Archaeological Resources

Airport Vicinity Development Checklist

Parking Study

Trip Generation Comparison

Parking Master Plan

7th Day Adventist Redevelopment

Traffic Impact and Mitigation Analysis

Northeast Corner of Scottsdale Road and Sutton Drive in
Scottsdale, Arizona

May 2020
Project No. 19-0760

Prepared For:
Arizona Conference of Seventh-Day Adventists
13405 North Scottsdale Road
Scottsdale, Arizona 85254

For Submittal to:
City of Scottsdale

Prepared By:

CivTech

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14-ZN-2019
6/03/2020

7TH DAY ADVENTIST REDEVELOPMENT
TRAFFIC IMPACT AND MITIGATION ANALYSIS

Northeast Corner of Scottsdale Road and Sutton Drive
Scottsdale, Arizona

Prepared for:
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EXECUTIVE SUMMARY

The Arizona Conference of the Seventh-Day Adventist campus is currently located on the northeast corner of the intersection of Scottsdale Road and Joan D Arc Avenue/Sutton Drive. The Adventists are proposing to allow redevelopment of property surrounding their educational facilities and church offices to sustain these facilities for at least the next ten years. The redevelopment is planned to include office space, some industrial uses, approximately 12 single-family detached homes, and five (5) airplane hangars. There are approximately 20 existing townhomes located on the property that will be relocated to the southwest corner of the campus once redevelopment begins. The net change in trips for the townhome land use will be very close to zero, however, a few of the townhomes have been included in this analysis in order to give a more conservative estimate of trips generated by the proposed site.

The following conclusions and recommendations have been documented in this study:

- The results of the existing conditions analysis indicate that most intersections operate with acceptable levels of service within the study area, but a few already have at least one approach operating with high delays. This is due to the high volume of vehicles currently utilizing the roadway network today.
- The proposed development is estimated to generate approximately 6,440 external weekday daily trips with 605 trips occurring during the AM peak hour (508 in/97 out), and 616 trips occurring during the PM peak hour (109 in/507 out).
- The results of the 2024 level of service analysis indicate that most intersections will operate with overall acceptable levels of service within the study area; a few may have one approach or more operating with higher delays. As the site develops over time, the development team will work with the staff of the City's Transportation Department to address issues of delays at and progression through the signalized intersections in the study area via adjustments to signal cycles and phasing.
- The results of the 2029 level of service analysis indicate that most intersections will continue to operate at acceptable overall levels of service; a few may have at least one approach operating with higher delays. A comparison of the results of the no-build and full-build analyses in 2029 year reveals that the average delays at the study intersections would not be substantially impacted by the addition of site generated traffic, warranting no mitigation measures beyond continued cooperation with City staff to determine adjustments to signal cycles and timing necessitated by changes in traffic volumes and patterns. The proposed design of the project at build-out is designed with several access points that will provide users alternative access routes via Scottsdale Road, Sutton Drive, or Redfield/Thunderbird Road.
- The recommended storage lengths are provided for study horizon year 2029 using the total traffic projections.
- With the Loop 101 Pima Freeway diverting regional traffic away from Scottsdale Road upon its opening in the 1990's, Scottsdale Road, which was planned and constructed for a future condition in which there was no such freeway, currently experiences traffic volumes well below levels previously experienced, resulting in excess capacity on Scottsdale Road. With no access to the Pima Freeway to the east or to State Route 51 five miles to the west, Thunderbird Road is a sub-regional road carrying little regional traffic. The proposed development is not expected to adversely impact either of these roadways.

INTRODUCTION

The Arizona Conference of the Seventh-Day Adventist campus is currently located on the northeast corner of the intersection of Scottsdale Road and Joan D Arc Avenue/Sutton Drive. The Adventists are proposing to allow redevelopment of property surrounding their educational facilities and church offices to sustain these facilities for at least the next ten years. The redevelopment is planned to include office space, some industrial uses, approximately 12 single-family detached homes, and five (5) airplane hangars. There are approximately 20 existing townhomes located on the property that will be relocated to the southwest corner of the campus once redevelopment begins. The net change in trips for the townhome land use will be very close to zero, however, a few of the townhomes have been included in this analysis in order to give a more conservative estimate of trips generated by the proposed site. The vicinity of the site is shown in **Figure 1**.

STUDY REQUIREMENTS

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

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

STUDY AREA

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

- Scottsdale Road & Greenway Parkway
- Scottsdale Road & Thunderbird Road
- Airport Taxiway & Redfield Road
- 76th Place & Redfield Road
- Scottsdale Road & Sutton Drive
- Scottsdale Road & Cactus Road
- Scottsdale Road & Acoma Road
- 73rd Street & Thunderbird Road
- 76th Street & Redfield Road
- Hayden Road & Redfield Road
- Scottsdale Road & Sweetwater Avenue
- Existing Driveways

HORIZON YEARS

This study has been conducted to conform to the *Design Standards and Policies Manual (DS&PM), Chapter 5*, Transportation Impact Studies, prepared by the City of Scottsdale in 2018. For a Category 3 TIMA, the existing year, opening year and five (5) year horizon will be analyzed. The existing year is 2019, the buildout year for this development will be 2024 and the five (5) year horizon will be 2029.

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

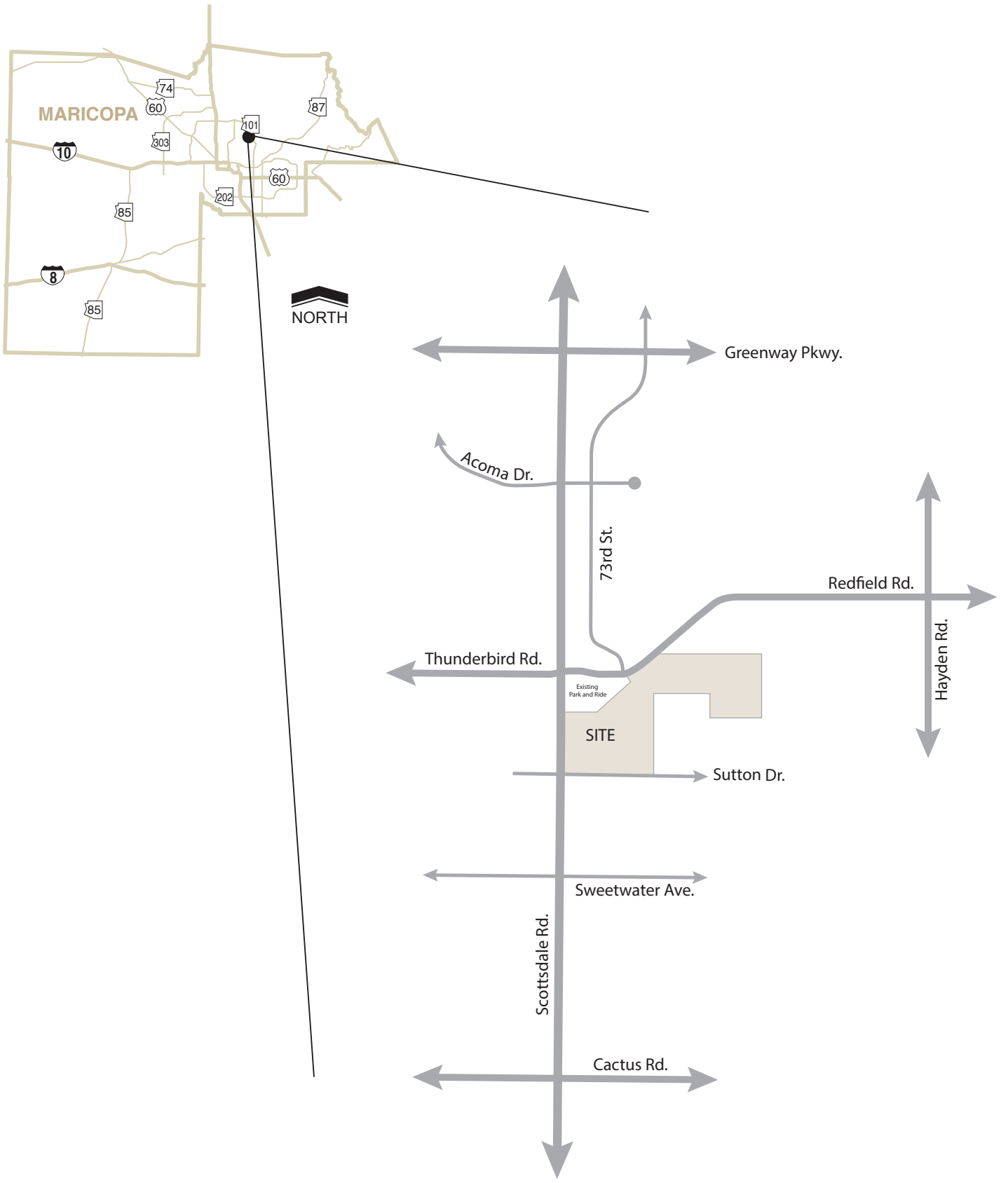


Figure 1: Vicinity Map

EXISTING CONDITIONS

EXISTING LAND USE

The Seventh-Day Adventist campus currently exists and includes their educational center and church offices. Surrounding the campus, where the redevelopment is planned, are some single-family detached homes, warehouses and airplane storage space.

SURROUNDING LAND USE

Directly north of the campus is the Scottsdale Airport and Scottsdale Airpark, the commercial area surrounding the airport. Northwest of the site is an existing park-and-ride operated by Valley Metro; this park-and-ride location offers access to local bus routes 72 and 154. Directly west of the site is the Fairfield Inn Scottsdale, some small offices and a small shopping center with a natural grocery store, restaurants and retail. Southwest of the site is a Shell Superpumper gas station and an existing LA fitness that is planned for redevelopment. South of the site are single-family detached homes. Southeast of the site is the Thunderbird Christian Academy, east of the site is single-family detached homes. Northeast of the site are offices and retail stores, mostly consisting of consultants offering a multitude of services.

EXISTING ROADWAY NETWORK

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

Scottsdale Road is a north-south, six-lane major arterial divided by raised medians north of Joan D Arc Avenue/Sutton Drive. South of Joan D Arc Avenue and north of Sweetwater Avenue, Scottsdale Road is divided by a continuous two-way-left-turn lane (TWLTL). South of Sweetwater Avenue, Scottsdale Road is divided by a raised median. Within the City of Scottsdale, Scottsdale Road begins near Carefree Highway as a minor arterial roadway. Near Happy Valley Road, Scottsdale Road is classified as a major arterial roadway. Scottsdale Road continues south as a major arterial roadway until McKellips Road, where is enters City of Tempe jurisdiction. Within the vicinity of the site, the posted speed limit is 45 miles per hour (mph).

Acoma Drive is a generally east-west local roadway north of the proposed site. East of Scottsdale Road, there is one lane in each direction with a center left turn lane. West of Scottsdale Road, Acoma Drive consists of two lanes in each direction divided by a TWLTL. Acoma Drive begins approximately 870 feet east of Scottsdale Road at a turnaround point and continues west until transitioning into Kierland Boulevard approximately 1,600 feet west of Scottsdale Road. There is no posted speed limit.

Thunderbird Road is an east-west, four-lane major collector divided by a TWLTL west of 73rd Street. East of 73rd Street, Thunderbird Road narrows to one lane in the eastbound direction and two lanes in the westbound direction divided by a TWLTL. West of Scottsdale Road, the posted speed limit is 40 mph, east of Scottsdale Road the posted speed limit is 35 mph.

73rd Street is a generally north-south, two-lane minor collector divided by a TWLTL. There is one lane in each direction of travel and a bicycle lane. 73rd Street begins at the intersection with

Thunderbird Road and continues north until terminating at the intersection with Paradise Lane. The posted speed limit is 30 mph.

Airport Taxiway is a north-south, two-lane local roadway within the vicinity of the site. At the intersection of Airport Taxiway and Thunderbird Road, there are signs indicating that no turns should be made at the intersection, however, there are existing driveways to surrounding businesses on the roadway indicating that vehicles do use the roadway as well as planes. The purpose of this roadway is to allow airplanes stored south of Thunderbird Road to cross Thunderbird Road to get to the airport without the interference of other vehicles. There is no posted speed limit.

Sutton Drive is an east-west, two-lane local roadway bordering the site to the south. This portion of the road begins at the western edge of the LA Fitness/Superpumper site within the City of Phoenix as Joan De Arc Avenue and continues east until terminating at the intersection with 76th Place. There is no posted speed limit.

Sweetwater Avenue is an east-west, two-lane divided minor collector east of Scottsdale Road. West of Scottsdale Road, Sweetwater Avenue is not divided and consists of one lane in each direction of travel. Within the City of Scottsdale, Sweetwater Avenue begins at the intersection with Scottsdale Road and continues east until terminating at the intersection with Hayden Road. The posted speed limit is 25 mph.

Cactus Road is an east-west, four-lane major collector divided by a TWLTL. Within the City of Scottsdale, Cactus Road begins at the intersection with Scottsdale Road and continues east as a major collector until 96th Street. East of 96th Street, Cactus Road continues as a minor collector until terminating at the intersection with Frank Lloyd Wright Boulevard. East of Frank Lloyd Wright Boulevard, Cactus Road transitions into Taliesin Drive and provides private access to Taliesin West and single-family residential units. Within the vicinity of the site, the posted speed limit is 45 mph.

Access B is an east-west, existing driveway located along Scottsdale Road. East of Scottsdale Road, Access B provides access to the existing Arizona Conference for the 7th Day Adventists. West of Scottsdale Road, Access B provides access to an existing shopping center and the Fairfield Inn. There is no posted speed limit.

EXISTING INTERSECTION CONFIGURATION

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

The intersection of **Scottsdale Road and Thunderbird Road** is a four-legged signalized intersection with protected left turns on the northbound and southbound approaches and permissive-protected left turns on the eastbound and westbound approaches. The northbound approach consists

of dual left turn lanes, three through lanes and one dedicated right turn lane. The westbound approach consists of dual left turn lanes, two through lanes, a bicycle lane and a dedicated right turn lane. The southbound approach consists of dual left turn lanes, two though lanes and one shared through/right turn lane. The eastbound approach consists of one dedicated left turn lane, one through lane and one shared through/right turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **73rd Street & Thunderbird Road** is a four-legged signalized intersection with permissive phasing on all approaches. The northbound and southbound approaches each consist of one dedicated left turn lane, one through lane and one dedicated right turn lane. The westbound approach consists of one dedicated left turn lane, two through lanes, a bicycle lane and one dedicated right turn lane. The eastbound approach consists of one dedicated left turn lane, one through lane, one shared through/right turn lane and a bicycle lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Airport Taxiway and Thunderbird Road/Redfield Road** is a four-legged signalized intersection with restricted movements on all approaches. According to signs posted at the intersection no turning movements are permitted at the intersection. The northbound and southbound approaches each consist of one through lane. The westbound approach consists of two through lanes, although it has been observed that some vehicles are turning left from the center lane. The eastbound approach consists of one through lane, although it has been observed that some vehicles are making right turns from this lane. There are no pedestrian crosswalks at this intersection.

The intersection of **Scottsdale Road & Sutton Drive** is a four-legged unsignalized intersection with stop sign controls on the eastbound and westbound approaches. The northbound and southbound approaches each consist of one dedicated left turn lane, two through lanes and one shared through/right turn lane. The eastbound and westbound approaches each consist of one shared left turn/through/right turn lane. There are no striped pedestrian crosswalks at this intersection.

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

The intersection of **Scottsdale Road and Cactus Road** is a four-legged signalized intersection with protected left turns on all approaches of the intersection. The northbound approach consists of dual left turn lanes, three through lanes and one dedicated right turn lane. The eastbound and westbound approaches each consist of dual left turn lanes, two through lanes and one dedicated right turn lane. The southbound approach consists of dual left turn lanes, two through lanes and one share through/right turn lane. There are pedestrian crosswalks across all legs of the intersection.

The intersection of **Scottsdale Road and Access B** is a four-legged unsignalized intersection with stop sign controls on the eastbound and westbound approaches. The northbound and southbound approaches each consist of an exclusive left turn lane, two through lanes and a shared through/right

turn lane. The eastbound and westbound approaches each consist of one shared left turn/ through/right turn lane.

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

EXISTING TRAFFIC VOLUMES

CivTech engaged Field Data Services of Arizona, Inc. to record traffic volumes at seven (7) study intersections within the project vicinity. Peak hour volume turning movement counts were performed from 7:00-9:00 AM and 4:00-6:00 PM on Tuesday, May 14, 2019. Peak hour turning movement counts were conducted at the following study intersections:

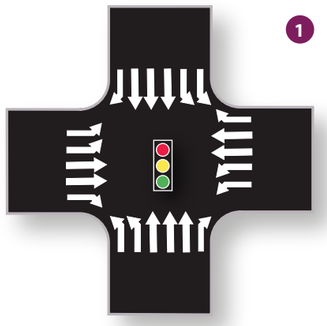
- Scottsdale Road & Acoma Drive
- 73rd Street & Thunderbird Road
- Scottsdale Road & Cactus Road
- Existing Driveways
- Scottsdale Road & Thunderbird Road
- Airport Taxiway & Redfield Road
- Scottsdale Road & Sweetwater Avenue

The following intersection was counted previously for a different project in the surrounding area. The count at this intersection was performed from 7:00-9:00 AM and 4:00-6:00 PM on Thursday, November 8, 2018.

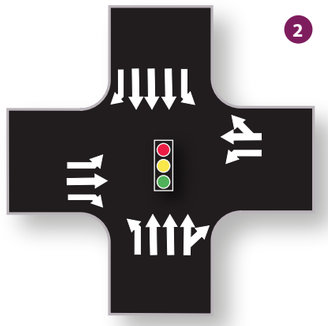
- Scottsdale Road & Sutton Drive

This same intersection was counted Tuesday July 23, 2019 from 7:00-9:00 AM and 4:00-6:00 PM. The current numbers were compared to the numbers from November 2018 and an adjustment factor was found. During the AM peak hour, a difference of approximately 28% was found, and during the PM peak hour a difference of approximately 22% was found. These percent increases were applied to all of the remaining intersections in order to remain conservative as well as to reflect more accurate traffic volumes for the study area.

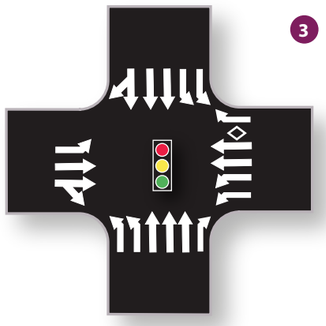
The adjusted traffic volumes for this study are presented in **Figure 3** for the weekday AM and PM peak hours. Traffic volume data obtained for this study have been included in **Appendix B**.



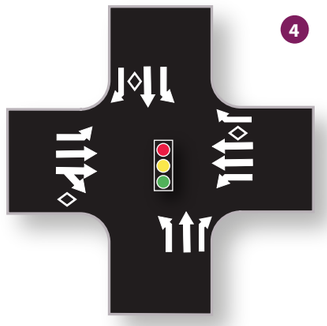
Scottsdale Rd. & Greenway Pkwy.



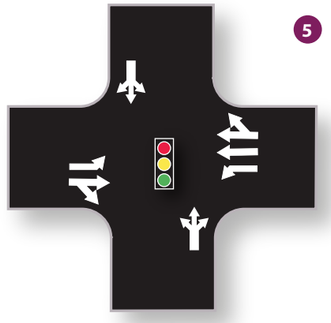
Scottsdale Rd. & Acoma Dr.



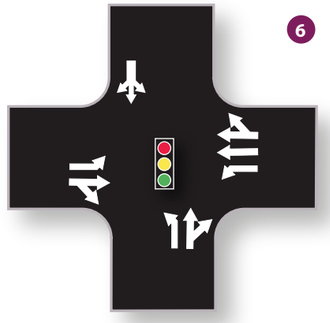
Scottsdale Rd. & Thunderbird Rd.



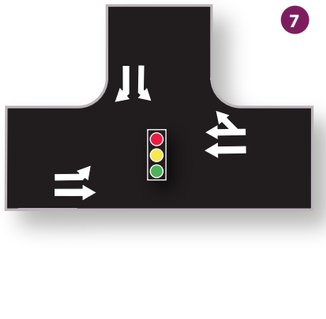
73rd St. & Thunderbird Rd.



Airport Taxiway & Redfield Rd.



76th St. & Redfield Rd.



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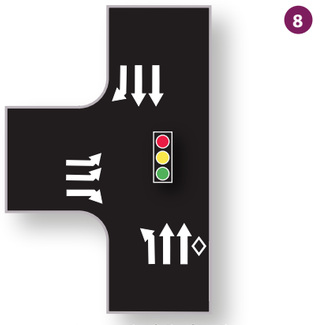
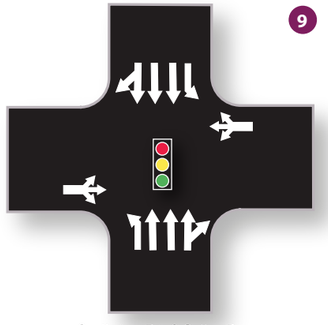


Hayden Rd. & Redfield Rd.



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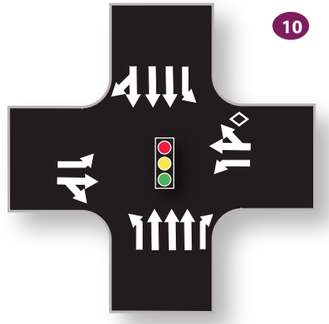
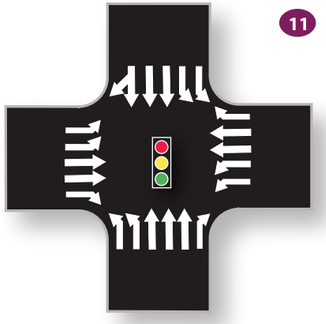
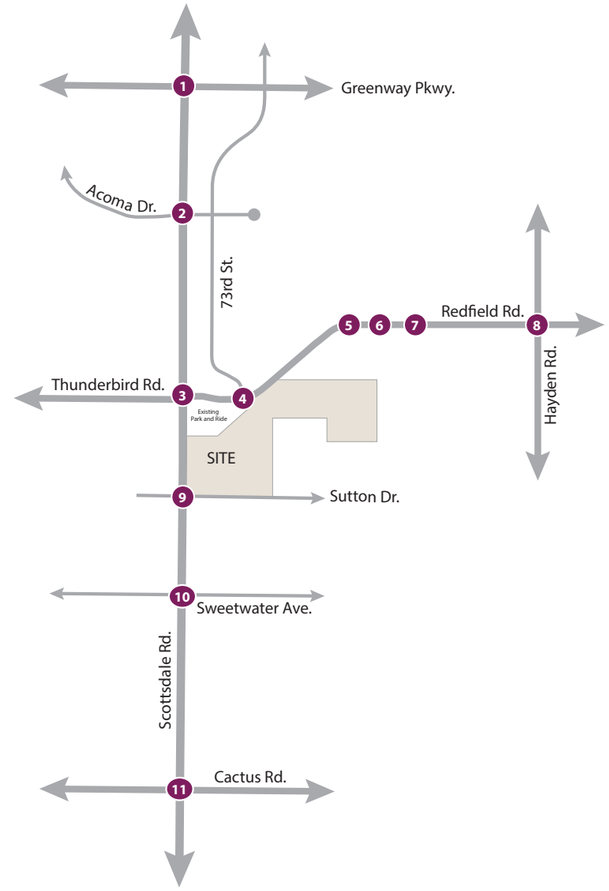


Scottsdale Rd. & Sweetwater Ave.



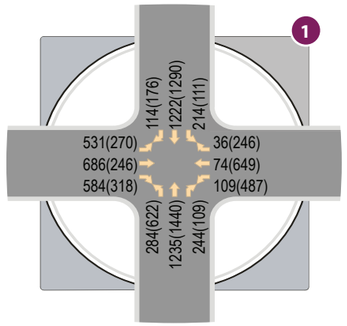
Scottsdale Rd. & Cactus Rd.



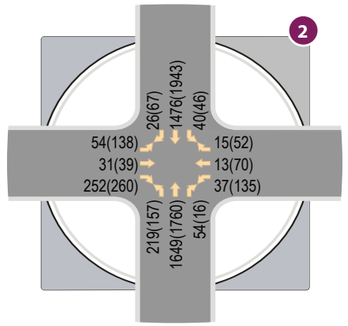
LEGEND

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

Figure 2: Existing Lane Configurations and Traffic Controls



Scottsdale Rd. & Greenway Pkwy.



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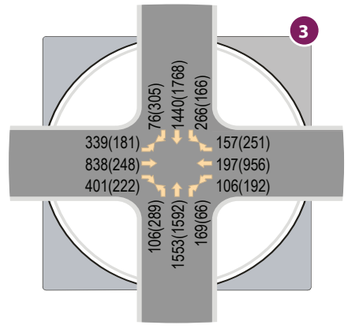

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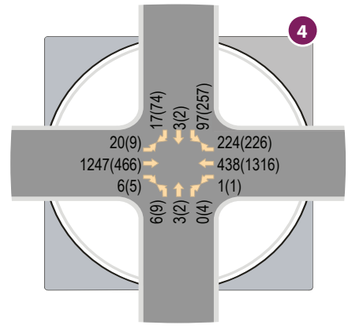
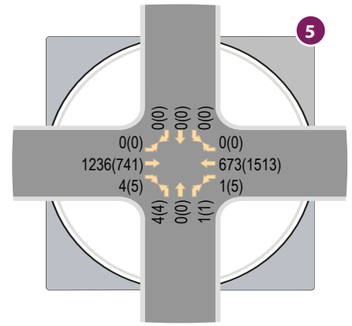
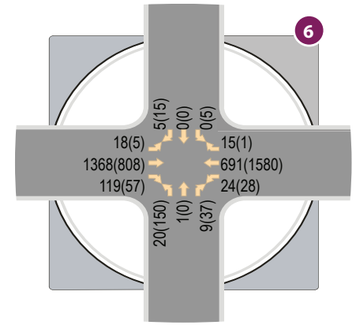


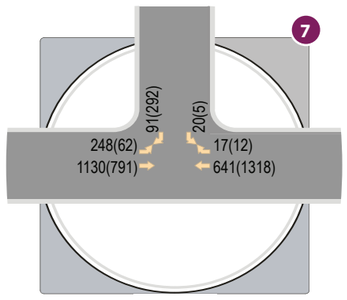
73rd St. & Thunderbird Rd.



Airport Taxiway & Redfield Rd.



76th St. & Redfield Rd.



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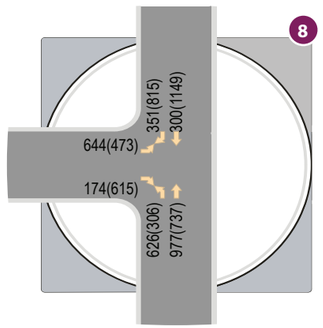

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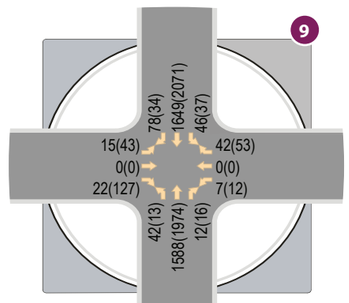

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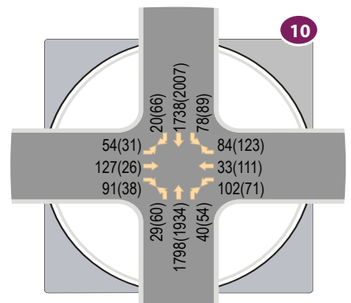

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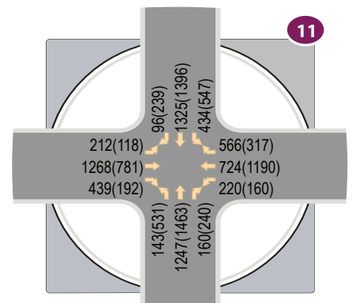

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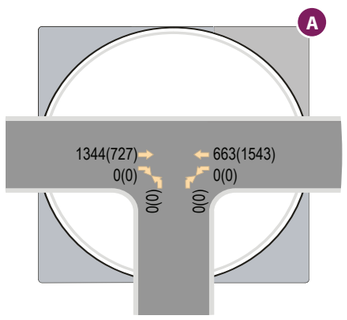
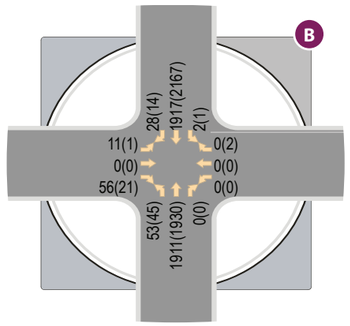
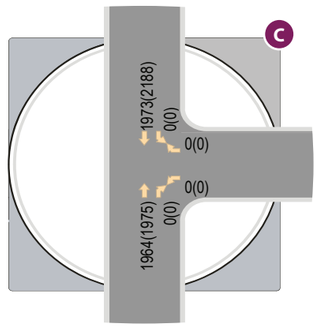


Access A & Redfield Rd.



Scottsdale Rd. & Access B



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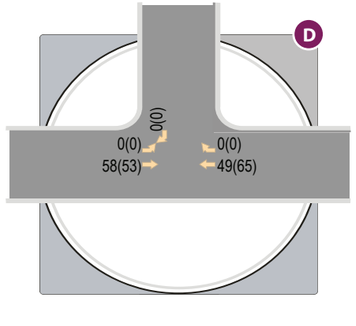

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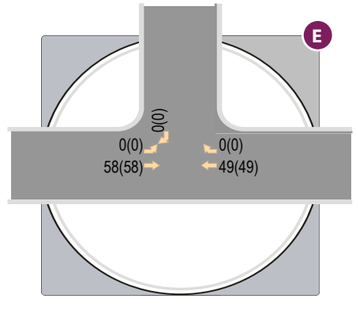


Access E & Sutton Dr.

LEGEND

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

NORTH

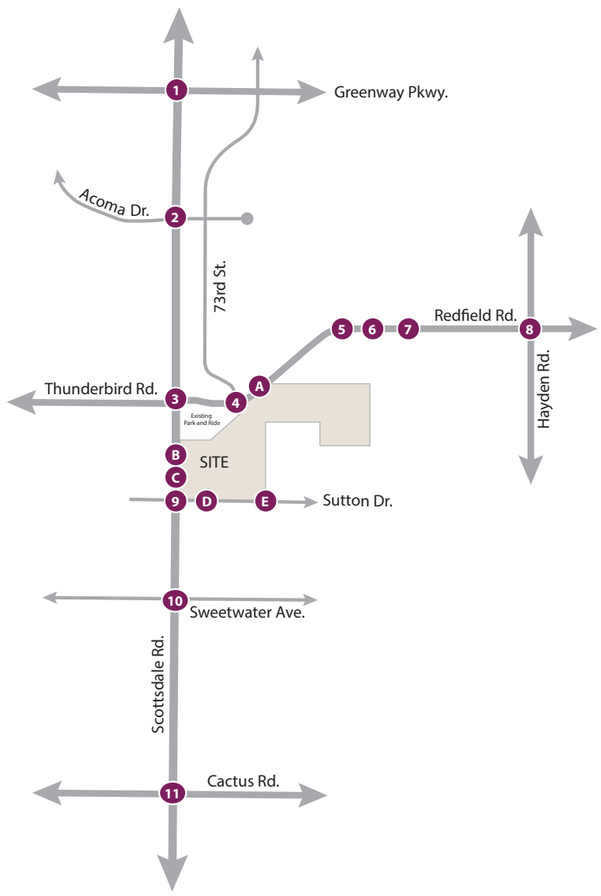


Figure 3: Existing Traffic Volumes

EXISTING CAPACITY ANALYSIS

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

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

Table 1 – Level of Service Criteria for Controlled Intersections

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

Source: Exhibits 19-8, 20-2, 21-8, and 22-8, Highway Capacity Manual 2016

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

Table 2 – Existing Peak Hour Levels of Service

ID	Intersection	Control	Approach	AM	PM
1	Scottsdale Road & Greenway Parkway	Signal	NB	D (51.1)	D (43.1)
			SB	D (37.9)	D (42.7)
			EB	D (45.9)	E (68.4)
			WB	E (59.7)	E (55.9)
			Overall	**D (45.7)**	**D (49.0)**
2	Scottsdale Road & Acoma Drive	Signal	NB	A (2.0)	A (3.4)
			SB	A (9.2)	C (30.6)
			EB	F (82.1)	F (159.6)
			WB	D (48.8)	F (86.6)
			Overall	**B (10.7)**	**C (31.9)**
3	Scottsdale Road & Thunderbird Road	Signal	NB	E (74.1)	F (106.1)
			SB	D (46.9)	D (45.0)
			EB	F (89.8)	F (121.3)
			WB	D (54.9)	E (62.2)
			Overall	**E (68.6)**	**E (75.1)**
4	73rd Street & Thunderbird Road	Signal	NB	B (13.1)	B (13.1)
			SB	B (14.8)	B (19.0)
			EB	C (22.4)	B (16.0)
			WB	B (15.3)	D (38.6)
			Overall	**B (19.9)**	**C (31.1)**
5	Airport Taxiway & Redfield Road	Signal	NB	E (67.8)	E (67.8)
			SB	A (0.0)	A (0.0)
			EB	A (9.8)	A (2.8)
			WB	A (1.5)	A (2.5)
			Overall	**A (7.3)**	**A (2.8)**
6	76th Street & Redfield Road	Signal	NB	B (17.4)	D (44.5)
			SB	B (16.9)	D (36.4)
			EB	F (283.6)	B (15.3)
			WB	A (2.9)	A (8.6)
			Overall	**F (187.2)**	**B (14.0)**
7	76th Place and Redfield Road	Signal	SB	B (17.5)	E (58.5)
			EB	F (85.5)	A (4.1)
			WB	A (8.9)	B (10.1)
			Overall	**E (58.1)**	**B (14.2)**
8	Hayden Road & Redfield Road	Signal	NB	C (22.8)	B (14.5)
			SB	C (20.3)	D (42.7)
			EB	E (55.3)	D (39.6)
			Overall	**C (31.5)**	**C (34.5)**
9	Scottsdale Road & Joan D Arc Avenue/Sutton Drive	2-way stop (EB)	NB Left	B (10.8)	B (11.9)
			SB Left	B (10.8)	B (11.9)
			EB Shared	C (16.1)	F (64.3)
			WB Shared	B (14.5)	C (20.7)
10	Scottsdale Road & Sweetwater Avenue	Signal	NB	D (43.9)	D (41.9)
			SB	A (7.0)	A (6.5)
			EB	D (39.6)	D (39.0)
			WB	D (45.3)	D (40.2)
			Overall	**C (27.9)**	**C (25.2)**

Table 2 – Existing Peak Hour Levels of Service (cont.)

ID	Intersection	Control	Approach	AM	PM
11	Scottsdale Road & Cactus Road	Signal	NB	F (97.3)	F (361.5)
			SB	E (58.7)	F (82.0)
			EB	F (83.1)	D (39.4)
			WB	D (43.5)	E (59.4)
			Overall	**E (71.2)**	**F (163.6)**
B	Scottsdale Road & Access B	2-way stop (EB/WB)	NB Left	B (11.8)	B (12.9)
			SB Left	B (11.1)	B (11.1)
			EB Shared	E (35.7)	C (22.9)
			WB Shared	A (0.0)	B (12.7)

The results of the existing conditions analysis summarized in **Table 2** indicate that most intersections operate with acceptable levels of service within the study area, but a few already have at least one approach operating with high delays. This is due to the high volume of vehicles currently utilizing the roadway network today.

PROPOSED DEVELOPMENT

SITE LOCATION

The location of the proposed site is north of Sutton Drive and east of Scottsdale Road in the City of Scottsdale, Arizona. The site is currently occupied by the Seventh-Day Adventist campus and affiliated buildings. The proposed site will consist of offices, industrial uses, several airplane hangars, townhomes and single-family detached homes.

SITE ACCESS

All site access points to the proposed development are existing. The access points are as follows:

- *Access A* is a full movement access located on Thunderbird Road approximately 675 east of the signalized intersection of 73rd Street and Thunderbird Road. Currently there is space for one shared egress lane and one ingress lane.
- *Access B* is a full movement access located on Scottsdale Road approximately 665 feet south of the signalized intersection of Scottsdale Road and Thunderbird Road. This access point currently aligns with a retail driveway for the complex west of Scottsdale Road.
- *Access C* is a right-in/right-out only access on Scottsdale Road approximately 995 feet south of the signalized intersection of Scottsdale Road and Thunderbird Road.
- *Access D* is a full movement access located on Sutton Drive approximately 350 feet east of the unsignalized intersection of Scottsdale Road and Sutton Drive.
- *Access E* is a full movement access located on Sutton Drive approximately 1,580 feet east of the unsignalized intersection of Scottsdale Road and Sutton Drive. This access point only allows access to the existing school campus as well as the existing residential units.

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

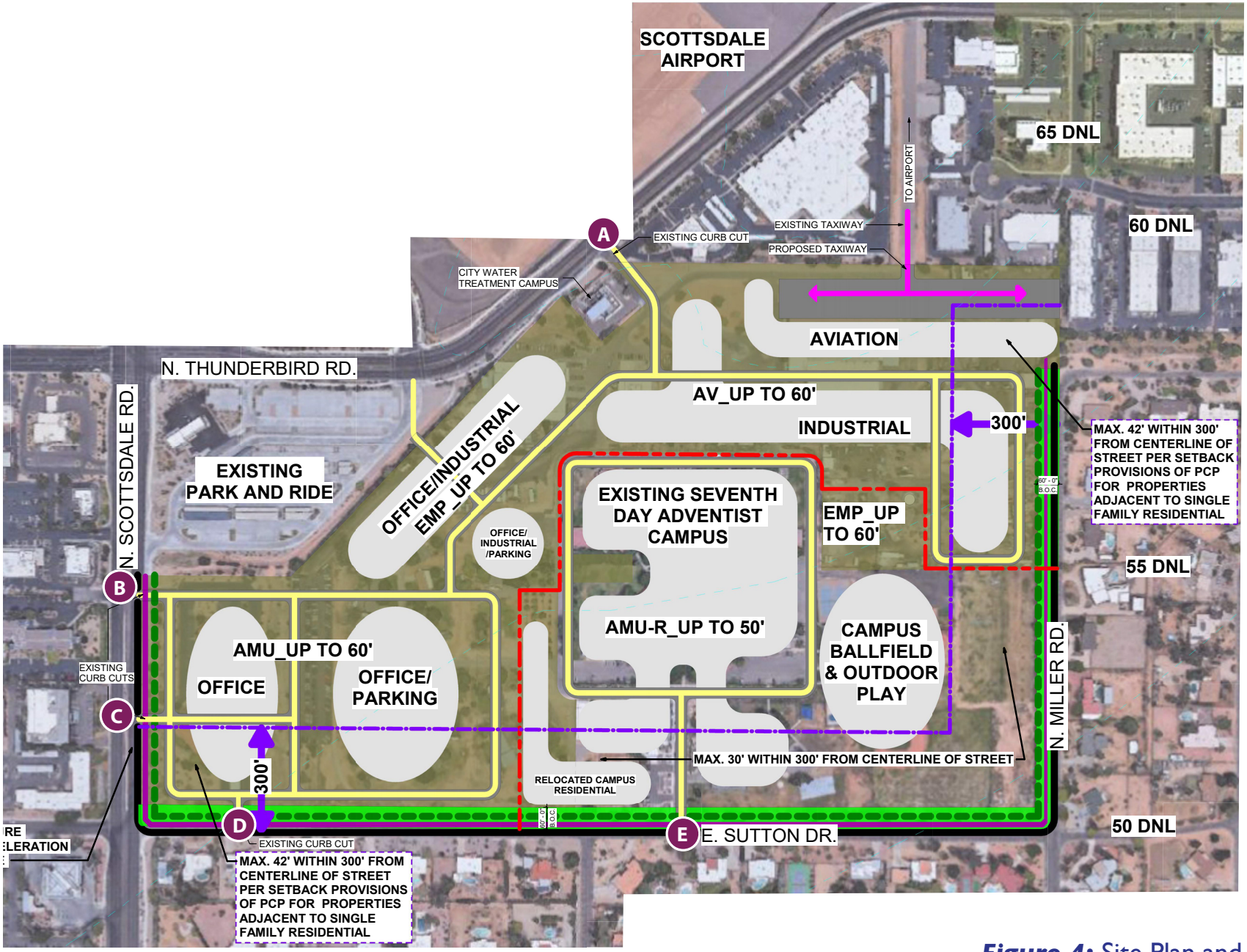


Figure 4: Site Plan and Access

TRIP GENERATION COMPARISON

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

The proposed site currently provides the Thunderbird Academy, the Conference for the 7th Day Adventists, some single-family homes for faculty and students of the Thunderbird Academy, some airplane hangars and some light industrial space. It can be assumed that the Conference for the 7th Day Adventists produces a majority of their traffic on Sunday with minimal AM and PM peak hour traffic during the weekday. Additionally, the airplane Hangars and the light industrial space likely produce little to no traffic on a typical weekday. Since the Thunderbird Academy will remain as-is and the single-family housing surrounding the school will be rebuilt, no existing trips will be subtracted from the existing traffic counts in order to remain conservative.

The proposed development will consist of approximately 168,200 square feet (SF) of industrial usage, 508,000 SF of office space, 6 single-family detached homes and 5 airplane hangars. Although the townhomes currently exist on the property today and will only be re-located within the current site, they have been included in this analysis in order to give a more conservative estimate of trips generated by the proposed site. There is no explicit land use for airplane hangars, so for the purpose of this study, the land use code (LUC) for mini-warehouse was used. Mini-warehouse and airplane hangars are assumed to generate roughly the same number of daily trips per storage unit/hangar, which is very small. It is unlikely that the airplane hangars will be generating trips every day, but they were still included in the trip generation to remain conservative. The trip generation for the proposed medical office building is summarized in **Table 3**. Detailed trip generation calculations are provided in **Appendix D**.

Table 3 – Trip Generation Summary

Proposed Use	ITE LUC	Size	Units	Weekday Trips						
				Daily	AM			PM		
				Total	In	Out	Total	In	Out	Total
Airplane Hangars	151	5	Storage Units	0	0	0	0	1	1	2
Industrial Park	130	147,270	Square Feet	1,148	48	11	59	12	47	59
General Office Building	710	508,000	Square Feet	5,164	457	74	531	86	453	539
Homes	210	6	DU	78	2	7	9	4	3	7
Townhomes	220	12	DU	50	1	5	6	6	3	9
			Subtotals	**6,440**	**508**	**97**	**605**	**109**	**507**	**616**

As summarized in **Table 3**, the proposed development is estimated to generate approximately 6,440 external weekday daily trips with 605 trips occurring during the AM peak hour (508 in/97 out), and 616 trips occurring during the PM peak hour (109 in/507 out).

VEHICLE TRIP DISTRIBUTION AND ASSIGNMENT

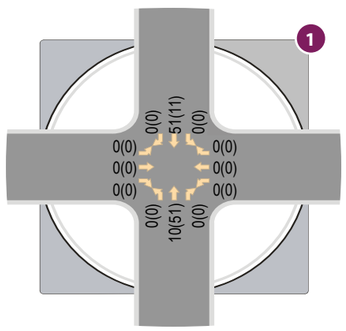
A single trip distribution pattern was assumed for the proposed development. It is expected that the proposed development will generate trips based on future population. Future total population, as predicted by the 2020/2030 socio-economic data compiled by the Maricopa Association of Governments (MAG), was used as a basis to estimate trip distribution within a 7-mile radius. The resulting trip distribution percentages for the study area are shown in **Table 4**. The trip distribution calculations are included in **Appendix E**.

Table 4 – Site Trip Distribution

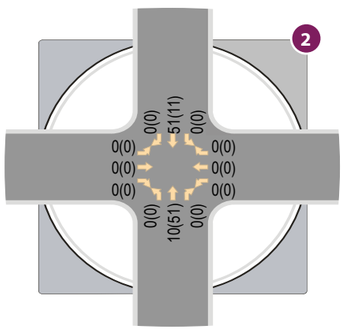
Direction (To/From)	Percentage
North on Scottsdale Road (north of Acoma Drive)	10%
South on Scottsdale Road (south of Cactus Drive)	12%
North on Hayden Road (north of Redfield Road)	12%
South on Hayden Road (south of Redfield Road)	18%
West on Thunderbird Road (west of Scottsdale Road)	20%
East on Sweetwater Avenue (east of Scottsdale Road)	2%
West on Sweetwater Avenue (west of Scottsdale Road)	6%
East on Cactus Drive (east of Scottsdale Road)	2%
West on Cactus Drive (west of Scottsdale Road)	18%
Total	**100%**

Figure 5 illustrates the trip distribution percentages noted in **Table 4** on the roadway network within the study area. The percentages presented in **Figure 5** were applied to the site trips generated to determine the AM and PM peak hour site traffic at the intersections within the study area. **Figure 6** presents the resulting site trip assignment for the proposed development.

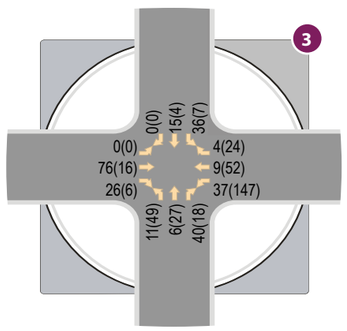
Figure 5: Trip Distribution



Scottsdale Rd. & Greenway Pkwy.



Scottsdale Rd. & Acoma Dr.



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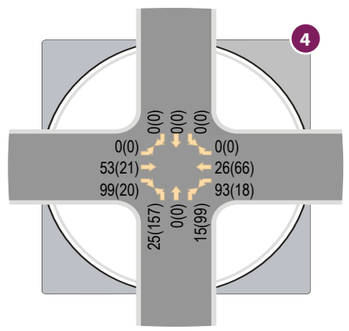
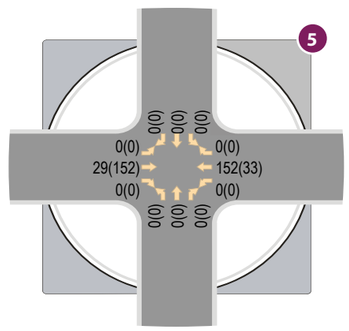


73rd St. & Thunderbird Rd.



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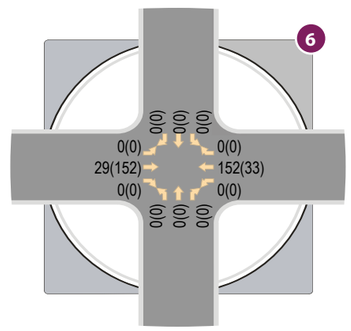

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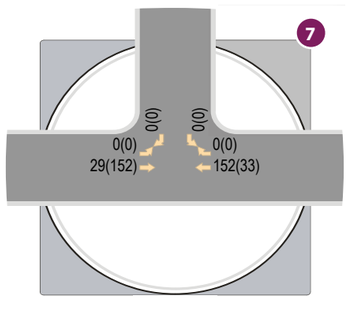

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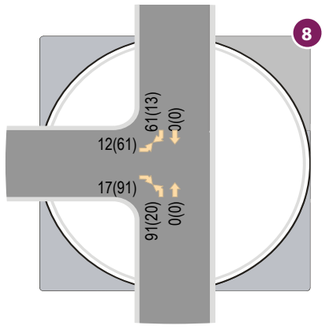
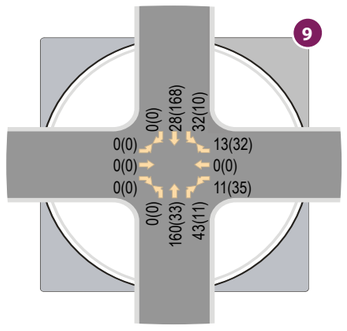


Hayden Rd. & Redfield Rd.



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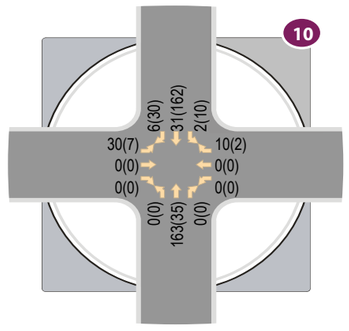
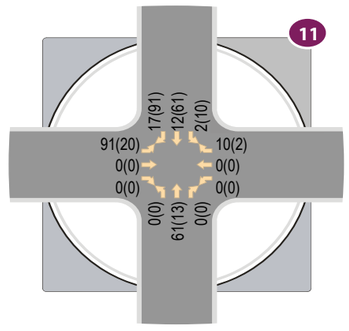
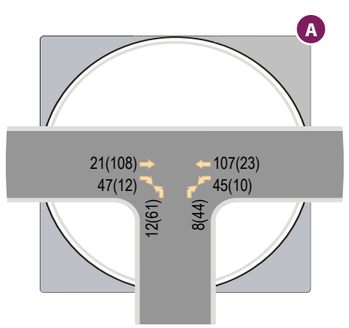


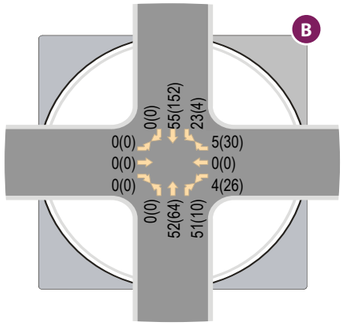
Scottsdale Rd. & Sweetwater Ave.



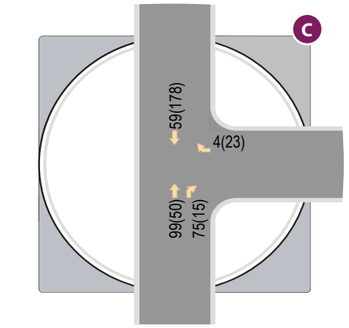
Scottsdale Rd. & Cactus Rd.



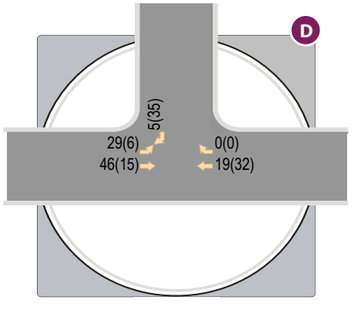
Access A & Redfield Rd.



Scottsdale Rd. & Access B



Scottsdale Rd. & Access C



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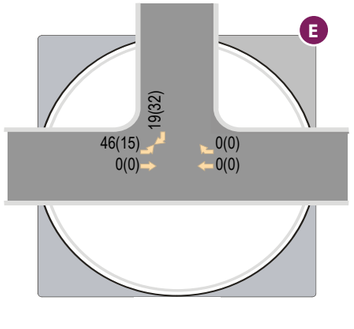

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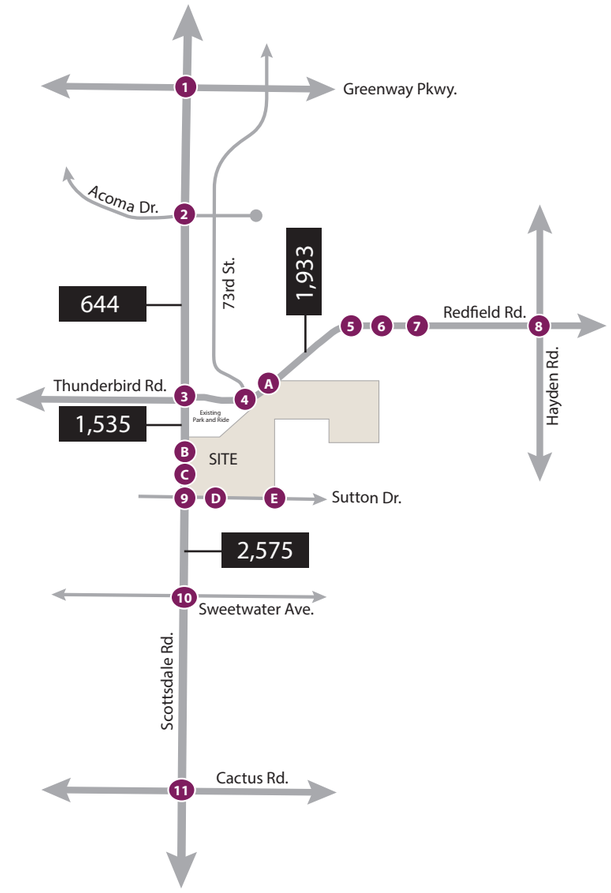


LEGEND

NORTH

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

XX,XXX Average Daily Traffic Volumes

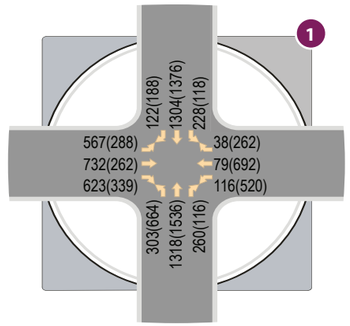
Figure 6: Site Traffic Volumes

FUTURE BACKGROUND TRAFFIC

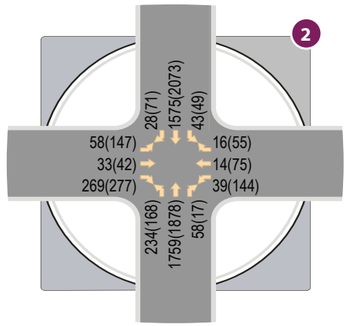
CivTech applied an expansion factor to the existing traffic counts conducted for this study to obtain the background traffic volumes along the adjacent roadway network. In reviewing the City of Scottsdale historic traffic count maps, a regional growth rate of 1.3% per year was found near the intersection of Sweetwater Avenue and Hayden Road. This growth rate was converted to an expansion factor of 1.067 for the opening year 2024 and an expansion factor of 1.138 for horizon year 2029. **Figure 7** presents the background volumes for the opening year 2024 and **Figure 8** presents the background volumes for the horizon year 2029. Background volume calculation worksheets are included in **Appendix F**.

TOTAL TRAFFIC

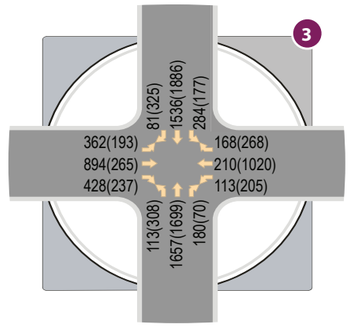
Total traffic was determined by adding the site generated traffic to the estimated projected background traffic. Total peak hour traffic volumes for the opening year of 2024 are shown in **Figure 9**, total volumes for the horizon year 2029 are presented in **Figure 10.**



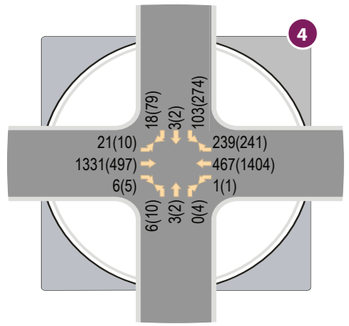
Scottsdale Rd. & Greenway Pkwy.



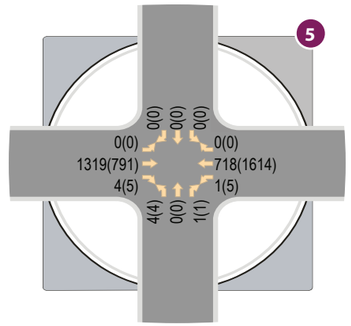
Scottsdale Rd. & Acoma Dr.



Scottsdale Rd. & Thunderbird Rd.



73rd St. & Thunderbird Rd.



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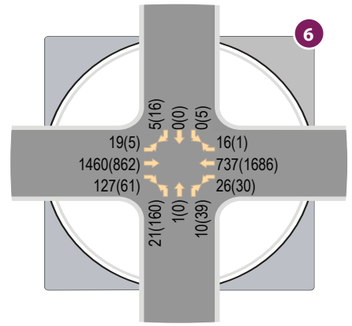
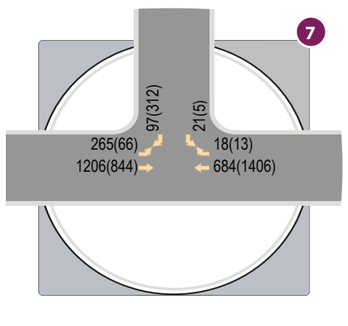


76th St. & Redfield Rd.



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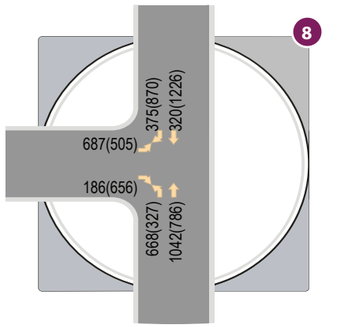
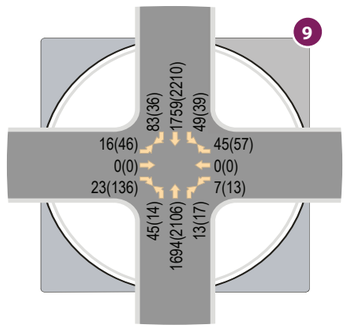
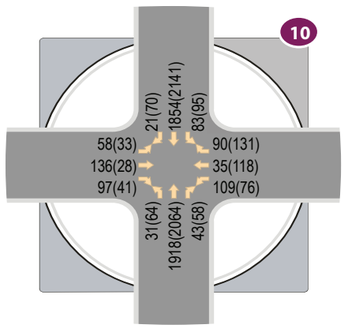


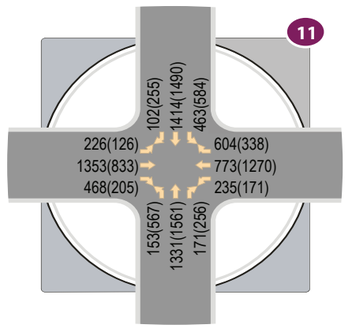
Hayden Rd. & Redfield Rd.



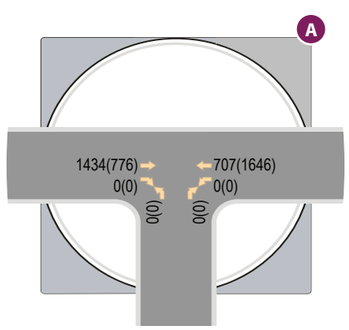
Scottsdale Rd. & Sutton Dr.



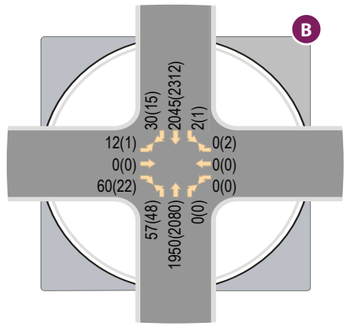
Scottsdale Rd. & Sweetwater Ave.



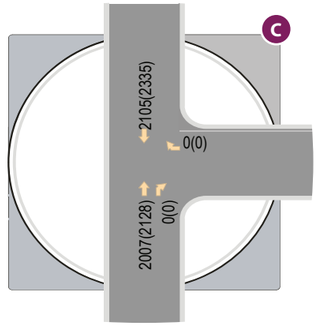
Scottsdale Rd. & Cactus Rd.



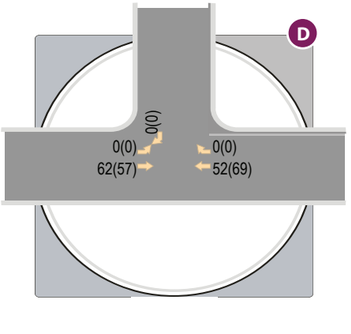
Access A & Redfield Rd.



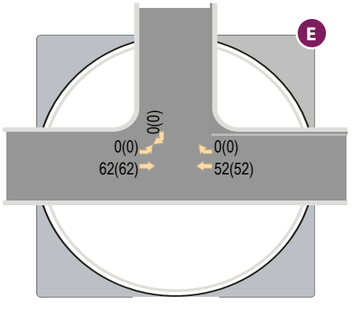
Scottsdale Rd. & Access B



Scottsdale Rd. & Access C



Access D & Sutton Dr.



Access E & Sutton Dr.

LEGEND

NORTH

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

XX,XXX Average Daily Traffic Volumes

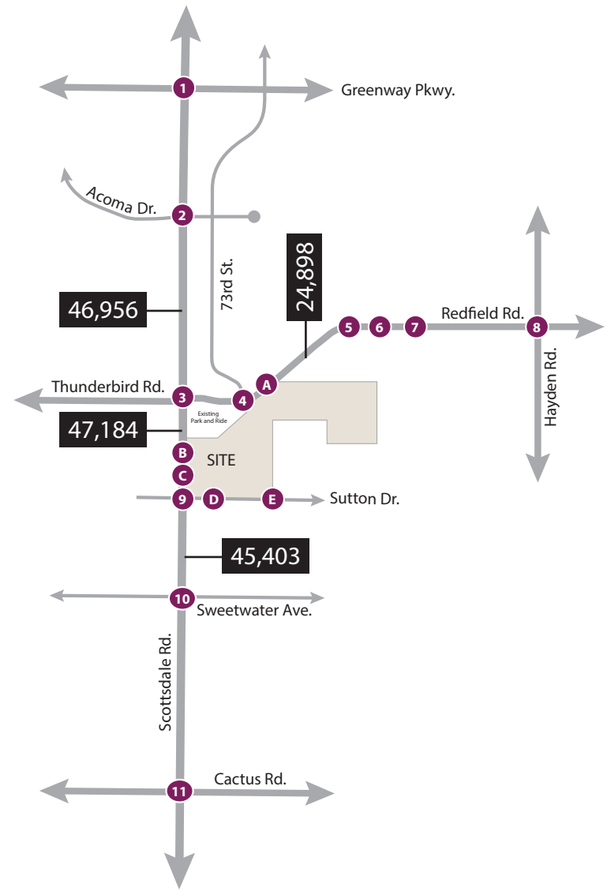
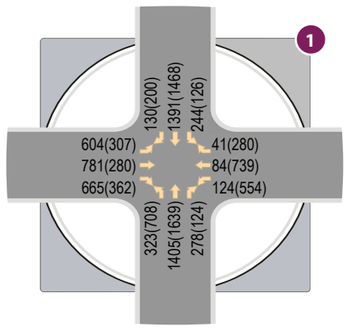
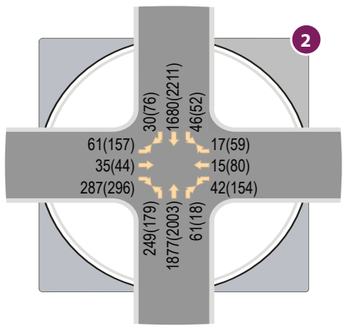


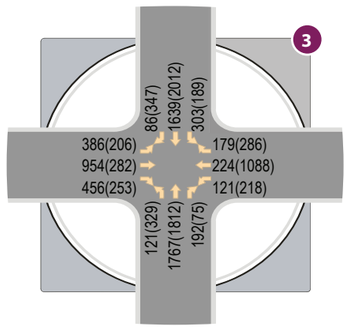
Figure 7: 2024 Background Traffic Volumes



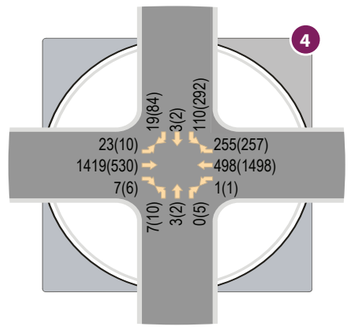
Scottsdale Rd. & Greenway Pkwy.



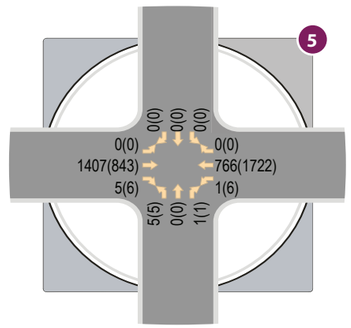
Scottsdale Rd. & Acoma Dr.



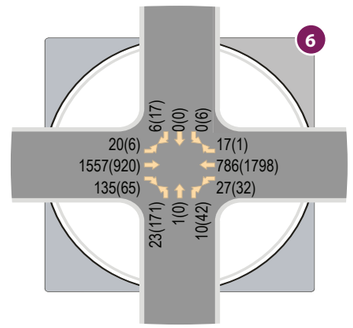
Scottsdale Rd. & Thunderbird Rd.



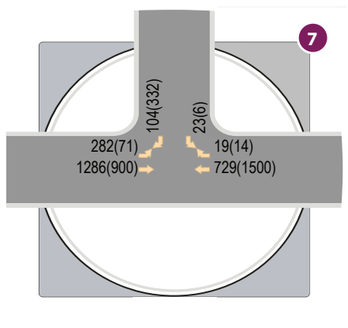
73rd St. & Thunderbird Rd.



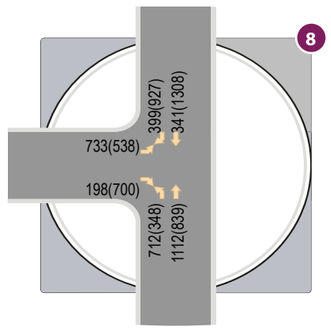
Airport Taxiway & Redfield Rd.



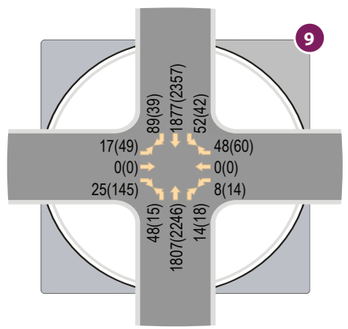
76th St. & Redfield Rd.



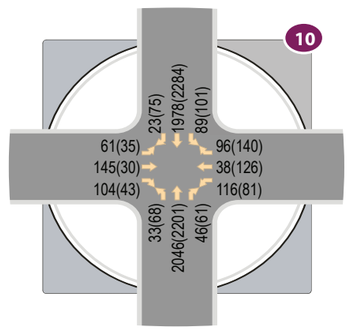
76th Pl. & Redfield Rd.



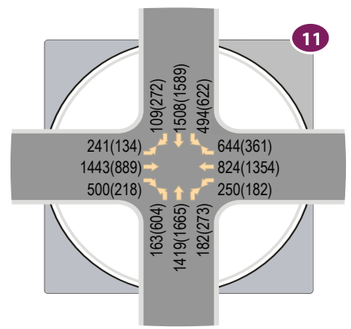
Hayden Rd. & Redfield Rd.



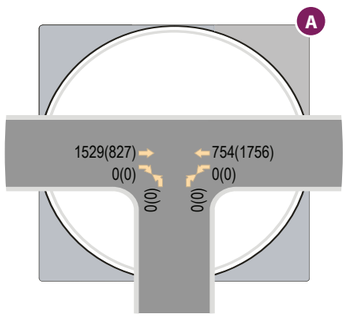
Scottsdale Rd. & Sutton Dr.



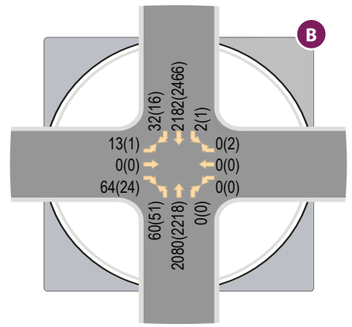
Scottsdale Rd. & Sweetwater Ave.



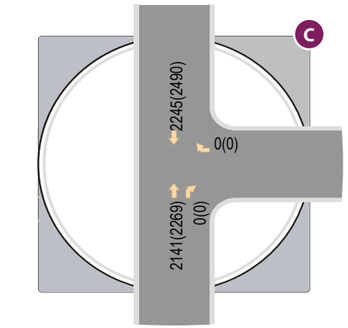
Scottsdale Rd. & Cactus Rd.



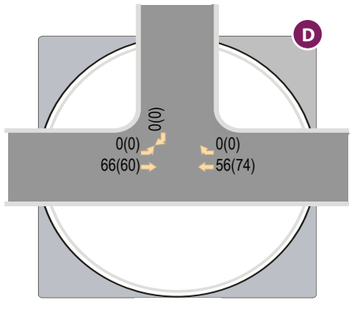
Access A & Redfield Rd.



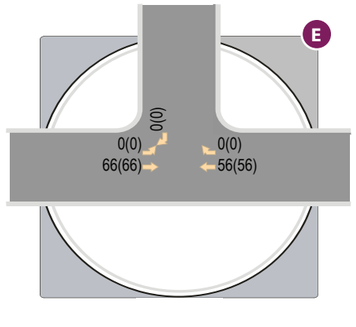
Scottsdale Rd. & Access B



Scottsdale Rd. & Access C



Access D & Sutton Dr.



Access E & Sutton Dr.

LEGEND

NORTH

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

XX,XXX Average Daily Traffic Volumes

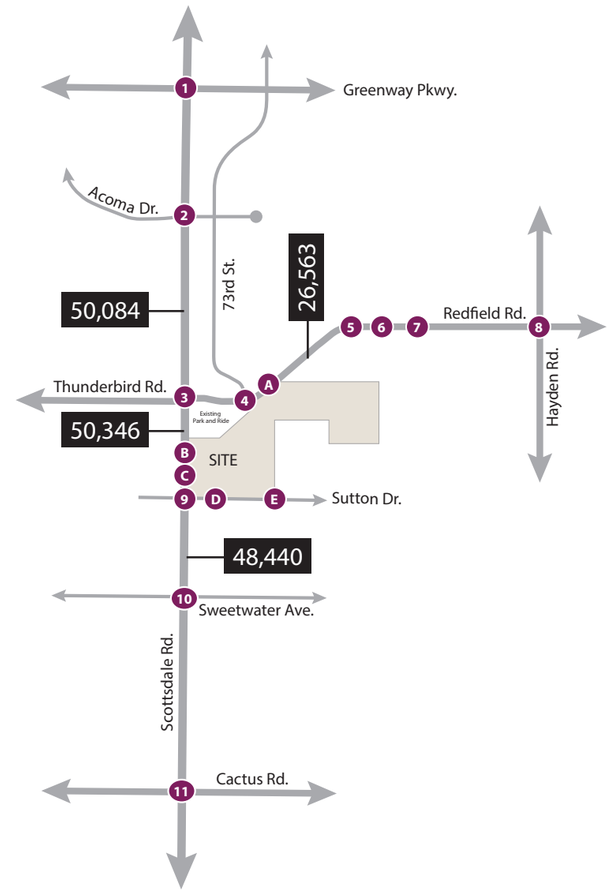
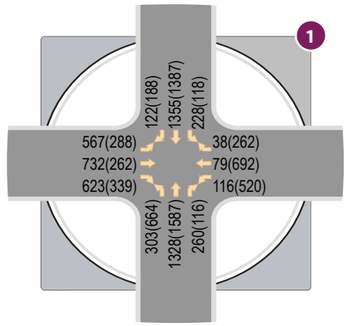
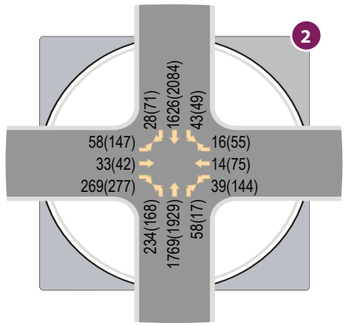


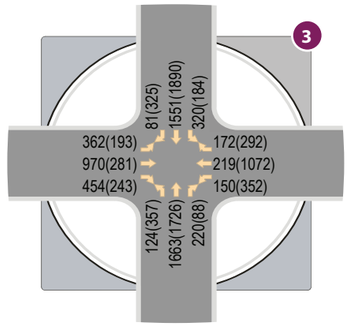
Figure 8: 2029 Background Traffic Volumes



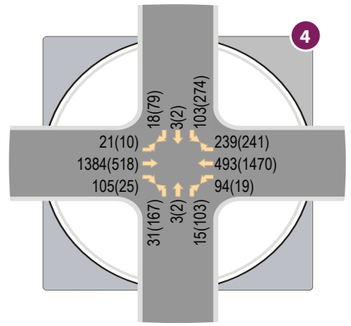
Scottsdale Rd. & Greenway Pkwy.



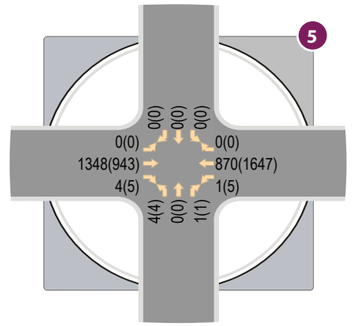
Scottsdale Rd. & Acoma Dr.



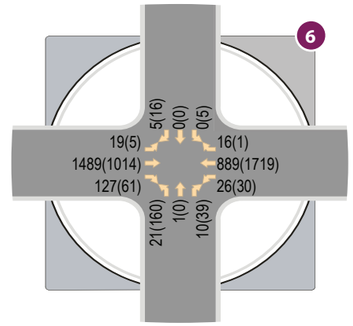
Scottsdale Rd. & Thunderbird Rd.



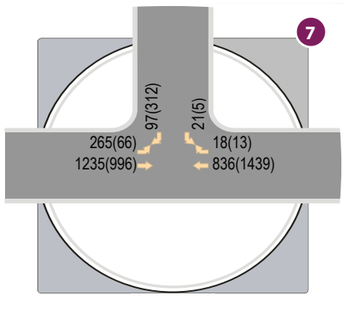
73rd St. & Thunderbird Rd.



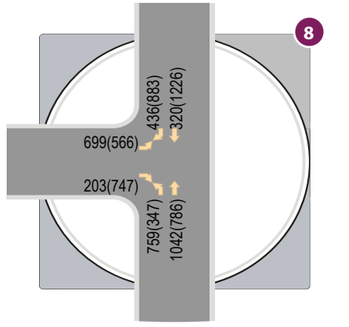
Airport Taxiway & Redfield Rd.



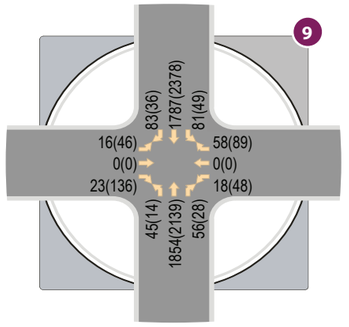
76th St. & Redfield Rd.



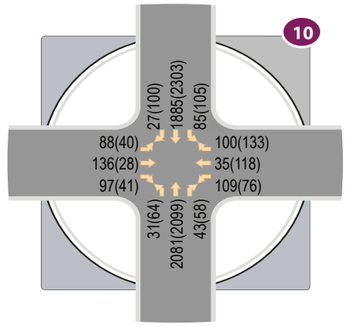
76th Pl. & Redfield Rd.



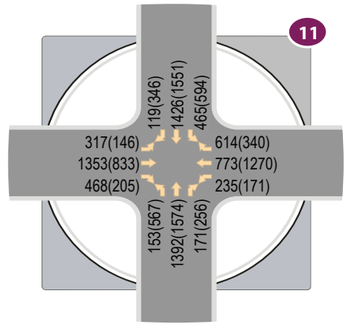
Hayden Rd. & Redfield Rd.



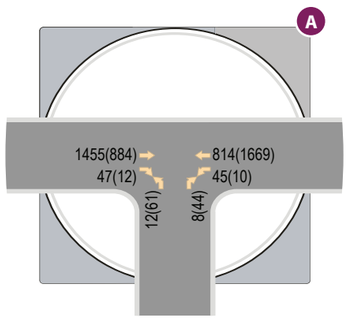
Scottsdale Rd. & Sutton Dr.



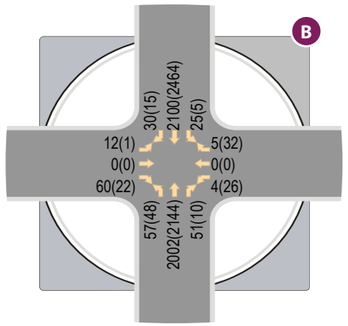
Scottsdale Rd. & Sweetwater Ave.



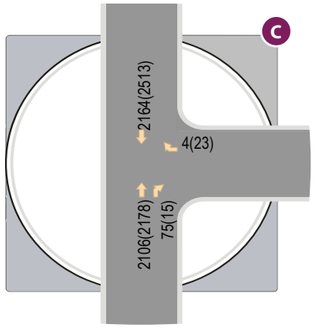
Scottsdale Rd. & Cactus Rd.



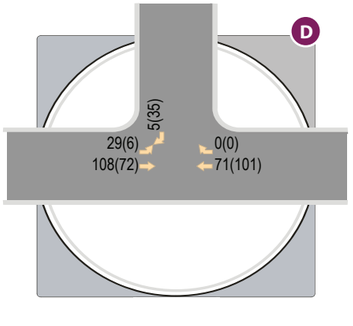
Access A & Redfield Rd.



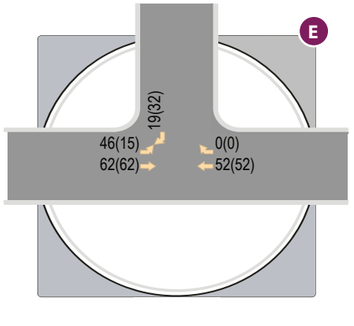
Scottsdale Rd. & Access B



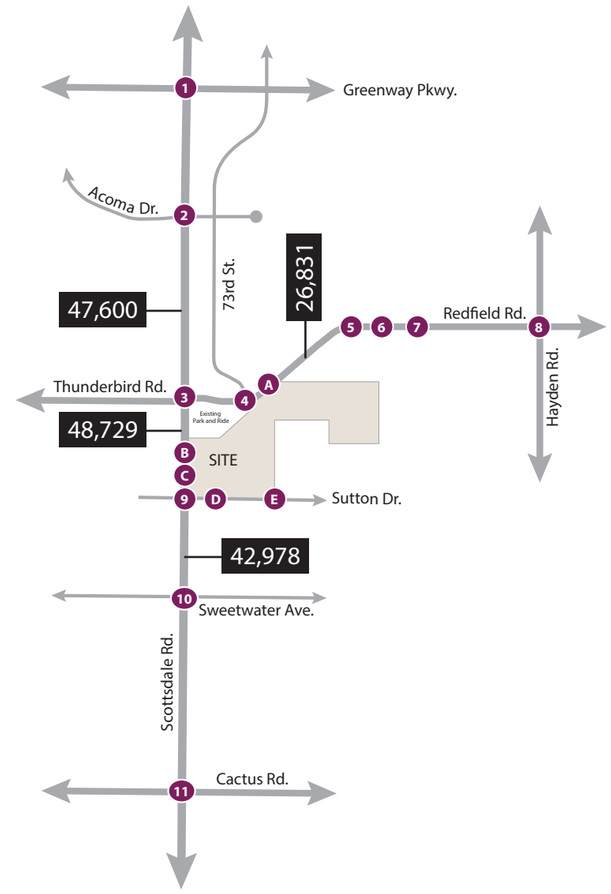
Scottsdale Rd. & Access C



Access D & Sutton Dr.



Access E & Sutton Dr.



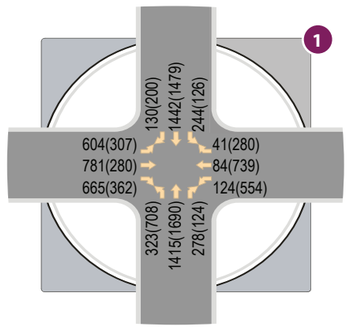
LEGEND

NORTH

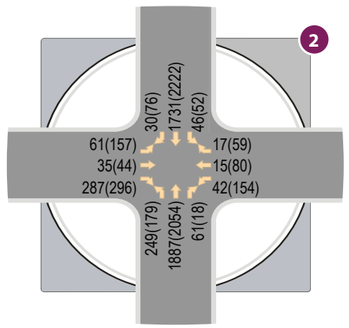
XX(XX) - AM(PM) Peak Hour Traffic Volumes

XX,XXX Average Daily Traffic Volumes

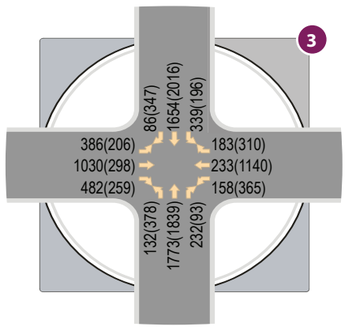
Figure 9: 2024 Total Traffic Volumes



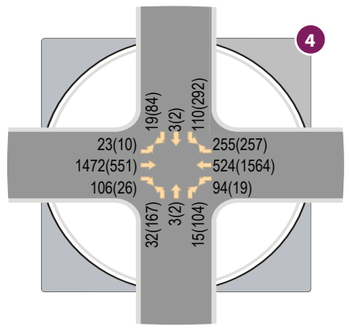
Scottsdale Rd. & Greenway Pkwy.



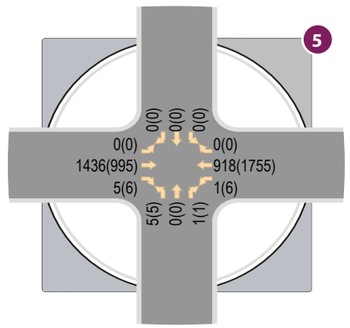
Scottsdale Rd. & Acoma Dr.



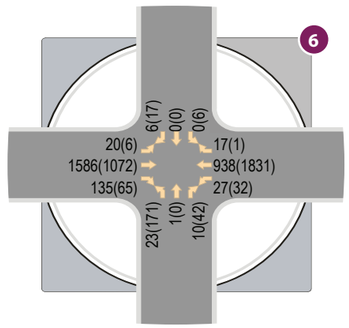
Scottsdale Rd. & Thunderbird Rd.



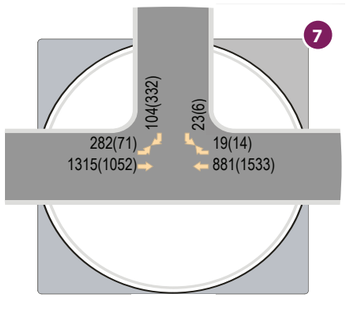
73rd St. & Thunderbird Rd.



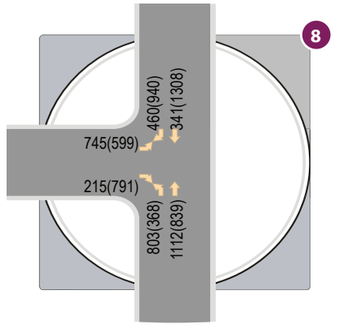
Airport Taxiway & Redfield Rd.



