occ.[4]	% Transit	% Non-Motorized	Veh. Occ.[4]	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses[2]						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*

Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		1	0	1	0
Restaurant	0	2		0	1	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	1	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary

	Total	Entering	Exiting
All Person-Trips	71	43	28
Internal Capture Percentage	17%	14%	21%
External Vehicle-Trips[5]	59	37	22
External Transit-Trips[6]	0	0	0
External Non-Motorized Trips[6]	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use

Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	67%	67%
Restaurant	6%	15%
Cinema/Entertainment	N/A	N/A
Residential	29%	20%
Hotel	N/A	N/A

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

APPENDIX G

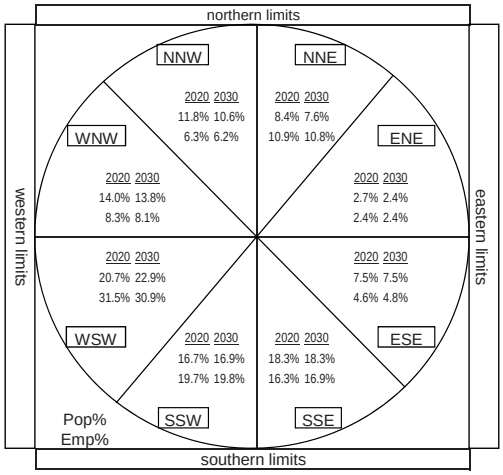
TRIP DISTRIBUTION

Quadrant	2020 Population	2020 Percent	2020 Employment	2020 Percent	2030 Population	2030 Percent	2030 Employment	2030 Percent
North Northwest	125,511	11.8%	54,849	6.3%	133,044	10.6%	58,720	6.2%
North Northeast	89,222	8.4%	94,597	10.9%	94,959	7.6%	102,246	10.8%
North	214,733	20.2%	149,445	17.2%	228,003	**18.2%**	160,965	**17.0%**
East Northeast	28,802	2.7%	20,511	2.4%	29,957	2.4%	22,801	2.4%
East Southeast	79,985	7.5%	40,289	4.6%	93,560	7.5%	45,589	4.8%
East	108,787	10.2%	60,800	7.0%	123,517	**9.9%**	68,390	**7.2%**
South Southeast	195,077	18.3%	142,336	16.3%	229,032	18.3%	159,816	16.9%
South Southwest	178,396	16.7%	171,737	19.7%	212,134	16.9%	187,563	19.8%
South	373,473	35.0%	314,074	36.0%	441,166	**35.2%**	347,379	**36.7%**
West Southwest	221,344	20.7%	274,556	31.5%	286,902	22.9%	292,250	30.9%
West Northwest	149,627	14.0%	72,692	8.3%	172,388	13.8%	76,869	8.1%
West	370,972	34.7%	347,247	39.8%	459,290	**36.7%**	369,119	**39.0%**
Totals	1,067,965	100.1%	871,566	100.0%	1,251,976	100.0%	945,853	99.9%

Radii

Population radius:	10	miles
Employment radius:	10	miles

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



10-mile radius

		2020	2030	% of	2020	2030			2020	2030	% of	2020	2030
RAZ	**MPA**	Employment	Employment	**TAZ**	**Adjusted**	**Adjusted**	**RAZ**	**MPA**	Employment	Employment	**TAZ**	**Adjusted**	**Adjusted**
NNW							**NNE**						
246	PH	35,168	36,720	90%	31,651	33,048	228	PH	22,158	26,143	5%	1,108	1,307
228	PH	22,158	26,143	10%	2,216	2,614	246	PH	35,168	36,720	10%	3,517	3,672
227	PH	14,922	17,233	5%	746	862	247	SC	43,547	45,939	95%	41,370	43,642
245	PH	14,622	16,015	85%	12,429	13,613	262	PV	5,433	6,241	20%	1,087	1,248
244	PH	14,653	15,798	10%	1,465	1,580	263	SC	24,741	25,695	60%	14,845	15,417
242	PH	8,942	9,504	10%	894	950	264	SR	20,282	26,738	5%	1,014	1,337
349	MC	51	56	20%	10	11	248	SC	27,396	28,489	90%	24,656	25,640
262	PV	5,433	6,241	60%	3,260	3,745	249	SC	7,011	7,474	10%	701	747
247	SC	43,547	45,939	5%	2,177	2,297	230	SC	25,198	36,939	25%	6,300	9,235
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
From NNW					**54,849**	**58,720**	**From NNE**					**94,597**	**102,246**
From North												**149,445**	**160,965**

10-mile radius

		2020	2030	% of	2020	2030			2020	2030	% of	2020	2030
RAZ	MPA	Employment	Employment	TAZ	Adjusted	Adjusted	RAZ	MPA	Employment	Employment	TAZ	Adjusted	Adjusted
ENE							ESE						
264	SR	20,282	26,738	25%	5,071	6,685	264	SR	20,282	26,738	25%	5,071	6,685
263	SC	24,741	25,695	40%	9,896	10,278	272	SC	55,578	62,010	25%	13,895	15,503
248	SC	27,396	28,489	10%	2,740	2,849	289	ME	22,892	25,176	20%	4,578	5,035
249	SC	7,011	7,474	40%	2,804	2,990	290	ME	32,071	34,902	40%	12,828	13,961
		-	-		-	-	291	ME	13,056	14,688	30%	3,917	4,406
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
From ENE					20,511	22,801	From ESE					40,289	45,589
From East												60,800	68,390

10-mile radius

		2020	2030	% of	2020	2030			2020	2030	% of	2020	2030
RAZ	MPA	Employment	Employment	TAZ	Adjusted	Adjusted	RAZ	MPA	Employment	Employment	TAZ	Adjusted	Adjusted
SSE							SSW						
272	SC	55,578	62,010	60%	33,347	37,206	271	PH	47,178	49,236	5%	2,359	2,462
288	TE	91,219	108,636	50%	45,610	54,318	272	SC	55,578	62,010	10%	5,558	6,201
297	TE	48,900	51,510	50%	24,450	25,755	276	PH	21,332	22,600	60%	12,799	13,560
208	CF	1,962	2,320	10%	196	232	288	TE	91,219	108,636	50%	45,610	54,318
309	ME	38,666	41,186	30%	11,600	12,356	287	PH	70,682	74,070	50%	35,341	37,035
289	ME	22,892	25,176	80%	18,314	20,141	297	TE	48,900	51,510	50%	24,450	25,755
290	ME	32,071	34,902	20%	6,414	6,980	296	PH	43,174	45,538	90%	38,857	40,984
298	ME	13,922	14,909	10%	1,392	1,491	306	PH	16,212	17,305	40%	6,485	6,922
264	SR	20,282	26,738	5%	1,014	1,337	313	PH	6,917	7,924	1%	69	79
		-	-		-	-	208	CF	1,962	2,320	10%	196	232
		-	-		-	-	307	GU	1,393	1,473	1%	14	15
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
From SSE					142,336	159,816	From SSW					171,737	187,563
From South												314,074	347,379

10-mile radius

RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted
WSW							**WNW**						
271	PH	47,178	49,236	85%	40,101	41,851	349	MC	51	56	80%	41	45
270	PH	88,544	95,588	100%	88,544	95,588	261	PH	32,143	33,195	100%	32,143	33,195
276	PH	21,332	22,600	40%	8,533	9,040	262	PV	5,433	6,241	20%	1,087	1,248
275	PH	99,166	105,347	90%	89,249	94,812	271	PH	47,178	49,236	10%	4,718	4,924
286	PH	16,332	17,637	80%	13,066	14,110	260	PH	24,724	26,675	90%	22,252	24,008
287	PH	70,682	74,070	40%	28,273	29,628	244	PH	14,653	15,798	75%	10,990	11,849
296	PH	43,174	45,538	10%	4,317	4,554	245	PH	14,622	16,015	10%	1,462	1,602
260	PH	24,724	26,675	10%	2,472	2,668			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From WSW					**274,556**	**292,250**	**From WNW**					**72,692**	**76,869**
From West												**347,247**	**369,119**

APPENDIX H

BACKGROUND TRAFFIC CALCULATIONS

Location of counts: Goldwater Blvd btw Camelback and Indian School
Source(s): https://www.scottsdaleaz.gov/transportation/studies-reports/traffic-volume

	Year	Volume	Avg Growth Rate to 2014	Expansion Factor to 2014
Beginning	2014	17,800		
End	2016	18,400	1.7%	0.967

Growth Rate Used	1.7%
Per-Year Multiplier	1.017

Year	Expansion Factor(s)	
2018	1.000	
2019	1.017	
2020	1.034	<- Expansion factor to opening
2021	1.052	
2022	1.070	
2023	1.088	
2024	1.106	
2025	1.125	
2026	1.144	
2027	1.164	
2028	1.184	
2029	1.204	
2030	1.224	
2031	1.245	
2032	1.266	
2033	1.288	
2034	1.310	
2035	1.332	
2036	1.354	
2037	1.378	
2038	1.401	

