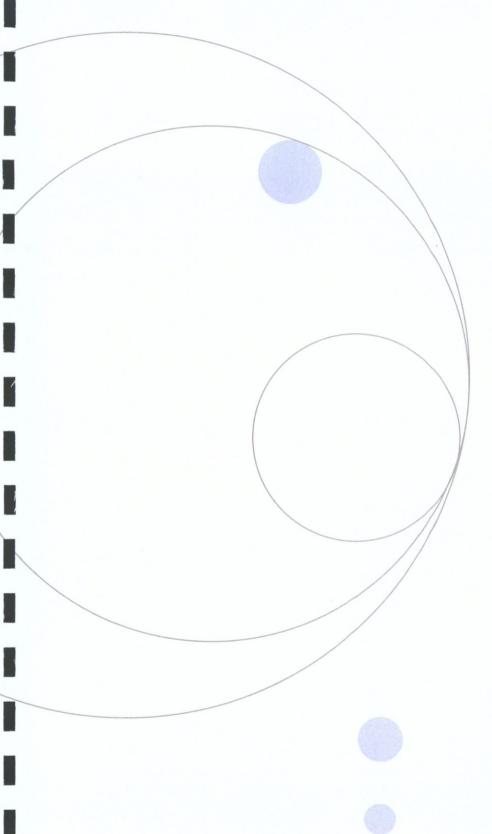
Exterior Building Color & Material Samples (Photo)
Color Drawdowns
Drainage Reports
TIMA

Abbreveated Water & Sewer Need Report
Archaeological Resources
Airport Vicinity Development Checklist
Parking Study
Parking Master Plan
Water Study
Wastewater Study
Stormwater Waiver Application



# District at the Quarter

Traffic Impact and Mitigation Analysis 2<sup>nd</sup> Submittal - *REVISED* 

Township 3 North, Range 4 East Section 2 - Scottsdale, Arizona

August 2016 Project No. 16-0110

Prepared For:
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For Submittal to: **City of Scottsdale** 

Prepared By:



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> 3-GP-16/8-ZN-16 08/05/16

# DISTRICT AT THE QUARTER TRAFFIC IMPACT AND MITIGATION ANALYSIS 2<sup>ND</sup> SUBMITTAL <u>REVISED</u>

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#### **EXECUTIVE SUMMARY**

The District at the Quarter development is located on the northeast corner of Dial Boulevard/73<sup>rd</sup> Street and Greenway Hayden Loop. The proposed development is a 622-unit apartment complex with seven optional live/work units on the ground floor, a 7,855-square foot (SF) clubhouse, a 7,035-SF quality restaurant, and a 5,354-SF fitness center, the latter two of which are expected to be open to the public. The project will redevelop the site of the existing 130,000-SF International Cruise & Excursions, Inc. (ICE) offices at 15501 North Dial Boulevard in Scottsdale, on the northeast corner of Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop.

Access for residents and diners to two planned parking garages will be via two new site accesses, one each from Greenway-Hayden Loop and Dial Boulevard. Another new driveway on Dial Boulevard nearer the adjacent intersection will serve as a valet parking area for the restaurant, fitness center, and clubhouse. A second new driveway on Greenway-Hayden Loop will serve a fire lane around the complex that will re-use the existing northern site access to Dial Boulevard. Two other accesses, including the existing ICE main driveway, will be closed.

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

- ◆ The proposed development is expected to generate a total of 4,992 trips daily, with 283 trips (92 in/191 out) during the AM peak hour and 360 trips (214 in/146 out) during the PM peak hour. Overall, the development could generate a net of 1,878 more trips each day than the current office use with 336 fewer during the AM peak hour and 203 fewer during the PM peak hour. These trips, the majority of which are typically considered commuter trips to and from places of employment, are in the opposite direction of those currently being generated by the office building.
- Of 34 reported crashes at the three existing study intersections, 33 occurred at the intersection of Scottsdale Road and Greenway-Hayden Loop. From the above review of crash data at this intersection, it can be concluded that there are no obvious crash patterns that stand out and could be treated with any type of low-cost mitigation measures that could be implemented by the City.
- All study intersections currently operate at overall LOS D or better during the peak hours. The eastbound Kierland Boulevard approach to Scottsdale Road operates at poor levels of service (LOS E or F) in the PM peak hour with the existing signal timing.
- Right-turn deceleration lanes are not required by City of Scottsdale's Design Standards and Polices Manual Section 5-3.206 on Dial Boulevard approaching the site driveways.
- ♦ In 2017, with the proposed development, all signalized intersections are anticipated to operate at overall LOS D or better during both peak hours. The eastbound Kierland Boulevard approach to Scottsdale Road is expected to continue to operate with delays at LOS E during the PM peak hour with the existing signal timing. With the addition of site traffic, the westbound Greenway-Hayden Loop approach to Scottsdale Road is also expected to operate with delays at LOS E during the PM peak hour with the same signal timing. The City of Scottsdale