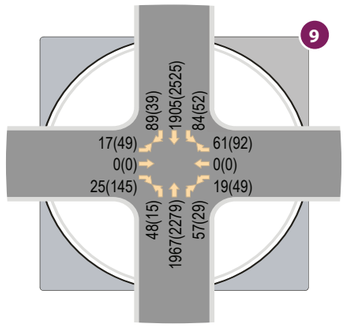
76th St. & Redfield Rd.



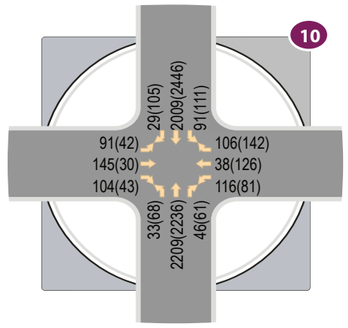
76th Pl. & Redfield Rd.



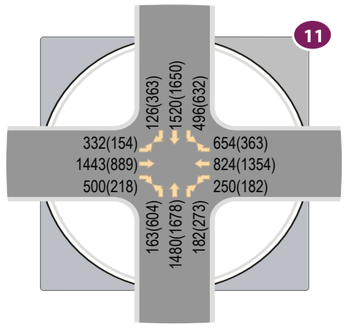
Hayden Rd. & Redfield Rd.



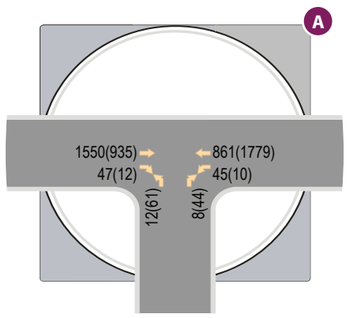
Scottsdale Rd. & Sutton Dr.



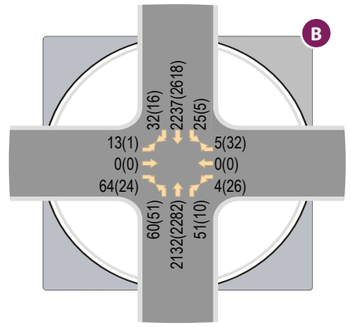
Scottsdale Rd. & Sweetwater Ave.



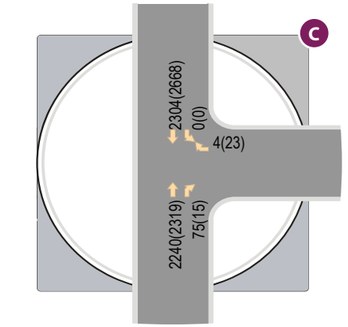
Scottsdale Rd. & Cactus Rd.



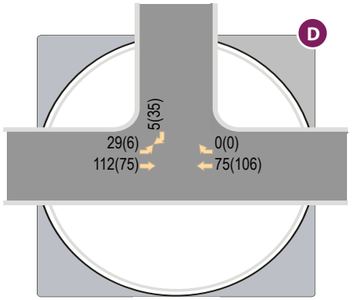
Access A & Redfield Rd.



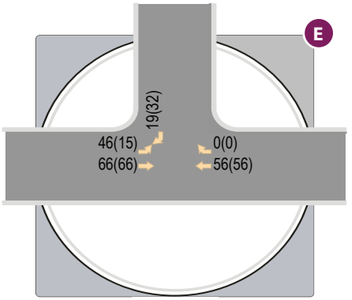
Scottsdale Rd. & Access B



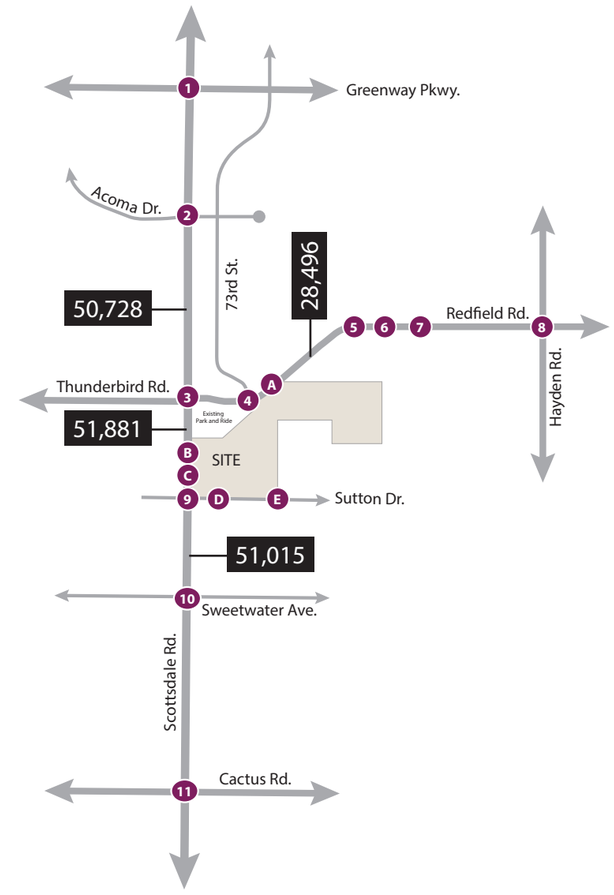
Scottsdale Rd. & Access C



Access D & Sutton Dr.



Access E & Sutton Dr.



LEGEND

NORTH

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

XX,XXX Average Daily Traffic Volumes

Figure 10: 2029 Total Traffic Volumes

TRAFFIC AND IMPROVEMENT ANALYSIS

Opening Year 2024

The overall intersection and approach levels of service are summarized in **Table 5** for the 2024 total traffic conditions. Detailed analysis worksheets for the 2024 opening year can be found in **Appendix G.**

Table 5 – 2024 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build AM (PM)	Full Build AM (PM)	With Timing Adjustments AM (PM)
1	Scottsdale Road & Greenway Parkway	Signal	NB	D 54.1 (E 59.0)	D 54.3 (D 45.8)	[Not adjusted]
			SB	D 39.6 (D 45.9)	D 40.3 (D 46.4)	
			EB	D 46.3 (E 74.9)	D 46.3 (E 74.9)	
			WB	E 60.7 (E 59.2)	E 60.7 (E 59.2)	
			Overall	**D 47.3 (E 57.4)**	**D 47.5 (D 52.6)**	
2	Scottsdale Road & Acoma Drive	Signal	NB	A 2.4 (A 3.4)	A 32.6 (A 3.3)	[Not adjusted]
			SB	A 9.7 (C 32.8)	A 9.9 (C 33.0)	
			EB	F 101.5 (F 202.5)	F 101.5 (F 202.5)	
			WB	D 49.0 (F 101.4)	D 49.0 (F 101.4)	
			Overall	**B 12.5 (D 37.1)**	**B 12.6 (D 36.7)**	
3	Scottsdale Road & Thunderbird Road	Signal	NB	F 93.9 (F 120.4)	F 94.5 (F 148.9)	F 86.3 (F 103.4)
			SB	D 52.0 (D 51.2)	E 62.0 (D 41.1)	C 23.6 (E 74.1)
			EB	F 113.8 (F 132.6)	F 146.3 (F 129.3)	F 108.2 (F 111.9)
			WB	D 54.3 (E 74.6)	E 55.2 (F 88.9)	E 59.1 (E 77.6)
			Overall	**F 83.6 (F 85.7)**	**F 96.0 (F 94.3)**	**E 71.3 (F 87.5)**
4	73rd Street & Thunderbird Road	Signal	NB	B 13.1 (B 13.1)	B 13.6 (B 15.4)	[Not adjusted]
			SB	B 14.9 (B 19.6)	B 15.0 (C 20.9)	
			EB	C 25.0 (B 16.2)	E 56.6 (B 16.4)	
			WB	B 15.5 (D 54.7)	C 33.1 (E 70.3)	
			Overall	**C 21.7 (D 41.7)**	**D 46.4 (D 49.4)**	
5	Airport Taxiway & Redfield Road	Signal	NB	E 67.8 (E 67.8)	E 67.8 (E 67.8)	[Not adjusted]
			SB	A 0.0 (A 0.0)	A 0.0 (A 0.0)	
			EB	B 13.9 (A 3.0)	B 16.2 (A 3.9)	
			WB	A 1.5 (A 2.6)	A 1.6 (A 2.6)	
			Overall	**B 10.1 (A 2.9)**	**B 11.1 (A 3.3)**	
6	76th Street & Redfield Road	Signal	NB	B 17.4 (D 42.9)	B 17.4 (D 42.7)	[Not adjusted]
			SB	B 16.9 (C 34.9)	B 16.9 (C 34.8)	
			EB	F 331.1 (B 19.0)	F 344.4 (C 29.1)	
			WB	A 2.9 (B 10.3)	A 2.9 (B 10.8)	
			Overall	**F 218.4 (B 16.0)**	**F 215.1 (B 19.9)**	
7	76th Place and Redfield Road	Signal	SB	B 17.5 (E 59.8)	B 17.5 (E 60.1)	[Not adjusted]
			EB	F 115.7 (A 5.0)	F 139.9 (A 6.7)	
			WB	A 9.0 (B 11.8)	A 9.6 (B 12.2)	
			Overall	**E 77.4 (B 15.6)**	**F 88.3 (B 15.8)**	
8	Hayden Road & Redfield Road	Signal	NB	C 23.6 (B 15.8)	D 40.4 (C 20.3)	[Not adjusted]
			SB	C 20.2 (D 50.7)	B 19.8 (D 46.7)	
			EB	E 60.2 (D 41.9)	E 62.5 (D 51.2)	
			Overall	**C 33.3 (D 39.3)**	**D 42.6 (D 41.2)**	

Table 5 – 2024 Peak Hour Levels of Service (cont'd.)

ID	Intersection	Control	Approach	No Build LOS AM (PM)	Full Build LOS AM (PM)	With Timing Adjustments AM (PM)
9	Scottsdale Road & Joan D Arc Avenue/Sutton Drive	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	B 11.4 (B 12.8) B 11.1 (B 12.3) C 17.8 (F 123.8) C 15.6 (D 26.2)	B 11.4 (B 13.2) B 12.6 (B 12.9) C 20.2 (F 0.0) C 21.3 (F 0.0)	[Not adjusted]
10	Scottsdale Road & Sweetwater Avenue	Signal	NB SB EB WB **Overall**	D 44.9 (D 43.5) A 6.8 (B 15.0) D 41.5 (D 40.0) D 49.5 (D 41.5) **C 28.7 (C 30.0)**	D 46.7 (D 44.0) A 6.7 (B 16.3) D 43.5 (D 40.9) D 50.5 (D 41.6) **C 30.2 (C 30.4)**	[Not adjusted]
11	Scottsdale Road & Cactus Road	Signal	NB SB EB WB **Overall**	F 124.6 (F 410.3) E 73.3 (F 95.0) F 104.6 (D 40.4) D 48.9 (E 74.4) **F 88.6 (F 186.9)**	F 143.8 (F 420.4) E 75.5 (F 111.2) F 116.3 (D 40.1) D 50.3 (E 74.4) **F 97.7 (F 193.4)**	F 94.6 (F 91.0) E 73.8 (F 105.6) F 96.5 (F 86.7) E 74.0 (F 120.3) **F 85.0 (F 101.3)**
A	Access A & Thunderbird Road	1-way stop (NB)	NB Shared WB Left	-- (--) -- (--)	F [(1)] (D 29.2) F [(1)] (B 12.5)	[Not adjusted]
B	Scottsdale Road & Access B	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	B 12.6 (B 14.0) B 11.4 (B 11.7) F 61.2 (D 30.6) A 0.0 (B 13.5)	B 12.6 (B 14.7) B 11.7 (B 12.2) F 126.5 (F 53.6) C 20.9 (D 27.3)	[Not adjusted]
C	Scottsdale Road & Access C	1-way stop (WB)	WB Right	-- (--)	B 13.6 (B 14.5)	[Not adjusted]
D	Access D & Sutton Drive	1-way stop (SB)	SB Shared EB Left	-- (--) -- (--)	A 8.7 (A 9.0) A 7.4 (A 7.4)	[Not adjusted]
E	Access E & Sutton Drive	1-way stop (SB)	SB Shared EB Left	-- (--) -- (--)	A 8.6 (A 8.7) A 7.4 (A 7.4)	[Not adjusted]

The results of the 2024 level of service analysis indicate that most intersections will operate with overall acceptable levels of service within the study area; a few may have at least one approach operating with higher delays. At the two following major signalized intersections CivTech recommends the City consider making the described adjustments to signal timing to minimize delays and bring future overall delays at these intersections closer to the same levels as existing delays or those expected without the project:

The signalized intersection of Scottsdale Road and Thunderbird Road is expected to experience delay on all approaches during both the AM and PM peak hours. In order to demonstrate that these delays can be reduced, CivTech adjusted the signal timing. While some of the approaches will experience increased delays with these adjustments, each approach delay will be more-evenly distributed overall and no single approach will be substantially delayed longer than another. Note that these levels of delays are already present under existing conditions and will continue to be experienced without the project with the continued growth of background traffic volumes. Adjusting the cycle length of the signal would impact the progression through the signals along Scottsdale Road and, thus, cannot be recommended. Adjustments can be made to the signal timing to reduce the overall delay during the AM peak hour from 96.0 seconds per vehicle to 71.3 seconds per vehicle and to reduce the overall

delay during the PM peak hour from 94.3 seconds per vehicle to 87.5 seconds per vehicle. These are comparable to existing 83.6 seconds per vehicle AM delays and 68.6 seconds per vehicle PM delays. The Synchro reports of these intersections in the appendix provide the timing, where adjusted. CivTech recommends the City of Scottsdale carefully consider implementing these timing adjustments. Any additional measures would be the responsibility of the City of Scottsdale. If delays at this intersection become too high, vehicles will likely re-route themselves to another one of the access points either along Scottsdale Road, Sutton Drive, or to Redfield/Thunderbird Road.

The signalized intersection of Scottsdale Road and Cactus Road is expected to experience delay on the northbound, southbound and eastbound approaches during the AM peak hour and the northbound, southbound and westbound approaches during the PM peak hour. As at Thunderbird Road, CivTech adjusted the signal timing and recommends that the City of Scottsdale consider changing the cycle length from 120 seconds to 145 seconds. Please note that this delay is present under existing conditions and will continue without the project with the continued growth of background traffic. While it is not the responsibility of the developer to mitigate the delay via capacity improvements, the analysis shows that, with some adjustments to signal timing, the overall delay during the AM peak hour could be reduced from 97.7 seconds per vehicle to 85.0 seconds per vehicle and the PM peak hour delay could be reduced from 193.4 seconds per vehicle to 101.3 seconds per vehicle. These are comparable to existing 71.2 seconds per vehicle AM delays and 163.6 seconds per vehicle PM delays. The Synchro reports of these intersection in the appendix provide the timing, where adjusted. CivTech also recommends the City of Scottsdale carefully consider implementing these timing adjustments and, as the site develops over time, the development team will work with the staff of the City's Transportation Department to address issues of delays at and progression through the signalized intersections in the study area via adjustments to signal cycles and phasing.

CivTech recommends at the following intersections no measures for which the developer would be responsible for the reasons indicated:

The signalized intersections of **76th Street/76th Place and Redfield Road** are expected to experience delay on the southbound and eastbound approaches. By full buildout of this site, the City of Scottsdale is planning on widening Redfield Road to add a second through lane in both the eastbound and westbound directions. This should help with the capacity of vehicles on the road in the future, meaning that this delay will likely not be present if the road is wider. No mitigation by the developer is recommended at this time.

The unsignalized intersection of **Scottsdale Road and Sutton Drive** is expected to continue experiencing delay on the eastbound and westbound approaches during the PM peak hour. The delays that are anticipated for the 2024 horizon year are typical for minor streets intersecting with major streets. No traffic signal is being requested at this intersection; however, it is recommended that the City of Scottsdale monitor this intersection for safety and higher delays in the future.

Horizon Year 2029

The overall intersection and approach levels of service are summarized in **Table 6** for the 2029 total traffic conditions. The same signal timing adjustments developed from the opening year 2024 analysis were applied to the full build scenario for 2029. Detailed analysis worksheets for the 2029 horizon year can be found in **Appendix H.**

Table 6 – 2029 Peak Hour Levels of Service

ID	Intersection	Control	Approach	No Build LOS AM (PM)	Full Build LOS AM (PM)
1	Scottsdale Road & Greenway Parkway	Signal	NB	E 57.1 (E 62.7)	E 57.2 (E 61.5)
			SB	D 41.3 (D 52.2)	D 42.2 (D 53.0)
			EB	D 54.1 (F 83.1)	D 54.1 (F 83.1)
			WB	E 61.7 (E 69.0)	E 61.7 (E 69.0)
			Overall	**D 51.4 (E 63.8)**	**D 51.7 (E 63.6)**
2	Scottsdale Road & Acoma Drive	Signal	NB	A 3.8 (A 3.3)	A 4.7 (A 3.3)
			SB	B 10.2 (C 22.8)	B 10.4 (C 22.9)
			EB	F 125.0 (F 259.4)	F 125.0 (F 259.4)
			WB	D 49.3 (F 119.3)	D 49.3 (F 119.3)
			Overall	**B 15.1 (D 38.2)**	**B 15.5 (D 37.9)**
3	Scottsdale Road & Thunderbird Road	Signal	NB	F 119.3 (F 142.3)	F 110.1 (F 124.3)
			SB	D 52.0 (E 58.1)	B 16.5 (F 102.1)
			EB	F 142.2 (F 144.0)	F 134.4 (F 121.7)
			WB	D 53.8 (F 99.5)	E 60.2 (F 97.6)
			Overall	**F 100.1 (F 101.6)**	**F 84.7 (F 109.8)**
4	73rd Street & Thunderbird Road	Signal	NB	B 13.1 (B 13.1)	B 13.6 (B 15.5)
			SB	B 15.1 (C 20.1)	B 15.1 (C 21.9)
			EB	D 35.1 (B 16.3)	F 83.6 (B 16.5)
			WB	B 15.7 (E 77.9)	C 32.3 (F 95.5)
			Overall	**C 28.4 (E 57.0)**	**E 63.4 (D 64.9)**
5	Airport Taxiway & Redfield Road	Signal	NB	E 66.8 (E 66.8)	E 66.8 (E 66.8)
			SB	A 0.0 (A 0.0)	A 0.0 (A 0.0)
			EB	C 25.6 (A 3.6)	C 31.1 (A 4.7)
			WB	A 1.7 (A 3.1)	A 1.9 (A 3.1)
			Overall	**B 18.1 (A 3.4)**	**C 20.8 (A 3.9)**
6	76th Street & Redfield Road	Signal	NB	B 17.5 (D 41.7)	B 17.5 (D 41.6)
			SB	B 16.9 (C 33.7)	B 16.9 (C 33.6)
			EB	F 381.2 (C 24.3)	F 394.5 (D 44.0)
			WB	A 2.9 (B 12.3)	A 3.1 (B 13.1)
			Overall	**F 251.1 (B 18.8)**	**F 247.0 (C 26.2)**
7	76th Place and Redfield Road	Signal	SB	B 17.6 (E 61.2)	B 18.0 (E 61.9)
			EB	F 150.6 (A 6.6)	F 185.3 (A 9.0)
			WB	A 9.2 (B 13.8)	A 9.7 (B 14.1)
			Overall	**F 99.5 (B 17.4)**	**F 115.9 (B 17.9)**
8	Hayden Road & Redfield Road	Signal	NB	C 31.1 (B 17.1)	D 53.0 (B 19.2)
			SB	C 20.4 (E 64.9)	C 20.0 (E 59.4)
			EB	E 74.0 (D 45.9)	E 77.3 (D 52.2)
			Overall	**D 41.2 (D 47.5)**	**D 53.4 (D 47.1)**
9	Scottsdale Road & Joan D Arc Avenue/Sutton Drive	2-way stop (EB/WB)	NB Left	B 11.7 (B 13.3)	B 11.7 (B 14.5)
			SB Left	B 11.8 (B 13.3)	B 13.6 (B 13.5)
			EB Shared	C 19.2 (F [(1)])	C 22.8 (F [(1)])
			WB Shared	C 17.0 (F [(1)])	C 24.9 (F [(1)])
10	Scottsdale Road & Sweetwater Avenue	Signal	NB	D 46.3 (D 45.1)	C 28.0 (C 25.3)
			SB	A 7.0 (B 16.0)	A 7.0 (A 8.0)
			EB	D 43.4 (D 40.6)	D 44.9 (D 41.7)
			WB	D 54.6 (D 42.4)	D 54.8 (D 42.5)
			Overall	**C 29.8 (C 31.3)**	**C 21.8 (B 18.3)**

Table 6 – 2029 Peak Hour Levels of Service (cont'd.)

ID	Intersection	Control	Approach	No Build LOS AM (PM)	Full Build LOS AM (PM)
11	Scottsdale Road & Cactus Road	Signal	NB SB EB WB **Overall**	F 153.8 (F 463.1) F 87.2 (F 112.7) F 128.9 (D 41.8) E 57.6 (F 94.6) **F 107.8 (F 214.2)**	F 117.5 (F 106.0) F 84.6 (F 130.1) F 118.6 (F 94.1) F 86.2 (F 146.6) **F 102.1 (F 120.8)**
A	Access A & Thunderbird Road	1-way stop (NB)	NB Shared WB Left	-- (--) -- (--)	F (1) (E 36.2) F (1) (B 13.5)
B	Scottsdale Road & Access B	2-way stop (EB/WB)	NB Left SB Left EB Shared WB Shared	B 13.2 (B 14.8) B 11.8 (B 12.5) F 178.0 (E 45.1) A 0.0 (B 14.5)	B 13.7 (C 16.6) B 12.5 (B 12.6) F 356.8 (F 184.2) C 22.9 (D 33.8)
C	Scottsdale Road & Access C	1-way stop (WB)	WB Right	-- (--)	B 14.6 (C 15.8)
D	Access D & Sutton Drive	1-way stop (SB)	SB Shared EB Left	-- (--) -- (--)	A 8.7 (A 9.0) A 7.4 (A 7.5)
E	Access E & Sutton Drive	1-way stop (SB)	SB Shared EB Left	-- (--) -- (--)	A 8.7 (A 8.7) A 7.4 (A 7.4)

The results of the 2029 level of service analysis, summarized in **Table 6**, indicate that most intersections will continue to operate at acceptable overall levels of service; a few may have at least one approach operating with higher delays. A comparison of the results of the no-build and full-build scenarios in 2029 reveals that the average delays at the study intersections would not be substantially impacted by the addition of site generated traffic, warranting no mitigation measures beyond continued cooperation with City staff to determine adjustments to signal cycles and timing necessitated by changes in traffic volumes and patterns. The proposed design of the project at build-out is designed with several access points that will provide users alternative access routes via Scottsdale Road, Sutton Drive, or Redfield/Thunderbird Road.

Please note that, in spite of the poor levels of service of a few individual movements reported above, with the Loop 101 Pima Freeway diverting regional traffic away from Scottsdale Road upon its opening in the 1990's, Scottsdale Road, which was planned and constructed for a future condition in which there was no such freeway, currently experiences traffic volumes well below levels previously experienced, resulting in excess capacity on Scottsdale Road. With no access to the Pima Freeway to the east or to State Route 51 five miles to the west, Thunderbird Road is a sub-regional road carrying little regional traffic. The proposed development is not expected to adversely impact either of these roadways.

TURN LANE WARRANTING AND QUEUE LENGTH ANALYSIS

Right-Turn Deceleration Lanes

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

Scottsdale Road is classified as a major arterial, meaning that a right turn deceleration lane would be required at both access points on Scottsdale Road. Since Thunderbird Road is classified as a major collector, under the *DS&PM*, a right turn deceleration lane is not required at the driveway on Thunderbird Road. The City indicated via a comment a requirement that the developer provide a right turn lane along Thunderbird Road, a requirement with which the developer does not concur; therefore, this issue will remain a matter of negotiation the City and the developer.

Left-Turn Deceleration Lanes

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

There is an existing left turn lane for the northern access point on Scottsdale Road, the southern access is right-in/right-out only and does not require a left turn lane. Thunderbird Road is classified as a major collector, meaning that a left turn into the driveway on Thunderbird Road is required. There is an existing center left turn lane that would need to be restriped as a dedicated left turn at this access. Sutton Drive does not require dedicated left turn lanes because it is classified as a local road.

Queue Storage

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

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

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

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

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

Table 7 – Queue Storage Lengths

ID	Intersection	Control	Movement	Queue Storage			
				Existing(1)	AASHTO	HCM(2)	Recommended
1	Scottsdale Road & Greenway Parkway	Signal	NB Left	(3) 380'	(3) 1,250'	(3) 505'	(3) (4) 380'
			SB Left	(3) 540'	(3) 475'	(3) 145'	(3) 540'
			EB Left	(3) 615'	(3) 1,075'	(3) 300'	(3) 615'
			WB Left	(3) 480'	(3) 1,000'	(3) 400'	(3) 480'
			NB Right	180'	550'	255'	(6) 255'
			SB Right	270'	425'	75'	270'
			EB Right	245'	1,175'	750'	(5) 245'
			WB Right	100'	550'	175'	(6) 175'
2	Scottsdale Road & Acoma Drive	Signal	NB Left	300'	500'	220'	300'
			SB Left	95'	175'	25'	95'
			EB Left	155'	350'	350'	(6) 350'
			WB Left	70'	350'	285'	(6) 285'
			SB Right	80'	200'	25'	80'
			EB Right	155'	575'	400'	(6) (7) 350'
3	Scottsdale Road & Thunderbird Road	Signal	NB Left	(3) 370'	(3) 700'	(3) 305'	(3) 370'
			SB Left	(3) 530'	(3) 650'	(3) 300'	(3) 530'
			EB Left	265'	725'	365'	(6) (7) 350'
			WB Left	(3) 340'	(3) 675'	(3) 140'	(3) 340'
			NB Right	140'	475'	175'	175'
			WB Right	130'	600'	195'	195'
4	73rd Street & Thunderbird Road	Signal	NB Left	50'	350'	100'	100'
			SB Left	105'	575'	190'	(6) 190'
			EB Left	105'	125'	25'	105'
			WB Left	130'	250'	150'	130'
			NB Right	50'	250'	30'	50'
			SB Right	105'	225'	45'	105'
			WB Right	325'	500'	45'	325'
6	76th Street & Redfield Road	Signal	NB Left	100'	375'	190'	(6) 190'
			EB Left	80'	125'	25'	80'
			WB Left	40'	150'	25'	40'
7	76th Place & Redfield Road	Signal	SB Left	90'	125'	25'	90'
			EB Left	45'	550'	25'	45'
8	Hayden Road & Redfield Road	Signal	NB Left	300'	1,475'	635'	(3) 640'
			EB Left	(3) 360'	(3) 1,300'	255'	(3) 360'
			SB Right	250'	1,700'	1,005'	(7) 350'
			EB Right	180'	1,450'	835'	(5) 180'

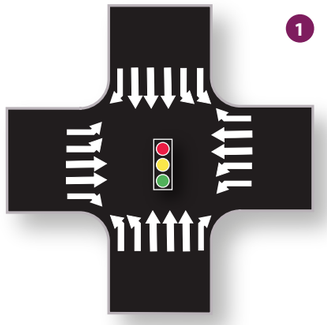
(1) Measured from beginning of stop bar
(2) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.
(3) Dual left turn lanes, queue length is total storage length of both lanes
(4) Existing back-to-back left turns prevent extension of turn lane
(5) Additional space available
(6) Not the responsibility of the developer
(7) Minimum of 150 feet is required per *City of Scottsdale DS&PM* with a maximum of 350 feet per lane

Table 7 – Queue Storage Lengths (cont.)

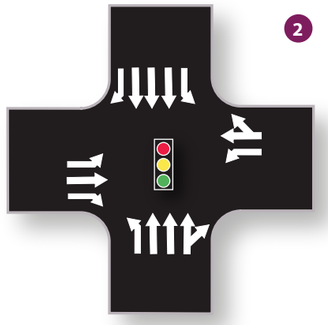
ID	Intersection	Control	Movement	Queue Storage			
				Existing(1)	AASHTO	HCM(2)	Recommended
9	Scottsdale Road & Sutton Drive	2-way stop (EB/WB)	SB Left	150'	150'	25'	150'
10	Scottsdale Road & Sweetwater Avenue	Signal	NB Left	185'	200'	125'	185'
			SB Left	130'	275'	55'	130'
			EB Left	160'	225'	120'	160'
			WB Left	75'	275'	200'	(6) 200'
			NB Right	155'	175'	25'	155'
11	Scottsdale Road & Cactus Road	Signal	NB Left	(3) 370'	(3) 1,075'	(3) 550'	(3) (6) 550'
			SB Left	(3) 480'	(3) 1,125'	(3) 550'	(3) 550'
			EB Left	(3) 290'	(3) 625'	(3) 310'	(3) 310'
			WB Left	(3) 490'	(3) 500'	(3) 265'	(3) 490'
			NB Right	330'	525'	230'	330'
			EB Right	175'	900'	570'	(6) (7) 350'
			WB Right	260'	1,150'	865'	(7) 350'
A	Access A & Redfield Road	1-way stop (NB)	WB Left	-	125'	25'	(7) 150'
B	Scottsdale Road & Access B	2-way stop (EB/WB)	NB Left	150'	125'	25'	150'
			SB Left	105'	100'	25'	105'
C	Scottsdale Road & Access C	1-way stop (WB)	NB Right	-	150'	25'	(7) 150'

(1) Measured from beginning of stop bar
(2) HCM 95th percentile queue reported in vehicles/lane, assuming 1 vehicle ~ 25 feet.
(3) Dual left turn lanes, queue length is total storage length of both lanes
(4) Existing back-to-back left turns prevent extension of turn lane
(5) Additional space available
(6) Not the responsibility of the developer
(7) Minimum of 150 feet is required per *City of Scottsdale DS&PM* with a maximum of 350 feet per lane

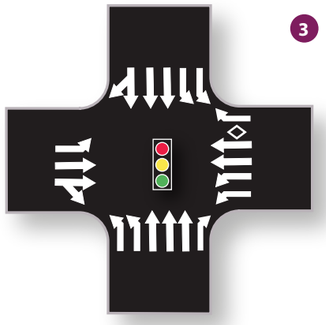
The recommended storage lengths summarized in **Table 7** are provided for study horizon year 2029 using the total traffic projections. Proposed lane configurations are shown in **Figure 11**.



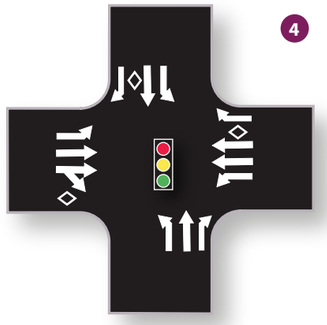
Scottsdale Rd. & Greenway Pkwy.



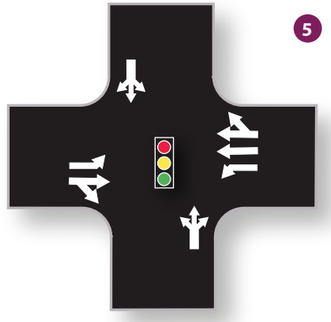
Scottsdale Rd. & Acoma Dr.



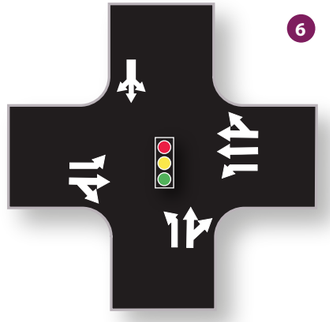
Scottsdale Rd. & Thunderbird Rd.



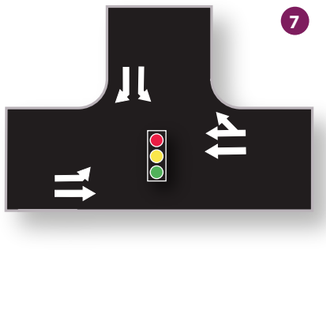
73rd St. & Thunderbird Rd.



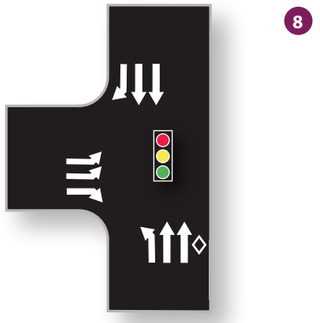
Airport Taxiway & Redfield Rd.



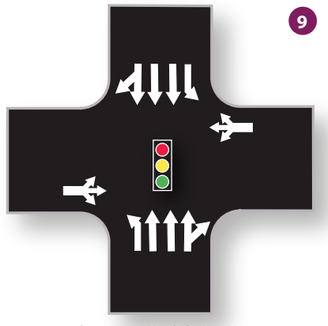
76th St. & Redfield Rd.



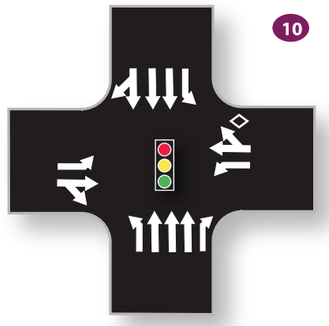
76th Pl. & Redfield Rd.



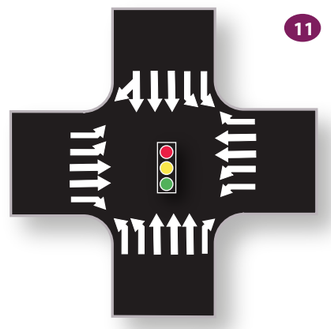
Hayden Rd. & Redfield Rd.



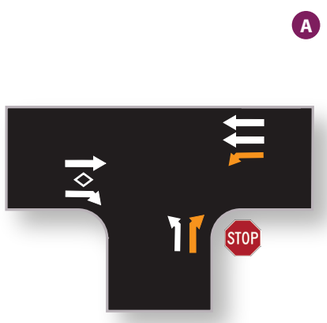
Scottsdale Rd. & Sutton Dr.



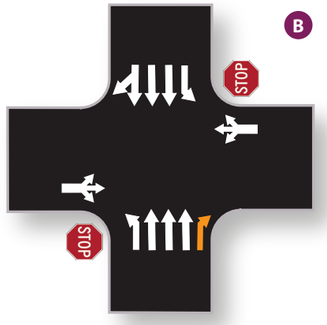
Scottsdale Rd. & Sweetwater Ave.



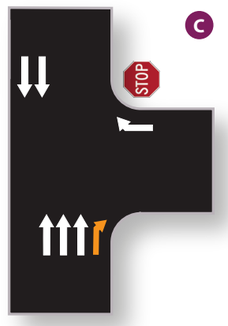
Scottsdale Rd. & Cactus Rd.



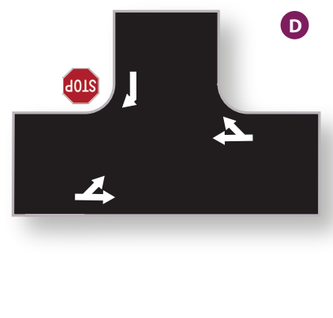
Access A & Redfield Rd.



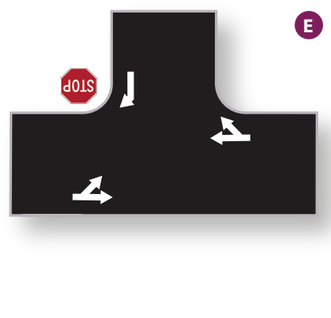
Scottsdale Rd. & Access B



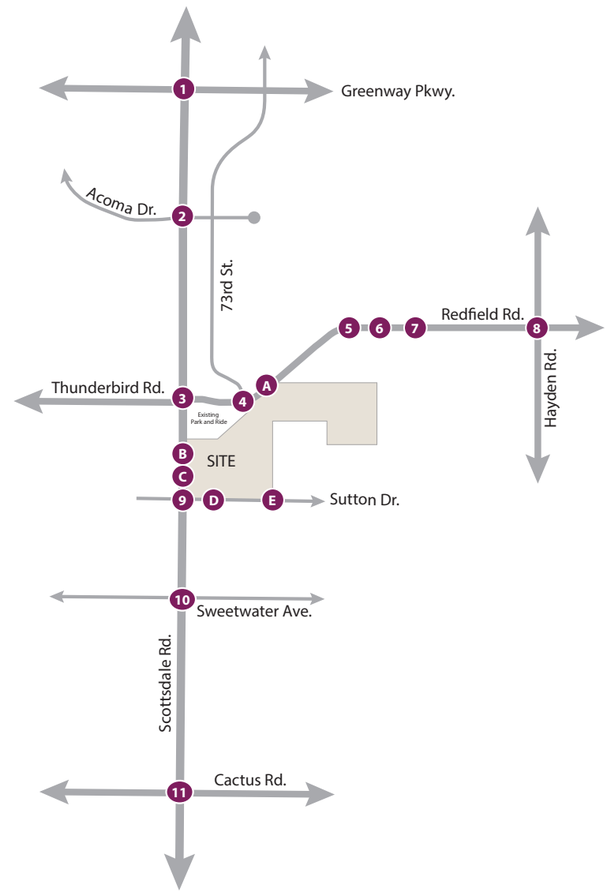
Scottsdale Rd. & Access C



Access D & Sutton Dr.



Access E & Sutton Dr.



LEGEND

- Thru or Turning Movement
- Two-Way Left Turn-Lane
- Raised Median
- Bike Lane
- Traffic Signal
- Stop Sign
- NORTH
- Developer Improvements by 2024

Figure 11: Proposed Lane Configurations and Traffic Controls

CONCLUSIONS

The following conclusions and recommendations have been documented in this study:

- The results of the 2024 level of service analysis indicate that most intersections will operate with overall acceptable levels of service within the study area; a few may have at least one approach operating with higher delays. At the two following major signalized intersections CivTech recommends the City consider making the described adjustments to signal timing to minimize delays and bring future overall delays at these intersections closer to the same levels as existing delays or those expected without the project:
  - The signalized intersection of Scottsdale Road and Thunderbird Road is expected to experience delay on all approaches during both the AM and PM peak hours. In order to demonstrate that these delays can be reduced, CivTech adjusted the signal timing. While some of the approaches will experience increased delays with this mitigation, each approach delay will be more-evenly distributed overall and no single approach will be substantially delayed longer than another. Note that these levels of delays are already present under existing conditions and will continue to be experienced without the project with the continued growth of background traffic volumes. Adjusting the cycle length of the signal would impact the progression through the signals along Scottsdale Road and, thus, cannot be recommended. Adjustments can be made to the signal timing to reduce the overall delay during the AM peak hour from 96.0 seconds per vehicle to 71.3 seconds per vehicle and to reduce the overall delay during the PM peak hour from 94.3 seconds per vehicle to 87.5 seconds per vehicle. These are comparable to existing 83.6 seconds per vehicle AM delays and 68.6 seconds per vehicle PM delays. The Synchro reports of these intersection with mitigation in the appendix provide the adjusted timing. CivTech recommends the City of Scottsdale carefully consider implementing these timing adjustments. Any additional measures would be the responsibility of the City of Scottsdale.
  - The signalized intersection of Scottsdale Road and Cactus Road is expected to experience delay on the northbound, southbound and eastbound approaches during the AM peak hour and the northbound, southbound and westbound approaches during the PM peak hour. As at Thunderbird Road, CivTech adjusted the signal timing and recommends that the City of Scottsdale consider changing the cycle length from 120 seconds to 145 seconds. Please note that this delay is present under existing conditions and will continue without the project with the continued growth of background traffic. While it is not the responsibility of the developer to mitigate the delay via capacity improvements, the analysis shows that, with some adjustments to signal timing, the overall delay during the AM peak hour could be reduced from 97.7 seconds per vehicle to 85.0 seconds per vehicle and the PM peak hour delay could be reduced from 193.4 seconds per vehicle to 101.3 seconds per vehicle. These are comparable to existing 71.2 seconds per vehicle AM delays and 163.6 seconds per vehicle PM delays. The Synchro reports of these intersection with mitigation in the appendix provide the adjusted timing. CivTech also recommends the City of Scottsdale carefully consider implementing these timing adjustments and, as the site develops over time, the development team will work with the staff of the City's Transportation Department to address issues of delays at and progression through the signalized intersections in the study area via adjustments to signal cycles and phasing.

- CivTech recommends at the following intersections no measures for which the developer would be responsible for the reasons indicated:
  - The signalized intersections of **76th Street / 76th Place and Redfield Road** are expected to experience delay on the southbound and eastbound approaches. By full buildout of this site, the City of Scottsdale is planning on widening Redfield Road to add a second through lane in both the eastbound and westbound directions. This should help with the capacity of vehicles on the road in the future, meaning that this delay will likely not be present if the road is wider. No mitigation by the developer is recommended at this time.
  - The unsignalized intersection of **Scottsdale Road and Sutton Drive** is expected to continue experiencing delay on the eastbound and westbound approaches during the PM peak hour. The delays that are anticipated for the 2024 horizon year are typical for minor streets intersecting with major streets. No traffic signal is being requested at this intersection; however, it is recommended that the City of Scottsdale monitor this intersection for safety and higher delays in the future.
- The results of the 2029 level of service analysis indicate that most intersections will continue to operate at acceptable overall levels of service; a few may have at least one approach operating with higher delays. A comparison of the results of the no-build and full-build scenarios in 2029 reveals that the average delays at the study intersections would not be substantially impacted by the addition of site generated traffic, warranting no mitigation measures beyond continued cooperation with City staff to determine adjustments to signal cycles and timing necessitated by changes in traffic volumes and patterns. The proposed design of the project at build-out is designed with several access points that will provide users alternative access routes via Scottsdale Road, Sutton Drive, or Redfield/Thunderbird Road.
- The recommended storage lengths are provided for study horizon year 2029 using the total traffic projections.
- With the Loop 101 Pima Freeway diverting regional traffic away from Scottsdale Road upon its opening in the 1990's, Scottsdale Road, which was planned and constructed for a future condition in which there was no such freeway, currently experiences traffic volumes well below levels previously experienced, resulting in excess capacity on Scottsdale Road. With no access to the Pima Freeway to the east or to State Route 51 five miles to the west, Thunderbird Road is a sub-regional road carrying little regional traffic. The proposed development is not expected to adversely impact either of these roadways.

LIST OF REFERENCES

Highway Capacity Manual, 6th Edition. Transportation Research Board, Washington, D.C., 2016.

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

Trip Generation Manual, 10th Edition, Institute of Transportation Engineers, Washington, D.C., 2017.

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

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

TECHNICAL APPENDICES

APPENDIX A

REVIEW COMMENTS AND RESPONSES (Reserved)

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

Reviewer Name, Agency: **Bryan Cluff, City of Scottsdale**

Item	Review Comment	(Code) & Response
a.	Signalization is proposed at Scottsdale Road and the existing, northerly site driveway, approximately 665 feet south of Thunderbird Road. Based on the following information, the proposed signal is not acceptable:	(3) A signal at this intersection is no longer being requested by the developer. Analysis has been updated accordingly.
	(1) DSPM 5-3.123 G2b states "Traffic signals should be spaced no less than 1/2 mile on major arterials and minor arterials, with 1 mile spacing desirable."	(3) A signal at this intersection is no longer being requested by the developer. Analysis has been updated accordingly.
	(2) The projected 50 percentile queue in 2024 for the northbound through movement approaching Thunderbird Road is projected to extend beyond this driveway during the AM and PM peak hours according to HCM analysis reports in Appendix G.	(3) A signal at this intersection is no longer being requested by the developer. Analysis has been updated accordingly.
	(3) Preliminary analysis for signalization at this location was suggested when cross-access through the transit center was not considered an option. Since cross-access through the transit center is now being pursued, it is not necessary to make an exception to the above standards.	(3) A signal at this intersection is no longer being requested by the developer. Analysis has been updated accordingly.
b.	The TIMA recommends changing the existing. Southerly site driveway, approximately 330 feet south of the northerly driveway and 325 feet north of Sutton Drive. From a right-in/right-out access driveway to add left-in access. An exhibit within the application (and not in the TIMA) further depicts the driveway with full access. DSPM 5-3.123 F1a states "Full median openings should occur at not less than 1/4 mile intervals (1320 feet) on major arterial streets. Partial median openings, which allow only left turns off major streets, are acceptable at 1/8 mile spacing (660 feet)". Please revise the TIMA and associated documents to remove the proposed median modification at this driveway.	(3) The developer is no longer requesting any changes to the southern driveway on Scottsdale Road. It will remain as a right in/right out driveway only. Analysis has been updated accordingly.
c.	Other modifications depicted in the development plan exhibits include a possible median on Thunderbird Road at Access A and addition of median and modifications to Sutton Drive at Driveway D, For Thunderbird Road at Access A, it may be possible and it is recommended to consider restriping to provide a full lane width left-turn refuge should a median be installed. For Sutton Drive at Access D, an acceleration lane/merge condition is not acceptable, and 16 feet of pavement is required adjacent to a median for fire department access.	(3) The acceleration lane on Sutton Drive is no longer being requested by the developer. A striped westbound left turn lane is anticipated to be provided by the developer at Access A. Analysis of both intersections has been updated accordingly as well as the access exhibit.

Reviewed Date: 01/03/2020
CivTech Received Date: 01/04/2020
CivTech Entered Date: 01/14/2020
CivTech Response Date: 05/20/2020

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

Reviewer Name, Agency: **Bryan Cluff, City of Scottsdale**

Item	Review Comment	(Code) & Response
d.	If signalization of Driveway B or access change at Driveway C is proposed, a separate analysis should be provided that models conditions without proposed improvements and include justification for proposed exception(s) to Scottsdale's standards.	(3) The previously proposed changes at both Access B and Access C are no longer being requested by the developer.
e.	With the proposed cross access through the transit center driveway at 73rd Street, a right turn deceleration lane appears to be warranted on the eastbound approach. Please verify traffic volumes and confirm.	(2) Per the City of Scottsdale DS&PM, "Right turn lanes may be requires by the Transportation Department on minor arterial and collector street intersections." Thunderbird Road is classified as a collector, however, the DS&PM does not provide cirteria to compare our total volumes to so it cannot be determined wheter a right turn lane is warranted or not. Based on the level of service analysis conducted for both the 2024 and 2029 horizon years, the delay on the eastbound approach is anticipated without the addition of the connection to the 7th Day Adventist site.
f.	Trip distribution percentages in Table 4 changed, but do not add to 100% and does not match Figure 5. Volumes in Figure 6 appear to correlate to the percentages in Figure 5. Distribution will likely be influenced on whether or not the proposed signal is allowed.	(1) Distribution in Figure 5 has been updated to match the percentages shown in Table 4 in the report.
g.	Analysis	
	(4) Signal progression - Please address the following comments regarding progression analysis results:	(2) Signalization at Access B is no longer being requested by the developer. Since the progression analysis was only requested by the City when the signal was being requested, this section has been removed.
	a) The analysis appears to only be Scottsdale Road between Thunderbird Road and Access B. If signalization is proposed for Access B, the progression alaysis extents should include signals beyond Access B.	(2) Signalization at Access B is no longer being requested by the developer. Since the progression analysis was only requested by the City when the signal was being requested, this section has been removed.
	b) The time-space diagrams were not found in the Appendix as the TIMA states.	(2) Signalization at Access B is no longer being requested by the developer. Since the progression analysis was only requested by the City when the signal was being requested, this section has been removed.
	c) If offsets are modified that affect the coordinated corridors (Cactus Road), a grid progression analysis should be provided. Review of the provided TIMA could not determine if such changes were analyzed due to the above.	(2) Signalization at Access B is no longer being requested by the developer. Since the progression analysis was only requested by the City when the signal was being requested, this section has been removed.
	d) Please provide better labeling for the 2 sections of Table 7 (i.e. existing offsets and timing signalization, ect.). It would be helpful to note changes to offsets, if any.	(2) Signalization at Access B is no longer being requested by the developer. Since the progression analysis was only requested by the City when the signal was being requested, this section has been removed.

Reviewed Date: 01/03/2020
CivTech Received Date: 01/04/2020
CivTech Entered Date: 01/14/2020
CivTech Response Date: 05/20/2020

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

Reviewer Name, Agency: **Bryan Cluff, City of Scottsdale**

Item	Review Comment	(Code) & Response
	(5) Projected Site Traffic, Total Traffic, Intersection Capacity Analyses, ect. - The projected total traffic volumes do not appear to match the volumed used in the analysis provided in the appendices. The traffic volumes in the analyses appear to heavily utilize Driveway B and avoid the cross access to the existing 73rd Street signal. Verify traffic volumed in figures and in analyses. verify levels-of-service tables with provided analysis results.	(1) All synchro analysis has been updated and it has been confirmed that the volumes used to analyze the full buildout scenarios in Synchro match the volumes that are presented in the total volume figures.
	(6) Signal Warrant Analysis - A right turn reduction factor is expected for the provided signal warrant assessment. Also, please modify wording to indicate expected conditions were evaluated. Warrant(s) need to be met with counted volumed prior to signalization.	(3) Signalization at Access B is no longer being requested.
	TIMA	
18.	Please review the TIMA for clarity in statements. Some statements may infer things that are not intended. Consider the following:	
	a) Page 1 (and elsewhere) does the intersection capcity analysis results of projected mitigated conditions also include cycle length changes (if any) and/or offset changes (if any)? Since these items are discussed in various parts it is difficult to determine what is recommended and if the analysis of mitigated conditions include all the recommendations.	(2) No cycle length or offset changes are recommended as part of the mitigation.
	b) Page 2 (and elsewhere) states that "the City of Scottsdale has indicated that this intersection cannot be signalized…" whereas the same statement is not included regarding Access B.	(2) The developer is no longer requesting signalization of Access B. This statement has also been removed from the Scottsdale/Sutton statement as the developer is also not requesting signalization of this intersection making the statement irrelevent.
	c) Page 2 (and elsewhere) states that the interim scenario of the traffic signal warrant analysis considered the offices at half occupancy - does the occupancy of the industrial uses matter?	(3) Signalizeation of Access B is no longer being requested, meaning that a signal warrant analysis has not been included in the TIMA.
	d) Page 2 (and elsewhere) states that the "City of Scottsdale does not require the mitigation of intersections with LOS E." This is not true, stand alone statement. Please review DSPM 5-1.801.	(1) This statement has been removed.
19.	Please provide segment average daily traffic volumes generated by the site per typical TIMA requirements.	(1) Segment ADT's have been provided for the site/background/total scenarios.

Reviewed Date: 01/03/2020
CivTech Received Date: 01/04/2020
CivTech Entered Date: 01/14/2020
CivTech Response Date: 05/20/2020
14-ZN-2019
6/03/2020

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

Reviewer Name, Agency: **Doug Ostler, City of Scottsdale**

Item	Review Comment	(Code) & Response
1.	**Volumes: Sizeable seasonal factors were applied to existing traffic volumes based on a traffic count in July 2019 (off-peak) and November 2018 and the same intersection. Please confirm if the seasonal adjustment facotre and/or consider if it is more reasonable to calculate separate factors for minor roads/turning movements versus through movements/major roads**	(2) While it may be more reasonable to calculate separate adjustment factors for major and minor roadways, the two prominent roadways that are being evaluated in this study are Scottsdale Road and Thunderbird Road, both of which are major roadways within the City of Scottsdale. The seasonal adjustment factor was applied to all movements on all roadways for both the AM and PM peak hour (different rates were found for both) in order to give a more conservative estimate for traffic.
2.	**Trip Generation: Based on previous discussion and information in the project narrative, there may be the potential to include upwards of 300 dwelling units as dorm rooms for the campus which hthe TIMA does not address. Please confirm proposed land uses and/or options for the site.**	(2) The discussion related to the 300 dwelling units of dorm is not applicable to the 7th Day Adventist redevelopment. If 300 dorm rooms are constructed, they would be exclusive to the exisitng school and have access from Sutton Drive only. This condition is also a potential future condition, it has not been confirmed by the school and will also not impact any of the access points being analyzed in the study.
3.	**Trip Distribution: A higher percentage of trips generated by the site are expected to be to/from north of the study area limits via Scottsdale Road. Please review the distribution precentages via Sweetwater (perhaps too high for a minor collector) and Cactus Road to/from the east (perhaps too low)**	(2) CivTech believes that vehicles will choose to use Hayden Road over Scottsdale Road due to the heavy congestion present on Scottsdale Road during the AM and PM peak hours. As an office complex, it is assumed that the trips to/from the site will be the same vehicles/passengers every day and will therefore not utilize Scottsdale Road as much as some of the surrounding roads.
4.	**Analysis: Signal Progression - The TIMA did not include a progression analysis, which was required. This is particularly desired due to the spacing of the proposed signal. In addition, recommendations at two of the study intersection included changing the cycle length.**	(1) A signal progression analysis has been included in the TIMA to show the affects of the addition of a signal on Scottsdale Road at one of the 7th Day Adventist access points. Additionally, both of the recommendations for signal cycle length changes have been removed and changed to only recommend signal timing changes.
5.	**Analysis: Queue - The southbound left turn movement had a projected queue of 350'-375' per Table 7 which is not acceptable with a proposed turn lane length of 105'**	(1) The southern access point on Scottsdale Road will be changed to now allow full movement at the access, meaning that some southbound left turning vehicles will now utilize this access and relieve the northern access of some queue. The HCM queue for the northern signalized access is now 25' so the recommendation to keep the lane at 105' is more appropriate.
6.	**Analysis: Background/Existing Conditions - Although the four-legged intersection B Currently exisits and appears to have had traffic counts, it was not included in the exisitng or background analysis.**	(1) All existing access points have now been added to the existing and background analyses.
7.	**Analysis: Trip Generation Comparison - we require a trip generation comparison to existing land uses (when applicable) for all traffic study categories.**	(1) Text has been added to the trip generation section of the TIMA comparing the exisitng land uses and trips generated to the proposed. Since the exisitng land uses generate little to no traffic on an average day, the exisitng site trips were not reduced from the total traffic volumes in order to remain conservative.

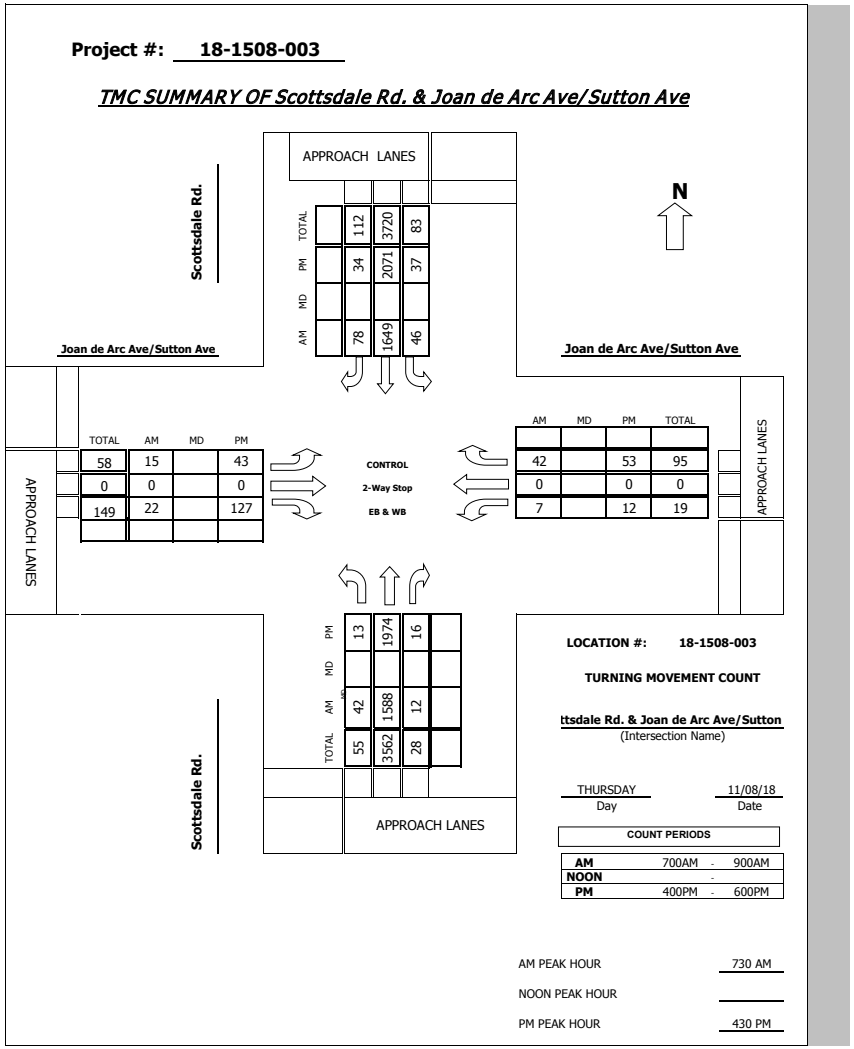
Reviewed Date: 08/27/2019
CivTech Received Date: 08/27/2019
CivTech Entered Date: 11/19/2019
CivTech Response Date: 11/04/2019

APPENDIX B

EXISTING TRAFFIC COUNTS

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 11/08/18 LOCATION: Scottsdale
E-W STREET: Joan de Arc Ave/Sutton Ave DAY: THURSDAY PROJECT# 18-1508-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	0	1	3	0	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	2	227	1	3	323	6	6	0	4	2	1	11	586
7:15 AM	9	275	4	8	421	12	7	0	8	3	0	4	751
7:30 AM	12	355	4	6	451	18	3	0	6	2	0	4	861
7:45 AM	5	466	4	11	404	15	4	0	5	3	0	9	926
8:00 AM	11	368	4	24	386	20	3	0	6	2	0	19	843
8:15 AM	14	399	0	5	408	25	5	0	5	0	0	10	871
8:30 AM	9	383	0	4	401	27	9	0	6	1	0	10	850
8:45 AM	13	417	1	2	330	25	7	0	15	2	0	5	817
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	75	2890	18	63	3124	148	44	0	55	15	1	72	6505
Approach %	2.51	96.88	0.60	1.89	93.67	4.44	44.44	0.00	55.56	17.05	1.14	81.82	
App/Depart	2983	/	3006	3335	/	3194	99	/	81	88	/	224	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	42	1588	12	46	1649	78	15	0	22	7	0	42	3501
Approach %	2.56	96.71	0.73	2.59	93.01	4.40	40.54	0.00	59.46	14.29	0.00	85.71	
PEAK HR. FACTOR:		0.864			0.933			0.925			0.583		0.945

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1:
GPS: 33.607627, -111.925844

14-ZN-2019
6/03/2020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Scottsdale Rd.
0
E-W STREET: Joan de Arc Ave/Sutton Ave

DATE: 11/08/18
DAY: THURSDAY

LOCATION: Scottsdale
PROJECT# 18-1508-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	3	0	1	3	0	0	1	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	3	494	4	10	473	7	9	0	13	1	0	11	1025
4:15 PM	3	491	3	13	502	10	8	0	20	2	1	13	1066
4:30 PM	3	485	4	5	494	10	18	0	54	4	0	15	1092
4:45 PM	4	497	6	9	505	7	11	0	18	3	0	7	1067
5:00 PM	3	467	4	9	512	12	8	0	37	2	0	15	1069
5:15 PM	3	525	2	14	560	5	6	0	18	3	0	16	1152
5:30 PM	1	529	2	9	462	5	6	0	7	0	0	15	1036
5:45 PM	1	449	9	11	440	6	0	0	15	1	0	14	946
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	21	3937	34	80	3948	62	66	0	182	16	1	106	8453
Approach %	0.53	98.62	0.85	1.96	96.53	1.52	26.61	0.00	73.39	13.01	0.81	86.18	
App/Depart	3992	/	4109	4090	/	4146	248	/	114	123	/	84	

PM Peak Hr Begins at: 430 PM

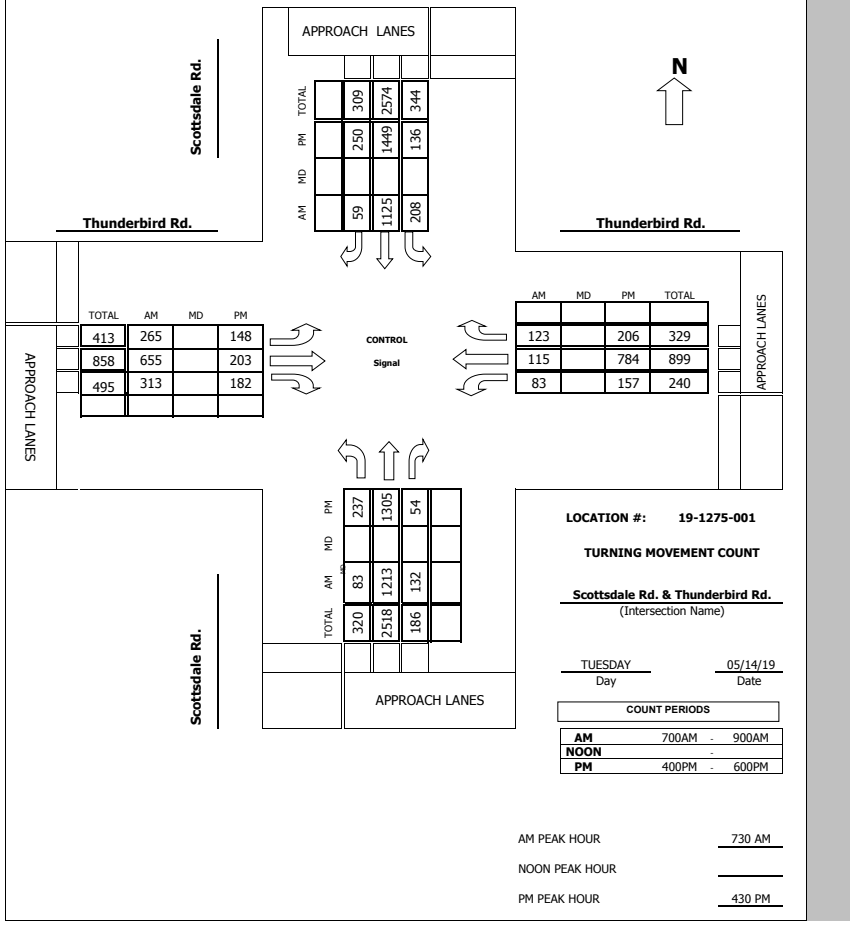
PEAK													
Volumes	13	1974	16	37	2071	34	43	0	127	12	0	53	4380
Approach %	0.65	98.55	0.80	1.73	96.69	1.59	25.29	0.00	74.71	18.46	0.00	81.54	
PEAK HR. FACTOR:		0.945			0.925			0.590			0.855		0.951

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1: 0
GPS: 33.607627, -111.925844

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

Project #: 19-1275-001

TMC SUMMARY OF Scottsdale Rd. & Thunderbird Rd.



14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 05/14/19 LOCATION: Scottsdale
E-W STREET: Thunderbird Rd. DAY: TUESDAY PROJECT# 19-1275-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 0	WL 2	WT 2	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	17	177	18	38	182	11	34	108	91	17	37	26	756
7:15 AM	9	229	30	34	244	15	51	161	112	17	20	32	954
7:30 AM	21	248	23	46	317	13	67	182	97	15	26	22	1077
7:45 AM	26	377	38	61	272	17	95	173	81	21	28	29	1218
8:00 AM	18	277	48	55	291	14	59	165	74	26	30	32	1089
8:15 AM	18	311	23	46	245	15	44	135	61	21	31	40	990
8:30 AM	18	252	32	46	268	18	33	150	80	23	36	44	1000
8:45 AM	28	310	32	40	288	14	52	153	71	17	51	44	1100
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	155	2181	244	366	2107	117	435	1227	667	157	259	269	8184
Approach %	6.01	84.53	9.46	14.13	81.35	4.52	18.68	52.68	28.64	22.92	37.81	39.27	
App/Depart	2580	/	2885	2590	/	2931	2329	/	1837	685	/	531	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	83	1213	132	208	1125	59	265	655	313	83	115	123	4374
Approach %	5.81	84.94	9.24	14.94	80.82	4.24	21.49	53.12	25.39	25.86	35.83	38.32	
PEAK HR. FACTOR:		0.810			0.926			0.883			0.872		0.898

CONTROL: Signal
COMMENT 1:
GPS: 33.611253, -111.925768

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Scottsdale Rd. 0 DATE: 05/14/19 LOCATION: Scottsdale
E-W STREET: Thunderbird Rd. DAY: TUESDAY PROJECT# 19-1275-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 0	EL 1	ET 2	ER 0	WL 2	WT 2	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	63	362	22	35	373	66	33	46	48	52	195	49	1344
4:15 PM	61	321	12	46	334	35	40	53	41	42	166	57	1208
4:30 PM	48	334	18	47	364	49	30	50	50	33	169	51	1243
4:45 PM	72	328	14	28	310	39	35	66	49	40	175	49	1205
5:00 PM	59	279	12	39	412	78	35	41	44	44	223	53	1319
5:15 PM	58	364	10	22	363	84	48	46	39	40	217	53	1344
5:30 PM	62	288	14	36	351	50	36	32	36	23	179	38	1145
5:45 PM	59	299	11	26	304	40	30	45	42	18	140	38	1052
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	482	2575	113	279	2811	441	287	379	349	292	1464	388	9860
Approach %	15.21	81.23	3.56	7.90	79.61	12.49	28.28	37.34	34.38	13.62	68.28	18.10	
App/Depart	3170	/	3250	3531	/	3452	1015	/	771	2144	/	2387	

PM Peak Hr Begins at: 430 PM

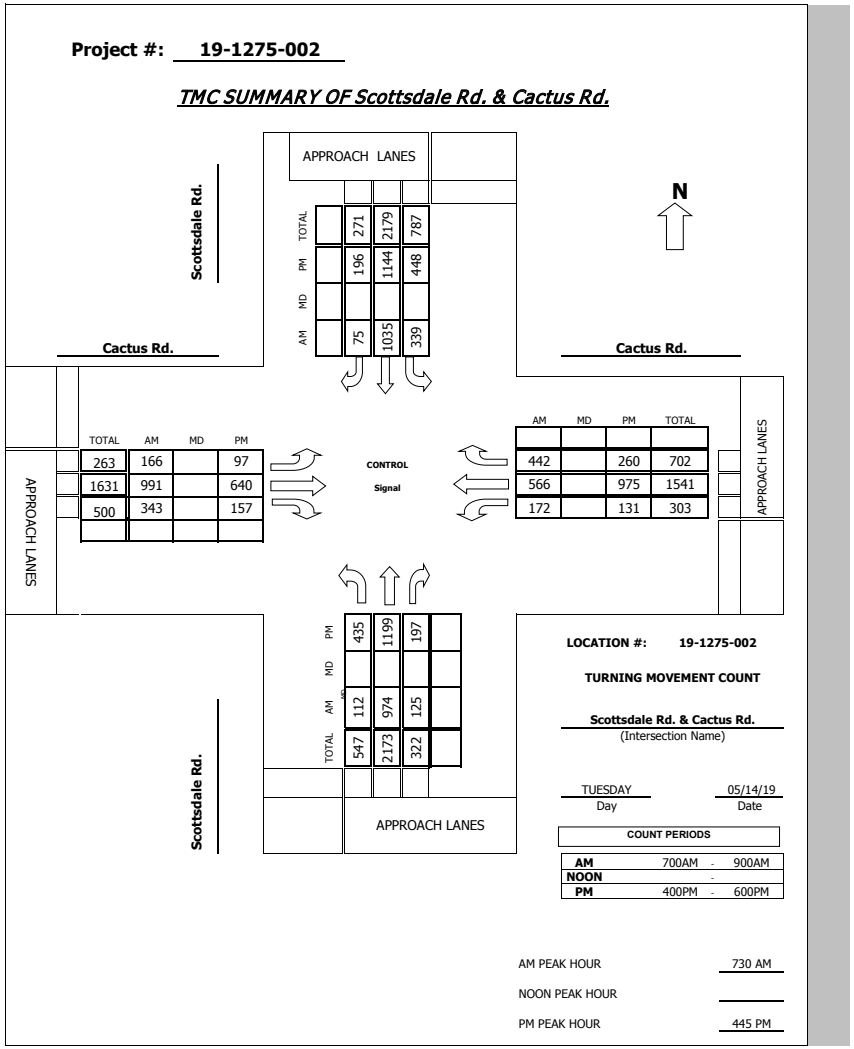
PEAK													
Volumes	237	1305	54	136	1449	250	148	203	182	157	784	206	5111
Approach %	14.85	81.77	3.38	7.41	78.96	13.62	27.77	38.09	34.15	13.69	68.35	17.96	
PEAK HR. FACTOR:		0.924			0.867			0.888			0.896		0.951

CONTROL: Signal
COMMENT 1: 0
GPS: 33.611253, -111.925768

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 05/14/19 LOCATION: Scottsdale

E-W STREET: Cactus Rd. DAY: TUESDAY PROJECT# 19-1275-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 0	EL 2	ET 2	ER 1	WL 2	WT 2	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	21	125	14	71	189	7	22	241	80	40	97	82	989
7:15 AM	19	159	28	97	264	10	31	270	71	65	117	79	1210
7:30 AM	26	247	39	78	272	14	39	249	79	51	166	114	1374
7:45 AM	28	274	34	99	282	20	43	268	95	47	123	121	1434
8:00 AM	31	227	25	89	243	20	47	244	88	42	125	101	1282
8:15 AM	27	226	27	73	238	21	37	230	81	32	152	106	1250
8:30 AM	28	238	26	81	202	20	42	234	97	42	143	114	1267
8:45 AM	46	263	29	67	252	20	34	192	84	40	148	113	1288
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	226	1759	222	655	1942	132	295	1928	675	359	1071	830	10094
Approach %	10.24	79.70	10.06	24.00	71.16	4.84	10.18	66.53	23.29	15.88	47.39	36.73	
App/Depart	2207	/	2884	2729	/	2976	2898	/	2805	2260	/	1429	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	112	974	125	339	1035	75	166	991	343	172	566	442	5340
Approach %	9.25	80.43	10.32	23.40	71.43	5.18	11.07	66.07	22.87	14.58	47.97	37.46	
PEAK HR. FACTOR:		0.901			0.903			0.924			0.891		0.931

CONTROL: Signal
COMMENT 1:
GPS: 33.596710, -111.925930

14-ZN-2019
6/03/2020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Scottsdale Rd.
0
E-W STREET: Cactus Rd.

DATE: 05/14/19
DAY: TUESDAY

LOCATION: Scottsdale
PROJECT# 19-1275-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	2	3	0	2	2	1	2	2	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	109	324	45	130	267	45	28	141	42	28	245	81	1485
4:15 PM	91	313	32	115	261	27	25	163	49	17	269	63	1425
4:30 PM	123	345	36	105	256	48	21	144	47	26	236	48	1435
4:45 PM	117	294	39	96	252	50	29	171	36	30	248	78	1440
5:00 PM	98	293	56	115	302	51	22	157	41	26	245	50	1456
5:15 PM	113	324	62	106	300	43	25	159	44	22	266	68	1532
5:30 PM	107	288	40	131	290	52	21	153	36	53	216	64	1451
5:45 PM	85	258	42	87	234	40	36	139	36	70	181	55	1263
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	843	2439	352	885	2162	356	207	1227	331	272	1906	507	11487
Approach %	23.20	67.12	9.69	26.01	63.53	10.46	11.73	69.52	18.75	10.13	70.99	18.88	
App/Depart	3634	/	3153	3403	/	2765	1765	/	2464	2685	/	3105	

PM Peak Hr Begins at: 445 PM

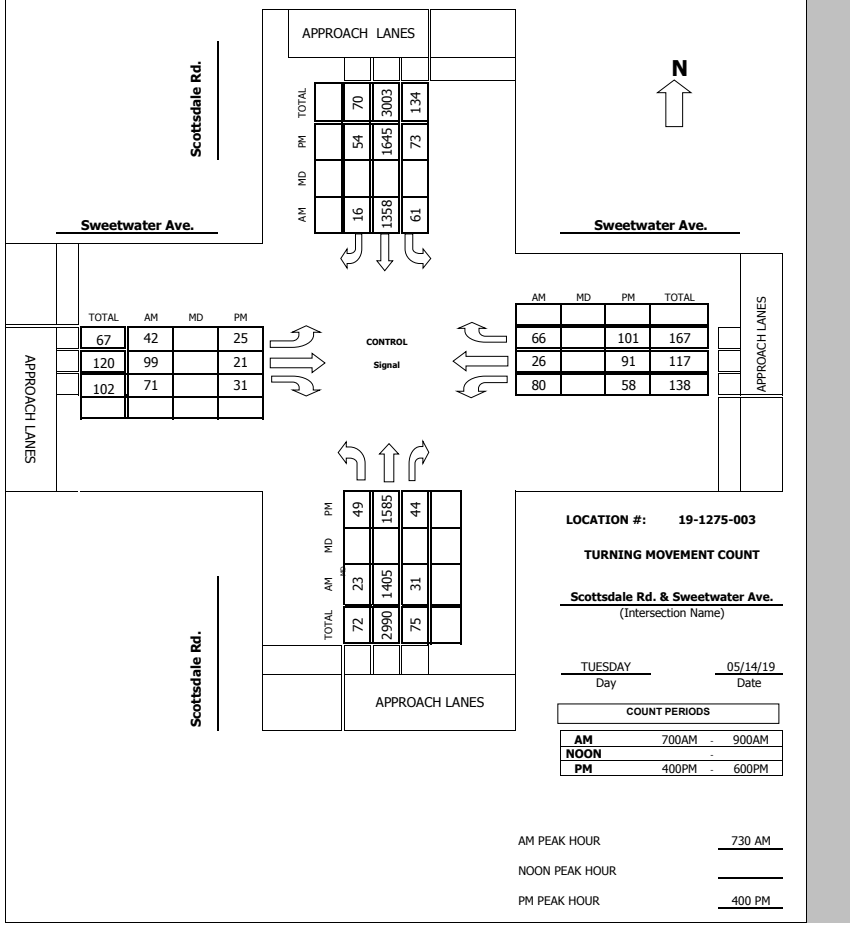
PEAK													
Volumes	435	1199	197	448	1144	196	97	640	157	131	975	260	5879
Approach %	23.76	65.48	10.76	25.06	63.98	10.96	10.85	71.59	17.56	9.59	71.38	19.03	
PEAK HR. FACTOR:		0.917			0.945			0.947			0.959		0.959

CONTROL: Signal
COMMENT 1: 0
GPS: 33.596710, -111.925930

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

Project #: 19-1275-003

TMC SUMMARY OF Scottsdale Rd. & Sweetwater Ave.



LOCATION #: 19-1275-003

TURNING MOVEMENT COUNT

Scottsdale Rd. & Sweetwater Ave.
(Intersection Name)

TUESDAY (Day) 05/14/19 (Date)

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

AM PEAK HOUR 730 AM
NOON PEAK HOUR
PM PEAK HOUR 400 PM

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 05/14/19 LOCATION: Scottsdale
E-W STREET: Sweetwater Ave. DAY: TUESDAY PROJECT# 19-1275-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	5	208	4	10	276	6	5	7	14	6	4	7	552
7:15 AM	7	275	6	20	322	2	10	11	26	10	2	10	701
7:30 AM	9	297	7	19	387	3	12	27	19	15	5	17	817
7:45 AM	5	430	10	18	319	4	12	32	18	29	8	14	899
8:00 AM	1	324	6	13	364	4	13	24	19	27	9	17	821
8:15 AM	8	354	8	11	288	5	5	16	15	9	4	18	741
8:30 AM	5	317	6	15	334	10	9	10	18	9	4	14	751
8:45 AM	8	401	10	14	315	8	4	12	19	8	9	14	822
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	48	2606	57	120	2605	42	70	139	148	113	45	111	6104
Approach %	1.77	96.13	2.10	4.34	94.15	1.52	19.61	38.94	41.46	42.01	16.73	41.26	
App/Depart	2711	/	2787	2767	/	2866	357	/	316	269	/	135	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	23	1405	31	61	1358	16	42	99	71	80	26	66	3278
Approach %	1.58	96.30	2.12	4.25	94.63	1.11	19.81	46.70	33.49	46.51	15.12	38.37	
PEAK HR. FACTOR:		0.820			0.877			0.855			0.811		0.912

CONTROL: Signal
COMMENT 1:
GPS: 33.603972, -111.925869

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 05/14/19 LOCATION: Scottsdale
0
E-W STREET: Sweetwater Ave. DAY: TUESDAY PROJECT# 19-1275-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 1	SL 1	ST 3	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	9	405	13	17	406	14	7	7	8	22	20	20	948
4:15 PM	16	417	13	18	424	13	10	5	7	12	21	30	986
4:30 PM	13	357	9	23	387	11	2	5	7	12	28	23	877
4:45 PM	11	406	9	15	428	16	6	4	9	12	22	28	966
5:00 PM	12	306	11	18	454	19	11	1	8	20	31	26	917
5:15 PM	10	325	5	21	430	17	6	4	12	7	22	18	877
5:30 PM	5	327	10	16	444	18	4	7	11	13	26	22	903
5:45 PM	13	339	10	19	344	18	3	4	4	5	16	24	799
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	89	2882	80	147	3317	126	49	37	66	103	186	191	7273
Approach %	2.92	94.46	2.62	4.09	92.40	3.51	32.24	24.34	43.42	21.46	38.75	39.79	
App/Depart	3051	/	3122	3590	/	3486	152	/	264	480	/	401	

PM Peak Hr Begins at: 400 PM

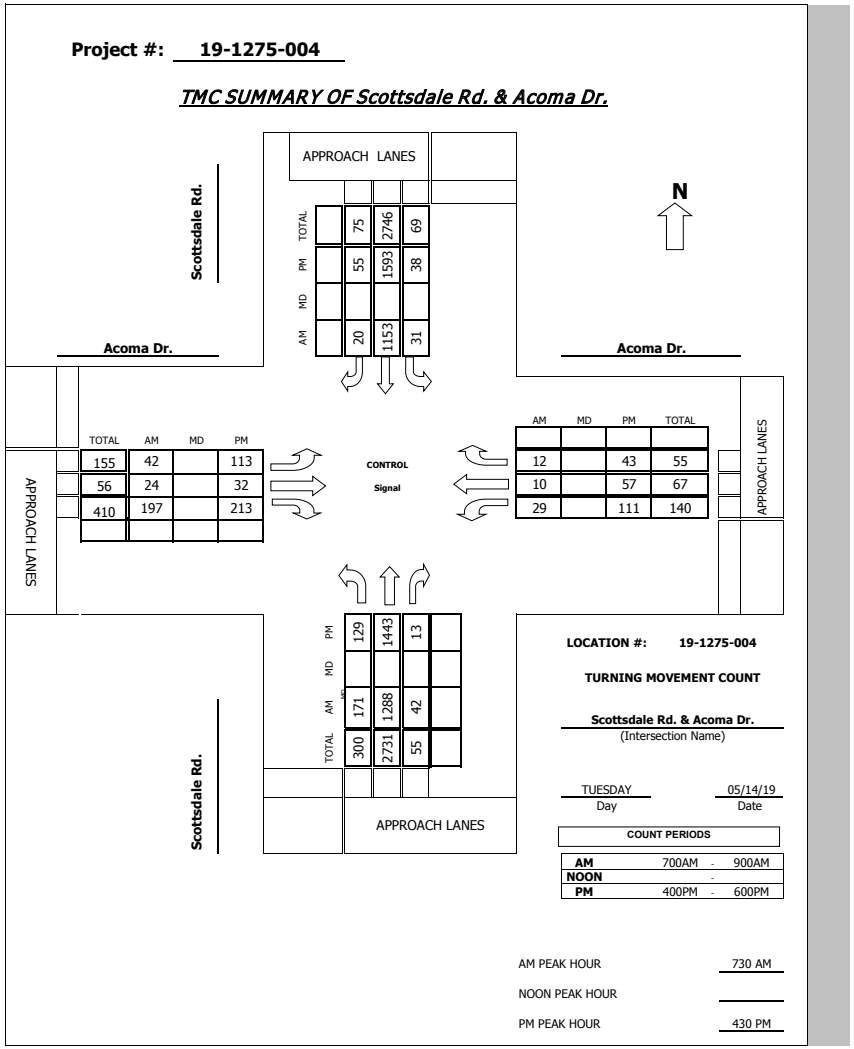
PEAK													
Volumes	49	1585	44	73	1645	54	25	21	31	58	91	101	3777
Approach %	2.92	94.46	2.62	4.12	92.83	3.05	32.47	27.27	40.26	23.20	36.40	40.40	
PEAK HR. FACTOR:		0.941			0.965			0.875			0.992		0.958

CONTROL: Signal
COMMENT 1: 0
GPS: 33.603972, -111.925869

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 05/14/19 LOCATION: Scottsdale
E-W STREET: Acoma Dr. DAY: TUESDAY PROJECT# 19-1275-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	1	1	1	1	1	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	33	213	4	8	206	7	7	5	42	5	2	2	534
7:15 AM	41	241	6	1	244	3	9	2	42	5	0	1	595
7:30 AM	41	298	7	6	325	2	10	3	58	7	1	2	760
7:45 AM	50	382	10	8	265	6	10	9	55	8	3	3	809
8:00 AM	43	310	14	9	310	6	12	3	47	6	3	5	768
8:15 AM	37	298	11	8	253	6	10	9	37	8	3	2	682
8:30 AM	36	306	6	9	297	4	5	3	45	3	2	5	721
8:45 AM	43	315	7	7	288	8	15	7	46	11	2	2	751
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	324	2363	65	56	2188	42	78	41	372	53	16	22	5620
Approach %	11.77	85.86	2.36	2.45	95.71	1.84	15.89	8.35	75.76	58.24	17.58	24.18	
App/Depart	2752	/	2463	2286	/	2613	491	/	162	91	/	382	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	171	1288	42	31	1153	20	42	24	197	29	10	12	3019
Approach %	11.39	85.81	2.80	2.57	95.76	1.66	15.97	9.13	74.90	56.86	19.61	23.53	
PEAK HR. FACTOR:		0.849			0.904			0.889			0.911		0.933

CONTROL: Signal
COMMENT 1:
GPS: 33.618042, -111.925788

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd.
0
E-W STREET: Acoma Dr.