APPENDIX I

2020 PEAK HOUR TRAFFIC ANALYSIS

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	1149	23	30	1033	5	23	1	41	1	0	0
Future Vol, veh/h	7	1149	23	30	1033	5	23	1	41	1	0	0
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1249	25	33	1123	5	25	1	45	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1128	0	0	1274	0	0	1793	2472	637	1708	2482	564
Stage 1	-	-	-	-	-	-	1278	1278	-	1192	1192	-
Stage 2	-	-	-	-	-	-	515	1194	-	516	1290	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	339	-	-	288	-	-	85	30	360	96	29	402
Stage 1	-	-	-	-	-	-	127	235	-	146	259	-
Stage 2	-	-	-	-	-	-	466	258	-	466	232	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	339	-	-	288	-	-	76	26	360	73	25	402
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	26	-	73	25	-
Stage 1	-	-	-	-	-	-	124	229	-	142	229	-
Stage 2	-	-	-	-	-	-	413	228	-	397	226	-

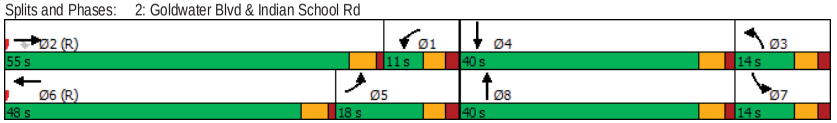
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	52.6	55.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	143	339	-	-	288	-	-	73
HCM Lane V/C Ratio	0.494	0.022	-	-	0.113	-	-	0.015
HCM Control Delay (s)	52.6	15.9	-	-	19.1	-	-	55.1
HCM Lane LOS	F	C	-	-	C	-	-	F
HCM 95th %tile Q(veh)	2.3	0.1	-	-	0.4	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	174	1002	71	63	829	66	387	31	263
Future Volume (vph)	174	1002	71	63	829	66	387	31	263
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	7.0	5.0	7.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	55.0	55.0	11.0	48.0	14.0	40.0	14.0	40.0
Total Split (%)	15.0%	45.8%	45.8%	9.2%	40.0%	11.7%	33.3%	11.7%	33.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	11.7	73.4	73.4	5.6	65.2	12.4	19.4	7.0	11.9
Actuated g/C Ratio	0.10	0.61	0.61	0.05	0.54	0.10	0.16	0.06	0.10
v/c Ratio	0.60	0.48	0.08	0.45	0.47	0.42	0.75	0.35	0.66
Control Delay	59.8	15.8	1.0	65.6	19.6	55.8	55.3	63.4	48.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.8	15.8	1.0	65.6	19.6	55.8	55.3	63.4	48.3
LOS	E	B	A	E	B	E	E	E	D
Approach Delay		21.1			22.6		55.4		49.6
Approach LOS		C			C		E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 30.5	Intersection LOS: C	
Intersection Capacity Utilization 63.0%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	174	1002	71	63	829	48	66	387	25	31	263	86
Future Volume (veh/h)	174	1002	71	63	829	48	66	387	25	31	263	86
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	189	1089	77	68	901	52	72	421	27	34	286	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	981	1559	626	790	1288	74	120	498	32	48	395	121
Arrive On Green	0.30	0.42	0.42	0.24	0.36	0.36	0.07	0.14	0.14	0.03	0.10	0.10
Sat Flow, veh/h	3274	3741	1502	3274	3594	207	1688	3570	228	1688	4075	1252
Grp Volume(v), veh/h	189	1089	77	68	469	484	72	220	228	34	249	130
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1931	1688	1870	1928	1688	1792	1743
Q Serve(g_s), s	5.1	28.7	3.8	1.9	25.8	25.8	5.0	13.8	13.9	2.4	8.1	8.7
Cycle Q Clear(g_c), s	5.1	28.7	3.8	1.9	25.8	25.8	5.0	13.8	13.9	2.4	8.1	8.7
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.12	1.00		0.72
Lane Grp Cap(c), veh/h	981	1559	626	790	670	692	120	261	269	48	347	169
V/C Ratio(X)	0.19	0.70	0.12	0.09	0.70	0.70	0.60	0.84	0.85	0.71	0.72	0.77
Avail Cap(c_a), veh/h	981	1559	626	790	670	692	122	541	557	122	1036	504
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	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.2	28.8	21.5	35.3	33.0	33.0	54.1	50.3	50.4	57.8	52.6	52.9
Incr Delay (d2), s/veh	0.0	2.6	0.4	0.0	6.0	5.8	5.3	2.8	2.8	7.1	1.1	2.7
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	2.1	13.3	1.4	0.8	12.7	13.1	2.3	6.6	6.9	1.1	3.7	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	31.4	21.9	35.3	39.0	38.8	59.4	53.2	53.2	65.0	53.7	55.6
LnGrp LOS	C	C	C	D	D	D	E	D	D	E	D	E
Approach Vol, veh/h		1355			1021			520			413	
Approach Delay, s/veh		30.9			38.6			54.0			55.2	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.3	55.0	13.8	16.9	41.3	48.0	8.7	22.0
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	5.7	* 50	* 8.7	* 35	12.7	* 43	* 8.7	* 35
Max Q Clear Time (g_c+I1), s	3.9	30.7	7.0	10.7	7.1	27.8	4.4	15.9
Green Ext Time (p_c), s	0.0	3.2	0.0	0.9	0.2	2.1	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	39.9
HCM 6th LOS	D

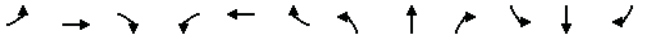
Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	3	3	3	9	476	4	374
Future Volume (vph)	4	3	3	3	9	476	4	374
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.2		7.2	133.0	133.0	133.0	133.0
Actuated g/C Ratio		0.05		0.05	0.95	0.95	0.95	0.95
v/c Ratio		0.20		0.19	0.01	0.15	0.01	0.08
Control Delay		69.3		68.7	0.9	0.7	1.0	0.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		69.3		68.7	0.9	0.7	1.0	0.6
LOS		E		E	A	A	A	A
Approach Delay		69.3		68.7		0.7		0.6
Approach LOS		E		E		A		A

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.20		
Intersection Signal Delay: 3.0	Intersection LOS: A	
Intersection Capacity Utilization 26.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 3: Main St & Goldwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	3	9	3	3	9	9	476	1	4	374	13
Future Volume (veh/h)	4	3	9	3	3	9	9	476	1	4	374	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	4	3	10	3	3	10	10	517	1	4	407	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	41	16	36	37	16	39	860	3418	7	784	4763	163
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89	0.89	0.89
Sat Flow, veh/h	246	456	1003	187	456	1071	915	3830	7	837	5337	183
Grp Volume(v), veh/h	17	0	0	16	0	0	10	252	266	4	273	148
Grp Sat Flow(s),veh/h/ln	1706	0	0	1713	0	0	915	1870	1967	837	1792	1936
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.3	2.4	0.1	1.2	1.3
Cycle Q Clear(g_c), s	1.3	0.0	0.0	1.2	0.0	0.0	1.4	2.3	2.4	2.4	1.2	1.3
Prop In Lane	0.24		0.59	0.19		0.62	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	93	0	0	92	0	0	860	1669	1756	784	3198	1728
V/C Ratio(X)	0.18	0.00	0.00	0.17	0.00	0.00	0.01	0.15	0.15	0.01	0.09	0.09
Avail Cap(c_a), veh/h	570	0	0	573	0	0	860	1669	1756	784	3198	1728
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.82	0.82	0.82
Uniform Delay (d), s/veh	65.7	0.0	0.0	65.6	0.0	0.0	1.0	0.9	0.9	1.1	0.9	0.9
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.0	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	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.5	0.5	0.0	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	0.0	0.0	66.0	0.0	0.0	1.0	1.1	1.1	1.1	0.9	1.0
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		17			16			528			425	
Approach Delay, s/veh		66.0			66.0			1.1			0.9	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		130.1		9.9		130.1		9.9				
Change Period (Y+Rc), s		* 5.2		* 4.8		* 5.2		* 4.8				
Max Green Setting (Gmax), s		* 85		* 45		* 85		* 45				
Max Q Clear Time (g_c+I1), s		4.4		3.2		4.4		3.3				
Green Ext Time (p_c), s		0.5		0.0		0.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		3.2
HCM 6th LOS		A

Notes

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

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	13	12	12	3	3	2	30	8	8	20	4
Future Vol, veh/h	21	13	12	12	3	3	2	30	8	8	20	4
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	14	13	13	3	3	2	33	9	9	22	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	87	88	24	98	86	38	26	0	0	42	0	0
Stage 1	42	42	-	42	42	-	-	-	-	-	-	-
Stage 2	45	46	-	56	44	-	-	-	-	-	-	-
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	899	802	1052	884	804	1034	1588	-	-	1567	-	-
Stage 1	972	860	-	972	860	-	-	-	-	-	-	-
Stage 2	969	857	-	956	858	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	888	796	1052	857	798	1034	1588	-	-	1567	-	-
Mov Cap-2 Maneuver	888	796	-	857	798	-	-	-	-	-	-	-
Stage 1	971	855	-	971	859	-	-	-	-	-	-	-
Stage 2	961	856	-	923	853	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.3	9.2	0.4	1.8
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1588	-	-	895	871	1567	-	-
HCM Lane V/C Ratio	0.001	-	-	0.056	0.022	0.006	-	-
HCM Control Delay (s)	7.3	0	-	9.3	9.2	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	1	9	1	0	4	2	489	1	3	378	10
Future Vol, veh/h	8	1	9	1	0	4	2	489	1	3	378	10
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	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	1	10	1	0	4	2	532	1	3	411	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	693	960	211	708	965	267	422	0	0	533	0	0
Stage 1	423	423	-	537	537	-	-	-	-	-	-	-
Stage 2	270	537	-	171	428	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	356	255	676	348	253	731	737	-	-	1031	-	-
Stage 1	510	586	-	480	521	-	-	-	-	-	-	-
Stage 2	687	521	-	776	583	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	352	253	676	340	251	731	737	-	-	1031	-	-
Mov Cap-2 Maneuver	352	253	-	340	251	-	-	-	-	-	-	-
Stage 1	508	584	-	479	519	-	-	-	-	-	-	-
Stage 2	681	519	-	761	581	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.4	11.1	0	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	737	-	-	450	340	731	1031	-	-
HCM Lane V/C Ratio	0.003	-	-	0.043	0.003	0.006	0.003	-	-
HCM Control Delay (s)	9.9	-	-	13.4	15.6	10	8.5	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	2	40	0	4	41
Future Vol, veh/h	0	2	40	0	4	41
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	2	43	0	4	45