DATE: 05/14/19
DAY: TUESDAY

LOCATION: Scottsdale
PROJECT# 19-1275-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	3	0	1	3	1	1	1	1	1	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	27	373	5	7	397	18	31	6	65	27	15	15	986
4:15 PM	46	364	1	8	345	6	25	10	40	24	13	7	889
4:30 PM	36	377	3	10	393	16	25	4	56	25	13	12	970
4:45 PM	34	340	3	13	353	11	28	7	46	28	11	9	883
5:00 PM	30	305	2	7	451	16	30	14	57	34	17	15	978
5:15 PM	29	421	5	8	396	12	30	7	54	24	16	7	1009
5:30 PM	40	322	5	4	383	12	22	8	52	26	13	6	893
5:45 PM	44	298	4	6	294	5	18	3	27	14	7	9	729
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	286	2800	28	63	3012	96	209	59	397	202	105	80	7337
Approach %	9.18	89.92	0.90	1.99	94.99	3.03	31.43	8.87	59.70	52.20	27.13	20.67	
App/Depart	3114	/	3089	3171	/	3611	665	/	150	387	/	487	

PM Peak Hr Begins at: 430 PM

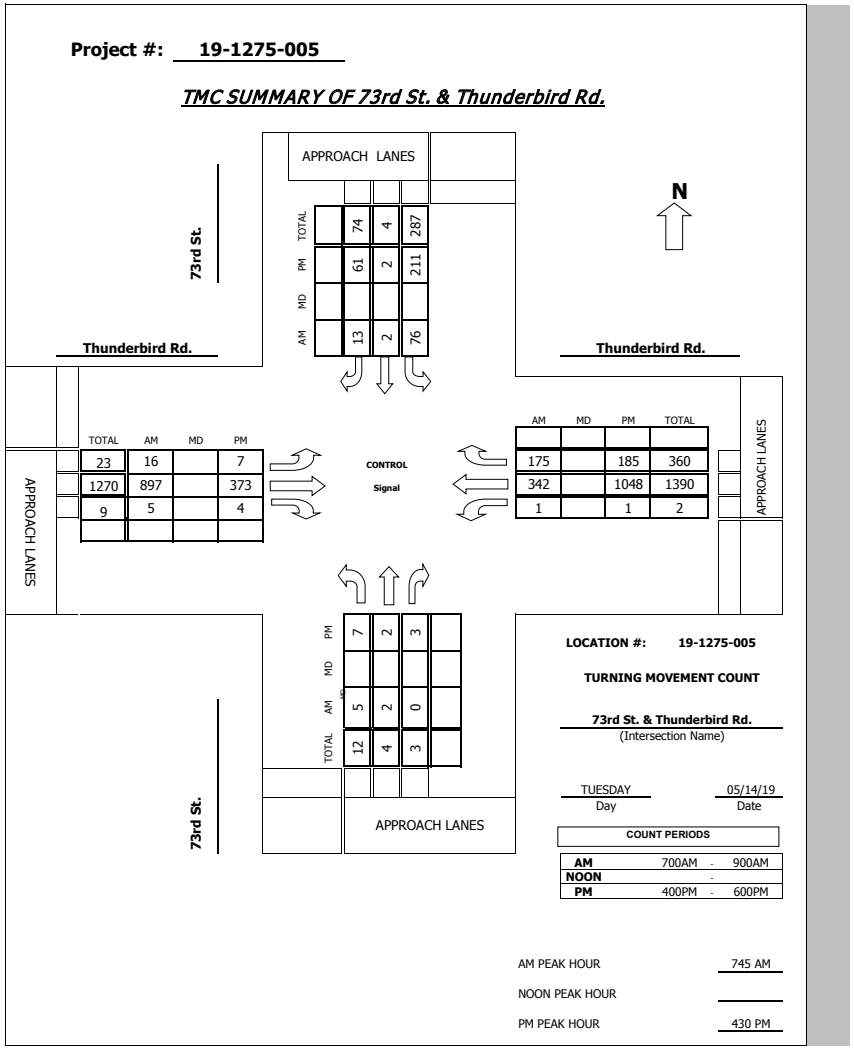
PEAK													
Volumes	129	1443	13	38	1593	55	113	32	213	111	57	43	3840
Approach %	8.14	91.04	0.82	2.25	94.48	3.26	31.56	8.94	59.50	52.61	27.01	20.38	
PEAK HR. FACTOR:		0.871			0.889			0.886			0.799		0.951

CONTROL: Signal
COMMENT 1: 0
GPS: 33.618042, -111.925788

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 19-1275-005

TMC SUMMARY OF 73rd St. & Thunderbird Rd.



14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 73rd St.
E-W STREET: Thunderbird Rd.
DATE: 05/14/19
DAY: TUESDAY
LOCATION: Scottsdale
PROJECT#: 19-1275-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	0	1	14	1	3	5	140	1	1	79	30	276
7:15 AM	1	1	3	19	1	3	3	225	0	0	61	31	348
7:30 AM	3	0	1	14	0	5	4	222	1	0	64	39	353
7:45 AM	1	1	0	24	1	1	3	265	1	0	70	60	427
8:00 AM	1	0	0	13	0	4	3	236	0	0	90	43	390
8:15 AM	2	1	0	24	0	6	3	192	3	0	86	39	356
8:30 AM	1	0	0	15	1	2	7	204	1	1	96	33	361
8:45 AM	3	1	1	15	1	3	0	213	3	0	102	43	385
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	13	4	6	138	5	27	28	1697	10	2	648	318	2896
Approach %	56.52	17.39	26.09	81.18	2.94	15.88	1.61	97.81	0.58	0.21	66.94	32.85	
App/Depart	23	/	350	170	/	17	1735	/	1841	968	/	688	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	5	2	0	76	2	13	16	897	5	1	342	175	1534
Approach %	71.43	28.57	0.00	83.52	2.20	14.29	1.74	97.71	0.54	0.19	66.02	33.78	
PEAK HR. FACTOR:	0.583			0.758			0.853			0.974			0.898

CONTROL: Signal
COMMENT 1:
GPS: 33.611189, -111.923184

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 73rd St.
0
E-W STREET: Thunderbird Rd.
DATE: 05/14/19
DAY: TUESDAY
LOCATION: Scottsdale
PROJECT#: 19-1275-005

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 2	ER 0	WL 1	WT 2	WR 1	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	1	0	0	68	0	14	1	107	0	0	306	47	544
4:15 PM	2	1	0	34	1	12	3	91	1	0	217	40	402
4:30 PM	1	0	2	39	0	17	0	101	1	0	238	38	437
4:45 PM	2	1	0	56	0	17	0	101	1	0	241	39	458
5:00 PM	2	0	1	70	1	20	2	92	2	0	313	58	561
5:15 PM	2	1	0	46	1	7	5	79	0	1	256	50	448
5:30 PM	1	0	1	41	0	5	1	74	2	0	213	22	360
5:45 PM	2	1	0	26	0	9	3	87	1	0	192	23	344
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	13	4	4	380	3	101	15	732	8	1	1976	317	3554
Approach %	61.90	19.05	19.05	78.51	0.62	20.87	1.99	96.95	1.06	0.04	86.14	13.82	
App/Depart	21	/	336	484	/	12	755	/	1116	2294	/	2090	

PM Peak Hr Begins at: 430 PM

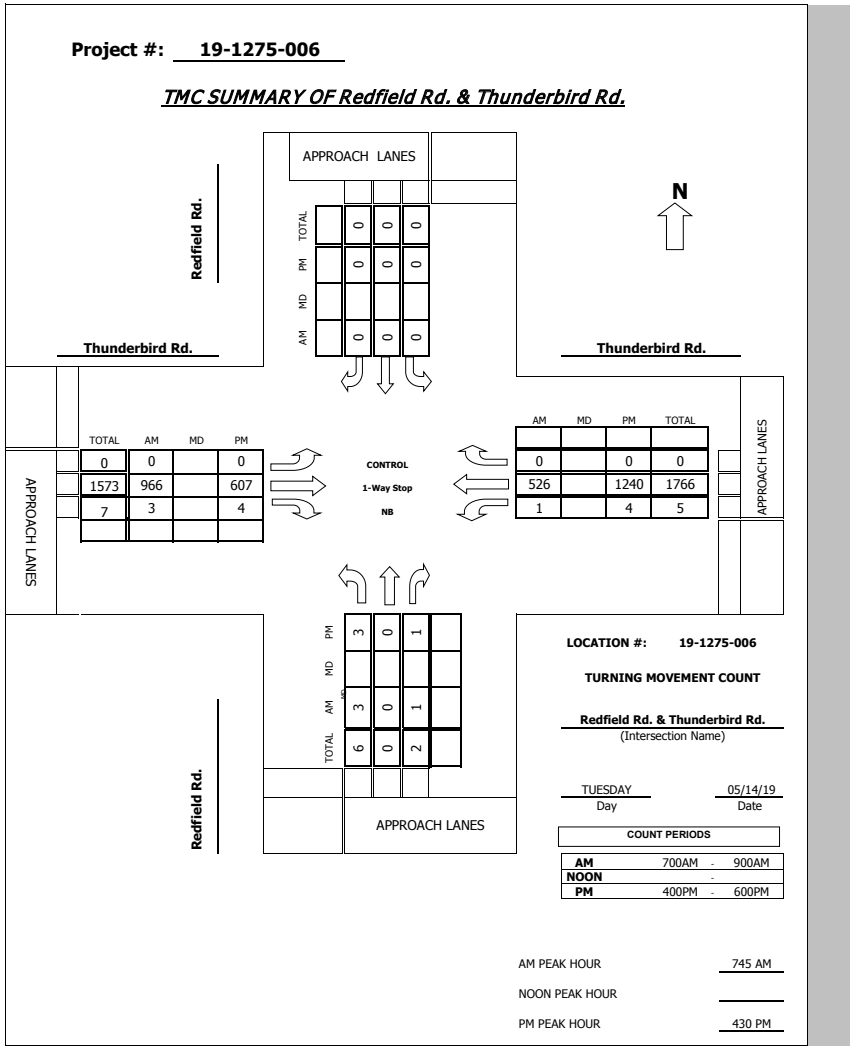
PEAK													
Volumes	7	2	3	211	2	61	7	373	4	1	1048	185	1904
Approach %	58.33	16.67	25.00	77.01	0.73	22.26	1.82	97.14	1.04	0.08	84.93	14.99	
PEAK HR. FACTOR:	1.000			0.753			0.941			0.832			0.848

CONTROL: Signal
COMMENT 1: 0
GPS: 33.611189, -111.923184

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Redfield Rd. DATE: 05/14/19 LOCATION: Scottsdale
E-W STREET: Thunderbird Rd. DAY: TUESDAY PROJECT# 19-1275-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 1	NR 0	SL 0	ST 0	SR 0	EL 0	ET 1	ER 1	WL 0	WT 2	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	1	0	0	0	0	0	0	151	1	0	102	0	255
7:15 AM	0	0	0	0	0	0	0	235	2	2	91	0	330
7:30 AM	0	0	0	0	0	0	0	223	1	1	103	0	328
7:45 AM	1	0	1	0	0	0	0	289	0	0	133	0	424
8:00 AM	0	0	0	0	0	0	0	248	0	0	132	0	380
8:15 AM	0	0	0	0	0	0	0	214	1	0	125	0	340
8:30 AM	2	0	0	0	0	0	0	215	2	1	136	0	356
8:45 AM	0	0	1	0	0	0	0	232	0	0	145	0	378
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	4	0	2	0	0	0	0	1807	7	4	967	0	2791
Approach %	66.67	0.00	33.33	####	####	####	0.00	99.61	0.39	0.41	99.59	0.00	
App/Depart	6	/	0	0	/	11	1814	/	1809	971	/	971	

AM Peak Hr Begins at: 745 AM

PEAK													
Volumes	3	0	1	0	0	0	0	966	3	1	526	0	1500
Approach %	75.00	0.00	25.00	####	####	####	0.00	99.69	0.31	0.19	99.81	0.00	
PEAK HR. FACTOR:	0.500			0.000			0.838			0.962			0.884

CONTROL: 1-Way Stop (NB)
COMMENT 1:
GPS: 33.612183, -111.921430

14-ZN-2019
6/03/2020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Redfield Rd.
0
E-W STREET: Thunderbird Rd.

DATE: 05/14/19
DAY: TUESDAY

LOCATION: Scottsdale
PROJECT# 19-1275-006

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	1	0	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	2	0	0	0	0	0	0	169	0	0	346	0	517
4:15 PM	1	0	1	0	0	0	0	134	0	1	251	0	388
4:30 PM	0	0	0	0	0	0	0	139	0	0	282	0	421
4:45 PM	1	0	0	0	0	0	0	167	1	0	284	0	453
5:00 PM	2	0	0	0	0	0	0	169	2	2	364	0	539
5:15 PM	0	0	1	0	0	0	0	132	1	2	310	0	446
5:30 PM	1	0	0	0	0	0	0	133	0	0	234	0	368
5:45 PM	1	0	1	0	0	0	0	106	1	0	212	0	321
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	8	0	3	0	0	0	0	1149	5	5	2283	0	3453
Approach %	72.73	0.00	27.27	####	####	####	0.00	99.57	0.43	0.22	99.78	0.00	
App/Depart	11	/	0	0	/	10	1154	/	1152	2288	/	2291	

PM Peak Hr Begins at: 430 PM

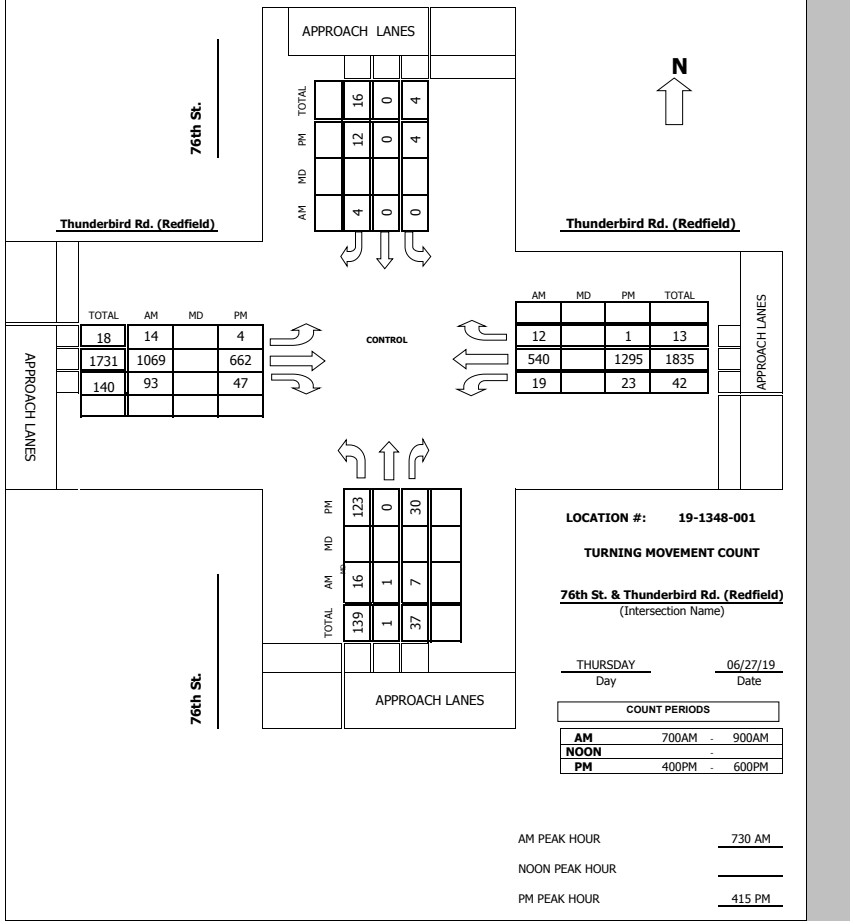
PEAK													
Volumes	3	0	1	0	0	0	0	607	4	4	1240	0	1859
Approach %	75.00	0.00	25.00	####	####	####	0.00	99.35	0.65	0.32	99.68	0.00	
PEAK HR. FACTOR:	0.500			0.000			0.893			0.850			0.862

CONTROL: 1-Way Stop (NB)
COMMENT 1: 0
GPS: 33.612183, -111.921430

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

Project #: 19-1348-001

TMC SUMMARY OF 76th St. & Thunderbird Rd. (Redfield)



14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 76th St. DATE: 06/27/19 LOCATION: Scottsdale

E-W STREET: Thunderbird Rd. (Redfield) DAY: THURSDAY PROJECT# 19-1348-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	1	0	1	1	0	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	0	1	0	0	0	1	176	19	4	103	0	308
7:15 AM	2	0	2	0	0	1	4	202	16	5	101	1	334
7:30 AM	5	0	1	0	0	0	1	258	20	5	108	1	399
7:45 AM	2	0	3	0	0	1	5	301	24	3	136	2	477
8:00 AM	6	0	2	0	0	2	2	285	28	6	155	3	489
8:15 AM	3	1	1	0	0	1	6	225	21	5	141	6	410
8:30 AM	2	0	2	0	0	0	3	214	19	8	139	2	389
8:45 AM	8	0	1	0	0	1	6	185	20	4	125	5	355
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	32	1	13	0	0	6	28	1846	167	40	1008	20	3161
Approach %	69.57	2.17	28.26	0.00	0.00	100.00	1.37	90.45	8.18	3.75	94.38	1.87	
App/Depart	46	/	49	6	/	207	2041	/	1859	1068	/	1046	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	16	1	7	0	0	4	14	1069	93	19	540	12	1775
Approach %	66.67	4.17	29.17	0.00	0.00	100.00	1.19	90.90	7.91	3.33	94.57	2.10	
PEAK HR. FACTOR:	0.750			0.500			0.891			0.870			0.907

CONTROL: Signal
COMMENT 1:
GPS: 33.613954, -111.916956

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: 76th St. DATE: 06/27/19 LOCATION: Scottsdale
0
E-W STREET: Thunderbird Rd. (Redfield) DAY: THURSDAY PROJECT# 19-1348-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	0	1	0	1	1	0	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	29	0	3	1	0	1	1	158	7	3	289	0	492
4:15 PM	30	0	6	2	0	2	2	151	11	6	301	0	511
4:30 PM	41	0	9	1	0	5	1	166	10	5	325	0	563
4:45 PM	28	0	6	1	0	2	1	169	14	8	344	0	573
5:00 PM	24	0	9	0	0	3	0	176	12	4	325	1	554
5:15 PM	25	0	5	1	0	2	1	151	8	7	289	0	489
5:30 PM	21	0	8	2	0	5	2	155	5	5	276	1	480
5:45 PM	19	0	4	4	0	1	1	139	9	8	254	0	439
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	217	0	50	12	0	21	9	1265	76	46	2403	2	4101
Approach %	81.27	0.00	18.73	36.36	0.00	63.64	0.67	93.70	5.63	1.88	98.04	0.08	
App/Depart	267	/	11	33	/	122	1350	/	1327	2451	/	2641	

PM Peak Hr Begins at: 415 PM

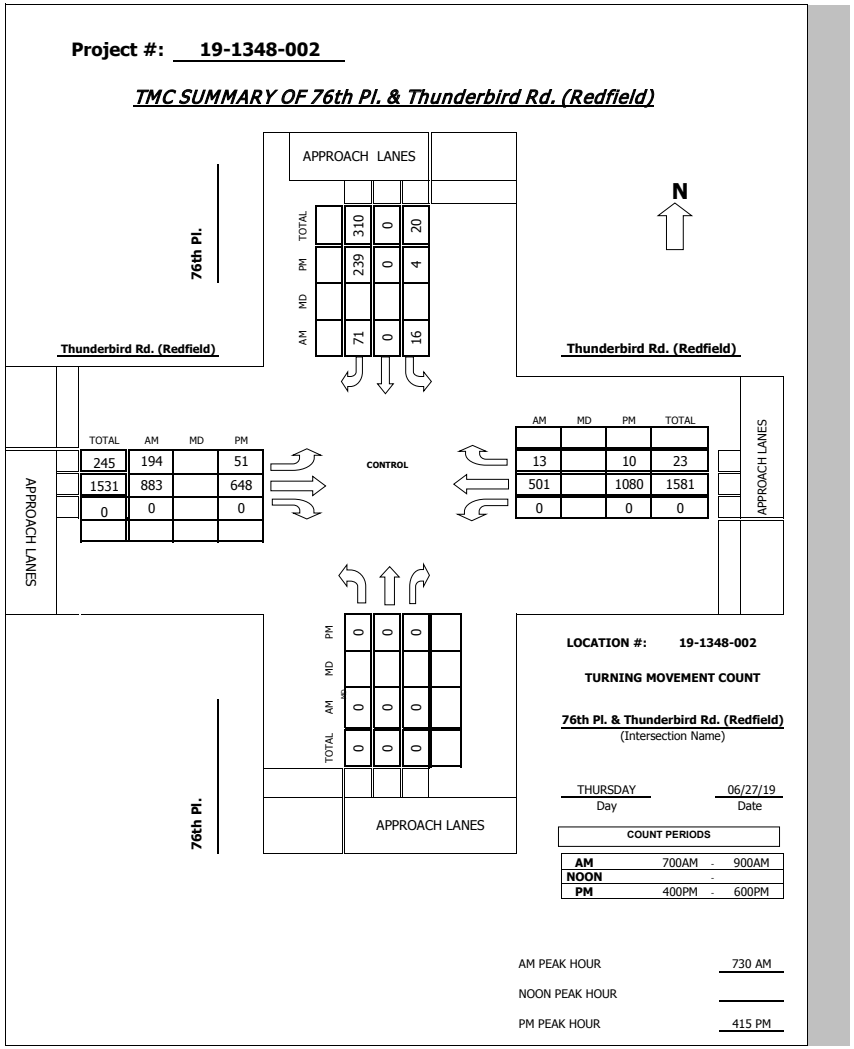
PEAK													
Volumes	123	0	30	4	0	12	4	662	47	23	1295	1	2201
Approach %	80.39	0.00	19.61	25.00	0.00	75.00	0.56	92.85	6.59	1.74	98.18	0.08	
PEAK HR. FACTOR:	0.765			0.667			0.948			0.937			0.960

CONTROL: Signal
COMMENT 1: 0
GPS: 33.613954, -111.916956

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: 76th Pl. DATE: 06/27/19 LOCATION: Scottsdale

E-W STREET: Thunderbird Rd. (Redfield) DAY: THURSDAY PROJECT# 19-1348-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 0	NT 0	NR 0	SL 1	ST 0	SR 1	EL 1	ET 1	ER 0	WL 0	WT 2	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	0	4	0	13	28	151	0	0	96	2	294
7:15 AM	0	0	0	1	0	16	24	181	0	0	90	5	317
7:30 AM	0	0	0	5	0	14	41	218	0	0	99	2	379
7:45 AM	0	0	0	2	0	21	45	260	0	0	121	3	452
8:00 AM	0	0	0	6	0	20	50	236	0	0	144	6	462
8:15 AM	0	0	0	3	0	16	58	169	0	0	137	2	385
8:30 AM	0	0	0	2	0	16	54	162	0	0	133	5	372
8:45 AM	0	0	0	5	0	17	46	139	0	0	117	2	326
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	28	0	133	346	1516	0	0	937	27	2987
Approach %	####	####	####	17.39	0.00	82.61	18.58	81.42	0.00	0.00	97.20	2.80	
App/Depart	0	/	373	161	/	0	1862	/	1544	964	/	1070	

AM Peak Hr Begins at: 730 AM

PEAK													
Volumes	0	0	0	16	0	71	194	883	0	0	501	13	1678
Approach %	####	####	####	18.39	0.00	81.61	18.01	81.99	0.00	0.00	97.47	2.53	
PEAK HR. FACTOR:		0.000			0.837			0.883			0.857		0.908

CONTROL: Signal
COMMENT 1:
GPS: 33.613956, -111.916135

14-ZN-2019
6/03/2020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: 76th Pl.
0
E-W STREET: Thunderbird Rd. (Redfield)

DATE: 06/27/19
DAY: THURSDAY

LOCATION: Scottsdale
PROJECT# 19-1348-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	0	0	1	0	1	1	1	0	0	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	0	0	1	0	58	9	154	0	0	236	2	460
4:15 PM	0	0	0	2	0	65	11	151	0	0	243	3	475
4:30 PM	0	0	0	1	0	60	10	165	0	0	270	2	508
4:45 PM	0	0	0	0	0	69	14	162	0	0	282	1	528
5:00 PM	0	0	0	1	0	45	16	170	0	0	285	4	521
5:15 PM	0	0	0	3	0	41	13	143	0	0	256	1	457
5:30 PM	0	0	0	2	0	24	9	156	0	0	258	2	451
5:45 PM	0	0	0	1	0	28	6	141	0	0	234	1	411
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	0	0	11	0	390	88	1242	0	0	2064	16	3811
Approach %	####	####	####	2.74	0.00	97.26	6.62	93.38	0.00	0.00	99.23	0.77	
App/Depart	0	/	104	401	/	0	1330	/	1253	2080	/	2454	

PM Peak Hr Begins at: 415 PM

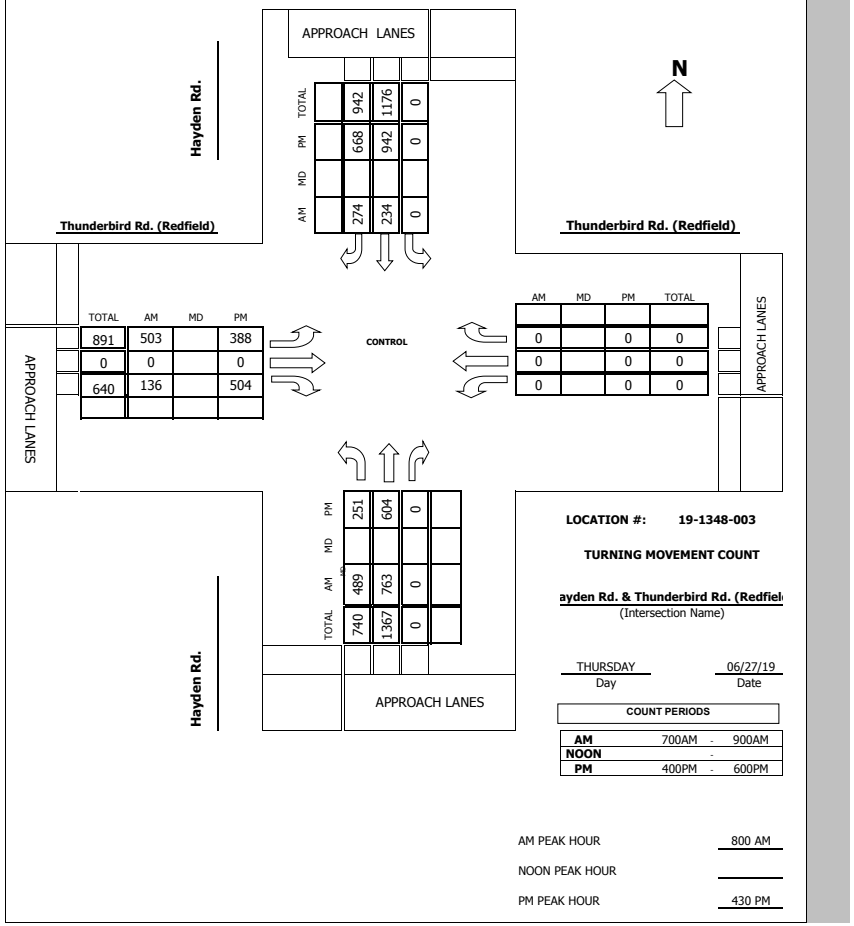
PEAK													
Volumes	0	0	0	4	0	239	51	648	0	0	1080	10	2032
Approach %	####	####	####	1.65	0.00	98.35	7.30	92.70	0.00	0.00	99.08	0.92	
PEAK HR. FACTOR:		0.000			0.880			0.940			0.943		0.962

CONTROL: Signal
COMMENT 1: 0
GPS: 33.613956, -111.916135

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

Project #: 19-1348-003

TMC SUMMARY OF Hayden Rd. & Thunderbird Rd. (Redfield)



14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Hayden Rd. DATE: 06/27/19 LOCATION: Scottsdale
E-W STREET: Thunderbird Rd. (Redfield) DAY: THURSDAY PROJECT# 19-1348-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 2	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	76	128	0	0	27	43	89	0	25	0	0	0	388
7:15 AM	103	141	0	0	45	54	101	0	32	0	0	0	476
7:30 AM	101	163	0	0	50	58	104	0	30	0	0	0	506
7:45 AM	108	196	0	0	59	65	105	0	39	0	0	0	572
8:00 AM	102	214	0	0	60	65	103	0	43	0	0	0	587
8:15 AM	125	181	0	0	65	60	139	0	41	0	0	0	611
8:30 AM	122	199	0	0	55	69	133	0	24	0	0	0	602
8:45 AM	140	169	0	0	54	80	128	0	28	0	0	0	599
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	877	1391	0	0	415	494	902	0	262	0	0	0	4341
Approach %	38.67	61.33	0.00	0.00	45.65	54.35	77.49	0.00	22.51	####	####	####	
App/Depart	2268	/	2293	909	/	677	1164	/	0	0	/	1371	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	489	763	0	0	234	274	503	0	136	0	0	0	2399
Approach %	39.06	60.94	0.00	0.00	46.06	53.94	78.72	0.00	21.28	####	####	####	
PEAK HR. FACTOR:	0.975			0.948			0.888			0.000			0.982

CONTROL: Signal
COMMENT 1:
GPS: 33.613927, -111.908495

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Hayden Rd. DATE: 06/27/19 LOCATION: Scottsdale
0
E-W STREET: Thunderbird Rd. (Redfield) DAY: THURSDAY PROJECT# 19-1348-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 2	NR 0	SL 0	ST 2	SR 1	EL 2	ET 0	ER 1	WL 0	WT 0	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	63	139	0	0	220	133	100	0	104	0	0	0	759
4:15 PM	60	141	0	0	208	139	85	0	120	0	0	0	753
4:30 PM	65	147	0	0	204	146	103	0	133	0	0	0	798
4:45 PM	58	154	0	0	245	174	96	0	121	0	0	0	848
5:00 PM	54	152	0	0	252	187	99	0	122	0	0	0	866
5:15 PM	74	151	0	0	241	161	90	0	128	0	0	0	845
5:30 PM	75	155	0	0	189	133	98	0	108	0	0	0	758
5:45 PM	50	146	0	0	196	139	101	0	79	0	0	0	711
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	499	1185	0	0	1755	1212	772	0	915	0	0	0	6338
Approach %	29.63	70.37	0.00	0.00	59.15	40.85	45.76	0.00	54.24	####	####	####	
App/Depart	1684	/	1957	2967	/	2670	1687	/	0	0	/	1711	

PM Peak Hr Begins at: 430 PM

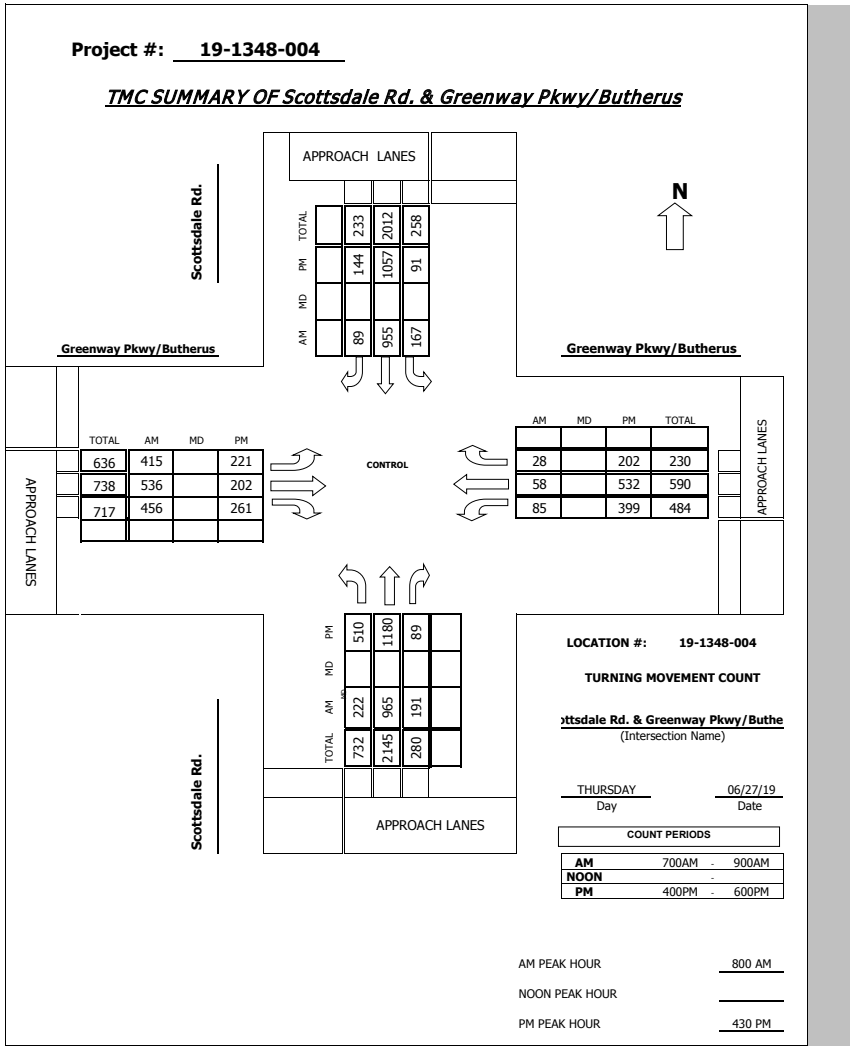
PEAK													
Volumes	251	604	0	0	942	668	388	0	504	0	0	0	3357
Approach %	29.36	70.64	0.00	0.00	58.51	41.49	43.50	0.00	56.50	####	####	####	
PEAK HR. FACTOR:	0.950			0.917			0.945			0.000			0.969

CONTROL: Signal
COMMENT 1: 0
GPS: 33.613927, -111.908495

14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745



Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 06/27/19 LOCATION: Scottsdale

E-W STREET: Greenway Pkwy/Butherus DAY: THURSDAY PROJECT# 19-1348-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 1	EL 2	ET 2	ER 1	WL 2	WT 2	WR 1	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	39	173	29	29	179	28	54	85	89	13	8	4	730
7:15 AM	45	208	30	24	199	25	74	104	101	16	11	8	845
7:30 AM	50	241	32	28	222	32	78	133	108	17	10	2	953
7:45 AM	54	244	41	42	208	30	80	128	128	21	14	3	993
8:00 AM	63	258	42	41	245	26	103	145	133	24	16	6	1102
8:15 AM	55	236	45	54	225	24	101	133	111	20	13	9	1026
8:30 AM	50	243	50	33	246	20	108	136	104	22	16	5	1033
8:45 AM	54	228	54	39	239	19	103	122	108	19	13	8	1006
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	410	1831	323	290	1763	204	701	986	882	152	101	45	7688
Approach %	15.99	71.41	12.60	12.85	78.11	9.04	27.29	38.38	34.33	51.01	33.89	15.10	
App/Depart	2564	/	2577	2257	/	2797	2569	/	1599	298	/	715	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	222	965	191	167	955	89	415	536	456	85	58	28	4167
Approach %	16.11	70.03	13.86	13.79	78.86	7.35	29.50	38.10	32.41	49.71	33.92	16.37	
PEAK HR. FACTOR:		0.949			0.970			0.923			0.929		0.945

CONTROL: Signal
COMMENT 1:
GPS: 33.622773, -111.925724

14-ZN-2019
6/03/2020

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 veracitytrafficgroup

N-S STREET: Scottsdale Rd.
0
E-W STREET: Greenway Pkwy/Butherus

DATE: 06/27/19
DAY: THURSDAY

LOCATION: Scottsdale
PROJECT# 19-1348-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	2	3	1	2	3	1	2	2	1	2	2	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	79	252	28	26	246	28	74	39	60	82	99	30	1043
4:15 PM	103	249	24	24	258	25	76	43	65	87	103	39	1096
4:30 PM	128	258	29	28	252	32	50	50	58	101	128	43	1157
4:45 PM	133	325	20	24	243	30	54	55	54	103	122	54	1217
5:00 PM	121	301	21	20	296	39	41	43	74	99	143	50	1248
5:15 PM	128	296	19	19	266	43	76	54	75	96	139	55	1266
5:30 PM	104	276	16	17	228	40	60	50	85	76	101	54	1107
5:45 PM	105	252	13	20	246	29	69	45	58	74	108	28	1047
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	901	2209	170	178	2035	266	500	379	529	718	943	353	9181
Approach %	27.47	67.35	5.18	7.18	82.09	10.73	35.51	26.92	37.57	35.65	46.82	17.53	
App/Depart	3280	/	3062	2479	/	3282	1408	/	727	2014	/	2110	

PM Peak Hr Begins at: 430 PM

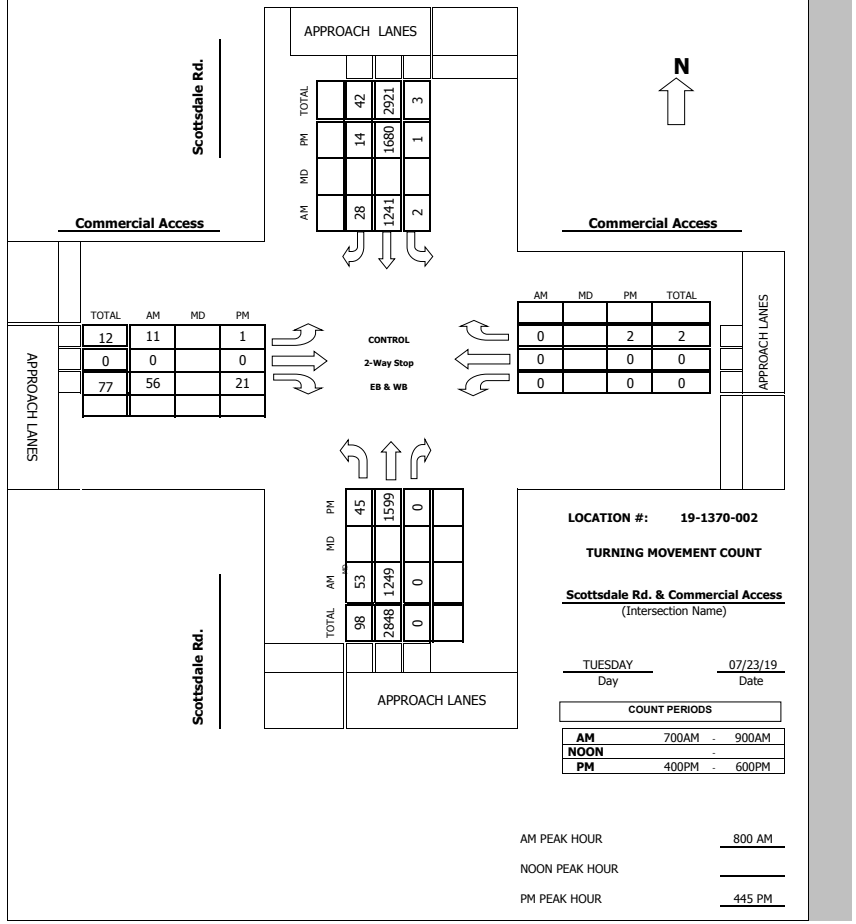
PEAK													
Volumes	510	1180	89	91	1057	144	221	202	261	399	532	202	4888
Approach %	28.67	66.33	5.00	7.04	81.81	11.15	32.31	29.53	38.16	35.22	46.95	17.83	
PEAK HR. FACTOR:		0.930			0.910			0.834			0.970		0.965

CONTROL: Signal
COMMENT 1: 0
GPS: 33.622773, -111.925724

Intersection Turning Movement
Prepared by:
FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

Project #: 19-1370-002

TMC SUMMARY OF Scottsdale Rd. & Commercial Access



14-ZN-2019
6/03/2020

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 07/23/19 LOCATION: Scottsdale
E-W STREET: Commercial Access DAY: TUESDAY PROJECT# 19-1370-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 0	SL 1	ST 3	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	9	178	0	1	236	7	0	0	13	0	0	1	445
7:15 AM	5	257	0	0	238	4	4	0	10	0	0	0	518
7:30 AM	20	292	0	0	317	9	2	0	11	0	0	0	651
7:45 AM	16	326	0	4	273	6	1	0	12	0	0	0	638
8:00 AM	17	314	0	1	274	6	3	0	14	0	0	0	629
8:15 AM	8	283	0	0	320	12	2	0	20	0	0	0	645
8:30 AM	15	294	0	1	340	4	3	0	11	0	0	0	668
8:45 AM	13	358	0	0	307	6	3	0	11	0	0	0	698
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	103	2302	0	7	2305	54	18	0	102	0	0	1	4892
Approach %	4.28	95.72	0.00	0.30	97.42	2.28	15.00	0.00	85.00	0.00	0.00	100.00	
App/Depart	2405	/	2321	2366	/	2407	120	/	7	1	/	157	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	53	1249	0	2	1241	28	11	0	56	0	0	0	2640
Approach %	4.07	95.93	0.00	0.16	97.64	2.20	16.42	0.00	83.58	####	####	####	
PEAK HR. FACTOR:	0.877			0.921			0.761			0.000			0.946

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1:
GPS: 33.609437, -111.925838

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 07/23/19 LOCATION: Scottsdale
0
E-W STREET: Commercial Access DAY: TUESDAY PROJECT# 19-1370-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
LANES:	NL 1	NT 3	NR 0	SL 1	ST 3	SR 0	EL 0	ET 1	ER 0	WL 0	WT 1	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	12	397	0	0	440	3	1	0	12	0	0	2	867
4:15 PM	11	389	0	0	389	7	1	0	7	0	0	1	805
4:30 PM	6	375	0	0	398	1	0	0	5	0	0	2	787
4:45 PM	18	348	0	1	397	6	1	0	5	0	0	2	778
5:00 PM	8	456	0	0	477	5	0	0	6	0	0	0	952
5:15 PM	13	378	0	0	422	1	0	0	6	0	0	0	820
5:30 PM	6	417	0	0	384	2	0	0	4	0	0	0	813
5:45 PM	9	331	0	0	304	4	2	0	4	0	0	0	654
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	83	3091	0	1	3211	29	5	0	49	0	0	7	6476
Approach %	2.61	97.39	0.00	0.03	99.07	0.89	9.26	0.00	90.74	0.00	0.00	100.00	
App/Depart	3174	/	3103	3241	/	3260	54	/	1	7	/	112	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	45	1599	0	1	1680	14	1	0	21	0	0	2	3363
Approach %	2.74	97.26	0.00	0.06	99.12	0.83	4.55	0.00	95.45	0.00	0.00	100.00	
PEAK HR. FACTOR:	0.886			0.879			0.917			0.250			0.883

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1: 0
GPS: 33.609437, -111.925838

14-ZN-2019
6/03/2020

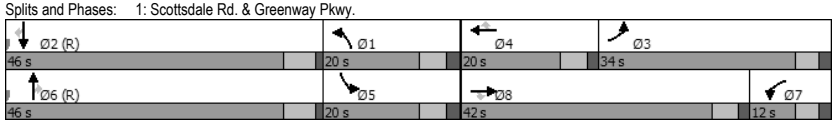
APPENDIX C

EXISTING PEAK HOUR ANALYSIS AND SIGNAL TIMING

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	531	686	584	109	74	36	284	1235	244	214	1222	114
Future Volume (vph)	531	686	584	109	74	36	284	1235	244	214	1222	114
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	34.0	42.0	42.0	12.0	20.0	20.0	20.0	46.0	46.0	20.0	46.0	46.0
Total Split (%)	28.3%	35.0%	35.0%	10.0%	16.7%	16.7%	16.7%	38.3%	38.3%	16.7%	38.3%	38.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.9	37.0	37.0	6.6	7.2	7.2	13.4	40.5	40.5	13.4	40.5	40.5
Actuated g/C Ratio	0.32	0.31	0.31	0.06	0.06	0.06	0.11	0.34	0.34	0.11	0.34	0.34
v/c Ratio	0.55	0.65	0.99	0.66	0.36	0.15	0.82	0.72	0.41	0.61	0.70	0.19
Control Delay	36.7	39.2	57.3	73.6	58.8	1.2	78.5	33.5	16.4	58.2	37.0	1.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.7	39.2	57.3	73.6	58.8	1.2	78.5	33.5	16.4	58.2	37.0	1.5
LOS	D	D	E	E	E	A	E	C	B	E	D	A
Approach Delay		44.3			56.6			38.4			37.3	
Approach LOS		D			E			D			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 80 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 115			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 40.9		Intersection LOS: D	
Intersection Capacity Utilization 78.5%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	531	686	584	109	74	36	284	1235	244	214	1222	114
Future Volume (veh/h)	531	686	584	109	74	36	284	1235	244	214	1222	114
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	577	746	396	117	80	24	299	1300	0	221	1260	77
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	901	1058	425	167	218	88	468	1805		468	1805	504
Arrive On Green	0.28	0.28	0.28	0.05	0.06	0.06	0.05	0.11	0.00	0.14	0.34	0.34
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	577	746	396	117	80	24	299	1300	0	221	1260	77
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	18.6	21.4	30.8	4.2	2.5	1.8	10.8	28.0	0.0	7.4	24.4	4.3
Cycle Q Clear(g_c), s	18.6	21.4	30.8	4.2	2.5	1.8	10.8	28.0	0.0	7.4	24.4	4.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	901	1058	425	167	218	88	468	1805		468	1805	504
V/C Ratio(X)	0.64	0.71	0.93	0.70	0.37	0.27	0.64	0.72		0.47	0.70	0.15
Avail Cap(c_a), veh/h	901	1138	457	183	452	181	468	1805		468	1805	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.84	0.84	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.3	38.6	41.9	56.1	54.4	54.1	54.1	47.9	0.0	47.2	34.6	27.9
Incr Delay (d2), s/veh	1.2	1.5	24.5	8.1	0.4	0.6	1.9	2.1	0.0	0.3	2.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	10.0	14.2	1.9	1.2	0.7	4.9	13.9	0.0	3.1	10.9	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.5	40.0	66.5	64.2	54.7	54.7	56.0	50.0	0.0	47.5	36.8	28.5
LnGrp LOS	D	D	E	E	D	D	E	D		D	D	C
Approach Vol, veh/h		1719			221			1599	A		1558	
Approach Delay, s/veh		45.9			59.7			51.1			37.9	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.2	46.0	38.3	12.5	23.2	46.0	11.4	39.4
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	14.0	40.3	28.7	* 15	14.0	40.3	6.7	* 37
Max Q Clear Time (g_c+I1), s	12.8	26.4	20.6	4.5	9.4	30.0	6.2	32.8
Green Ext Time (p_c), s	0.1	3.6	0.9	0.1	0.2	3.3	0.0	1.1

Intersection Summary		
HCM 6th Ctrl Delay	45.7	
HCM 6th LOS	D	

Notes

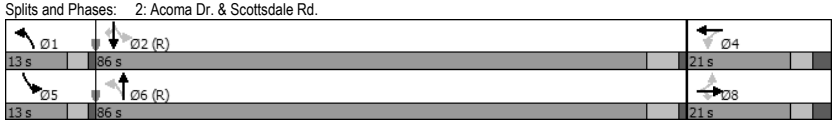
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	54	31	252	37	13	219	1649	40	1476	26
Future Volume (vph)	54	31	252	37	13	219	1649	40	1476	26
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	14.0	14.0	14.0	14.0	14.0	94.9	85.7	88.1	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.79	0.71	0.73	0.67	0.67
v/c Ratio	0.40	0.15	0.93	0.27	0.13	0.93	0.53	0.24	0.46	0.03
Control Delay	57.0	48.7	62.1	52.6	29.7	61.7	4.1	9.9	11.1	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.0	48.7	62.1	52.6	29.7	61.7	4.1	9.9	11.1	0.2
LOS	E	D	E	D	C	E	A	A	B	A
Approach Delay		60.0			43.0		10.7		10.9	
Approach LOS		E			D		B		B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.93		
Intersection Signal Delay: 15.5	Intersection LOS: B	
Intersection Capacity Utilization 66.9%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	31	252	37	13	15	219	1649	54	40	1476	26
Future Volume (veh/h)	54	31	252	37	13	15	219	1649	54	40	1476	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	61	35	176	41	14	12	258	1940	46	44	1640	18
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	246	188	181	122	105	324	3867	92	243	3627	1013
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.13	1.00	1.00	0.03	0.67	0.67
Sat Flow, veh/h	1312	1969	1502	1109	979	839	1688	5401	128	1688	5375	1502
Grp Volume(v), veh/h	61	35	176	41	0	26	258	1286	700	44	1640	18
Grp Sat Flow(s),veh/h/ln	1312	1969	1502	1109	0	1818	1688	1792	1946	1688	1792	1502
Q Serve(g_s), s	5.2	1.9	13.9	4.1	0.0	1.5	5.9	0.0	0.0	1.0	17.1	0.5
Cycle Q Clear(g_c), s	6.7	1.9	13.9	6.0	0.0	1.5	5.9	0.0	0.0	1.0	17.1	0.5
Prop In Lane	1.00		1.00	1.00		0.46	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	207	246	188	181	0	227	324	2566	1393	243	3627	1013
V/C Ratio(X)	0.29	0.14	0.94	0.23	0.00	0.11	0.80	0.50	0.50	0.18	0.45	0.02
Avail Cap(c_a), veh/h	207	246	188	181	0	227	338	2566	1393	326	3627	1013
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.27	0.27	0.27	0.52	0.52	0.52
Uniform Delay (d), s/veh	49.6	46.8	52.0	49.4	0.0	46.6	11.8	0.0	0.0	5.5	9.1	6.4
Incr Delay (d2), s/veh	0.8	0.3	48.0	0.6	0.0	0.2	3.5	0.2	0.4	0.2	0.2	0.0
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	1.8	1.0	7.7	1.2	0.0	0.7	4.0	0.1	0.1	0.3	6.3	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.4	47.0	100.0	50.1	0.0	46.8	15.4	0.2	0.4	5.7	9.3	6.4
LnGrp LOS	D	D	F	D	A	D	B	A	A	A	A	A
Approach Vol, veh/h		272			67			2244			1702	
Approach Delay, s/veh		82.1			48.8			2.0			9.2	
Approach LOS		F			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.0	87.0		21.0	7.1	91.9		21.0				
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0				
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0				
Max Q Clear Time (g_c+I1), s	7.9	19.1		8.0	3.0	2.0		15.9				
Green Ext Time (p_c), s	0.1	20.8		0.1	0.0	29.6		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	10.7	
HCM 6th LOS	B	

Notes

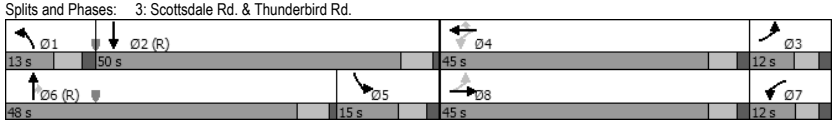
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	339	838	106	197	157	106	1553	169	266	1440
Future Volume (vph)	339	838	106	197	157	106	1553	169	266	1440
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.2	38.9	20.4	13.1	13.1	7.1	42.5	42.5	9.0	44.4
Actuated g/C Ratio	0.43	0.32	0.17	0.11	0.11	0.06	0.35	0.35	0.08	0.37
v/c Ratio	0.63	1.18	0.41	0.56	0.55	0.68	1.01	0.34	1.18	0.83
Control Delay	36.0	123.9	30.7	55.7	13.0	61.3	68.3	18.5	155.9	34.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	36.0	123.9	30.7	55.7	13.0	61.3	68.3	18.5	155.9	34.5
LOS	D	F	C	E	B	E	E	B	F	C
Approach Delay		105.1		35.4			63.3			52.6
Approach LOS		F		D			E			D

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 140			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 69.4		Intersection LOS: E	
Intersection Capacity Utilization 94.1%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	339	838	401	106	197	157	106	1553	169	266	1440	76
Future Volume (veh/h)	339	838	401	106	197	157	106	1553	169	266	1440	76
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	1870
Adj Flow Rate, veh/h	385	952	342	122	226	111	131	1917	123	286	1548	60
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	530	876	313	254	388	156	183	1895	529	286	2026	79
Arrive On Green	0.26	0.32	0.32	0.04	0.10	0.10	0.02	0.12	0.12	0.09	0.38	0.38
Sat Flow, veh/h	1688	2702	964	3274	3741	1502	3274	5375	1502	3274	5309	206
Grp Volume(v), veh/h	385	657	637	122	226	111	131	1917	123	286	1045	563
Grp Sat Flow(s),veh/h/ln	1688	1870	1795	1637	1870	1502	1637	1792	1502	1637	1792	1932
Q Serve(g_s), s	18.0	38.9	38.9	0.0	6.9	8.6	4.8	42.3	8.9	10.5	30.5	30.5
Cycle Q Clear(g_c), s	18.0	38.9	38.9	0.0	6.9	8.6	4.8	42.3	8.9	10.5	30.5	30.5
Prop In Lane	1.00		0.54	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	530	606	582	254	388	156	183	1895	529	286	1367	737
V/C Ratio(X)	0.73	1.08	1.09	0.48	0.58	0.71	0.72	1.01	0.23	1.00	0.76	0.76
Avail Cap(c_a), veh/h	530	606	582	303	1213	487	191	1895	529	286	1367	737
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	37.2	40.6	40.6	55.2	51.3	52.1	58.0	53.0	38.3	54.8	32.4	32.4
Incr Delay (d2), s/veh	4.9	61.3	65.6	1.4	1.4	5.8	11.6	23.6	1.0	48.7	3.5	6.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.7	27.9	27.5	1.8	3.3	3.5	2.3	24.5	3.7	6.2	13.7	15.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	101.9	106.2	56.5	52.7	57.8	69.6	76.6	39.3	103.5	35.9	38.7
LnGrp LOS	D	F	F	E	D	E	E	F	D	F	D	D
Approach Vol, veh/h		1679			459			2171			1894	
Approach Delay, s/veh		89.8			54.9			74.1			46.9	
Approach LOS		F			D			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	51.8	37.0	18.5	16.5	48.0	10.5	45.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	6.8	32.5	20.0	10.6	12.5	44.3	2.0	40.9
Green Ext Time (p_c), s	0.0	8.0	0.0	1.9	0.0	0.0	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay	68.6	
HCM 6th LOS	E	

Notes

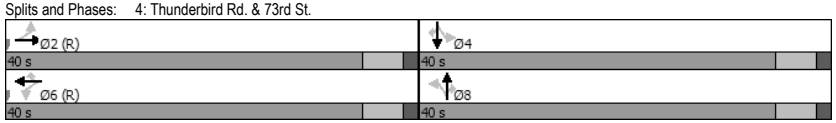
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	20	1247	1	438	224	6	3	97	3	17
Future Volume (vph)	20	1247	1	438	224	6	3	97	3	17
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2		6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	2	2	6	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.07	0.92	0.01	0.28	0.30	0.02	0.01	0.22	0.00	0.03
Control Delay	14.1	32.3	14.0	15.3	3.2	13.3	13.0	15.7	13.0	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.1	32.3	14.0	15.3	3.2	13.3	13.0	15.7	13.0	3.5
LOS	B	C	B	B	A	B	B	B	B	A
Approach Delay		32.0		11.2			13.2		13.8	
Approach LOS		C		B			B		B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 54.4%		ICU Level of Service A	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1247	6	1	438	224	6	3	0	97	3	17
Future Volume (veh/h)	20	1247	6	1	438	224	6	3	0	97	3	17
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	24	1467	5	1	452	164	10	5	0	128	4	13
Peak Hour Factor	0.85	0.85	0.85	0.97	0.97	0.97	0.58	0.58	0.58	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	360	1649	6	116	1613	648	659	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.00	0.43	0.43	0.43
Sat Flow, veh/h	764	3824	13	341	3741	1502	1322	1969	1502	1337	1969	1502
Grp Volume(v), veh/h	24	717	755	1	452	164	10	5	0	128	4	13
Grp Sat Flow(s),veh/h/ln	764	1870	1966	341	1870	1502	1322	1969	1502	1337	1969	1502
Q Serve(g_s), s	1.7	28.3	28.3	0.2	6.3	5.6	0.3	0.1	0.0	4.8	0.1	0.4
Cycle Q Clear(g_c), s	7.9	28.3	28.3	28.5	6.3	5.6	0.4	0.1	0.0	4.9	0.1	0.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	360	807	848	116	1613	648	659	849	648	665	849	648
V/C Ratio(X)	0.07	0.89	0.89	0.01	0.28	0.25	0.02	0.01	0.00	0.19	0.00	0.02
Avail Cap(c_a), veh/h	360	807	848	116	1613	648	659	849	648	665	849	648
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.3	21.0	21.0	34.2	14.7	14.5	13.1	13.0	0.0	14.4	13.0	13.1
Incr Delay (d2), s/veh	0.0	1.6	1.5	0.1	0.4	0.9	0.0	0.0	0.0	0.6	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	0.3	11.7	12.3	0.0	2.6	2.0	0.1	0.1	0.0	1.5	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.3	22.6	22.5	34.3	15.2	15.5	13.1	13.0	0.0	15.0	13.0	13.1
LnGrp LOS	B	C	C	C	B	B	B	B	A	B	B	B
Approach Vol, veh/h		1496			617			15			145	
Approach Delay, s/veh		22.4			15.3			13.1			14.8	
Approach LOS		C			B			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		34.5		34.5		34.5		34.5				
Max Q Clear Time (g_c+I1), s		30.3		6.9		30.5		2.4				
Green Ext Time (p_c), s		3.2		0.4		1.3		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		19.9	
HCM 6th LOS		B	

Notes

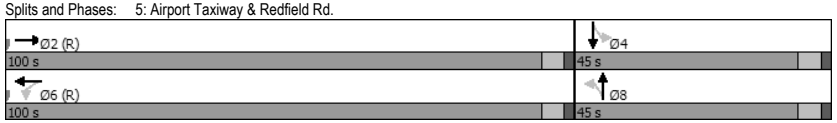
User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	1236	1	673	4	0	
Future Volume (vph)	1236	1	673	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.79	0.01	0.20		0.04	
Control Delay	8.3	2.0	1.3		6.6	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	8.3	2.0	1.3		6.6	
LOS	A	A	A		A	
Approach Delay	8.3		1.3		6.6	
Approach LOS	A		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.79		
Intersection Signal Delay: 6.1	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.



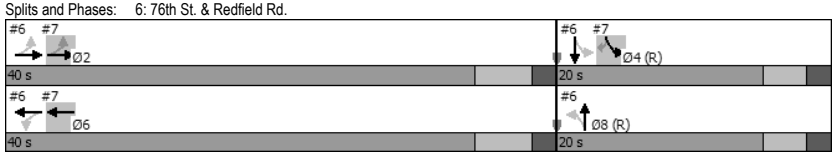
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1236	4	1	673	0	4	0	1	0	0	0
Future Volume (veh/h)	0	1236	4	1	673	0	4	0	1	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking 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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1471	4	1	701	0	8	0	0	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.96	0.96	0.96	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1726	5	225	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1963	5	340	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1475	1	701	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	340	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	52.4	0.2	4.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	52.4	52.6	4.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	225	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.85	0.00	0.21	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	225	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.92	0.92	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	4.2	16.9	1.3	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	5.5	0.0	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	14.4	0.0	0.9	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	9.8	16.9	1.4	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	B	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1475			702			8			0	
Approach Delay, s/veh		9.8			1.5			67.8			0.0	
Approach LOS		A			A			E				
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		133.5		11.5		133.5		11.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		54.4		0.0		54.6		2.8				
Green Ext Time (p_c), s		26.2		0.0		5.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	7.3	
HCM 6th LOS	A	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	18	1368	24	691	20	1	0
Future Volume (vph)	18	1368	24	691	20	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0
Total Split (s)	40.0	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Ped	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	15.0	15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25	0.25
v/c Ratio	0.06	1.60	0.23	0.41	0.08	0.03	0.02
Control Delay	6.4	291.8	7.0	3.4	18.0	10.4	0.0
Queue Delay	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Total Delay	6.4	292.3	7.0	3.5	18.0	10.4	0.0
LOS	A	F	A	A	B	B	A
Approach Delay		288.9		3.6		15.5	
Approach LOS		F		A		B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.60			
Intersection Signal Delay: 190.8		Intersection LOS: F	
Intersection Capacity Utilization 96.2%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	1368	119	24	691	15	20	1	9	0	0	5
Future Volume (vph)	18	1368	119	24	691	15	20	1	9	0	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1840		1770	3528		1770	1605			1611	
Flt Permitted	0.32	1.00		0.12	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	604	1840		219	3528		1399	1605			1611	
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.75	0.75	0.75	0.50	0.50	0.50
Adj. Flow (vph)	20	1537	134	28	794	17	27	1	12	0	0	10
RTOR Reduction (vph)	0	5	0	0	3	0	0	9	0	0	8	0
Lane Group Flow (vph)	20	1666	0	28	808	0	27	4	0	0	3	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	342	1042		124	1999		349	401			402	
v/s Ratio Prot		c0.91			0.23			0.00			0.00	
v/s Ratio Perm	0.03			0.13			c0.02					
v/c Ratio	0.06	1.60		0.23	0.40		0.08	0.01			0.01	
Uniform Delay, d1	5.8	13.0		6.5	7.3		17.2	16.9			16.9	
Progression Factor	1.00	1.00		0.41	0.38		1.00	1.00			1.00	
Incremental Delay, d2	0.1	273.9		0.9	0.1		0.4	0.0			0.0	
Delay (s)	5.9	286.9		3.5	2.9		17.6	17.0			16.9	
Level of Service	A	F		A	A		B	B			B	
Approach Delay (s)		283.6			2.9			17.4			16.9	
Approach LOS		F			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	187.2	HCM 2000 Level of Service		F	
HCM 2000 Volume to Capacity ratio	1.13				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	96.2%	ICU Level of Service		F	
Analysis Period (min)	15				

c Critical Lane Group

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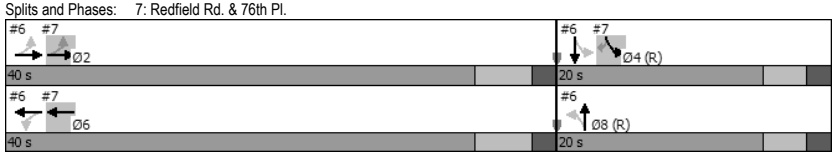
Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	248	1130	641	20	91	
Future Volume (vph)	248	1130	641	20	91	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	15.0	15.0	
Actuated g/C Ratio	0.57	0.57	0.57	0.25	0.25	
v/c Ratio	0.77	1.22	0.38	0.05	0.23	
Control Delay	9.1	111.3	9.3	17.6	5.9	
Queue Delay	0.1	0.8	0.0	0.0	0.0	
Total Delay	9.3	112.1	9.3	17.6	5.9	
LOS	A	F	A	B	A	
Approach Delay		93.6	9.3	8.0		
Approach LOS		F	A	A		

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.60			
Intersection Signal Delay: 62.8		Intersection LOS: E	
Intersection Capacity Utilization 73.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	248	1130	641	17	20	91
Future Volume (vph)	248	1130	641	17	20	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3525		1770	1583
Flt Permitted	0.35	1.00	1.00		0.95	1.00
Satd. Flow (perm)	644	1863	3525		1770	1583
Peak-hour factor, PHF	0.88	0.88	0.86	0.86	0.84	0.84
Adj. Flow (vph)	282	1284	745	20	24	108
RTOR Reduction (vph)	0	0	3	0	0	81
Lane Group Flow (vph)	282	1284	762	0	24	27
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	34.0	34.0	34.0		15.0	15.0
Effective Green, g (s)	34.0	34.0	34.0		15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	364	1055	1997		442	395
v/s Ratio Prot		c0.69	0.22		0.01	
v/s Ratio Perm	0.44					c0.02
v/c Ratio	0.77	1.22	0.38		0.05	0.07
Uniform Delay, d1	10.0	13.0	7.2		17.1	17.2
Progression Factor	0.40	0.36	1.23		1.00	1.00
Incremental Delay, d2	1.0	98.5	0.1		0.2	0.3
Delay (s)	5.0	103.2	8.9		17.3	17.5
Level of Service	A	F	A		B	B
Approach Delay (s)		85.5	8.9		17.5	
Approach LOS		F	A		B	

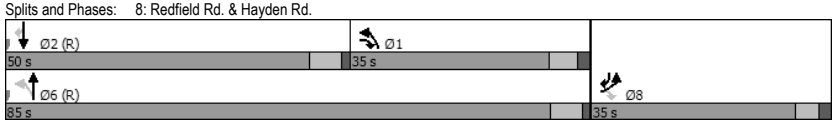
Intersection Summary			
HCM 2000 Control Delay	58.1	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	644	174	626	977	300	351
Future Volume (vph)	644	174	626	977	300	351
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.2	63.5	79.5	79.6	44.6	79.7
Actuated g/C Ratio	0.24	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.92	0.22	0.79	0.40	0.23	0.35
Control Delay	46.0	5.6	28.4	10.0	26.6	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.0	5.6	28.4	10.0	26.6	4.9
LOS	D	A	C	A	C	A
Approach Delay	37.4			17.1	14.9	
Approach LOS	D			B	B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 80		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.92		
Intersection Signal Delay: 22.5	Intersection LOS: C	
Intersection Capacity Utilization 78.6%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	644	174	626	977	300	351
Future Volume (veh/h)	644	174	626	977	300	351
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	732	118	639	997	316	227
Peak Hour Factor	0.88	0.88	0.98	0.98	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	787	735	719	2490	1375	913
Arrive On Green	0.24	0.24	0.25	0.67	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	732	118	639	997	316	227
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	26.3	0.0	20.7	14.6	7.0	8.4
Cycle Q Clear(g_c), s	26.3	0.0	20.7	14.6	7.0	8.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	787	735	719	2490	1375	913
V/C Ratio(X)	0.93	0.16	0.89	0.40	0.23	0.25
Avail Cap(c_a), veh/h	810	745	719	2490	1375	913
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	44.6	17.0	30.2	9.2	26.2	10.9
Incr Delay (d2), s/veh	16.9	0.1	13.1	0.5	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.4	1.8	19.3	5.8	3.2	5.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	61.5	17.1	43.3	9.6	26.6	11.5
LnGrp LOS	E	B	D	A	C	B
Approach Vol, veh/h	850			1636	543	
Approach Delay, s/veh	55.3			22.8	20.3	
Approach LOS	E			C	C	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	35.9	50.0			85.9	34.1
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	22.7	10.4			16.6	28.3
Green Ext Time (p_c), s	1.3	3.0			9.5	0.6

Intersection Summary		
HCM 6th Ctrl Delay	31.5	
HCM 6th LOS	C	

Notes

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

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Intersection	
Int Delay, s/veh	18.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	22	7	0	42	42	1588	12	46	1649	78
Future Vol, veh/h	15	0	22	7	0	42	42	1588	12	46	1649	78
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	58	58	58	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	0	24	12	0	72	49	1847	14	49	1773	84

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2750	3872	929	2759	3907	931	1857	0	0	1861	0	0
Stage 1	1913	1913	-	1952	1952	-	-	-	-	-	-	-
Stage 2	837	1959	-	807	1955	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	21	3	231	21	3	231	148	-	-	147	-	-
Stage 1	45	114	-	42	109	-	-	-	-	-	-	-
Stage 2	297	108	-	310	109	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 8	1	231	~ 11	1	231	148	-	-	147	-	-
Mov Cap-2 Maneuver	~ 8	1	-	~ 11	1	-	-	-	-	-	-	-
Stage 1	30	76	-	28	73	-	-	-	-	-	-	-
Stage 2	136	72	-	186	73	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 929.6	$ 372.3	1	1.1
HCM LOS	F	F		

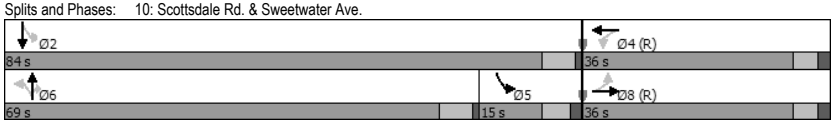
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	148	-	-	19	60	147	-	-
HCM Lane V/C Ratio	0.33	-	-	2.094	1.408	0.336	-	-
HCM Control Delay (s)	40.9	-	-	$ 929.6	$ 372.3	41.4	-	-
HCM Lane LOS	E	-	-	F	F	E	-	-
HCM 95th %tile Q(veh)	1.3	-	-	5.4	7.4	1.4	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	54	127	102	33	29	1798	40	78	1738
Future Volume (vph)	54	127	102	33	29	1798	40	78	1738
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	62.7	62.7	62.7	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.52	0.52	0.52	0.65	0.65
v/c Ratio	0.23	0.53	0.67	0.28	0.59	0.78	0.06	0.47	0.57
Control Delay	38.3	40.7	59.5	13.9	31.6	23.4	3.5	48.8	20.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.3	40.7	59.5	13.9	31.6	23.4	3.5	48.8	20.8
LOS	D	D	E	B	C	C	A	D	C
Approach Delay		40.2		35.1		23.1			22.0
Approach LOS		D		D		C			C

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green		
Natural Cycle: 100		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.78		
Intersection Signal Delay: 24.4	Intersection LOS: C	
Intersection Capacity Utilization 77.4%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	54	127	91	102	33	84	29	1798	40	78	1738	20
Future Volume (veh/h)	54	127	91	102	33	84	29	1798	40	78	1738	20
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	63	148	77	126	41	79	35	2193	31	89	1975	17
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.82	0.82	0.82	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	320	328	171	244	162	312	143	2741	766	205	3490	30
Arrive On Green	0.27	0.27	0.27	0.27	0.27	0.27	0.17	0.17	0.17	0.10	0.84	0.84
Sat Flow, veh/h	1205	1220	635	1095	601	1159	206	5375	1502	1688	5496	47
Grp Volume(v), veh/h	63	0	225	126	0	120	35	2193	31	89	1287	705
Grp Sat Flow(s),veh/h/ln	1205	0	1855	1095	0	1760	206	1792	1502	1688	1792	1960
Q Serve(g_s), s	5.2	0.0	12.1	13.0	0.0	6.4	18.8	47.1	2.1	0.3	12.8	12.8
Cycle Q Clear(g_c), s	11.6	0.0	12.1	25.1	0.0	6.4	31.6	47.1	2.1	0.3	12.8	12.8
Prop In Lane	1.00		0.34	1.00		0.66	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	320	0	499	244	0	474	143	2741	766	205	2275	1245
V/C Ratio(X)	0.20	0.00	0.45	0.52	0.00	0.25	0.25	0.80	0.04	0.44	0.57	0.57
Avail Cap(c_a), veh/h	320	0	499	244	0	474	146	2826	790	205	2332	1276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	0.0	36.5	46.9	0.0	34.4	43.5	44.0	25.3	48.7	4.4	4.4
Incr Delay (d2), s/veh	1.4	0.0	2.9	7.6	0.0	1.3	0.1	0.2	0.0	6.6	0.3	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.7	0.0	5.9	4.1	0.0	2.9	1.0	22.7	0.7	2.8	3.1	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	0.0	39.4	54.5	0.0	35.7	43.6	44.2	25.3	55.3	4.7	5.0
LnGrp LOS	D	A	D	D	A	D	D	D	C	E	A	A
Approach Vol, veh/h		288			246			2259			2081	
Approach Delay, s/veh		39.6			45.3			43.9			7.0	
Approach LOS		D			D			D			A	
Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		82.1		37.9	15.0	67.1		37.9				
Change Period (Y+Rc), s		* 5.9		5.6	* 5.9	* 5.9		5.6				
Max Green Setting (Gmax), s		* 78		30.4	* 9.1	* 63		30.4				
Max Q Clear Time (g_c+I1), s		14.8		27.1	2.3	49.1		14.1				
Green Ext Time (p_c), s		27.8		0.4	0.1	12.1		1.4				

Intersection Summary	
HCM 6th Ctrl Delay	27.9
HCM 6th LOS	C

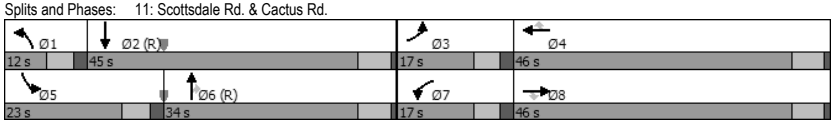
Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	212	1268	439	220	724	566	143	1247	160	434	1325
Future Volume (vph)	212	1268	439	220	724	566	143	1247	160	434	1325
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	10.9	40.3	40.3	11.0	40.4	40.4	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.78	1.10	0.76	0.83	0.65	0.95	0.98	1.10	0.36	1.05	0.91
Control Delay	72.2	96.2	30.0	76.5	36.7	49.1	123.2	99.6	6.7	102.9	62.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.2	96.2	30.0	76.5	36.7	49.1	123.2	99.6	6.7	102.9	62.8
LOS	E	F	C	E	D	D	F	F	A	F	E
Approach Delay		78.4			47.1			92.1			72.2
Approach LOS		E			D			F			E

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.10		
Intersection Signal Delay: 72.8	Intersection LOS: E	
Intersection Capacity Utilization 95.4%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	212	1268	439	220	724	566	143	1247	160	434	1325	96
Future Volume (veh/h)	212	1268	439	220	724	566	143	1247	160	434	1325	96
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	230	1378	303	247	813	411	159	1386	106	482	1472	79
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	282	1256	504	298	1274	511	164	1272	355	464	1714	92
Arrive On Green	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33	0.33
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5221	280
Grp Volume(v), veh/h	230	1378	303	247	813	411	159	1386	106	482	1010	541
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1918
Q Serve(g_s), s	8.3	40.3	20.1	8.9	22.0	29.8	5.8	28.4	7.0	17.0	31.6	31.6
Cycle Q Clear(g_c), s	8.3	40.3	20.1	8.9	22.0	29.8	5.8	28.4	7.0	17.0	31.6	31.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	282	1256	504	298	1274	511	164	1272	355	464	1176	630
V/C Ratio(X)	0.82	1.10	0.60	0.83	0.64	0.80	0.97	1.09	0.30	1.04	0.86	0.86
Avail Cap(c_a), veh/h	300	1256	504	300	1274	511	164	1272	355	464	1176	630
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	0.79	0.79	0.79
Uniform Delay (d), s/veh	53.9	39.8	33.2	53.6	33.3	35.9	56.9	45.8	37.6	51.5	37.7	37.7
Incr Delay (d2), s/veh	15.1	56.2	2.0	17.4	1.1	9.0	61.6	53.4	2.1	47.7	6.7	11.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	28.0	7.6	4.4	10.1	12.1	3.8	18.8	2.8	10.0	14.8	16.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	69.0	96.0	35.1	71.0	34.4	45.0	118.5	99.3	39.8	99.2	44.4	49.3
LnGrp LOS	E	F	D	E	C	D	F	F	D	F	D	D
Approach Vol, veh/h		1911			1471			1651			2033	
Approach Delay, s/veh		83.1			43.5			97.3			58.7	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	45.1	16.3	46.6	23.0	34.1	16.9	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	7.8	33.6	10.3	31.8	19.0	30.4	10.9	42.3
Green Ext Time (p_c), s	0.0	4.2	0.1	4.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.2
HCM 6th LOS	E

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1240	0	0	663	0	0
Future Vol, veh/h	1240	0	0	663	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	85	85	97	97	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1459	0	0	684	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1459	0	1801	1459
Stage 1	-	-	-	-	1459	-
Stage 2	-	-	-	-	342	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	461	-	79	158
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	692	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	461	-	79	158
Mov Cap-2 Maneuver	-	-	-	-	173	-
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	692	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	461	-
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	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	0	56	0	0	0	53	1249	0	2	1241	28
Future Vol, veh/h	11	0	56	0	0	0	53	1249	0	2	1241	28
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	-	-	0	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	12	0	62	0	0	0	62	1452	0	2	1334	30

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2058	2929	682	2114	2944	726	1364	0	0	1452	0	0
Stage 1	1353	1353	-	1576	1576	-	-	-	-	-	-	-
Stage 2	705	1576	-	538	1368	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*230	*34	*624	*205	*33	*624	*784	-	-	769	-	-
Stage 1	*640	*609	-	*471	*499	-	-	-	-	-	-	-
Stage 2	*640	*499	-	*640	*609	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*216	*31	*624	*173	*30	*624	*784	-	-	769	-	-
Mov Cap-2 Maneuver	*216	*31	-	*173	*30	-	-	-	-	-	-	-
Stage 1	*590	*607	-	*434	*459	-	-	-	-	-	-	-
Stage 2	*590	*459	-	*575	*607	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	0	0.4	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	* 784	-	-	216	624	-	-	769	-	-
HCM Lane V/C Ratio	0.079	-	-	0.057	0.1	-	-	0.003	-	-
HCM Control Delay (s)	10	-	-	22.7	11.4	0	0	9.7	-	-
HCM Lane LOS	A	-	-	C	B	A	A	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.2	0.3	-	-	0	-	-

Notes

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

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1302	0	0	1773
Future Vol, veh/h	0	0	1302	0	0	1773
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	86	86	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1514	0	0	1906

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	757	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	*624	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*624	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

Notes

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

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	58	49	0	0	0
Future Vol, veh/h	0	58	49	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	64	54	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	54	0	-	0	118	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	64	-
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	1551	-	-	-	878	1013
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	959	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1551	-	-	-	878	1013
Mov Cap-2 Maneuver	-	-	-	-	878	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	959	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	58	49	0	0	0
Future Vol, veh/h	0	58	49	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	64	54	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	54	0	-	0	118	54
Stage 1	-	-	-	-	54	-
Stage 2	-	-	-	-	64	-
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	1551	-	-	-	878	1013
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	959	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1551	-	-	-	878	1013
Mov Cap-2 Maneuver	-	-	-	-	878	-
Stage 1	-	-	-	-	969	-
Stage 2	-	-	-	-	959	-

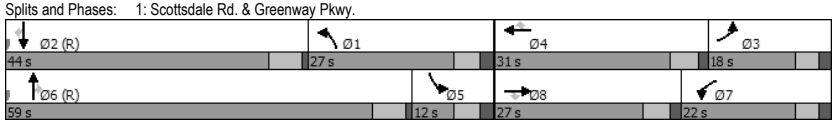
Approach	EB	WB	SB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1551	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	246	318	487	649	246	622	1440	109	111	1290	176
Future Volume (vph)	270	246	318	487	649	246	622	1440	109	111	1290	176
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	18.0	27.0	27.0	22.0	31.0	31.0	27.0	59.0	59.0	12.0	44.0	44.0
Total Split (%)	15.0%	22.5%	22.5%	18.3%	25.8%	25.8%	22.5%	49.2%	49.2%	10.0%	36.7%	36.7%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	14.2	16.1	16.1	22.1	24.0	24.0	21.0	53.3	53.3	6.0	38.3	38.3
Actuated g/C Ratio	0.12	0.13	0.13	0.18	0.20	0.20	0.18	0.44	0.44	0.05	0.32	0.32
v/c Ratio	0.84	0.59	0.91	0.84	0.90	0.57	1.18	0.65	0.16	0.75	0.83	0.32
Control Delay	72.3	53.0	43.2	61.7	62.8	18.8	138.5	21.3	2.1	83.8	43.0	5.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	72.3	53.0	43.2	61.7	62.8	18.8	138.5	21.3	2.1	83.8	43.0	5.6
LOS	E	D	D	E	E	B	F	C	A	F	D	A
Approach Delay		55.6			54.6			53.9			41.7	
Approach LOS		E			D			D			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 59 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 135			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 51.1		Intersection LOS: D	
Intersection Capacity Utilization 86.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	246	318	487	649	246	622	1440	109	111	1290	176
Future Volume (veh/h)	270	246	318	487	649	246	622	1440	109	111	1290	176
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	325	296	118	502	669	240	669	1548	0	122	1418	149
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	371	149	667	738	296	623	2387		214	1715	479
Arrive On Green	0.11	0.10	0.10	0.20	0.20	0.20	0.25	0.59	0.00	0.07	0.32	0.32
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	325	296	118	502	669	240	669	1548	0	122	1418	149
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	11.8	9.3	9.2	17.3	21.0	18.3	22.8	22.9	0.0	4.3	29.3	9.0
Cycle Q Clear(g_c), s	11.8	9.3	9.2	17.3	21.0	18.3	22.8	22.9	0.0	4.3	29.3	9.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	371	149	667	738	296	623	2387		214	1715	479
V/C Ratio(X)	0.94	0.80	0.79	0.75	0.91	0.81	1.07	0.65		0.57	0.83	0.31
Avail Cap(c_a), veh/h	346	670	269	667	795	319	623	2387		214	1715	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.76	0.76	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.3	52.9	52.8	44.9	47.1	46.0	44.8	18.3	0.0	54.5	37.8	30.9
Incr Delay (d2), s/veh	32.3	1.5	3.5	4.3	12.9	12.3	53.3	1.0	0.0	2.3	4.7	1.7
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	6.4	4.4	3.6	7.4	11.0	7.8	13.4	8.4	0.0	1.9	13.5	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	85.5	54.4	56.4	49.2	59.9	58.4	98.1	19.4	0.0	56.8	42.5	32.6
LnGrp LOS	F	D	E	D	E	E	F	B		E	D	C
Approach Vol, veh/h		739			1411			2217	A		1689	
Approach Delay, s/veh		68.4			55.9			43.1			42.7	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.8	44.0	18.0	29.2	13.8	59.0	29.8	17.4
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	21.0	38.3	12.7	* 26	6.0	53.3	16.7	* 22
Max Q Clear Time (g_c+I1), s	24.8	31.3	13.8	23.0	6.3	24.9	19.3	11.3
Green Ext Time (p_c), s	0.0	3.0	0.0	0.7	0.0	5.5	0.0	0.6

Intersection Summary			
HCM 6th Ctrl Delay		49.0	
HCM 6th LOS		D	

Notes

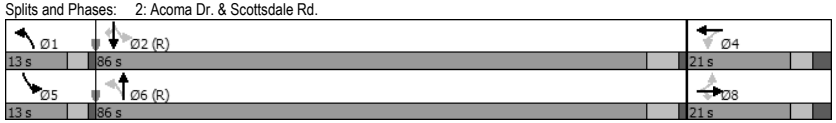
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	138	39	260	135	70	157	1760	46	1943	67
Future Volume (vph)	138	39	260	135	70	157	1760	46	1943	67
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.8	84.6	88.3	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	1.42	0.18	1.00	1.06	0.61	0.96	0.54	0.30	0.61	0.07
Control Delay	273.5	49.1	83.0	137.3	52.6	87.5	2.6	8.8	23.3	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	273.5	49.1	83.0	137.3	52.6	87.5	2.6	8.8	23.3	6.7
LOS	F	D	F	F	D	F	A	A	C	A
Approach Delay		140.1			97.1		9.5		22.4	
Approach LOS		F			F		A		C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.42		
Intersection Signal Delay: 32.4	Intersection LOS: C	
Intersection Capacity Utilization 79.8%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	138	39	260	135	70	52	157	1760	16	46	1943	67
Future Volume (veh/h)	138	39	260	135	70	52	157	1760	16	46	1943	67
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	155	44	180	169	88	60	180	2023	1	52	2183	64
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.87	0.87	0.87	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	117	246	188	175	136	93	203	3963	2	243	3696	1032
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.11	1.00	1.00	0.01	0.23	0.23
Sat Flow, veh/h	1174	1969	1502	1096	1091	744	1688	5549	3	1688	5375	1502
Grp Volume(v), veh/h	155	44	180	169	0	148	180	1306	718	52	2183	64
Grp Sat Flow(s),veh/h/ln	1174	1969	1502	1096	0	1835	1688	1792	1968	1688	1792	1502
Q Serve(g_s), s	5.8	2.4	14.3	12.6	0.0	9.2	4.4	0.0	0.0	1.1	43.5	4.0
Cycle Q Clear(g_c), s	15.0	2.4	14.3	15.0	0.0	9.2	4.4	0.0	0.0	1.1	43.5	4.0
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	117	246	188	175	0	229	203	2559	1406	243	3696	1032
V/C Ratio(X)	1.33	0.18	0.96	0.97	0.00	0.65	0.89	0.51	0.51	0.21	0.59	0.06
Avail Cap(c_a), veh/h	117	246	188	175	0	229	239	2559	1406	324	3696	1032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.33	0.33	0.33	0.42	0.42	0.42
Uniform Delay (d), s/veh	58.6	47.0	52.2	55.7	0.0	50.0	27.0	0.0	0.0	5.1	31.3	16.0
Incr Delay (d2), s/veh	195.2	0.3	53.7	57.6	0.0	6.1	11.4	0.2	0.4	0.2	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.9	1.2	8.2	7.9	0.0	4.6	4.1	0.1	0.2	0.4	21.0	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	253.8	47.3	105.9	113.4	0.0	56.1	38.4	0.2	0.4	5.3	31.6	16.1
LnGrp LOS	F	D	F	F	A	E	D	A	A	A	C	B
Approach Vol, veh/h		379			317			2204			2299	
Approach Delay, s/veh		159.6			86.6			3.4			30.6	
Approach LOS		F			F			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.5	88.5		21.0	7.3	91.7		21.0				
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0				
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0				
Max Q Clear Time (g_c+I1), s	6.4	45.5		17.0	3.1	2.0		17.0				
Green Ext Time (p_c), s	0.1	24.4		0.0	0.0	30.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	31.9	
HCM 6th LOS	C	

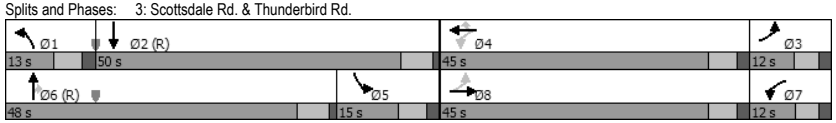
Notes

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	181	248	192	956	251	289	1592	66	166	1768
Future Volume (vph)	181	248	192	956	251	289	1592	66	166	1768
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	26.5	18.9	51.7	38.3	38.3	7.0	42.3	42.3	9.0	44.3
Actuated g/C Ratio	0.22	0.16	0.43	0.32	0.32	0.06	0.35	0.35	0.08	0.37
v/c Ratio	1.28	0.77	0.24	0.89	0.46	1.66	0.92	0.12	0.79	1.22
Control Delay	202.2	40.6	28.4	49.7	13.5	347.5	54.3	6.9	69.1	135.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	202.2	40.6	28.4	49.7	13.5	347.5	54.3	6.9	69.1	135.0
LOS	F	D	C	D	B	F	D	A	E	F
Approach Delay		85.5		40.3			96.2			130.1
Approach LOS		F		D			F			F

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.66			
Intersection Signal Delay: 95.1		Intersection LOS: F	
Intersection Capacity Utilization 102.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	248	222	192	956	251	289	1592	66	166	1768	305
Future Volume (veh/h)	181	248	222	192	956	251	289	1592	66	166	1768	305
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	1870
Adj Flow Rate, veh/h	203	279	114	213	1062	212	314	1730	-4	191	2032	328
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	371	148	889	1169	469	191	1895	529	283	1769	280
Arrive On Green	0.05	0.14	0.14	0.22	0.31	0.31	0.02	0.12	0.00	0.12	0.50	0.50
Sat Flow, veh/h	1688	2611	1041	3274	3741	1502	3274	5375	1502	3274	4678	740
Grp Volume(v), veh/h	203	198	195	213	1062	212	314	1730	-4	191	1547	813
Grp Sat Flow(s),veh/h/ln	1688	1870	1781	1637	1870	1502	1637	1792	1502	1637	1792	1836
Q Serve(g_s), s	6.4	12.2	12.7	0.3	32.7	13.6	7.0	38.2	0.0	6.7	45.4	45.4
Cycle Q Clear(g_c), s	6.4	12.2	12.7	0.3	32.7	13.6	7.0	38.2	0.0	6.7	45.4	45.4
Prop In Lane	1.00		0.58	1.00		1.00	1.00		1.00	1.00		0.40
Lane Grp Cap(c), veh/h	150	266	253	889	1169	469	191	1895	529	283	1355	694
V/C Ratio(X)	1.35	0.74	0.77	0.24	0.91	0.45	1.64	0.91	-0.01	0.67	1.14	1.17
Avail Cap(c_a), veh/h	150	606	577	889	1213	487	191	1895	529	283	1355	694
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.24	0.24	0.24	1.00	1.00	0.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	55.5	49.4	49.6	36.0	39.6	33.0	58.8	51.2	0.0	51.5	29.8	29.8
Incr Delay (d2), s/veh	196.2	4.1	4.9	0.0	2.8	0.2	312.2	8.2	0.0	4.2	70.1	87.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	6.0	6.0	2.5	15.3	5.0	11.3	19.8	0.0	2.9	30.6	34.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	251.8	53.5	54.5	36.0	42.3	33.2	371.1	59.4	0.0	55.7	99.9	117.4
LnGrp LOS	F	D	D	D	D	C	F	E	A	E	F	F
Approach Vol, veh/h		596			1487			2040			2551	
Approach Delay, s/veh		121.3			40.1			107.5			102.2	
Approach LOS		F			D			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	51.4	12.0	43.6	16.4	48.0	32.4	23.2
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	9.0	47.4	8.4	34.7	8.7	40.2	2.3	14.7
Green Ext Time (p_c), s	0.0	0.0	0.0	2.8	0.0	1.8	0.3	2.4

Intersection Summary		
HCM 6th Ctrl Delay		91.7
HCM 6th LOS		F

Notes

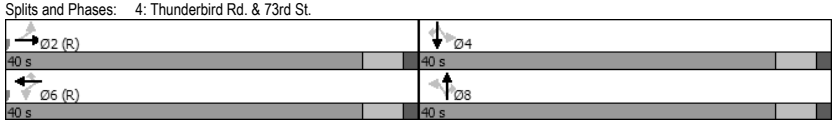
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	9	466	1	1316	226	9	2	4	257	2	74
Future Volume (vph)	9	466	1	1316	226	9	2	4	257	2	74
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.11	0.31	0.00	0.99	0.34	0.02	0.00	0.01	0.60	0.00	0.15
Control Delay	17.7	15.6	13.0	43.6	3.3	13.2	13.0	0.0	22.7	13.0	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.7	15.6	13.0	43.6	3.3	13.2	13.0	0.0	22.7	13.0	10.3
LOS	B	B	B	D	A	B	B	A	C	B	B
Approach Delay		15.6		37.7			9.7			19.9	
Approach LOS		B		D			A			B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 65.4%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	466	5	1	1316	226	9	2	4	257	2	74
Future Volume (veh/h)	9	466	5	1	1316	226	9	2	4	257	2	74
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	10	496	1	1	1586	176	9	2	4	343	3	90
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	1.00	1.00	1.00	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	93	1652	3	386	1613	648	621	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	257	3830	8	853	3741	1502	1235	1969	1502	1336	1969	1502
Grp Volume(v), veh/h	10	242	255	1	1586	176	9	2	4	343	3	90
Grp Sat Flow(s),veh/h/ln	257	1870	1967	853	1870	1502	1235	1969	1502	1336	1969	1502
Q Serve(g_s), s	1.0	6.8	6.8	0.1	33.5	6.0	0.3	0.0	0.1	15.7	0.1	2.9
Cycle Q Clear(g_c), s	34.5	6.8	6.8	6.8	33.5	6.0	0.4	0.0	0.1	15.8	0.1	2.9
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	93	807	848	386	1613	648	621	849	648	665	849	648
V/C Ratio(X)	0.11	0.30	0.30	0.00	0.98	0.27	0.01	0.00	0.01	0.52	0.00	0.14
Avail Cap(c_a), veh/h	93	807	848	386	1613	648	621	849	648	665	849	648
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)	0.63	0.63	0.63	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	14.9	14.9	17.1	22.5	14.7	13.1	13.0	13.0	17.4	13.0	13.8
Incr Delay (d2), s/veh	1.5	0.6	0.6	0.0	18.7	1.0	0.0	0.0	0.0	2.8	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	2.8	3.0	0.0	17.6	2.1	0.1	0.0	0.0	5.0	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	15.5	15.4	17.1	41.2	15.7	13.1	13.0	13.0	20.3	13.0	14.2
LnGrp LOS	D	B	B	B	D	B	B	B	B	C	B	B
Approach Vol, veh/h		507			1763			15			436	
Approach Delay, s/veh		16.0			38.6			13.1			19.0	
Approach LOS		B			D			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		34.5		34.5		34.5		34.5				
Max Q Clear Time (g_c+I1), s		36.5		17.8		35.5		2.4				
Green Ext Time (p_c), s		0.0		1.3		0.0		0.0				

Intersection Summary			
HCM 6th Ctrl Delay		31.1	
HCM 6th LOS		C	

Notes

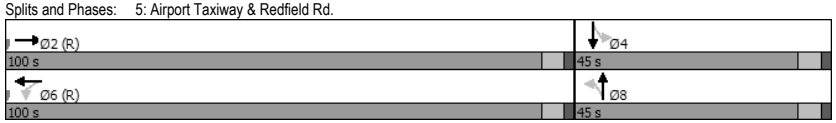
User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	741	5	1513	4	0	
Future Volume (vph)	741	5	1513	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.45	0.01	0.50		0.04	
Control Delay	2.6	2.0	2.3		6.6	
Queue Delay	0.0	0.0	0.1		0.0	
Total Delay	2.6	2.0	2.4		6.6	
LOS	A	A	A		A	
Approach Delay	2.6		2.4		6.6	
Approach LOS	A		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.50		
Intersection Signal Delay: 2.4	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	741	5	5	1513	0	4	0	1	0	0	0
Future Volume (veh/h)	0	741	5	5	1513	0	4	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	833	3	6	1780	0	8	0	0	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1724	6	542	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1960	7	623	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	836	6	1780	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	623	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	12.9	0.3	15.9	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	12.9	13.2	15.9	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	542	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.48	0.01	0.54	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	542	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.67	0.67	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.8	3.2	2.0	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.0	0.0	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	3.4	0.0	3.6	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	2.8	3.3	2.4	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	A	A	A
Approach Vol, veh/h		836			1786			8			0	
Approach Delay, s/veh		2.8			2.5			67.8			0.0	
Approach LOS		A			A			E				

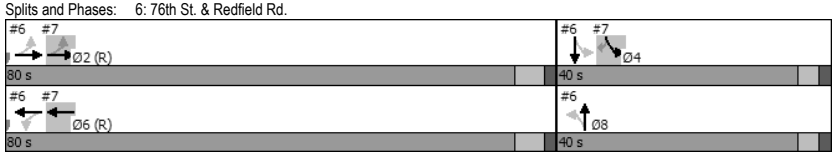
Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		133.5		11.5		133.5		11.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		14.9		0.0		17.9		2.8				
Green Ext Time (p_c), s		8.2		0.0		28.5		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	2.8	
HCM 6th LOS	A	

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	808	28	1580	150	0	5	0
Future Volume (vph)	5	808	28	1580	150	0	5	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0	11.0
Total Split (s)	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	82.2	82.2	82.2	82.2	26.8	26.8		26.8
Actuated g/C Ratio	0.68	0.68	0.68	0.68	0.22	0.22		0.22
v/c Ratio	0.04	0.72	0.12	0.69	0.64	0.10		0.08
Control Delay	9.6	17.3	5.9	9.6	50.8	0.4		12.6
Queue Delay	0.0	13.5	0.0	0.1	0.0	0.0		0.0
Total Delay	9.6	30.8	5.9	9.7	50.8	0.4		12.6
LOS	A	C	A	A	D	A		B
Approach Delay		30.7		9.6		40.9		12.6
Approach LOS		C		A		D		B

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 18.9		Intersection LOS: B	
Intersection Capacity Utilization 70.1%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	808	57	28	1580	1	150	0	37	5	0	15
Future Volume (vph)	5	808	57	28	1580	1	150	0	37	5	0	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1844		1770	3539		1770	1583			1652	
Flt Permitted	0.09	1.00		0.20	1.00		0.74	1.00			0.95	
Satd. Flow (perm)	168	1844		367	3539		1375	1583			1594	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.77	0.77	0.77	0.67	0.67	0.67
Adj. Flow (vph)	5	851	60	30	1681	1	195	0	48	7	0	22
RTOR Reduction (vph)	0	2	0	0	0	0	0	37	0	0	21	0
Lane Group Flow (vph)	5	909	0	30	1682	0	195	11	0	0	8	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	82.2	82.2		82.2	82.2		26.8	26.8			26.8	
Effective Green, g (s)	82.2	82.2		82.2	82.2		26.8	26.8			26.8	
Actuated g/C Ratio	0.69	0.69		0.69	0.69		0.22	0.22			0.22	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	115	1263		251	2424		307	353			355	
v/s Ratio Prot		c0.49			0.48			0.01				
v/s Ratio Perm	0.03			0.08			c0.14				0.01	
v/c Ratio	0.04	0.72		0.12	0.69		0.64	0.03			0.02	
Uniform Delay, d1	6.1	11.7		6.5	11.3		42.2	36.4			36.4	
Progression Factor	1.00	1.00		0.58	0.65		1.00	1.00			1.00	
Incremental Delay, d2	0.7	3.6		0.8	1.3		4.3	0.0			0.0	
Delay (s)	6.8	15.3		4.5	8.7		46.4	36.5			36.4	
Level of Service	A	B		A	A		D	D			D	
Approach Delay (s)		15.3			8.6			44.5			36.4	
Approach LOS		B			A			D			D	

Intersection Summary					
HCM 2000 Control Delay	14.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.70				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	70.1%	ICU Level of Service		C	
Analysis Period (min)	15				

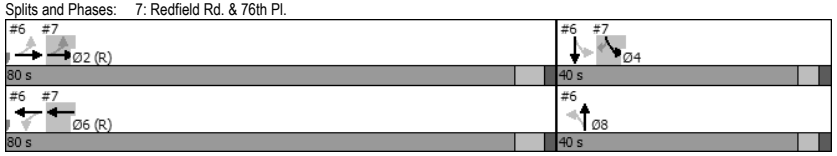
c Critical Lane Group

14-ZN-2019
6/03/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	62	791	1318	5	292	
Future Volume (vph)	62	791	1318	5	292	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	82.2	82.2	82.2	26.8	26.8	
Actuated g/C Ratio	0.68	0.68	0.68	0.22	0.22	
v/c Ratio	0.37	0.66	0.58	0.02	0.84	
Control Delay	6.7	4.2	11.1	32.2	56.1	
Queue Delay	0.0	0.5	0.1	0.0	1.8	
Total Delay	6.7	4.7	11.2	32.2	57.9	
LOS	A	A	B	C	E	
Approach Delay		4.9	11.2	57.4		
Approach LOS		A	B	E		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.84			
Intersection Signal Delay: 14.9		Intersection LOS: B	
Intersection Capacity Utilization 64.3%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	62	791	1318	12	5	292
Future Volume (vph)	62	791	1318	12	5	292
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3534		1770	1583
Flt Permitted	0.14	1.00	1.00		0.95	1.00
Satd. Flow (perm)	263	1863	3534		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.88	0.88
Adj. Flow (vph)	66	841	1402	13	6	332
RTOR Reduction (vph)	0	0	0	0	0	40
Lane Group Flow (vph)	66	841	1415	0	6	292
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	82.2	82.2	82.2		26.8	26.8
Effective Green, g (s)	82.2	82.2	82.2		26.8	26.8
Actuated g/C Ratio	0.69	0.69	0.69		0.22	0.22
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	180	1276	2420		395	353
v/s Ratio Prot		c0.45	0.40		0.00	
v/s Ratio Perm	0.25					c0.18
v/c Ratio	0.37	0.66	0.58		0.02	0.83
Uniform Delay, d1	8.0	10.9	9.9		36.3	44.4
Progression Factor	0.22	0.18	0.94		1.00	1.00
Incremental Delay, d2	4.1	1.9	0.8		0.0	14.5
Delay (s)	5.9	3.9	10.1		36.3	58.9
Level of Service	A	A	B		D	E
Approach Delay (s)		4.1	10.1		58.5	
Approach LOS		A	B		E	

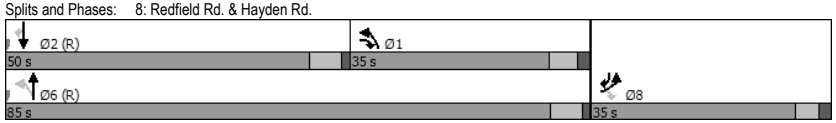
Intersection Summary			
HCM 2000 Control Delay	14.2	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.70		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	64.3%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	473	615	306	737	1149	815
Future Volume (vph)	473	615	306	737	1149	815
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.62	0.80	0.70	0.32	0.91	0.82
Control Delay	33.5	21.1	43.8	9.2	47.3	18.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.5	21.1	43.8	9.2	47.3	18.5
LOS	C	C	D	A	D	B
Approach Delay	26.5			19.4	35.3	
Approach LOS	C			B	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.91		
Intersection Signal Delay: 29.0	Intersection LOS: C	
Intersection Capacity Utilization 80.6%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	473	615	306	737	1149	815
Future Volume (veh/h)	473	615	306	737	1149	815
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	498	573	322	776	1249	756
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	620	735	573	2681	1375	836
Arrive On Green	0.19	0.19	0.30	0.72	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	498	573	322	776	1249	756
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	17.5	1.8	13.9	8.9	38.0	44.1
Cycle Q Clear(g_c), s	17.5	1.8	13.9	8.9	38.0	44.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	620	735	573	2681	1375	836
V/C Ratio(X)	0.80	0.78	0.56	0.29	0.91	0.90
Avail Cap(c_a), veh/h	810	822	573	2681	1375	836
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	46.5	25.3	32.8	6.1	36.0	21.6
Incr Delay (d2), s/veh	4.5	4.4	1.3	0.3	10.4	15.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	14.0	7.8	3.3	19.0	26.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	51.0	29.7	34.0	6.4	46.4	36.6
LnGrp LOS	D	C	C	A	D	D
Approach Vol, veh/h	1071			1098	2005	
Approach Delay, s/veh	39.6			14.5	42.7	
Approach LOS	D			B	D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	42.0	50.0			92.0	28.0
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	15.9	46.1			10.9	19.5
Green Ext Time (p_c), s	0.8	0.0			6.7	3.3

Intersection Summary		
HCM 6th Ctrl Delay	34.5	
HCM 6th LOS	C	

Notes

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

Intersection	
Int Delay, s/veh	432.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	0	127	12	0	53	13	1974	16	37	2071	34
Future Vol, veh/h	43	0	127	12	0	53	13	1974	16	37	2071	34
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	86	86	86	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	0	215	14	0	62	14	2078	17	40	2227	37

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3185	4449	1132	3086	4459	1048	2264	0	0	2095	0	0
Stage 1	2326	2326	-	2115	2115	-	-	-	-	-	-	-
Stage 2	859	2123	-	971	2344	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	~ 11	1	~ 169	~ 13	1	193	92	-	-	112	-	-
Stage 1	~ 22	70	-	32	90	-	-	-	-	-	-	-
Stage 2	288	89	-	245	69	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	~ 5	1	~ 169	-	1	193	92	-	-	112	-	-
Mov Cap-2 Maneuver	~ 5	1	-	-	1	-	-	-	-	-	-	-
Stage 1	~ 19	45	-	27	76	-	-	-	-	-	-	-
Stage 2	166	75	-	-	44	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, $	7165.4		0.3	0.9
HCM LOS	F	-		

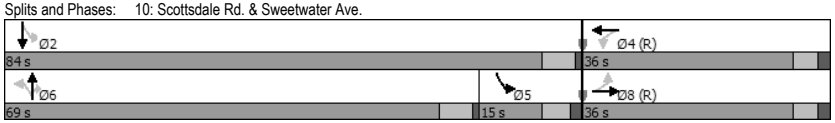
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	92	-	-	18 -	112	-	-
HCM Lane V/C Ratio	0.149	-	-	16.008 -	0.355	-	-
HCM Control Delay (s)	50.9	-	-	$ 7165.4 -	53.9	-	-
HCM Lane LOS	F	-	-	F -	F	-	-
HCM 95th %tile Q(veh)	0.5	-	-	36.7 -	1.4	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	31	26	71	111	60	1934	54	89	2007
Future Volume (vph)	31	26	71	111	60	1934	54	89	2007
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.17	0.16	0.23	0.48	1.10	0.73	0.07	0.50	0.62
Control Delay	37.8	29.2	37.9	34.5	104.6	27.8	5.6	52.3	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.8	29.2	37.9	34.5	104.6	27.8	5.6	52.3	25.6
LOS	D	C	D	C	F	C	A	D	C
Approach Delay		32.0		35.3		29.5			26.7
Approach LOS		C		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 90	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.10	
Intersection Signal Delay: 28.6	Intersection LOS: C
Intersection Capacity Utilization 84.3%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	26	38	71	111	123	60	1934	54	89	2007	66
Future Volume (veh/h)	31	26	38	71	111	123	60	1934	54	89	2007	66
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	35	30	20	72	112	104	64	2057	41	92	2069	63
Peak Hour Factor	0.88	0.88	0.88	0.99	0.99	0.99	0.94	0.94	0.94	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	283	189	363	242	224	134	2806	784	214	3468	105
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.17	0.17	0.17	0.10	0.86	0.86
Sat Flow, veh/h	1104	1102	735	1284	939	872	179	5375	1502	1688	5360	163
Grp Volume(v), veh/h	35	0	50	72	0	216	64	2057	41	92	1382	750
Grp Sat Flow(s),veh/h/ln	1104	0	1837	1284	0	1812	179	1792	1502	1688	1792	1939
Q Serve(g_s), s	3.3	0.0	2.5	5.4	0.0	12.1	42.0	43.5	2.7	0.0	13.3	13.3
Cycle Q Clear(g_c), s	15.4	0.0	2.5	7.9	0.0	12.1	55.4	43.5	2.7	0.0	13.3	13.3
Prop In Lane	1.00		0.40	1.00		0.48	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	233	0	472	363	0	466	134	2806	784	214	2318	1255
V/C Ratio(X)	0.15	0.00	0.11	0.20	0.00	0.46	0.48	0.73	0.05	0.43	0.60	0.60
Avail Cap(c_a), veh/h	233	0	472	363	0	466	134	2826	790	214	2332	1262
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	34.0	37.1	0.0	37.6	53.2	41.7	24.9	47.4	3.9	3.9
Incr Delay (d2), s/veh	1.4	0.0	0.5	1.2	0.0	3.3	0.2	0.1	0.0	6.2	0.4	0.8
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	1.0	0.0	1.2	1.8	0.0	5.8	2.0	20.9	1.0	2.9	3.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	0.0	34.5	38.3	0.0	40.9	53.4	41.8	24.9	53.6	4.3	4.7
LnGrp LOS	D	A	C	D	A	D	D	D	C	D	A	A
Approach Vol, veh/h		85			288			2162			2224	
Approach Delay, s/veh		39.0			40.2			41.9			6.5	
Approach LOS		D			D			D			A	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		83.5		36.5	15.0	68.5		36.5				
Change Period (Y+Rc), s		* 5.9		5.6	* 5.9	* 5.9		5.6				
Max Green Setting (Gmax), s		* 78		30.4	* 9.1	* 63		30.4				
Max Q Clear Time (g_c+I1), s		15.3		14.1	2.0	57.4		17.4				
Green Ext Time (p_c), s		31.5		1.3	0.1	5.3		0.2				

Intersection Summary		
HCM 6th Ctrl Delay	25.2	
HCM 6th LOS	C	

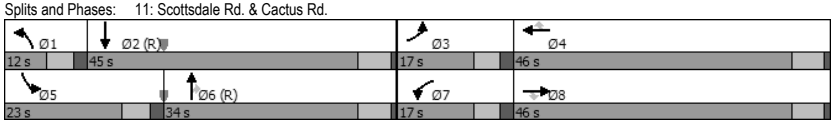
Notes

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

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	118	781	192	160	1190	317	531	1463	240	547	1396
Future Volume (vph)	118	781	192	160	1190	317	531	1463	240	547	1396
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	9.6	41.0	41.0	10.3	41.7	41.7	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.08	0.34	0.34	0.09	0.35	0.35	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.48	0.65	0.32	0.60	0.96	0.48	3.56	1.26	0.50	1.25	0.99
Control Delay	58.9	36.4	6.5	62.2	55.5	9.3	1184.6	162.2	11.8	170.5	76.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.9	36.4	6.5	62.2	55.5	9.3	1184.6	162.2	11.8	170.5	76.5
LOS	E	D	A	E	E	A	F	F	B	F	E
Approach Delay		33.5			47.4			389.0			100.1
Approach LOS		C			D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 3.56		
Intersection Signal Delay: 170.2	Intersection LOS: F	
Intersection Capacity Utilization 101.6%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



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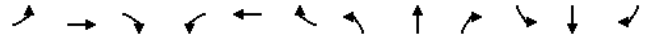

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	118	781	192	160	1190	317	531	1463	240	547	1396	239
Future Volume (veh/h)	118	781	192	160	1190	317	531	1463	240	547	1396	239
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		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	124	822	44	167	1240	111	577	1590	190	576	1469	226
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1205	484	222	1256	504	164	1470	411	464	1716	264
Arrive On Green	0.05	0.32	0.32	0.07	0.34	0.34	0.05	0.27	0.27	0.09	0.24	0.24
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4700	722
Grp Volume(v), veh/h	124	822	44	167	1240	111	577	1590	190	576	1120	575
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1839
Q Serve(g_s), s	4.5	22.9	2.5	6.0	39.5	6.4	6.0	32.8	12.6	17.0	35.8	35.9
Cycle Q Clear(g_c), s	4.5	22.9	2.5	6.0	39.5	6.4	6.0	32.8	12.6	17.0	35.8	35.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	177	1205	484	222	1256	504	164	1470	411	464	1308	671
V/C Ratio(X)	0.70	0.68	0.09	0.75	0.99	0.22	3.52	1.08	0.46	1.24	0.86	0.86
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1470	411	464	1308	671
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	55.8	35.3	28.4	55.0	39.6	28.6	57.0	43.6	36.3	54.3	42.3	42.3
Incr Delay (d2), s/veh	5.0	1.5	0.1	7.1	22.2	0.2	1151.4	49.0	3.7	122.5	5.8	10.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	10.6	0.9	2.7	21.7	2.3	28.7	21.1	5.1	15.1	17.5	18.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.8	36.8	28.5	62.1	61.8	28.8	1208.4	92.6	40.0	176.8	48.1	53.0
LnGrp LOS	E	D	C	E	E	C	F	F	D	F	D	D
Approach Vol, veh/h		990			1518			2357			2271	
Approach Delay, s/veh		39.4			59.4			361.5			82.0	
Approach LOS		D			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	49.5	12.5	46.0	23.0	38.5	14.1	44.4
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	37.9	6.5	41.5	19.0	34.8	8.0	24.9
Green Ext Time (p_c), s	0.0	1.2	0.1	0.0	0.0	0.0	0.1	5.3

Intersection Summary	
HCM 6th Ctrl Delay	163.6
HCM 6th LOS	F

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	746	0	0	1543	0	0
Future Vol, veh/h	746	0	0	1543	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized		None		None		None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	94	94	83	83	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	794	0	0	1859	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	794	0	1724	794
Stage 1	-	-	-	-	794	-
Stage 2	-	-	-	-	930	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*668	-	*88	*446
Stage 1	-	-	-	-	*421	-
Stage 2	-	-	-	-	*406	-
Platoon blocked, %	-	-	1	-		1
Mov Cap-1 Maneuver	-	-	*668	-	*88	*446
Mov Cap-2 Maneuver	-	-	-	-	*289	-
Stage 1	-	-	-	-	*421	-
Stage 2	-	-	-	-	*406	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	* 668	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Notes

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

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Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	21	0	0	2	45	1599	0	1	1680	14
Future Vol, veh/h	1	0	21	0	0	2	45	1599	0	1	1680	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	0	-	-	0	-	-	100	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	23	0	0	2	47	1683	0	1	1806	15

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2583	3593	911	2501	3600	842	1821	0	0	1683	0	0
Stage 1	1816	1816	-	1777	1777	-	-	-	-	-	-	-
Stage 2	767	1777	-	724	1823	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*131	*9	*514	*160	*9	*536	*646	-	-	*673	-	-
Stage 1	*527	*501	-	*550	*523	-	-	-	-	-	-	-
Stage 2	*550	*523	-	*527	*501	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*123	*8	*514	*144	*8	*536	*646	-	-	*673	-	-
Mov Cap-2 Maneuver	*123	*8	-	*144	*8	-	-	-	-	-	-	-
Stage 1	*489	*501	-	*510	*485	-	-	-	-	-	-	-
Stage 2	*508	*485	-	*502	*501	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.3	11.7	0.3	0
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	* 646	-	-	123	514	-	536	* 673	-	-
HCM Lane V/C Ratio	0.073	-	-	0.009	0.045	-	0.004	0.002	-	-
HCM Control Delay (s)	11	-	-	34.5	12.3	0	11.7	10.4	-	-
HCM Lane LOS	B	-	-	D	B	A	B	B	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0	0.1	-	0	0	-	-

Notes

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

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	1644	0	0	2142
Future Vol, veh/h	0	0	1644	0	0	2142
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	95	95	93	93
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	1731	0	0	2303

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	866	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	*536	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*536	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

Notes

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

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	53	65	0	0	0
Future Vol, veh/h	0	53	65	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	59	72	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	72	0	-	0	131	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	59	-
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	1528	-	-	-	863	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	964	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1528	-	-	-	863	990
Mov Cap-2 Maneuver	-	-	-	-	863	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	964	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1528	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	53	65	0	0	0
Future Vol, veh/h	0	53	65	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	59	72	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	72	0	-	0	131	72
Stage 1	-	-	-	-	72	-
Stage 2	-	-	-	-	59	-
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	1528	-	-	-	863	990
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	964	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1528	-	-	-	863	990
Mov Cap-2 Maneuver	-	-	-	-	863	-
Stage 1	-	-	-	-	951	-
Stage 2	-	-	-	-	964	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1528	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

APPENDIX D

TRIP GENERATION

7th Day Redevelopment

Trip Generation

June 2019

Appendix

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
Hangars	0.05	Storage units (100s)	151	Mini-Warehouse
Industrial Park	126.250	1,000 square feet	130	Industrial Park
General Office Building	626.400	1,000 square feet	710	General Office Building
Homes	6	Dwelling Units	210	Single-Family Detached Housing
Townhomes	12	Dwelling Units	220	Multifamily Housing (Low-Rise)
General Office Building	10.250	1,000 square feet	710	General Office Building

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

Proposed Use	Setting		ADT Available	ADT Used	AM Peak Hour Available	AM Peak Hour Used	PM Peak Hour Available	PM Peak Hour Used	(not used)		
Hangars	General Urban/Suburbar	G	G	G	G	G	G	G			
Industrial Park	General Urban/Suburbar	G	G	G	G	G	G	G			
General Office Building	General Urban/Suburbar	G	G	G	G D C	G	G D C	G			
Homes	General Urban/Suburbar	G	G	G	G	G	G	G			
Townhomes	General Urban/Suburbar	G	G	G	G	G	G	G			
General Office Building	General Urban/Suburbar	G	G	G	G D C	G	G D C	G			

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

Equation Type: Equation Used [Equated Rate] (Type Abbreviations: Weighted Average Rate ("WA"), Fitted Curve ("FC"), or Custom ("C"))

Proposed Use	ADT	AM Peak Hour	PM Peak Hour	(not used)
Hangars	WA: T=X*17.96 [17.96]	WA: T=X*1.39 [1.39]	FC: T=1.52*X+2.02 [41.92]	
Industrial Park	FC: LN(T)=0.52*LN(X)+4.45 [8.39]	WA: T=X*0.4 [0.40]	WA: T=X*0.4 [0.40]	
General Office Building	FC: LN(T)=0.97*LN(X)+2.5 [10.04]	WA: T=X*1.16 [1.16]	WA: T=X*1.15 [1.15]	
Homes	FC: LN(T)=0.92*LN(X)+2.71 [13.02]	FC: T=0.71*X+4.8 [1.51]	FC: LN(T)=0.96*LN(X)+0.2 [1.14]	
Townhomes	FC: T=7.56*X-40.86 [4.16]	FC: LN(T)=0.95*LN(X)-0.51 [0.53]	FC: LN(T)=0.89*LN(X)-0.02 [0.75]	
General Office Building	FC: LN(T)=0.97*LN(X)+2.5 [11.36]	FC: T=0.94*X+26.49 [3.52]	FC: LN(T)=0.95*LN(X)+0.36 [1.28]	

Baseline Vehicular Trips

Proposed Use	ADT % In	ADT In	ADT Out	ADT Total	AM Peak Hour % In	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour % In	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	(not used)
Hangars	50%	0	0	0	51%	0	0	0	50%	1	1	2	
Industrial Park	50%	530	530	1,060	81%	41	10	51	21%	11	40	51	
General Office Building	50%	3,145	3,145	6,290	86%	625	102	727	16%	115	605	720	
Homes	50%	39	39	78	25%	2	7	9	63%	4	3	7	
Townhomes	50%	25	25	50	23%	1	5	6	63%	6	3	9	
General Office Building	50%	58	58	116	86%	31	5	36	16%	2	11	13	
Totals		**3,797**	**3,797**	**7,594**		**700**	**129**	**829**		**139**	**663**	**802**	

APPENDIX E

TRIP DISTRIBUTION

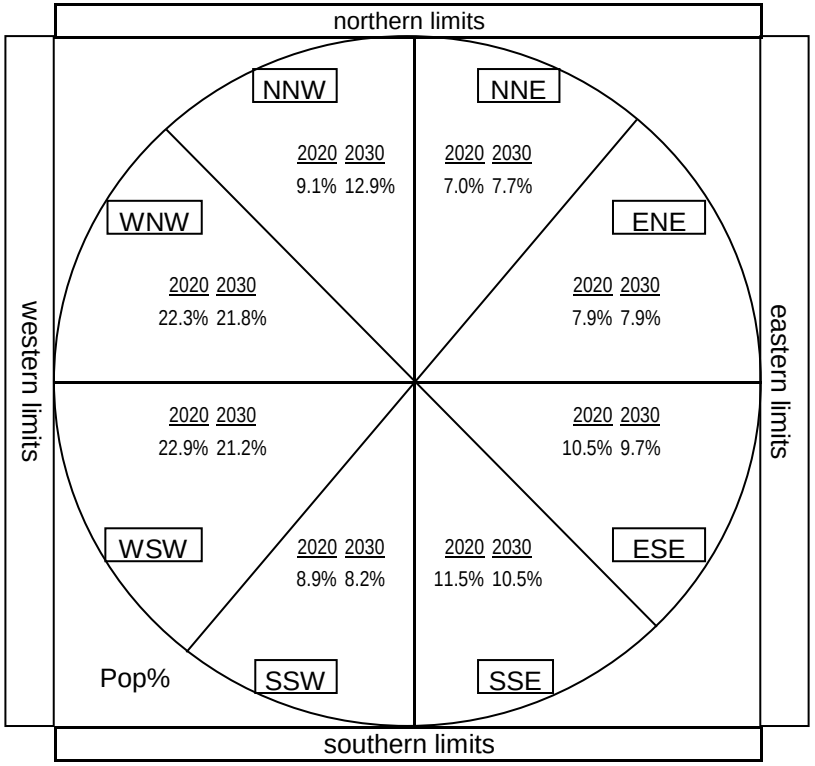
	2020				2030			
Quadrant	**Population**	**Percent**			**Population**	**Percent**		
North Northwest	31,672	9.1%			50,979	12.9%		
North Northeast	24,455	7.0%			30,330	7.7%		
North	56,127	16.1%			81,309	**20.6%**		
East Northeast	27,405	7.9%			30,993	7.9%		
East Southeast	36,766	10.5%			38,260	9.7%		
East	64,171	18.4%			69,253	**17.6%**		
South Southeast	40,141	11.5%			41,435	10.5%		
South Southwest	30,888	8.9%			32,342	8.2%		
South	71,029	20.4%			73,777	**18.7%**		
West Southwest	79,663	22.9%			83,664	21.2%		
West Northwest	77,551	22.3%			85,934	21.8%		
West	157,214	45.2%			169,598	**43.0%**		
Totals	348,540	100.1%			393,937	99.9%		

Radius

Population radius: 7 miles

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

2020



14-ZN-2019
6/03/2020

7-mile radius

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
NNW							**NNE**						
227	PH	56,483	67,265	20%	11,297	13,453	229	SC	20,869	27,608	40%	8,348	11,043
228	PH	17,962	39,116	80%	14,370	31,293	230	SC	33,607	41,394	40%	13,443	16,558
246	PH	60,062	62,330	10%	6,006	6,233	247	SC	13,321	13,647	20%	2,664	2,729
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From NNW					**31,672**	**50,979**	**From NNE**					**24,455**	**30,330**
From North												**56,127**	**81,309**

Trip Distribution - Population from North

CivTech

7-mile radius

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
ENE							**ESE**						
230	SC	33,607	41,394	40%	13,443	16,558	247	SC	13,321	13,647	20%	2,664	2,729
247	SC	13,321	13,647	20%	2,664	2,729	248	SC	37,661	39,019	60%	22,597	23,411
248	SC	37,661	39,019	30%	11,298	11,706	249	SC	21,657	22,818	50%	10,829	11,409
		-	-		-	-	264	SR	6,766	7,102	10%	677	710
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From ENE					**27,405**	**30,993**	**From ESE**					**36,766**	**38,260**
From East												**64,171**	**69,253**

CivTech

7-mile radius

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
SSE							**SSW**						
247	SC	13,321	13,647	20%	2,664	2,729	247	SC	13,321	13,647	20%	2,664	2,729
263	SC	36,704	37,882	90%	33,034	34,094	263	SC	36,704	37,882	10%	3,670	3,788
248	SC	37,661	39,019	10%	3,766	3,902	262	PV	14,198	14,871	80%	11,358	11,897
264	SR	6,766	7,102	10%	677	710	271	PH	67,978	72,784	10%	6,798	7,278
		-	-		-	-	349	MC	391	416		391	416
		-	-		-	-	246	PH	60,062	62,330	10%	6,006	6,233
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From SSE					**40,141**	**41,435**	**From SSW**					**30,888**	**32,342**
From South												**71,029**	**73,777**

Trip Distribution - Population from South

CivTech

7-mile radius

RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Population	2030 Population	% of TAZ	2020 Adjusted	2030 Adjusted
WSW							**WNW**						
246	PH	60,062	62,330	40%	24,025	24,932	246	PH	60,062	62,330	40%	24,025	24,932
262	PV	14,198	14,871	10%	1,420	1,487	245	PH	57,570	59,845	40%	23,028	23,938
261	PH	35,232	38,363	40%	14,093	15,345	242	PH	30,543	31,232	20%	6,109	6,246
245	PH	57,570	59,845	60%	34,542	35,907	228	PH	17,962	39,116	10%	1,796	3,912
244	PH	55,833	59,925	10%	5,583	5,993	227	PH	56,483	67,265	40%	22,593	26,906
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
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		-	-		-	-			-	-		-	-
		-	-		-	-			-	-		-	-
From WSW					**79,663**	**83,664**	**From WNW**					**77,551**	**85,934**
From West												**157,214**	**169,598**

APPENDIX F

BACKGROUND TRAFFIC CALCULATIONS

Location of counts: Sweetwater Avenue between Scottsdale Road and Hayden Road
Source(s): https://www.scottsdaleaz.gov/transportation/studies-reports/traffic-volume

	Year	Volume
Start	2014	3,900
End	2016	4,000
AAGR		1.3%
Exp Factor		1.026

Growth Rate Used	1.3%
Per-Year Multiplier	1.013

Year	Expansion Factor(s)	
2019	1.000	
2020	1.013	
2021	**1.026**	**25% Buildout**
2022	**1.040**	**50% Buildout**
2023	**1.053**	**75% Buildout**
2024	**1.067**	**100% Buildout**
2025	1.081	
2026	1.095	
2027	1.109	
2028	1.123	
2029	**1.138**	**5 Year Horizon**
2030	1.153	
2031	1.168	
2032	1.183	
2033	1.198	
2034	1.214	
2035	1.230	
2036	1.246	
2037	1.262	
2038	1.278	
2039	1.295	
2040	1.312	
2041	1.329	
2042	1.346	
2043	1.363	
2044	1.381	
2045	1.399	
2046	1.417	
2047	1.436	
2048	1.454	
2049	1.473	
2050	1.492	
2051	1.512	

APPENDIX G

2024 PEAK HOUR ANALYSIS

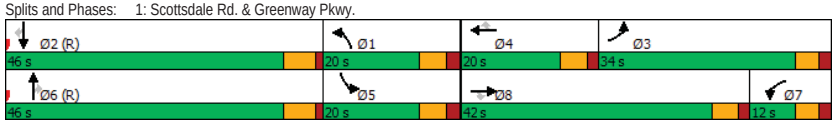
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	567	732	623	116	79	38	303	1318	260	228	1304	122
Future Volume (vph)	567	732	623	116	79	38	303	1318	260	228	1304	122
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	34.0	42.0	42.0	12.0	20.0	20.0	20.0	46.0	46.0	20.0	46.0	46.0
Total Split (%)	28.3%	35.0%	35.0%	10.0%	16.7%	16.7%	16.7%	38.3%	38.3%	16.7%	38.3%	38.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.7	36.9	36.9	6.6	7.3	7.3	13.6	40.4	40.4	13.6	40.4	40.4
Actuated g/C Ratio	0.32	0.31	0.31	0.06	0.06	0.06	0.11	0.34	0.34	0.11	0.34	0.34
v/c Ratio	0.59	0.70	1.06	0.70	0.38	0.16	0.86	0.77	0.44	0.64	0.75	0.20
Control Delay	37.7	40.6	77.6	76.4	59.1	1.3	81.2	33.9	16.6	59.2	38.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	40.6	77.6	76.4	59.1	1.3	81.2	33.9	16.6	59.2	38.4	2.0
LOS	D	D	E	E	E	A	F	C	B	E	D	A
Approach Delay		51.7			58.3			39.1			38.6	
Approach LOS		D			E			D			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 80 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.06		
Intersection Signal Delay: 44.1	Intersection LOS: D	
Intersection Capacity Utilization 82.6%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	567	732	623	116	79	38	303	1318	260	228	1304	122
Future Volume (veh/h)	567	732	623	116	79	38	303	1318	260	228	1304	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	616	796	438	125	85	26	319	1387	0	235	1344	85
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	978	1136	456	175	218	88	391	1805		391	1805	504
Arrive On Green	0.30	0.30	0.30	0.05	0.06	0.06	0.04	0.11	0.00	0.12	0.34	0.34
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	616	796	438	125	85	26	319	1387	0	235	1344	85
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	19.5	22.6	34.4	4.5	2.6	2.0	11.6	30.1	0.0	8.2	26.6	4.8
Cycle Q Clear(g_c), s	19.5	22.6	34.4	4.5	2.6	2.0	11.6	30.1	0.0	8.2	26.6	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	978	1136	456	175	218	88	391	1805		391	1805	504
V/C Ratio(X)	0.63	0.70	0.96	0.71	0.39	0.30	0.82	0.77		0.60	0.74	0.17
Avail Cap(c_a), veh/h	978	1138	457	183	452	181	391	1805		391	1805	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	37.0	41.1	55.9	54.4	54.1	56.3	48.8	0.0	50.1	35.3	28.1
Incr Delay (d2), s/veh	1.0	1.6	31.8	10.0	0.4	0.7	9.6	2.6	0.0	1.8	2.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	10.5	16.6	2.1	1.3	0.8	5.6	14.9	0.0	3.4	12.0	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	38.6	72.8	65.9	54.9	54.8	65.9	51.4	0.0	51.9	38.1	28.8
LnGrp LOS	D	D	E	E	D	D	E	D		D	D	C
Approach Vol, veh/h		1850			236			1706	A		1664	
Approach Delay, s/veh		46.3			60.7			54.1			39.6	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	46.0	41.2	12.5	20.3	46.0	11.7	41.9
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	14.0	40.3	28.7	* 15	14.0	40.3	6.7	* 37
Max Q Clear Time (g_c+I1), s	13.6	28.6	21.5	4.6	10.2	32.1	6.5	36.4
Green Ext Time (p_c), s	0.0	3.6	0.9	0.1	0.2	3.1	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay	47.3	
HCM 6th LOS	D	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	58	33	269	39	14	234	1759	43	1575	28
Future Volume (vph)	58	33	269	39	14	234	1759	43	1575	28
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.8	84.6	88.3	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	0.40	0.15	0.98	0.27	0.14	1.13	0.57	0.29	0.49	0.03
Control Delay	56.6	48.6	74.5	52.4	29.1	112.2	5.2	15.1	11.6	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	48.6	74.5	52.4	29.1	112.2	5.2	15.1	11.6	0.2
LOS	E	D	E	D	C	F	A	B	B	A
Approach Delay		69.3			42.3		17.4		11.5	
Approach LOS		E			D		B		B	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.13			
Intersection Signal Delay: 19.9		Intersection LOS: B	
Intersection Capacity Utilization 69.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	33	269	39	14	16	234	1759	58	43	1575	28
Future Volume (veh/h)	58	33	269	39	14	16	234	1759	58	43	1575	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	65	37	195	43	15	14	275	2069	50	48	1750	20
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	246	188	178	117	109	310	3860	93	227	3605	1007
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.14	1.00	1.00	0.03	0.67	0.67
Sat Flow, veh/h	1308	1969	1502	1088	937	874	1688	5398	130	1688	5375	1502
Grp Volume(v), veh/h	65	37	195	43	0	29	275	1372	747	48	1750	20
Grp Sat Flow(s),veh/h/ln	1308	1969	1502	1088	0	1811	1688	1792	1945	1688	1792	1502
Q Serve(g_s), s	5.6	2.0	15.0	4.4	0.0	1.7	6.5	0.0	0.0	1.1	19.1	0.5
Cycle Q Clear(g_c), s	7.3	2.0	15.0	6.4	0.0	1.7	6.5	0.0	0.0	1.1	19.1	0.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	205	246	188	178	0	226	310	2562	1391	227	3605	1007
V/C Ratio(X)	0.32	0.15	1.04	0.24	0.00	0.13	0.89	0.54	0.54	0.21	0.49	0.02
Avail Cap(c_a), veh/h	205	246	188	178	0	226	317	2562	1391	308	3605	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.13	0.13	0.13	0.43	0.43	0.43
Uniform Delay (d), s/veh	49.9	46.8	52.5	49.7	0.0	46.7	15.6	0.0	0.0	5.7	9.7	6.6
Incr Delay (d2), s/veh	0.9	0.3	76.3	0.7	0.0	0.3	4.3	0.1	0.2	0.2	0.2	0.0
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	1.9	1.0	9.6	1.2	0.0	0.8	5.5	0.0	0.1	0.4	7.1	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	47.1	128.8	50.4	0.0	46.9	19.8	0.1	0.2	5.9	9.9	6.6
LnGrp LOS	D	D	F	D	A	D	B	A	A	A	A	A
Approach Vol, veh/h		297			72			2394			1818	
Approach Delay, s/veh		101.5			49.0			2.4			9.7	
Approach LOS		F			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.5	86.5		21.0	7.2	91.8		21.0
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0
Max Q Clear Time (g_c+I1), s	8.5	21.1		8.4	3.1	2.0		17.0
Green Ext Time (p_c), s	0.0	23.2		0.1	0.0	33.9		0.0

Intersection Summary		
HCM 6th Ctrl Delay	12.5	
HCM 6th LOS	B	

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

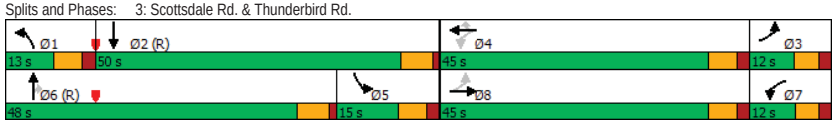
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	362	894	113	210	168	113	1657	180	284	1536
Future Volume (vph)	362	894	113	210	168	113	1657	180	284	1536
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.3	38.9	21.1	13.7	13.7	7.1	42.4	42.4	9.0	44.3
Actuated g/C Ratio	0.43	0.32	0.18	0.11	0.11	0.06	0.35	0.35	0.08	0.37
v/c Ratio	0.69	1.26	0.44	0.57	0.57	0.73	1.08	0.36	1.26	0.88
Control Delay	38.7	156.0	31.4	55.2	13.3	57.9	89.2	21.8	182.6	37.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	156.0	31.4	55.2	13.3	57.9	89.2	21.8	182.6	37.2
LOS	D	F	C	E	B	E	F	C	F	D
Approach Delay		130.8		35.4			81.2			58.9
Approach LOS		F		D			F			E

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.26		
Intersection Signal Delay: 84.6	Intersection LOS: F	
Intersection Capacity Utilization 98.9%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	362	894	428	113	210	168	113	1657	180	284	1536	81
Future Volume (veh/h)	362	894	428	113	210	168	113	1657	180	284	1536	81
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	1870
Adj Flow Rate, veh/h	411	1016	372	130	241	124	140	2046	136	305	1652	65
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	520	872	316	255	423	170	191	1895	529	286	2010	79
Arrive On Green	0.25	0.32	0.32	0.04	0.11	0.11	0.02	0.12	0.12	0.09	0.38	0.38
Sat Flow, veh/h	1688	2690	974	3274	3741	1502	3274	5375	1502	3274	5306	209
Grp Volume(v), veh/h	411	703	685	130	241	124	140	2046	136	305	1115	602
Grp Sat Flow(s),veh/h/ln	1688	1870	1794	1637	1870	1502	1637	1792	1502	1637	1792	1931
Q Serve(g_s), s	20.0	38.9	38.9	0.2	7.3	9.6	5.1	42.3	9.9	10.5	33.7	33.7
Cycle Q Clear(g_c), s	20.0	38.9	38.9	0.2	7.3	9.6	5.1	42.3	9.9	10.5	33.7	33.7
Prop In Lane	1.00		0.54	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	520	606	581	255	423	170	191	1895	529	286	1358	732
V/C Ratio(X)	0.79	1.16	1.18	0.51	0.57	0.73	0.73	1.08	0.26	1.07	0.82	0.82
Avail Cap(c_a), veh/h	520	606	581	303	1213	487	191	1895	529	286	1358	732
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	0.81	0.81	0.81
Uniform Delay (d), s/veh	38.6	40.6	40.6	55.2	50.4	51.4	57.9	53.0	38.7	54.8	33.6	33.6
Incr Delay (d2), s/veh	8.1	89.1	97.2	1.5	1.2	5.7	13.5	46.0	1.2	67.2	4.7	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.1	32.6	32.6	1.9	3.5	3.9	2.5	28.4	4.1	7.0	15.3	17.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.7	129.6	137.7	56.7	51.6	57.2	71.4	99.0	39.9	122.0	38.3	42.0
LnGrp LOS	D	F	F	E	D	E	E	F	D	F	D	D
Approach Vol, veh/h		1799			495			2322			2022	
Approach Delay, s/veh		113.8			54.3			93.9			52.0	
Approach LOS		F			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	51.5	35.9	19.7	16.5	48.0	10.5	45.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	7.1	35.7	22.0	11.6	12.5	44.3	2.2	40.9
Green Ext Time (p_c), s	0.0	6.5	0.0	2.0	0.0	0.0	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay	83.6	
HCM 6th LOS	F	

Notes

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

14-ZN-2019
6/03/2020

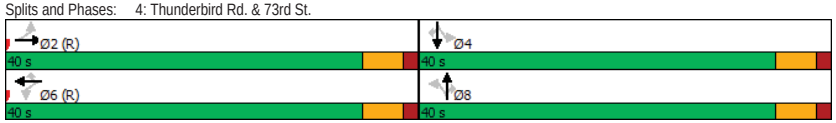
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	21	1331	1	467	239	6	3	103	3	18
Future Volume (vph)	21	1331	1	467	239	6	3	103	3	18
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2		6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	2	2	6	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.07	0.98	0.01	0.30	0.31	0.02	0.01	0.24	0.00	0.04
Control Delay	14.2	42.0	14.0	15.5	3.2	13.3	13.0	15.8	13.0	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.2	42.0	14.0	15.5	3.2	13.3	13.0	15.8	13.0	3.8
LOS	B	D	B	B	A	B	B	B	B	A
Approach Delay		41.5		11.4			13.2		14.0	
Approach LOS		D		B			B		B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.98			
Intersection Signal Delay: 30.8		Intersection LOS: C	
Intersection Capacity Utilization 57.0%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1331	6	1	467	239	6	3	0	103	3	18
Future Volume (veh/h)	21	1331	6	1	467	239	6	3	0	103	3	18
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	25	1566	5	1	481	179	10	5	0	136	4	15
Peak Hour Factor	0.85	0.85	0.85	0.97	0.97	0.97	0.58	0.58	0.58	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	345	1649	5	101	1613	648	658	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.00	0.43	0.43	0.43
Sat Flow, veh/h	734	3825	12	310	3741	1502	1320	1969	1502	1337	1969	1502
Grp Volume(v), veh/h	25	766	805	1	481	179	10	5	0	136	4	15
Grp Sat Flow(s),veh/h/ln	734	1870	1967	310	1870	1502	1320	1969	1502	1337	1969	1502
Q Serve(g_s), s	1.8	31.5	31.6	0.2	6.7	6.2	0.3	0.1	0.0	5.2	0.1	0.5
Cycle Q Clear(g_c), s	8.6	31.5	31.6	31.8	6.7	6.2	0.4	0.1	0.0	5.3	0.1	0.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	345	807	848	101	1613	648	658	849	648	665	849	648
V/C Ratio(X)	0.07	0.95	0.95	0.01	0.30	0.28	0.02	0.01	0.00	0.20	0.00	0.02
Avail Cap(c_a), veh/h	345	807	848	101	1613	648	658	849	648	665	849	648
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	21.9	21.9	37.2	14.8	14.7	13.1	13.0	0.0	14.5	13.0	13.1
Incr Delay (d2), s/veh	0.0	3.3	3.2	0.2	0.5	1.1	0.0	0.0	0.0	0.7	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	0.3	13.4	14.0	0.0	2.8	2.2	0.1	0.1	0.0	1.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.7	25.2	25.1	37.4	15.3	15.7	13.1	13.0	0.0	15.2	13.0	13.1
LnGrp LOS	B	C	C	D	B	B	B	B	A	B	B	B
Approach Vol, veh/h		1596			661			15			155	
Approach Delay, s/veh		25.0			15.5			13.1			14.9	
Approach LOS		C			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.0	40.0	40.0	40.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	34.5	34.5	34.5	34.5
Max Q Clear Time (g_c+I1), s	33.6	7.3	33.8	2.4
Green Ext Time (p_c), s	0.8	0.5	0.3	0.0

Intersection Summary		
HCM 6th Ctrl Delay	21.7	
HCM 6th LOS	C	

Notes

User approved pedestrian interval to be less than phase max green.

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	1319	1	718	4	0	
Future Volume (vph)	1319	1	718	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.84	0.02	0.21		0.04	
Control Delay	10.1	3.0	1.3		6.6	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	10.1	3.0	1.3		6.6	
LOS	B	A	A		A	
Approach Delay	10.1		1.3		6.6	
Approach LOS	B		A		A	

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 145	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.84	
Intersection Signal Delay: 7.3	Intersection LOS: A
Intersection Capacity Utilization 101.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1319	4	1	718	0	4	0	1	0	0	0
Future Volume (veh/h)	0	1319	4	1	718	0	4	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1570	4	1	748	0	8	0	0	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.96	0.96	0.96	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1726	4	172	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1963	5	309	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1574	1	748	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	309	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	70.0	0.3	4.4	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	70.0	70.3	4.4	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	172	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.91	0.01	0.23	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	172	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.91	0.91	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	5.3	26.5	1.3	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	8.6	0.1	0.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	19.8	0.0	1.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	13.9	26.5	1.5	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	B	C	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1574			749			8			0	
Approach Delay, s/veh		13.9			1.5			67.8			0.0	
Approach LOS		B			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		133.5		11.5		133.5		11.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		72.0		0.0		72.3		2.8				
Green Ext Time (p_c), s		18.6		0.0		5.4		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	10.1	
HCM 6th LOS	B	

14-ZN-2019
6/03/2020

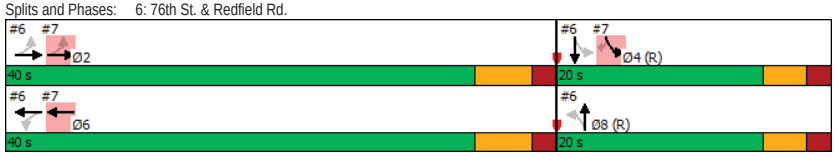
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	19	1460	26	737	21	1	0
Future Volume (vph)	19	1460	26	737	21	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0
Total Split (s)	40.0	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Ped	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	15.0	15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25	0.25
v/c Ratio	0.07	1.70	0.24	0.43	0.08	0.03	0.02
Control Delay	6.6	339.4	7.3	3.4	18.0	10.2	0.0
Queue Delay	0.0	0.5	0.0	0.1	0.0	0.0	0.0
Total Delay	6.6	340.0	7.3	3.5	18.0	10.2	0.0
LOS	A	F	A	A	B	B	A
Approach Delay		336.1		3.7		15.4	
Approach LOS		F		A		B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.70			
Intersection Signal Delay: 221.8		Intersection LOS: F	
Intersection Capacity Utilization 101.5%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1460	127	26	737	16	21	1	10	0	0	5
Future Volume (vph)	19	1460	127	26	737	16	21	1	10	0	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1840		1770	3528		1770	1603			1611	
Flt Permitted	0.30	1.00		0.12	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	560	1840		219	3528		1399	1603			1611	
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.75	0.75	0.75	0.50	0.50	0.50
Adj. Flow (vph)	21	1640	143	30	847	18	28	1	13	0	0	10
RTOR Reduction (vph)	0	5	0	0	3	0	0	10	0	0	8	0
Lane Group Flow (vph)	21	1778	0	30	862	0	28	4	0	0	3	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	317	1042		124	1999		349	400			402	
v/s Ratio Prot		c0.97			0.24			0.00			0.00	
v/s Ratio Perm	0.04			0.14			c0.02					
v/c Ratio	0.07	1.71		0.24	0.43		0.08	0.01			0.01	
Uniform Delay, d1	5.9	13.0		6.5	7.5		17.2	16.9			16.9	
Progression Factor	1.00	1.00		0.40	0.37		1.00	1.00			1.00	
Incremental Delay, d2	0.1	321.9		1.0	0.1		0.4	0.0			0.0	
Delay (s)	5.9	334.9		3.6	2.9		17.7	17.0			16.9	
Level of Service	A	F		A	A		B	B			B	
Approach Delay (s)		331.1			2.9			17.4			16.9	
Approach LOS		F			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	218.4	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.21				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	101.5%	ICU Level of Service	G		
Analysis Period (min)	15				

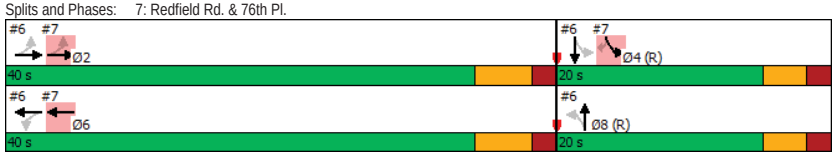
c Critical Lane Group

Timings
7: Redfield Rd. & 76th Pl. 04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	265	1206	684	21	97	
Future Volume (vph)	265	1206	684	21	97	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	15.0	15.0	
Actuated g/C Ratio	0.57	0.57	0.57	0.25	0.25	
v/c Ratio	0.89	1.30	0.41	0.06	0.24	
Control Delay	14.0	148.7	9.4	17.7	5.8	
Queue Delay	0.0	0.8	0.0	0.0	0.0	
Total Delay	14.0	149.5	9.4	17.7	5.8	
LOS	B	F	A	B	A	
Approach Delay		125.1	9.4	8.0		
Approach LOS		F	A	A		

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.70			
Intersection Signal Delay: 82.9		Intersection LOS: F	
Intersection Capacity Utilization 77.6%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl. 04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	265	1206	684	18	21	97
Future Volume (vph)	265	1206	684	18	21	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3526		1770	1583
Flt Permitted	0.32	1.00	1.00		0.95	1.00
Satd. Flow (perm)	600	1863	3526		1770	1583
Peak-hour factor, PHF	0.88	0.88	0.86	0.86	0.84	0.84
Adj. Flow (vph)	301	1370	795	21	25	115
RTOR Reduction (vph)	0	0	3	0	0	86
Lane Group Flow (vph)	301	1370	813	0	25	29
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	34.0	34.0	34.0		15.0	15.0
Effective Green, g (s)	34.0	34.0	34.0		15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	340	1055	1998		442	395
v/s Ratio Prot		c0.74	0.23		0.01	
v/s Ratio Perm	0.50					c0.02
v/c Ratio	0.89	1.30	0.41		0.06	0.07
Uniform Delay, d1	11.3	13.0	7.3		17.1	17.2
Progression Factor	0.39	0.35	1.22		1.00	1.00
Incremental Delay, d2	2.8	135.0	0.1		0.2	0.4
Delay (s)	7.2	139.6	9.0		17.4	17.5
Level of Service	A	F	A		B	B
Approach Delay (s)		115.7	9.0		17.5	
Approach LOS		F	A		B	

Intersection Summary			
HCM 2000 Control Delay	77.4	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	77.6%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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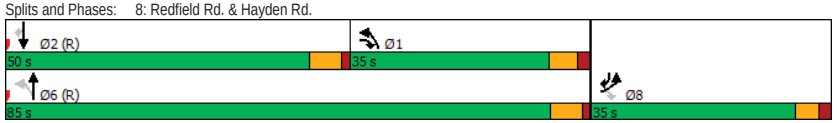
Timings
8: Redfield Rd. & Hayden Rd. 04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	687	186	668	1042	320	375
Future Volume (vph)	687	186	668	1042	320	375
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.97	0.23	0.86	0.43	0.25	0.38
Control Delay	49.5	5.6	35.1	10.4	27.0	6.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.5	5.6	35.1	10.4	27.0	6.0
LOS	D	A	D	B	C	A
Approach Delay	40.1			20.1	15.7	
Approach LOS	D			C	B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.97		
Intersection Signal Delay: 24.9	Intersection LOS: C	
Intersection Capacity Utilization 82.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd. 04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	687	186	668	1042	320	375
Future Volume (veh/h)	687	186	668	1042	320	375
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	781	131	682	1063	337	253
Peak Hour Factor	0.88	0.88	0.98	0.98	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	810	777	741	2569	1375	924
Arrive On Green	0.25	0.25	0.27	0.69	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	781	131	682	1063	337	253
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	28.3	0.0	25.3	14.9	7.5	9.4
Cycle Q Clear(g_c), s	28.3	0.0	25.3	14.9	7.5	9.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	810	777	741	2569	1375	924
V/C Ratio(X)	0.96	0.17	0.92	0.41	0.25	0.27
Avail Cap(c_a), veh/h	810	777	741	2569	1375	924
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	44.6	15.3	30.2	8.2	26.4	10.7
Incr Delay (d2), s/veh	23.1	0.1	16.7	0.5	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.0	1.9	21.5	5.8	3.4	5.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	67.7	15.4	46.9	8.7	26.8	11.4
LnGrp LOS	E	B	D	A	C	B
Approach Vol, veh/h	912			1745	590	
Approach Delay, s/veh	60.2			23.6	20.2	
Approach LOS	E			C	C	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.5	50.0			88.5	35.0
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	27.3	11.4			16.9	30.3
Green Ext Time (p_c), s	0.5	3.3			10.5	0.0

Intersection Summary		
HCM 6th Ctrl Delay	33.3	
HCM 6th LOS	C	

Notes

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

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Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	23	7	0	45	45	1694	13	49	1759	83
Future Vol, veh/h	16	0	23	7	0	45	45	1694	13	49	1759	83
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	58	58	58	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	0	25	12	0	78	52	1970	15	53	1891	89

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	2934	4131	990	2944	4168	993	1980	0	0	1985	0	0
Stage 1	2042	2042	-	2082	2082	-	-	-	-	-	-	-
Stage 2	892	2089	-	862	2086	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*101	*24	*492	*101	*15	*514	*618	-	-	640	-	-
Stage 1	*504	*480	-	*400	*418	-	-	-	-	-	-	-
Stage 2	*527	*413	-	*504	*480	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*75	*20	*492	*84	*12	*514	*618	-	-	640	-	-
Mov Cap-2 Maneuver	*217	*180	-	*210	*181	-	-	-	-	-	-	-
Stage 1	*462	*440	-	*366	*383	-	-	-	-	-	-	-
Stage 2	*410	*379	-	*439	*440	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.8	15.6	0.3	0.3
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1		SBL	SBT	SBR
Capacity (veh/h)	* 618	-	-	324	430	640	-	-
HCM Lane V/C Ratio	0.085	-	-	0.129	0.209	0.082	-	-
HCM Control Delay (s)	11.4	-	-	17.8	15.6	11.1	-	-
HCM Lane LOS	B	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.4	0.8	0.3	-	-

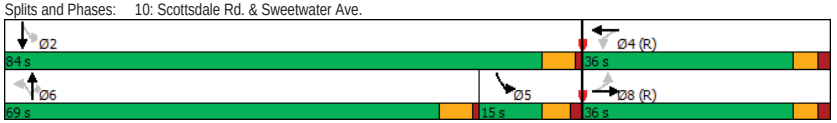
Notes

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	58	136	109	35	31	1918	43	83	1854
Future Volume (vph)	58	136	109	35	31	1918	43	83	1854
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.25	0.57	0.77	0.30	0.66	0.83	0.06	0.51	0.61
Control Delay	38.8	42.7	70.8	14.7	34.5	24.7	3.7	52.7	24.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	42.7	70.8	14.7	34.5	24.7	3.7	52.7	24.9
LOS	D	D	E	B	C	C	A	D	C
Approach Delay		41.9		40.9		24.4			26.0
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.83	
Intersection Signal Delay: 27.1	Intersection LOS: C
Intersection Capacity Utilization 80.8%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



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HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	136	97	109	35	90	31	1918	43	83	1854	21
Future Volume (veh/h)	58	136	97	109	35	90	31	1918	43	83	1854	21
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	67	158	84	135	43	86	38	2339	34	94	2107	18
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.82	0.82	0.82	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	302	316	168	222	153	306	133	2786	778	199	3536	30
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.17	0.17	0.17	0.10	0.86	0.86
Sat Flow, veh/h	1195	1210	643	1078	586	1172	180	5375	1502	1688	5497	47
Grp Volume(v), veh/h	67	0	242	135	0	129	38	2339	34	94	1373	752
Grp Sat Flow(s),veh/h/ln	1195	0	1853	1078	0	1758	180	1792	1502	1688	1792	1960
Q Serve(g_s), s	5.7	0.0	13.3	14.6	0.0	7.0	23.5	50.5	2.3	1.0	13.5	13.6
Cycle Q Clear(g_c), s	12.7	0.0	13.3	27.9	0.0	7.0	37.1	50.5	2.3	1.0	13.5	13.6
Prop In Lane	1.00		0.35	1.00		0.67	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	302	0	483	222	0	459	133	2786	778	199	2305	1261
V/C Ratio(X)	0.22	0.00	0.50	0.61	0.00	0.28	0.29	0.84	0.04	0.47	0.60	0.60
Avail Cap(c_a), veh/h	302	0	483	222	0	459	134	2826	790	199	2332	1276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	0.0	37.7	49.6	0.0	35.4	45.7	44.9	24.9	49.3	4.1	4.1
Incr Delay (d2), s/veh	1.7	0.0	3.7	11.9	0.0	1.5	0.1	0.2	0.0	7.8	0.4	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	0.0	6.5	4.7	0.0	3.2	1.1	24.4	0.8	3.0	3.1	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.1	0.0	41.4	61.4	0.0	36.9	45.8	45.1	24.9	57.2	4.5	4.8
LnGrp LOS	D	A	D	E	A	D	D	D	C	E	A	A
Approach Vol, veh/h		309			264			2411			2219	
Approach Delay, s/veh		41.5			49.5			44.9			6.8	
Approach LOS		D			D			D			A	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	83.1	36.9	15.0	68.1	36.9
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	15.6	29.9	3.0	52.5	15.3
Green Ext Time (p_c), s	31.2	0.1	0.1	9.6	1.4

Intersection Summary	
HCM 6th Ctrl Delay	28.7
HCM 6th LOS	C

Notes

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

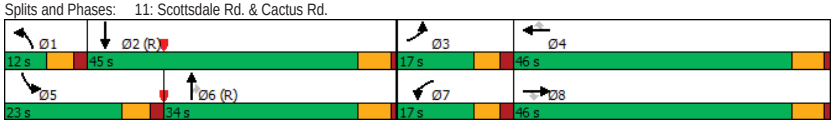
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	226	1353	468	235	773	604	153	1331	171	463	1414
Future Volume (vph)	226	1353	468	235	773	604	153	1331	171	463	1414
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.0	40.3	40.3	11.0	40.3	40.3	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.83	1.18	0.81	0.89	0.70	1.02	1.05	1.17	0.38	1.12	0.97
Control Delay	76.2	124.6	34.0	83.9	38.1	65.8	139.0	127.0	7.6	122.6	69.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	76.2	124.6	34.0	83.9	38.1	65.8	139.0	127.0	7.6	122.6	69.5
LOS	E	F	C	F	D	E	F	F	A	F	E
Approach Delay		98.6			55.1			115.8			81.9
Approach LOS		F			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.18		
Intersection Signal Delay: 88.2	Intersection LOS: F	
Intersection Capacity Utilization 100.5%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	226	1353	468	235	773	604	153	1331	171	463	1414	102
Future Volume (veh/h)	226	1353	468	235	773	604	153	1331	171	463	1414	102
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	246	1471	335	264	869	454	170	1479	118	514	1571	85
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	1256	504	300	1260	506	164	1268	354	464	1709	92
Arrive On Green	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.09	0.22	0.22
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5219	282
Grp Volume(v), veh/h	246	1471	335	264	869	454	170	1479	118	514	1078	578
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1918
Q Serve(g_s), s	8.9	40.3	22.9	9.6	24.1	34.5	6.0	28.3	7.8	17.0	35.3	35.3
Cycle Q Clear(g_c), s	8.9	40.3	22.9	9.6	24.1	34.5	6.0	28.3	7.8	17.0	35.3	35.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	297	1256	504	300	1260	506	164	1268	354	464	1174	628
V/C Ratio(X)	0.83	1.17	0.66	0.88	0.69	0.90	1.04	1.17	0.33	1.11	0.92	0.92
Avail Cap(c_a), veh/h	300	1256	504	300	1260	506	164	1268	354	464	1174	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	53.6	39.8	34.1	53.8	34.4	37.8	57.0	45.8	38.0	54.3	45.3	45.3
Incr Delay (d2), s/veh	17.2	85.7	3.3	24.5	1.6	18.6	80.9	83.9	2.5	69.4	10.1	16.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	33.2	8.8	5.0	11.2	15.1	4.3	22.3	3.1	11.7	17.9	20.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	70.9	125.6	37.3	78.3	36.0	56.4	137.9	129.8	40.5	123.7	55.4	61.9
LnGrp LOS	E	F	D	E	D	E	F	F	D	F	E	E
Approach Vol, veh/h		2052			1587			1767			2170	
Approach Delay, s/veh		104.6			48.9			124.6			73.3	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	45.0	16.9	46.1	23.0	34.0	17.0	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	37.3	10.9	36.5	19.0	30.3	11.6	42.3
Green Ext Time (p_c), s	0.0	1.7	0.0	2.5	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	88.6
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1434	0	0	707	0	0
Future Vol, veh/h	1434	0	0	707	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1593	0	0	786	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1593	0	1986	1593
Stage 1	-	-	-	-	1593	-
Stage 2	-	-	-	-	393	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	-	-	*60	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*752	-
Platoon blocked, %	-	-	2	-		2
Mov Cap-1 Maneuver	-	-	-	-	*60	-
Mov Cap-2 Maneuver	-	-	-	-	*~ -6	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*752	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B 04/23/2020

Intersection	
Int Delay, s/veh	1.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	60	0	0	0	57	1950	0	2	2045	30
Future Vol, veh/h	12	0	60	0	0	0	57	1950	0	2	2045	30
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	67	0	0	0	63	2167	0	2	2272	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3286	4586	1153	3206	4602	1084	2305	0	0	2167	0	0
Stage 1	2293	2293	-	2293	2293	-	-	-	-	-	-	-
Stage 2	993	2293	-	913	2309	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*35	*0	*425	*45	*0	*447	*535	-	-	*563	-	-
Stage 1	*436	*415	-	*459	*437	-	-	-	-	-	-	-
Stage 2	*459	*437	-	*436	*415	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*32	*0	*425	*35	*0	*447	*535	-	-	*563	-	-
Mov Cap-2 Maneuver	*32	*0	-	*174	*167	-	-	-	-	-	-	-
Stage 1	*385	*413	-	*405	*385	-	-	-	-	-	-	-
Stage 2	*405	*385	-	*367	*413	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	61.2	0	0.4	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 535	-	-	139	-	* 563	-	-
HCM Lane V/C Ratio	0.118	-	-	0.576	-	0.004	-	-
HCM Control Delay (s)	12.6	-	-	61.2	0	11.4	-	-
HCM Lane LOS	B	-	-	F	A	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	2.9	-	0	-	-

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C 04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	2007	0	0	2105
Future Vol, veh/h	0	0	2007	0	0	2105
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2230	0	0	2339

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1115	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	*447	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*447	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

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

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	62	52	0	0	0
Future Vol, veh/h	0	62	52	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	69	58	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	127	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	69	-
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	1546	-	-	-	868	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	868	1008
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	62	52	0	0	0
Future Vol, veh/h	0	62	52	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	69	58	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	127	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	69	-
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	1546	-	-	-	868	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	868	1008
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

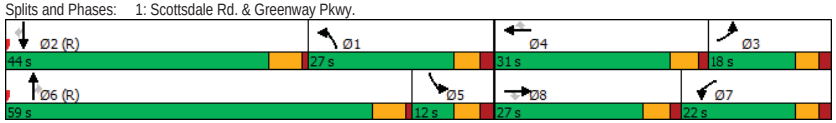
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	262	339	520	692	262	664	1536	116	118	1376	188
Future Volume (vph)	288	262	339	520	692	262	664	1536	116	118	1376	188
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	18.0	27.0	27.0	22.0	31.0	31.0	27.0	59.0	59.0	12.0	44.0	44.0
Total Split (%)	15.0%	22.5%	22.5%	18.3%	25.8%	25.8%	22.5%	49.2%	49.2%	10.0%	36.7%	36.7%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	13.5	17.5	17.5	20.7	24.7	24.7	21.0	53.3	53.3	6.0	38.3	38.3
Actuated g/C Ratio	0.11	0.15	0.15	0.17	0.21	0.21	0.18	0.44	0.44	0.05	0.32	0.32
v/c Ratio	0.95	0.58	0.94	0.96	0.93	0.60	1.25	0.69	0.17	0.80	0.89	0.34
Control Delay	89.2	51.6	48.8	78.7	66.3	20.7	167.3	21.4	1.9	89.7	46.2	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.2	51.6	48.8	78.7	66.3	20.7	167.3	21.4	1.9	89.7	46.2	6.7
LOS	F	D	D	E	E	C	F	C	A	F	D	A
Approach Delay		62.7			62.6			62.2			44.8	
Approach LOS		E			E			E			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 59 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.25			
Intersection Signal Delay: 57.7		Intersection LOS: E	
Intersection Capacity Utilization 90.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	262	339	520	692	262	664	1536	116	118	1376	188
Future Volume (veh/h)	288	262	339	520	692	262	664	1536	116	118	1376	188
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	347	316	143	536	713	256	714	1652	0	130	1512	163
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	430	173	646	772	310	593	2387		183	1715	479
Arrive On Green	0.11	0.12	0.12	0.20	0.21	0.21	0.24	0.59	0.00	0.06	0.32	0.32
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	347	316	143	536	713	256	714	1652	0	130	1512	163
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	12.7	9.8	11.2	18.9	22.4	19.6	21.7	25.5	0.0	4.7	32.0	9.9
Cycle Q Clear(g_c), s	12.7	9.8	11.2	18.9	22.4	19.6	21.7	25.5	0.0	4.7	32.0	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	430	173	646	772	310	593	2387		183	1715	479
V/C Ratio(X)	1.00	0.73	0.83	0.83	0.92	0.83	1.21	0.69		0.71	0.88	0.34
Avail Cap(c_a), veh/h	346	670	269	646	795	319	593	2387		183	1715	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.71	0.71	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	51.3	51.9	46.2	46.7	45.5	45.6	18.9	0.0	55.7	38.7	31.2
Incr Delay (d2), s/veh	48.7	0.9	6.4	8.4	15.6	14.7	103.5	1.2	0.0	10.3	6.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	4.6	4.5	8.4	12.1	8.5	16.9	9.4	0.0	2.2	15.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.4	52.2	58.3	54.6	62.3	60.3	149.1	20.1	0.0	66.0	45.6	33.1
LnGrp LOS	F	D	E	D	E	E	F	C		E	D	C
Approach Vol, veh/h		806			1505			2366	A		1805	
Approach Delay, s/veh		74.9			59.2			59.0			45.9	
Approach LOS		E			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.7	44.0	18.0	30.3	12.7	59.0	29.0	19.3
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	21.0	38.3	12.7	* 26	6.0	53.3	16.7	* 22
Max Q Clear Time (g_c+I1), s	23.7	34.0	14.7	24.4	6.7	27.5	20.9	13.2
Green Ext Time (p_c), s	0.0	2.3	0.0	0.4	0.0	5.9	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay	57.4	
HCM 6th LOS	E	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	42	277	144	75	168	1878	49	2073	71
Future Volume (vph)	147	42	277	144	75	168	1878	49	2073	71
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.6	84.4	88.5	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	1.63	0.19	1.07	1.12	0.65	1.04	0.58	0.34	0.65	0.08
Control Delay	359.4	49.4	104.5	156.3	55.1	100.5	3.5	10.2	24.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	359.4	49.4	104.5	156.3	55.1	100.5	3.5	10.2	24.3	6.6
LOS	F	D	F	F	E	F	A	B	C	A
Approach Delay		180.0			108.2		11.4		23.4	
Approach LOS		F			F		B		C	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.63		
Intersection Signal Delay: 37.9	Intersection LOS: D	
Intersection Capacity Utilization 83.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	42	277	144	75	55	168	1878	17	49	2073	71
Future Volume (veh/h)	147	42	277	144	75	55	168	1878	17	49	2073	71
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	165	47	199	180	94	64	193	2159	3	55	2329	69
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.87	0.87	0.87	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	110	246	188	171	136	93	215	3956	5	224	3615	1010
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.14	1.00	1.00	0.01	0.22	0.22
Sat Flow, veh/h	1164	1969	1502	1074	1092	743	1688	5543	8	1688	5375	1502
Grp Volume(v), veh/h	165	47	199	180	0	158	193	1396	766	55	2329	69
Grp Sat Flow(s),veh/h/ln	1164	1969	1502	1074	0	1835	1688	1792	1967	1688	1792	1502
Q Serve(g_s), s	5.1	2.6	15.0	12.4	0.0	9.9	6.3	0.0	0.0	1.2	47.2	4.4
Cycle Q Clear(g_c), s	15.0	2.6	15.0	15.0	0.0	9.9	6.3	0.0	0.0	1.2	47.2	4.4
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	246	188	171	0	229	215	2557	1404	224	3615	1010
V/C Ratio(X)	1.51	0.19	1.06	1.05	0.00	0.69	0.90	0.55	0.55	0.25	0.64	0.07
Avail Cap(c_a), veh/h	110	246	188	171	0	229	225	2557	1404	304	3615	1010
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.18	0.18	0.18	0.29	0.29	0.29
Uniform Delay (d), s/veh	58.8	47.1	52.5	56.0	0.0	50.3	31.1	0.0	0.0	5.7	33.6	17.0
Incr Delay (d2), s/veh	269.2	0.4	82.5	82.9	0.0	8.4	8.7	0.2	0.3	0.2	0.3	0.0
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	11.5	1.3	9.9	9.2	0.0	5.1	5.8	0.1	0.1	0.4	22.7	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	328.1	47.4	135.0	138.8	0.0	58.7	39.8	0.2	0.3	5.8	33.9	17.0
LnGrp LOS	F	D	F	F	A	E	D	A	A	A	C	B
Approach Vol, veh/h		411			338			2355			2453	
Approach Delay, s/veh		202.5			101.4			3.4			32.8	
Approach LOS		F			F			A			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.3	86.7		21.0	7.4	91.6		21.0
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0
Max Q Clear Time (g_c+I1), s	8.3	49.2		17.0	3.2	2.0		17.0
Green Ext Time (p_c), s	0.0	24.0		0.0	0.0	35.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay	37.1	
HCM 6th LOS	D	