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	96	43	0	0	43	0
Stage 1	43	-	-	-	-	-
Stage 2	53	-	-	-	-	-
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	903	1027	-	-	1566	-
Stage 1	979	-	-	-	-	-
Stage 2	970	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	900	1027	-	-	1566	-
Mov Cap-2 Maneuver	900	-	-	-	-	-
Stage 1	976	-	-	-	-	-
Stage 2	970	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.5	0	0.6
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	1027	1566	-
HCM Lane V/C Ratio	-	-	0.002	0.003	-
HCM Control Delay (s)	-	-	8.5	7.3	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	1	0	491	387	0
Future Vol, veh/h	0	1	0	491	387	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	1	0	534	421	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	211	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	676	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	676	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.3	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	676	-	-
HCM Lane V/C Ratio	-	0.002	-	-
HCM Control Delay (s)	-	10.3	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	41	5	1	18	5	4	8	5	10	2	27
Future Vol, veh/h	28	41	5	1	18	5	4	8	5	10	2	27
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	30	45	5	1	20	5	4	9	5	11	2	29

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	25	0	0	50	0	0	148	135	48	140	135	23
Stage 1	-	-	-	-	-	-	108	108	-	25	25	-
Stage 2	-	-	-	-	-	-	40	27	-	115	110	-
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	1589	-	-	1557	-	-	820	756	1021	830	756	1054
Stage 1	-	-	-	-	-	-	897	806	-	993	874	-
Stage 2	-	-	-	-	-	-	975	873	-	890	804	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1589	-	-	1557	-	-	783	741	1021	806	741	1054
Mov Cap-2 Maneuver	-	-	-	-	-	-	783	741	-	806	741	-
Stage 1	-	-	-	-	-	-	880	791	-	974	873	-
Stage 2	-	-	-	-	-	-	945	872	-	859	789	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.8	0.3	9.5	8.9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	817	1589	-	-	1557	-	-	958
HCM Lane V/C Ratio	0.023	0.019	-	-	0.001	-	-	0.044
HCM Control Delay (s)	9.5	7.3	0	-	7.3	0	-	8.9
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.1

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	17	17	17	4	9	15	8	459	4	26	365	13
Future Vol, veh/h	17	17	17	4	9	15	8	459	4	26	365	13
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	18	18	4	10	16	9	499	4	28	397	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	733	981	206	743	986	252	411	0	0	503	0	0
Stage 1	460	460	-	519	519	-	-	-	-	-	-	-
Stage 2	273	521	-	224	467	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	336	248	681	331	246	748	745	-	-	1058	-	-
Stage 1	481	564	-	492	531	-	-	-	-	-	-	-
Stage 2	684	530	-	721	560	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	309	239	681	294	237	748	745	-	-	1058	-	-
Mov Cap-2 Maneuver	309	239	-	294	237	-	-	-	-	-	-	-
Stage 1	475	549	-	486	525	-	-	-	-	-	-	-
Stage 2	649	524	-	660	545	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.7	15	0.2	0.5
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	745	-	-	338	391	1058	-	-
HCM Lane V/C Ratio	0.012	-	-	0.164	0.078	0.027	-	-
HCM Control Delay (s)	9.9	-	-	17.7	15	8.5	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.6	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1065	29	55	1246	1	32	0	42	3	0	5
Future Vol, veh/h	5	1065	29	55	1246	1	32	0	42	3	0	5
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1158	32	60	1354	1	35	0	46	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1355	0	0	1190	0	0	1846	2659	595	1948	2675	678
Stage 1	-	-	-	-	-	-	1184	1184	-	1475	1475	-
Stage 2	-	-	-	-	-	-	662	1475	-	473	1200	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	263	-	-	317	-	-	79	22	383	68	22	338
Stage 1	-	-	-	-	-	-	148	261	-	92	189	-
Stage 2	-	-	-	-	-	-	380	189	-	494	256	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	263	-	-	317	-	-	65	18	383	50	18	338
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	18	-	50	18	-
Stage 1	-	-	-	-	-	-	145	256	-	90	153	-
Stage 2	-	-	-	-	-	-	303	153	-	427	251	-

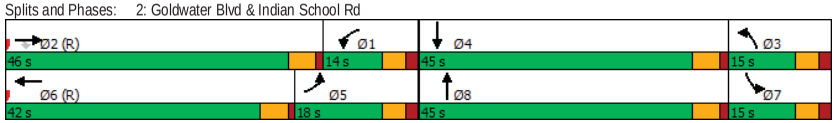
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.8	77.5	41.6
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	123	263	-	-	317	-	-	107
HCM Lane V/C Ratio	0.654	0.021	-	-	0.189	-	-	0.081
HCM Control Delay (s)	77.5	19	-	-	19	-	-	41.6
HCM Lane LOS	F	C	-	-	C	-	-	E
HCM 95th %tile Q(veh)	3.4	0.1	-	-	0.7	-	-	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	157	916	61	57	1031	101	233	90	749
Future Volume (vph)	157	916	61	57	1031	101	233	90	749
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	46.0	46.0	14.0	42.0	15.0	45.0	15.0	45.0
Total Split (%)	15.0%	38.3%	38.3%	11.7%	35.0%	12.5%	37.5%	12.5%	37.5%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	10.5	55.3	55.3	6.9	49.5	13.1	13.2	25.8	25.9
Actuated g/C Ratio	0.09	0.46	0.46	0.06	0.41	0.11	0.11	0.22	0.22
v/c Ratio	0.60	0.58	0.09	0.34	0.78	0.60	0.73	0.27	0.82
Control Delay	61.5	28.0	0.7	58.8	36.3	64.2	58.3	39.9	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.5	28.0	0.7	58.8	36.3	64.2	58.3	39.9	49.8
LOS	E	C	A	E	D	E	E	D	D
Approach Delay		31.2			37.4		59.9		48.9
Approach LOS		C			D		E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 75		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.82		
Intersection Signal Delay: 40.9	Intersection LOS: D	
Intersection Capacity Utilization 73.3%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	916	61	57	1031	60	101	233	48	90	749	124
Future Volume (veh/h)	157	916	61	57	1031	60	101	233	48	90	749	124
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	171	996	66	62	1121	65	110	253	52	98	814	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	760	1278	513	651	1108	64	133	319	65	308	960	158
Arrive On Green	0.23	0.34	0.34	0.20	0.31	0.31	0.08	0.10	0.10	0.18	0.21	0.21
Sat Flow, veh/h	3274	3741	1502	3274	3593	208	1688	3100	627	1688	4648	766
Grp Volume(v), veh/h	171	996	66	62	583	603	110	151	154	98	626	323
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1931	1688	1870	1856	1688	1792	1831
Q Serve(g_s), s	5.1	28.7	3.6	1.9	37.0	37.0	7.7	9.5	9.7	6.0	20.2	20.4
Cycle Q Clear(g_c), s	5.1	28.7	3.6	1.9	37.0	37.0	7.7	9.5	9.7	6.0	20.2	20.4
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.34	1.00		0.42
Lane Grp Cap(c), veh/h	760	1278	513	651	577	595	133	193	191	308	740	378
V/C Ratio(X)	0.23	0.78	0.13	0.10	1.01	1.01	0.83	0.78	0.81	0.32	0.85	0.85
Avail Cap(c_a), veh/h	760	1278	513	651	577	595	136	619	614	308	1185	606
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	37.3	35.4	27.2	39.3	41.5	41.5	54.5	52.5	52.6	42.6	45.8	45.9
Incr Delay (d2), s/veh	0.1	4.7	0.5	0.0	40.3	40.0	30.0	2.6	3.0	0.2	1.7	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	2.1	13.8	1.4	0.8	23.3	24.0	4.4	4.6	4.7	2.6	9.1	9.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	40.2	27.7	39.3	81.8	81.5	84.5	55.1	55.6	42.8	47.5	49.5
LnGrp LOS	D	D	C	D	F	F	F	E	E	D	D	D
Approach Vol, veh/h		1233			1248			415			1047	
Approach Delay, s/veh		39.1			79.5			63.1			47.7	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.2	46.0	14.8	30.1	33.2	42.0	27.2	17.7
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	8.7	* 41	* 9.7	* 40	12.7	* 37	* 9.7	* 40
Max Q Clear Time (g_c+I1), s	3.9	30.7	9.7	22.4	7.1	39.0	8.0	11.7
Green Ext Time (p_c), s	0.0	2.4	0.0	2.4	0.1	0.0	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay	56.7	
HCM 6th LOS	E	

Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	13	4	9	8	16	364	21	845
Future Volume (vph)	13	4	9	8	16	364	21	845
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.4		7.4	129.4	129.4	129.4	129.4
Actuated g/C Ratio		0.05		0.05	0.92	0.92	0.92	0.92
v/c Ratio		0.27		0.33	0.04	0.12	0.03	0.19
Control Delay		54.0		51.0	1.3	1.0	1.2	1.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		54.0		51.0	1.3	1.0	1.2	1.0
LOS		D		D	A	A	A	A
Approach Delay		54.0		51.0		1.0		1.0
Approach LOS		D		D		A		A

Intersection Summary			
Cycle Length: 140			
Actuated Cycle Length: 140			
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 105			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.33			
Intersection Signal Delay: 3.1		Intersection LOS: A	
Intersection Capacity Utilization 32.6%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 3: Main St & Goldwater Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	4	8	9	8	13	16	364	13	21	845	26
Future Volume (veh/h)	13	4	8	9	8	13	16	364	13	21	845	26
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	14	4	9	10	9	14	17	396	14	23	918	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	22	26	49	29	33	534	3256	115	855	4735	144
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.88	0.88	0.88	0.88	0.88	0.88
Sat Flow, veh/h	653	483	568	352	639	730	562	3686	130	924	5359	163
Grp Volume(v), veh/h	27	0	0	33	0	0	17	201	209	23	613	333
Grp Sat Flow(s),veh/h/ln	1704	0	0	1721	0	0	562	1870	1945	924	1792	1939
Q Serve(g_s), s	0.0	0.0	0.0	0.5	0.0	0.0	0.6	2.0	2.0	0.5	3.4	3.4
Cycle Q Clear(g_c), s	2.0	0.0	0.0	2.5	0.0	0.0	4.0	2.0	2.0	2.4	3.4	3.4
Prop In Lane	0.52		0.33	0.30		0.42	1.00		0.07	1.00		0.08
Lane Grp Cap(c), veh/h	116	0	0	111	0	0	534	1652	1719	855	3165	1713
V/C Ratio(X)	0.23	0.00	0.00	0.30	0.00	0.00	0.03	0.12	0.12	0.03	0.19	0.19
Avail Cap(c_a), veh/h	557	0	0	575	0	0	534	1652	1719	855	3165	1713
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	64.8	0.0	0.0	65.0	0.0	0.0	1.4	1.1	1.1	1.2	1.1	1.1
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.5	0.0	0.0	0.1	0.2	0.1	0.0	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	1.0	0.0	0.0	1.2	0.0	0.0	0.1	0.4	0.5	0.1	0.6	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.1	0.0	0.0	65.5	0.0	0.0	1.5	1.2	1.2	1.3	1.2	1.3
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		27			33			427			969	
Approach Delay, s/veh		65.1			65.5			1.2			1.3	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8
Phs Duration (G+Y+Rc), s		128.9		11.1		128.9		11.1
Change Period (Y+Rc), s		* 5.2		* 4.8		* 5.2		* 4.8
Max Green Setting (Gmax), s		* 85		* 45		* 85		* 45
Max Q Clear Time (g_c+I1), s		5.4		4.5		6.0		4.0
Green Ext Time (p_c), s		1.3		0.1		0.5		0.1

Intersection Summary			
HCM 6th Ctrl Delay		3.9	
HCM 6th LOS		A	

Notes

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

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	8	4	3	2	4	10	8	22	4	5	65	10
Future Vol, veh/h	8	4	3	2	4	10	8	22	4	5	65	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	4	3	2	4	11	9	24	4	5	71	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	139	133	77	134	136	26	82	0	0	28	0	0
Stage 1	87	87	-	44	44	-	-	-	-	-	-	-
Stage 2	52	46	-	90	92	-	-	-	-	-	-	-
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	831	758	984	838	755	1050	1515	-	-	1585	-	-
Stage 1	921	823	-	970	858	-	-	-	-	-	-	-
Stage 2	961	857	-	917	819	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	814	751	984	825	748	1050	1515	-	-	1585	-	-
Mov Cap-2 Maneuver	814	751	-	825	748	-	-	-	-	-	-	-
Stage 1	915	821	-	964	853	-	-	-	-	-	-	-
Stage 2	941	852	-	906	817	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.5	9	1.7	0.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1515	-	-	824	925	1585	-	-
HCM Lane V/C Ratio	0.006	-	-	0.02	0.019	0.003	-	-
HCM Control Delay (s)	7.4	0	-	9.5	9	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↰	↱	↰	↑↑↕		↰	↑↑↕	
Traffic Vol, veh/h	8	0	8	2	0	1	13	378	1	4	839	12
Future Vol, veh/h	8	0	8	2	0	1	13	378	1	4	839	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	9	2	0	1	14	411	1	4	912	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1161	1367	463	813	1373	206	925	0	0	412	0	0
Stage 1	927	927	-	440	440	-	-	-	-	-	-	-
Stage 2	234	440	-	373	933	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	176	146	467	298	145	800	425	-	-	1143	-	-
Stage 1	229	345	-	547	576	-	-	-	-	-	-	-
Stage 2	721	576	-	587	343	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	171	141	467	284	140	800	425	-	-	1143	-	-
Mov Cap-2 Maneuver	171	141	-	284	140	-	-	-	-	-	-	-
Stage 1	221	344	-	529	557	-	-	-	-	-	-	-
Stage 2	696	557	-	574	342	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.5	15	0.5	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	425	-	-	250	284	800	1143	-	-
HCM Lane V/C Ratio	0.033	-	-	0.07	0.008	0.001	0.004	-	-
HCM Control Delay (s)	13.8	-	-	20.5	17.8	9.5	8.2	-	-
HCM Lane LOS	B	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0	0	0	-	-

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	40	0	0	71
Future Vol, veh/h	0	0	40	0	0	71
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	43	0	0	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	120	43	0	0	43	0
Stage 1	43	-	-	-	-	-
Stage 2	77	-	-	-	-	-
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	876	1027	-	-	1566	-
Stage 1	979	-	-	-	-	-
Stage 2	946	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	876	1027	-	-	1566	-
Mov Cap-2 Maneuver	876	-	-	-	-	-
Stage 1	979	-	-	-	-	-
Stage 2	946	-	-	-	-	-

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)	-	-	-	1566	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	0	0	405	858	0
Future Vol, veh/h	0	0	0	405	858	0
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	0	440	933	0

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	467	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	464	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	464	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

Intersection	
Int Delay, s/veh	4.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	19	33	10	5	58	6	5	10	8	9	20	43
Future Vol, veh/h	19	33	10	5	58	6	5	10	8	9	20	43
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	21	36	11	5	63	7	5	11	9	10	22	47

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	70	0	0	47	0	0	195	164	42	171	166	67
Stage 1	-	-	-	-	-	-	84	84	-	77	77	-
Stage 2	-	-	-	-	-	-	111	80	-	94	89	-
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	1531	-	-	1560	-	-	764	729	1029	792	727	997
Stage 1	-	-	-	-	-	-	924	825	-	932	831	-
Stage 2	-	-	-	-	-	-	894	828	-	913	821	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1531	-	-	1560	-	-	702	717	1029	766	715	997
Mov Cap-2 Maneuver	-	-	-	-	-	-	702	717	-	766	715	-
Stage 1	-	-	-	-	-	-	911	813	-	919	829	-
Stage 2	-	-	-	-	-	-	827	826	-	881	810	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.3	0.5	9.7	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	797	1531	-	-	1560	-	-	869
HCM Lane V/C Ratio	0.031	0.013	-	-	0.003	-	-	0.09
HCM Control Delay (s)	9.7	7.4	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	2.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑↑↕		↰	↑↑↕	
Traffic Vol, veh/h	5	18	26	11	20	47	21	354	17	29	800	25
Future Vol, veh/h	5	18	26	11	20	47	21	354	17	29	800	25
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	20	28	12	22	51	23	385	18	32	870	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1198	1397	449	862	1401	202	897	0	0	403	0	0
Stage 1	948	948	-	440	440	-	-	-	-	-	-	-
Stage 2	250	449	-	422	961	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	166	140	477	276	139	805	439	-	-	1152	-	-
Stage 1	221	338	-	547	576	-	-	-	-	-	-	-
Stage 2	706	571	-	548	333	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	127	129	477	216	128	805	439	-	-	1152	-	-
Mov Cap-2 Maneuver	127	129	-	216	128	-	-	-	-	-	-	-
Stage 1	210	329	-	519	546	-	-	-	-	-	-	-
Stage 2	602	541	-	471	324	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	27.9	22.1	0.7	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	439	-	-	210	294	1152	-	-
HCM Lane V/C Ratio	0.052	-	-	0.254	0.288	0.027	-	-
HCM Control Delay (s)	13.7	-	-	27.9	22.1	8.2	-	-
HCM Lane LOS	B	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	1	1.2	0.1	-	-

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	7	1149	31	30	1033	5	30	1	48	1	0	0
Future Vol, veh/h	7	1149	31	30	1033	5	30	1	48	1	0	0
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	8	1249	34	33	1123	5	33	1	52	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1128	0	0	1283	0	0	1797	2476	642	1708	2491	564
Stage 1	-	-	-	-	-	-	1282	1282	-	1192	1192	-
Stage 2	-	-	-	-	-	-	515	1194	-	516	1299	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	339	-	-	285	-	-	85	29	357	96	29	402
Stage 1	-	-	-	-	-	-	126	234	-	146	259	-
Stage 2	-	-	-	-	-	-	466	258	-	466	230	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	339	-	-	285	-	-	76	25	357	71	25	402
Mov Cap-2 Maneuver	-	-	-	-	-	-	76	25	-	71	25	-
Stage 1	-	-	-	-	-	-	123	228	-	142	229	-
Stage 2	-	-	-	-	-	-	412	228	-	387	224	-

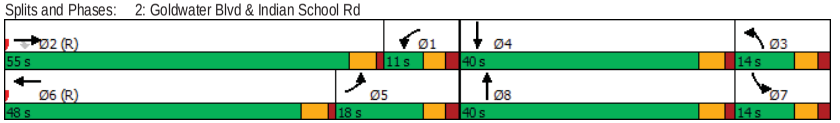
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.5	65.7	56.5
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	139	339	-	-	285	-	-	71
HCM Lane V/C Ratio	0.618	0.022	-	-	0.114	-	-	0.015
HCM Control Delay (s)	65.7	15.9	-	-	19.3	-	-	56.5
HCM Lane LOS	F	C	-	-	C	-	-	F
HCM 95th %tile Q(veh)	3.3	0.1	-	-	0.4	-	-	0

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	177	1006	71	67	829	66	387	31	266
Future Volume (vph)	177	1006	71	67	829	66	387	31	266
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	7.0	5.0	7.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	55.0	55.0	11.0	48.0	14.0	40.0	14.0	40.0
Total Split (%)	15.0%	45.8%	45.8%	9.2%	40.0%	11.7%	33.3%	11.7%	33.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	11.7	73.4	73.4	5.6	65.2	12.4	19.4	7.0	12.0
Actuated g/C Ratio	0.10	0.61	0.61	0.05	0.54	0.10	0.16	0.06	0.10
v/c Ratio	0.60	0.48	0.08	0.49	0.47	0.42	0.75	0.35	0.66
Control Delay	60.1	15.8	1.0	66.9	19.6	55.9	55.3	63.4	48.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.1	15.8	1.0	66.9	19.6	55.9	55.3	63.4	48.5
LOS	E	B	A	E	B	E	E	E	D
Approach Delay		21.2			22.9		55.4		49.7
Approach LOS		C			C		E		D

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green		
Natural Cycle: 60		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.75		
Intersection Signal Delay: 30.7	Intersection LOS: C	
Intersection Capacity Utilization 63.1%	ICU Level of Service B	
Analysis Period (min) 15		

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	177	1006	71	67	829	48	66	387	25	31	266	86
Future Volume (veh/h)	177	1006	71	67	829	48	66	387	25	31	266	86
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	192	1093	77	73	901	52	72	421	27	34	289	93
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	981	1559	626	790	1288	74	119	498	32	48	398	121
Arrive On Green	0.30	0.42	0.42	0.24	0.36	0.36	0.07	0.14	0.14	0.03	0.10	0.10
Sat Flow, veh/h	3274	3741	1502	3274	3594	207	1688	3570	228	1688	4085	1243
Grp Volume(v), veh/h	192	1093	77	73	469	484	72	220	228	34	251	131
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1931	1688	1870	1928	1688	1792	1745
Q Serve(g_s), s	5.2	28.9	3.8	2.1	25.8	25.8	5.0	13.8	13.9	2.4	8.2	8.8
Cycle Q Clear(g_c), s	5.2	28.9	3.8	2.1	25.8	25.8	5.0	13.8	13.9	2.4	8.2	8.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.12	1.00		0.71
Lane Grp Cap(c), veh/h	981	1559	626	790	670	692	119	261	269	48	349	170
V/C Ratio(X)	0.20	0.70	0.12	0.09	0.70	0.70	0.61	0.84	0.85	0.71	0.72	0.77
Avail Cap(c_a), veh/h	981	1559	626	790	670	692	122	541	557	122	1036	505
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	0.99	0.99	0.99	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	28.8	21.5	35.3	33.0	33.0	54.2	50.3	50.4	57.8	52.6	52.8
Incr Delay (d2), s/veh	0.0	2.7	0.4	0.0	6.0	5.8	5.4	2.8	2.8	7.1	1.1	2.7
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	2.1	13.4	1.4	0.8	12.7	13.1	2.3	6.6	6.9	1.1	3.7	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	31.5	21.9	35.3	39.0	38.8	59.6	53.2	53.2	65.0	53.6	55.6
LnGrp LOS	C	C	C	D	D	D	E	D	D	E	D	E
Approach Vol, veh/h		1362			1026			520			416	
Approach Delay, s/veh		30.9			38.6			54.1			55.2	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	34.3	55.0	13.7	17.0	41.3	48.0	8.7	22.0
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	5.7	* 50	* 8.7	* 35	12.7	* 43	* 8.7	* 35
Max Q Clear Time (g_c+I1), s	4.1	30.9	7.0	10.8	7.2	27.8	4.4	15.9
Green Ext Time (p_c), s	0.0	3.2	0.0	0.9	0.2	2.1	0.0	0.9

Intersection Summary	
HCM 6th Ctrl Delay	40.0
HCM 6th LOS	D

Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	4	4	4	3	9	476	4	382
Future Volume (vph)	4	4	4	3	9	476	4	382
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.2		7.2	133.0	133.0	133.0	133.0
Actuated g/C Ratio		0.05		0.05	0.95	0.95	0.95	0.95
v/c Ratio		0.21		0.20	0.01	0.15	0.01	0.08
Control Delay		69.5		69.2	1.0	0.7	1.0	0.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		69.5		69.2	1.0	0.7	1.0	0.6
LOS		E		E	A	A	A	A
Approach Delay		69.5		69.2		0.7		0.6
Approach LOS		E		E		A		A

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.21		
Intersection Signal Delay: 3.1	Intersection LOS: A	
Intersection Capacity Utilization 26.7%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 3: Main St & Goldwater Blvd

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	4	9	4	3	9	9	476	1	4	382	13
Future Volume (veh/h)	4	4	9	4	3	9	9	476	1	4	382	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	4	4	10	4	3	10	10	517	1	4	415	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	40	20	36	41	17	37	853	3414	7	783	4761	160
Arrive On Green	0.04	0.04	0.04	0.04	0.04	0.04	0.89	0.89	0.89	0.89	0.89	0.89
Sat Flow, veh/h	230	534	955	242	461	1004	908	3830	7	837	5341	179
Grp Volume(v), veh/h	18	0	0	17	0	0	10	252	266	4	278	151
Grp Sat Flow(s),veh/h/ln	1720	0	0	1707	0	0	908	1870	1967	837	1792	1937
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	0.2	2.4	2.4	0.1	1.3	1.3
Cycle Q Clear(g_c), s	1.4	0.0	0.0	1.3	0.0	0.0	1.5	2.4	2.4	2.5	1.3	1.3
Prop In Lane	0.22		0.56	0.24		0.59	1.00		0.00	1.00		0.09
Lane Grp Cap(c), veh/h	95	0	0	95	0	0	853	1667	1754	783	3194	1726
V/C Ratio(X)	0.19	0.00	0.00	0.18	0.00	0.00	0.01	0.15	0.15	0.01	0.09	0.09
Avail Cap(c_a), veh/h	574	0	0	570	0	0	853	1667	1754	783	3194	1726
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	65.6	0.0	0.0	65.5	0.0	0.0	1.0	1.0	1.0	1.1	0.9	0.9
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.2	0.0	0.0	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	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.5	0.5	0.0	0.2	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.9	0.0	0.0	65.8	0.0	0.0	1.0	1.1	1.1	1.1	0.9	1.0
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		18			17			528			433	
Approach Delay, s/veh		65.9			65.8			1.1			1.0	
Approach LOS		E			E			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	130.0	10.0	130.0	10.0
Change Period (Y+Rc), s	* 5.2	* 4.8	* 5.2	* 4.8
Max Green Setting (Gmax), s	* 85	* 45	* 85	* 45
Max Q Clear Time (g_c+I1), s	4.5	3.3	4.4	3.4
Green Ext Time (p_c), s	0.5	0.0	0.5	0.0

Intersection Summary	
HCM 6th Ctrl Delay	3.3
HCM 6th LOS	A

Notes

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

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	13	12	13	3	3	2	45	8	8	28	4
Future Vol, veh/h	21	13	12	13	3	3	2	45	8	8	28	4
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	14	13	14	3	3	2	49	9	9	30	4