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

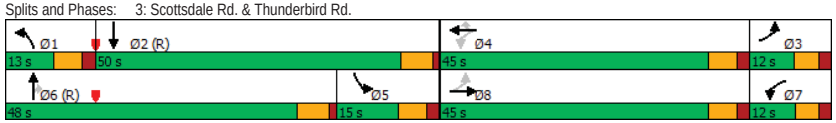
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	265	205	1020	268	308	1699	70	177	1886
Future Volume (vph)	193	265	205	1020	268	308	1699	70	177	1886
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	27.5	20.6	51.7	38.9	38.9	7.0	42.3	42.3	9.0	44.3
Actuated g/C Ratio	0.23	0.17	0.43	0.32	0.32	0.06	0.35	0.35	0.08	0.37
v/c Ratio	1.46	0.77	0.27	0.94	0.49	1.77	0.98	0.12	0.84	1.30
Control Delay	271.2	40.9	29.9	54.6	14.9	389.7	62.0	9.1	71.6	169.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	271.2	40.9	29.9	54.6	14.9	389.7	62.0	9.1	71.6	169.5
LOS	F	D	C	D	B	F	E	A	E	F
Approach Delay		104.9		44.1			108.8			162.2
Approach LOS		F		D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.77		
Intersection Signal Delay: 113.7	Intersection LOS: F	
Intersection Capacity Utilization 108.3%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	265	237	205	1020	268	308	1699	70	177	1886	325
Future Volume (veh/h)	193	265	237	205	1020	268	308	1699	70	177	1886	325
Initial Q (Qb), veh	0	0	0	12	25	10	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	1870
Adj Flow Rate, veh/h	217	298	131	228	1133	154	335	1847	38	203	2168	259
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	392	168	882	1213	483	191	1895	529	443	2082	259
Arrive On Green	0.05	0.15	0.15	0.22	0.32	0.32	0.02	0.12	0.12	0.10	0.49	0.49
Sat Flow, veh/h	1688	2548	1094	3274	3741	1502	3274	5375	1502	3274	4876	573
Grp Volume(v), veh/h	217	217	212	228	1133	154	335	1847	38	203	1583	844
Grp Sat Flow(s),veh/h/ln	1688	1870	1772	1637	1870	1502	1637	1792	1502	1637	1792	1866
Q Serve(g_s), s	6.4	13.3	13.8	0.8	35.4	9.3	7.0	41.1	2.7	7.3	44.4	44.4
Cycle Q Clear(g_c), s	6.4	13.3	13.8	0.8	35.4	9.3	7.0	41.1	2.7	7.3	44.4	44.4
Prop In Lane	1.00		0.62	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	150	287	272	882	1213	483	191	1895	529	443	1530	843
V/C Ratio(X)	1.45	0.75	0.78	0.26	0.93	0.32	1.75	0.97	0.07	0.46	1.03	1.00
Avail Cap(c_a), veh/h	150	606	574	881	1213	487	191	1895	529	256	1325	690
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.10	0.10	0.10	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	55.5	48.6	48.8	36.8	40.6	32.0	58.8	52.5	35.5	45.4	25.5	24.0
Incr Delay (d2), s/veh	234.3	4.0	4.8	0.0	1.8	0.0	360.0	15.5	0.3	1.4	27.7	24.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	1.8	44.7	4.5	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	6.5	6.5	3.6	25.4	5.3	12.6	22.5	1.0	2.7	23.7	25.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	289.8	52.6	53.6	38.6	87.0	36.6	418.9	68.0	35.8	46.8	53.2	48.5
LnGrp LOS	F	D	D	D	F	D	F	E	D	D	F	F
Approach Vol, veh/h		646			1515			2220			2630	
Approach Delay, s/veh		132.6			74.6			120.4			51.2	
Approach LOS		F			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	50.4	12.0	44.6	15.4	48.0	32.1	24.5
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	9.0	46.4	8.4	37.4	9.3	43.1	2.8	15.8
Green Ext Time (p_c), s	0.0	0.0	0.0	1.1	0.0	0.0	0.3	2.6

Intersection Summary		
HCM 6th Ctrl Delay	85.7	
HCM 6th LOS	F	

Notes

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

14-ZN-2019
6/03/2020

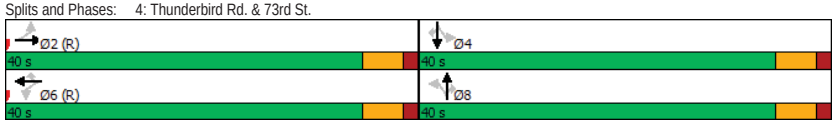
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	497	1	1404	241	10	2	4	274	2	79
Future Volume (vph)	10	497	1	1404	241	10	2	4	274	2	79
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.12	0.33	0.00	1.05	0.36	0.02	0.00	0.01	0.63	0.00	0.16
Control Delay	18.1	15.8	13.0	62.3	3.3	13.2	13.0	0.0	23.9	13.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	15.8	13.0	62.3	3.3	13.2	13.0	0.0	23.9	13.0	10.5
LOS	B	B	B	E	A	B	B	A	C	B	B
Approach Delay		15.9		53.7			9.9			20.9	
Approach LOS		B		D			A			C	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.05			
Intersection Signal Delay: 41.5		Intersection LOS: D	
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	497	5	1	1404	241	10	2	4	274	2	79
Future Volume (veh/h)	10	497	5	1	1404	241	10	2	4	274	2	79
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	11	529	1	1	1692	194	10	2	4	365	3	96
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	1.00	1.00	1.00	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1652	3	371	1613	648	618	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	228	3831	7	828	3741	1502	1228	1969	1502	1336	1969	1502
Grp Volume(v), veh/h	11	258	272	1	1692	194	10	2	4	365	3	96
Grp Sat Flow(s),veh/h/ln	228	1870	1967	828	1870	1502	1228	1969	1502	1336	1969	1502
Q Serve(g_s), s	0.0	7.3	7.3	0.1	34.5	6.8	0.4	0.0	0.1	17.1	0.1	3.1
Cycle Q Clear(g_c), s	34.5	7.3	7.3	7.4	34.5	6.8	0.4	0.0	0.1	17.2	0.1	3.1
Prop In Lane	1.00		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	807	848	371	1613	648	618	849	648	665	849	648
V/C Ratio(X)	0.12	0.32	0.32	0.00	1.05	0.30	0.02	0.00	0.01	0.55	0.00	0.15
Avail Cap(c_a), veh/h	90	807	848	371	1613	648	618	849	648	665	849	648
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)	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	15.0	15.0	17.4	22.7	14.9	13.1	13.0	13.0	17.8	13.0	13.8
Incr Delay (d2), s/veh	1.7	0.6	0.6	0.0	36.4	1.2	0.0	0.0	0.0	3.2	0.0	0.5
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	0.3	3.1	3.2	0.0	22.0	2.4	0.1	0.0	0.0	5.5	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	15.7	15.6	17.5	59.2	16.0	13.1	13.0	13.0	21.1	13.0	14.3
LnGrp LOS	D	B	B	B	F	B	B	B	B	C	B	B
Approach Vol, veh/h		541			1887			16			464	
Approach Delay, s/veh		16.2			54.7			13.1			19.6	
Approach LOS		B			D			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		34.5		34.5		34.5		34.5				
Max Q Clear Time (g_c+I1), s		36.5		19.2		36.5		2.4				
Green Ext Time (p_c), s		0.0		1.4		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	41.7	
HCM 6th LOS	D	

Notes

User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	791	5	1614	4	0	
Future Volume (vph)	791	5	1614	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.48	0.01	0.53		0.04	
Control Delay	2.8	2.0	2.5		6.6	
Queue Delay	0.0	0.0	0.1		0.0	
Total Delay	2.8	2.0	2.6		6.6	
LOS	A	A	A		A	
Approach Delay	2.8		2.6		6.6	
Approach LOS	A		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.53		
Intersection Signal Delay: 2.7	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	791	5	5	1614	0	4	0	1	0	0	0
Future Volume (veh/h)	0	791	5	5	1614	0	4	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	889	3	6	1899	0	8	0	0	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1724	6	510	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1961	7	591	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	892	6	1899	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	591	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	14.5	0.3	18.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	14.5	14.8	18.1	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	510	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.52	0.01	0.58	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	510	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.59	0.59	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	1.9	3.6	2.1	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.1	0.0	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	3.8	0.0	4.1	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	3.0	3.6	2.6	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	A	A	A
Approach Vol, veh/h		892			1905			8			0	
Approach Delay, s/veh		3.0			2.6			67.8			0.0	
Approach LOS		A			A			E				

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	133.5	11.5	133.5	11.5
Change Period (Y+Rc), s	6.0	6.0	6.0	6.0
Max Green Setting (Gmax), s	94.0	39.0	94.0	39.0
Max Q Clear Time (g_c+I1), s	16.5	0.0	20.1	2.8
Green Ext Time (p_c), s	9.3	0.0	32.4	0.0

Intersection Summary		
HCM 6th Ctrl Delay	2.9	
HCM 6th LOS	A	

14-ZN-2019
6/03/2020

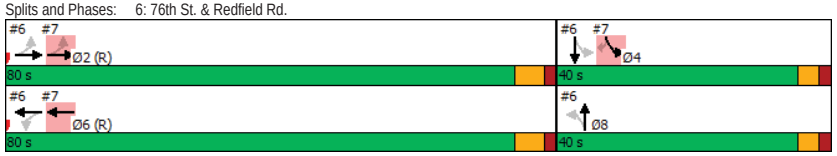
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	862	30	1686	160	0	5	0
Future Volume (vph)	5	862	30	1686	160	0	5	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0	11.0
Total Split (s)	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	80.2	80.2	80.2	80.2	28.8	28.8		28.8
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.24	0.24		0.24
v/c Ratio	0.06	0.79	0.17	0.76	0.63	0.10		0.08
Control Delay	11.0	21.2	6.9	11.4	49.0	0.4		13.2
Queue Delay	0.0	30.5	0.0	0.1	0.0	0.0		0.0
Total Delay	11.0	51.7	6.9	11.5	49.0	0.4		13.2
LOS	B	D	A	B	D	A		B
Approach Delay		51.5		11.4		39.4		13.2
Approach LOS		D		B		D		B

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 26.4		Intersection LOS: C	
Intersection Capacity Utilization 73.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	862	61	30	1686	1	160	0	39	5	0	16
Future Volume (vph)	5	862	61	30	1686	1	160	0	39	5	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1844		1770	3539		1770	1583			1649	
Flt Permitted	0.07	1.00		0.15	1.00		0.74	1.00			0.96	
Satd. Flow (perm)	126	1844		285	3539		1373	1583			1596	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.77	0.77	0.77	0.67	0.67	0.67
Adj. Flow (vph)	5	907	64	32	1794	1	208	0	51	7	0	24
RTOR Reduction (vph)	0	2	0	0	0	0	0	39	0	0	21	0
Lane Group Flow (vph)	5	969	0	32	1795	0	208	12	0	0	10	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.2	80.2		80.2	80.2		28.8	28.8			28.8	
Effective Green, g (s)	80.2	80.2		80.2	80.2		28.8	28.8			28.8	
Actuated g/C Ratio	0.67	0.67		0.67	0.67		0.24	0.24			0.24	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	84	1232		190	2365		329	379			383	
v/s Ratio Prot		c0.53			0.51			0.01				
v/s Ratio Perm	0.04			0.11			c0.15				0.01	
v/c Ratio	0.06	0.79		0.17	0.76		0.63	0.03			0.03	
Uniform Delay, d1	6.9	13.9		7.4	13.4		40.9	34.9			34.9	
Progression Factor	1.00	1.00		0.54	0.65		1.00	1.00			1.00	
Incremental Delay, d2	1.4	5.1		1.4	1.8		3.9	0.0			0.0	
Delay (s)	8.2	19.0		5.5	10.4		44.8	35.0			34.9	
Level of Service	A	B		A	B		D	C			C	
Approach Delay (s)		19.0			10.3			42.9			34.9	
Approach LOS		B			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	16.0	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.75				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	73.8%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

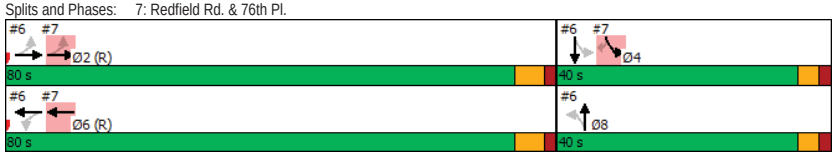
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	66	844	1406	5	312	
Future Volume (vph)	66	844	1406	5	312	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	80.2	80.2	80.2	28.8	28.8	
Actuated g/C Ratio	0.67	0.67	0.67	0.24	0.24	
v/c Ratio	0.48	0.72	0.64	0.01	0.86	
Control Delay	10.3	5.0	12.9	31.2	58.6	
Queue Delay	0.0	0.8	0.2	0.0	49.6	
Total Delay	10.3	5.8	13.1	31.2	108.1	
LOS	B	A	B	C	F	
Approach Delay		6.1	13.1	106.9		
Approach LOS		A	B	F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 70			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.86			
Intersection Signal Delay: 22.6		Intersection LOS: C	
Intersection Capacity Utilization 67.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	844	1406	13	5	312
Future Volume (vph)	66	844	1406	13	5	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3534		1770	1583
Flt Permitted	0.12	1.00	1.00		0.95	1.00
Satd. Flow (perm)	218	1863	3534		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.88	0.88
Adj. Flow (vph)	70	898	1496	14	6	355
RTOR Reduction (vph)	0	0	0	0	0	32
Lane Group Flow (vph)	70	898	1510	0	6	323
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	80.2	80.2	80.2		28.8	28.8
Effective Green, g (s)	80.2	80.2	80.2		28.8	28.8
Actuated g/C Ratio	0.67	0.67	0.67		0.24	0.24
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	145	1245	2361		424	379
v/s Ratio Prot		c0.48	0.43		0.00	
v/s Ratio Perm	0.32					c0.20
v/c Ratio	0.48	0.72	0.64		0.01	0.85
Uniform Delay, d1	9.7	12.7	11.5		34.8	43.6
Progression Factor	0.20	0.18	0.95		1.00	1.00
Incremental Delay, d2	7.3	2.4	0.9		0.0	16.7
Delay (s)	9.3	4.7	11.8		34.8	60.2
Level of Service	A	A	B		C	E
Approach Delay (s)		5.0	11.8		59.8	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	67.8%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

14-ZN-2019
6/03/2020

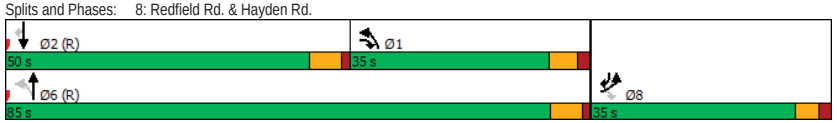
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	505	656	327	786	1226	870
Future Volume (vph)	505	656	327	786	1226	870
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.66	0.86	0.74	0.34	0.97	0.89
Control Delay	33.2	24.1	46.8	9.4	56.6	24.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.2	24.1	46.8	9.4	56.6	24.4
LOS	C	C	D	A	E	C
Approach Delay	28.1			20.4	43.2	
Approach LOS	C			C	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.97		
Intersection Signal Delay: 33.5	Intersection LOS: C	
Intersection Capacity Utilization 85.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	505	656	327	786	1226	870
Future Volume (veh/h)	505	656	327	786	1226	870
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	532	617	344	827	1333	816
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	653	735	549	2642	1375	851
Arrive On Green	0.20	0.20	0.29	0.71	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	532	617	344	827	1333	816
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	18.6	8.0	16.5	10.0	42.0	44.1
Cycle Q Clear(g_c), s	18.6	8.0	16.5	10.0	42.0	44.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	653	735	549	2642	1375	851
V/C Ratio(X)	0.81	0.84	0.63	0.31	0.97	0.96
Avail Cap(c_a), veh/h	810	807	549	2642	1375	851
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	45.9	26.6	34.7	6.6	37.3	20.8
Incr Delay (d2), s/veh	5.3	7.4	2.3	0.3	18.0	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	16.3	8.8	3.8	22.3	30.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	51.2	33.9	36.9	7.0	55.3	43.1
LnGrp LOS	D	C	D	A	E	D
Approach Vol, veh/h	1149			1171	2149	
Approach Delay, s/veh	41.9			15.8	50.7	
Approach LOS	D			B	D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	40.8	50.0			90.8	29.2
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	18.5	46.1			12.0	20.6
Green Ext Time (p_c), s	0.8	0.0			7.3	3.3

Intersection Summary		
HCM 6th Ctrl Delay	39.3	
HCM 6th LOS	D	

Notes

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

14-ZN-2019
6/03/2020

Intersection	
Int Delay, s/veh	8.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	0	136	13	0	57	14	2106	17	39	2210	36
Future Vol, veh/h	46	0	136	13	0	57	14	2106	17	39	2210	36
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	86	86	86	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	78	0	231	15	0	66	15	2217	18	42	2376	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3397	4745	1208	3290	4755	1118	2415	0	0	2235	0	0
Stage 1	2480	2480	-	2256	2256	-	-	-	-	-	-	-
Stage 2	917	2265	-	1034	2499	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*~ 0	*0	*381	*~ 0	*0	*425	*479	-	-	*535	-	-
Stage 1	*391	*372	-	*436	*415	-	-	-	-	-	-	-
Stage 2	*436	*415	-	*391	*372	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*0	*0	*381	*0	*0	*425	*479	-	-	*535	-	-
Mov Cap-2 Maneuver	*157	*160	-	*89	*165	-	-	-	-	-	-	-
Stage 1	*379	*343	-	*423	*402	-	-	-	-	-	-	-
Stage 2	*357	*402	-	*142	*343	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	123.8	26.2	0.1	0.2
HCM LOS	F	D		

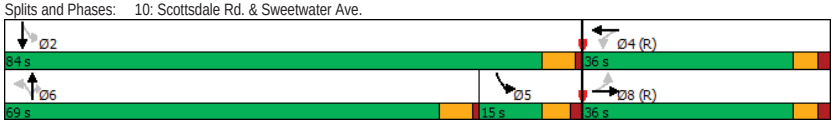
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 479	-	-	280	250	* 535	-	-
HCM Lane V/C Ratio	0.031	-	-	1.102	0.326	0.078	-	-
HCM Control Delay (s)	12.8	-	-	123.8	26.2	12.3	-	-
HCM Lane LOS	B	-	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	12.7	1.4	0.3	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	33	28	76	118	64	2064	58	95	2141
Future Volume (vph)	33	28	76	118	64	2064	58	95	2141
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.20	0.17	0.24	0.51	1.17	0.78	0.08	0.53	0.66
Control Delay	38.7	31.7	38.2	35.5	129.0	29.1	5.8	52.1	29.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.7	31.7	38.2	35.5	129.0	29.1	5.8	52.1	29.6
LOS	D	C	D	D	F	C	A	D	C
Approach Delay		34.0		36.1		31.4			30.6
Approach LOS		C		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 31.4	Intersection LOS: C
Intersection Capacity Utilization 87.6%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	28	41	76	118	131	64	2064	58	95	2141	70
Future Volume (veh/h)	33	28	41	76	118	131	64	2064	58	95	2141	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	38	32	24	77	119	112	68	2196	46	98	2207	67
Peak Hour Factor	0.88	0.88	0.88	0.99	0.99	0.99	0.94	0.94	0.94	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	217	265	198	353	236	222	104	2826	790	207	3489	106
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.17	0.17	0.17	0.08	0.65	0.65
Sat Flow, veh/h	1089	1044	783	1277	933	878	156	5375	1502	1688	5361	162
Grp Volume(v), veh/h	38	0	56	77	0	231	68	2196	46	98	1473	801
Grp Sat Flow(s),veh/h/ln	1089	0	1828	1277	0	1811	156	1792	1502	1688	1792	1940
Q Serve(g_s), s	3.7	0.0	2.8	5.9	0.0	13.1	33.6	46.8	3.1	0.9	29.2	29.5
Cycle Q Clear(g_c), s	16.8	0.0	2.8	8.8	0.0	13.1	63.1	46.8	3.1	0.9	29.2	29.5
Prop In Lane	1.00		0.43	1.00		0.48	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	217	0	463	353	0	459	104	2826	790	207	2332	1262
V/C Ratio(X)	0.18	0.00	0.12	0.22	0.00	0.50	0.66	0.78	0.06	0.47	0.63	0.63
Avail Cap(c_a), veh/h	217	0	463	353	0	459	104	2826	790	207	2332	1262
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.5	0.0	34.5	37.9	0.0	38.3	70.4	42.9	24.8	49.9	12.4	12.5
Incr Delay (d2), s/veh	1.8	0.0	0.5	1.4	0.0	3.9	1.4	0.1	0.0	7.6	0.6	1.1
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	1.1	0.0	1.3	2.0	0.0	6.3	2.2	22.5	1.1	3.2	11.1	12.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.3	0.0	35.0	39.3	0.0	42.3	71.7	43.0	24.8	57.5	13.0	13.5
LnGrp LOS	D	A	D	D	A	D	E	D	C	E	B	B
Approach Vol, veh/h		94			308			2310			2372	
Approach Delay, s/veh		40.0			41.5			43.5			15.0	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	84.0	36.0	15.0	69.0	36.0
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	31.5	15.1	2.9	65.1	18.8
Green Ext Time (p_c), s	29.8	1.4	0.1	0.0	0.3

Intersection Summary		
HCM 6th Ctrl Delay		30.0
HCM 6th LOS		C

Notes

User approved pedestrian interval to be less than phase max green.

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

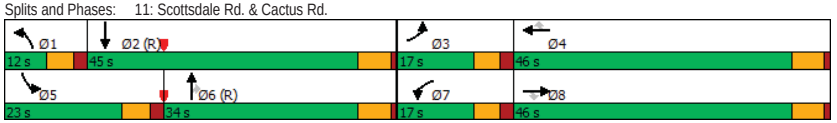
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	126	833	205	171	1270	338	567	1561	256	584	1490
Future Volume (vph)	126	833	205	171	1270	338	567	1561	256	584	1490
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	9.7	40.9	40.9	10.4	41.6	41.6	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.08	0.34	0.34	0.09	0.35	0.35	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.51	0.69	0.34	0.63	1.03	0.51	3.80	1.34	0.54	1.34	1.06
Control Delay	59.5	37.7	7.5	63.4	70.8	10.9	1291.6	197.3	14.5	203.1	92.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.5	37.7	7.5	63.4	70.8	10.9	1291.6	197.3	14.5	203.1	92.7
LOS	E	D	A	E	E	B	F	F	B	F	F
Approach Delay		34.7			58.7			437.8			120.4
Approach LOS		C			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 3.80		
Intersection Signal Delay: 194.7	Intersection LOS: F	
Intersection Capacity Utilization 106.8%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	126	833	205	171	1270	338	567	1561	256	584	1490	255
Future Volume (veh/h)	126	833	205	171	1270	338	567	1561	256	584	1490	255
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	133	877	58	178	1323	133	616	1697	207	615	1568	242
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	187	1204	483	232	1256	504	164	1454	406	464	1702	262
Arrive On Green	0.06	0.32	0.32	0.07	0.34	0.34	0.05	0.27	0.27	0.09	0.24	0.24
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4699	723
Grp Volume(v), veh/h	133	877	58	178	1323	133	616	1697	207	615	1195	615
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1839
Q Serve(g_s), s	4.8	24.9	3.3	6.4	40.3	7.7	6.0	32.5	14.0	17.0	39.0	39.2
Cycle Q Clear(g_c), s	4.8	24.9	3.3	6.4	40.3	7.7	6.0	32.5	14.0	17.0	39.0	39.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	187	1204	483	232	1256	504	164	1454	406	464	1298	666
V/C Ratio(X)	0.71	0.73	0.12	0.77	1.05	0.26	3.76	1.17	0.51	1.33	0.92	0.92
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1454	406	464	1298	666
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.72	0.72
Uniform Delay (d), s/veh	55.6	36.0	28.7	54.8	39.8	29.0	57.0	43.8	37.0	54.3	43.8	43.8
Incr Delay (d2), s/veh	5.0	2.1	0.1	8.5	40.6	0.3	1258.2	83.1	4.5	157.3	9.2	16.1
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	2.1	11.6	1.2	2.9	25.3	2.8	31.1	25.4	5.7	17.4	19.6	21.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	38.1	28.8	63.2	80.5	29.3	1315.2	126.9	41.6	211.6	53.0	59.9
LnGrp LOS	E	D	C	E	F	C	F	F	D	F	D	E
Approach Vol, veh/h		1068			1634			2520			2425	
Approach Delay, s/veh		40.4			74.4			410.3			95.0	
Approach LOS		D			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	49.2	12.8	46.0	23.0	38.2	14.5	44.3
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	41.2	6.8	42.3	19.0	34.5	8.4	26.9
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.1	5.3

Intersection Summary	
HCM 6th Ctrl Delay	186.9
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	776	0	0	1646	0	0
Future Vol, veh/h	776	0	0	1646	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	862	0	0	1829	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	862	0	1777	862
Stage 1	-	-	-	-	862	-
Stage 2	-	-	-	-	915	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*668	-	*82	*446
Stage 1	-	-	-	-	*421	-
Stage 2	-	-	-	-	*365	-
Platoon blocked, %	-	-	1	-		1
Mov Cap-1 Maneuver	-	-	*668	-	*82	*446
Mov Cap-2 Maneuver	-	-	-	-	*272	-
Stage 1	-	-	-	-	*421	-
Stage 2	-	-	-	-	*365	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	* 668	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B 04/23/2020

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	1	0	22	0	0	2	48	2080	0	1	2312	15
Future Vol, veh/h	1	0	22	0	0	2	48	2080	0	1	2312	15
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	24	0	0	2	53	2311	0	1	2569	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3610	4997	1293	3447	5005	1156	2586	0	0	2311	0	0
Stage 1	2580	2580	-	2417	2417	-	-	-	-	-	-	-
Stage 2	1030	2417	-	1030	2588	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*14	*0	*359	*24	*0	*425	*452	-	-	*535	-	-
Stage 1	*369	*351	-	*431	*412	-	-	-	-	-	-	-
Stage 2	*436	*412	-	*369	*351	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*13	*0	*359	*21	*0	*425	*452	-	-	*535	-	-
Mov Cap-2 Maneuver	*13	*0	-	*160	*149	-	-	-	-	-	-	-
Stage 1	*325	*350	-	*380	*364	-	-	-	-	-	-	-
Stage 2	*383	*364	-	*343	*350	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.6	13.5	0.3	0
HCM LOS	D	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 452	-	-	166	425	* 535	-	-
HCM Lane V/C Ratio	0.118	-	-	0.154	0.005	0.002	-	-
HCM Control Delay (s)	14	-	-	30.6	13.5	11.7	-	-
HCM Lane LOS	B	-	-	D	B	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.5	0	0	-	-

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C 04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	2128	0	0	2335
Future Vol, veh/h	0	0	2128	0	0	2335
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2364	0	0	2594

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1182	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	*403	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*403	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

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

14-ZN-2019
6/03/2020

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	57	69	0	0	0
Future Vol, veh/h	0	57	69	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	63	77	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	77	0	-	0	140	77
Stage 1	-	-	-	-	77	-
Stage 2	-	-	-	-	63	-
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	1522	-	-	-	853	984
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	960	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1522	-	-	-	853	984
Mov Cap-2 Maneuver	-	-	-	-	853	-
Stage 1	-	-	-	-	946	-
Stage 2	-	-	-	-	960	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1522	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	62	52	0	0	0
Future Vol, veh/h	0	62	52	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	69	58	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	127	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	69	-
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	1546	-	-	-	868	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	868	1008
Mov Cap-2 Maneuver	-	-	-	-	868	-
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	954	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

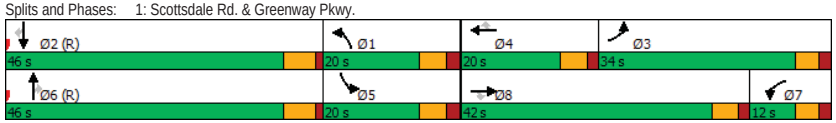
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	567	732	623	116	79	38	303	1328	260	228	1355	122
Future Volume (vph)	567	732	623	116	79	38	303	1328	260	228	1355	122
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	34.0	42.0	42.0	12.0	20.0	20.0	20.0	46.0	46.0	20.0	46.0	46.0
Total Split (%)	28.3%	35.0%	35.0%	10.0%	16.7%	16.7%	16.7%	38.3%	38.3%	16.7%	38.3%	38.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	38.7	36.9	36.9	6.6	7.3	7.3	13.6	40.4	40.4	13.6	40.4	40.4
Actuated g/C Ratio	0.32	0.31	0.31	0.06	0.06	0.06	0.11	0.34	0.34	0.11	0.34	0.34
v/c Ratio	0.59	0.70	1.06	0.70	0.38	0.16	0.86	0.78	0.44	0.64	0.78	0.20
Control Delay	37.7	40.6	78.2	76.4	59.1	1.3	81.0	33.9	16.5	59.2	39.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	37.7	40.6	78.2	76.4	59.1	1.3	81.0	33.9	16.5	59.2	39.4	2.0
LOS	D	D	E	E	E	A	F	C	B	E	D	A
Approach Delay		51.9			58.3			39.0			39.3	
Approach LOS		D			E			D			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 80 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.06		
Intersection Signal Delay: 44.3	Intersection LOS: D	
Intersection Capacity Utilization 83.5%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	567	732	623	116	79	38	303	1328	260	228	1355	122
Future Volume (veh/h)	567	732	623	116	79	38	303	1328	260	228	1355	122
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
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	616	796	438	125	85	26	319	1398	0	235	1397	85
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	978	1136	456	175	218	88	391	1805		391	1805	504
Arrive On Green	0.30	0.30	0.30	0.05	0.06	0.06	0.04	0.11	0.00	0.12	0.34	0.34
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	616	796	438	125	85	26	319	1398	0	235	1397	85
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	19.5	22.6	34.4	4.5	2.6	2.0	11.6	30.4	0.0	8.2	28.0	4.8
Cycle Q Clear(g_c), s	19.5	22.6	34.4	4.5	2.6	2.0	11.6	30.4	0.0	8.2	28.0	4.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	978	1136	456	175	218	88	391	1805		391	1805	504
V/C Ratio(X)	0.63	0.70	0.96	0.71	0.39	0.30	0.82	0.77		0.60	0.77	0.17
Avail Cap(c_a), veh/h	978	1138	457	183	452	181	391	1805		391	1805	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.80	0.80	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.3	37.0	41.1	55.9	54.4	54.1	56.3	48.9	0.0	50.1	35.8	28.1
Incr Delay (d2), s/veh	1.0	1.6	31.8	10.0	0.4	0.7	9.6	2.7	0.0	1.8	3.3	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	10.5	16.6	2.1	1.3	0.8	5.6	15.1	0.0	3.4	12.7	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.3	38.6	72.8	65.9	54.9	54.8	65.9	51.6	0.0	51.9	39.1	28.8
LnGrp LOS	D	D	E	E	D	D	E	D		D	D	C
Approach Vol, veh/h		1850			236			1717	A		1717	
Approach Delay, s/veh		46.3			60.7			54.3			40.3	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.3	46.0	41.2	12.5	20.3	46.0	11.7	41.9
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	14.0	40.3	28.7	* 15	14.0	40.3	6.7	* 37
Max Q Clear Time (g_c+I1), s	13.6	30.0	21.5	4.6	10.2	32.4	6.5	36.4
Green Ext Time (p_c), s	0.0	3.6	0.9	0.1	0.2	3.1	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay	47.5	
HCM 6th LOS	D	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	58	33	269	39	14	234	1769	43	1626	28
Future Volume (vph)	58	33	269	39	14	234	1769	43	1626	28
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.8	84.6	88.3	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	0.40	0.15	0.99	0.27	0.14	1.18	0.57	0.30	0.51	0.03
Control Delay	56.6	48.6	78.6	52.4	29.1	131.4	5.3	15.5	11.7	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.6	48.6	78.6	52.4	29.1	131.4	5.3	15.5	11.7	0.2
LOS	E	D	E	D	C	F	A	B	B	A
Approach Delay		72.3			42.3		19.6		11.6	
Approach LOS		E			D		B		B	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.18			
Intersection Signal Delay: 21.3		Intersection LOS: C	
Intersection Capacity Utilization 70.8%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	33	269	39	14	16	234	1769	58	43	1626	28
Future Volume (veh/h)	58	33	269	39	14	16	234	1769	58	43	1626	28
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	65	37	195	43	15	14	275	2081	50	48	1807	20
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	246	188	178	117	109	302	3861	93	225	3605	1007
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.14	1.00	1.00	0.03	0.67	0.67
Sat Flow, veh/h	1308	1969	1502	1088	937	874	1688	5399	130	1688	5375	1502
Grp Volume(v), veh/h	65	37	195	43	0	29	275	1380	751	48	1807	20
Grp Sat Flow(s),veh/h/ln	1308	1969	1502	1088	0	1811	1688	1792	1945	1688	1792	1502
Q Serve(g_s), s	5.6	2.0	15.0	4.4	0.0	1.7	6.5	0.0	0.0	1.1	20.0	0.5
Cycle Q Clear(g_c), s	7.3	2.0	15.0	6.4	0.0	1.7	6.5	0.0	0.0	1.1	20.0	0.5
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	205	246	188	178	0	226	302	2562	1391	225	3605	1007
V/C Ratio(X)	0.32	0.15	1.04	0.24	0.00	0.13	0.91	0.54	0.54	0.21	0.50	0.02
Avail Cap(c_a), veh/h	205	246	188	178	0	226	308	2562	1391	307	3605	1007
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.12	0.12	0.12	0.40	0.40	0.40
Uniform Delay (d), s/veh	49.9	46.8	52.5	49.7	0.0	46.7	16.8	0.0	0.0	5.7	9.8	6.6
Incr Delay (d2), s/veh	0.9	0.3	76.3	0.7	0.0	0.3	5.4	0.1	0.2	0.2	0.2	0.0
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	1.9	1.0	9.6	1.2	0.0	0.8	5.5	0.0	0.1	0.4	7.4	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.8	47.1	128.8	50.4	0.0	46.9	22.2	0.1	0.2	5.8	10.0	6.6
LnGrp LOS	D	D	F	D	A	D	C	A	A	A	B	A
Approach Vol, veh/h		297			72			2406			1875	
Approach Delay, s/veh		101.5			49.0			2.6			9.9	
Approach LOS		F			D			A			A	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.5	86.5		21.0	7.2	91.8		21.0
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0
Max Q Clear Time (g_c+I1), s	8.5	22.0		8.4	3.1	2.0		17.0
Green Ext Time (p_c), s	0.0	24.4		0.1	0.0	34.3		0.0

Intersection Summary		
HCM 6th Ctrl Delay	12.6	
HCM 6th LOS	B	

Notes

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

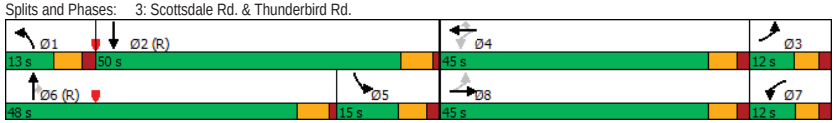
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	362	970	150	219	172	124	1663	220	320	1551
Future Volume (vph)	362	970	150	219	172	124	1663	220	320	1551
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.4	38.9	21.5	14.0	14.0	7.0	42.3	42.3	9.0	44.3
Actuated g/C Ratio	0.43	0.32	0.18	0.12	0.12	0.06	0.35	0.35	0.08	0.37
v/c Ratio	0.69	1.35	0.57	0.58	0.57	0.81	1.09	0.44	1.42	0.89
Control Delay	39.2	197.3	37.2	55.1	13.0	63.6	89.9	23.5	244.1	37.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	197.3	37.2	55.1	13.0	63.6	89.9	23.5	244.1	37.1
LOS	D	F	D	E	B	E	F	C	F	D
Approach Delay		165.3		36.8			81.0			71.0
Approach LOS		F		D			F			E

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.42		
Intersection Signal Delay: 97.9	Intersection LOS: F	
Intersection Capacity Utilization 103.2%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	362	970	454	150	219	172	124	1663	220	320	1551	81
Future Volume (veh/h)	362	970	454	150	219	172	124	1663	220	320	1551	81
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	1870
Adj Flow Rate, veh/h	411	1102	402	172	252	129	153	2053	186	344	1668	65
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	514	875	313	256	438	176	191	1895	529	284	2009	78
Arrive On Green	0.25	0.32	0.32	0.04	0.12	0.12	0.02	0.12	0.12	0.09	0.38	0.38
Sat Flow, veh/h	1688	2699	967	3274	3741	1502	3274	5375	1502	3274	5308	207
Grp Volume(v), veh/h	411	757	747	172	252	129	153	2053	186	344	1126	607
Grp Sat Flow(s),veh/h/ln	1688	1870	1795	1637	1870	1502	1637	1792	1502	1637	1792	1932
Q Serve(g_s), s	20.1	38.9	38.9	1.7	7.7	10.0	5.6	42.3	13.7	10.4	34.2	34.2
Cycle Q Clear(g_c), s	20.1	38.9	38.9	1.7	7.7	10.0	5.6	42.3	13.7	10.4	34.2	34.2
Prop In Lane	1.00		0.54	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	514	606	582	256	438	176	191	1895	529	284	1356	731
V/C Ratio(X)	0.80	1.25	1.28	0.67	0.58	0.73	0.80	1.08	0.35	1.21	0.83	0.83
Avail Cap(c_a), veh/h	514	606	582	303	1213	487	191	1895	529	284	1356	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	38.9	40.6	40.6	55.3	50.2	51.2	58.2	53.0	40.4	54.8	33.8	33.8
Incr Delay (d2), s/veh	8.7	125.5	140.1	4.4	1.2	5.7	21.1	47.4	1.8	118.1	4.9	8.7
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	12.3	38.8	39.6	2.7	3.7	4.0	2.9	28.7	5.8	8.9	15.6	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.6	166.0	180.7	59.7	51.3	56.8	79.3	100.4	42.2	172.9	38.7	42.5
LnGrp LOS	D	F	F	E	D	E	E	F	D	F	D	D
Approach Vol, veh/h		1915			553			2392			2077	
Approach Delay, s/veh		146.3			55.2			94.5			62.0	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	51.4	35.4	20.1	16.4	48.0	10.6	45.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	7.6	36.2	22.1	12.0	12.4	44.3	3.7	40.9
Green Ext Time (p_c), s	0.0	6.2	0.0	2.1	0.0	0.0	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay		96.0
HCM 6th LOS		F

Notes

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

14-ZN-2019
6/03/2020

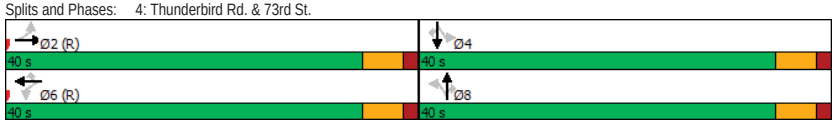
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	21	1384	94	493	239	31	3	15	103	3	18
Future Volume (vph)	21	1384	94	493	239	31	3	15	103	3	18
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.08	1.10	1.10	0.32	0.31	0.09	0.01	0.04	0.24	0.00	0.04
Control Delay	14.3	78.6	156.5	15.7	3.2	14.1	13.0	4.2	15.8	13.0	3.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.3	78.6	156.5	15.7	3.2	14.1	13.0	4.2	15.8	13.0	3.8
LOS	B	E	F	B	A	B	B	A	B	B	A
Approach Delay		77.7		28.1			11.0			14.0	
Approach LOS		E		C			B			B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 110			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 57.5		Intersection LOS: E	
Intersection Capacity Utilization 74.3%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	1384	105	94	493	239	31	3	15	103	3	18
Future Volume (veh/h)	21	1384	105	94	493	239	31	3	15	103	3	18
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	25	1628	122	97	508	179	53	5	26	136	4	15
Peak Hour Factor	0.85	0.85	0.85	0.97	0.97	0.97	0.58	0.58	0.58	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	335	1522	113	90	1613	648	658	849	648	651	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	715	3530	262	260	3741	1502	1320	1969	1502	1306	1969	1502
Grp Volume(v), veh/h	25	856	894	97	508	179	53	5	26	136	4	15
Grp Sat Flow(s),veh/h/ln	715	1870	1922	260	1870	1502	1320	1969	1502	1306	1969	1502
Q Serve(g_s), s	1.9	34.5	34.5	0.0	7.2	6.2	1.9	0.1	0.8	5.3	0.1	0.5
Cycle Q Clear(g_c), s	9.1	34.5	34.5	34.5	7.2	6.2	2.0	0.1	0.8	5.4	0.1	0.5
Prop In Lane	1.00		0.14	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	335	807	829	90	1613	648	658	849	648	651	849	648
V/C Ratio(X)	0.07	1.06	1.08	1.08	0.31	0.28	0.08	0.01	0.04	0.21	0.00	0.02
Avail Cap(c_a), veh/h	335	807	829	90	1613	648	658	849	648	651	849	648
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.0	22.7	22.8	40.0	15.0	14.7	13.5	13.0	13.2	14.5	13.0	13.1
Incr Delay (d2), s/veh	0.0	30.9	37.7	117.5	0.5	1.1	0.2	0.0	0.1	0.7	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	0.3	20.8	22.9	4.7	3.0	2.2	0.6	0.1	0.3	1.6	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.0	53.7	60.5	157.5	15.5	15.7	13.8	13.0	13.3	15.2	13.0	13.1
LnGrp LOS	B	F	F	F	B	B	B	B	B	B	B	B
Approach Vol, veh/h		1775			784			84			155	
Approach Delay, s/veh		56.6			33.1			13.6			15.0	
Approach LOS		E			C			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.0	40.0	40.0	40.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	34.5	34.5	34.5	34.5
Max Q Clear Time (g_c+I1), s	36.5	7.4	36.5	4.0
Green Ext Time (p_c), s	0.0	0.5	0.0	0.2

Intersection Summary		
HCM 6th Ctrl Delay	46.4	
HCM 6th LOS	D	

Notes

User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	1348	1	870	4	0	
Future Volume (vph)	1348	1	870	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.86	0.02	0.25		0.04	
Control Delay	10.9	3.0	1.4		6.6	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	10.9	3.0	1.4		6.6	
LOS	B	A	A		A	
Approach Delay	10.9		1.4		6.6	
Approach LOS	B		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.86		
Intersection Signal Delay: 7.5	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1348	4	1	870	0	4	0	1	0	0	0
Future Volume (veh/h)	0	1348	4	1	870	0	4	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1605	4	1	906	0	8	0	0	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.96	0.96	0.96	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1726	4	151	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1963	5	298	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1609	1	906	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	298	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	78.5	0.3	5.6	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	78.5	78.8	5.6	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	151	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.93	0.01	0.28	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	151	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.85	0.85	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	5.8	31.9	1.4	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	10.4	0.1	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	22.6	0.0	1.3	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	16.2	32.0	1.6	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	B	C	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1609			907			8			0	
Approach Delay, s/veh		16.2			1.6			67.8			0.0	
Approach LOS		B			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		133.5		11.5		133.5		11.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		80.5		0.0		80.8		2.8				
Green Ext Time (p_c), s		12.2		0.0		5.3		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	11.1	
HCM 6th LOS	B	

14-ZN-2019
6/03/2020

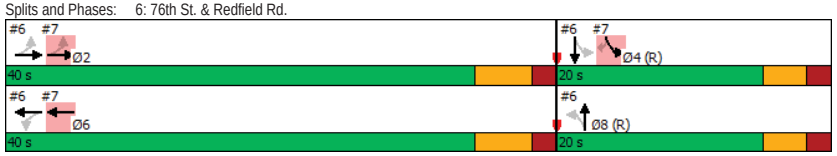
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	19	1489	26	889	21	1	0
Future Volume (vph)	19	1489	26	889	21	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0
Total Split (s)	40.0	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Ped	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	15.0	15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25	0.25
v/c Ratio	0.09	1.73	0.24	0.52	0.08	0.03	0.02
Control Delay	7.1	353.4	6.8	3.5	18.0	10.2	0.0
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	7.1	354.0	6.8	3.6	18.0	10.2	0.0
LOS	A	F	A	A	B	B	A
Approach Delay		350.0		3.7		15.4	
Approach LOS		F		A		B	

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.73			
Intersection Signal Delay: 218.9		Intersection LOS: F	
Intersection Capacity Utilization 103.1%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	1489	127	26	889	16	21	1	10	0	0	5
Future Volume (vph)	19	1489	127	26	889	16	21	1	10	0	0	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1841		1770	3530		1770	1603			1611	
Flt Permitted	0.23	1.00		0.12	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	432	1841		219	3530		1399	1603			1611	
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.75	0.75	0.75	0.50	0.50	0.50
Adj. Flow (vph)	21	1673	143	30	1022	18	28	1	13	0	0	10
RTOR Reduction (vph)	0	5	0	0	2	0	0	10	0	0	8	0
Lane Group Flow (vph)	21	1811	0	30	1038	0	28	4	0	0	3	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	244	1043		124	2000		349	400			402	
v/s Ratio Prot		c0.98			0.29			0.00			0.00	
v/s Ratio Perm	0.05			0.14			c0.02					
v/c Ratio	0.09	1.74		0.24	0.52		0.08	0.01			0.01	
Uniform Delay, d1	5.9	13.0		6.5	8.0		17.2	16.9			16.9	
Progression Factor	1.00	1.00		0.37	0.33		1.00	1.00			1.00	
Incremental Delay, d2	0.2	335.3		0.9	0.2		0.4	0.0			0.0	
Delay (s)	6.1	348.3		3.3	2.8		17.7	17.0			16.9	
Level of Service	A	F		A	A		B	B			B	
Approach Delay (s)		344.4			2.9			17.4			16.9	
Approach LOS		F			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	215.1	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.23				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	103.1%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

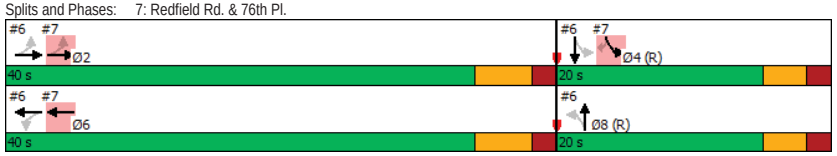
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	265	1235	836	21	97	
Future Volume (vph)	265	1235	836	21	97	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	15.0	15.0	
Actuated g/C Ratio	0.57	0.57	0.57	0.25	0.25	
v/c Ratio	1.15	1.33	0.50	0.06	0.24	
Control Delay	86.9	162.9	10.0	17.7	6.0	
Queue Delay	0.0	0.8	0.0	0.0	0.0	
Total Delay	86.9	163.8	10.0	17.7	6.0	
LOS	F	F	B	B	A	
Approach Delay		150.2	10.0	8.1		
Approach LOS		F	B	A		

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.73			
Intersection Signal Delay: 94.1		Intersection LOS: F	
Intersection Capacity Utilization 79.2%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	265	1235	836	18	21	97
Future Volume (vph)	265	1235	836	18	21	97
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3528		1770	1583
Flt Permitted	0.25	1.00	1.00		0.95	1.00
Satd. Flow (perm)	464	1863	3528		1770	1583
Peak-hour factor, PHF	0.88	0.88	0.86	0.86	0.84	0.84
Adj. Flow (vph)	301	1403	972	21	25	115
RTOR Reduction (vph)	0	0	3	0	0	85
Lane Group Flow (vph)	301	1403	990	0	25	30
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	34.0	34.0	34.0		15.0	15.0
Effective Green, g (s)	34.0	34.0	34.0		15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	262	1055	1999		442	395
v/s Ratio Prot		c0.75	0.28		0.01	
v/s Ratio Perm	0.65					c0.02
v/c Ratio	1.15	1.33	0.50		0.06	0.08
Uniform Delay, d1	13.0	13.0	7.8		17.1	17.2
Progression Factor	0.37	0.35	1.21		1.00	1.00
Incremental Delay, d2	71.5	149.1	0.1		0.2	0.4
Delay (s)	76.3	153.6	9.6		17.4	17.6
Level of Service	E	F	A		B	B
Approach Delay (s)		139.9	9.6		17.5	
Approach LOS		F	A		B	

Intersection Summary			
HCM 2000 Control Delay	88.3	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.95		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	79.2%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

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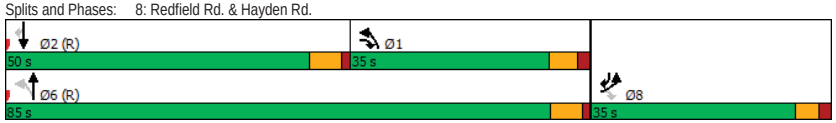
6/03/2020

Timings
8: Redfield Rd. & Hayden Rd. 04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	699	203	759	1042	320	436
Future Volume (vph)	699	203	759	1042	320	436
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.99	0.25	0.98	0.43	0.25	0.44
Control Delay	51.8	5.6	54.1	10.4	27.0	8.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	5.6	54.1	10.4	27.0	8.2
LOS	D	A	D	B	C	A
Approach Delay	41.4			28.8	16.1	
Approach LOS	D			C	B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.99		
Intersection Signal Delay: 29.6	Intersection LOS: C	
Intersection Capacity Utilization 88.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd. 04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	699	203	759	1042	320	436
Future Volume (veh/h)	699	203	759	1042	320	436
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	794	151	774	1063	337	317
Peak Hour Factor	0.88	0.88	0.98	0.98	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	810	777	728	2569	1375	924
Arrive On Green	0.25	0.25	0.27	0.69	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	794	151	774	1063	337	317
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	28.9	0.0	32.4	14.9	7.5	12.4
Cycle Q Clear(g_c), s	28.9	0.0	32.4	14.9	7.5	12.4
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	810	777	728	2569	1375	924
V/C Ratio(X)	0.98	0.19	1.06	0.41	0.25	0.34
Avail Cap(c_a), veh/h	810	777	728	2569	1375	924
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	44.9	15.5	32.7	8.2	26.4	11.3
Incr Delay (d2), s/veh	26.6	0.1	51.3	0.5	0.4	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	2.2	31.0	5.8	3.4	7.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	71.5	15.7	84.0	8.7	26.8	12.3
LnGrp LOS	E	B	F	A	C	B
Approach Vol, veh/h	945			1837	654	
Approach Delay, s/veh	62.5			40.4	19.8	
Approach LOS	E			D	B	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.5	50.0			88.5	35.0
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	34.4	14.4			16.9	30.9
Green Ext Time (p_c), s	0.0	3.5			10.5	0.0

Intersection Summary		
HCM 6th Ctrl Delay	42.6	
HCM 6th LOS	D	

Notes

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

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6/03/2020

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	0	23	18	0	58	45	1854	56	81	1787	83
Future Vol, veh/h	16	0	23	18	0	58	45	1854	56	81	1787	83
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	58	58	58	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	17	0	25	31	0	100	52	2156	65	87	1922	89

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3107	4466	1006	3236	4478	1111	2011	0	0	2221	0	0
Stage 1	2141	2141	-	2293	2293	-	-	-	-	-	-	-
Stage 2	966	2325	-	943	2185	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*101	0	*492	*101	0	*469	*618	-	-	562	-	-
Stage 1	*435	435	-	*362	380	-	-	-	-	-	-	-
Stage 2	*482	357	-	*504	401	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*66	0	*492	*79	0	*469	*618	-	-	562	-	-
Mov Cap-2 Maneuver	*172	133	-	*192	144	-	-	-	-	-	-	-
Stage 1	*398	368	-	*332	348	-	-	-	-	-	-	-
Stage 2	*347	327	-	*405	339	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	20.2	21.3	0.3	0.5
HCM LOS	C	C		

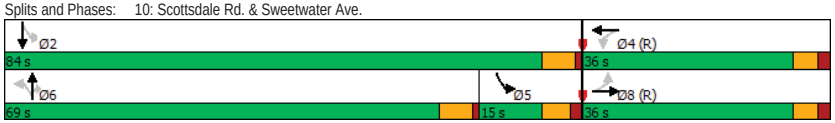
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1		SBL	SBT	SBR
Capacity (veh/h)	* 618	-	-	279	350	562	-	-
HCM Lane V/C Ratio	0.085	-	-	0.15	0.374	0.155	-	-
HCM Control Delay (s)	11.4	-	-	20.2	21.3	12.6	-	-
HCM Lane LOS	B	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	1.7	0.5	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	88	136	109	35	31	2081	43	85	1885
Future Volume (vph)	88	136	109	35	31	2081	43	85	1885
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.40	0.57	0.77	0.31	0.66	0.90	0.06	0.52	0.62
Control Delay	42.7	42.9	70.8	14.2	34.0	26.4	3.5	52.6	24.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.7	42.9	70.8	14.2	34.0	26.4	3.5	52.6	24.5
LOS	D	D	E	B	C	C	A	D	C
Approach Delay		42.8		39.6		26.1			25.7
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.90	
Intersection Signal Delay: 27.8	Intersection LOS: C
Intersection Capacity Utilization 81.5%	ICU Level of Service D
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



14-ZN-2019
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HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	136	97	109	35	100	31	2081	43	85	1885	27
Future Volume (veh/h)	88	136	97	109	35	100	31	2081	43	85	1885	27
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	102	158	84	135	43	98	38	2538	34	97	2142	25
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.82	0.82	0.82	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	285	309	164	215	136	310	131	2816	787	193	3554	41
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.17	0.17	0.17	0.10	0.86	0.86
Sat Flow, veh/h	1182	1210	643	1078	534	1216	173	5375	1502	1688	5477	64
Grp Volume(v), veh/h	102	0	242	135	0	141	38	2538	34	97	1401	766
Grp Sat Flow(s),veh/h/ln	1182	0	1853	1078	0	1750	173	1792	1502	1688	1792	1957
Q Serve(g_s), s	9.2	0.0	13.4	14.7	0.0	7.8	24.5	55.5	2.3	1.7	13.4	13.4
Cycle Q Clear(g_c), s	17.0	0.0	13.4	28.1	0.0	7.8	38.0	55.5	2.3	1.7	13.4	13.4
Prop In Lane	1.00		0.35	1.00		0.70	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	285	0	473	215	0	447	131	2816	787	193	2325	1270
V/C Ratio(X)	0.36	0.00	0.51	0.63	0.00	0.32	0.29	0.90	0.04	0.50	0.60	0.60
Avail Cap(c_a), veh/h	285	0	473	215	0	447	132	2826	790	193	2332	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.1	0.0	38.3	50.3	0.0	36.2	45.6	46.6	24.6	49.9	3.8	3.8
Incr Delay (d2), s/veh	3.5	0.0	3.9	13.2	0.0	1.8	0.1	0.4	0.0	9.0	0.4	0.8
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	3.0	0.0	6.6	4.7	0.0	3.6	1.1	26.8	0.8	3.1	3.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.6	0.0	42.2	63.5	0.0	38.0	45.7	47.0	24.6	58.9	4.2	4.6
LnGrp LOS	D	A	D	E	A	D	D	D	C	E	A	A
Approach Vol, veh/h		344			276			2610			2264	
Approach Delay, s/veh		43.5			50.5			46.7			6.7	
Approach LOS		D			D			D			A	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	83.8	36.2	15.0	68.8	36.2
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	15.4	30.1	3.7	57.5	19.0
Green Ext Time (p_c), s	32.3	0.0	0.1	5.4	1.4

Intersection Summary	
HCM 6th Ctrl Delay	30.2
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

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

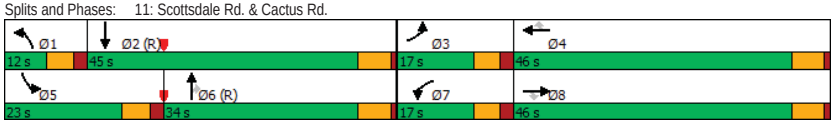
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	317	1353	468	235	773	614	153	1392	171	465	1426
Future Volume (vph)	317	1353	468	235	773	614	153	1392	171	465	1426
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.0	40.3	40.3	11.0	40.3	40.3	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	1.16	1.18	0.81	0.89	0.70	1.04	1.05	1.23	0.38	1.12	0.99
Control Delay	149.6	124.6	34.0	83.9	38.1	72.2	139.0	148.4	7.8	124.4	73.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	149.6	124.6	34.0	83.9	38.1	72.2	139.0	148.4	7.8	124.4	73.0
LOS	F	F	C	F	D	E	F	F	A	F	E
Approach Delay		108.5			57.6			133.5			84.9
Approach LOS		F			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.23		
Intersection Signal Delay: 96.7	Intersection LOS: F	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1353	468	235	773	614	153	1392	171	465	1426	119
Future Volume (veh/h)	317	1353	468	235	773	614	153	1392	171	465	1426	119
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	345	1471	335	264	869	465	170	1547	118	517	1584	104
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	300	1256	504	300	1256	504	164	1268	354	464	1688	111
Arrive On Green	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.09	0.22	0.22
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5153	338
Grp Volume(v), veh/h	345	1471	335	264	869	465	170	1547	118	517	1101	587
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1908
Q Serve(g_s), s	11.0	40.3	22.9	9.6	24.1	35.8	6.0	28.3	7.8	17.0	36.3	36.3
Cycle Q Clear(g_c), s	11.0	40.3	22.9	9.6	24.1	35.8	6.0	28.3	7.8	17.0	36.3	36.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	300	1256	504	300	1256	504	164	1268	354	464	1174	625
V/C Ratio(X)	1.15	1.17	0.66	0.88	0.69	0.92	1.04	1.22	0.33	1.11	0.94	0.94
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1268	354	464	1174	625
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	54.5	39.8	34.1	53.8	34.5	38.3	57.0	45.8	38.0	54.3	45.6	45.7
Incr Delay (d2), s/veh	98.7	85.7	3.3	24.5	1.6	22.6	80.9	106.5	2.5	71.5	11.9	19.1
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	8.6	33.2	8.8	5.0	11.2	16.1	4.3	25.0	3.1	11.8	18.6	21.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	153.2	125.6	37.3	78.3	36.1	60.9	137.9	152.4	40.5	125.8	57.6	64.8
LnGrp LOS	F	F	D	E	D	E	F	F	D	F	E	E
Approach Vol, veh/h		2151			1598			1835			2205	
Approach Delay, s/veh		116.3			50.3			143.8			75.5	
Approach LOS		F			D			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	45.0	17.0	46.0	23.0	34.0	17.0	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	38.3	13.0	37.8	19.0	30.3	11.6	42.3
Green Ext Time (p_c), s	0.0	0.9	0.0	1.8	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	97.7
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1455	47	45	814	12	8
Future Vol, veh/h	1455	47	45	814	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1617	52	50	904	13	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1669	0	2169	1617
Stage 1	-	-	-	-	1617	-
Stage 2	-	-	-	-	552	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	-	-	*45	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*711	-
Platoon blocked, %	-	-	2	-		2
Mov Cap-1 Maneuver	-	-	-	-	*45	-
Mov Cap-2 Maneuver	-	-	-	-	*~ -4	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*711	-

Approach	EB	WB	NB
HCM Control Delay, s	0		
HCM LOS			-

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B 04/23/2020

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	60	4	0	5	57	2002	51	25	2100	30
Future Vol, veh/h	12	0	60	4	0	5	57	2002	51	25	2100	30
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	13	0	67	4	0	6	63	2224	57	28	2333	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3422	4813	1183	3368	4801	1141	2366	0	0	2281	0	0
Stage 1	2406	2406	-	2379	2379	-	-	-	-	-	-	-
Stage 2	1016	2407	-	989	2422	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*23	*0	*425	*28	0	*447	*535	-	-	*563	-	-
Stage 1	*436	*415	-	*365	376	-	-	-	-	-	-	-
Stage 2	*459	*355	-	*436	407	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*20	*0	*425	*20	0	*447	*535	-	-	*563	-	-
Mov Cap-2 Maneuver	*20	*0	-	*148	149	-	-	-	-	-	-	-
Stage 1	*385	*394	-	*322	331	-	-	-	-	-	-	-
Stage 2	*400	*313	-	*350	387	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	126.5	20.9	0.3	0.1
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 535	-	-	97	236	* 563	-	-
HCM Lane V/C Ratio	0.118	-	-	0.825	0.042	0.049	-	-
HCM Control Delay (s)	12.6	-	-	126.5	20.9	11.7	-	-
HCM Lane LOS	B	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	4.5	0.1	0.2	-	-

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C 04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	2106	75	0	2164
Future Vol, veh/h	0	4	2106	75	0	2164
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	2340	83	0	2404

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1212	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	*425	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*425	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 425	-
HCM Lane V/C Ratio	-	- 0.01	-
HCM Control Delay (s)	-	- 13.6	-
HCM Lane LOS	-	- B	-
HCM 95th %tile Q(veh)	-	- 0	-

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

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	108	71	0	0	5
Future Vol, veh/h	29	108	71	0	0	5
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	120	79	0	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	79	0	-	0	263	79
Stage 1	-	-	-	-	79	-
Stage 2	-	-	-	-	184	-
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	1519	-	-	-	726	981
Stage 1	-	-	-	-	944	-
Stage 2	-	-	-	-	848	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1519	-	-	-	709	981
Mov Cap-2 Maneuver	-	-	-	-	709	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	848	-

Approach	EB	WB	SB
HCM Control Delay, s	1.6	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1519	-	-	-	981
HCM Lane V/C Ratio	0.021	-	-	-	0.006
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	62	52	0	0	19
Future Vol, veh/h	46	62	52	0	0	19
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	69	58	0	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	229	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	171	-
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	1546	-	-	-	759	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	859	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	733	1008
Mov Cap-2 Maneuver	-	-	-	-	733	-
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	859	-

Approach	EB	WB	SB
HCM Control Delay, s	3.2	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	1008
HCM Lane V/C Ratio	0.033	-	-	-	0.021
HCM Control Delay (s)	7.4	0	-	-	8.6
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

Timings
3: Scottsdale Rd. & Thunderbird Rd.

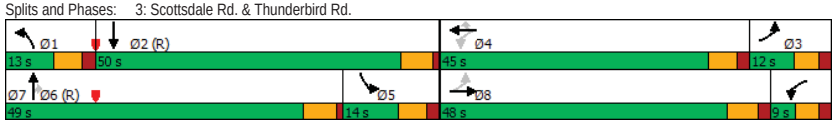
04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	362	970	150	219	172	124	1663	220	320	1551
Future Volume (vph)	362	970	150	219	172	124	1663	220	320	1551
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	3.7	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	9.0	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	48.0	9.0	45.0	45.0	13.0	49.0	49.0	14.0	50.0
Total Split (%)	10.0%	40.0%	7.5%	37.5%	37.5%	10.8%	40.8%	40.8%	11.7%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.4	41.9	18.5	14.0	14.0	7.0	43.3	43.3	8.0	44.3
Actuated g/C Ratio	0.43	0.35	0.15	0.12	0.12	0.06	0.36	0.36	0.07	0.37
v/c Ratio	0.69	1.26	0.78	0.58	0.58	0.81	1.06	0.43	1.59	0.89
Control Delay	39.2	156.5	54.0	55.1	15.0	63.4	80.6	23.2	318.5	37.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.2	156.5	54.0	55.1	15.0	63.4	80.6	23.2	318.5	37.1
LOS	D	F	D	E	B	E	F	C	F	D
Approach Delay		132.8		42.0			73.2			83.2
Approach LOS		F		D			E			F

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green
Natural Cycle: 150
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.59
Intersection Signal Delay: 90.2 — Intersection LOS: F
Intersection Capacity Utilization 103.2% — ICU Level of Service G
Analysis Period (min) 15

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	362	970	454	150	219	172	124	1663	220	320	1551	81
Future Volume (veh/h)	362	970	454	150	219	172	124	1663	220	320	1551	81
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	1870
Adj Flow Rate, veh/h	411	1102	380	172	252	129	153	2053	186	344	1668	65
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	538	957	325	221	438	176	191	1939	542	766	2834	110
Arrive On Green	0.26	0.35	0.35	0.03	0.12	0.12	0.02	0.12	0.12	0.23	0.53	0.53
Sat Flow, veh/h	1688	2741	930	3274	3741	1502	3274	5375	1502	3274	5308	207
Grp Volume(v), veh/h	411	746	736	172	252	129	153	2053	186	344	1126	607
Grp Sat Flow(s),veh/h/ln	1688	1870	1801	1637	1870	1502	1637	1792	1502	1637	1792	1932
Q Serve(g_s), s	19.6	41.9	41.9	1.8	7.7	10.0	5.6	43.3	13.7	10.8	25.6	25.6
Cycle Q Clear(g_c), s	19.6	41.9	41.9	1.8	7.7	10.0	5.6	43.3	13.7	10.8	25.6	25.6
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	538	653	629	221	438	176	191	1939	542	766	1913	1031
V/C Ratio(X)	0.76	1.14	1.17	0.78	0.58	0.73	0.80	1.06	0.34	0.45	0.59	0.59
Avail Cap(c_a), veh/h	538	653	629	221	1213	487	191	1939	542	766	1913	1031
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.97	0.97	0.97	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	37.4	39.0	39.1	56.6	50.2	51.2	58.2	52.9	39.8	39.4	19.0	19.0
Incr Delay (d2), s/veh	6.4	81.6	92.7	15.7	1.2	5.7	21.1	38.0	1.7	0.3	1.1	2.0
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	11.7	33.7	34.4	3.0	3.7	4.0	2.9	27.7	5.8	4.4	10.7	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	120.6	131.7	72.3	51.3	56.8	79.3	90.8	41.5	39.7	20.1	21.0
LnGrp LOS	D	F	F	E	D	E	E	F	D	D	C	C
Approach Vol, veh/h		1893			553			2392			2077	
Approach Delay, s/veh		108.2			59.1			86.3			23.6	
Approach LOS		F			E			F			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	70.7	37.2	20.1	34.7	49.0	9.3	48.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	8.0	43.3	* 3.7	* 42
Max Q Clear Time (g_c+I1), s	7.6	27.6	21.6	12.0	12.8	45.3	3.8	43.9
Green Ext Time (p_c), s	0.0	11.0	0.0	2.1	0.0	0.0	0.0	0.0

Intersection Summary

HCM 6th Ctrl Delay		71.3
HCM 6th LOS		E

Notes

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

14-ZN-2019
6/03/2020

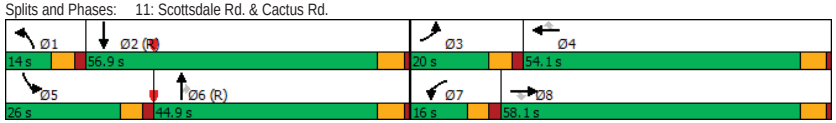
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	317	1353	468	235	773	614	153	1392	171	465	1426
Future Volume (vph)	317	1353	468	235	773	614	153	1392	171	465	1426
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	20.0	58.1	58.1	16.0	54.1	54.1	14.0	44.9	44.9	26.0	56.9
Total Split (%)	13.8%	40.1%	40.1%	11.0%	37.3%	37.3%	9.7%	31.0%	31.0%	17.9%	39.2%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	14.0	52.4	52.4	10.0	48.4	48.4	8.0	39.2	39.2	20.0	51.2
Actuated g/C Ratio	0.10	0.36	0.36	0.07	0.33	0.33	0.06	0.27	0.27	0.14	0.35
v/c Ratio	1.10	1.09	0.79	1.18	0.70	1.04	0.95	1.07	0.37	1.15	0.92
Control Delay	139.5	97.2	38.6	172.6	45.6	76.7	122.3	94.2	11.9	145.6	53.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	139.5	97.2	38.6	172.6	45.6	76.7	122.3	94.2	11.9	145.6	53.2
LOS	F	F	D	F	D	E	F	F	B	F	D
Approach Delay		90.7			75.8			88.5			74.6
Approach LOS		F			E			F			E

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.18		
Intersection Signal Delay: 82.6	Intersection LOS: F	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	317	1353	468	235	773	614	153	1392	171	465	1426	119
Future Volume (veh/h)	317	1353	468	235	773	614	153	1392	171	465	1426	119
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	345	1471	335	264	869	465	170	1547	118	517	1584	104
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	1352	543	226	1249	501	181	1453	406	452	1820	119
Arrive On Green	0.10	0.36	0.36	0.07	0.33	0.33	0.06	0.27	0.27	0.14	0.35	0.35
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5153	338
Grp Volume(v), veh/h	345	1471	335	264	869	465	170	1547	118	517	1101	587
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1908
Q Serve(g_s), s	14.0	52.4	26.6	10.0	29.2	43.3	7.5	39.2	9.0	20.0	41.6	41.7
Cycle Q Clear(g_c), s	14.0	52.4	26.6	10.0	29.2	43.3	7.5	39.2	9.0	20.0	41.6	41.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	316	1352	543	226	1249	501	181	1453	406	452	1265	674
V/C Ratio(X)	1.09	1.09	0.62	1.17	0.70	0.93	0.94	1.06	0.29	1.14	0.87	0.87
Avail Cap(c_a), veh/h	316	1352	543	226	1249	501	181	1453	406	452	1265	674
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	0.73	0.73	0.73
Uniform Delay (d), s/veh	65.5	46.3	38.1	67.5	41.9	46.6	68.3	52.9	41.9	62.5	43.8	43.8
Incr Delay (d2), s/veh	77.3	52.2	2.1	113.2	1.7	23.7	50.1	42.9	1.8	83.2	6.3	11.1
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	9.3	34.0	10.2	7.7	13.8	19.4	4.4	23.4	3.6	13.6	19.5	21.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	142.8	98.5	40.2	180.7	43.6	70.3	118.3	95.8	43.7	145.7	50.1	54.9
LnGrp LOS	F	F	D	F	D	E	F	F	D	F	D	D
Approach Vol, veh/h		2151			1598			1835			2205	
Approach Delay, s/veh		96.5			74.0			94.6			73.8	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	56.9	20.0	54.1	26.0	44.9	16.0	58.1
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	8.0	51.2	14.0	48.4	20.0	39.2	10.0	52.4
Max Q Clear Time (g_c+I1), s	9.5	43.7	16.0	45.3	22.0	41.2	12.0	54.4
Green Ext Time (p_c), s	0.0	5.7	0.0	2.1	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	85.0
HCM 6th LOS	F

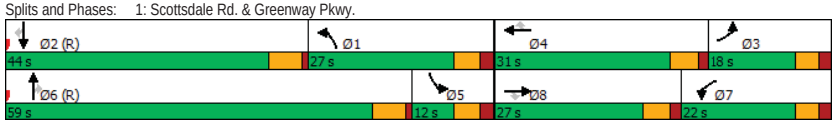
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	288	262	339	520	692	262	664	1587	116	118	1387	188
Future Volume (vph)	288	262	339	520	692	262	664	1587	116	118	1387	188
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	18.0	27.0	27.0	22.0	31.0	31.0	27.0	59.0	59.0	12.0	44.0	44.0
Total Split (%)	15.0%	22.5%	22.5%	18.3%	25.8%	25.8%	22.5%	49.2%	49.2%	10.0%	36.7%	36.7%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	13.5	17.5	17.5	20.7	24.7	24.7	21.0	53.3	53.3	6.0	38.3	38.3
Actuated g/C Ratio	0.11	0.15	0.15	0.17	0.21	0.21	0.18	0.44	0.44	0.05	0.32	0.32
v/c Ratio	0.95	0.58	0.94	0.96	0.93	0.60	1.25	0.72	0.17	0.80	0.89	0.34
Control Delay	89.2	51.5	49.2	79.0	66.3	20.7	166.7	21.6	1.9	89.7	46.7	6.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	89.2	51.5	49.2	79.0	66.3	20.7	166.7	21.6	1.9	89.7	46.7	6.8
LOS	F	D	D	E	E	C	F	C	A	F	D	A
Approach Delay		62.9			62.7			61.4			45.3	
Approach LOS		E			E			E			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 59 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.25		
Intersection Signal Delay: 57.6	Intersection LOS: E	
Intersection Capacity Utilization 91.0%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	288	262	339	520	692	262	664	1587	116	118	1387	188
Future Volume (veh/h)	288	262	339	520	692	262	664	1587	116	118	1387	188
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	347	316	143	536	713	256	714	1706	0	130	1524	163
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	430	173	646	772	310	593	2387		183	1715	479
Arrive On Green	0.11	0.12	0.12	0.20	0.21	0.21	0.36	0.89	0.00	0.06	0.32	0.32
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	347	316	143	536	713	256	714	1706	0	130	1524	163
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	12.7	9.8	11.2	18.9	22.4	19.6	21.7	11.6	0.0	4.7	32.3	9.9
Cycle Q Clear(g_c), s	12.7	9.8	11.2	18.9	22.4	19.6	21.7	11.6	0.0	4.7	32.3	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	430	173	646	772	310	593	2387		183	1715	479
V/C Ratio(X)	1.00	0.73	0.83	0.83	0.92	0.83	1.21	0.71		0.71	0.89	0.34
Avail Cap(c_a), veh/h	346	670	269	646	795	319	593	2387		183	1715	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.69	0.69	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	51.3	51.9	46.2	46.7	45.5	38.3	4.4	0.0	55.7	38.8	31.2
Incr Delay (d2), s/veh	48.7	0.9	6.4	8.4	15.6	14.7	103.3	1.3	0.0	10.3	7.3	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.6	4.6	4.5	8.4	12.1	8.5	15.7	2.2	0.0	2.2	15.2	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	102.4	52.2	58.3	54.6	62.3	60.3	141.5	5.7	0.0	66.0	46.1	33.1
LnGrp LOS	F	D	E	D	E	E	F	A		E	D	C
Approach Vol, veh/h		806			1505			2420	A		1817	
Approach Delay, s/veh		74.9			59.2			45.8			46.4	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.7	44.0	18.0	30.3	12.7	59.0	29.0	19.3
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	21.0	38.3	12.7	* 26	6.0	53.3	16.7	* 22
Max Q Clear Time (g_c+I1), s	23.7	34.3	14.7	24.4	6.7	13.6	20.9	13.2
Green Ext Time (p_c), s	0.0	2.1	0.0	0.4	0.0	6.5	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay	52.6	
HCM 6th LOS	D	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	147	42	277	144	75	168	1929	49	2084	71
Future Volume (vph)	147	42	277	144	75	168	1929	49	2084	71
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.5	84.3	88.6	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	1.63	0.19	1.07	1.12	0.65	1.04	0.60	0.35	0.66	0.08
Control Delay	359.4	49.4	104.5	156.3	55.1	98.9	4.1	10.8	24.3	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	359.4	49.4	104.5	156.3	55.1	98.9	4.1	10.8	24.3	6.6
LOS	F	D	F	F	E	F	A	B	C	A
Approach Delay		180.0			108.2		11.6		23.5	
Approach LOS		F			F		B		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.63			
Intersection Signal Delay: 37.7		Intersection LOS: D	
Intersection Capacity Utilization 83.3%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	147	42	277	144	75	55	168	1929	17	49	2084	71
Future Volume (veh/h)	147	42	277	144	75	55	168	1929	17	49	2084	71
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	165	47	199	180	94	64	193	2217	3	55	2342	69
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.87	0.87	0.87	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	110	246	188	171	136	93	215	3956	5	218	3612	1009
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.14	1.00	1.00	0.01	0.22	0.22
Sat Flow, veh/h	1164	1969	1502	1074	1092	743	1688	5543	8	1688	5375	1502
Grp Volume(v), veh/h	165	47	199	180	0	158	193	1433	787	55	2342	69
Grp Sat Flow(s),veh/h/ln	1164	1969	1502	1074	0	1835	1688	1792	1967	1688	1792	1502
Q Serve(g_s), s	5.1	2.6	15.0	12.4	0.0	9.9	6.3	0.0	0.0	1.2	47.5	4.4
Cycle Q Clear(g_c), s	15.0	2.6	15.0	15.0	0.0	9.9	6.3	0.0	0.0	1.2	47.5	4.4
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	110	246	188	171	0	229	215	2557	1404	218	3612	1009
V/C Ratio(X)	1.51	0.19	1.06	1.05	0.00	0.69	0.90	0.56	0.56	0.25	0.65	0.07
Avail Cap(c_a), veh/h	110	246	188	171	0	229	224	2557	1404	297	3612	1009
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.33	0.33	0.33
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.15	0.15	0.15	0.29	0.29	0.29
Uniform Delay (d), s/veh	58.8	47.1	52.5	56.0	0.0	50.3	31.3	0.0	0.0	5.7	33.8	17.0
Incr Delay (d2), s/veh	269.2	0.4	82.5	82.9	0.0	8.4	7.4	0.1	0.2	0.2	0.3	0.0
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	11.5	1.3	9.9	9.2	0.0	5.1	5.7	0.0	0.1	0.4	22.9	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	328.1	47.4	135.0	138.8	0.0	58.7	38.7	0.1	0.2	5.9	34.1	17.0
LnGrp LOS	F	D	F	F	A	E	D	A	A	A	C	B
Approach Vol, veh/h		411			338			2413			2466	
Approach Delay, s/veh		202.5			101.4			3.3			33.0	
Approach LOS		F			F			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.4	86.6		21.0	7.4	91.6		21.0				
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0				
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0				
Max Q Clear Time (g_c+I1), s	8.3	49.5		17.0	3.2	2.0		17.0				
Green Ext Time (p_c), s	0.0	23.9		0.0	0.0	37.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	36.7	
HCM 6th LOS	D	

Notes

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

14-ZN-2019
6/03/2020

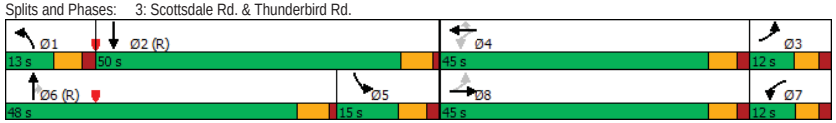
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	281	352	1072	292	357	1726	88	184	1890
Future Volume (vph)	193	281	352	1072	292	357	1726	88	184	1890
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	29.1	22.2	51.7	38.9	38.9	7.0	42.3	42.3	9.0	44.3
Actuated g/C Ratio	0.24	0.18	0.43	0.32	0.32	0.06	0.35	0.35	0.08	0.37
v/c Ratio	1.46	0.77	0.49	0.99	0.53	2.05	0.99	0.16	0.87	1.30
Control Delay	270.5	41.1	37.0	63.5	17.1	511.3	64.7	11.4	75.3	170.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	270.5	41.1	37.0	63.5	17.1	511.3	64.7	11.4	75.3	170.3
LOS	F	D	D	E	B	F	E	B	E	F
Approach Delay		102.8		50.2			135.9			163.0
Approach LOS		F		D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 2.05		
Intersection Signal Delay: 121.2	Intersection LOS: F	
Intersection Capacity Utilization 111.3%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	281	243	352	1072	292	357	1726	88	184	1890	325
Future Volume (veh/h)	193	281	243	352	1072	292	357	1726	88	184	1890	325
Initial Q (Qb), veh	0	0	0	12	25	10	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	1870
Adj Flow Rate, veh/h	217	316	138	391	1191	180	388	1876	58	211	2172	259
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	412	176	868	1213	487	191	1895	529	524	2203	258
Arrive On Green	0.05	0.16	0.16	0.22	0.32	0.32	0.02	0.12	0.12	0.21	0.60	0.60
Sat Flow, veh/h	1688	2552	1091	3274	3741	1502	3274	5375	1502	3274	4877	572
Grp Volume(v), veh/h	217	230	224	391	1191	180	388	1876	58	211	1586	845
Grp Sat Flow(s),veh/h/ln	1688	1870	1772	1637	1870	1502	1637	1792	1502	1637	1792	1866
Q Serve(g_s), s	6.4	14.1	14.6	6.1	37.9	11.0	7.0	41.8	4.1	6.7	51.5	54.2
Cycle Q Clear(g_c), s	6.4	14.1	14.6	6.1	37.9	11.0	7.0	41.8	4.1	6.7	51.5	54.2
Prop In Lane	1.00		0.62	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	150	302	286	868	1213	487	191	1895	529	524	1618	843
V/C Ratio(X)	1.45	0.76	0.78	0.45	0.98	0.37	2.03	0.99	0.11	0.40	0.98	1.00
Avail Cap(c_a), veh/h	150	606	575	868	1213	487	191	1895	529	524	1618	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.12	0.12	0.12	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	55.5	48.1	48.3	38.5	40.6	32.4	58.8	52.8	36.2	42.3	23.4	24.0
Incr Delay (d2), s/veh	234.3	4.0	4.7	0.0	5.6	0.1	482.1	18.5	0.4	0.3	13.3	24.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	2.5	66.2	4.8	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.1	6.9	6.8	5.9	29.7	6.0	15.8	23.4	1.6	2.7	21.2	25.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	289.8	52.1	53.0	41.1	112.4	37.2	541.0	71.3	36.6	42.6	36.8	48.9
LnGrp LOS	F	D	D	D	F	D	F	E	D	D	D	F
Approach Vol, veh/h		671			1762			2322			2642	
Approach Delay, s/veh		129.3			88.9			148.9			41.1	
Approach LOS		F			F			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	60.5	12.0	45.0	25.5	48.0	31.5	25.5
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	9.0	56.2	8.4	39.9	8.7	43.8	8.1	16.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8

Intersection Summary		
HCM 6th Ctrl Delay		94.3
HCM 6th LOS		F

Notes

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

14-ZN-2019
6/03/2020

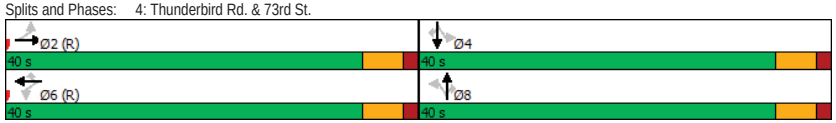
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	518	19	1470	241	167	2	103	274	2	79
Future Volume (vph)	10	518	19	1470	241	167	2	103	274	2	79
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.12	0.36	0.08	1.10	0.36	0.29	0.00	0.15	0.63	0.00	0.16
Control Delay	18.1	15.9	14.4	80.4	3.3	16.6	13.0	3.7	23.9	13.0	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	15.9	14.4	80.4	3.3	16.6	13.0	3.7	23.9	13.0	10.5
LOS	B	B	B	F	A	B	B	A	C	B	B
Approach Delay		16.0		68.9			11.7			20.9	
Approach LOS		B		E			B			C	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.10			
Intersection Signal Delay: 48.6		Intersection LOS: D	
Intersection Capacity Utilization 70.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	518	25	19	1470	241	167	2	103	274	2	79
Future Volume (veh/h)	10	518	25	19	1470	241	167	2	103	274	2	79
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	11	551	23	23	1771	194	167	2	103	365	3	96
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	1.00	1.00	1.00	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1578	66	352	1613	648	618	849	648	616	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	211	3659	153	795	3741	1502	1228	1969	1502	1221	1969	1502
Grp Volume(v), veh/h	11	281	293	23	1771	194	167	2	103	365	3	96
Grp Sat Flow(s),veh/h/ln	211	1870	1941	795	1870	1502	1228	1969	1502	1221	1969	1502
Q Serve(g_s), s	0.0	8.1	8.1	1.6	34.5	6.8	7.2	0.0	3.4	19.4	0.1	3.1
Cycle Q Clear(g_c), s	34.5	8.1	8.1	9.7	34.5	6.8	7.2	0.0	3.4	19.5	0.1	3.1
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	807	837	352	1613	648	618	849	648	616	849	648
V/C Ratio(X)	0.12	0.35	0.35	0.07	1.10	0.30	0.27	0.00	0.16	0.59	0.00	0.15
Avail Cap(c_a), veh/h	90	807	837	352	1613	648	618	849	648	616	849	648
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)	0.61	0.61	0.61	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	15.2	15.2	18.5	22.7	14.9	15.0	13.0	13.9	18.5	13.0	13.8
Incr Delay (d2), s/veh	1.7	0.7	0.7	0.4	54.2	1.2	1.1	0.0	0.5	4.2	0.0	0.5
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	0.3	3.4	3.5	0.3	26.0	2.4	2.1	0.0	1.2	5.8	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.7	16.0	15.9	18.8	76.9	16.0	16.1	13.0	14.4	22.6	13.0	14.3
LnGrp LOS	D	B	B	B	F	B	B	B	B	C	B	B
Approach Vol, veh/h		585			1988			272			464	
Approach Delay, s/veh		16.4			70.3			15.4			20.9	
Approach LOS		B			E			B			C	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		34.5		34.5		34.5		34.5				
Max Q Clear Time (g_c+I1), s		36.5		21.5		36.5		9.2				
Green Ext Time (p_c), s		0.0		1.5		0.0		0.9				

Intersection Summary		
HCM 6th Ctrl Delay	49.4	
HCM 6th LOS	D	

Notes
User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	943	5	1647	4	0	
Future Volume (vph)	943	5	1647	4	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	138.6	138.6	138.6		20.0	
Actuated g/C Ratio	0.96	0.96	0.96		0.14	
v/c Ratio	0.57	0.01	0.54		0.04	
Control Delay	3.7	2.2	2.6		6.6	
Queue Delay	0.0	0.0	0.1		0.0	
Total Delay	3.7	2.2	2.7		6.6	
LOS	A	A	A		A	
Approach Delay	3.7		2.7		6.6	
Approach LOS	A		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.57		
Intersection Signal Delay: 3.0	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	943	5	5	1647	0	4	0	1	0	0	0
Future Volume (veh/h)	0	943	5	5	1647	0	4	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1060	3	6	1938	0	8	0	0	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1725	5	420	3289	0	106	0	0	0	75	0
Arrive On Green	0.00	0.88	0.88	0.88	0.88	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1962	6	503	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1063	6	1938	0	8	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	503	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	20.6	0.5	18.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	20.6	21.0	18.8	0.0	0.8	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1730	420	3289	0	106	0	0	0	75	0
V/C Ratio(X)	0.00	0.00	0.61	0.01	0.59	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1730	420	3289	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.56	0.56	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	2.3	5.1	2.2	0.0	67.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.6	0.0	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	5.4	0.1	4.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	3.9	5.1	2.6	0.0	67.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1063			1944			8			0	
Approach Delay, s/veh		3.9			2.6			67.8			0.0	
Approach LOS		A			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		133.5		11.5		133.5		11.5				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		22.6		0.0		23.0		2.8				
Green Ext Time (p_c), s		13.7		0.0		33.3		0.0				

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

14-ZN-2019
6/03/2020

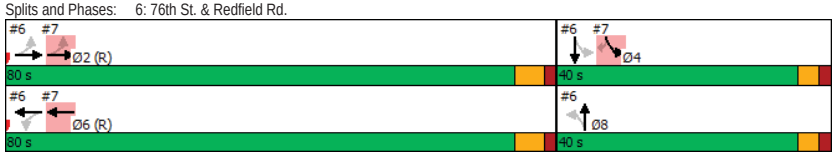
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	5	1014	30	1719	160	0	5	0
Future Volume (vph)	5	1014	30	1719	160	0	5	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0	11.0
Total Split (s)	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	80.1	80.1	80.1	80.1	28.9	28.9		28.9
Actuated g/C Ratio	0.67	0.67	0.67	0.67	0.24	0.24		0.24
v/c Ratio	0.07	0.92	0.42	0.78	0.63	0.11		0.08
Control Delay	11.6	31.6	21.8	11.7	48.7	0.5		13.1
Queue Delay	0.0	46.1	0.0	0.1	0.0	0.0		0.0
Total Delay	11.6	77.7	21.8	11.8	48.7	0.5		13.1
LOS	B	E	C	B	D	A		B
Approach Delay		77.4		12.0		39.2		13.1
Approach LOS		E		B		D		B

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 36.7		Intersection LOS: D	
Intersection Capacity Utilization 81.8%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	1014	61	30	1719	1	160	0	39	5	0	16
Future Volume (vph)	5	1014	61	30	1719	1	160	0	39	5	0	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1847		1770	3539		1770	1583			1649	
Flt Permitted	0.06	1.00		0.06	1.00		0.74	1.00			0.96	
Satd. Flow (perm)	116	1847		115	3539		1373	1583			1596	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.77	0.77	0.77	0.67	0.67	0.67
Adj. Flow (vph)	5	1067	64	32	1829	1	208	0	51	7	0	24
RTOR Reduction (vph)	0	2	0	0	0	0	0	39	0	0	20	0
Lane Group Flow (vph)	5	1129	0	32	1830	0	208	12	0	0	11	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	80.1	80.1		80.1	80.1		28.9	28.9			28.9	
Effective Green, g (s)	80.1	80.1		80.1	80.1		28.9	28.9			28.9	
Actuated g/C Ratio	0.67	0.67		0.67	0.67		0.24	0.24			0.24	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	77	1232		76	2362		330	381			384	
v/s Ratio Prot		c0.61			0.52			0.01				
v/s Ratio Perm	0.04			0.28			c0.15				0.01	
v/c Ratio	0.06	0.92		0.42	0.77		0.63	0.03			0.03	
Uniform Delay, d1	6.9	17.1		9.2	13.7		40.8	34.9			34.8	
Progression Factor	1.00	1.00		0.58	0.64		1.00	1.00			1.00	
Incremental Delay, d2	1.6	12.1		12.1	1.9		3.9	0.0			0.0	
Delay (s)	8.6	29.2		17.4	10.7		44.7	34.9			34.8	
Level of Service	A	C		B	B		D	C			C	
Approach Delay (s)		29.1			10.8			42.7			34.8	
Approach LOS		C			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	19.9	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.84				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	81.8%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

14-ZN-2019
6/03/2020

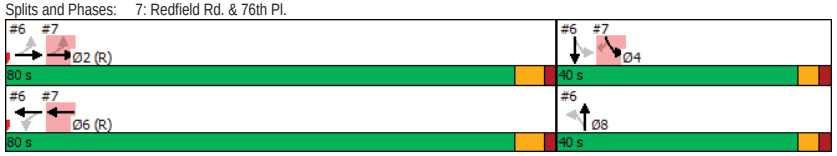
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	66	996	1439	5	312	
Future Volume (vph)	66	996	1439	5	312	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	80.1	80.1	80.1	28.9	28.9	
Actuated g/C Ratio	0.67	0.67	0.67	0.24	0.24	
v/c Ratio	0.51	0.85	0.65	0.01	0.87	
Control Delay	10.2	8.3	13.3	31.2	59.3	
Queue Delay	0.0	3.1	0.2	0.0	56.3	
Total Delay	10.2	11.5	13.5	31.2	115.6	
LOS	B	B	B	C	F	
Approach Delay		11.4	13.5	114.2		
Approach LOS		B	B	F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 80			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.92			
Intersection Signal Delay: 24.7		Intersection LOS: C	
Intersection Capacity Utilization 68.7%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	66	996	1439	13	5	312
Future Volume (vph)	66	996	1439	13	5	312
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3534		1770	1583
Flt Permitted	0.11	1.00	1.00		0.95	1.00
Satd. Flow (perm)	205	1863	3534		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.88	0.88
Adj. Flow (vph)	70	1060	1531	14	6	355
RTOR Reduction (vph)	0	0	0	0	0	29
Lane Group Flow (vph)	70	1060	1545	0	6	326
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	80.1	80.1	80.1		28.9	28.9
Effective Green, g (s)	80.1	80.1	80.1		28.9	28.9
Actuated g/C Ratio	0.67	0.67	0.67		0.24	0.24
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	136	1243	2358		426	381
v/s Ratio Prot		c0.57	0.44		0.00	
v/s Ratio Perm	0.34					c0.21
v/c Ratio	0.51	0.85	0.66		0.01	0.86
Uniform Delay, d1	10.1	15.4	11.8		34.7	43.6
Progression Factor	0.22	0.19	0.96		1.00	1.00
Incremental Delay, d2	6.4	3.7	0.9		0.0	16.9
Delay (s)	8.6	6.6	12.2		34.7	60.5
Level of Service	A	A	B		C	E
Approach Delay (s)		6.7	12.2		60.1	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	15.8	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	68.7%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

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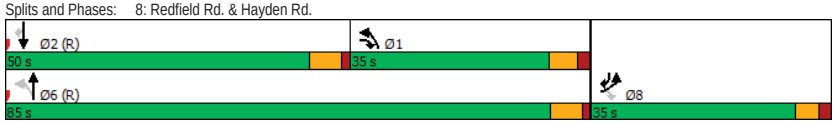
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	566	747	347	786	1226	883
Future Volume (vph)	566	747	347	786	1226	883
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.74	0.98	0.79	0.34	0.97	0.90
Control Delay	34.2	39.4	50.1	9.4	56.6	27.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	34.2	39.4	50.1	9.4	56.6	27.0
LOS	C	D	D	A	E	C
Approach Delay	37.2			21.9	44.2	
Approach LOS	D			C	D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.98		
Intersection Signal Delay: 36.7	Intersection LOS: D	
Intersection Capacity Utilization 90.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	566	747	347	786	1226	883
Future Volume (veh/h)	566	747	347	786	1226	883
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	596	712	365	827	1333	830
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	781	735	483	2496	1375	910
Arrive On Green	0.24	0.24	0.25	0.67	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	596	712	365	827	1333	830
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	20.3	25.2	19.4	11.3	42.0	44.1
Cycle Q Clear(g_c), s	20.3	25.2	19.4	11.3	42.0	44.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	781	735	483	2496	1375	910
V/C Ratio(X)	0.76	0.97	0.76	0.33	0.97	0.91
Avail Cap(c_a), veh/h	810	748	483	2496	1375	910
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	42.5	29.8	39.4	8.5	37.3	18.0
Incr Delay (d2), s/veh	4.2	25.3	6.7	0.4	18.0	14.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	11.8	10.6	4.5	22.3	29.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.7	55.1	46.1	8.9	55.3	32.9
LnGrp LOS	D	E	D	A	E	C
Approach Vol, veh/h	1308			1192	2163	
Approach Delay, s/veh	51.2			20.3	46.7	
Approach LOS	D			C	D	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	36.1	50.0			86.1	33.9
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	21.4	46.1			13.3	27.2
Green Ext Time (p_c), s	0.7	0.0			7.3	1.4

Intersection Summary		
HCM 6th Ctrl Delay	41.2	
HCM 6th LOS	D	

Notes

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

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6/03/2020

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	46	0	136	48	0	89	14	2139	28	49	2378	36
Future Vol, veh/h	46	0	136	48	0	89	14	2139	28	49	2378	36
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	86	86	86	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	78	0	231	56	0	103	15	2252	29	53	2557	39

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3614	4994	1298	3426	4999	1141	2596	0	0	2281	0	0
Stage 1	2683	2683	-	2297	2297	-	-	-	-	-	-	-
Stage 2	931	2311	-	1129	2702	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	-	-	*359	-	-	*403	*452	-	-	*507	-	-
Stage 1	*369	*351	-	*414	*394	-	-	-	-	-	-	-
Stage 2	*414	*394	-	*369	*351	-	-	-	-	-	-	-
Platoon blocked, %	2	2	1	2	2	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	-	-	*359	-	-	*403	*452	-	-	*507	-	-
Mov Cap-2 Maneuver	*132	*146	-	*74	*152	-	-	-	-	-	-	-
Stage 1	*356	*314	-	*400	*381	-	-	-	-	-	-	-
Stage 2	*297	*381	-	*118	*314	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	0.3
HCM LOS	-	-		

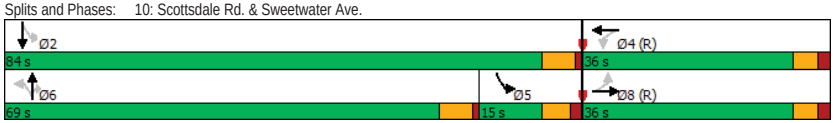
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 452	-	-	- -	* 507	-	-
HCM Lane V/C Ratio	0.033	-	-	- -	0.104	-	-
HCM Control Delay (s)	13.2	-	-	- -	12.9	-	-
HCM Lane LOS	B	-	-	- -	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	- -	0.3	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	40	28	76	118	64	2099	58	105	2303
Future Volume (vph)	40	28	76	118	64	2099	58	105	2303
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.24	0.17	0.24	0.52	1.17	0.79	0.08	0.58	0.71
Control Delay	39.8	33.1	38.2	35.6	128.9	29.3	5.7	53.9	29.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	33.1	38.2	35.6	128.9	29.3	5.7	53.9	29.1
LOS	D	C	D	D	F	C	A	D	C
Approach Delay		35.5		36.2		31.6			30.1
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.17	
Intersection Signal Delay: 31.2	Intersection LOS: C
Intersection Capacity Utilization 91.4%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



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HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	28	41	76	118	133	64	2099	58	105	2303	100
Future Volume (veh/h)	40	28	41	76	118	133	64	2099	58	105	2303	100
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	45	32	24	77	119	114	68	2233	46	108	2374	98
Peak Hour Factor	0.88	0.88	0.88	0.99	0.99	0.99	0.94	0.94	0.94	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	265	198	353	234	224	91	2826	790	205	3447	141
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.17	0.17	0.17	0.08	0.65	0.65
Sat Flow, veh/h	1087	1044	783	1277	924	885	128	5375	1502	1688	5296	217
Grp Volume(v), veh/h	45	0	56	77	0	233	68	2233	46	108	1601	871
Grp Sat Flow(s),veh/h/ln	1087	0	1828	1277	0	1809	128	1792	1502	1688	1792	1930
Q Serve(g_s), s	4.4	0.0	2.8	5.9	0.0	13.2	28.7	47.8	3.1	1.7	33.9	34.4
Cycle Q Clear(g_c), s	17.7	0.0	2.8	8.8	0.0	13.2	63.1	47.8	3.1	1.7	33.9	34.4
Prop In Lane	1.00		0.43	1.00		0.49	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	215	0	463	353	0	458	91	2826	790	205	2332	1256
V/C Ratio(X)	0.21	0.00	0.12	0.22	0.00	0.51	0.75	0.79	0.06	0.53	0.69	0.69
Avail Cap(c_a), veh/h	215	0	463	353	0	458	91	2826	790	205	2332	1256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.0	0.0	34.5	37.9	0.0	38.4	74.7	43.2	24.8	50.4	13.2	13.3
Incr Delay (d2), s/veh	2.2	0.0	0.5	1.4	0.0	4.0	3.2	0.1	0.0	9.3	0.9	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.0	1.3	2.0	0.0	6.4	2.3	23.0	1.1	3.6	12.9	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	35.0	39.3	0.0	42.4	77.9	43.4	24.8	59.7	14.1	15.0
LnGrp LOS	D	A	D	D	A	D	E	D	C	E	B	B
Approach Vol, veh/h		101			310			2347			2580	
Approach Delay, s/veh		40.9			41.6			44.0			16.3	
Approach LOS		D			D			D			B	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		84.0		36.0	15.0	69.0		36.0				
Change Period (Y+Rc), s		* 5.9		5.6	* 5.9	* 5.9		5.6				
Max Green Setting (Gmax), s		* 78		30.4	* 9.1	* 63		30.4				
Max Q Clear Time (g_c+I1), s		36.4		15.2	3.7	65.1		19.7				
Green Ext Time (p_c), s		30.7		1.4	0.1	0.0		0.3				

Intersection Summary		
HCM 6th Ctrl Delay	30.4	
HCM 6th LOS	C	

Notes

User approved pedestrian interval to be less than phase max green.

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

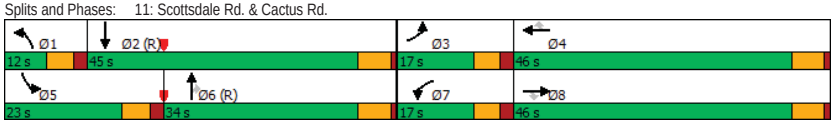
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	146	833	205	171	1270	340	567	1574	256	594	1551
Future Volume (vph)	146	833	205	171	1270	340	567	1574	256	594	1551
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	10.1	40.9	40.9	10.4	41.2	41.2	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.08	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.56	0.69	0.34	0.63	1.04	0.51	3.80	1.36	0.54	1.36	1.15
Control Delay	60.9	37.7	7.5	63.4	73.8	11.2	1291.6	201.9	14.5	210.6	124.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	37.7	7.5	63.4	73.8	11.2	1291.6	201.9	14.5	210.6	124.5
LOS	E	D	A	E	E	B	F	F	B	F	F
Approach Delay		35.3			60.9			439.6			145.0
Approach LOS		D			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 3.80		
Intersection Signal Delay: 202.0	Intersection LOS: F	
Intersection Capacity Utilization 110.1%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	833	205	171	1270	340	567	1574	256	594	1551	346
Future Volume (veh/h)	146	833	205	171	1270	340	567	1574	256	594	1551	346
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	154	877	58	178	1323	135	616	1711	207	625	1633	338
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	1229	493	232	1256	504	164	1418	396	464	1589	326
Arrive On Green	0.06	0.33	0.33	0.07	0.34	0.34	0.05	0.26	0.26	0.09	0.24	0.24
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4469	917
Grp Volume(v), veh/h	154	877	58	178	1323	135	616	1711	207	625	1307	664
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1804
Q Serve(g_s), s	5.5	24.7	3.2	6.4	40.3	7.9	6.0	31.7	14.1	17.0	42.7	42.7
Cycle Q Clear(g_c), s	5.5	24.7	3.2	6.4	40.3	7.9	6.0	31.7	14.1	17.0	42.7	42.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	208	1229	493	232	1256	504	164	1418	396	464	1274	641
V/C Ratio(X)	0.74	0.71	0.12	0.77	1.05	0.27	3.76	1.21	0.52	1.35	1.03	1.04
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1418	396	464	1274	641
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.65	0.65	0.65
Uniform Delay (d), s/veh	55.2	35.3	28.1	54.8	39.8	29.1	57.0	44.2	37.7	54.3	45.7	45.7
Incr Delay (d2), s/veh	5.5	1.9	0.1	8.5	40.6	0.3	1258.2	99.9	4.9	165.6	27.2	38.5
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	2.4	11.5	1.2	2.9	25.3	2.9	31.1	27.0	5.7	17.9	24.4	26.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.7	37.2	28.2	63.2	80.5	29.4	1315.2	144.0	42.6	220.0	72.9	84.2
LnGrp LOS	E	D	C	E	F	C	F	F	D	F	F	F
Approach Vol, veh/h		1089			1636			2534			2596	
Approach Delay, s/veh		40.1			74.4			420.4			111.2	
Approach LOS		D			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	48.4	13.6	46.0	23.0	37.4	14.5	45.1
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	44.7	7.5	42.3	19.0	33.7	8.4	26.7
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.1	5.4

Intersection Summary	
HCM 6th Ctrl Delay	193.4
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	884	12	10	1669	61	44
Future Vol, veh/h	884	12	10	1669	61	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	982	13	11	1854	68	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	995	0	1931	982
Stage 1	-	-	-	-	982	-
Stage 2	-	-	-	-	949	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*493	-	*~ 65	*329
Stage 1	-	-	-	-	*311	-
Stage 2	-	-	-	-	*365	-
Platoon blocked, %	-	-	1	-		1
Mov Cap-1 Maneuver	-	-	*493	-	*~ 64	*329
Mov Cap-2 Maneuver	-	-	-	-	*230	-
Stage 1	-	-	-	-	*311	-
Stage 2	-	-	-	-	*357	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	29.2
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	263	-	-	* 493	-
HCM Lane V/C Ratio	0.444	-	-	0.023	-
HCM Control Delay (s)	29.2	-	-	12.5	-
HCM Lane LOS	D	-	-	B	-
HCM 95th %tile Q(veh)	2.1	-	-	0.1	-

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

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	22	26	0	32	48	2144	10	5	2464	15
Future Vol, veh/h	1	0	22	26	0	32	48	2144	10	5	2464	15
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	24	29	0	36	53	2382	11	6	2738	17

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3818	5258	1378	3601	5261	1197	2755	0	0	2393	0	0
Stage 1	2759	2759	-	2494	2494	-	-	-	-	-	-	-
Stage 2	1059	2499	-	1107	2767	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*7	*0	*337	*~ 17	*0	*403	*424	-	-	*507	-	-
Stage 1	*346	*329	-	*414	*394	-	-	-	-	-	-	-
Stage 2	*414	*394	-	*346	*329	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*6	*0	*337	*~ 14	*0	*403	*424	-	-	*507	-	-
Mov Cap-2 Maneuver	*6	*0	-	*146	*139	-	-	-	-	-	-	-
Stage 1	*303	*325	-	*362	*344	-	-	-	-	-	-	-
Stage 2	*330	*344	-	*317	*325	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	53.6	27.3	0.3	0
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 424	-	-	99	225	* 507	-	-
HCM Lane V/C Ratio	0.126	-	-	0.258	0.286	0.011	-	-
HCM Control Delay (s)	14.7	-	-	53.6	27.3	12.2	-	-
HCM Lane LOS	B	-	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.4	-	-	0.9	1.1	0	-	-

Notes

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

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	2178	15	0	2513
Future Vol, veh/h	0	23	2178	15	0	2513
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	2420	17	0	2792

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1219	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	*403	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*403	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.5	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 403	-
HCM Lane V/C Ratio	-	- 0.063	-
HCM Control Delay (s)	-	- 14.5	-
HCM Lane LOS	-	- B	-
HCM 95th %tile Q(veh)	-	- 0.2	-

Notes

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

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	72	101	0	0	35
Future Vol, veh/h	6	72	101	0	0	35
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	80	112	0	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	112	0	-	0	206	112
Stage 1	-	-	-	-	112	-
Stage 2	-	-	-	-	94	-
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	1478	-	-	-	782	941
Stage 1	-	-	-	-	913	-
Stage 2	-	-	-	-	930	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1478	-	-	-	778	941
Mov Cap-2 Maneuver	-	-	-	-	778	-
Stage 1	-	-	-	-	908	-
Stage 2	-	-	-	-	930	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1478	-	-	-	941
HCM Lane V/C Ratio	0.005	-	-	-	0.041
HCM Control Delay (s)	7.4	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	62	52	0	0	32
Future Vol, veh/h	15	62	52	0	0	32
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	69	58	0	0	36

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	58	0	-	0	161	58
Stage 1	-	-	-	-	58	-
Stage 2	-	-	-	-	103	-
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	1546	-	-	-	830	1008
Stage 1	-	-	-	-	965	-
Stage 2	-	-	-	-	921	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1546	-	-	-	821	1008
Mov Cap-2 Maneuver	-	-	-	-	821	-
Stage 1	-	-	-	-	954	-
Stage 2	-	-	-	-	921	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1546	-	-	-	1008
HCM Lane V/C Ratio	0.011	-	-	-	0.035
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

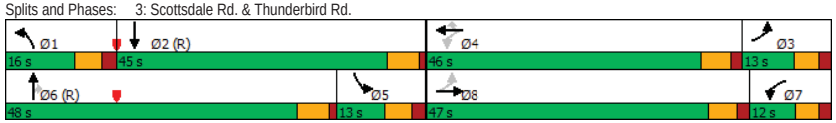
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	193	281	352	1072	292	357	1726	88	184	1890
Future Volume (vph)	193	281	352	1072	292	357	1726	88	184	1890
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	13.0	47.0	12.0	46.0	46.0	16.0	48.0	48.0	13.0	45.0
Total Split (%)	10.8%	39.2%	10.0%	38.3%	38.3%	13.3%	40.0%	40.0%	10.8%	37.5%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	28.8	20.9	53.7	39.9	39.9	10.0	42.3	42.3	7.0	39.3
Actuated g/C Ratio	0.24	0.17	0.45	0.33	0.33	0.08	0.35	0.35	0.06	0.33
v/c Ratio	1.33	0.77	0.45	0.96	0.52	1.43	0.99	0.16	1.12	1.47
Control Delay	221.2	37.8	35.0	57.6	16.6	240.3	61.6	10.1	135.3	242.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	221.2	37.8	35.0	57.6	16.6	240.3	61.6	10.1	135.3	242.0
LOS	F	D	C	E	B	F	E	B	F	F
Approach Delay		87.1		46.0			88.9			233.8
Approach LOS		F		D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.47		
Intersection Signal Delay: 129.3	Intersection LOS: F	
Intersection Capacity Utilization 111.3%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	193	281	243	352	1072	292	357	1726	88	184	1890	325
Future Volume (veh/h)	193	281	243	352	1072	292	357	1726	88	184	1890	325
Initial Q (Qb), veh	0	0	0	12	25	10	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	1870
Adj Flow Rate, veh/h	217	316	138	391	1191	180	388	1876	58	211	2172	259
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	413	177	919	1244	498	273	1895	529	448	2000	234
Arrive On Green	0.06	0.16	0.16	0.23	0.33	0.33	0.03	0.12	0.12	0.16	0.51	0.51
Sat Flow, veh/h	1688	2552	1091	3274	3741	1502	3274	5375	1502	3274	4877	572
Grp Volume(v), veh/h	217	230	224	391	1191	180	388	1876	58	211	1586	845
Grp Sat Flow(s),veh/h/ln	1688	1870	1772	1637	1870	1502	1637	1792	1502	1637	1792	1866
Q Serve(g_s), s	7.4	14.1	14.6	5.8	37.5	10.9	10.0	41.8	4.1	7.1	46.1	46.1
Cycle Q Clear(g_c), s	7.4	14.1	14.6	5.8	37.5	10.9	10.0	41.8	4.1	7.1	46.1	46.1
Prop In Lane	1.00		0.62	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	164	303	287	919	1244	498	273	1895	529	448	1469	765
V/C Ratio(X)	1.32	0.76	0.78	0.43	0.96	0.36	1.42	0.99	0.11	0.47	1.08	1.10
Avail Cap(c_a), veh/h	164	637	604	919	1244	499	273	1895	529	386	1378	718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.12	0.12	0.12	1.00	1.00	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	54.9	48.1	48.3	37.0	40.0	31.6	58.3	52.8	36.2	45.2	27.3	27.3
Incr Delay (d2), s/veh	181.2	3.9	4.6	0.0	3.1	0.1	210.1	18.5	0.4	0.6	44.0	59.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	2.1	53.3	4.5	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.0	6.9	6.8	5.8	27.8	5.9	12.4	23.4	1.6	2.8	27.2	31.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	236.2	52.0	52.9	39.1	96.5	36.2	268.4	71.3	36.6	45.8	71.2	86.5
LnGrp LOS	F	D	D	D	F	D	F	E	D	D	F	F
Approach Vol, veh/h		671			1762			2322			2642	
Approach Delay, s/veh		111.9			77.6			103.4			74.1	
Approach LOS		F			E			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	52.4	13.0	45.9	20.4	48.0	33.4	25.5
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	10.0	* 39	* 7.4	39.9	7.0	42.3	* 6.7	* 41
Max Q Clear Time (g_c+I1), s	12.0	48.1	9.4	39.5	9.1	43.8	7.8	16.6
Green Ext Time (p_c), s	0.0	0.0	0.0	0.3	0.0	0.0	0.0	2.8

Intersection Summary		
HCM 6th Ctrl Delay		87.5
HCM 6th LOS		F

Notes

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

14-ZN-2019
6/03/2020

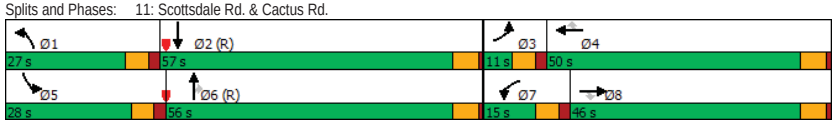
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	146	833	205	171	1270	340	567	1574	256	594	1551
Future Volume (vph)	146	833	205	171	1270	340	567	1574	256	594	1551
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	11.0	46.0	46.0	15.0	50.0	50.0	27.0	56.0	56.0	28.0	57.0
Total Split (%)	7.6%	31.7%	31.7%	10.3%	34.5%	34.5%	18.6%	38.6%	38.6%	19.3%	39.3%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	5.0	40.3	40.3	9.0	44.3	44.3	21.0	50.3	50.3	22.0	51.3
Actuated g/C Ratio	0.03	0.28	0.28	0.06	0.31	0.31	0.14	0.35	0.35	0.15	0.35
v/c Ratio	1.38	0.85	0.43	0.89	1.16	0.59	1.31	0.92	0.47	1.27	1.07
Control Delay	263.5	58.3	20.4	106.1	127.5	20.8	201.3	54.7	24.4	184.0	85.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	263.5	58.3	20.4	106.1	127.5	20.8	201.3	54.7	24.4	184.0	85.9
LOS	F	E	C	F	F	C	F	D	C	F	F
Approach Delay		77.1			105.1			86.1			109.3
Approach LOS		E			F			F			F

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.38		
Intersection Signal Delay: 96.3	Intersection LOS: F	
Intersection Capacity Utilization 110.1%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	146	833	205	171	1270	340	567	1574	256	594	1551	346
Future Volume (veh/h)	146	833	205	171	1270	340	567	1574	256	594	1551	346
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	154	877	58	178	1323	135	616	1711	207	625	1633	338
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	1040	417	203	1143	459	474	1865	521	497	1581	325
Arrive On Green	0.03	0.28	0.28	0.06	0.31	0.31	0.14	0.35	0.35	0.15	0.35	0.35
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4469	917
Grp Volume(v), veh/h	154	877	58	178	1323	135	616	1711	207	625	1307	664
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1804
Q Serve(g_s), s	5.0	32.1	4.2	7.8	44.3	9.9	21.0	44.2	15.1	22.0	51.3	51.3
Cycle Q Clear(g_c), s	5.0	32.1	4.2	7.8	44.3	9.9	21.0	44.2	15.1	22.0	51.3	51.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	113	1040	417	203	1143	459	474	1865	521	497	1268	638
V/C Ratio(X)	1.36	0.84	0.14	0.88	1.16	0.29	1.30	0.92	0.40	1.26	1.03	1.04
Avail Cap(c_a), veh/h	113	1040	417	203	1143	459	474	1865	521	497	1268	638
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	0.65	0.65	0.65
Uniform Delay (d), s/veh	70.0	49.4	39.3	67.4	50.3	38.4	62.0	45.4	35.9	61.5	46.9	46.9
Incr Delay (d2), s/veh	210.4	6.5	0.2	32.0	81.1	0.4	149.5	8.7	2.3	126.7	28.7	40.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	15.9	1.6	4.2	33.5	3.8	18.6	21.1	5.9	17.9	27.7	29.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	280.4	55.8	39.5	99.5	131.4	38.8	211.5	54.1	38.1	188.2	75.5	86.9
LnGrp LOS	F	E	D	F	F	D	F	D	D	F	F	F
Approach Vol, veh/h		1089			1636			2534			2596	
Approach Delay, s/veh		86.7			120.3			91.0			105.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	57.0	11.0	50.0	28.0	56.0	15.0	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	21.0	51.3	5.0	44.3	22.0	50.3	9.0	40.3
Max Q Clear Time (g_c+I1), s	23.0	53.3	7.0	46.3	24.0	46.2	9.8	34.1
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	3.5	0.0	3.1

Intersection Summary		
HCM 6th Ctrl Delay	101.3	
HCM 6th LOS	F	

APPENDIX H

2029 PEAK HOUR ANALYSIS

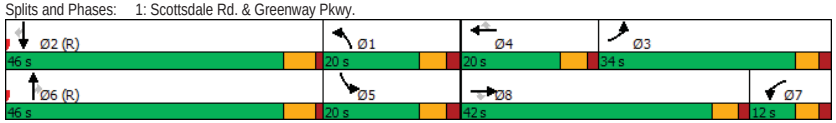
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	604	781	665	124	84	41	323	1405	278	244	1391	130
Future Volume (vph)	604	781	665	124	84	41	323	1405	278	244	1391	130
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	34.0	42.0	42.0	12.0	20.0	20.0	20.0	46.0	46.0	20.0	46.0	46.0
Total Split (%)	28.3%	35.0%	35.0%	10.0%	16.7%	16.7%	16.7%	38.3%	38.3%	16.7%	38.3%	38.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	36.0	36.6	36.6	6.7	7.3	7.3	13.9	40.3	40.3	13.9	40.3	40.3
Actuated g/C Ratio	0.30	0.30	0.30	0.06	0.06	0.06	0.12	0.34	0.34	0.12	0.34	0.34
v/c Ratio	0.67	0.75	1.14	0.74	0.40	0.17	0.90	0.82	0.47	0.67	0.80	0.22
Control Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.2	34.4	16.6	60.4	40.2	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.2	34.4	16.6	60.4	40.2	2.4
LOS	D	D	F	E	E	A	F	C	B	E	D	A
Approach Delay		62.4			59.9			40.0			40.2	
Approach LOS		E			E			D			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 80 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 135		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.14		
Intersection Signal Delay: 48.7	Intersection LOS: D	
Intersection Capacity Utilization 86.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	604	781	665	124	84	41	323	1405	278	244	1391	130
Future Volume (veh/h)	604	781	665	124	84	41	323	1405	278	244	1391	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	657	849	484	133	90	29	340	1479	0	252	1434	93
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	988	1138	457	183	218	88	382	1805		382	1805	504
Arrive On Green	0.30	0.30	0.30	0.06	0.06	0.06	0.04	0.11	0.00	0.12	0.34	0.34
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	657	849	484	133	90	29	340	1479	0	252	1434	93
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	21.0	24.5	36.5	4.8	2.8	2.2	12.4	32.3	0.0	8.8	29.0	5.3
Cycle Q Clear(g_c), s	21.0	24.5	36.5	4.8	2.8	2.2	12.4	32.3	0.0	8.8	29.0	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	988	1138	457	183	218	88	382	1805		382	1805	504
V/C Ratio(X)	0.67	0.75	1.06	0.73	0.41	0.33	0.89	0.82		0.66	0.79	0.18
Avail Cap(c_a), veh/h	988	1138	457	183	452	181	382	1805		382	1805	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.77	0.77	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	37.6	41.7	55.8	54.5	54.3	56.9	49.8	0.0	50.7	36.1	28.2
Incr Delay (d2), s/veh	1.4	2.4	58.8	12.0	0.5	0.8	17.4	3.3	0.0	3.3	3.7	0.8
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	8.6	11.5	20.8	2.3	1.3	0.9	6.4	16.1	0.0	3.8	13.2	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	40.0	100.6	67.7	55.0	55.1	74.3	53.1	0.0	54.1	39.8	29.0
LnGrp LOS	D	D	F	E	D	E	E	D		D	D	C
Approach Vol, veh/h		1990			252			1819	A		1779	
Approach Delay, s/veh		54.1			61.7			57.1			41.3	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	46.0	41.5	12.5	20.0	46.0	12.0	42.0
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	14.0	40.3	28.7	* 15	14.0	40.3	6.7	* 37
Max Q Clear Time (g_c+I1), s	14.4	31.0	23.0	4.8	10.8	34.3	6.8	38.5
Green Ext Time (p_c), s	0.0	3.5	0.8	0.1	0.2	2.7	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		51.4
HCM 6th LOS		D

Notes

User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	35	287	42	15	249	1877	46	1680	30
Future Volume (vph)	61	35	287	42	15	249	1877	46	1680	30
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.6	84.4	88.5	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	0.43	0.16	1.06	0.29	0.15	1.31	0.61	0.34	0.52	0.03
Control Delay	57.6	48.8	99.1	52.9	28.9	178.4	6.4	21.3	12.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	48.8	99.1	52.9	28.9	178.4	6.4	21.3	12.2	0.2
LOS	E	D	F	D	C	F	A	C	B	A
Approach Delay		87.9			42.6		26.0		12.2	
Approach LOS		F			D		C		B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.31		
Intersection Signal Delay: 26.2	Intersection LOS: C	
Intersection Capacity Utilization 72.9%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	35	287	42	15	17	249	1877	61	46	1680	30
Future Volume (veh/h)	61	35	287	42	15	17	249	1877	61	46	1680	30
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	69	39	215	46	16	15	293	2208	54	51	1867	22
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	246	188	174	117	110	298	3855	94	211	3583	1001
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.15	1.00	1.00	0.03	0.67	0.67
Sat Flow, veh/h	1306	1969	1502	1066	935	876	1688	5397	132	1688	5375	1502
Grp Volume(v), veh/h	69	39	215	46	0	31	293	1464	798	51	1867	22
Grp Sat Flow(s),veh/h/ln	1306	1969	1502	1066	0	1811	1688	1792	1945	1688	1792	1502
Q Serve(g_s), s	6.0	2.1	15.0	4.8	0.0	1.8	8.5	0.0	0.0	1.1	21.3	0.6
Cycle Q Clear(g_c), s	7.8	2.1	15.0	7.0	0.0	1.8	8.5	0.0	0.0	1.1	21.3	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	203	246	188	174	0	226	298	2560	1390	211	3583	1001
V/C Ratio(X)	0.34	0.16	1.15	0.26	0.00	0.14	0.98	0.57	0.57	0.24	0.52	0.02
Avail Cap(c_a), veh/h	203	246	188	174	0	226	298	2560	1390	292	3583	1001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.31	0.31	0.31
Uniform Delay (d), s/veh	50.2	46.9	52.5	50.0	0.0	46.7	20.2	0.0	0.0	5.8	10.2	6.8
Incr Delay (d2), s/veh	1.0	0.3	110.3	0.8	0.0	0.3	12.1	0.1	0.2	0.2	0.2	0.0
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	1.1	11.4	1.3	0.0	0.8	6.4	0.0	0.1	0.4	7.9	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	47.2	162.8	50.8	0.0	47.0	32.3	0.1	0.2	6.0	10.4	6.8
LnGrp LOS	D	D	F	D	A	D	C	A	A	A	B	A
Approach Vol, veh/h		323			77			2555			1940	
Approach Delay, s/veh		125.0			49.3			3.8			10.2	
Approach LOS		F			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	86.0		21.0	7.3	91.7		21.0				
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0				
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0				
Max Q Clear Time (g_c+I1), s	10.5	23.3		9.0	3.1	2.0		17.0				
Green Ext Time (p_c), s	0.0	25.7		0.1	0.0	38.8		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	15.1	
HCM 6th LOS	B	

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

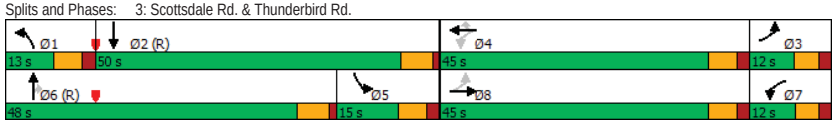
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	386	954	121	224	179	121	1767	192	303	1639
Future Volume (vph)	386	954	121	224	179	121	1767	192	303	1639
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.3	38.9	21.6	14.2	14.2	7.1	42.4	42.4	9.0	44.3
Actuated g/C Ratio	0.43	0.32	0.18	0.12	0.12	0.06	0.35	0.35	0.08	0.37
v/c Ratio	0.75	1.34	0.46	0.58	0.58	0.78	1.15	0.38	1.34	0.94
Control Delay	42.2	191.1	32.3	55.0	13.9	60.4	115.7	21.6	214.3	41.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.2	191.1	32.3	55.0	13.9	60.4	115.7	21.6	214.3	41.6
LOS	D	F	C	E	B	E	F	C	F	D
Approach Delay		159.1		35.7			103.8			67.4
Approach LOS		F		D			F			E

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 102.8		Intersection LOS: F	
Intersection Capacity Utilization 103.9%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	954	456	121	224	179	121	1767	192	303	1639	86
Future Volume (veh/h)	386	954	456	121	224	179	121	1767	192	303	1639	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	1870
Adj Flow Rate, veh/h	439	1084	404	139	257	137	149	2181	151	326	1762	70
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	508	869	318	255	459	184	191	1895	529	285	2009	80
Arrive On Green	0.24	0.32	0.32	0.04	0.12	0.12	0.02	0.12	0.12	0.12	0.50	0.50
Sat Flow, veh/h	1688	2681	982	3274	3741	1502	3274	5375	1502	3274	5304	211
Grp Volume(v), veh/h	439	750	738	139	257	137	149	2181	151	326	1190	642
Grp Sat Flow(s),veh/h/ln	1688	1870	1792	1637	1870	1502	1637	1792	1502	1637	1792	1931
Q Serve(g_s), s	22.5	38.9	38.9	0.5	7.8	10.6	5.4	42.3	11.0	10.4	35.4	35.5
Cycle Q Clear(g_c), s	22.5	38.9	38.9	0.5	7.8	10.6	5.4	42.3	11.0	10.4	35.4	35.5
Prop In Lane	1.00		0.55	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	508	606	581	255	459	184	191	1895	529	285	1357	731
V/C Ratio(X)	0.86	1.24	1.27	0.54	0.56	0.74	0.78	1.15	0.29	1.14	0.88	0.88
Avail Cap(c_a), veh/h	508	606	581	303	1213	487	191	1895	529	285	1357	731
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	0.77	0.77	0.77
Uniform Delay (d), s/veh	40.2	40.6	40.6	55.2	49.6	50.8	58.1	53.0	39.2	53.1	27.3	27.3
Incr Delay (d2), s/veh	14.3	120.7	134.5	1.7	1.0	5.6	18.5	74.6	1.4	91.9	6.5	11.3
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	14.1	37.9	38.6	2.1	3.7	4.3	2.8	33.5	4.6	7.8	14.8	16.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.4	161.2	175.0	56.9	50.6	56.4	76.6	127.6	40.6	144.9	33.8	38.6
LnGrp LOS	D	F	F	E	D	E	E	F	D	F	C	D
Approach Vol, veh/h		1927			533			2481			2158	
Approach Delay, s/veh		142.2			53.8			119.3			52.0	
Approach LOS		F			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	51.4	34.7	20.8	16.4	48.0	10.6	45.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	7.4	37.5	24.5	12.6	12.4	44.3	2.5	40.9
Green Ext Time (p_c), s	0.0	5.5	0.0	2.1	0.0	0.0	0.1	0.0

Intersection Summary		
HCM 6th Ctrl Delay	100.1	
HCM 6th LOS	F	

Notes

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

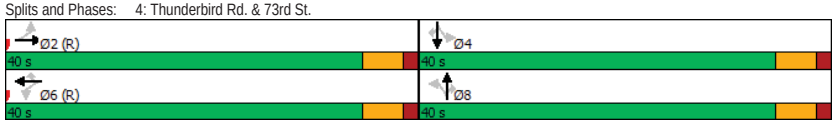
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	23	1419	1	498	255	7	3	110	3	19
Future Volume (vph)	23	1419	1	498	255	7	3	110	3	19
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	NA	Perm
Protected Phases		2		6			8		4	
Permitted Phases	2		6		6	8		4		4
Detector Phase	2	2	6	6	6	8	8	4	4	4
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag										
Lead-Lag Optimize?										
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.08	1.04	0.01	0.32	0.33	0.02	0.01	0.25	0.00	0.04
Control Delay	14.4	59.4	14.0	15.7	3.2	13.3	13.0	16.0	13.0	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.4	59.4	14.0	15.7	3.2	13.3	13.0	16.0	13.0	4.1
LOS	B	E	B	B	A	B	B	B	B	A
Approach Delay		58.7		11.5			13.2		14.3	
Approach LOS		E		B			B		B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.04			
Intersection Signal Delay: 41.8		Intersection LOS: D	
Intersection Capacity Utilization 59.7%		ICU Level of Service B	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1419	7	1	498	255	7	3	0	110	3	19
Future Volume (veh/h)	23	1419	7	1	498	255	7	3	0	110	3	19
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	27	1669	6	1	513	196	12	5	0	145	4	16
Peak Hour Factor	0.85	0.85	0.85	0.97	0.97	0.97	0.58	0.58	0.58	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	329	1649	6	90	1613	648	657	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.00	0.43	0.43	0.43
Sat Flow, veh/h	701	3823	14	280	3741	1502	1319	1969	1502	1337	1969	1502
Grp Volume(v), veh/h	27	816	859	1	513	196	12	5	0	145	4	16
Grp Sat Flow(s),veh/h/ln	701	1870	1966	280	1870	1502	1319	1969	1502	1337	1969	1502
Q Serve(g_s), s	2.1	34.5	34.5	0.0	7.2	6.8	0.4	0.1	0.0	5.5	0.1	0.5
Cycle Q Clear(g_c), s	9.3	34.5	34.5	34.5	7.2	6.8	0.5	0.1	0.0	5.7	0.1	0.5
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	329	807	848	90	1613	648	657	849	648	665	849	648
V/C Ratio(X)	0.08	1.01	1.01	0.01	0.32	0.30	0.02	0.01	0.00	0.22	0.00	0.02
Avail Cap(c_a), veh/h	329	807	848	90	1613	648	657	849	648	665	849	648
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.1	22.7	22.8	40.0	15.0	14.9	13.1	13.0	0.0	14.6	13.0	13.1
Incr Delay (d2), s/veh	0.0	12.6	12.6	0.2	0.5	1.2	0.1	0.0	0.0	0.8	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	0.3	16.7	17.5	0.0	3.0	2.4	0.1	0.1	0.0	1.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.1	35.4	35.4	40.2	15.5	16.1	13.2	13.0	0.0	15.3	13.0	13.1
LnGrp LOS	B	F	F	D	B	B	B	B	A	B	B	B
Approach Vol, veh/h		1702			710			17			165	
Approach Delay, s/veh		35.1			15.7			13.1			15.1	
Approach LOS		D			B			B			B	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.0	40.0	40.0	40.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	34.5	34.5	34.5	34.5
Max Q Clear Time (g_c+I1), s	36.5	7.7	36.5	2.5
Green Ext Time (p_c), s	0.0	0.5	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay	28.4	
HCM 6th LOS	C	

Notes

User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	1407	1	766	5	0	
Future Volume (vph)	1407	1	766	5	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	132.2	132.2	132.2		20.0	
Actuated g/C Ratio	0.91	0.91	0.91		0.14	
v/c Ratio	0.94	0.02	0.23		0.05	
Control Delay	21.8	4.0	2.3		9.0	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	21.8	4.0	2.4		9.0	
LOS	C	A	A		A	
Approach Delay	21.8		2.4		9.0	
Approach LOS	C		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.94		
Intersection Signal Delay: 15.5	Intersection LOS: B	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1407	5	1	766	0	5	0	1	0	0	0
Future Volume (veh/h)	0	1407	5	1	766	0	5	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1675	5	1	798	0	10	0	0	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.96	0.96	0.96	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1710	5	83	3260	0	118	0	0	0	90	0
Arrive On Green	0.00	0.87	0.87	0.87	0.87	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1962	6	279	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1680	1	798	0	10	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	279	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	108.8	0.5	5.1	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	108.8	109.2	5.1	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1715	83	3260	0	118	0	0	0	90	0
V/C Ratio(X)	0.00	0.00	0.98	0.01	0.24	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1715	83	3260	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.89	0.89	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	8.2	56.2	1.5	0.0	66.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	17.4	0.2	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	34.8	0.0	1.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	25.6	56.4	1.7	0.0	66.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	C	E	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1680			799			10			0	
Approach Delay, s/veh		25.6			1.7			66.8			0.0	
Approach LOS		C			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		132.4		12.6		132.4		12.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		110.8		0.0		111.2		2.9				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	18.1	
HCM 6th LOS	B	

14-ZN-2019
6/03/2020

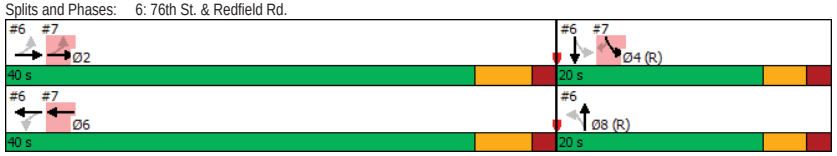
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	20	1557	27	786	23	1	0
Future Volume (vph)	20	1557	27	786	23	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0
Total Split (s)	40.0	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Ped	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	15.0	15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25	0.25
v/c Ratio	0.08	1.82	0.25	0.46	0.09	0.03	0.02
Control Delay	6.8	389.6	7.4	3.5	18.2	10.2	0.2
Queue Delay	0.0	0.6	0.0	0.1	0.0	0.0	0.0
Total Delay	6.8	390.2	7.4	3.6	18.2	10.2	0.2
LOS	A	F	A	A	B	B	A
Approach Delay		385.8		3.7		15.7	0.2
Approach LOS		F		A		B	A

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.82			
Intersection Signal Delay: 254.3		Intersection LOS: F	
Intersection Capacity Utilization 107.2%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1557	135	27	786	17	23	1	10	0	0	6
Future Volume (vph)	20	1557	135	27	786	17	23	1	10	0	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1840		1770	3528		1770	1603			1611	
Flt Permitted	0.28	1.00		0.12	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	515	1840		219	3528		1397	1603			1611	
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.75	0.75	0.75	0.50	0.50	0.50
Adj. Flow (vph)	22	1749	152	31	903	20	31	1	13	0	0	12
RTOR Reduction (vph)	0	5	0	0	3	0	0	10	0	0	9	0
Lane Group Flow (vph)	22	1896	0	31	920	0	31	4	0	0	3	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	291	1042		124	1999		349	400			402	
v/s Ratio Prot		c1.03			0.26			0.00			0.00	
v/s Ratio Perm	0.04			0.14			c0.02					
v/c Ratio	0.08	1.82		0.25	0.46		0.09	0.01			0.01	
Uniform Delay, d1	5.9	13.0		6.6	7.6		17.3	16.9			16.9	
Progression Factor	1.00	1.00		0.40	0.36		1.00	1.00			1.00	
Incremental Delay, d2	0.1	372.5		1.0	0.2		0.5	0.0			0.0	
Delay (s)	6.0	385.5		3.6	2.9		17.8	17.0			16.9	
Level of Service	A	F		A	A		B	B			B	
Approach Delay (s)		381.2			2.9			17.5			16.9	
Approach LOS		F			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	251.1	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.29				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	107.2%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

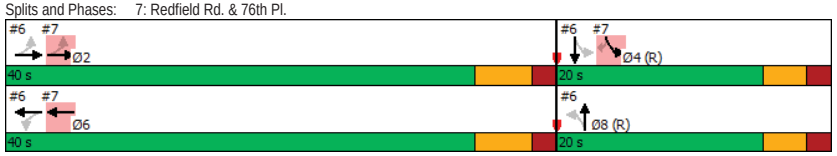
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	282	1286	729	23	104	
Future Volume (vph)	282	1286	729	23	104	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	15.0	15.0	
Actuated g/C Ratio	0.57	0.57	0.57	0.25	0.25	
v/c Ratio	1.02	1.38	0.43	0.06	0.25	
Control Delay	32.8	188.1	9.6	17.7	5.8	
Queue Delay	0.0	0.8	0.0	0.0	0.0	
Total Delay	32.8	189.0	9.6	17.7	5.8	
LOS	C	F	A	B	A	
Approach Delay		160.9	9.6	7.9		
Approach LOS		F	A	A		

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.82			
Intersection Signal Delay: 105.7		Intersection LOS: F	
Intersection Capacity Utilization 81.9%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	1286	729	19	23	104
Future Volume (vph)	282	1286	729	19	23	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3526		1770	1583
Flt Permitted	0.30	1.00	1.00		0.95	1.00
Satd. Flow (perm)	556	1863	3526		1770	1583
Peak-hour factor, PHF	0.88	0.88	0.86	0.86	0.84	0.84
Adj. Flow (vph)	320	1461	848	22	27	124
RTOR Reduction (vph)	0	0	3	0	0	93
Lane Group Flow (vph)	320	1461	867	0	27	31
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	34.0	34.0	34.0		15.0	15.0
Effective Green, g (s)	34.0	34.0	34.0		15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	315	1055	1998		442	395
v/s Ratio Prot		c0.78	0.25		0.02	
v/s Ratio Perm	0.58					c0.02
v/c Ratio	1.02	1.38	0.43		0.06	0.08
Uniform Delay, d1	13.0	13.0	7.5		17.1	17.2
Progression Factor	0.37	0.35	1.22		1.00	1.00
Incremental Delay, d2	19.3	173.7	0.1		0.3	0.4
Delay (s)	24.2	178.3	9.2		17.4	17.6
Level of Service	C	F	A		B	B
Approach Delay (s)		150.6	9.2		17.6	
Approach LOS		F	A		B	

Intersection Summary			
HCM 2000 Control Delay	99.5	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	81.9%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

14-ZN-2019
6/03/2020

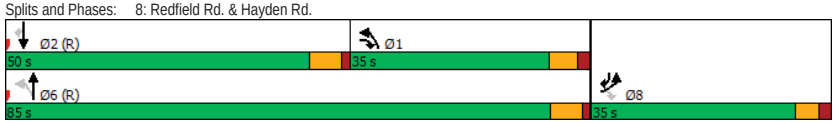
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	733	198	712	1112	341	399
Future Volume (vph)	733	198	712	1112	341	399
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	1.04	0.25	0.94	0.46	0.26	0.40
Control Delay	64.5	5.6	45.6	10.8	27.2	7.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.5	5.6	45.6	10.8	27.2	7.1
LOS	E	A	D	B	C	A
Approach Delay	52.0			24.4	16.4	
Approach LOS	D			C	B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.04		
Intersection Signal Delay: 30.6	Intersection LOS: C	
Intersection Capacity Utilization 86.9%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	733	198	712	1112	341	399
Future Volume (veh/h)	733	198	712	1112	341	399
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	833	145	727	1135	359	278
Peak Hour Factor	0.88	0.88	0.98	0.98	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	810	777	728	2569	1375	924
Arrive On Green	0.25	0.25	0.27	0.69	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	833	145	727	1135	359	278
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	29.7	0.0	32.2	16.4	8.1	10.5
Cycle Q Clear(g_c), s	29.7	0.0	32.2	16.4	8.1	10.5
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	810	777	728	2569	1375	924
V/C Ratio(X)	1.03	0.19	1.00	0.44	0.26	0.30
Avail Cap(c_a), veh/h	810	777	728	2569	1375	924
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	45.1	15.5	32.7	8.5	26.6	10.9
Incr Delay (d2), s/veh	39.0	0.1	32.9	0.6	0.5	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	2.1	27.2	6.3	3.7	6.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	84.1	15.6	65.6	9.0	27.0	11.8
LnGrp LOS	F	B	E	A	C	B
Approach Vol, veh/h	978			1862	637	
Approach Delay, s/veh	74.0			31.1	20.4	
Approach LOS	E			C	C	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.5	50.0			88.5	35.0
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	34.2	12.5			18.4	31.7
Green Ext Time (p_c), s	0.0	3.6			11.6	0.0

Intersection Summary		
HCM 6th Ctrl Delay	41.2	
HCM 6th LOS	D	

Notes

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

14-ZN-2019
6/03/2020

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	25	8	0	48	48	1807	14	52	1877	89
Future Vol, veh/h	17	0	25	8	0	48	48	1807	14	52	1877	89
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	58	58	58	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	27	14	0	83	56	2101	16	56	2018	96

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3130	4407	1057	3140	4447	1059	2114	0	0	2117	0	0
Stage 1	2178	2178	-	2221	2221	-	-	-	-	-	-	-
Stage 2	952	2229	-	919	2226	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*79	*1	*469	*79	0	*492	*590	-	-	584	-	-
Stage 1	*482	*458	-	*346	375	-	-	-	-	-	-	-
Stage 2	*504	*369	-	*482	433	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*56	*0	*469	*64	0	*492	*590	-	-	584	-	-
Mov Cap-2 Maneuver	*195	*152	-	*181	154	-	-	-	-	-	-	-
Stage 1	*436	*414	-	*313	340	-	-	-	-	-	-	-
Stage 2	*380	*334	-	*411	392	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.2	17	0.3	0.3
HCM LOS	C	C		

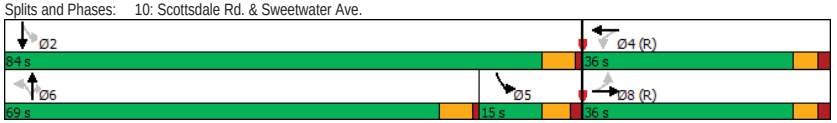
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 590	-	-	299	395	584	-	-
HCM Lane V/C Ratio	0.095	-	-	0.151	0.244	0.096	-	-
HCM Control Delay (s)	11.7	-	-	19.2	17	11.8	-	-
HCM Lane LOS	B	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.5	0.9	0.3	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	61	145	116	38	33	2046	46	89	1978
Future Volume (vph)	61	145	116	38	33	2046	46	89	1978
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.28	0.61	0.89	0.32	0.69	0.89	0.07	0.55	0.65
Control Delay	39.5	44.9	92.4	16.6	36.0	26.4	3.9	54.2	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.5	44.9	92.4	16.6	36.0	26.4	3.9	54.2	25.9
LOS	D	D	F	B	D	C	A	D	C
Approach Delay		43.8		51.7		26.1			27.1
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 110	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.89	
Intersection Signal Delay: 29.0	Intersection LOS: C
Intersection Capacity Utilization 84.4%	ICU Level of Service E
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	145	104	116	38	96	33	2046	46	89	1978	23
Future Volume (veh/h)	61	145	104	116	38	96	33	2046	46	89	1978	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	71	169	92	143	47	94	40	2495	38	101	2248	20
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.82	0.82	0.82	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	307	167	202	150	300	123	2812	786	194	3561	32
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.17	0.17	0.17	0.10	0.86	0.86
Sat Flow, veh/h	1182	1199	653	1060	586	1172	157	5375	1502	1688	5494	49
Grp Volume(v), veh/h	71	0	261	143	0	141	40	2495	38	101	1465	803
Grp Sat Flow(s),veh/h/ln	1182	0	1851	1060	0	1758	157	1792	1502	1688	1792	1960
Q Serve(g_s), s	6.2	0.0	14.7	16.1	0.0	7.8	29.1	54.4	2.5	1.9	14.8	14.9
Cycle Q Clear(g_c), s	14.0	0.0	14.7	30.7	0.0	7.8	43.9	54.4	2.5	1.9	14.8	14.9
Prop In Lane	1.00		0.35	1.00		0.67	1.00		1.00	1.00		0.02
Lane Grp Cap(c), veh/h	286	0	474	202	0	450	123	2812	786	194	2323	1270
V/C Ratio(X)	0.25	0.00	0.55	0.71	0.00	0.31	0.33	0.89	0.05	0.52	0.63	0.63
Avail Cap(c_a), veh/h	286	0	474	202	0	450	123	2826	790	194	2332	1276
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.8	0.0	38.7	52.0	0.0	36.1	48.9	46.2	24.7	49.9	3.9	3.9
Incr Delay (d2), s/veh	2.1	0.0	4.6	18.9	0.0	1.8	0.1	0.4	0.0	9.6	0.6	1.0
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	0.0	7.3	5.4	0.0	3.6	1.2	26.3	0.9	3.3	3.2	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.8	0.0	43.2	71.0	0.0	37.9	49.0	46.5	24.7	59.5	4.5	4.9
LnGrp LOS	D	A	D	E	A	D	D	D	C	E	A	A
Approach Vol, veh/h		332			284			2573			2369	
Approach Delay, s/veh		43.4			54.6			46.3			7.0	
Approach LOS		D			D			D			A	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	83.7	36.3	15.0	68.7	36.3
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	16.9	32.7	3.9	56.4	16.7
Green Ext Time (p_c), s	34.6	0.0	0.1	6.4	1.5

Intersection Summary	
HCM 6th Ctrl Delay	29.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

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

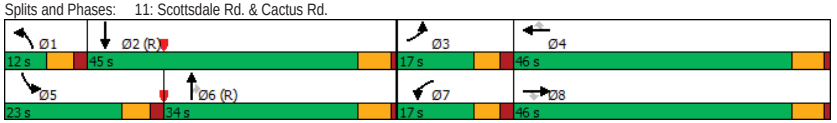
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	241	1443	500	250	824	644	163	1419	182	494	1508
Future Volume (vph)	241	1443	500	250	824	644	163	1419	182	494	1508
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	11.0	40.3	40.3	11.0	40.3	40.3	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.88	1.25	0.86	0.94	0.74	1.09	1.12	1.25	0.40	1.19	1.03
Control Delay	82.9	156.2	39.5	93.9	39.6	87.5	157.0	158.0	8.5	148.1	82.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	82.9	156.2	39.5	93.9	39.6	87.5	157.0	158.0	8.5	148.1	82.7
LOS	F	F	D	F	D	F	F	F	A	F	F
Approach Delay		121.4			65.4			142.5			98.0
Approach LOS		F			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.25		
Intersection Signal Delay: 107.3	Intersection LOS: F	
Intersection Capacity Utilization 105.8%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	241	1443	500	250	824	644	163	1419	182	494	1508	109
Future Volume (veh/h)	241	1443	500	250	824	644	163	1419	182	494	1508	109
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	262	1568	369	281	926	499	181	1577	130	549	1676	93
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	300	1256	504	300	1256	504	164	1268	354	464	1707	95
Arrive On Green	0.09	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.09	0.22	0.22
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5211	289
Grp Volume(v), veh/h	262	1568	369	281	926	499	181	1577	130	549	1152	617
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1917
Q Serve(g_s), s	9.5	40.3	26.0	10.2	26.2	39.7	6.0	28.3	8.7	17.0	38.4	38.4
Cycle Q Clear(g_c), s	9.5	40.3	26.0	10.2	26.2	39.7	6.0	28.3	8.7	17.0	38.4	38.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.15
Lane Grp Cap(c), veh/h	300	1256	504	300	1256	504	164	1268	354	464	1174	628
V/C Ratio(X)	0.87	1.25	0.73	0.94	0.74	0.99	1.11	1.24	0.37	1.18	0.98	0.98
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1268	354	464	1174	628
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	53.8	39.8	35.1	54.2	35.2	39.6	57.0	45.8	38.4	54.3	46.5	46.5
Incr Delay (d2), s/veh	23.4	118.5	5.4	35.5	2.3	37.2	101.5	116.7	2.9	97.3	17.9	26.0
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	4.9	38.9	10.2	5.7	12.2	19.6	4.8	26.2	3.5	13.5	20.6	23.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	77.2	158.3	40.5	89.6	37.5	76.9	158.5	162.5	41.3	151.6	64.4	72.5
LnGrp LOS	E	F	D	F	D	E	F	F	D	F	E	E
Approach Vol, veh/h		2199			1706			1888			2318	
Approach Delay, s/veh		128.9			57.6			153.8			87.2	
Approach LOS		F			E			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	45.0	17.0	46.0	23.0	34.0	17.0	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	40.4	11.5	41.7	19.0	30.3	12.2	42.3
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	107.8
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1529	0	0	754	0	0
Future Vol, veh/h	1529	0	0	754	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1699	0	0	838	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1699	0	2118	1699
Stage 1	-	-	-	-	1699	-
Stage 2	-	-	-	-	419	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	-	-	*49	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*731	-
Platoon blocked, %	-	-	2	-		2
Mov Cap-1 Maneuver	-	-	-	-	*49	-
Mov Cap-2 Maneuver	-	-	-	-	*~ -5	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*731	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	-

Notes

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B 04/23/2020

Intersection	
Int Delay, s/veh	3.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	64	0	0	0	60	2080	0	2	2182	32
Future Vol, veh/h	13	0	64	0	0	0	60	2080	0	2	2182	32
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	0	71	0	0	0	67	2311	0	2	2424	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3504	4891	1230	3419	4909	1156	2460	0	0	2311	0	0
Stage 1	2446	2446	-	2445	2445	-	-	-	-	-	-	-
Stage 2	1058	2445	-	974	2464	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*20	*0	*403	*27	*0	*425	*507	-	-	*535	-	-
Stage 1	*414	*394	-	*393	*388	-	-	-	-	-	-	-
Stage 2	*436	*388	-	*414	*394	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*18	*0	*403	*20	*0	*425	*507	-	-	*535	-	-
Mov Cap-2 Maneuver	*18	*0	-	*147	*151	-	-	-	-	-	-	-
Stage 1	*359	*392	-	*341	*337	-	-	-	-	-	-	-
Stage 2	*379	*337	-	*340	*392	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	178	0	0.4	0
HCM LOS	F	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 507	-	-	87	-	* 535	-	-
HCM Lane V/C Ratio	0.131	-	-	0.983	-	0.004	-	-
HCM Control Delay (s)	13.2	-	-	178	0	11.8	-	-
HCM Lane LOS	B	-	-	F	A	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	5.6	-	0	-	-

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C 04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	2141	0	0	2245
Future Vol, veh/h	0	0	2141	0	0	2245
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2379	0	0	2494

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1190	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	*403	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*403	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

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

14-ZN-2019
6/03/2020

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	66	56	0	0	0
Future Vol, veh/h	0	66	56	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	73	62	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	135	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	73	-
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	1541	-	-	-	859	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	859	1003
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	66	56	0	0	0
Future Vol, veh/h	0	66	56	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	73	62	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	135	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	73	-
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	1541	-	-	-	859	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	859	1003
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

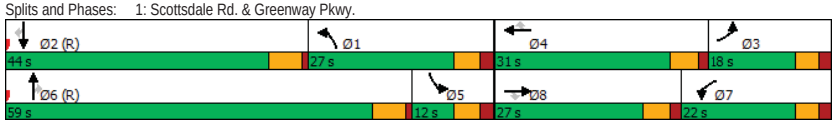
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	280	362	554	739	280	708	1639	124	126	1468	200
Future Volume (vph)	307	280	362	554	739	280	708	1639	124	126	1468	200
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	18.0	27.0	27.0	22.0	31.0	31.0	27.0	59.0	59.0	12.0	44.0	44.0
Total Split (%)	15.0%	22.5%	22.5%	18.3%	25.8%	25.8%	22.5%	49.2%	49.2%	10.0%	36.7%	36.7%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	12.9	19.0	19.0	19.2	25.3	25.3	21.0	53.3	53.3	6.0	38.3	38.3
Actuated g/C Ratio	0.11	0.16	0.16	0.16	0.21	0.21	0.18	0.44	0.44	0.05	0.32	0.32
v/c Ratio	1.06	0.57	0.97	1.10	0.97	0.63	1.34	0.74	0.18	0.85	0.94	0.36
Control Delay	116.1	50.2	56.4	116.1	72.8	23.0	199.2	21.5	1.8	96.8	52.1	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.1	50.2	56.4	116.1	72.8	23.0	199.2	21.5	1.8	96.8	52.1	7.8
LOS	F	D	E	F	E	C	F	C	A	F	D	A
Approach Delay		73.9			79.2			71.4			50.3	
Approach LOS		E			E			E			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 59 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.34			
Intersection Signal Delay: 67.9		Intersection LOS: E	
Intersection Capacity Utilization 95.7%		ICU Level of Service F	
Analysis Period (min) 15			

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	280	362	554	739	280	708	1639	124	126	1468	200
Future Volume (veh/h)	307	280	362	554	739	280	708	1639	124	126	1468	200
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	370	337	171	571	762	275	761	1762	0	138	1613	176
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	497	200	607	795	319	573	2387		164	1715	479
Arrive On Green	0.11	0.13	0.13	0.19	0.21	0.21	0.35	0.89	0.00	0.05	0.32	0.32
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	370	337	171	571	762	275	761	1762	0	138	1613	176
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	12.7	10.3	13.4	20.7	24.2	21.2	21.0	12.8	0.0	5.0	35.0	10.8
Cycle Q Clear(g_c), s	12.7	10.3	13.4	20.7	24.2	21.2	21.0	12.8	0.0	5.0	35.0	10.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	497	200	607	795	319	573	2387		164	1715	479
V/C Ratio(X)	1.07	0.68	0.86	0.94	0.96	0.86	1.33	0.74		0.84	0.94	0.37
Avail Cap(c_a), veh/h	346	670	269	607	795	319	573	2387		164	1715	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.64	0.64	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	49.6	50.9	48.2	46.7	45.6	39.0	4.4	0.0	56.5	39.7	31.5
Incr Delay (d2), s/veh	67.5	0.6	14.5	22.7	22.1	19.9	155.5	1.3	0.0	29.6	11.6	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	4.9	5.8	10.3	13.6	9.6	19.4	2.3	0.0	2.7	17.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	121.2	50.2	65.4	71.0	68.9	65.4	194.5	5.8	0.0	86.1	51.3	33.7
LnGrp LOS	F	D	E	E	E	E	F	A		F	D	C
Approach Vol, veh/h		878			1608			2523	A		1927	
Approach Delay, s/veh		83.1			69.0			62.7			52.2	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	44.0	18.0	31.0	12.0	59.0	27.5	21.5
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	21.0	38.3	12.7	* 26	6.0	53.3	16.7	* 22
Max Q Clear Time (g_c+I1), s	23.0	37.0	14.7	26.2	7.0	14.8	22.7	15.4
Green Ext Time (p_c), s	0.0	0.8	0.0	0.0	0.0	6.9	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay	63.8	
HCM 6th LOS	E	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	157	44	296	154	80	179	2003	52	2211	76
Future Volume (vph)	157	44	296	154	80	179	2003	52	2211	76
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.4	84.2	88.7	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	1.91	0.20	1.15	1.21	0.69	1.11	0.62	0.38	0.70	0.08
Control Delay	477.7	49.5	131.3	184.8	58.2	108.0	4.6	11.2	25.7	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	477.7	49.5	131.3	184.8	58.2	108.0	4.6	11.2	25.7	6.7
LOS	F	D	F	F	E	F	A	B	C	A
Approach Delay		233.4			124.8		13.0		24.8	
Approach LOS		F			F		B		C	

Intersection Summary

Cycle Length: 120
Actuated Cycle Length: 120
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green
Natural Cycle: 90
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 1.91
Intersection Signal Delay: 45.0 — Intersection LOS: D
Intersection Capacity Utilization 86.9% — ICU Level of Service E
Analysis Period (min) 15

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	44	296	154	80	59	179	2003	18	52	2211	76
Future Volume (veh/h)	157	44	296	154	80	59	179	2003	18	52	2211	76
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	176	49	221	192	100	69	206	2302	4	58	2484	74
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.87	0.87	0.87	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	246	188	168	136	94	221	3951	7	209	3583	1001
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.15	1.00	1.00	0.02	0.45	0.45
Sat Flow, veh/h	1152	1969	1502	1051	1085	749	1688	5541	10	1688	5375	1502
Grp Volume(v), veh/h	176	49	221	192	0	169	206	1489	817	58	2484	74
Grp Sat Flow(s),veh/h/ln	1152	1969	1502	1051	0	1834	1688	1792	1967	1688	1792	1502
Q Serve(g_s), s	4.3	2.7	15.0	12.3	0.0	10.7	7.6	0.0	0.0	1.3	44.5	3.4
Cycle Q Clear(g_c), s	15.0	2.7	15.0	15.0	0.0	10.7	7.6	0.0	0.0	1.3	44.5	3.4
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	246	188	168	0	229	221	2555	1403	209	3583	1001
V/C Ratio(X)	1.73	0.20	1.18	1.14	0.00	0.74	0.93	0.58	0.58	0.28	0.69	0.07
Avail Cap(c_a), veh/h	102	246	188	168	0	229	221	2555	1403	287	3583	1001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.13	0.13	0.13
Uniform Delay (d), s/veh	59.1	47.1	52.5	56.0	0.0	50.6	32.3	0.0	0.0	5.8	23.4	12.0
Incr Delay (d2), s/veh	366.4	0.4	121.6	113.3	0.0	11.8	7.1	0.1	0.2	0.1	0.1	0.0
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	13.4	1.3	12.0	10.4	0.0	5.6	4.2	0.0	0.1	0.4	19.8	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	425.5	47.5	174.1	169.4	0.0	62.4	39.4	0.1	0.2	5.9	23.5	12.0
LnGrp LOS	F	D	F	F	A	E	D	A	A	A	C	B
Approach Vol, veh/h		446			361			2512			2616	
Approach Delay, s/veh		259.4			119.3			3.3			22.8	
Approach LOS		F			F			A			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	86.0		21.0	7.4	91.6		21.0
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0
Max Q Clear Time (g_c+I1), s	9.6	46.5		17.0	3.3	2.0		17.0
Green Ext Time (p_c), s	0.0	27.2		0.0	0.0	40.2		0.0

Intersection Summary

HCM 6th Ctrl Delay 38.2
HCM 6th LOS D

Notes

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

14-ZN-2019
6/03/2020

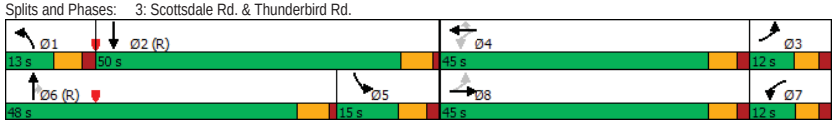
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	206	282	218	1088	286	329	1812	75	189	2012
Future Volume (vph)	206	282	218	1088	286	329	1812	75	189	2012
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	45.0	12.0	45.0	45.0	13.0	48.0	48.0	15.0	50.0
Total Split (%)	10.0%	37.5%	10.0%	37.5%	37.5%	10.8%	40.0%	40.0%	12.5%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	29.1	22.2	51.7	38.9	38.9	7.0	42.3	42.3	9.0	44.3
Actuated g/C Ratio	0.24	0.18	0.43	0.32	0.32	0.06	0.35	0.35	0.08	0.37
v/c Ratio	1.55	0.78	0.30	1.00	0.52	1.89	1.04	0.13	0.89	1.39
Control Delay	308.3	41.1	31.6	67.0	16.6	440.6	76.2	8.9	75.5	206.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	308.3	41.1	31.6	67.0	16.6	440.6	76.2	8.9	75.5	206.3
LOS	F	D	C	E	B	F	E	A	E	F
Approach Delay		115.3		53.1			128.1			196.6
Approach LOS		F		D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.89		
Intersection Signal Delay: 135.3	Intersection LOS: F	
Intersection Capacity Utilization 114.3%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	282	253	218	1088	286	329	1812	75	189	2012	347
Future Volume (veh/h)	206	282	253	218	1088	286	329	1812	75	189	2012	347
Initial Q (Qb), veh	0	0	0	12	25	10	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	1870
Adj Flow Rate, veh/h	231	317	149	242	1209	174	358	1970	44	217	2313	284
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	412	189	855	1213	487	191	1895	529	524	2197	263
Arrive On Green	0.05	0.17	0.17	0.21	0.32	0.32	0.02	0.12	0.12	0.21	0.60	0.60
Sat Flow, veh/h	1688	2488	1145	3274	3741	1502	3274	5375	1502	3274	4864	583
Grp Volume(v), veh/h	231	237	229	242	1209	174	358	1970	44	217	1689	908
Grp Sat Flow(s),veh/h/ln	1688	1870	1763	1637	1870	1502	1637	1792	1502	1637	1792	1864
Q Serve(g_s), s	6.4	14.5	15.0	1.2	38.7	10.6	7.0	42.3	3.1	6.9	54.2	54.2
Cycle Q Clear(g_c), s	6.4	14.5	15.0	1.2	38.7	10.6	7.0	42.3	3.1	6.9	54.2	54.2
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	150	309	292	855	1213	487	191	1895	529	524	1618	842
V/C Ratio(X)	1.54	0.76	0.79	0.28	1.00	0.36	1.87	1.04	0.08	0.41	1.04	1.08
Avail Cap(c_a), veh/h	150	606	571	855	1213	487	191	1895	529	524	1618	842
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	0.53	0.53	0.53
Uniform Delay (d), s/veh	55.5	47.8	48.0	37.7	40.6	32.2	58.8	53.0	35.7	42.4	24.0	24.0
Incr Delay (d2), s/veh	273.4	3.9	4.7	0.0	7.1	0.0	412.8	31.9	0.3	0.3	29.1	47.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	2.0	72.9	4.7	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	7.1	7.0	3.8	31.1	5.8	14.0	26.0	1.2	2.7	25.7	30.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	328.9	51.8	52.7	39.7	120.5	37.0	471.7	84.9	36.0	42.7	53.1	71.0
LnGrp LOS	F	D	D	D	F	D	F	F	D	D	F	F
Approach Vol, veh/h		697			1625			2372			2814	
Approach Delay, s/veh		144.0			99.5			142.3			58.1	
Approach LOS		F			F			F			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	60.5	12.0	45.0	25.5	48.0	31.1	25.9
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	9.0	42.3	* 6.7	* 39
Max Q Clear Time (g_c+I1), s	9.0	56.2	8.4	40.7	8.9	44.3	3.2	17.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.9

Intersection Summary		
HCM 6th Ctrl Delay	101.6	
HCM 6th LOS	F	

Notes

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

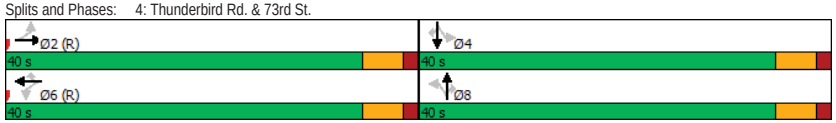
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	530	1	1498	257	10	2	5	292	2	84
Future Volume (vph)	10	530	1	1498	257	10	2	5	292	2	84
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.12	0.36	0.00	1.12	0.38	0.02	0.00	0.01	0.68	0.00	0.17
Control Delay	18.1	16.0	13.0	88.8	3.3	13.2	13.0	0.0	25.4	13.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	16.0	13.0	88.8	3.3	13.2	13.0	0.0	25.4	13.0	10.7
LOS	B	B	B	F	A	B	B	A	C	B	B
Approach Delay		16.1		76.2			9.3			22.1	
Approach LOS		B		E			A			C	

Intersection Summary		
Cycle Length: 80		
Actuated Cycle Length: 80		
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green		
Natural Cycle: 100		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.12		
Intersection Signal Delay: 56.5	Intersection LOS: E	
Intersection Capacity Utilization 72.2%	ICU Level of Service C	
Analysis Period (min) 15		

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	530	6	1	1498	257	10	2	5	292	2	84
Future Volume (veh/h)	10	530	6	1	1498	257	10	2	5	292	2	84
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	11	564	2	1	1805	214	10	2	5	389	3	103
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	1.00	1.00	1.00	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1649	6	356	1613	648	615	849	648	665	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	200	3823	14	800	3741	1502	1220	1969	1502	1334	1969	1502
Grp Volume(v), veh/h	11	276	290	1	1805	214	10	2	5	389	3	103
Grp Sat Flow(s),veh/h/ln	200	1870	1966	800	1870	1502	1220	1969	1502	1334	1969	1502
Q Serve(g_s), s	0.0	7.9	7.9	0.1	34.5	7.6	0.4	0.0	0.2	18.7	0.1	3.4
Cycle Q Clear(g_c), s	34.5	7.9	7.9	7.9	34.5	7.6	0.4	0.0	0.2	18.8	0.1	3.4
Prop In Lane	1.00		0.01	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	807	848	356	1613	648	615	849	648	665	849	648
V/C Ratio(X)	0.12	0.34	0.34	0.00	1.12	0.33	0.02	0.00	0.01	0.59	0.00	0.16
Avail Cap(c_a), veh/h	90	807	848	356	1613	648	615	849	648	665	849	648
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)	0.58	0.58	0.58	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	15.2	15.2	17.8	22.7	15.1	13.1	13.0	13.0	18.3	13.0	13.9
Incr Delay (d2), s/veh	1.6	0.7	0.6	0.0	62.5	1.4	0.0	0.0	0.0	3.7	0.0	0.5
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	0.3	3.3	3.5	0.0	27.8	2.7	0.1	0.0	0.1	6.1	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.6	15.8	15.8	17.8	85.2	16.5	13.1	13.0	13.0	22.0	13.0	14.4
LnGrp LOS	D	B	B	B	F	B	B	B	B	C	B	B
Approach Vol, veh/h		577			2020			17			495	
Approach Delay, s/veh		16.3			77.9			13.1			20.4	
Approach LOS		B			E			B			C	

Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	40.0		40.0		40.0		40.0					
Change Period (Y+Rc), s	5.5		5.5		5.5		5.5					
Max Green Setting (Gmax), s	34.5		34.5		34.5		34.5					
Max Q Clear Time (g_c+I1), s	36.5		20.8		36.5		2.4					
Green Ext Time (p_c), s	0.0		1.4		0.0		0.0					

Intersection Summary		
HCM 6th Ctrl Delay	57.0	
HCM 6th LOS	E	

Notes

User approved pedestrian interval to be less than phase max green.