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	111	112	32	122	110	54	34	0	0	58	0	0
Stage 1	50	50	-	58	58	-	-	-	-	-	-	-
Stage 2	61	62	-	64	52	-	-	-	-	-	-	-
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	867	778	1042	853	780	1013	1578	-	-	1546	-	-
Stage 1	963	853	-	954	847	-	-	-	-	-	-	-
Stage 2	950	843	-	947	852	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	857	773	1042	827	775	1013	1578	-	-	1546	-	-
Mov Cap-2 Maneuver	857	773	-	827	775	-	-	-	-	-	-	-
Stage 1	962	848	-	953	846	-	-	-	-	-	-	-
Stage 2	942	842	-	914	847	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.4	9.4	0.3	1.5
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1578	-	-	871	842	1546	-	-
HCM Lane V/C Ratio	0.001	-	-	0.057	0.025	0.006	-	-
HCM Control Delay (s)	7.3	0	-	9.4	9.4	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	1	9	1	0	4	3	489	1	3	386	10
Future Vol, veh/h	8	1	9	1	0	4	3	489	1	3	386	10
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	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	1	10	1	0	4	3	532	1	3	420	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	704	971	216	714	976	267	431	0	0	533	0	0
Stage 1	432	432	-	539	539	-	-	-	-	-	-	-
Stage 2	272	539	-	175	437	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	350	251	671	345	250	731	730	-	-	1031	-	-
Stage 1	503	581	-	479	520	-	-	-	-	-	-	-
Stage 2	685	520	-	772	578	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	346	249	671	337	248	731	730	-	-	1031	-	-
Mov Cap-2 Maneuver	346	249	-	337	248	-	-	-	-	-	-	-
Stage 1	501	579	-	477	518	-	-	-	-	-	-	-
Stage 2	678	518	-	757	576	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.5	11.1	0.1	0.1
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	730	-	-	444	337	731	1031	-	-
HCM Lane V/C Ratio	0.004	-	-	0.044	0.003	0.006	0.003	-	-
HCM Control Delay (s)	10	-	-	13.5	15.7	10	8.5	-	-
HCM Lane LOS	A	-	-	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	0	0	-	-

Intersection	
Int Delay, s/veh	2.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	4	16	40	16	13	41
Future Vol, veh/h	4	16	40	16	13	41
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	4	17	43	17	14	45

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	125	52	0	0	60	0
Stage 1	52	-	-	-	-	-
Stage 2	73	-	-	-	-	-
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	870	1016	-	-	1544	-
Stage 1	970	-	-	-	-	-
Stage 2	950	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	862	1016	-	-	1544	-
Mov Cap-2 Maneuver	862	-	-	-	-	-
Stage 1	961	-	-	-	-	-
Stage 2	950	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	1.8
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	981	1544	-
HCM Lane V/C Ratio	-	-	0.022	0.009	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	12	0	492	387	8
Future Vol, veh/h	0	12	0	492	387	8
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	13	0	535	421	9

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	215	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	672	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	672	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	10.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	672	-	-
HCM Lane V/C Ratio	-	0.019	-	-
HCM Control Delay (s)	-	10.5	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	41	5	1	18	17	4	8	5	11	2	30
Future Vol, veh/h	32	41	5	1	18	17	4	8	5	11	2	30
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	45	5	1	20	18	4	9	5	12	2	33

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	38	0	0	50	0	0	167	158	48	156	151	29
Stage 1	-	-	-	-	-	-	118	118	-	31	31	-
Stage 2	-	-	-	-	-	-	49	40	-	125	120	-
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	1572	-	-	1557	-	-	797	734	1021	810	741	1046
Stage 1	-	-	-	-	-	-	887	798	-	986	869	-
Stage 2	-	-	-	-	-	-	964	862	-	879	796	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1572	-	-	1557	-	-	756	716	1021	783	723	1046
Mov Cap-2 Maneuver	-	-	-	-	-	-	756	716	-	783	723	-
Stage 1	-	-	-	-	-	-	867	780	-	963	868	-
Stage 2	-	-	-	-	-	-	931	861	-	845	778	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	3	0.2	9.6	9
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	796	1572	-	-	1557	-	-	945
HCM Lane V/C Ratio	0.023	0.022	-	-	0.001	-	-	0.049
HCM Control Delay (s)	9.6	7.3	0	-	7.3	0	-	9
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.2

Intersection	
Int Delay, s/veh	1.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	17	18	4	10	15	19	460	4	27	375	14
Future Vol, veh/h	17	17	18	4	10	15	19	460	4	27	375	14
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	18	20	4	11	16	21	500	4	29	408	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	772	1020	212	774	1025	252	423	0	0	504	0	0
Stage 1	474	474	-	544	544	-	-	-	-	-	-	-
Stage 2	298	546	-	230	481	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	317	235	675	316	234	748	736	-	-	1057	-	-
Stage 1	471	556	-	476	517	-	-	-	-	-	-	-
Stage 2	662	516	-	715	552	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	286	222	675	275	221	748	736	-	-	1057	-	-
Mov Cap-2 Maneuver	286	222	-	275	221	-	-	-	-	-	-	-
Stage 1	457	541	-	462	502	-	-	-	-	-	-	-
Stage 2	615	501	-	652	537	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.6	15.9	0.4	0.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	736	-	-	320	363	1057	-	-
HCM Lane V/C Ratio	0.028	-	-	0.177	0.087	0.028	-	-
HCM Control Delay (s)	10	-	-	18.6	15.9	8.5	-	-
HCM Lane LOS	B	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.6	0.3	0.1	-	-

Intersection	
Int Delay, s/veh	6.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	25	1	2	8	11	18
Future Vol, veh/h	25	1	2	8	11	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	1	2	9	12	20

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	11	0	-	0	62	7
Stage 1	-	-	-	-	7	-
Stage 2	-	-	-	-	55	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1608	-	-	-	944	1075
Stage 1	-	-	-	-	1016	-
Stage 2	-	-	-	-	968	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1608	-	-	-	928	1075
Mov Cap-2 Maneuver	-	-	-	-	928	-
Stage 1	-	-	-	-	999	-
Stage 2	-	-	-	-	968	-

Approach	EB	WB	SB
HCM Control Delay, s	7	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1608	-	-	-	1014
HCM Lane V/C Ratio	0.017	-	-	-	0.031
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	1065	38	55	1246	1	38	0	48	3	0	5
Future Vol, veh/h	5	1065	38	55	1246	1	38	0	48	3	0	5
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	50	-	-	75	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	1158	41	60	1354	1	41	0	52	3	0	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	1355	0	0	1199	0	0	1851	2664	600	1948	2684	678
Stage 1	-	-	-	-	-	-	1189	1189	-	1475	1475	-
Stage 2	-	-	-	-	-	-	662	1475	-	473	1209	-
Critical Hdwy	5.34	-	-	5.34	-	-	6.44	6.54	7.14	6.44	6.54	7.14
Critical Hdwy Stg 1	-	-	-	-	-	-	7.34	5.54	-	7.34	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.74	5.54	-	6.74	5.54	-
Follow-up Hdwy	3.12	-	-	3.12	-	-	3.82	4.02	3.92	3.82	4.02	3.92
Pot Cap-1 Maneuver	263	-	-	313	-	-	79	22	381	68	22	338
Stage 1	-	-	-	-	-	-	147	260	-	92	189	-
Stage 2	-	-	-	-	-	-	380	189	-	494	254	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	263	-	-	313	-	-	65	17	381	49	17	338
Mov Cap-2 Maneuver	-	-	-	-	-	-	65	17	-	49	17	-
Stage 1	-	-	-	-	-	-	144	255	-	90	153	-
Stage 2	-	-	-	-	-	-	302	153	-	418	249	-

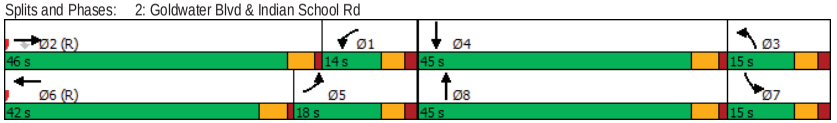
Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.8	97.4	42.4
HCM LOS			F	E

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	121	263	-	-	313	-	-	105
HCM Lane V/C Ratio	0.773	0.021	-	-	0.191	-	-	0.083
HCM Control Delay (s)	97.4	19	-	-	19.2	-	-	42.4
HCM Lane LOS	F	C	-	-	C	-	-	E
HCM 95th %tile Q(veh)	4.4	0.1	-	-	0.7	-	-	0.3

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	159	920	61	62	1031	101	233	90	752
Future Volume (vph)	159	920	61	62	1031	101	233	90	752
Turn Type	Prot	NA	Perm	Prot	NA	Prot	NA	Prot	NA
Protected Phases	5	2		1	6	3	8	7	4
Permitted Phases			2						
Detector Phase	5	2	2	1	6	3	8	7	4
Switch Phase									
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	11.0	16.0	16.0	11.0	16.0	11.0	16.0	11.0	16.0
Total Split (s)	18.0	46.0	46.0	14.0	42.0	15.0	45.0	15.0	45.0
Total Split (%)	15.0%	38.3%	38.3%	11.7%	35.0%	12.5%	37.5%	12.5%	37.5%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	3.3	4.0	3.3	4.0
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	2.0	1.3	2.0	1.3
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	5.0	5.0	5.3	5.0	5.3	5.3	5.3	5.3
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead
Lead-Lag Optimize?									
Recall Mode	None	C-Max	C-Max	None	C-Max	None	None	None	None
Act Effct Green (s)	10.6	55.1	55.1	6.9	49.4	13.1	13.2	25.9	26.0
Actuated g/C Ratio	0.09	0.46	0.46	0.06	0.41	0.11	0.11	0.22	0.22
v/c Ratio	0.60	0.58	0.09	0.36	0.78	0.60	0.73	0.27	0.82
Control Delay	61.4	28.2	0.7	59.3	36.5	64.2	58.3	39.8	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	28.2	0.7	59.3	36.5	64.2	58.3	39.8	49.8
LOS	E	C	A	E	D	E	E	D	D
Approach Delay		31.3			37.7		59.9		48.9
Approach LOS		C			D		E		D