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	843	6	1722	5	0	
Future Volume (vph)	843	6	1722	5	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	132.2	132.2	132.2		20.0	
Actuated g/C Ratio	0.91	0.91	0.91		0.14	
v/c Ratio	0.53	0.02	0.60		0.05	
Control Delay	4.8	3.2	4.7		9.0	
Queue Delay	0.0	0.0	0.1		0.0	
Total Delay	4.8	3.2	4.7		9.0	
LOS	A	A	A		A	
Approach Delay	4.8		4.7		9.0	
Approach LOS	A		A		A	

Intersection Summary	
Cycle Length: 145	
Actuated Cycle Length: 145	
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green	
Natural Cycle: 125	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 0.60	
Intersection Signal Delay: 4.8	Intersection LOS: A
Intersection Capacity Utilization 101.7%	ICU Level of Service G
Analysis Period (min) 15	

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	843	6	6	1722	0	5	0	1	0	0	0
Future Volume (veh/h)	0	843	6	6	1722	0	5	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	947	4	7	2026	0	10	0	0	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1707	7	470	3260	0	118	0	0	0	90	0
Arrive On Green	0.00	0.87	0.87	0.87	0.87	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1959	8	559	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	951	7	2026	0	10	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1967	559	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	17.4	0.5	22.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	17.4	17.9	22.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1715	470	3260	0	118	0	0	0	90	0
V/C Ratio(X)	0.00	0.00	0.55	0.01	0.62	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1715	470	3260	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.49	0.49	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	2.3	4.5	2.6	0.0	66.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	1.3	0.0	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	4.8	0.1	5.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	3.6	4.6	3.1	0.0	66.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	A	A	A
Approach Vol, veh/h		951			2033			10			0	
Approach Delay, s/veh		3.6			3.1			66.8			0.0	
Approach LOS		A			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		132.4		12.6		132.4		12.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		19.4		0.0		24.0		2.9				
Green Ext Time (p_c), s		10.6		0.0		36.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	3.4	
HCM 6th LOS	A	

14-ZN-2019
6/03/2020

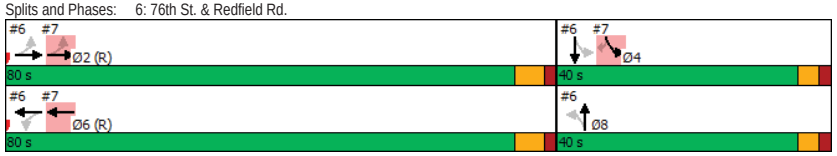
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	920	32	1798	171	0	6	0
Future Volume (vph)	6	920	32	1798	171	0	6	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0	11.0
Total Split (s)	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	78.5	78.5	78.5	78.5	30.5	30.5		30.5
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.25	0.25		0.25
v/c Ratio	0.10	0.86	0.27	0.83	0.64	0.11		0.08
Control Delay	13.8	26.5	9.5	13.4	48.1	0.4		14.2
Queue Delay	0.0	48.1	0.0	0.2	0.0	0.0		0.0
Total Delay	13.8	74.5	9.5	13.7	48.1	0.4		14.2
LOS	B	E	A	B	D	A		B
Approach Delay		74.2		13.6		38.6		14.2
Approach LOS		E		B		D		B

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 34.8		Intersection LOS: C	
Intersection Capacity Utilization 77.7%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	920	65	32	1798	1	171	0	42	6	0	17
Future Volume (vph)	6	920	65	32	1798	1	171	0	42	6	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1844		1770	3539		1770	1583			1656	
Flt Permitted	0.05	1.00		0.10	1.00		0.73	1.00			0.95	
Satd. Flow (perm)	95	1844		195	3539		1369	1583			1588	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.77	0.77	0.77	0.67	0.67	0.67
Adj. Flow (vph)	6	968	68	34	1913	1	222	0	55	9	0	25
RTOR Reduction (vph)	0	2	0	0	0	0	0	41	0	0	20	0
Lane Group Flow (vph)	6	1034	0	34	1914	0	222	14	0	0	14	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	78.5	78.5		78.5	78.5		30.5	30.5			30.5	
Effective Green, g (s)	78.5	78.5		78.5	78.5		30.5	30.5			30.5	
Actuated g/C Ratio	0.65	0.65		0.65	0.65		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	62	1206		127	2315		347	402			403	
v/s Ratio Prot		c0.56			0.54			0.01				
v/s Ratio Perm	0.06			0.17			c0.16				0.01	
v/c Ratio	0.10	0.86		0.27	0.83		0.64	0.03			0.03	
Uniform Delay, d1	7.7	16.3		8.7	15.6		39.9	33.7			33.7	
Progression Factor	1.00	1.00		0.51	0.64		1.00	1.00			1.00	
Incremental Delay, d2	3.1	8.0		3.5	2.5		3.9	0.0			0.0	
Delay (s)	10.7	24.3		7.9	12.4		43.7	33.7			33.7	
Level of Service	B	C		A	B		D	C			C	
Approach Delay (s)		24.3			12.3			41.7			33.7	
Approach LOS		C			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	18.8	HCM 2000 Level of Service		B	
HCM 2000 Volume to Capacity ratio	0.80				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)		11.0	
Intersection Capacity Utilization	77.7%	ICU Level of Service		D	
Analysis Period (min)	15				

c Critical Lane Group

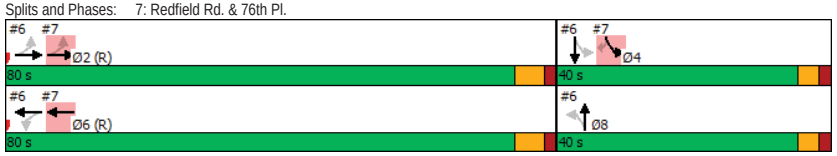
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	71	900	1500	6	332	
Future Volume (vph)	71	900	1500	6	332	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	78.5	78.5	78.5	30.5	30.5	
Actuated g/C Ratio	0.65	0.65	0.65	0.25	0.25	
v/c Ratio	0.67	0.79	0.70	0.02	0.88	
Control Delay	23.8	6.3	14.8	30.8	61.5	
Queue Delay	0.0	1.6	0.3	0.0	55.8	
Total Delay	23.8	7.9	15.1	30.8	117.3	
LOS	C	A	B	C	F	
Approach Delay		9.1	15.1	115.7		
Approach LOS		A	B	F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 75			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.88			
Intersection Signal Delay: 25.8		Intersection LOS: C	
Intersection Capacity Utilization 71.6%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	71	900	1500	14	6	332
Future Volume (vph)	71	900	1500	14	6	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3534		1770	1583
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	175	1863	3534		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.88	0.88
Adj. Flow (vph)	76	957	1596	15	7	377
RTOR Reduction (vph)	0	0	0	0	0	25
Lane Group Flow (vph)	76	957	1611	0	7	352
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	78.5	78.5	78.5		30.5	30.5
Effective Green, g (s)	78.5	78.5	78.5		30.5	30.5
Actuated g/C Ratio	0.65	0.65	0.65		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	114	1218	2311		449	402
v/s Ratio Prot		c0.51	0.46		0.00	
v/s Ratio Perm	0.44					c0.22
v/c Ratio	0.67	0.79	0.70		0.02	0.88
Uniform Delay, d1	12.7	14.8	13.2		33.5	42.9
Progression Factor	0.19	0.19	0.96		1.00	1.00
Incremental Delay, d2	16.0	3.0	1.1		0.0	18.8
Delay (s)	18.5	5.7	13.8		33.5	61.8
Level of Service	B	A	B		C	E
Approach Delay (s)		6.6	13.8		61.2	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	17.4	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.81		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	71.6%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

14-ZN-2019
6/03/2020

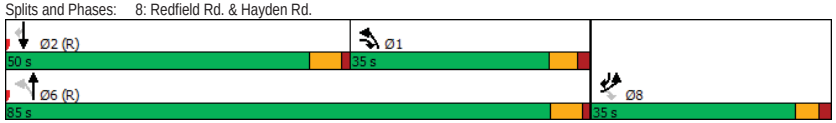
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	538	700	348	839	1308	927
Future Volume (vph)	538	700	348	839	1308	927
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.70	0.92	0.79	0.36	1.04	0.95
Control Delay	33.8	30.1	50.2	9.6	72.7	34.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.8	30.1	50.2	9.6	72.7	34.1
LOS	C	C	D	A	E	C
Approach Delay	31.7			21.5	56.7	
Approach LOS	C			C	E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.04		
Intersection Signal Delay: 41.3	Intersection LOS: D	
Intersection Capacity Utilization 90.4%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	538	700	348	839	1308	927
Future Volume (veh/h)	538	700	348	839	1308	927
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	566	663	366	883	1422	878
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	685	735	533	2606	1375	866
Arrive On Green	0.21	0.21	0.28	0.70	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	566	663	366	883	1422	878
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	19.8	14.9	18.5	11.2	44.1	44.1
Cycle Q Clear(g_c), s	19.8	14.9	18.5	11.2	44.1	44.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	685	735	533	2606	1375	866
V/C Ratio(X)	0.83	0.90	0.69	0.34	1.03	1.01
Avail Cap(c_a), veh/h	810	792	533	2606	1375	866
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	45.4	28.0	36.2	7.2	37.9	20.1
Incr Delay (d2), s/veh	6.1	13.0	3.7	0.4	33.6	34.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	5.4	9.9	4.3	26.2	34.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	51.5	41.1	39.9	7.6	71.6	54.2
LnGrp LOS	D	D	D	A	F	F
Approach Vol, veh/h	1229			1249	2300	
Approach Delay, s/veh	45.9			17.1	64.9	
Approach LOS	D			B	E	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	39.6	50.0			89.6	30.4
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	20.5	46.1			13.2	21.8
Green Ext Time (p_c), s	0.8	0.0			8.0	3.3

Intersection Summary		
HCM 6th Ctrl Delay	47.5	
HCM 6th LOS	D	

Notes

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

14-ZN-2019
6/03/2020

HCM 6th TWSC
9: Scottsdale Rd. & Sutton Dr. 04/23/2020

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	0	145	14	0	60	15	2246	18	42	2357	39
Future Vol, veh/h	49	0	145	14	0	60	15	2246	18	42	2357	39
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	86	86	86	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	83	0	246	16	0	70	16	2364	19	45	2534	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3623	5060	1288	3510	5072	1192	2576	0	0	2383	0	0
Stage 1	2645	2645	-	2406	2406	-	-	-	-	-	-	-
Stage 2	978	2415	-	1104	2666	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	-	-	*359	-	-	*381	*452	-	-	*479	-	-
Stage 1	*369	*351	-	*391	*372	-	-	-	-	-	-	-
Stage 2	*391	*372	-	*369	*351	-	-	-	-	-	-	-
Platoon blocked, %	2	2	1	2	2	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	-	-	*359	-	-	*381	*452	-	-	*479	-	-
Mov Cap-2 Maneuver	*138	*144	-	*65	*149	-	-	-	-	-	-	-
Stage 1	*356	*318	-	*378	*359	-	-	-	-	-	-	-
Stage 2	*308	*359	-	*105	*318	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	0.2
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 452	-	-	- -	* 479	-	-
HCM Lane V/C Ratio	0.035	-	-	- -	0.094	-	-
HCM Control Delay (s)	13.3	-	-	- -	13.3	-	-
HCM Lane LOS	B	-	-	- -	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	- -	0.3	-	-

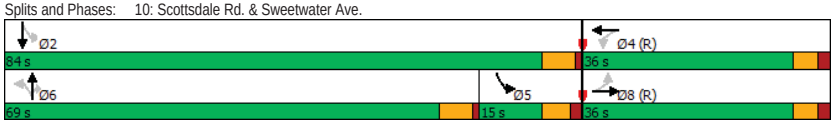
Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
10: Scottsdale Rd. & Sweetwater Ave. 04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	35	30	81	126	68	2201	61	101	2284
Future Volume (vph)	35	30	81	126	68	2201	61	101	2284
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.23	0.18	0.26	0.55	1.24	0.83	0.08	0.56	0.70
Control Delay	39.6	33.3	38.6	36.8	155.6	30.6	5.9	53.1	30.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.6	33.3	38.6	36.8	155.6	30.6	5.9	53.1	30.9
LOS	D	C	D	D	F	C	A	D	C
Approach Delay		35.4		37.2		33.6			31.8
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 33.0	Intersection LOS: C
Intersection Capacity Utilization 91.3%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	30	43	81	126	140	68	2201	61	101	2284	75
Future Volume (veh/h)	35	30	43	81	126	140	68	2201	61	101	2284	75
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	40	34	26	82	127	121	72	2341	49	104	2355	72
Peak Hour Factor	0.88	0.88	0.88	0.99	0.99	0.99	0.94	0.94	0.94	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	262	200	350	235	224	93	2826	790	200	3488	106
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.17	0.17	0.17	0.08	0.65	0.65
Sat Flow, veh/h	1072	1035	791	1272	927	883	134	5375	1502	1688	5360	163
Grp Volume(v), veh/h	40	0	60	82	0	248	72	2341	49	104	1571	856
Grp Sat Flow(s),veh/h/ln	1072	0	1826	1272	0	1810	134	1792	1502	1688	1792	1939
Q Serve(g_s), s	4.0	0.0	3.0	6.4	0.0	14.2	30.0	50.4	3.3	1.8	32.7	33.1
Cycle Q Clear(g_c), s	18.3	0.0	3.0	9.4	0.0	14.2	63.1	50.4	3.3	1.8	32.7	33.1
Prop In Lane	1.00		0.43	1.00		0.49	1.00		1.00	1.00		0.08
Lane Grp Cap(c), veh/h	205	0	463	350	0	458	93	2826	790	200	2332	1262
V/C Ratio(X)	0.20	0.00	0.13	0.23	0.00	0.54	0.77	0.83	0.06	0.52	0.67	0.68
Avail Cap(c_a), veh/h	205	0	463	350	0	458	93	2826	790	200	2332	1262
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.7	0.0	34.6	38.2	0.0	38.8	74.2	44.4	24.9	50.8	13.0	13.1
Incr Delay (d2), s/veh	2.1	0.0	0.6	1.6	0.0	4.5	3.6	0.2	0.0	9.3	0.8	1.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.0	1.4	2.2	0.0	6.9	2.4	24.3	1.2	3.4	12.5	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.8	0.0	35.2	39.8	0.0	43.3	77.8	44.6	24.9	60.1	13.8	14.6
LnGrp LOS	D	A	D	D	A	D	E	D	C	E	B	B
Approach Vol, veh/h		100			330			2462			2531	
Approach Delay, s/veh		40.6			42.4			45.1			16.0	
Approach LOS		D			D			D			B	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	84.0	36.0	15.0	69.0	36.0
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	35.1	16.2	3.8	65.1	20.3
Green Ext Time (p_c), s	30.7	1.5	0.1	0.0	0.3

Intersection Summary	
HCM 6th Ctrl Delay	31.3
HCM 6th LOS	C

Notes

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

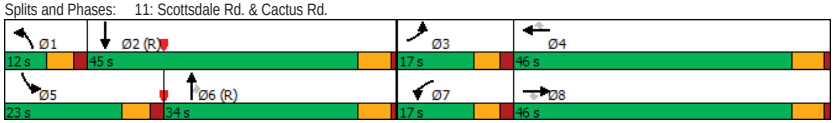
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	134	889	218	182	1354	361	604	1665	273	622	1589
Future Volume (vph)	134	889	218	182	1354	361	604	1665	273	622	1589
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	17.0	46.0	46.0	17.0	46.0	46.0	12.0	34.0	34.0	23.0	45.0
Total Split (%)	14.2%	38.3%	38.3%	14.2%	38.3%	38.3%	10.0%	28.3%	28.3%	19.2%	37.5%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	9.9	40.8	40.8	10.5	41.4	41.4	6.0	28.3	28.3	17.0	39.3
Actuated g/C Ratio	0.08	0.34	0.34	0.09	0.34	0.34	0.05	0.24	0.24	0.14	0.33
v/c Ratio	0.53	0.74	0.36	0.67	1.10	0.54	4.06	1.43	0.58	1.42	1.13
Control Delay	60.0	39.4	8.5	64.8	93.5	12.5	1404.2	234.9	17.4	237.6	116.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	39.4	8.5	64.8	93.5	12.5	1404.2	234.9	17.4	237.6	116.7
LOS	E	D	A	E	F	B	F	F	B	F	F
Approach Delay		36.2			75.3			489.5			147.0
Approach LOS		D			E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 109 (91%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 4.06		
Intersection Signal Delay: 223.2	Intersection LOS: F	
Intersection Capacity Utilization 112.3%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	889	218	182	1354	361	604	1665	273	622	1589	272
Future Volume (veh/h)	134	889	218	182	1354	361	604	1665	273	622	1589	272
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	141	936	71	190	1410	157	657	1810	226	655	1673	260
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	1200	482	244	1256	504	164	1440	402	464	1688	261
Arrive On Green	0.06	0.32	0.32	0.07	0.34	0.34	0.05	0.27	0.27	0.09	0.24	0.24
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4696	726
Grp Volume(v), veh/h	141	936	71	190	1410	157	657	1810	226	655	1275	658
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1838
Q Serve(g_s), s	5.1	27.2	4.0	6.8	40.3	9.3	6.0	32.2	15.6	17.0	42.5	42.9
Cycle Q Clear(g_c), s	5.1	27.2	4.0	6.8	40.3	9.3	6.0	32.2	15.6	17.0	42.5	42.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	195	1200	482	244	1256	504	164	1440	402	464	1288	661
V/C Ratio(X)	0.72	0.78	0.15	0.78	1.12	0.31	4.01	1.26	0.56	1.41	0.99	1.00
Avail Cap(c_a), veh/h	300	1256	504	300	1256	504	164	1440	402	464	1288	661
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Uniform Delay (d), s/veh	55.5	36.9	29.1	54.5	39.8	29.6	57.0	43.9	37.9	54.3	45.3	45.5
Incr Delay (d2), s/veh	5.0	3.1	0.1	10.0	66.0	0.3	1370.6	121.4	5.6	194.0	18.1	27.7
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	2.2	12.9	1.5	3.2	29.7	3.4	33.6	30.3	6.3	19.7	22.8	25.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.5	40.0	29.2	64.5	105.9	29.9	1427.6	165.4	43.4	248.3	63.4	73.2
LnGrp LOS	E	D	C	E	F	C	F	F	D	F	E	E
Approach Vol, veh/h		1148			1757			2693			2588	
Approach Delay, s/veh		41.8			94.6			463.1			112.7	
Approach LOS		D			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.0	48.9	13.1	46.0	23.0	37.9	15.0	44.2
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	6.0	39.3	11.0	40.3	17.0	28.3	11.0	40.3
Max Q Clear Time (g_c+I1), s	8.0	44.9	7.1	42.3	19.0	34.2	8.8	29.2
Green Ext Time (p_c), s	0.0	0.0	0.1	0.0	0.0	0.0	0.1	5.1

Intersection Summary	
HCM 6th Ctrl Delay	214.2
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	827	0	0	1756	0	0
Future Vol, veh/h	827	0	0	1756	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	919	0	0	1951	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	919	0	1895	919
Stage 1	-	-	-	-	919	-
Stage 2	-	-	-	-	976	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*610	-	*69	*407
Stage 1	-	-	-	-	*384	-
Stage 2	-	-	-	-	*324	-
Platoon blocked, %	-	-	1	-		1
Mov Cap-1 Maneuver	-	-	*610	-	*69	*407
Mov Cap-2 Maneuver	-	-	-	-	*243	-
Stage 1	-	-	-	-	*384	-
Stage 2	-	-	-	-	*324	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	* 610	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B 04/23/2020

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	1	0	24	0	0	2	51	2218	0	1	2466	16
Future Vol, veh/h	1	0	24	0	0	2	51	2218	0	1	2466	16
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	27	0	0	2	57	2464	0	1	2740	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3851	5329	1379	3676	5338	1232	2758	0	0	2464	0	0
Stage 1	2751	2751	-	2578	2578	-	-	-	-	-	-	-
Stage 2	1100	2578	-	1098	2760	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*7	*0	*337	*14	*0	*381	*424	-	-	*479	-	-
Stage 1	*346	*329	-	*391	*372	-	-	-	-	-	-	-
Stage 2	*391	*372	-	*346	*329	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*7	*0	*337	*12	*0	*381	*424	-	-	*479	-	-
Mov Cap-2 Maneuver	*7	*0	-	*140	*134	-	-	-	-	-	-	-
Stage 1	*300	*328	-	*339	*322	-	-	-	-	-	-	-
Stage 2	*337	*322	-	*318	*328	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	45.1	14.5	0.3	0
HCM LOS	E	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 424	-	-	117	381	* 479	-	-
HCM Lane V/C Ratio	0.134	-	-	0.237	0.006	0.002	-	-
HCM Control Delay (s)	14.8	-	-	45.1	14.5	12.5	-	-
HCM Lane LOS	B	-	-	E	B	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	0.9	0	0	-	-

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C 04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	2269	0	0	2490
Future Vol, veh/h	0	0	2269	0	0	2490
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	2521	0	0	2767

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1261	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	*381	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*381	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

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

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

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

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	60	74	0	0	0
Future Vol, veh/h	0	60	74	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	67	82	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	82	0	-	0	149	82
Stage 1	-	-	-	-	82	-
Stage 2	-	-	-	-	67	-
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	1515	-	-	-	843	978
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	956	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1515	-	-	-	843	978
Mov Cap-2 Maneuver	-	-	-	-	843	-
Stage 1	-	-	-	-	941	-
Stage 2	-	-	-	-	956	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1515	-	-	-	-
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	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	66	56	0	0	0
Future Vol, veh/h	0	66	56	0	0	0
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	73	62	0	0	0

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	135	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	73	-
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	1541	-	-	-	859	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	859	1003
Mov Cap-2 Maneuver	-	-	-	-	859	-
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	950	-

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

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	-	0
HCM Lane LOS	A	-	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	-

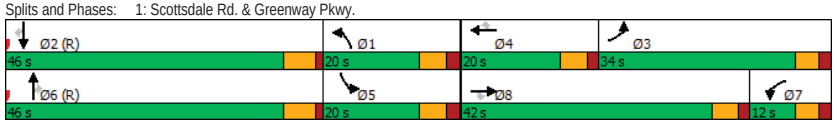
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	604	781	665	124	84	41	323	1415	278	244	1442	130
Future Volume (vph)	604	781	665	124	84	41	323	1415	278	244	1442	130
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	34.0	42.0	42.0	12.0	20.0	20.0	20.0	46.0	46.0	20.0	46.0	46.0
Total Split (%)	28.3%	35.0%	35.0%	10.0%	16.7%	16.7%	16.7%	38.3%	38.3%	16.7%	38.3%	38.3%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	36.0	36.6	36.6	6.7	7.3	7.3	13.9	40.3	40.3	13.9	40.3	40.3
Actuated g/C Ratio	0.30	0.30	0.30	0.06	0.06	0.06	0.12	0.34	0.34	0.12	0.34	0.34
v/c Ratio	0.67	0.75	1.14	0.74	0.40	0.17	0.90	0.83	0.47	0.67	0.83	0.22
Control Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.0	34.4	16.4	60.4	41.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.0	34.4	16.4	60.4	41.4	2.4
LOS	D	D	F	E	E	A	F	C	B	E	D	A
Approach Delay		62.4			59.9			39.9			41.2	
Approach LOS		E			E			D			D	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 80 (67%), Referenced to phase 2:SBT and 6:NBT, Start of Green			
Natural Cycle: 145			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.14			
Intersection Signal Delay: 48.8		Intersection LOS: D	
Intersection Capacity Utilization 87.8%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	604	781	665	124	84	41	323	1415	278	244	1442	130
Future Volume (veh/h)	604	781	665	124	84	41	323	1415	278	244	1442	130
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	657	849	484	133	90	29	340	1489	0	252	1487	93
Peak Hour Factor	0.92	0.92	0.92	0.93	0.93	0.93	0.95	0.95	0.95	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	988	1138	457	183	218	88	382	1805		382	1805	504
Arrive On Green	0.30	0.30	0.30	0.06	0.06	0.06	0.04	0.11	0.00	0.12	0.34	0.34
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	657	849	484	133	90	29	340	1489	0	252	1487	93
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	21.0	24.5	36.5	4.8	2.8	2.2	12.4	32.5	0.0	8.8	30.5	5.3
Cycle Q Clear(g_c), s	21.0	24.5	36.5	4.8	2.8	2.2	12.4	32.5	0.0	8.8	30.5	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	988	1138	457	183	218	88	382	1805		382	1805	504
V/C Ratio(X)	0.67	0.75	1.06	0.73	0.41	0.33	0.89	0.82		0.66	0.82	0.18
Avail Cap(c_a), veh/h	988	1138	457	183	452	181	382	1805		382	1805	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.76	0.76	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.6	37.6	41.7	55.8	54.5	54.3	56.9	49.9	0.0	50.7	36.6	28.2
Incr Delay (d2), s/veh	1.4	2.4	58.8	12.0	0.5	0.8	17.2	3.4	0.0	3.3	4.4	0.8
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	8.6	11.5	20.8	2.3	1.3	0.9	6.4	16.2	0.0	3.8	13.9	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.0	40.0	100.6	67.7	55.0	55.1	74.1	53.3	0.0	54.1	41.0	29.0
LnGrp LOS	D	D	F	E	D	E	E	D		D	D	C
Approach Vol, veh/h		1990			252			1829	A		1832	
Approach Delay, s/veh		54.1			61.7			57.2			42.2	
Approach LOS		D			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	20.0	46.0	41.5	12.5	20.0	46.0	12.0	42.0
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	14.0	40.3	28.7	* 15	14.0	40.3	6.7	* 37
Max Q Clear Time (g_c+I1), s	14.4	32.5	23.0	4.8	10.8	34.5	6.8	38.5
Green Ext Time (p_c), s	0.0	3.3	0.8	0.1	0.2	2.7	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay	51.7	
HCM 6th LOS	D	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	61	35	287	42	15	249	1887	46	1731	30
Future Volume (vph)	61	35	287	42	15	249	1887	46	1731	30
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.6	84.4	88.5	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	0.43	0.16	1.07	0.29	0.15	1.34	0.61	0.34	0.54	0.03
Control Delay	57.6	48.8	101.6	52.9	28.9	196.2	6.2	22.1	12.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	48.8	101.6	52.9	28.9	196.2	6.2	22.1	12.2	0.2
LOS	E	D	F	D	C	F	A	C	B	A
Approach Delay		89.8			42.6		27.7		12.3	
Approach LOS		F			D		C		B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.34		
Intersection Signal Delay: 27.1	Intersection LOS: C	
Intersection Capacity Utilization 73.9%	ICU Level of Service D	
Analysis Period (min) 15		

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	35	287	42	15	17	249	1887	61	46	1731	30
Future Volume (veh/h)	61	35	287	42	15	17	249	1887	61	46	1731	30
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	69	39	215	46	16	15	293	2220	54	51	1923	22
Peak Hour Factor	0.89	0.89	0.89	0.91	0.91	0.91	0.85	0.85	0.85	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	246	188	174	117	110	290	3856	94	210	3583	1001
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.15	1.00	1.00	0.03	0.67	0.67
Sat Flow, veh/h	1306	1969	1502	1066	935	876	1688	5397	131	1688	5375	1502
Grp Volume(v), veh/h	69	39	215	46	0	31	293	1472	802	51	1923	22
Grp Sat Flow(s),veh/h/ln	1306	1969	1502	1066	0	1811	1688	1792	1945	1688	1792	1502
Q Serve(g_s), s	6.0	2.1	15.0	4.8	0.0	1.8	9.0	0.0	0.0	1.1	22.3	0.6
Cycle Q Clear(g_c), s	7.8	2.1	15.0	7.0	0.0	1.8	9.0	0.0	0.0	1.1	22.3	0.6
Prop In Lane	1.00		1.00	1.00		0.48	1.00		0.07	1.00		1.00
Lane Grp Cap(c), veh/h	203	246	188	174	0	226	290	2560	1390	210	3583	1001
V/C Ratio(X)	0.34	0.16	1.15	0.26	0.00	0.14	1.01	0.57	0.58	0.24	0.54	0.02
Avail Cap(c_a), veh/h	203	246	188	174	0	226	290	2560	1390	290	3583	1001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.28	0.28	0.28
Uniform Delay (d), s/veh	50.2	46.9	52.5	50.0	0.0	46.7	21.8	0.0	0.0	5.8	10.4	6.8
Incr Delay (d2), s/veh	1.0	0.3	110.3	0.8	0.0	0.3	18.3	0.1	0.2	0.2	0.2	0.0
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	1.1	11.4	1.3	0.0	0.8	6.8	0.0	0.1	0.4	8.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.2	47.2	162.8	50.8	0.0	47.0	40.2	0.1	0.2	6.0	10.5	6.8
LnGrp LOS	D	D	F	D	A	D	F	A	A	A	B	A
Approach Vol, veh/h		323			77			2567			1996	
Approach Delay, s/veh		125.0			49.3			4.7			10.4	
Approach LOS		F			D			A			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	13.0	86.0		21.0	7.3	91.7		21.0
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0
Max Q Clear Time (g_c+I1), s	11.0	24.3		9.0	3.1	2.0		17.0
Green Ext Time (p_c), s	0.0	26.8		0.1	0.0	39.2		0.0

Intersection Summary		
HCM 6th Ctrl Delay	15.5	
HCM 6th LOS	B	

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

14-ZN-2019
6/03/2020

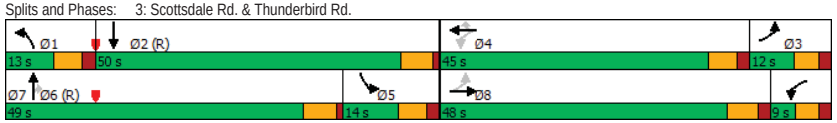
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	386	1030	158	233	183	132	1773	232	339	1654
Future Volume (vph)	386	1030	158	233	183	132	1773	232	339	1654
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	3.7	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	9.0	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	12.0	48.0	9.0	45.0	45.0	13.0	49.0	49.0	14.0	50.0
Total Split (%)	10.0%	40.0%	7.5%	37.5%	37.5%	10.8%	40.8%	40.8%	11.7%	41.7%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	51.4	41.9	19.2	14.7	14.7	7.0	43.3	43.3	8.0	44.3
Actuated g/C Ratio	0.43	0.35	0.16	0.12	0.12	0.06	0.36	0.36	0.07	0.37
v/c Ratio	0.76	1.34	0.83	0.59	0.61	0.86	1.13	0.46	1.69	0.95
Control Delay	43.0	189.4	60.3	54.6	17.2	68.1	106.1	23.3	358.3	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	189.4	60.3	54.6	17.2	68.1	106.1	23.3	358.3	42.0
LOS	D	F	E	D	B	E	F	C	F	D
Approach Delay		159.6		44.3			94.7			93.6
Approach LOS		F		D			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.69		
Intersection Signal Delay: 108.3	Intersection LOS: F	
Intersection Capacity Utilization 108.5%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	386	1030	482	158	233	183	132	1773	232	339	1654	86
Future Volume (veh/h)	386	1030	482	158	233	183	132	1773	232	339	1654	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	1870
Adj Flow Rate, veh/h	439	1170	412	182	268	141	163	2189	200	365	1778	70
Peak Hour Factor	0.88	0.88	0.88	0.87	0.87	0.87	0.81	0.81	0.81	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	527	953	328	221	471	189	191	1939	542	767	2834	111
Arrive On Green	0.25	0.35	0.35	0.03	0.13	0.13	0.02	0.12	0.12	0.31	0.71	0.71
Sat Flow, veh/h	1688	2731	939	3274	3741	1502	3274	5375	1502	3274	5306	209
Grp Volume(v), veh/h	439	793	789	182	268	141	163	2189	200	365	1200	648
Grp Sat Flow(s),veh/h/ln	1688	1870	1800	1637	1870	1502	1637	1792	1502	1637	1792	1931
Q Serve(g_s), s	22.0	41.9	41.9	2.2	8.1	10.9	6.0	43.3	14.7	10.8	21.0	21.0
Cycle Q Clear(g_c), s	22.0	41.9	41.9	2.2	8.1	10.9	6.0	43.3	14.7	10.8	21.0	21.0
Prop In Lane	1.00		0.52	1.00		1.00	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	527	653	628	221	471	189	191	1939	542	767	1914	1032
V/C Ratio(X)	0.83	1.21	1.26	0.82	0.57	0.75	0.85	1.13	0.37	0.48	0.63	0.63
Avail Cap(c_a), veh/h	527	653	628	221	1213	487	191	1939	542	767	1914	1032
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.96	0.96	0.96	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	38.9	39.0	39.1	56.7	49.4	50.6	58.3	52.9	40.3	35.4	11.1	11.1
Incr Delay (d2), s/veh	10.9	109.9	127.9	20.9	1.0	5.5	29.3	65.1	1.9	0.3	1.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	13.5	38.8	40.5	3.4	3.9	4.4	3.3	32.5	6.2	4.2	6.6	7.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.8	149.0	166.9	77.6	50.4	56.1	87.6	118.0	42.2	35.7	12.3	13.3
LnGrp LOS	D	F	F	E	D	E	F	F	D	D	B	B
Approach Vol, veh/h		2021			591			2552			2213	
Approach Delay, s/veh		134.4			60.2			110.1			16.5	
Approach LOS		F			E			F			B	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	13.0	70.7	36.1	21.2	34.7	49.0	9.3	48.0
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	7.0	* 44	* 6.4	38.9	8.0	43.3	* 3.7	* 42
Max Q Clear Time (g_c+I1), s	8.0	23.0	24.0	12.9	12.8	45.3	4.2	43.9
Green Ext Time (p_c), s	0.0	13.9	0.0	2.2	0.0	0.0	0.0	0.0

Intersection Summary		
HCM 6th Ctrl Delay		84.7
HCM 6th LOS		F

Notes

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

14-ZN-2019
6/03/2020

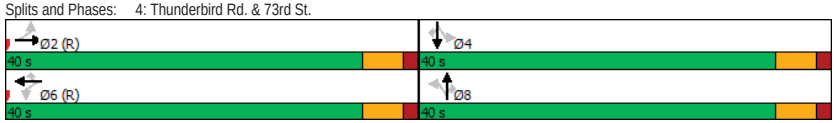
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	23	1472	94	524	255	32	3	15	110	3	19
Future Volume (vph)	23	1472	94	524	255	32	3	15	110	3	19
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.09	1.16	1.10	0.34	0.33	0.10	0.01	0.04	0.25	0.00	0.04
Control Delay	14.5	104.7	156.5	15.9	3.2	14.2	13.0	4.2	16.0	13.0	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	104.7	156.5	15.9	3.2	14.2	13.0	4.2	16.0	13.0	4.1
LOS	B	F	F	B	A	B	B	A	B	B	A
Approach Delay		103.4		27.3			11.1			14.3	
Approach LOS		F		C			B			B	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 130			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.16			
Intersection Signal Delay: 73.2		Intersection LOS: E	
Intersection Capacity Utilization 77.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	1472	106	94	524	255	32	3	15	110	3	19
Future Volume (veh/h)	23	1472	106	94	524	255	32	3	15	110	3	19
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	27	1732	123	97	540	196	55	5	26	145	4	16
Peak Hour Factor	0.85	0.85	0.85	0.97	0.97	0.97	0.58	0.58	0.58	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	319	1529	107	90	1613	648	657	849	648	651	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	684	3545	249	235	3741	1502	1319	1969	1502	1306	1969	1502
Grp Volume(v), veh/h	27	906	949	97	540	196	55	5	26	145	4	16
Grp Sat Flow(s),veh/h/ln	684	1870	1924	235	1870	1502	1319	1969	1502	1306	1969	1502
Q Serve(g_s), s	2.2	34.5	34.5	0.0	7.7	6.8	2.0	0.1	0.8	5.7	0.1	0.5
Cycle Q Clear(g_c), s	9.9	34.5	34.5	34.5	7.7	6.8	2.1	0.1	0.8	5.8	0.1	0.5
Prop In Lane	1.00		0.13	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	807	830	90	1613	648	657	849	648	651	849	648
V/C Ratio(X)	0.08	1.12	1.14	1.08	0.33	0.30	0.08	0.01	0.04	0.22	0.00	0.02
Avail Cap(c_a), veh/h	319	807	830	90	1613	648	657	849	648	651	849	648
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)	0.09	0.09	0.09	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.4	22.7	22.8	40.0	15.1	14.9	13.6	13.0	13.2	14.6	13.0	13.1
Incr Delay (d2), s/veh	0.0	57.0	66.4	117.5	0.6	1.2	0.2	0.0	0.1	0.8	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	0.3	26.6	29.5	4.7	3.2	2.4	0.6	0.1	0.3	1.7	0.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.4	79.8	89.2	157.5	15.7	16.1	13.8	13.0	13.3	15.4	13.0	13.1
LnGrp LOS	B	F	F	F	B	B	B	B	B	B	B	B
Approach Vol, veh/h		1882			833			86			165	
Approach Delay, s/veh		83.6			32.3			13.6			15.1	
Approach LOS		F			C			B			B	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.0		40.0		40.0		40.0				
Change Period (Y+Rc), s		5.5		5.5		5.5		5.5				
Max Green Setting (Gmax), s		34.5		34.5		34.5		34.5				
Max Q Clear Time (g_c+I1), s		36.5		7.8		36.5		4.1				
Green Ext Time (p_c), s		0.0		0.5		0.0		0.2				

Intersection Summary			
HCM 6th Ctrl Delay		63.4	
HCM 6th LOS		E	

Notes

User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	1436	1	918	5	0	
Future Volume (vph)	1436	1	918	5	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	132.2	132.2	132.2		20.0	
Actuated g/C Ratio	0.91	0.91	0.91		0.14	
v/c Ratio	0.96	0.02	0.28		0.05	
Control Delay	24.6	4.0	2.5		9.0	
Queue Delay	0.0	0.0	0.0		0.0	
Total Delay	24.6	4.0	2.5		9.0	
LOS	C	A	A		A	
Approach Delay	24.6		2.5		9.0	
Approach LOS	C		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 16.7	Intersection LOS: B	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1436	5	1	918	0	5	0	1	0	0	0
Future Volume (veh/h)	0	1436	5	1	918	0	5	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1710	5	1	956	0	10	0	0	0	0	0
Peak Hour Factor	0.84	0.84	0.84	0.96	0.96	0.96	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1710	5	50	3260	0	118	0	0	0	90	0
Arrive On Green	0.00	0.87	0.87	0.87	0.87	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1962	6	269	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1715	1	956	0	10	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	269	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	126.4	0.0	6.4	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	126.4	126.4	6.4	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1715	50	3260	0	118	0	0	0	90	0
V/C Ratio(X)	0.00	0.00	1.00	0.02	0.29	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1715	50	3260	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.83	0.83	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	9.3	72.5	1.6	0.0	66.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	21.7	0.6	0.2	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	41.1	0.0	1.6	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	31.1	73.1	1.8	0.0	66.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	F	E	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1715			957			10			0	
Approach Delay, s/veh		31.1			1.9			66.8			0.0	
Approach LOS		C			A			E				

Timer - Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	132.4		12.6		132.4		12.6					
Change Period (Y+Rc), s	6.0		6.0		6.0		6.0					
Max Green Setting (Gmax), s	94.0		39.0		94.0		39.0					
Max Q Clear Time (g_c+I1), s	128.4		0.0		128.4		2.9					
Green Ext Time (p_c), s	0.0		0.0		0.0		0.0					

Intersection Summary		
HCM 6th Ctrl Delay	20.8	
HCM 6th LOS	C	

14-ZN-2019
6/03/2020

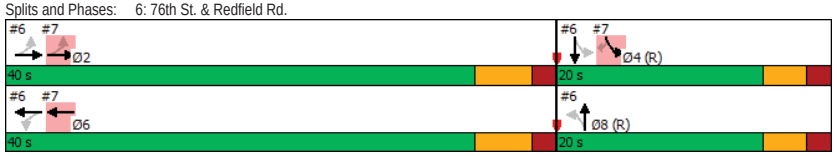
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Configurations							
Traffic Volume (vph)	20	1586	27	938	23	1	0
Future Volume (vph)	20	1586	27	938	23	1	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	NA
Protected Phases		2		6		8	4
Permitted Phases	2		6		8		
Detector Phase	2	2	6	6	8	8	4
Switch Phase							
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0
Total Split (s)	40.0	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0	5.0
Lead/Lag							
Lead-Lag Optimize?							
Recall Mode	Ped	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	34.0	15.0	15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57	0.57	0.25	0.25	0.25
v/c Ratio	0.10	1.85	0.25	0.55	0.09	0.03	0.03
Control Delay	7.4	403.6	7.0	3.8	18.2	10.2	0.2
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	404.2	7.0	3.8	18.2	10.2	0.2
LOS	A	F	A	A	B	B	A
Approach Delay		399.8		3.9		15.7	0.2
Approach LOS		F		A		B	A

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.85			
Intersection Signal Delay: 250.5		Intersection LOS: F	
Intersection Capacity Utilization 108.8%		ICU Level of Service G	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	1586	135	27	938	17	23	1	10	0	0	6
Future Volume (vph)	20	1586	135	27	938	17	23	1	10	0	0	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.86			0.86	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1770	1841		1770	3530		1770	1603			1611	
Flt Permitted	0.21	1.00		0.12	1.00		0.75	1.00			1.00	
Satd. Flow (perm)	395	1841		219	3530		1397	1603			1611	
Peak-hour factor, PHF	0.89	0.89	0.89	0.87	0.87	0.87	0.75	0.75	0.75	0.50	0.50	0.50
Adj. Flow (vph)	22	1782	152	31	1078	20	31	1	13	0	0	12
RTOR Reduction (vph)	0	5	0	0	2	0	0	10	0	0	9	0
Lane Group Flow (vph)	22	1929	0	31	1096	0	31	4	0	0	3	0
Turn Type	Perm	NA		Perm	NA		Perm	NA			NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Effective Green, g (s)	34.0	34.0		34.0	34.0		15.0	15.0			15.0	
Actuated g/C Ratio	0.57	0.57		0.57	0.57		0.25	0.25			0.25	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	223	1043		124	2000		349	400			402	
v/s Ratio Prot		c1.05			0.31			0.00			0.00	
v/s Ratio Perm	0.06			0.14			c0.02					
v/c Ratio	0.10	1.85		0.25	0.55		0.09	0.01			0.01	
Uniform Delay, d1	6.0	13.0		6.6	8.2		17.3	16.9			16.9	
Progression Factor	1.00	1.00		0.38	0.35		1.00	1.00			1.00	
Incremental Delay, d2	0.2	385.9		0.9	0.3		0.5	0.0			0.0	
Delay (s)	6.2	398.9		3.4	3.1		17.8	17.0			16.9	
Level of Service	A	F		A	A		B	B			B	
Approach Delay (s)		394.5			3.1			17.5			16.9	
Approach LOS		F			A			B			B	

Intersection Summary					
HCM 2000 Control Delay	247.0	HCM 2000 Level of Service	F		
HCM 2000 Volume to Capacity ratio	1.31				
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	108.8%	ICU Level of Service	G		
Analysis Period (min)	15				

c Critical Lane Group

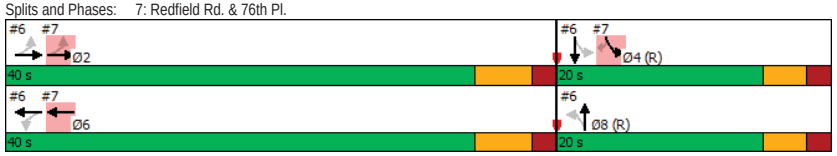
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	282	1315	881	23	104	
Future Volume (vph)	282	1315	881	23	104	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	40.0	40.0	40.0	20.0	20.0	20.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	Ped	Ped	Ped	C-Max	C-Max	C-Max
Act Effct Green (s)	34.0	34.0	34.0	15.0	15.0	
Actuated g/C Ratio	0.57	0.57	0.57	0.25	0.25	
v/c Ratio	1.32	1.42	0.52	0.06	0.26	
Control Delay	164.0	202.5	10.2	17.7	8.1	
Queue Delay	0.0	0.8	0.0	0.0	0.0	
Total Delay	164.0	203.3	10.2	17.7	8.1	
LOS	F	F	B	B	A	
Approach Delay		196.4	10.2	9.8		
Approach LOS		F	B	A		

Intersection Summary			
Cycle Length: 60			
Actuated Cycle Length: 60			
Offset: 40 (67%), Referenced to phase 4:SBTL and 8:NBTL, Start of Green			
Natural Cycle: 150			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.85			
Intersection Signal Delay: 122.3		Intersection LOS: F	
Intersection Capacity Utilization 83.4%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	282	1315	881	19	23	104
Future Volume (vph)	282	1315	881	19	23	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3528		1770	1583
Flt Permitted	0.23	1.00	1.00		0.95	1.00
Satd. Flow (perm)	428	1863	3528		1770	1583
Peak-hour factor, PHF	0.88	0.88	0.86	0.86	0.84	0.84
Adj. Flow (vph)	320	1494	1024	22	27	124
RTOR Reduction (vph)	0	0	3	0	0	74
Lane Group Flow (vph)	320	1494	1043	0	27	50
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	34.0	34.0	34.0		15.0	15.0
Effective Green, g (s)	34.0	34.0	34.0		15.0	15.0
Actuated g/C Ratio	0.57	0.57	0.57		0.25	0.25
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	242	1055	1999		442	395
v/s Ratio Prot		c0.80	0.30		0.02	
v/s Ratio Perm	0.75					c0.03
v/c Ratio	1.32	1.42	0.52		0.06	0.13
Uniform Delay, d1	13.0	13.0	8.0		17.1	17.4
Progression Factor	0.36	0.35	1.20		1.00	1.00
Incremental Delay, d2	147.7	187.8	0.1		0.3	0.7
Delay (s)	152.5	192.3	9.7		17.4	18.1
Level of Service	F	F	A		B	B
Approach Delay (s)		185.3	9.7		18.0	
Approach LOS		F	A		B	

Intersection Summary			
HCM 2000 Control Delay	115.9	HCM 2000 Level of Service	F
HCM 2000 Volume to Capacity ratio	1.02		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	83.4%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

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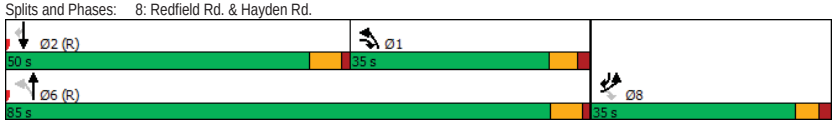
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	745	215	803	1112	341	460
Future Volume (vph)	745	215	803	1112	341	460
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	1.05	0.27	1.06	0.46	0.26	0.47
Control Delay	70.8	5.6	75.1	10.8	27.2	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	5.6	75.1	10.8	27.2	9.1
LOS	E	A	E	B	C	A
Approach Delay	56.2			37.7	16.8	
Approach LOS	E			D	B	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 90		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.06		
Intersection Signal Delay: 38.4	Intersection LOS: D	
Intersection Capacity Utilization 92.6%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	745	215	803	1112	341	460
Future Volume (veh/h)	745	215	803	1112	341	460
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	847	164	819	1135	359	342
Peak Hour Factor	0.88	0.88	0.98	0.98	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	810	777	716	2569	1375	924
Arrive On Green	0.25	0.25	0.27	0.69	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	847	164	819	1135	359	342
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	29.7	0.0	32.4	16.4	8.1	13.6
Cycle Q Clear(g_c), s	29.7	0.0	32.4	16.4	8.1	13.6
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	810	777	716	2569	1375	924
V/C Ratio(X)	1.05	0.21	1.14	0.44	0.26	0.37
Avail Cap(c_a), veh/h	810	777	716	2569	1375	924
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	45.1	15.7	33.1	8.5	26.6	11.5
Incr Delay (d2), s/veh	44.1	0.1	80.8	0.6	0.5	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.9	2.5	36.3	6.3	3.7	8.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	89.2	15.8	113.9	9.0	27.0	12.7
LnGrp LOS	F	B	F	A	C	B
Approach Vol, veh/h	1011			1954	701	
Approach Delay, s/veh	77.3			53.0	20.0	
Approach LOS	E			D	C	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.5	50.0			88.5	35.0
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	34.4	15.6			18.4	31.7
Green Ext Time (p_c), s	0.0	3.8			11.6	0.0

Intersection Summary		
HCM 6th Ctrl Delay	53.4	
HCM 6th LOS	D	

Notes

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

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6/03/2020

Intersection	
Int Delay, s/veh	1.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	17	0	25	19	0	61	48	1967	57	84	1905	89
Future Vol, veh/h	17	0	25	19	0	61	48	1967	57	84	1905	89
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	58	58	58	86	86	86	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	18	0	27	33	0	105	56	2287	66	90	2048	96

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3303	4741	1072	3431	4756	1177	2144	0	0	2353	0	0
Stage 1	2276	2276	-	2432	2432	-	-	-	-	-	-	-
Stage 2	1027	2465	-	999	2324	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*79	0	*469	*79	0	*447	*590	-	-	507	-	-
Stage 1	*381	393	-	*309	337	-	-	-	-	-	-	-
Stage 2	*459	315	-	*482	358	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*48	0	*469	*60	0	*447	*590	-	-	507	-	-
Mov Cap-2 Maneuver	*146	111	-	*163	122	-	-	-	-	-	-	-
Stage 1	*345	323	-	*279	305	-	-	-	-	-	-	-
Stage 2	*318	285	-	*374	294	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.8	24.9	0.3	0.6
HCM LOS	C	C		

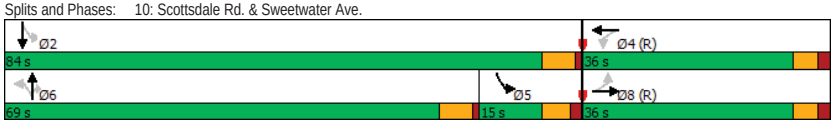
Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1		SBL	SBT	SBR
Capacity (veh/h)	* 590	-	-	247	316	507	-	-
HCM Lane V/C Ratio	0.095	-	-	0.183	0.436	0.178	-	-
HCM Control Delay (s)	11.7	-	-	22.8	24.9	13.6	-	-
HCM Lane LOS	B	-	-	C	C	B	-	-
HCM 95th %tile Q(veh)	0.3	-	-	0.7	2.1	0.6	-	-

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	91	145	116	38	33	2209	46	91	2009
Future Volume (vph)	91	145	116	38	33	2209	46	91	2009
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.43	0.61	0.89	0.34	0.69	0.96	0.07	0.56	0.67
Control Delay	43.9	44.9	92.4	16.2	80.3	37.1	1.8	53.4	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	44.9	92.4	16.2	80.3	37.1	1.8	53.4	25.3
LOS	D	D	F	B	F	D	A	D	C
Approach Delay		44.6		50.1		37.0			26.5
Approach LOS		D		D		D			C

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.96		
Intersection Signal Delay: 33.9	Intersection LOS: C	
Intersection Capacity Utilization 85.1%	ICU Level of Service E	
Analysis Period (min) 15		

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



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HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	91	145	104	116	38	106	33	2209	46	91	2009	29
Future Volume (veh/h)	91	145	104	116	38	106	33	2209	46	91	2009	29
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	106	169	92	143	47	106	40	2694	38	103	2283	27
Peak Hour Factor	0.86	0.86	0.86	0.81	0.81	0.81	0.82	0.82	0.82	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	274	305	166	200	137	308	120	2822	788	191	3560	42
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.10	0.86	0.86
Sat Flow, veh/h	1169	1199	653	1060	538	1213	150	5375	1502	1688	5476	65
Grp Volume(v), veh/h	106	0	261	143	0	153	40	2694	38	103	1493	817
Grp Sat Flow(s),veh/h/ln	1169	0	1851	1060	0	1751	150	1792	1502	1688	1792	1957
Q Serve(g_s), s	9.8	0.0	14.7	15.8	0.0	8.6	26.2	57.3	1.5	2.3	15.2	15.3
Cycle Q Clear(g_c), s	18.4	0.0	14.7	30.5	0.0	8.6	41.5	57.3	1.5	2.3	15.2	15.3
Prop In Lane	1.00		0.35	1.00		0.69	1.00		1.00	1.00		0.03
Lane Grp Cap(c), veh/h	274	0	470	200	0	445	120	2822	788	191	2329	1272
V/C Ratio(X)	0.39	0.00	0.55	0.72	0.00	0.34	0.33	0.95	0.05	0.54	0.64	0.64
Avail Cap(c_a), veh/h	274	0	470	200	0	445	120	2826	790	191	2332	1274
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	0.0	38.9	52.3	0.0	36.6	29.6	27.1	13.9	50.1	3.9	3.9
Incr Delay (d2), s/veh	4.1	0.0	4.7	19.8	0.0	2.1	0.1	1.1	0.0	10.5	0.6	1.1
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	3.2	0.0	7.3	5.4	0.0	3.9	0.9	23.6	0.5	3.4	3.2	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	0.0	43.5	72.1	0.0	38.7	29.8	28.2	13.9	60.6	4.5	5.0
LnGrp LOS	D	A	D	E	A	D	C	C	B	E	A	A
Approach Vol, veh/h		367			296			2772			2413	
Approach Delay, s/veh		44.9			54.8			28.0			7.0	
Approach LOS		D			D			C			A	

Timer - Assigned Phs	2	4	5	6	8
Phs Duration (G+Y+Rc), s	83.9	36.1	15.0	68.9	36.1
Change Period (Y+Rc), s	* 5.9	5.6	* 5.9	* 5.9	5.6
Max Green Setting (Gmax), s	* 78	30.4	* 9.1	* 63	30.4
Max Q Clear Time (g_c+I1), s	17.3	32.5	4.3	59.3	20.4
Green Ext Time (p_c), s	35.6	0.0	0.1	3.7	1.4

Intersection Summary	
HCM 6th Ctrl Delay	21.8
HCM 6th LOS	C

Notes

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

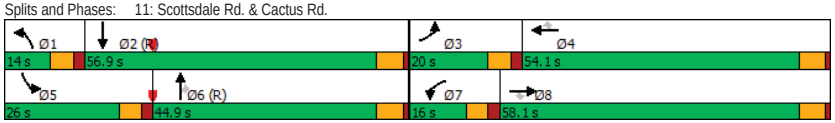
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	332	1443	500	250	824	654	163	1480	182	496	1520
Future Volume (vph)	332	1443	500	250	824	654	163	1480	182	496	1520
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	20.0	58.1	58.1	16.0	54.1	54.1	14.0	44.9	44.9	26.0	56.9
Total Split (%)	13.8%	40.1%	40.1%	11.0%	37.3%	37.3%	9.7%	31.0%	31.0%	17.9%	39.2%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	14.0	52.4	52.4	10.0	48.4	48.4	8.0	39.2	39.2	20.0	51.2
Actuated g/C Ratio	0.10	0.36	0.36	0.07	0.33	0.33	0.06	0.27	0.27	0.14	0.35
v/c Ratio	1.15	1.16	0.85	1.25	0.74	1.11	1.01	1.14	0.39	1.23	0.98
Control Delay	154.9	124.0	43.5	197.9	47.3	99.3	136.4	117.5	13.6	172.0	61.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	154.9	124.0	43.5	197.9	47.3	99.3	136.4	117.5	13.6	172.0	61.6
LOS	F	F	D	F	D	F	F	F	B	F	E
Approach Delay		110.9			88.8			108.8			87.1
Approach LOS		F			F			F			F

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.25		
Intersection Signal Delay: 99.1	Intersection LOS: F	
Intersection Capacity Utilization 107.0%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	332	1443	500	250	824	654	163	1480	182	496	1520	126
Future Volume (veh/h)	332	1443	500	250	824	654	163	1480	182	496	1520	126
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	361	1568	369	281	926	510	181	1644	130	551	1689	112
Peak Hour Factor	0.92	0.92	0.92	0.89	0.89	0.89	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	1352	543	226	1249	501	181	1453	406	452	1818	120
Arrive On Green	0.10	0.36	0.36	0.07	0.33	0.33	0.06	0.27	0.27	0.14	0.35	0.35
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5150	341
Grp Volume(v), veh/h	361	1568	369	281	926	510	181	1644	130	551	1175	626
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1907
Q Serve(g_s), s	14.0	52.4	30.2	10.0	31.8	48.4	8.0	39.2	10.0	20.0	45.7	45.9
Cycle Q Clear(g_c), s	14.0	52.4	30.2	10.0	31.8	48.4	8.0	39.2	10.0	20.0	45.7	45.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	316	1352	543	226	1249	501	181	1453	406	452	1265	674
V/C Ratio(X)	1.14	1.16	0.68	1.24	0.74	1.02	1.00	1.13	0.32	1.22	0.93	0.93
Avail Cap(c_a), veh/h	316	1352	543	226	1249	501	181	1453	406	452	1265	674
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	0.68	0.68	0.68
Uniform Delay (d), s/veh	65.5	46.3	39.2	67.5	42.8	48.3	68.5	52.9	42.3	62.5	45.1	45.2
Incr Delay (d2), s/veh	94.8	80.6	3.4	141.6	2.4	44.7	67.5	68.4	2.1	112.3	9.7	16.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	39.3	11.7	8.6	15.1	24.2	5.1	26.8	4.0	15.4	21.9	24.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	160.3	126.9	42.6	209.1	45.2	93.0	136.0	121.3	44.3	174.8	54.8	61.2
LnGrp LOS	F	F	D	F	D	F	F	F	D	F	D	E
Approach Vol, veh/h		2298			1717			1955			2352	
Approach Delay, s/veh		118.6			86.2			117.5			84.6	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	56.9	20.0	54.1	26.0	44.9	16.0	58.1
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	8.0	51.2	14.0	48.4	20.0	39.2	10.0	52.4
Max Q Clear Time (g_c+I1), s	10.0	47.9	16.0	50.4	22.0	41.2	12.0	54.4
Green Ext Time (p_c), s	0.0	2.8	0.0	0.0	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	102.1
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1550	47	45	861	12	8
Future Vol, veh/h	1550	47	45	861	12	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1722	52	50	957	13	9

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1774	0	2301	1722
Stage 1	-	-	-	-	1722	-
Stage 2	-	-	-	-	579	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	-	-	*37	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*691	-
Platoon blocked, %	-	-	2	-		2
Mov Cap-1 Maneuver	-	-	-	-	*37	-
Mov Cap-2 Maneuver	-	-	-	-	*~ -3	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	*691	-

Approach	EB	WB	NB
HCM Control Delay, s	0		
HCM LOS			-

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	-	-	-
HCM Lane LOS	-	-	-	-	-
HCM 95th %tile Q(veh)	-	-	-	-	-

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

HCM 6th TWSC
13: Scottsdale Rd. & Access B

04/23/2020

Intersection	
Int Delay, s/veh	6.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	13	0	64	4	0	5	60	2132	51	25	2237	32
Future Vol, veh/h	13	0	64	4	0	5	60	2132	51	25	2237	32
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	14	0	71	4	0	6	67	2369	57	28	2486	36

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3642	5120	1261	3582	5110	1213	2522	0	0	2426	0	0
Stage 1	2560	2560	-	2532	2532	-	-	-	-	-	-	-
Stage 2	1082	2560	-	1050	2578	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*~ 14	*0	*381	*18	*0	*403	*479	-	-	*507	-	-
Stage 1	*391	*372	-	*399	*384	-	-	-	-	-	-	-
Stage 2	*414	*361	-	*391	*372	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*~ 12	*0	*381	*12	*0	*403	*479	-	-	*507	-	-
Mov Cap-2 Maneuver	*~ 12	*0	-	*132	*140	-	-	-	-	-	-	-
Stage 1	*336	*352	-	*343	*331	-	-	-	-	-	-	-
Stage 2	*351	*311	-	*301	*352	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	$ 356.8	22.9	0.4	0.1
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 479	-	-	62	211	* 507	-	-
HCM Lane V/C Ratio	0.139	-	-	1.38	0.047	0.055	-	-
HCM Control Delay (s)	13.7	-	-	$ 356.8	22.9	12.5	-	-
HCM Lane LOS	B	-	-	F	C	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	7.3	0.1	0.2	-	-

Notes

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

HCM 6th TWSC
14: Scottsdale Rd. & Access C

04/23/2020

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	4	2240	75	0	2304
Future Vol, veh/h	0	4	2240	75	0	2304
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	4	2489	83	0	2560

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1286	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	*381	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*381	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 381	-
HCM Lane V/C Ratio	-	- 0.012	-
HCM Control Delay (s)	-	- 14.6	-
HCM Lane LOS	-	- B	-
HCM 95th %tile Q(veh)	-	- 0	-

Notes

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

Intersection	
Int Delay, s/veh	1.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	29	112	75	0	0	5
Future Vol, veh/h	29	112	75	0	0	5
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	124	83	0	0	6

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	83	0	-	0	271	83
Stage 1	-	-	-	-	83	-
Stage 2	-	-	-	-	188	-
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	1514	-	-	-	718	976
Stage 1	-	-	-	-	940	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1514	-	-	-	701	976
Mov Cap-2 Maneuver	-	-	-	-	701	-
Stage 1	-	-	-	-	918	-
Stage 2	-	-	-	-	844	-

Approach	EB	WB	SB
HCM Control Delay, s	1.5	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1514	-	-	-	976
HCM Lane V/C Ratio	0.021	-	-	-	0.006
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	46	66	56	0	0	19
Future Vol, veh/h	46	66	56	0	0	19
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	73	62	0	0	21

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	237	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	175	-
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	1541	-	-	-	751	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	725	1003
Mov Cap-2 Maneuver	-	-	-	-	725	-
Stage 1	-	-	-	-	927	-
Stage 2	-	-	-	-	855	-

Approach	EB	WB	SB
HCM Control Delay, s	3	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	1003
HCM Lane V/C Ratio	0.033	-	-	-	0.021
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

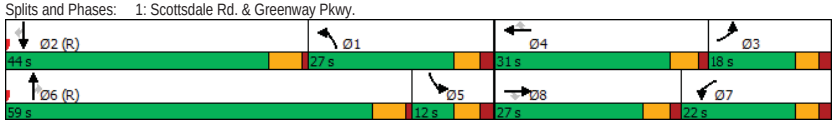
Timings
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	307	280	362	554	739	280	708	1690	124	126	1479	200
Future Volume (vph)	307	280	362	554	739	280	708	1690	124	126	1479	200
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm
Protected Phases	3	8		7	4		1	6		5	2	
Permitted Phases			8			4			6			2
Detector Phase	3	8	8	7	4	4	1	6	6	5	2	2
Switch Phase												
Minimum Initial (s)	5.0	7.0	7.0	5.0	7.0	7.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	10.3	35.5	35.5	10.3	41.5	41.5	11.0	32.7	32.7	11.0	37.7	37.7
Total Split (s)	18.0	27.0	27.0	22.0	31.0	31.0	27.0	59.0	59.0	12.0	44.0	44.0
Total Split (%)	15.0%	22.5%	22.5%	18.3%	25.8%	25.8%	22.5%	49.2%	49.2%	10.0%	36.7%	36.7%
Yellow Time (s)	3.3	4.0	4.0	3.3	4.0	4.0	4.0	4.7	4.7	4.0	4.7	4.7
All-Red Time (s)	2.0	1.5	1.5	2.0	1.5	1.5	2.0	1.0	1.0	2.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	5.5	5.5	5.3	5.5	5.5	6.0	5.7	5.7	6.0	5.7	5.7
Lead/Lag	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max	C-Max
Act Effct Green (s)	12.9	19.0	19.0	19.2	25.3	25.3	21.0	53.3	53.3	6.0	38.3	38.3
Actuated g/C Ratio	0.11	0.16	0.16	0.16	0.21	0.21	0.18	0.44	0.44	0.05	0.32	0.32
v/c Ratio	1.06	0.57	0.97	1.10	0.97	0.63	1.34	0.76	0.18	0.85	0.95	0.36
Control Delay	116.1	50.2	56.4	116.1	72.8	23.0	198.9	21.2	1.8	96.8	53.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.1	50.2	56.4	116.1	72.8	23.0	198.9	21.2	1.8	96.8	53.1	8.0
LOS	F	D	E	F	E	C	F	C	A	F	D	A
Approach Delay		73.9			79.2			70.2			51.2	
Approach LOS		E			E			E			D	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 59 (49%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.34		
Intersection Signal Delay: 67.6	Intersection LOS: E	
Intersection Capacity Utilization 95.9%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 1: Scottsdale Rd. & Greenway Pkwy.



HCM 6th Signalized Intersection Summary
1: Scottsdale Rd. & Greenway Pkwy.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	307	280	362	554	739	280	708	1690	124	126	1479	200
Future Volume (veh/h)	307	280	362	554	739	280	708	1690	124	126	1479	200
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	370	337	171	571	762	275	761	1817	0	138	1625	176
Peak Hour Factor	0.83	0.83	0.83	0.97	0.97	0.97	0.93	0.93	0.93	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	346	497	200	607	795	319	573	2387		164	1715	479
Arrive On Green	0.11	0.13	0.13	0.19	0.21	0.21	0.35	0.89	0.00	0.05	0.32	0.32
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	5375	1502
Grp Volume(v), veh/h	370	337	171	571	762	275	761	1817	0	138	1625	176
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1502
Q Serve(g_s), s	12.7	10.3	13.4	20.7	24.2	21.2	21.0	14.0	0.0	5.0	35.4	10.8
Cycle Q Clear(g_c), s	12.7	10.3	13.4	20.7	24.2	21.2	21.0	14.0	0.0	5.0	35.4	10.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	346	497	200	607	795	319	573	2387		164	1715	479
V/C Ratio(X)	1.07	0.68	0.86	0.94	0.96	0.86	1.33	0.76		0.84	0.95	0.37
Avail Cap(c_a), veh/h	346	670	269	607	795	319	573	2387		164	1715	479
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	0.62	0.62	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	49.6	50.9	48.2	46.7	45.6	39.0	4.5	0.0	56.5	39.9	31.5
Incr Delay (d2), s/veh	67.5	0.6	14.5	22.7	22.1	19.9	155.2	1.5	0.0	29.6	12.4	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	4.9	5.8	10.3	13.6	9.6	19.4	2.4	0.0	2.7	17.3	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	121.2	50.2	65.4	71.0	68.9	65.4	194.2	6.0	0.0	86.1	52.2	33.7
LnGrp LOS	F	D	E	E	E	E	F	A		F	D	C
Approach Vol, veh/h		878			1608			2578	A		1939	
Approach Delay, s/veh		83.1			69.0			61.5			53.0	
Approach LOS		F			E			E			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	44.0	18.0	31.0	12.0	59.0	27.5	21.5
Change Period (Y+Rc), s	6.0	5.7	5.3	* 5.5	6.0	5.7	5.3	* 5.5
Max Green Setting (Gmax), s	21.0	38.3	12.7	* 26	6.0	53.3	16.7	* 22
Max Q Clear Time (g_c+I1), s	23.0	37.4	14.7	26.2	7.0	16.0	22.7	15.4
Green Ext Time (p_c), s	0.0	0.6	0.0	0.0	0.0	7.2	0.0	0.6

Intersection Summary		
HCM 6th Ctrl Delay	63.6	
HCM 6th LOS	E	

Notes
User approved pedestrian interval to be less than phase max green.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

14-ZN-2019
6/03/2020

Timings
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Configurations										
Traffic Volume (vph)	157	44	296	154	80	179	2054	52	2222	76
Future Volume (vph)	157	44	296	154	80	179	2054	52	2222	76
Turn Type	Perm	NA	Perm	Perm	NA	pm+pt	NA	pm+pt	NA	Perm
Protected Phases		8			4	1	6	5	2	
Permitted Phases	8		8	4		6		2		2
Detector Phase	8	8	8	4	4	1	6	5	2	2
Switch Phase										
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	4.0	10.0	4.0	10.0	10.0
Minimum Split (s)	36.0	36.0	36.0	36.0	36.0	8.0	36.0	8.0	36.0	36.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	13.0	86.0	13.0	86.0	86.0
Total Split (%)	17.5%	17.5%	17.5%	17.5%	17.5%	10.8%	71.7%	10.8%	71.7%	71.7%
Yellow Time (s)	3.2	3.2	3.2	3.2	3.2	3.0	4.6	3.0	4.6	4.6
All-Red Time (s)	2.8	2.8	2.8	2.8	2.8	1.0	1.4	1.0	1.4	1.4
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	6.0	4.0	6.0	4.0	6.0	6.0
Lead/Lag						Lead	Lag	Lead	Lag	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	None	C-Max	C-Max
Act Effct Green (s)	15.0	15.0	15.0	15.0	15.0	93.4	84.2	88.7	80.0	80.0
Actuated g/C Ratio	0.12	0.12	0.12	0.12	0.12	0.78	0.70	0.74	0.67	0.67
v/c Ratio	1.91	0.20	1.15	1.21	0.69	1.11	0.63	0.38	0.70	0.08
Control Delay	477.7	49.5	131.3	184.8	58.2	109.1	6.4	11.1	25.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	477.7	49.5	131.3	184.8	58.2	109.1	6.4	11.1	25.8	6.6
LOS	F	D	F	F	E	F	A	B	C	A
Approach Delay		233.4			124.8		14.6		24.8	
Approach LOS		F			F		B		C	

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 5 (4%), Referenced to phase 2:SBTL and 6:NBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.91			
Intersection Signal Delay: 45.4		Intersection LOS: D	
Intersection Capacity Utilization 87.1%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 2: Acoma Dr. & Scottsdale Rd.

HCM 6th Signalized Intersection Summary
2: Acoma Dr. & Scottsdale Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	157	44	296	154	80	59	179	2054	18	52	2222	76
Future Volume (veh/h)	157	44	296	154	80	59	179	2054	18	52	2222	76
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	176	49	221	192	100	69	206	2361	4	58	2497	74
Peak Hour Factor	0.89	0.89	0.89	0.80	0.80	0.80	0.87	0.87	0.87	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	102	246	188	168	136	94	221	3952	7	203	3583	1001
Arrive On Green	0.13	0.13	0.13	0.13	0.13	0.13	0.15	1.00	1.00	0.02	0.45	0.45
Sat Flow, veh/h	1152	1969	1502	1051	1085	749	1688	5541	9	1688	5375	1502
Grp Volume(v), veh/h	176	49	221	192	0	169	206	1527	838	58	2497	74
Grp Sat Flow(s),veh/h/ln	1152	1969	1502	1051	0	1834	1688	1792	1967	1688	1792	1502
Q Serve(g_s), s	4.3	2.7	15.0	12.3	0.0	10.7	7.6	0.0	0.0	1.3	44.8	3.4
Cycle Q Clear(g_c), s	15.0	2.7	15.0	15.0	0.0	10.7	7.6	0.0	0.0	1.3	44.8	3.4
Prop In Lane	1.00		1.00	1.00		0.41	1.00		0.00	1.00		1.00
Lane Grp Cap(c), veh/h	102	246	188	168	0	229	221	2555	1403	203	3583	1001
V/C Ratio(X)	1.73	0.20	1.18	1.14	0.00	0.74	0.93	0.60	0.60	0.29	0.70	0.07
Avail Cap(c_a), veh/h	102	246	188	168	0	229	221	2555	1403	281	3583	1001
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	2.00	2.00	2.00	0.67	0.67	0.67
Upstream Filter(I)	1.00	1.00	1.00	1.00	0.00	1.00	0.09	0.09	0.09	0.12	0.12	0.12
Uniform Delay (d), s/veh	59.1	47.1	52.5	56.0	0.0	50.6	32.5	0.0	0.0	5.8	23.5	12.0
Incr Delay (d2), s/veh	366.4	0.4	121.6	113.3	0.0	11.8	7.5	0.1	0.2	0.1	0.1	0.0
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	13.4	1.3	12.0	10.4	0.0	5.6	4.2	0.0	0.1	0.4	20.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	425.5	47.5	174.1	169.4	0.0	62.4	40.0	0.1	0.2	5.9	23.6	12.0
LnGrp LOS	F	D	F	F	A	E	D	A	A	A	C	B
Approach Vol, veh/h		446			361			2571			2629	
Approach Delay, s/veh		259.4			119.3			3.3			22.9	
Approach LOS		F			F			A			C	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	86.0		21.0	7.4	91.6		21.0				
Change Period (Y+Rc), s	4.0	* 6		6.0	4.0	* 6		6.0				
Max Green Setting (Gmax), s	9.0	* 80		15.0	9.0	* 80		15.0				
Max Q Clear Time (g_c+I1), s	9.6	46.8		17.0	3.3	2.0		17.0				
Green Ext Time (p_c), s	0.0	27.1		0.0	0.0	42.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	37.9	
HCM 6th LOS	D	

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

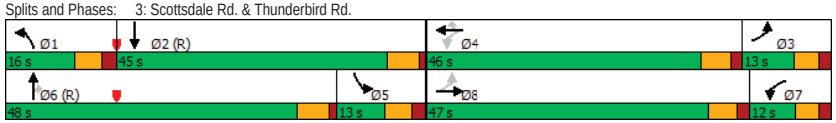
Timings
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	206	298	365	1140	310	378	1839	93	196	2016
Future Volume (vph)	206	298	365	1140	310	378	1839	93	196	2016
Turn Type	pm+pt	NA	pm+pt	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8	7	4		1	6		5	2
Permitted Phases	8		4		4			6		
Detector Phase	3	8	7	4	4	1	6	6	5	2
Switch Phase										
Minimum Initial (s)	2.0	7.0	5.0	7.0	7.0	2.0	10.0	10.0	2.0	10.0
Minimum Split (s)	7.6	44.1	10.3	40.1	40.1	8.0	36.7	36.7	8.0	31.7
Total Split (s)	13.0	47.0	12.0	46.0	46.0	16.0	48.0	48.0	13.0	45.0
Total Split (%)	10.8%	39.2%	10.0%	38.3%	38.3%	13.3%	40.0%	40.0%	10.8%	37.5%
Yellow Time (s)	3.6	4.4	3.3	4.4	4.4	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.7	2.0	1.7	1.7	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	6.1	5.3	6.1	6.1	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lag	Lead	Lag	Lead	Lead	Lead	Lead	Lead	Lag	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	30.3	22.4	53.7	39.9	39.9	10.0	42.3	42.3	7.0	39.3
Actuated g/C Ratio	0.25	0.19	0.45	0.33	0.33	0.08	0.35	0.35	0.06	0.33
v/c Ratio	1.42	0.78	0.49	1.02	0.55	1.52	1.06	0.16	1.19	1.57
Control Delay	253.3	37.9	37.0	71.4	18.3	274.3	78.4	9.8	156.0	283.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	253.3	37.9	37.0	71.4	18.3	274.3	78.4	9.8	156.0	283.9
LOS	F	D	D	E	B	F	E	A	F	F
Approach Delay		95.9		55.4			107.7			274.1
Approach LOS		F		E			F			F

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 82 (68%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 150		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.57		
Intersection Signal Delay: 152.6	Intersection LOS: F	
Intersection Capacity Utilization 117.2%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 3: Scottsdale Rd. & Thunderbird Rd.



HCM 6th Signalized Intersection Summary
3: Scottsdale Rd. & Thunderbird Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	206	298	259	365	1140	310	378	1839	93	196	2016	347
Future Volume (veh/h)	206	298	259	365	1140	310	378	1839	93	196	2016	347
Initial Q (Qb), veh	0	0	0	12	25	10	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	1870
Adj Flow Rate, veh/h	231	335	156	406	1267	200	411	1999	63	225	2317	284
Peak Hour Factor	0.89	0.89	0.89	0.90	0.90	0.90	0.92	0.92	0.92	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	164	433	198	885	1244	499	273	1895	529	469	1995	239
Arrive On Green	0.06	0.17	0.17	0.22	0.33	0.33	0.03	0.12	0.12	0.19	0.55	0.55
Sat Flow, veh/h	1688	2495	1139	3274	3741	1502	3274	5375	1502	3274	4865	582
Grp Volume(v), veh/h	231	250	241	406	1267	200	411	1999	63	225	1691	910
Grp Sat Flow(s),veh/h/ln	1688	1870	1764	1637	1870	1502	1637	1792	1502	1637	1792	1864
Q Serve(g_s), s	7.4	15.3	15.7	6.4	39.9	12.3	10.0	42.3	4.5	7.3	49.2	49.2
Cycle Q Clear(g_c), s	7.4	15.3	15.7	6.4	39.9	12.3	10.0	42.3	4.5	7.3	49.2	49.2
Prop In Lane	1.00		0.65	1.00		1.00	1.00		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	164	324	306	885	1244	499	273	1895	529	469	1469	764
V/C Ratio(X)	1.41	0.77	0.79	0.46	1.02	0.40	1.51	1.06	0.12	0.48	1.15	1.19
Avail Cap(c_a), veh/h	164	637	601	885	1244	499	273	1895	529	469	1469	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33	1.33	1.33	1.33
Upstream Filter(I)	1.00	1.00	1.00	0.09	0.09	0.09	1.00	1.00	1.00	0.53	0.53	0.53
Uniform Delay (d), s/veh	54.9	47.3	47.5	38.2	40.0	32.1	58.3	53.0	36.3	44.6	27.3	27.3
Incr Delay (d2), s/veh	215.8	3.8	4.5	0.0	13.0	0.0	246.1	37.0	0.5	0.4	72.7	92.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	2.4	72.4	4.8	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	7.4	7.3	6.1	32.8	6.5	13.7	26.9	1.8	2.9	33.1	38.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	270.7	51.1	52.0	40.6	125.4	36.9	304.4	90.0	36.8	45.0	100.0	120.0
LnGrp LOS	F	D	D	D	F	D	F	F	D	D	F	F
Approach Vol, veh/h		722			1873			2473			2826	
Approach Delay, s/veh		121.7			97.6			124.3			102.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	16.0	55.5	13.0	46.0	23.5	48.0	32.1	26.9
Change Period (Y+Rc), s	6.0	* 6	* 5.6	6.1	6.0	5.7	* 5.6	* 6.1
Max Green Setting (Gmax), s	10.0	* 39	* 7.4	39.9	7.0	42.3	* 6.7	* 41
Max Q Clear Time (g_c+I1), s	12.0	51.2	9.4	41.9	9.3	44.3	8.4	17.7
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.1

Intersection Summary		
HCM 6th Ctrl Delay		109.8
HCM 6th LOS		F

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

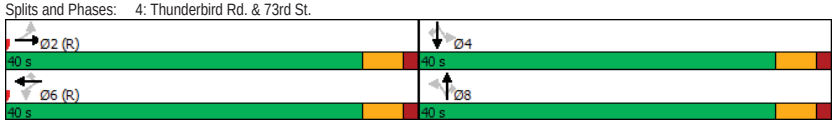
Timings
4: Thunderbird Rd. & 73rd St.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	551	19	1564	257	167	2	104	292	2	84
Future Volume (vph)	10	551	19	1564	257	167	2	104	292	2	84
Turn Type	Perm	NA	Perm	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases		2		6			8			4	
Permitted Phases	2		6		6	8		8	4		4
Detector Phase	2	2	6	6	6	8	8	8	4	4	4
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Minimum Split (s)	67.5	67.5	67.5	67.5	67.5	29.5	29.5	29.5	29.5	29.5	29.5
Total Split (s)	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
Total Split (%)	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5
Lead/Lag											
Lead-Lag Optimize?											
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	Max	Max	Max	Max	Max	Max
Act Effct Green (s)	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5	34.5
Actuated g/C Ratio	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
v/c Ratio	0.12	0.38	0.08	1.17	0.38	0.29	0.00	0.15	0.68	0.00	0.17
Control Delay	18.1	16.2	14.5	109.1	3.3	16.6	13.0	3.7	25.4	13.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	16.2	14.5	109.1	3.3	16.6	13.0	3.7	25.4	13.0	10.7
LOS	B	B	B	F	A	B	B	A	C	B	B
Approach Delay		16.2		93.3			11.6			22.1	
Approach LOS		B		F			B			C	

Intersection Summary			
Cycle Length: 80			
Actuated Cycle Length: 80			
Offset: 0 (0%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 100			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 1.17			
Intersection Signal Delay: 63.9		Intersection LOS: E	
Intersection Capacity Utilization 74.0%		ICU Level of Service D	
Analysis Period (min) 15			

Splits and Phases: 4: Thunderbird Rd. & 73rd St.



HCM 6th Signalized Intersection Summary
4: Thunderbird Rd. & 73rd St.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	551	26	19	1564	257	167	2	104	292	2	84
Future Volume (veh/h)	10	551	26	19	1564	257	167	2	104	292	2	84
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	11	586	24	23	1884	214	167	2	104	389	3	103
Peak Hour Factor	0.94	0.94	0.94	0.83	0.83	0.83	1.00	1.00	1.00	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	90	1579	65	338	1613	648	615	849	648	615	849	648
Arrive On Green	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43	0.43
Sat Flow, veh/h	185	3662	150	769	3741	1502	1220	1969	1502	1220	1969	1502
Grp Volume(v), veh/h	11	299	311	23	1884	214	167	2	104	389	3	103
Grp Sat Flow(s),veh/h/ln	185	1870	1942	769	1870	1502	1220	1969	1502	1220	1969	1502
Q Serve(g_s), s	0.0	8.7	8.7	1.7	34.5	7.6	7.2	0.0	3.4	21.3	0.1	3.4
Cycle Q Clear(g_c), s	34.5	8.7	8.7	10.3	34.5	7.6	7.3	0.0	3.4	21.4	0.1	3.4
Prop In Lane	1.00		0.08	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	90	807	837	338	1613	648	615	849	648	615	849	648
V/C Ratio(X)	0.12	0.37	0.37	0.07	1.17	0.33	0.27	0.00	0.16	0.63	0.00	0.16
Avail Cap(c_a), veh/h	90	807	837	338	1613	648	615	849	648	615	849	648
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)	0.48	0.48	0.48	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.0	15.4	15.4	18.9	22.7	15.1	15.0	13.0	13.9	19.0	13.0	13.9
Incr Delay (d2), s/veh	1.3	0.6	0.6	0.4	82.6	1.4	1.1	0.0	0.5	4.9	0.0	0.5
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	0.2	3.6	3.7	0.3	32.3	2.7	2.1	0.0	1.2	6.4	0.0	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.3	16.0	16.0	19.3	105.4	16.5	16.1	13.0	14.4	23.9	13.0	14.4
LnGrp LOS	D	B	B	B	F	B	B	B	B	C	B	B
Approach Vol, veh/h		621			2121			273			495	
Approach Delay, s/veh		16.5			95.5			15.5			21.9	
Approach LOS		B			F			B			C	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	40.0	40.0	40.0	40.0
Change Period (Y+Rc), s	5.5	5.5	5.5	5.5
Max Green Setting (Gmax), s	34.5	34.5	34.5	34.5
Max Q Clear Time (g_c+I1), s	36.5	23.4	36.5	9.3
Green Ext Time (p_c), s	0.0	1.5	0.0	0.9

Intersection Summary		
HCM 6th Ctrl Delay	64.9	
HCM 6th LOS	E	

Notes
User approved pedestrian interval to be less than phase max green.