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBT, Start of Green	
Natural Cycle: 75	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.82	
Intersection Signal Delay: 41.0	Intersection LOS: D
Intersection Capacity Utilization 73.4%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 2: Goldwater Blvd & Indian School Rd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	920	61	62	1031	60	101	233	48	90	752	124
Future Volume (veh/h)	159	920	61	62	1031	60	101	233	48	90	752	124
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	173	1000	66	67	1121	65	110	253	52	98	817	135
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	758	1278	513	649	1108	64	133	319	65	309	963	158
Arrive On Green	0.23	0.34	0.34	0.20	0.31	0.31	0.08	0.10	0.10	0.18	0.21	0.21
Sat Flow, veh/h	3274	3741	1502	3274	3593	208	1688	3100	627	1688	4651	764
Grp Volume(v), veh/h	173	1000	66	67	583	603	110	151	154	98	628	324
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1931	1688	1870	1856	1688	1792	1831
Q Serve(g_s), s	5.1	28.8	3.6	2.0	37.0	37.0	7.7	9.5	9.7	6.0	20.2	20.4
Cycle Q Clear(g_c), s	5.1	28.8	3.6	2.0	37.0	37.0	7.7	9.5	9.7	6.0	20.2	20.4
Prop In Lane	1.00		1.00	1.00		0.11	1.00		0.34	1.00		0.42
Lane Grp Cap(c), veh/h	758	1278	513	649	577	595	133	193	191	309	742	379
V/C Ratio(X)	0.23	0.78	0.13	0.10	1.01	1.01	0.83	0.78	0.81	0.32	0.85	0.85
Avail Cap(c_a), veh/h	758	1278	513	649	577	595	136	619	614	309	1185	606
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	37.4	35.5	27.2	39.4	41.5	41.5	54.5	52.5	52.6	42.5	45.7	45.8
Incr Delay (d2), s/veh	0.1	4.8	0.5	0.0	40.3	40.0	30.0	2.6	3.0	0.2	1.8	3.8
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	2.1	13.9	1.4	0.8	23.3	24.0	4.4	4.6	4.7	2.6	9.2	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	40.3	27.7	39.4	81.8	81.5	84.5	55.1	55.6	42.7	47.5	49.6
LnGrp LOS	D	D	C	D	F	F	F	E	E	D	D	D
Approach Vol, veh/h		1239			1253			415			1050	
Approach Delay, s/veh		39.2			79.4			63.1			47.7	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	29.1	46.0	14.8	30.2	33.1	42.0	27.3	17.7
Change Period (Y+Rc), s	5.3	* 5	* 5.3	* 5.3	5.3	* 5	* 5.3	* 5.3
Max Green Setting (Gmax), s	8.7	* 41	* 9.7	* 40	12.7	* 37	* 9.7	* 40
Max Q Clear Time (g_c+I1), s	4.0	30.8	9.7	22.4	7.1	39.0	8.0	11.7
Green Ext Time (p_c), s	0.0	2.4	0.0	2.4	0.1	0.0	0.0	0.6

Intersection Summary	
HCM 6th Ctrl Delay	56.7
HCM 6th LOS	E

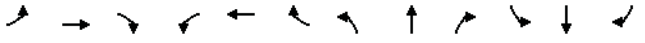
Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	13	5	10	8	16	364	21	853
Future Volume (vph)	13	5	10	8	16	364	21	853
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)	35.0	35.0	35.0	35.0	70.0	70.0	70.0	70.0
Total Split (s)	50.0	50.0	50.0	50.0	90.0	90.0	90.0	90.0
Total Split (%)	35.7%	35.7%	35.7%	35.7%	64.3%	64.3%	64.3%	64.3%
Yellow Time (s)	3.3	3.3	3.3	3.3	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.2	1.2	1.2	1.2
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.8		4.8	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)		7.5		7.5	129.3	129.3	129.3	129.3
Actuated g/C Ratio		0.05		0.05	0.92	0.92	0.92	0.92
v/c Ratio		0.28		0.33	0.04	0.12	0.03	0.19
Control Delay		54.6		51.6	1.3	1.0	1.2	1.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0
Total Delay		54.6		51.6	1.3	1.0	1.2	1.0
LOS		D		D	A	A	A	A
Approach Delay		54.6		51.6		1.0		1.0
Approach LOS		D		D		A		A

Intersection Summary		
Cycle Length: 140		
Actuated Cycle Length: 140		
Offset: 0 (0%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 105		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.33		
Intersection Signal Delay: 3.2	Intersection LOS: A	
Intersection Capacity Utilization 32.6%	ICU Level of Service A	
Analysis Period (min) 15		

Splits and Phases: 3: Main St & Goldwater Blvd



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	5	8	10	8	13	16	364	13	21	853	26
Future Volume (veh/h)	13	5	8	10	8	13	16	364	13	21	853	26
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	14	5	9	11	9	14	17	396	14	23	927	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	24	25	52	29	32	529	3255	115	855	4734	143
Arrive On Green	0.05	0.05	0.05	0.05	0.05	0.05	0.88	0.88	0.88	0.88	0.88	0.88
Sat Flow, veh/h	632	532	551	385	628	709	557	3686	130	924	5361	162
Grp Volume(v), veh/h	28	0	0	34	0	0	17	201	209	23	619	336
Grp Sat Flow(s),veh/h/ln	1714	0	0	1721	0	0	557	1870	1945	924	1792	1940
Q Serve(g_s), s	0.0	0.0	0.0	0.5	0.0	0.0	0.6	2.0	2.0	0.5	3.4	3.4
Cycle Q Clear(g_c), s	2.0	0.0	0.0	2.6	0.0	0.0	4.1	2.0	2.0	2.4	3.4	3.4
Prop In Lane	0.50		0.32	0.32		0.41	1.00		0.07	1.00		0.08
Lane Grp Cap(c), veh/h	117	0	0	112	0	0	529	1652	1718	855	3164	1713
V/C Ratio(X)	0.24	0.00	0.00	0.30	0.00	0.00	0.03	0.12	0.12	0.03	0.20	0.20
Avail Cap(c_a), veh/h	560	0	0	574	0	0	529	1652	1718	855	3164	1713
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	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	0.58	0.58	0.58
Uniform Delay (d), s/veh	64.7	0.0	0.0	65.0	0.0	0.0	1.4	1.1	1.1	1.2	1.2	1.2
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.6	0.0	0.0	0.1	0.2	0.1	0.0	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	1.0	0.0	0.0	1.2	0.0	0.0	0.1	0.4	0.5	0.1	0.7	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	65.1	0.0	0.0	65.5	0.0	0.0	1.6	1.2	1.2	1.3	1.2	1.3
LnGrp LOS	E	A	A	E	A	A	A	A	A	A	A	A
Approach Vol, veh/h		28			34			427			978	
Approach Delay, s/veh		65.1			65.5			1.2			1.3	
Approach LOS		E			E			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		128.8		11.2		128.8		11.2				
Change Period (Y+Rc), s		* 5.2		* 4.8		* 5.2		* 4.8				
Max Green Setting (Gmax), s		* 85		* 45		* 85		* 45				
Max Q Clear Time (g_c+I1), s		5.4		4.6		6.1		4.0				
Green Ext Time (p_c), s		1.3		0.1		0.5		0.1				

Intersection Summary		
HCM 6th Ctrl Delay		4.0
HCM 6th LOS		A

Notes

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

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	8	4	3	3	4	10	8	35	4	5	74	10
Future Vol, veh/h	8	4	3	3	4	10	8	35	4	5	74	10
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	4	3	3	4	11	9	38	4	5	80	11

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	162	156	86	157	159	40	91	0	0	42	0	0
Stage 1	96	96	-	58	58	-	-	-	-	-	-	-
Stage 2	66	60	-	99	101	-	-	-	-	-	-	-
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	736	973	809	733	1031	1504	-	-	1567	-	-
Stage 1	911	815	-	954	847	-	-	-	-	-	-	-
Stage 2	945	845	-	907	811	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	785	729	973	797	726	1031	1504	-	-	1567	-	-
Mov Cap-2 Maneuver	785	729	-	797	726	-	-	-	-	-	-	-
Stage 1	906	813	-	948	842	-	-	-	-	-	-	-
Stage 2	925	840	-	896	809	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	9.6	9.1	1.3	0.4
HCM LOS	A	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1504	-	-	800	896	1567	-	-
HCM Lane V/C Ratio	0.006	-	-	0.02	0.021	0.003	-	-
HCM Control Delay (s)	7.4	0	-	9.6	9.1	7.3	0	-
HCM Lane LOS	A	A	-	A	A	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0.1	0	-	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	0	8	2	0	1	14	378	1	4	848	12
Future Vol, veh/h	8	0	8	2	0	1	14	378	1	4	848	12
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	-	-	-	-	-	0	70	-	-	70	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	9	0	9	2	0	1	15	411	1	4	922	13