14-ZN-2019
6/03/2020

Timings
5: Airport Taxiway & Redfield Rd.

04/23/2020

Lane Group	EBT	WBL	WBT	NBL	NBT	Ø4
Lane Configurations						
Traffic Volume (vph)	995	6	1755	5	0	
Future Volume (vph)	995	6	1755	5	0	
Turn Type	NA	Perm	NA	Perm	NA	
Protected Phases	2		6		8	4
Permitted Phases		6		8		
Detector Phase	2	6	6	8	8	
Switch Phase						
Minimum Initial (s)	90.0	90.0	90.0	20.0	20.0	20.0
Minimum Split (s)	96.0	96.0	96.0	26.0	26.0	26.0
Total Split (s)	100.0	100.0	100.0	45.0	45.0	45.0
Total Split (%)	69.0%	69.0%	69.0%	31.0%	31.0%	31%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	2.0	2.0	2.0	2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0		0.0	
Total Lost Time (s)	6.0	6.0	6.0		6.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	132.2	132.2	132.2		20.0	
Actuated g/C Ratio	0.91	0.91	0.91		0.14	
v/c Ratio	0.63	0.02	0.61		0.05	
Control Delay	6.4	3.3	4.8		9.0	
Queue Delay	0.0	0.0	0.1		0.0	
Total Delay	6.4	3.3	4.9		9.0	
LOS	A	A	A		A	
Approach Delay	6.4		4.9		9.0	
Approach LOS	A		A		A	

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:EBT and 6:WBTL, Start of Green		
Natural Cycle: 125		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 0.63		
Intersection Signal Delay: 5.4	Intersection LOS: A	
Intersection Capacity Utilization 101.7%	ICU Level of Service G	
Analysis Period (min) 15		

Splits and Phases: 5: Airport Taxiway & Redfield Rd.

HCM 6th Signalized Intersection Summary
5: Airport Taxiway & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	995	6	6	1755	0	5	0	1	0	0	0
Future Volume (veh/h)	0	995	6	6	1755	0	5	0	1	0	0	0
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	0	1969	1772	1772	1969	0	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	0	1118	4	7	2065	0	10	0	0	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.85	0.85	0.85	0.50	0.50	0.50	0.25	0.25	0.25
Percent Heavy Veh, %	0	2	2	2	2	0	2	2	2	2	2	2
Cap, veh/h	0	1709	6	383	3260	0	118	0	0	0	90	0
Arrive On Green	0.00	0.87	0.87	0.87	0.87	0.00	0.05	0.00	0.00	0.00	0.00	0.00
Sat Flow, veh/h	0	1961	7	476	3839	0	1492	0	0	0	1969	0
Grp Volume(v), veh/h	0	0	1122	7	2065	0	10	0	0	0	0	0
Grp Sat Flow(s),veh/h/ln	0	0	1968	476	1870	0	1492	0	0	0	1969	0
Q Serve(g_s), s	0.0	0.0	24.7	0.6	23.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	0.0	24.7	25.4	23.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Prop In Lane	0.00		0.00	1.00		0.00	1.00		0.00	0.00		0.00
Lane Grp Cap(c), veh/h	0	0	1715	383	3260	0	118	0	0	0	90	0
V/C Ratio(X)	0.00	0.00	0.65	0.02	0.63	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Avail Cap(c_a), veh/h	0	0	1715	383	3260	0	451	0	0	0	530	0
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)	0.00	0.00	1.00	0.46	0.46	0.00	1.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	0.0	2.8	6.6	2.7	0.0	66.5	0.0	0.0	0.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	0.0	2.0	0.0	0.4	0.0	0.3	0.0	0.0	0.0	0.0	0.0
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	0.0	0.0	6.9	0.1	5.5	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	4.7	6.6	3.1	0.0	66.8	0.0	0.0	0.0	0.0	0.0
LnGrp LOS	A	A	A	A	A	A	E	A	A	A	A	A
Approach Vol, veh/h		1122			2072			10			0	
Approach Delay, s/veh		4.7			3.1			66.8			0.0	
Approach LOS		A			A			E				

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		132.4		12.6		132.4		12.6				
Change Period (Y+Rc), s		6.0		6.0		6.0		6.0				
Max Green Setting (Gmax), s		94.0		39.0		94.0		39.0				
Max Q Clear Time (g_c+I1), s		26.7		0.0		27.4		2.9				
Green Ext Time (p_c), s		15.6		0.0		36.7		0.0				

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

14-ZN-2019
6/03/2020

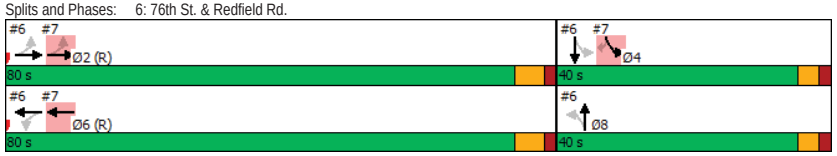
Timings
6: 76th St. & Redfield Rd.

04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	6	1072	32	1831	171	0	6	0
Future Volume (vph)	6	1072	32	1831	171	0	6	0
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases		2		6		8		4
Permitted Phases	2		6		8		4	
Detector Phase	2	2	6	6	8	8	4	4
Switch Phase								
Minimum Initial (s)	10.0	10.0	10.0	10.0	6.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	46.0	20.0	20.0	11.0	11.0
Total Split (s)	80.0	80.0	80.0	80.0	40.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	66.7%	33.3%	33.3%	33.3%	33.3%
Yellow Time (s)	4.2	4.2	4.2	4.2	3.1	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0		0.0
Total Lost Time (s)	6.0	6.0	6.0	6.0	5.0	5.0		5.0
Lead/Lag								
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	None	None	None	None
Act Effct Green (s)	78.4	78.4	78.4	78.4	30.6	30.6		30.6
Actuated g/C Ratio	0.65	0.65	0.65	0.65	0.26	0.26		0.26
v/c Ratio	0.10	0.99	0.56	0.84	0.64	0.12		0.08
Control Delay	13.8	45.8	36.9	14.0	47.9	1.7		14.2
Queue Delay	0.0	38.3	0.0	0.3	0.0	0.0		0.0
Total Delay	13.8	84.1	36.9	14.3	47.9	1.7		14.2
LOS	B	F	D	B	D	A		B
Approach Delay		83.7		14.7		38.7		14.2
Approach LOS		F		B		D		B

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 40.3		Intersection LOS: D	
Intersection Capacity Utilization 85.7%		ICU Level of Service E	
Analysis Period (min) 15			

Splits and Phases: 6: 76th St. & Redfield Rd.



HCM Signalized Intersection Capacity Analysis
6: 76th St. & Redfield Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	1072	65	32	1831	1	171	0	42	6	0	17
Future Volume (vph)	6	1072	65	32	1831	1	171	0	42	6	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Lane Util. Factor	1.00	1.00		1.00	0.95		1.00	1.00			1.00	
Frt	1.00	0.99		1.00	1.00		1.00	0.85			0.90	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00			0.99	
Satd. Flow (prot)	1770	1847		1770	3539		1770	1583			1656	
Flt Permitted	0.05	1.00		0.05	1.00		0.73	1.00			0.95	
Satd. Flow (perm)	95	1847		95	3539		1369	1583			1588	
Peak-hour factor, PHF	0.95	0.95	0.95	0.94	0.94	0.94	0.77	0.77	0.77	0.67	0.67	0.67
Adj. Flow (vph)	6	1128	68	34	1948	1	222	0	55	9	0	25
RTOR Reduction (vph)	0	2	0	0	0	0	0	41	0	0	20	0
Lane Group Flow (vph)	6	1194	0	34	1949	0	222	14	0	0	14	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		2			6			8			4	
Permitted Phases	2			6			8			4		
Actuated Green, G (s)	78.4	78.4		78.4	78.4		30.6	30.6			30.6	
Effective Green, g (s)	78.4	78.4		78.4	78.4		30.6	30.6			30.6	
Actuated g/C Ratio	0.65	0.65		0.65	0.65		0.26	0.26			0.26	
Clearance Time (s)	6.0	6.0		6.0	6.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0			3.0	
Lane Grp Cap (vph)	62	1206		62	2312		349	403			404	
v/s Ratio Prot		c0.65			0.55			0.01				
v/s Ratio Perm	0.06			0.36			c0.16				0.01	
v/c Ratio	0.10	0.99		0.55	0.84		0.64	0.03			0.03	
Uniform Delay, d1	7.7	20.4		11.2	16.1		39.7	33.6			33.6	
Progression Factor	1.00	1.00		0.57	0.63		1.00	1.00			1.00	
Incremental Delay, d2	3.1	23.7		21.4	2.7		3.8	0.0			0.0	
Delay (s)	10.8	44.1		27.8	12.8		43.5	33.6			33.6	
Level of Service	B	D		C	B		D	C			C	
Approach Delay (s)		44.0			13.1			41.6			33.6	
Approach LOS		D			B			D			C	

Intersection Summary					
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C		
HCM 2000 Volume to Capacity ratio	0.89				
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0		
Intersection Capacity Utilization	85.7%	ICU Level of Service	E		
Analysis Period (min)	15				

c Critical Lane Group

14-ZN-2019
6/03/2020

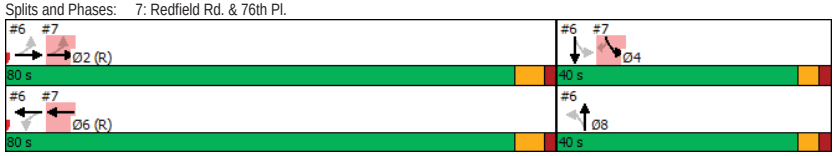
Timings
7: Redfield Rd. & 76th Pl.

04/23/2020

Lane Group	EBL	EBT	WBT	SBL	SBR	Ø8
Lane Configurations						
Traffic Volume (vph)	71	1052	1533	6	332	
Future Volume (vph)	71	1052	1533	6	332	
Turn Type	Perm	NA	NA	Prot	Perm	
Protected Phases		2	6	4		8
Permitted Phases	2				4	
Detector Phase	2	2	6	4	4	
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	6.0	6.0	6.0
Minimum Split (s)	46.0	46.0	46.0	11.0	11.0	20.0
Total Split (s)	80.0	80.0	80.0	40.0	40.0	40.0
Total Split (%)	66.7%	66.7%	66.7%	33.3%	33.3%	33%
Yellow Time (s)	4.2	4.2	4.2	3.1	3.1	3.1
All-Red Time (s)	1.8	1.8	1.8	1.9	1.9	1.9
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	6.0	6.0	6.0	5.0	5.0	
Lead/Lag						
Lead-Lag Optimize?						
Recall Mode	C-Max	C-Max	C-Max	None	None	None
Act Effct Green (s)	78.4	78.4	78.4	30.6	30.6	
Actuated g/C Ratio	0.65	0.65	0.65	0.26	0.26	
v/c Ratio	0.72	0.92	0.71	0.02	0.89	
Control Delay	23.6	11.4	15.2	30.8	62.0	
Queue Delay	0.0	12.3	0.3	0.0	55.8	
Total Delay	23.6	23.6	15.5	30.8	117.8	
LOS	C	C	B	C	F	
Approach Delay		23.6	15.5	116.3		
Approach LOS		C	B	F		

Intersection Summary			
Cycle Length: 120			
Actuated Cycle Length: 120			
Offset: 40 (33%), Referenced to phase 2:EBTL and 6:WBTL, Start of Green			
Natural Cycle: 90			
Control Type: Actuated-Coordinated			
Maximum v/c Ratio: 0.99			
Intersection Signal Delay: 30.5		Intersection LOS: C	
Intersection Capacity Utilization 72.5%		ICU Level of Service C	
Analysis Period (min) 15			

Splits and Phases: 7: Redfield Rd. & 76th Pl.



HCM Signalized Intersection Capacity Analysis
7: Redfield Rd. & 76th Pl.

04/23/2020

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (vph)	71	1052	1533	14	6	332
Future Volume (vph)	71	1052	1533	14	6	332
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.0	6.0	6.0		5.0	5.0
Lane Util. Factor	1.00	1.00	0.95		1.00	1.00
Frt	1.00	1.00	1.00		1.00	0.85
Flt Protected	0.95	1.00	1.00		0.95	1.00
Satd. Flow (prot)	1770	1863	3534		1770	1583
Flt Permitted	0.09	1.00	1.00		0.95	1.00
Satd. Flow (perm)	163	1863	3534		1770	1583
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.88	0.88
Adj. Flow (vph)	76	1119	1631	15	7	377
RTOR Reduction (vph)	0	0	0	0	0	22
Lane Group Flow (vph)	76	1119	1646	0	7	355
Turn Type	Perm	NA	NA		Prot	Perm
Protected Phases		2	6		4	
Permitted Phases	2					4
Actuated Green, G (s)	78.4	78.4	78.4		30.6	30.6
Effective Green, g (s)	78.4	78.4	78.4		30.6	30.6
Actuated g/C Ratio	0.65	0.65	0.65		0.26	0.26
Clearance Time (s)	6.0	6.0	6.0		5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0		3.0	3.0
Lane Grp Cap (vph)	106	1217	2308		451	403
v/s Ratio Prot		c0.60	0.47		0.00	
v/s Ratio Perm	0.47					c0.22
v/c Ratio	0.72	0.92	0.71		0.02	0.88
Uniform Delay, d1	13.6	18.1	13.5		33.4	42.9
Progression Factor	0.21	0.19	0.96		1.00	1.00
Incremental Delay, d2	13.4	5.1	1.1		0.0	19.5
Delay (s)	16.3	8.5	14.1		33.4	62.4
Level of Service	B	A	B		C	E
Approach Delay (s)		9.0	14.1		61.9	
Approach LOS		A	B		E	

Intersection Summary			
HCM 2000 Control Delay	17.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.91		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	11.0
Intersection Capacity Utilization	72.5%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

14-ZN-2019
6/03/2020

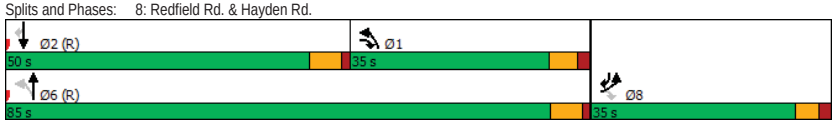
Timings
8: Redfield Rd. & Hayden Rd.

04/23/2020

Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (vph)	599	791	368	839	1308	940
Future Volume (vph)	599	791	368	839	1308	940
Turn Type	Prot	pm+ov	pm+pt	NA	NA	pm+ov
Protected Phases	8	1	1	6	2	8
Permitted Phases		8	6			2
Detector Phase	8	1	1	6	2	8
Switch Phase						
Minimum Initial (s)	7.0	5.0	5.0	10.0	10.0	7.0
Minimum Split (s)	31.3	11.0	11.0	23.9	27.9	31.3
Total Split (s)	35.0	35.0	35.0	85.0	50.0	35.0
Total Split (%)	29.2%	29.2%	29.2%	70.8%	41.7%	29.2%
Yellow Time (s)	3.3	4.0	4.0	4.7	4.7	3.3
All-Red Time (s)	2.0	2.0	2.0	1.2	1.2	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.3	6.0	6.0	5.9	5.9	5.3
Lead/Lag		Lag	Lag		Lead	
Lead-Lag Optimize?		Yes	Yes		Yes	
Recall Mode	None	None	None	C-Max	C-Max	None
Act Effct Green (s)	29.7	64.0	79.0	79.1	44.1	79.7
Actuated g/C Ratio	0.25	0.53	0.66	0.66	0.37	0.66
v/c Ratio	0.78	1.04	0.84	0.36	1.04	0.97
Control Delay	35.2	54.7	54.4	9.6	72.7	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	54.7	54.4	9.6	72.7	38.2
LOS	D	D	D	A	E	D
Approach Delay	46.3			23.3	58.3	
Approach LOS	D			C	E	

Intersection Summary		
Cycle Length: 120		
Actuated Cycle Length: 120		
Offset: 43 (36%), Referenced to phase 2:SBT and 6:NBTL, Start of Green		
Natural Cycle: 110		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.04		
Intersection Signal Delay: 46.3	Intersection LOS: D	
Intersection Capacity Utilization 96.0%	ICU Level of Service F	
Analysis Period (min) 15		

Splits and Phases: 8: Redfield Rd. & Hayden Rd.



HCM 6th Signalized Intersection Summary
8: Redfield Rd. & Hayden Rd.

04/23/2020

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	599	791	368	839	1308	940
Future Volume (veh/h)	599	791	368	839	1308	940
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00			1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1772	1772	1772	1969	1969	1772
Adj Flow Rate, veh/h	631	759	387	883	1422	892
Peak Hour Factor	0.95	0.95	0.95	0.95	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	808	773	512	2561	1375	922
Arrive On Green	0.25	0.25	0.27	0.68	0.37	0.37
Sat Flow, veh/h	3274	1502	1688	3839	3839	1502
Grp Volume(v), veh/h	631	759	387	883	1422	892
Grp Sat Flow(s),veh/h/ln	1637	1502	1688	1870	1870	1502
Q Serve(g_s), s	21.6	27.4	20.6	11.7	44.1	44.1
Cycle Q Clear(g_c), s	21.6	27.4	20.6	11.7	44.1	44.1
Prop In Lane	1.00	1.00	1.00			1.00
Lane Grp Cap(c), veh/h	808	773	512	2561	1375	922
V/C Ratio(X)	0.78	0.98	0.76	0.34	1.03	0.97
Avail Cap(c_a), veh/h	810	774	512	2561	1375	922
HCM Platoon Ratio	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
Uniform Delay (d), s/veh	42.2	28.6	38.1	7.8	37.9	17.4
Incr Delay (d2), s/veh	4.9	27.8	6.3	0.4	33.6	22.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.2	12.9	11.1	4.5	26.2	33.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	47.1	56.4	44.4	8.2	71.6	40.1
LnGrp LOS	D	E	D	A	F	D
Approach Vol, veh/h	1390			1270	2314	
Approach Delay, s/veh	52.2			19.2	59.4	
Approach LOS	D			B	E	

Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	38.2	50.0			88.2	34.9
Change Period (Y+Rc), s	* 6	5.9			* 6	5.3
Max Green Setting (Gmax), s	* 29	44.1			* 79	29.7
Max Q Clear Time (g_c+I1), s	22.6	46.1			13.7	29.4
Green Ext Time (p_c), s	0.7	0.0			8.0	0.2

Intersection Summary		
HCM 6th Ctrl Delay	47.1	
HCM 6th LOS	D	

Notes

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

14-ZN-2019
6/03/2020

HCM 6th TWSC
9: Scottsdale Rd. & Sutton Dr. 04/23/2020

Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	49	0	145	49	0	92	15	2279	29	52	2525	39
Future Vol, veh/h	49	0	145	49	0	92	15	2279	29	52	2525	39
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	-	-	-	-	-	-	50	-	-	155	-	-
Veh in Median Storage, #	-	1	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	59	59	59	86	86	86	95	95	95	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	83	0	246	57	0	107	16	2399	31	56	2715	42

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	3840	5310	1379	3645	5316	1215	2757	0	0	2430	0	0
Stage 1	2848	2848	-	2447	2447	-	-	-	-	-	-	-
Stage 2	992	2462	-	1198	2869	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	-	-	*315	-	-	*381	*396	-	-	*479	-	-
Stage 1	*323	*307	-	*391	*372	-	-	-	-	-	-	-
Stage 2	*391	*372	-	*323	*307	-	-	-	-	-	-	-
Platoon blocked, %	2	2	1	2	2	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	-	-	*315	-	-	*381	*396	-	-	*479	-	-
Mov Cap-2 Maneuver	*115	*130	-	*~ 38	*136	-	-	-	-	-	-	-
Stage 1	*310	*272	-	*376	*357	-	-	-	-	-	-	-
Stage 2	*270	*357	-	*63	*272	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s			0.1	0.3
HCM LOS	-	-		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 396	-	-	- -	* 479	-	-
HCM Lane V/C Ratio	0.04	-	-	- -	0.117	-	-
HCM Control Delay (s)	14.5	-	-	- -	13.5	-	-
HCM Lane LOS	B	-	-	- -	B	-	-
HCM 95th %tile Q(veh)	0.1	-	-	- -	0.4	-	-

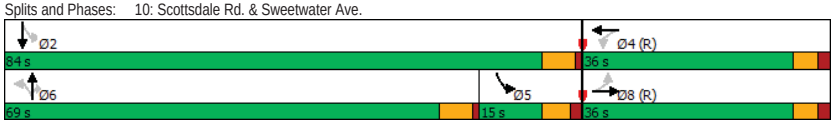
Notes
~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Timings
10: Scottsdale Rd. & Sweetwater Ave. 04/23/2020

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	42	30	81	126	68	2236	61	111	2446
Future Volume (vph)	42	30	81	126	68	2236	61	111	2446
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	pm+pt	NA
Protected Phases		8		4		6		5	2
Permitted Phases	8		4		6		6	2	
Detector Phase	8	8	4	4	6	6	6	5	2
Switch Phase									
Minimum Initial (s)	7.0	7.0	7.0	7.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	41.6	41.6	41.6	41.6	25.9	25.9	25.9	10.9	23.9
Total Split (s)	36.0	36.0	36.0	36.0	69.0	69.0	69.0	15.0	84.0
Total Split (%)	30.0%	30.0%	30.0%	30.0%	57.5%	57.5%	57.5%	12.5%	70.0%
Yellow Time (s)	3.6	3.6	3.6	3.6	4.7	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	2.0	2.0	2.0	1.2	1.2	1.2	1.9	1.2
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.6	5.6	5.6	5.6	5.9	5.9	5.9	5.9	5.9
Lead/Lag					Lead	Lead	Lead	Lag	
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	
Recall Mode	C-Max	C-Max	C-Max	C-Max	Ped	Ped	Ped	Max	Ped
Act Effct Green (s)	30.4	30.4	30.4	30.4	63.1	63.1	63.1	78.1	78.1
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.65	0.65
v/c Ratio	0.27	0.18	0.26	0.55	1.24	0.85	0.08	0.62	0.76
Control Delay	41.1	34.2	38.6	37.0	227.6	28.0	2.6	53.1	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	34.2	38.6	37.0	227.6	28.0	2.6	53.1	32.2
LOS	D	C	D	D	F	C	A	D	C
Approach Delay		36.7		37.4		33.0			33.0
Approach LOS		D		D		C			C

Intersection Summary	
Cycle Length: 120	
Actuated Cycle Length: 120	
Offset: 36 (30%), Referenced to phase 4:WBTL and 8:EBTL, Start of Green	
Natural Cycle: 100	
Control Type: Actuated-Coordinated	
Maximum v/c Ratio: 1.24	
Intersection Signal Delay: 33.4	Intersection LOS: C
Intersection Capacity Utilization 95.0%	ICU Level of Service F
Analysis Period (min) 15	

Splits and Phases: 10: Scottsdale Rd. & Sweetwater Ave.



14-ZN-2019
6/03/2020

HCM 6th Signalized Intersection Summary
10: Scottsdale Rd. & Sweetwater Ave.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	42	30	43	81	126	142	68	2236	61	111	2446	105
Future Volume (veh/h)	42	30	43	81	126	142	68	2236	61	111	2446	105
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1772	1969	1772	1772	1969	1772	1772	1969	1772	1772	1969	1772
Adj Flow Rate, veh/h	48	34	26	82	127	123	72	2379	49	114	2522	103
Peak Hour Factor	0.88	0.88	0.88	0.99	0.99	0.99	0.94	0.94	0.94	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	203	262	200	350	233	225	98	2826	790	206	3449	140
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.53	0.53	0.53	0.10	0.87	0.87
Sat Flow, veh/h	1070	1035	791	1272	919	890	110	5375	1502	1688	5299	215
Grp Volume(v), veh/h	48	0	60	82	0	250	72	2379	49	114	1698	927
Grp Sat Flow(s),veh/h/ln	1070	0	1826	1272	0	1809	110	1792	1502	1688	1792	1930
Q Serve(g_s), s	4.9	0.0	3.0	6.4	0.0	14.4	41.7	45.2	1.9	1.9	20.7	21.4
Cycle Q Clear(g_c), s	19.3	0.0	3.0	9.4	0.0	14.4	63.1	45.2	1.9	1.9	20.7	21.4
Prop In Lane	1.00		0.43	1.00		0.49	1.00		1.00	1.00		0.11
Lane Grp Cap(c), veh/h	203	0	463	350	0	458	98	2826	790	206	2332	1256
V/C Ratio(X)	0.24	0.00	0.13	0.23	0.00	0.55	0.73	0.84	0.06	0.55	0.73	0.74
Avail Cap(c_a), veh/h	203	0	463	350	0	458	98	2826	790	206	2332	1256
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.33	1.33	1.33
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	0.19	0.19	0.19	1.00	1.00	1.00
Uniform Delay (d), s/veh	47.2	0.0	34.6	38.2	0.0	38.8	49.0	24.2	13.9	48.8	4.2	4.3
Incr Delay (d2), s/veh	2.7	0.0	0.6	1.6	0.0	4.6	5.4	0.5	0.0	10.3	1.2	2.3
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	1.5	0.0	1.4	2.2	0.0	7.0	2.3	18.5	0.7	3.7	3.9	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	49.9	0.0	35.2	39.8	0.0	43.4	54.3	24.7	14.0	59.2	5.4	6.6
LnGrp LOS	D	A	D	D	A	D	D	C	B	E	A	A
Approach Vol, veh/h		108			332			2500			2739	
Approach Delay, s/veh		41.7			42.5			25.3			8.0	
Approach LOS		D			D			C			A	

Timer - Assigned Phs		2		4	5	6		8				
Phs Duration (G+Y+Rc), s		84.0		36.0	15.0	69.0		36.0				
Change Period (Y+Rc), s		* 5.9		5.6	* 5.9	* 5.9		5.6				
Max Green Setting (Gmax), s		* 78		30.4	* 9.1	* 63		30.4				
Max Q Clear Time (g_c+I1), s		23.4		16.4	3.9	65.1		21.3				
Green Ext Time (p_c), s		40.2		1.5	0.1	0.0		0.3				

Intersection Summary		
HCM 6th Ctrl Delay	18.3	
HCM 6th LOS	B	

Notes

User approved pedestrian interval to be less than phase max green.

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

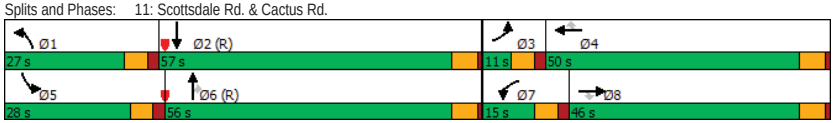
Timings
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Configurations											
Traffic Volume (vph)	154	889	218	182	1354	363	604	1678	273	632	1650
Future Volume (vph)	154	889	218	182	1354	363	604	1678	273	632	1650
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Perm	Prot	NA
Protected Phases	3	8		7	4		1	6		5	2
Permitted Phases			8			4			6		
Detector Phase	3	8	8	7	4	4	1	6	6	5	2
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	11.0	37.7	37.7	11.0	34.7	34.7	11.0	33.7	33.7	11.0	32.7
Total Split (s)	11.0	46.0	46.0	15.0	50.0	50.0	27.0	56.0	56.0	28.0	57.0
Total Split (%)	7.6%	31.7%	31.7%	10.3%	34.5%	34.5%	18.6%	38.6%	38.6%	19.3%	39.3%
Yellow Time (s)	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7	4.7	4.0	4.7
All-Red Time (s)	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0	1.0	2.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7	5.7	6.0	5.7
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	None	C-Max	C-Max	None	C-Max
Act Effct Green (s)	5.0	40.3	40.3	9.0	44.3	44.3	21.0	50.3	50.3	22.0	51.3
Actuated g/C Ratio	0.03	0.28	0.28	0.06	0.31	0.31	0.14	0.35	0.35	0.15	0.35
v/c Ratio	1.45	0.90	0.45	0.95	1.24	0.63	1.40	0.98	0.50	1.35	1.14
Control Delay	289.7	63.3	22.1	117.3	157.3	23.4	235.5	63.9	26.0	215.3	110.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	289.7	63.3	22.1	117.3	157.3	23.4	235.5	63.9	26.0	215.3	110.1
LOS	F	E	C	F	F	C	F	E	C	F	F
Approach Delay		83.8			127.9			100.4			135.2
Approach LOS		F			F			F			F

Intersection Summary		
Cycle Length: 145		
Actuated Cycle Length: 145		
Offset: 0 (0%), Referenced to phase 2:SBT and 6:NBT, Start of Green		
Natural Cycle: 145		
Control Type: Actuated-Coordinated		
Maximum v/c Ratio: 1.45		
Intersection Signal Delay: 115.0	Intersection LOS: F	
Intersection Capacity Utilization 115.9%	ICU Level of Service H	
Analysis Period (min) 15		

Splits and Phases: 11: Scottsdale Rd. & Cactus Rd.



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6/03/2020

HCM 6th Signalized Intersection Summary
11: Scottsdale Rd. & Cactus Rd.

04/23/2020

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	154	889	218	182	1354	363	604	1678	273	632	1650	363
Future Volume (veh/h)	154	889	218	182	1354	363	604	1678	273	632	1650	363
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	162	936	71	190	1410	159	657	1824	226	665	1737	356
Peak Hour Factor	0.95	0.95	0.95	0.96	0.96	0.96	0.92	0.92	0.92	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	1040	417	203	1143	459	474	1865	521	497	1586	321
Arrive On Green	0.03	0.28	0.28	0.06	0.31	0.31	0.14	0.35	0.35	0.15	0.35	0.35
Sat Flow, veh/h	3274	3741	1502	3274	3741	1502	3274	5375	1502	3274	4482	907
Grp Volume(v), veh/h	162	936	71	190	1410	159	657	1824	226	665	1384	709
Grp Sat Flow(s),veh/h/ln	1637	1870	1502	1637	1870	1502	1637	1792	1502	1637	1792	1806
Q Serve(g_s), s	5.0	34.9	5.2	8.4	44.3	11.9	21.0	48.6	16.8	22.0	51.3	51.3
Cycle Q Clear(g_c), s	5.0	34.9	5.2	8.4	44.3	11.9	21.0	48.6	16.8	22.0	51.3	51.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	113	1040	417	203	1143	459	474	1865	521	497	1268	639
V/C Ratio(X)	1.44	0.90	0.17	0.94	1.23	0.35	1.39	0.98	0.43	1.34	1.09	1.11
Avail Cap(c_a), veh/h	113	1040	417	203	1143	459	474	1865	521	497	1268	639
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	0.59	0.59	0.59
Uniform Delay (d), s/veh	70.0	50.4	39.7	67.7	50.3	39.1	62.0	46.8	36.4	61.5	46.9	46.9
Incr Delay (d2), s/veh	238.9	10.7	0.2	45.1	112.9	0.4	186.3	16.3	2.6	160.5	49.7	62.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.8	17.9	2.0	4.8	38.6	4.5	21.0	24.4	6.6	20.2	31.4	34.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	308.9	61.1	39.9	112.8	163.3	39.6	248.3	63.1	39.0	222.0	96.5	109.3
LnGrp LOS	F	E	D	F	F	D	F	E	D	F	F	F
Approach Vol, veh/h		1169			1759			2707			2758	
Approach Delay, s/veh		94.1			146.6			106.0			130.1	
Approach LOS		F			F			F			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	27.0	57.0	11.0	50.0	28.0	56.0	15.0	46.0
Change Period (Y+Rc), s	6.0	5.7	6.0	5.7	6.0	5.7	6.0	5.7
Max Green Setting (Gmax), s	21.0	51.3	5.0	44.3	22.0	50.3	9.0	40.3
Max Q Clear Time (g_c+I1), s	23.0	53.3	7.0	46.3	24.0	50.6	10.4	36.9
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0

Intersection Summary	
HCM 6th Ctrl Delay	120.8
HCM 6th LOS	F

HCM 6th TWSC
12: Access A

04/23/2020

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	935	12	10	1779	61	44
Future Vol, veh/h	935	12	10	1779	61	44
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	100	50	-	0	-
Veh in Median Storage, #	0	-	-	0	2	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	1039	13	11	1977	68	49

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1052	0	2050	1039
Stage 1	-	-	-	-	1039	-
Stage 2	-	-	-	-	1011	-
Critical Hdwy	-	-	4.13	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	-	-	2.219	-	3.519	3.319
Pot Cap-1 Maneuver	-	-	*434	-	*~ 54	*290
Stage 1	-	-	-	-	*274	-
Stage 2	-	-	-	-	*304	-
Platoon blocked, %	-	-	1	-		1
Mov Cap-1 Maneuver	-	-	*434	-	*~ 53	*290
Mov Cap-2 Maneuver	-	-	-	-	*197	-
Stage 1	-	-	-	-	*274	-
Stage 2	-	-	-	-	*296	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	36.2
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	228	-	-	* 434	-
HCM Lane V/C Ratio	0.512	-	-	0.026	-
HCM Control Delay (s)	36.2	-	-	13.5	-
HCM Lane LOS	E	-	-	B	-
HCM 95th %tile Q(veh)	2.6	-	-	0.1	-

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

Intersection	
Int Delay, s/veh	1.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	24	26	0	32	51	2282	10	5	2618	16
Future Vol, veh/h	1	0	24	26	0	32	51	2282	10	5	2618	16
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	-	-	100	-	-
Veh in Median Storage, #	-	0	-	-	1	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	27	29	0	36	57	2536	11	6	2909	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	4058	5591	1464	3832	5595	1274	2927	0	0	2547	0	0
Stage 1	2930	2930	-	2656	2656	-	-	-	-	-	-	-
Stage 2	1128	2661	-	1176	2939	-	-	-	-	-	-	-
Critical Hdwy	6.44	6.54	7.14	6.44	6.54	7.14	5.34	-	-	5.34	-	-
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	3.82	4.02	3.92	3.82	4.02	3.92	3.12	-	-	3.12	-	-
Pot Cap-1 Maneuver	*3	*0	*293	*~ 8	*0	*381	*368	-	-	*479	-	-
Stage 1	*301	*286	-	*355	*350	-	-	-	-	-	-	-
Stage 2	*391	*345	-	*301	*286	-	-	-	-	-	-	-
Platoon blocked, %	1	1	1	1	1	1	1	-	-	1	-	-
Mov Cap-1 Maneuver	*2	*0	*293	*~ 6	*0	*381	*368	-	-	*479	-	-
Mov Cap-2 Maneuver	*2	*0	-	*116	*117	-	-	-	-	-	-	-
Stage 1	*254	*282	-	*300	*295	-	-	-	-	-	-	-
Stage 2	*300	*292	-	*270	*282	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	184.2	33.8	0.4	0
HCM LOS	F	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	* 368	-	-	43	188	* 479	-	-
HCM Lane V/C Ratio	0.154	-	-	0.646	0.343	0.012	-	-
HCM Control Delay (s)	16.6	-	-	184.2	33.8	12.6	-	-
HCM Lane LOS	C	-	-	F	D	B	-	-
HCM 95th %tile Q(veh)	0.5	-	-	2.4	1.4	0	-	-

Notes

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

Intersection	
Int Delay, s/veh	0.1

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	23	2319	15	0	2668
Future Vol, veh/h	0	23	2319	15	0	2668
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	26	2577	17	0	2964

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	-	1297	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	*359	-	-	0	-
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		1	-	-		-
Mov Cap-1 Maneuver	-	*359	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.8	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBT
Capacity (veh/h)	-	- 359	-
HCM Lane V/C Ratio	-	- 0.071	-
HCM Control Delay (s)	-	- 15.8	-
HCM Lane LOS	-	- C	-
HCM 95th %tile Q(veh)	-	- 0.2	-

Notes

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

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	6	75	106	0	0	35
Future Vol, veh/h	6	75	106	0	0	35
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	83	118	0	0	39

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	118	0	-	0	215	118
Stage 1	-	-	-	-	118	-
Stage 2	-	-	-	-	97	-
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	1470	-	-	-	773	934
Stage 1	-	-	-	-	907	-
Stage 2	-	-	-	-	927	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1470	-	-	-	769	934
Mov Cap-2 Maneuver	-	-	-	-	769	-
Stage 1	-	-	-	-	902	-
Stage 2	-	-	-	-	927	-

Approach	EB	WB	SB
HCM Control Delay, s	0.6	0	9
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1470	-	-	-	934
HCM Lane V/C Ratio	0.005	-	-	-	0.042
HCM Control Delay (s)	7.5	0	-	-	9
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	15	66	56	0	0	32
Future Vol, veh/h	15	66	56	0	0	32
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	73	62	0	0	36

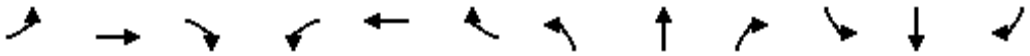
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	62	0	-	0	169	62
Stage 1	-	-	-	-	62	-
Stage 2	-	-	-	-	107	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1541	-	-	-	821	1003
Stage 1	-	-	-	-	961	-
Stage 2	-	-	-	-	917	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1541	-	-	-	811	1003
Mov Cap-2 Maneuver	-	-	-	-	811	-
Stage 1	-	-	-	-	949	-
Stage 2	-	-	-	-	917	-

Approach	EB	WB	SB
HCM Control Delay, s	1.4	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1541	-	-	-	1003
HCM Lane V/C Ratio	0.011	-	-	-	0.035
HCM Control Delay (s)	7.4	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0	-	-	-	0.1

APPENDIX I

QUEUE STORAGE ANALYSIS

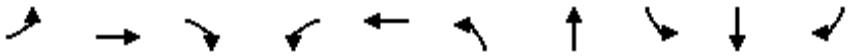


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	657	849	723	133	90	44	340	1489	293	252	1487	134
v/c Ratio	0.67	0.75	1.14	0.74	0.40	0.17	0.90	0.83	0.47	0.67	0.83	0.22
Control Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.0	34.4	16.4	60.4	41.4	2.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	42.4	105.3	79.5	59.4	1.4	84.0	34.4	16.4	60.4	41.4	2.4
Queue Length 50th (ft)	229	311	~507	53	36	0	143	432	172	97	386	0
Queue Length 95th (ft)	300	387	#746	#101	63	0	#226	480	255	143	447	21
Internal Link Dist (ft)		221			626			1650			462	
Turn Bay Length (ft)	330		245	245		100	190		170	270		270
Base Capacity (vph)	974	1137	636	181	450	336	379	1798	619	379	1798	619
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.67	0.75	1.14	0.73	0.20	0.13	0.90	0.83	0.47	0.66	0.83	0.22

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	69	39	322	46	35	293	2292	51	1923	33
v/c Ratio	0.43	0.16	1.07	0.29	0.15	1.34	0.61	0.34	0.54	0.03
Control Delay	57.6	48.8	101.6	52.9	28.9	196.2	6.2	22.1	12.2	0.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.6	48.8	101.6	52.9	28.9	196.2	6.2	22.1	12.2	0.2
Queue Length 50th (ft)	50	27	~182	33	11	~227	90	10	482	1
Queue Length 95th (ft)	98	61	#361	71	43	m#220	m84	m10	m423	m1
Internal Link Dist (ft)		478			565		2384		1650	
Turn Bay Length (ft)	150		150	75		305		95		80
Base Capacity (vph)	161	245	301	161	241	218	3749	185	3568	1021
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.16	1.07	0.29	0.15	1.34	0.61	0.28	0.54	0.03

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	439	1718	182	268	210	163	2189	286	365	1870
v/c Ratio	0.76	1.34	0.83	0.59	0.61	0.86	1.13	0.46	1.69	0.95
Control Delay	43.0	189.4	60.3	54.6	17.2	68.1	106.1	23.3	358.3	42.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.0	189.4	60.3	54.6	17.2	68.1	106.1	23.3	358.3	42.0
Queue Length 50th (ft)	259	~898	43	104	17	65	~741	151	~217	550
Queue Length 95th (ft)	#361	#1003	#67	138	81	m73	#693	m171	m#300	m#602
Internal Link Dist (ft)		219		727			577			2384
Turn Bay Length (ft)	265		175		130	190		140	265	
Base Capacity (vph)	581	1284	220	1207	611	189	1931	626	216	1966
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.34	0.83	0.22	0.34	0.86	1.13	0.46	1.69	0.95

Intersection Summary

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Queue shown is maximum after two cycles.

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	27	1857	97	540	263	55	5	26	145	4	25
v/c Ratio	0.09	1.16	1.10	0.34	0.33	0.10	0.01	0.04	0.25	0.00	0.04
Control Delay	14.5	104.7	156.5	15.9	3.2	14.2	13.0	4.2	16.0	13.0	4.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	14.5	104.7	156.5	15.9	3.2	14.2	13.0	4.2	16.0	13.0	4.1
Queue Length 50th (ft)	8	~590	~56	91	0	16	1	0	45	1	0
Queue Length 95th (ft)	22	#662	#149	127	41	23	5	4	69	6	8
Internal Link Dist (ft)		727		548			202			596	
Turn Bay Length (ft)	105		130		320	50		50	105		105
Base Capacity (vph)	312	1597	88	1606	796	574	845	666	573	845	666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.09	1.16	1.10	0.34	0.33	0.10	0.01	0.04	0.25	0.00	0.04

Intersection Summary

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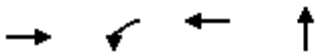
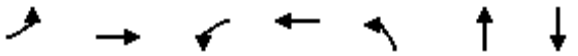
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	1716	1	956	12
v/c Ratio	0.96	0.02	0.28	0.05
Control Delay	24.6	4.0	2.5	9.0
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	24.6	4.0	2.5	9.0
Queue Length 50th (ft)	0	0	0	0
Queue Length 95th (ft)	#1886	2	146	0
Internal Link Dist (ft)	1118		412	452
Turn Bay Length (ft)		10		
Base Capacity (vph)	1788	51	3396	408
Starvation Cap Reductn	0	0	485	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.96	0.02	0.33	0.03

Intersection Summary

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



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	22	1934	31	1098	31	14	12
v/c Ratio	0.10	1.85	0.25	0.55	0.09	0.03	0.03
Control Delay	7.4	403.6	7.0	3.8	18.2	10.2	0.2
Queue Delay	0.0	0.6	0.0	0.0	0.0	0.0	0.0
Total Delay	7.4	404.2	7.0	3.8	18.2	10.2	0.2
Queue Length 50th (ft)	3	~1120	2	41	9	0	0
Queue Length 95th (ft)	13	#1350	m5	52	22	9	0
Internal Link Dist (ft)		412		165		194	174
Turn Bay Length (ft)	50		50		100		
Base Capacity (vph)	223	1047	124	2001	349	410	468
Starvation Cap Reductn	0	0	0	67	0	0	0
Spillback Cap Reductn	0	130	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	2.11	0.25	0.57	0.09	0.03	0.03

Intersection Summary

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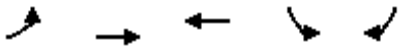
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	320	1494	1046	27	124
v/c Ratio	1.32	1.42	0.52	0.06	0.26
Control Delay	164.0	202.5	10.2	17.7	8.1
Queue Delay	0.0	0.8	0.0	0.0	0.0
Total Delay	164.0	203.3	10.2	17.7	8.1
Queue Length 50th (ft)	~151	~734	126	7	7
Queue Length 95th (ft)	m13	m59	m124	22	36
Internal Link Dist (ft)		165	1908	311	
Turn Bay Length (ft)	50				
Base Capacity (vph)	242	1055	2002	442	470
Starvation Cap Reductn	0	159	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	1.32	1.67	0.52	0.06	0.26

Intersection Summary

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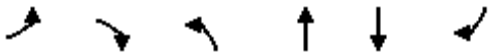
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	847	244	819	1135	359	484
v/c Ratio	1.05	0.27	1.06	0.46	0.26	0.47
Control Delay	70.8	5.6	75.1	10.8	27.2	9.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	5.6	75.1	10.8	27.2	9.1
Queue Length 50th (ft)	~382	39	~449	208	101	127
Queue Length 95th (ft)	m253	m12	#632	253	140	198
Internal Link Dist (ft)	177			890	744	
Turn Bay Length (ft)	180		295			250
Base Capacity (vph)	804	913	776	2455	1368	1031
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	1.05	0.27	1.06	0.46	0.26	0.47

Intersection Summary

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

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	106	290	143	178	40	2694	56	103	2316
v/c Ratio	0.43	0.61	0.89	0.34	0.69	0.96	0.07	0.56	0.67
Control Delay	43.9	44.9	92.4	16.2	80.3	37.1	1.8	53.4	25.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	43.9	44.9	92.4	16.2	80.3	37.1	1.8	53.4	25.3
Queue Length 50th (ft)	69	193	107	40	22	702	0	45	537
Queue Length 95th (ft)	120	272	#198	82	#82	651	9	m52	m533
Internal Link Dist (ft)		251		515		2563			1235
Turn Bay Length (ft)	160		75		185		155	130	
Base Capacity (vph)	248	472	160	525	58	2814	825	185	3477
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	0.43	0.61	0.89	0.34	0.69	0.96	0.07	0.56	0.67

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
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m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	361	1568	543	281	926	735	181	1644	202	551	1829
v/c Ratio	1.15	1.16	0.85	1.25	0.74	1.11	1.01	1.14	0.39	1.23	0.98
Control Delay	154.9	124.0	43.5	197.9	47.3	99.3	136.4	117.5	13.6	172.0	61.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	154.9	124.0	43.5	197.9	47.3	99.3	136.4	117.5	13.6	172.0	61.6
Queue Length 50th (ft)	~206	~922	355	~170	407	~630	~90	~660	33	~329	620
Queue Length 95th (ft)	#310	#1063	#567	#262	482	#862	#174	#756	103	#448	#733
Internal Link Dist (ft)		319			573			378			2563
Turn Bay Length (ft)	145		170	250		265	180		330	240	
Base Capacity (vph)	313	1346	641	224	1243	662	179	1447	519	448	1875
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.15	1.16	0.85	1.25	0.74	1.11	1.01	1.14	0.39	1.23	0.98

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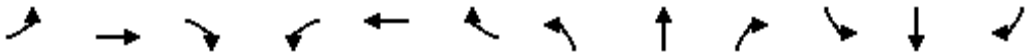
95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



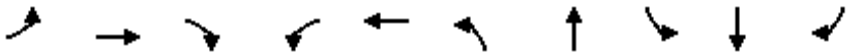
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	370	337	436	571	762	289	761	1817	133	138	1625	220
v/c Ratio	1.06	0.57	0.97	1.10	0.97	0.63	1.34	0.76	0.18	0.85	0.95	0.36
Control Delay	116.1	50.2	56.4	116.1	72.8	23.0	198.9	21.2	1.8	96.8	53.1	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	116.1	50.2	56.4	116.1	72.8	23.0	198.9	21.2	1.8	96.8	53.1	8.0
Queue Length 50th (ft)	~164	125	151	~286	310	75	~406	516	12	55	449	15
Queue Length 95th (ft)	#231	158	#279	#399	#436	173	m#502	m447	m17	#115	#552	75
Internal Link Dist (ft)		221			626			1650			462	
Turn Bay Length (ft)	330		245	245		100	190		170	270		270
Base Capacity (vph)	349	667	476	520	791	459	569	2377	735	162	1708	609
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.06	0.51	0.92	1.10	0.96	0.63	1.34	0.76	0.18	0.85	0.95	0.36

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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



Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	176	49	333	193	174	206	2382	58	2497	85
v/c Ratio	1.91	0.20	1.15	1.21	0.69	1.11	0.63	0.38	0.70	0.08
Control Delay	477.7	49.5	131.3	184.8	58.2	109.1	6.4	11.1	25.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	477.7	49.5	131.3	184.8	58.2	109.1	6.4	11.1	25.8	6.6
Queue Length 50th (ft)	~209	35	~220	~182	112	~138	65	12	597	20
Queue Length 95th (ft)	#349	72	#399	#281	164	m#138	m378	m12	m605	m20
Internal Link Dist (ft)		478			565		2384		1650	
Turn Bay Length (ft)	150		150	75		305		95		80
Base Capacity (vph)	92	245	289	159	251	185	3754	185	3568	1021
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.91	0.20	1.15	1.21	0.69	1.11	0.63	0.31	0.70	0.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

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

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	231	626	406	1267	344	411	1999	101	225	2716
v/c Ratio	1.42	0.78	0.49	1.02	0.55	1.52	1.06	0.16	1.19	1.57
Control Delay	253.3	37.9	37.0	71.4	18.3	274.3	78.4	9.8	156.0	283.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	253.3	37.9	37.0	71.4	18.3	274.3	78.4	9.8	156.0	283.9
Queue Length 50th (ft)	~174	170	100	~549	96	~232	~636	19	~110	~1109
Queue Length 95th (ft)	#317	213	136	#686	193	m#303	#734	m33	m#168	m#1097
Internal Link Dist (ft)		1719		727			577			2384
Turn Bay Length (ft)	265		175		130	190		140	265	
Base Capacity (vph)	163	1311	833	1238	622	271	1886	615	189	1734
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.42	0.48	0.49	1.02	0.55	1.52	1.06	0.16	1.19	1.57

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

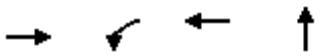
m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	11	614	23	1884	310	167	2	104	389	3	112
v/c Ratio	0.12	0.38	0.08	1.17	0.38	0.29	0.00	0.15	0.68	0.00	0.17
Control Delay	18.1	16.2	14.5	109.1	3.3	16.6	13.0	3.7	25.4	13.0	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.1	16.2	14.5	109.1	3.3	16.6	13.0	3.7	25.4	13.0	10.7
Queue Length 50th (ft)	3	104	7	~601	0	53	1	0	151	1	23
Queue Length 95th (ft)	15	145	19	#643	32	97	4	27	189	5	42
Internal Link Dist (ft)		727		526			202			596	
Turn Bay Length (ft)	105		130		320	100		100	105		105
Base Capacity (vph)	88	1599	277	1606	823	575	845	706	576	845	666
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.38	0.08	1.17	0.38	0.29	0.00	0.15	0.68	0.00	0.17

Intersection Summary

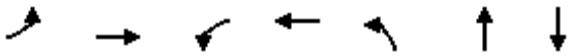
~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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



Lane Group	EBT	WBL	WBT	NBT
Lane Group Flow (vph)	1125	7	2065	12
v/c Ratio	0.63	0.02	0.61	0.05
Control Delay	6.4	3.3	4.8	9.0
Queue Delay	0.0	0.0	0.1	0.0
Total Delay	6.4	3.3	4.9	9.0
Queue Length 50th (ft)	0	0	0	0
Queue Length 95th (ft)	620	5	443	0
Internal Link Dist (ft)	1134		412	452
Turn Bay Length (ft)		10		
Base Capacity (vph)	1786	336	3396	408
Starvation Cap Reductn	0	0	258	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.63	0.02	0.66	0.03

Intersection Summary



Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBT
Lane Group Flow (vph)	6	1196	34	1949	222	55	34
v/c Ratio	0.10	0.99	0.56	0.84	0.64	0.12	0.08
Control Delay	13.8	45.8	36.9	14.0	47.9	1.7	14.2
Queue Delay	0.0	38.3	0.0	0.3	0.0	0.0	0.0
Total Delay	13.8	84.1	36.9	14.3	47.9	1.7	14.2
Queue Length 50th (ft)	2	~917	6	644	150	0	4
Queue Length 95th (ft)	9	#1273	m12	700	188	0	17
Internal Link Dist (ft)		412		165		194	174
Turn Bay Length (ft)	50		50		100		
Base Capacity (vph)	61	1208	61	2312	399	529	482
Starvation Cap Reductn	0	212	0	65	0	0	0
Spillback Cap Reductn	0	23	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.10	1.20	0.56	0.87	0.56	0.10	0.07

Intersection Summary

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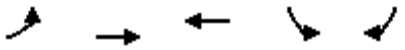
Queue shown is maximum after two cycles.

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

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



Lane Group	EBL	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	76	1119	1646	7	377
v/c Ratio	0.72	0.92	0.71	0.02	0.89
Control Delay	23.6	11.4	15.2	30.8	62.0
Queue Delay	0.0	12.3	0.3	0.0	55.8
Total Delay	23.6	23.6	15.5	30.8	117.8
Queue Length 50th (ft)	6	84	367	4	257
Queue Length 95th (ft)	m6	m92	m470	15	#363
Internal Link Dist (ft)		165	1908	311	
Turn Bay Length (ft)	50				
Base Capacity (vph)	105	1217	2310	516	482
Starvation Cap Reductn	0	107	0	0	0
Spillback Cap Reductn	0	0	194	0	177
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	1.01	0.78	0.01	1.24

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
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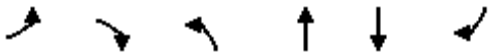
m Volume for 95th percentile queue is metered by upstream signal.



Lane Group	EBL	EBR	NBL	NBT	SBT	SBR
Lane Group Flow (vph)	631	833	387	883	1422	1022
v/c Ratio	0.78	1.04	0.84	0.36	1.04	0.97
Control Delay	35.2	54.7	54.4	9.6	72.7	38.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	35.2	54.7	54.4	9.6	72.7	38.2
Queue Length 50th (ft)	217	~686	233	147	~625	612
Queue Length 95th (ft)	m251	m#833	#397	183	#764	#1005
Internal Link Dist (ft)	177			890	744	
Turn Bay Length (ft)	180		295			250
Base Capacity (vph)	804	802	463	2455	1368	1054
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	0.78	1.04	0.84	0.36	1.04	0.97

Intersection Summary

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

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

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	83	82	270	72	2379	65	114	2630
v/c Ratio	0.27	0.18	0.26	0.55	1.24	0.85	0.08	0.62	0.76
Control Delay	41.1	34.2	38.6	37.0	227.6	28.0	2.6	53.1	32.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.1	34.2	38.6	37.0	227.6	28.0	2.6	53.1	32.2
Queue Length 50th (ft)	30	47	51	151	~69	555	0	57	656
Queue Length 95th (ft)	65	88	98	240	#124	624	17	m54	m441
Internal Link Dist (ft)		251		515		2563			1235
Turn Bay Length (ft)	160		75		185		155	130	
Base Capacity (vph)	176	456	314	491	58	2814	825	185	3466
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	0.27	0.18	0.26	0.55	1.24	0.85	0.08	0.62	0.76

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
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m Volume for 95th percentile queue is metered by upstream signal.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	162	936	229	190	1410	378	657	1824	297	665	2119
v/c Ratio	1.45	0.90	0.45	0.95	1.24	0.63	1.40	0.98	0.50	1.35	1.14
Control Delay	289.7	63.3	22.1	117.3	157.3	23.4	235.5	63.9	26.0	215.3	110.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	289.7	63.3	22.1	117.3	157.3	23.4	235.5	63.9	26.0	215.3	110.1
Queue Length 50th (ft)	~107	451	78	93	~867	135	~425	624	137	~422	~844
Queue Length 95th (ft)	#184	#567	161	#173	#1007	251	#550	#738	230	#546	#936
Internal Link Dist (ft)		319			573			378			2563
Turn Bay Length (ft)	145		170	250		265	180		330	240	
Base Capacity (vph)	112	1035	507	201	1138	604	470	1856	592	493	1866
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.45	0.90	0.45	0.95	1.24	0.63	1.40	0.98	0.50	1.35	1.14

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

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

Signalized Intersection

2029

		Length (ft)	% Vehicles	Veh. Type		
Average Vehicle Length (ft):	26	25	98%	Passenger	Cycles:	2
Intersection Cycle Length (sec):	120	75	2%	Truck		

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

Intersection	Approach	AM Peak (veh/hr)	Midday Peak	PM Peak (veh/hr)	Max vehs per 2 cycles	Max trucks per 2 cycles	Storage Length
Scottsdale Rd. & Greenway Pkwy.	NB Left	323	0	708	47	1	1250'
	SB Left	244	0	126	16	1	475'
	EB Left	604	0	307	40	1	1075'
	WB Left	124	0	554	37	1	1000'
	NB Right	278	0	124	19	1	550'
	SB Right	130	0	200	14	1	425'
	EB Right	665	0	362	44	1	1175'
	WB Right	41	0	280	19	1	550'
Scottsdale Rd. & Acoma Dr.	NB Left	249	0	179	17	1	500'
	SB Left	46	0	52	4	1	175'
	EB Left	61	0	157	11	1	350'
	WB Left	42	0	154	11	1	350'
	NB Right	61	0	18	4	1	175'
	SB Right	30	0	76	5	1	200'
	EB Right	287	0	296	20	1	575'
	WB Right	17	0	59	4	1	175'
Scottsdale Rd. & Thunderbird Rd.	NB Left	132	0	378	25	1	700'
	SB Left	339	0	196	23	1	650'
	EB Left	386	0	206	26	1	725'
	WB Left	158	0	365	24	1	675'
	NB Right	232	0	93	16	1	475'
	SB Right	86	0	347	23	1	650'
	EB Right	482	0	259	32	1	875'
	WB Right	183	0	310	21	1	600'
73rd St. & Thunderbird Rd.	NB Left	32	0	167	11	1	350'
	SB Left	110	0	292	20	1	575'
	EB Left	23	0	10	2	1	125'
	WB Left	94	0	19	7	1	250'
	NB Right	15	0	104	7	1	250'
	SB Right	19	0	84	6	1	225'
	EB Right	106	0	26	7	1	250'
	WB Right	255	0	257	17	1	500'
76th St. & Redfield Rd.	NB Left	23	0	171	12	1	375'
	SB Left	0	0	6	1	1	100'
	EB Left	20	0	6	2	1	125'
	WB Left	27	0	32	3	1	150'
	NB Right	10	0	42	3	1	150'
	SB Right	6	0	17	2	1	125'
	EB Right	135	0	65	9	1	300'
	WB Right	17	0	1	2	1	125'
76th Pl. & Redfield Rd.	NB Left	0	0	0	0	0	0'
	SB Left	23	0	6	2	1	125'
	EB Left	282	0	71	19	1	550'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	104	0	332	22	1	625'
	EB Right	0	0	0	0	0	0'
	WB Right	19	0	14	2	1	125'

Signalized Intersection

2029

		Length (ft)	% Vehicles	Veh. Type		
Average Vehicle Length (ft):	26	25	98%	Passenger	Cycles:	2
Intersection Cycle Length (sec):	120	75	2%	Truck		

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
Hayden Rd. & Redfield Rd.	NB Left	803	0	368	53	2	1475'
	SB Left	0	0	0	0	0	0'
	EB Left	745	0	599	49	1	1300'
	WB Left	0	0	0	0	0	0'
	NB Right	0	0	0	0	0	0'
	SB Right	460	0	940	62	2	1700'
	EB Right	215	0	791	52	2	1450'
	WB Right	0	0	0	0	0	0'
Scottsdale Rd. & Sweetwater Ave.	NB Left	33	0	68	5	1	200'
	SB Left	91	0	111	8	1	275'
	EB Left	91	0	42	6	1	225'
	WB Left	116	0	81	8	1	275'
	NB Right	46	0	61	4	1	175'
	SB Right	29	0	105	7	1	250'
	EB Right	104	0	43	7	1	250'
	WB Right	106	0	142	10	1	325'
Scottsdale Rd. & Cactus Rd.	NB Left	163	0	604	40	1	1075'
	SB Left	496	0	632	42	1	1125'
	EB Left	332	0	154	22	1	625'
	WB Left	250	0	182	17	1	500'
	NB Right	182	0	273	18	1	525'
	SB Right	126	0	363	24	1	675'
	EB Right	500	0	218	33	1	900'
	WB Right	654	0	363	43	1	1150'

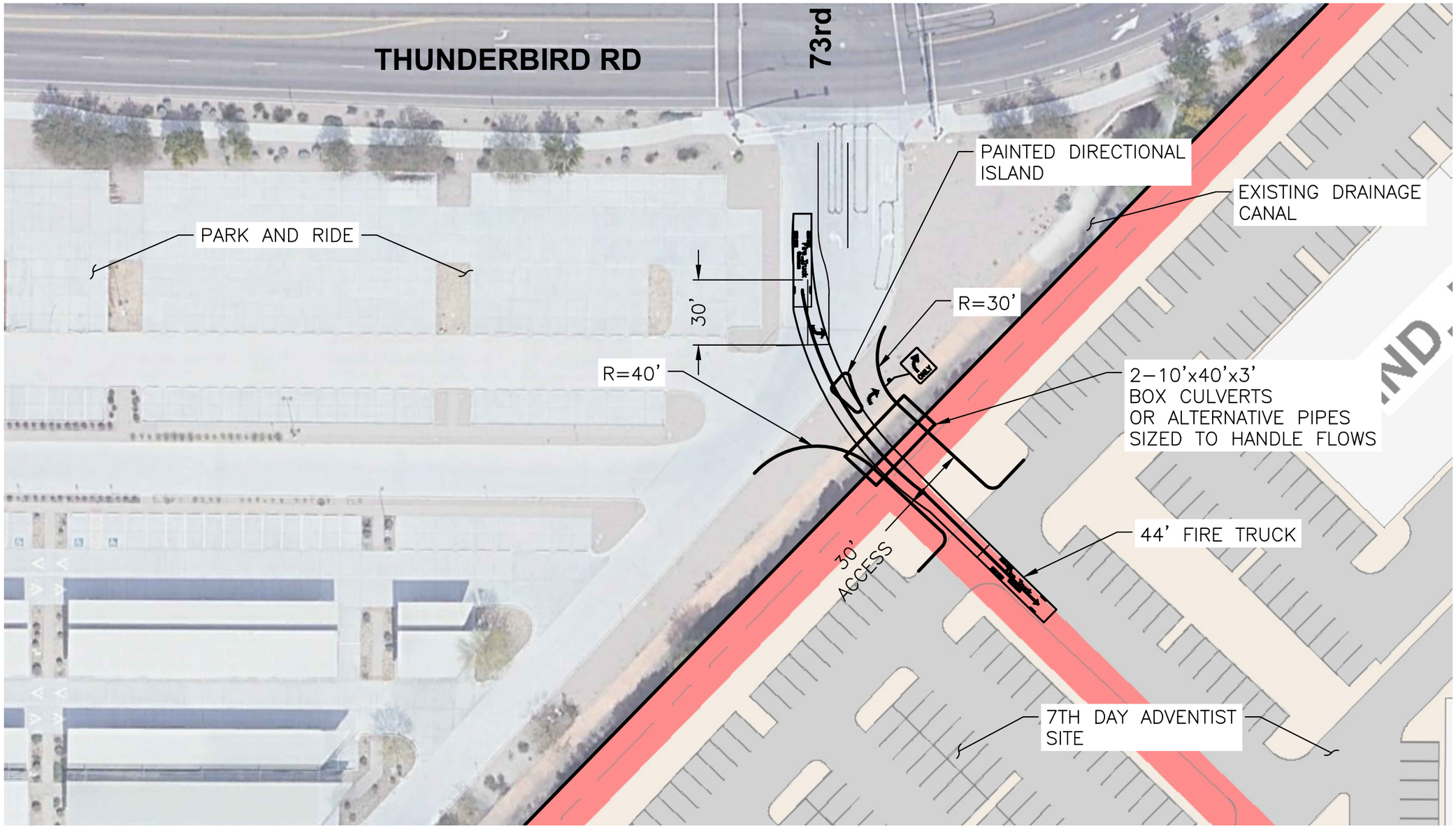
Unsignalized Intersection

2029

		Length (ft)	% Vehicles	Veh. Type
Average Vehicle Length (ft):	26	25	98%	Passenger
	120	75	2%	Truck

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
Scottsdale Rd. & Sutton Dr.	NB Left	48	0	15	2	1	125'
	SB Left	84	0	52	3	1	150'
	EB Left	17	0	49	2	1	125'
	WB Left	19	0	49	2	1	125'
	NB Right	57	0	29	2	1	125'
	SB Right	89	0	39	3	1	150'
	EB Right	25	0	145	5	1	200'
	WB Right	61	0	92	4	1	175'
Access A & Redfield Rd.	NB Left	12	0	61	2	1	125'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	45	0	10	2	1	125'
	NB Right	8	0	44	2	1	125'
	SB Right	0	0	0	0	0	0'
	EB Right	47	0	12	2	1	125'
	WB Right	0	0	0	0	0	0'
Scottsdale Rd. & Access B	NB Left	60	0	51	2	1	125'
	SB Left	25	0	5	1	1	100'
	EB Left	13	0	1	1	1	100'
	WB Left	4	0	26	1	1	100'
	NB Right	51	0	10	2	1	125'
	SB Right	32	0	16	2	1	125'
	EB Right	64	0	24	3	1	150'
	WB Right	5	0	32	2	1	125'
Scottsdale Rd. & Access C	NB Left	0	0	0	0	0	0'
	SB Left	0	0	0	0	0	0'
	EB Left	0	0	0	0	0	0'
	WB Left	0	0	0	0	0	0'
	NB Right	75	0	15	3	1	150'
	SB Right	0	0	0	0	0	0'
	EB Right	0	0	0	0	0	0'
	WB Right	4	0	23	1	1	100'



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May 6, 2020 – 11:45am
Mario Marquez

CivTech Inc.
10605 N. Hayden Rd. Suite 140 Scottsdale, AZ 85260
480.659.4250 p
480.659.0566 f
info@civtech.com

7th DAY ADVENTIST
N. SCOSSTDALE RD.
AND E. SUTTON DR.

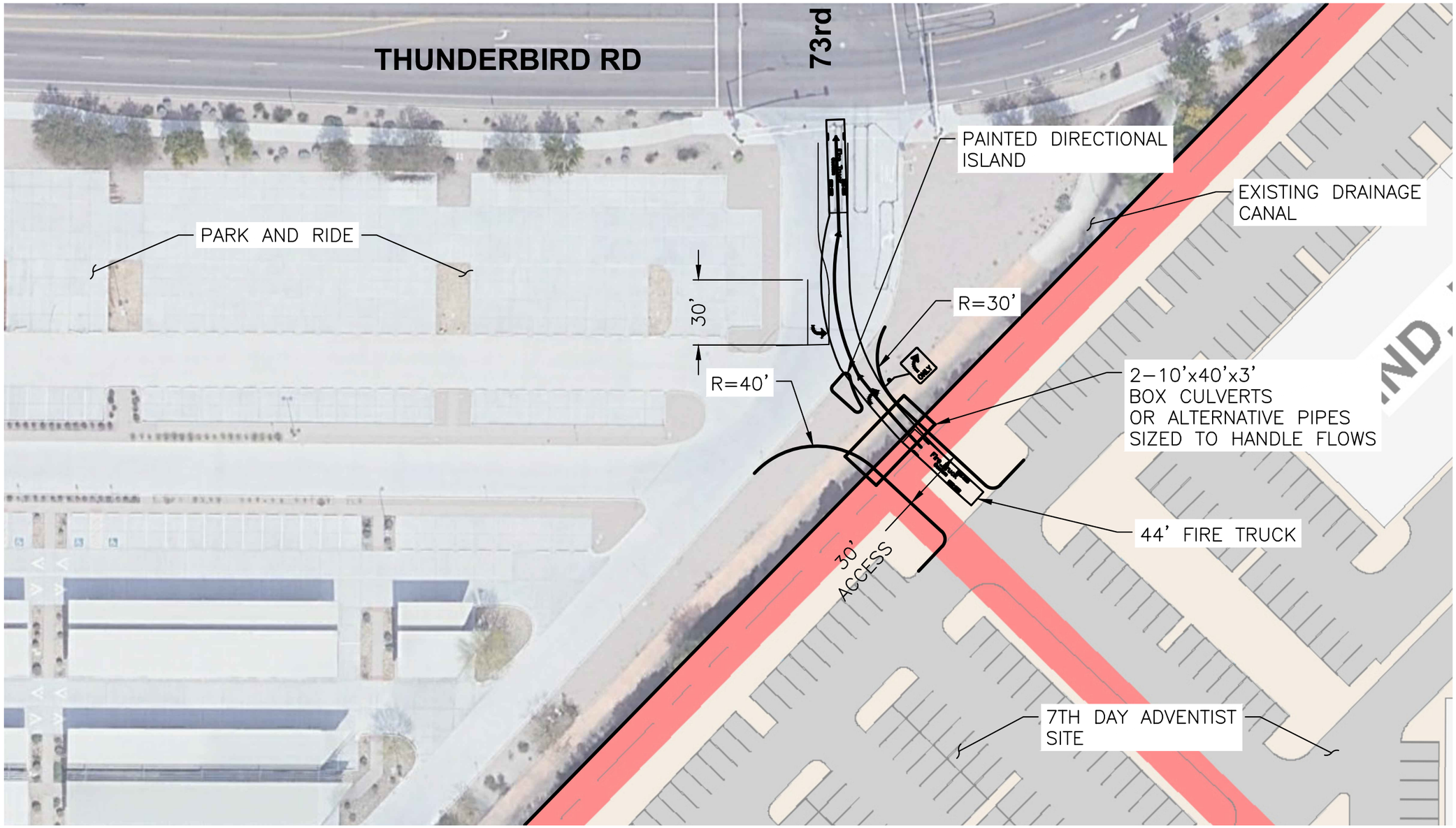
BOX CULVERT & TURNING MOVEMENT CONCEPT

PRELIMINARY NOT FOR CONSTRUCTION

JOB NO:	19-0761
1ST SUBMITTAL:	05/02/20
2ND SUBMITTAL:	
3RD SUBMITTAL:	
DESIGN:	SP
DRAWN:	SP
CHECKED:	JY

SHEET
AT-01
01 OF 04

14-ZN-2019
6/03/2020



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Mario Marquez

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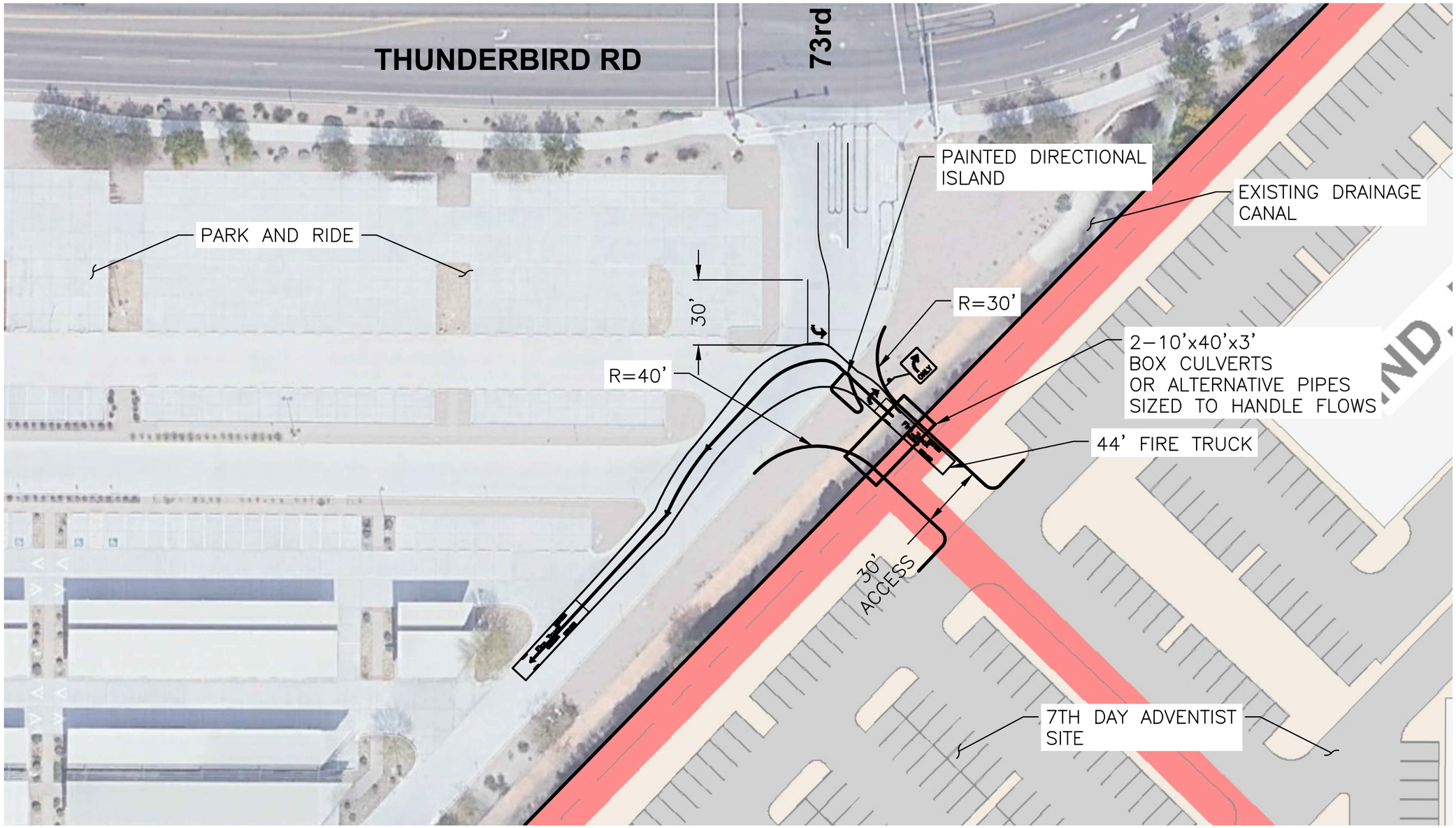
3RD SUBMITTAL:	
DESIGN:	SP
DRAWN:	SP
CHECKED:	JY

SHEET
AT-02
02 OF 04

14-ZN-2019
6/03/2020



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May 6, 2020 - 11:49am
Mario Marquez

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BOX CULVERT & TURNING MOVEMENT CONCEPT

PRELIMINARY NOT FOR CONSTRUCTION

JOB NO:	19-0761
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3RD SUBMITTAL:	
DESIGN:	SP
DRAWN:	SP
CHECKED:	JY

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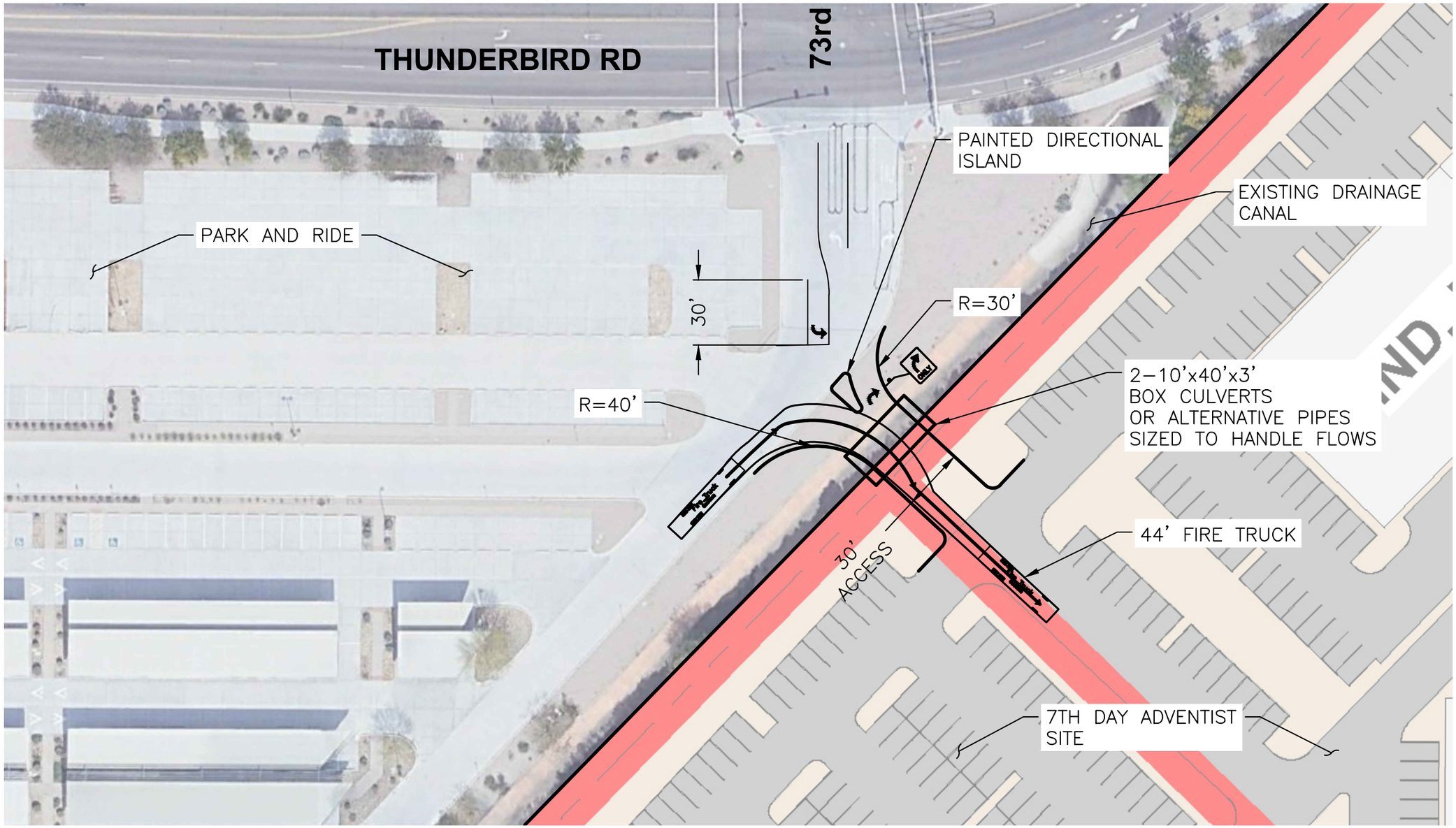
AT-03
03 OF 04

14-ZN-2019
6/03/2020



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Mario Marquez

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BOX CULVERT & TURNING MOVEMENT CONCEPT

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3RD SUBMITTAL:	
DESIGN:	SP
DRAWN:	SP
CHECKED:	JY

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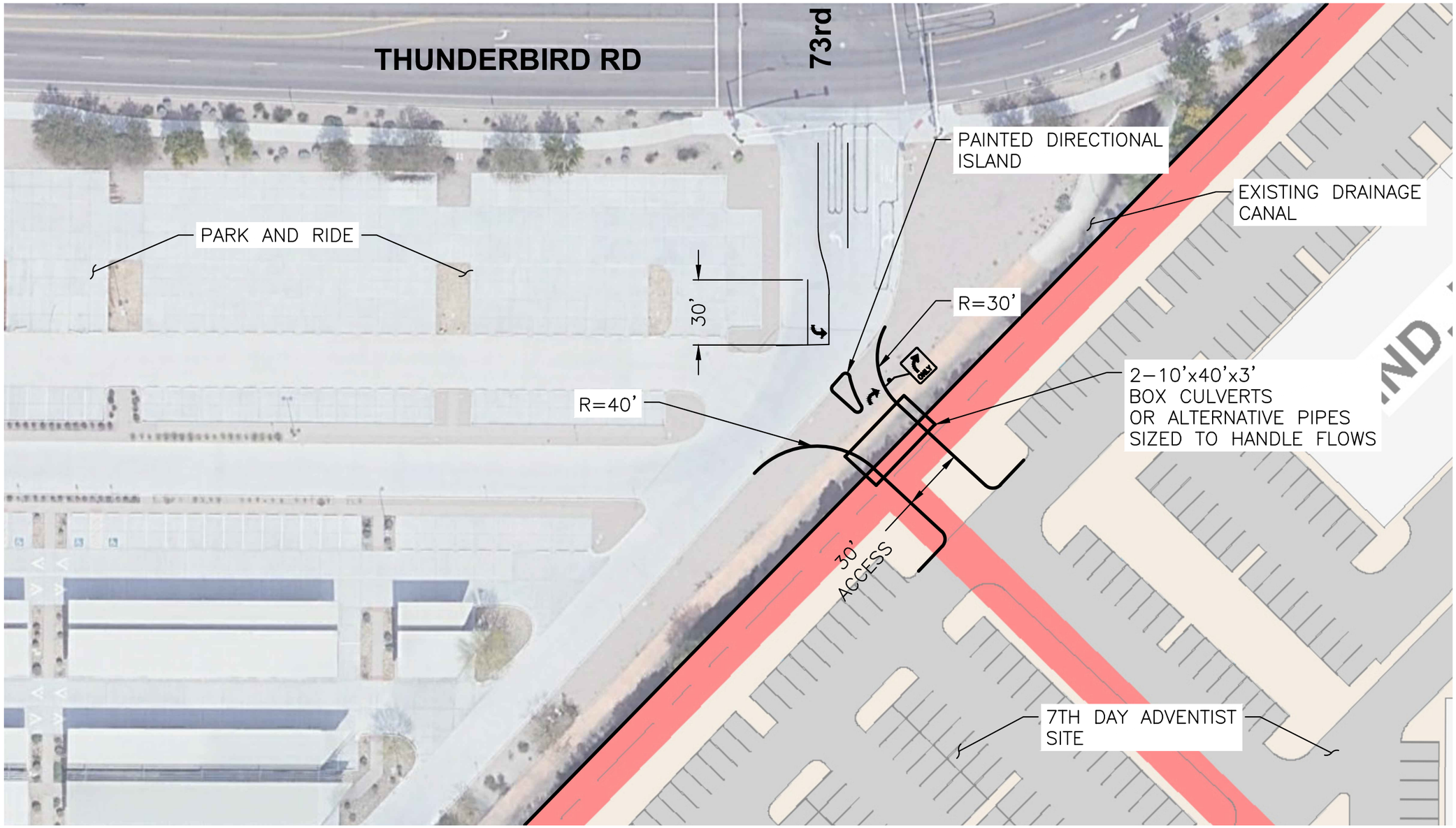
04 OF 04

14-ZN-2019
6/03/2020



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May 6, 2020 – 4:46pm
Mario Marquez

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DRIVEWAY CONNECTION DESIGN TO PARK & RIDE FACILITY

PRELIMINARY NOT FOR CONSTRUCTION

JOB NO:	19-0761
1ST SUBMITTAL:	05/02/20
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3RD SUBMITTAL:	
DESIGN:	SP
DRAWN:	SP
CHECKED:	JY

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05 OF 05

14-ZN-2019
6/03/2020