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1173	1379	468	819	1385	206	935	0	0	412	0	0
Stage 1	937	937	-	442	442	-	-	-	-	-	-	-
Stage 2	236	442	-	377	943	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	172	143	463	295	142	800	421	-	-	1143	-	-
Stage 1	225	342	-	546	575	-	-	-	-	-	-	-
Stage 2	719	575	-	583	339	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	167	137	463	281	136	800	421	-	-	1143	-	-
Mov Cap-2 Maneuver	167	137	-	281	136	-	-	-	-	-	-	-
Stage 1	217	341	-	526	554	-	-	-	-	-	-	-
Stage 2	692	554	-	570	338	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.8	15.1	0.5	0
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	421	-	-	245	281	800	1143	-	-
HCM Lane V/C Ratio	0.036	-	-	0.071	0.008	0.001	0.004	-	-
HCM Control Delay (s)	13.9	-	-	20.8	17.9	9.5	8.2	-	-
HCM Lane LOS	B	-	-	C	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	0	0	0	-	-

Intersection	
Int Delay, s/veh	1.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	12	40	17	10	71
Future Vol, veh/h	3	12	40	17	10	71
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	13	43	18	11	77

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	151	52	0	0	61	0
Stage 1	52	-	-	-	-	-
Stage 2	99	-	-	-	-	-
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	841	1016	-	-	1542	-
Stage 1	970	-	-	-	-	-
Stage 2	925	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	835	1016	-	-	1542	-
Mov Cap-2 Maneuver	835	-	-	-	-	-
Stage 1	963	-	-	-	-	-
Stage 2	925	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	8.8	0	0.9
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	974	1542	-
HCM Lane V/C Ratio	-	-	0.017	0.007	-
HCM Control Delay (s)	-	-	8.8	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	9	0	406	858	9
Future Vol, veh/h	0	9	0	406	858	9
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	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	10	0	441	933	10

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	-	472	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	7.14	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.92	-	-	-	-
Pot Cap-1 Maneuver	0	461	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %					-	-
Mov Cap-1 Maneuver	-	461	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	13	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	-	461	-	-
HCM Lane V/C Ratio	-	0.021	-	-
HCM Control Delay (s)	-	13	-	-
HCM Lane LOS	-	B	-	-
HCM 95th %tile Q(veh)	-	0.1	-	-

Intersection	
Int Delay, s/veh	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	33	10	5	58	19	5	10	8	9	20	46
Future Vol, veh/h	23	33	10	5	58	19	5	10	8	9	20	46
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	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	36	11	5	63	21	5	11	9	10	22	50

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	84	0	0	47	0	0	212	186	42	186	181	74
Stage 1	-	-	-	-	-	-	92	92	-	84	84	-
Stage 2	-	-	-	-	-	-	120	94	-	102	97	-
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	1513	-	-	1560	-	-	745	708	1029	775	713	988
Stage 1	-	-	-	-	-	-	915	819	-	924	825	-
Stage 2	-	-	-	-	-	-	884	817	-	904	815	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1513	-	-	1560	-	-	680	694	1029	748	699	988
Mov Cap-2 Maneuver	-	-	-	-	-	-	680	694	-	748	699	-
Stage 1	-	-	-	-	-	-	899	805	-	908	823	-
Stage 2	-	-	-	-	-	-	815	815	-	869	801	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	2.6	0.4	9.8	9.6
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	779	1513	-	-	1560	-	-	860
HCM Lane V/C Ratio	0.032	0.017	-	-	0.003	-	-	0.095
HCM Control Delay (s)	9.8	7.4	0	-	7.3	0	-	9.6
HCM Lane LOS	A	A	A	-	A	A	-	A
HCM 95th %tile Q(veh)	0.1	0.1	-	-	0	-	-	0.3

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	5	18	26	11	21	47	33	355	17	30	808	25
Future Vol, veh/h	5	18	26	11	21	47	33	355	17	30	808	25
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	-	-	-	-	-	-	130	-	-	82	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	5	20	28	12	23	51	36	386	18	33	878	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1235	1434	453	894	1438	202	905	0	0	404	0	0
Stage 1	958	958	-	467	467	-	-	-	-	-	-	-
Stage 2	277	476	-	427	971	-	-	-	-	-	-	-
Critical Hdwy	6.99	6.54	7.14	6.99	6.54	6.94	5.34	-	-	4.14	-	-
Critical Hdwy Stg 1	7.34	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.74	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.67	4.02	3.92	3.67	4.02	3.32	3.12	-	-	2.22	-	-
Pot Cap-1 Maneuver	157	133	474	263	132	805	435	-	-	1151	-	-
Stage 1	218	334	-	528	560	-	-	-	-	-	-	-
Stage 2	681	555	-	544	329	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	115	118	474	198	117	805	435	-	-	1151	-	-
Mov Cap-2 Maneuver	115	118	-	198	117	-	-	-	-	-	-	-
Stage 1	200	324	-	484	514	-	-	-	-	-	-	-
Stage 2	559	509	-	467	319	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.3	24.5	1.1	0.3
HCM LOS	D	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	435	-	-	195	269	1151	-	-
HCM Lane V/C Ratio	0.082	-	-	0.273	0.319	0.028	-	-
HCM Control Delay (s)	14	-	-	30.3	24.5	8.2	-	-
HCM Lane LOS	B	-	-	D	C	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.1	1.3	0.1	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	27	0	0	9	9	16
Future Vol, veh/h	27	0	0	9	9	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	29	0	0	10	10	17

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	10	0	-	0	63	5
Stage 1	-	-	-	-	5	-
Stage 2	-	-	-	-	58	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1610	-	-	-	943	1078
Stage 1	-	-	-	-	1018	-
Stage 2	-	-	-	-	965	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1610	-	-	-	926	1078
Mov Cap-2 Maneuver	-	-	-	-	926	-
Stage 1	-	-	-	-	1000	-
Stage 2	-	-	-	-	965	-

Approach	EB	WB	SB
HCM Control Delay, s	7.3	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1610	-	-	-	1018
HCM Lane V/C Ratio	0.018	-	-	-	0.027
HCM Control Delay (s)	7.3	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

APPENDIX J

QUEUE STORAGE ANALYSIS

Winery Suites **Queue Length Analysis**

Signalized Intersection
2020

Average Vehicle Length (ft): 25 Cycles: 2
Intersection Cycle Length (sec): 120
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
Goldwater Blvd & Indiand School Rd.	NB Left	66	0	101	7	0	175'
	SB Left	31	0	90	6	0	150'
	EB Left	177	0	159	12	0	300'
	WB Left	67	0	62	5	0	125'
Goldwater Blvd & Main St	EB Right	71	0	61	5	0	125'
	NB Left	9	0	16	2	0	50'
	SB Left	4	0	21	2	0	50'

Winery Suites **Queue Length Analysis**

Unsignalized Intersection
2020

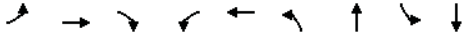
Average Vehicle Length (ft): 25

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
69th St & Indian School Rd.	EB Left	7	0	5	1	0	25'
	WB Left	30	0	55	2	0	50'
Goldwater Blvd. & 2nd St.	NB Left	19	0	33	2	0	50'
	SB Left	27	0	30	1	0	25'

2: Goldwater Blvd & Indian School Rd

Queues



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	173	1000	66	67	1186	110	305	98	952
v/c Ratio	0.60	0.58	0.09	0.36	0.78	0.60	0.73	0.27	0.82
Control Delay	61.4	28.2	0.7	59.3	36.5	64.2	58.3	39.8	49.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	61.4	28.2	0.7	59.3	36.5	64.2	58.3	39.8	49.8
Queue Length 50th (ft)	67	306	0	26	415	82	114	63	252
Queue Length 95th (ft)	103	445	4	50	#653	139	157	107	285
Internal Link Dist (ft)		548			753		580		255
Turn Bay Length (ft)	275		165	155		105		180	
Base Capacity (vph)	344	1711	752	235	1523	187	1214	361	1752
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	0.50	0.58	0.09	0.29	0.78	0.59	0.25	0.27	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

3: Main St & Goldwater Blvd

Queues

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	28	34	17	410	23	955
v/c Ratio	0.28	0.33	0.04	0.12	0.03	0.19
Control Delay	54.6	51.6	1.3	1.0	1.2	1.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.6	51.6	1.3	1.0	1.2	1.0
Queue Length 50th (ft)	17	18	1	18	2	32
Queue Length 95th (ft)	50	55	5	28	6	45
Internal Link Dist (ft)	234	426		251		580
Turn Bay Length (ft)			120		115	
Base Capacity (vph)	565	553	467	3424	833	4925
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.05	0.06	0.04	0.12	0.03	0.19

Intersection Summary

APPENDIX K

SIGHT DISTANCE ANALYSIS

SITE DISTANCE

SIX LANE ROADWAY[1]

DESIGN SPEED	SIGHT DISTANCE					
	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 ROADWAY[1]

DESIGN SPEED	SIGHT DISTANCE					
	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 ROADWAY[1]

DESIGN SPEED	SIGHT DISTANCE					
	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 ROADWAY[1]

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