- may consider modifying signal timing at this intersection to improve levels of service on the east- and westbound approaches.
- ♦ The queue storage analysis revealed that the existing turn lane storage capacities in and around the District at the Quarter development can accommodate anticipated queuing in up to 95% of situations.
- ◆ It is recommended that the proposed site driveway be designed to meet the standards established by the City of Scottsdale in its Design Standards and Policies Manual, 2010 Update. A CL-1 two-way commercial driveway is recommended for Accesses A and B, for the valet parking driveway on Dial Boulevard, and for the fire lane driveway to Greenway-Hayden Loop near the eastern boundary of the property. Since there are no resident-only accesses and there is a continuous drive aisle from Access A to Access B, turnarounds for errant vehicles, as requested by the City via a comment, are no longer warranted.
- The proposed valet parking area driveway to Dial Boulevard will be located approximately 270 feet north of the intersection, which exceeds the City's standard driveway spacing of 165 feet for a minor collector roadway as required by the City's 2010 Design Standards and Policies Manual.
- Dial Boulevard was constructed with horizontal curvature at a relatively flat grade; therefore, the only impediments to the sight distance would be existing structures and landscaping. The developer should ensure that adequate sight distance is provided at the intersections to allow safe left and right turning movements from the development and left turns into the development from Dial Boulevard. Landscaping should be maintained at a maximum of three feet in height. To maintain sight distance, tree branches should be trimmed lower than seven feet and maintained to meet current acceptable landscape requirements.



#### INTRODUCTION

The proposed District at the Quarter development is a 622-unit apartment complex that will redevelop the site of the existing 130,000 square foot (SF) International Cruise & Excursions, Inc. (ICE) offices at 15501 North Dial Boulevard in Scottsdale. The site is on the northeast corner of the signalized intersection of Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop and consists of two parcels that front Greenway-Hayden Loop. The vicinity is shown in **Figure 1**.

The proposed redevelopment project is expected to consist of two buildings, designated as A and B on a new site plan dated August 3, 2016. (The prior TIMA was based on a preliminary plan from September 2015.) Building A is the southern of the two and will have 332 dwelling units on four floors, a 7,855-SF clubhouse a 7,035-SF quality restaurant, and a 5,354-SF fitness center. Building B will have 290 dwelling units, also on four floors. The complex will, thus, have a total of 622 dwelling units. Access for residents and diners to two planned parking garages will be via two new site accesses, one each from Greenway-Hayden Loop and Dial Boulevard. Another new driveway on Dial Boulevard nearer the adjacent intersection will serve as a valet parking area for the restaurant, fitness center, and clubhouse. A second new driveway on Greenway-Hayden Loop will serve a fire lane around the complex that will re-use the existing northern site access to Dial Boulevard. Two other accesses, including the existing ICE main driveway, will be closed.

CivTech Inc. was retained by Rick Engineering to perform the traffic impact and mitigation analysis (TIMA) as required by the City of Scottsdale for the proposed development.

**Purpose of Report and Study Objectives** 

The purpose of this study is to address the traffic and transportation impacts of the proposed development on the surrounding streets and intersections. This Traffic Impact Mitigation Analysis (TIMA) was prepared for submittal to the City of Scottsdale in conformance to City guidelines. The specific objectives of the TIMA are:

- 1. To evaluate lane requirements on all existing roadways and at all existing intersections within the study area.
- 2. To determine future level of service for all proposed major intersections within the study area and recommend any capacity related improvements.
- 3. To determine necessary lane configurations at all major intersections within the proposed development to provide acceptable future levels of service.
- 4. To evaluate the need for future traffic control changes within the proposed development and at the major entry points.
- 5. To evaluate the need for auxiliary lanes at stop and signal controlled intersections.

Study Requirements

With the concurrence of City of Scottsdale staff, the study area for this TIMA will include the following intersections:

- Scottsdale Road and Kierland Boulevard/Greenway-Hayden Loop
- ◆ Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop
- Dial Boulevard and Tierra Buena Lane

Weekday AM and PM peak hour levels of service for these study intersections will be analyzed under current conditions and under two opening year scenarios: without and with the proposed development. It is anticipated that the development will open in 2017. For purposes of this analysis, the development will be considered to be built-out upon opening. This report represents a second submittal of the TIMA revised to reflect a new site plan. The City of Scottsdale reviewed and commented on the first submittal dated March 2016. The City's comments, dated May 2016, and CivTech's responses can be found in **Appendix A**.



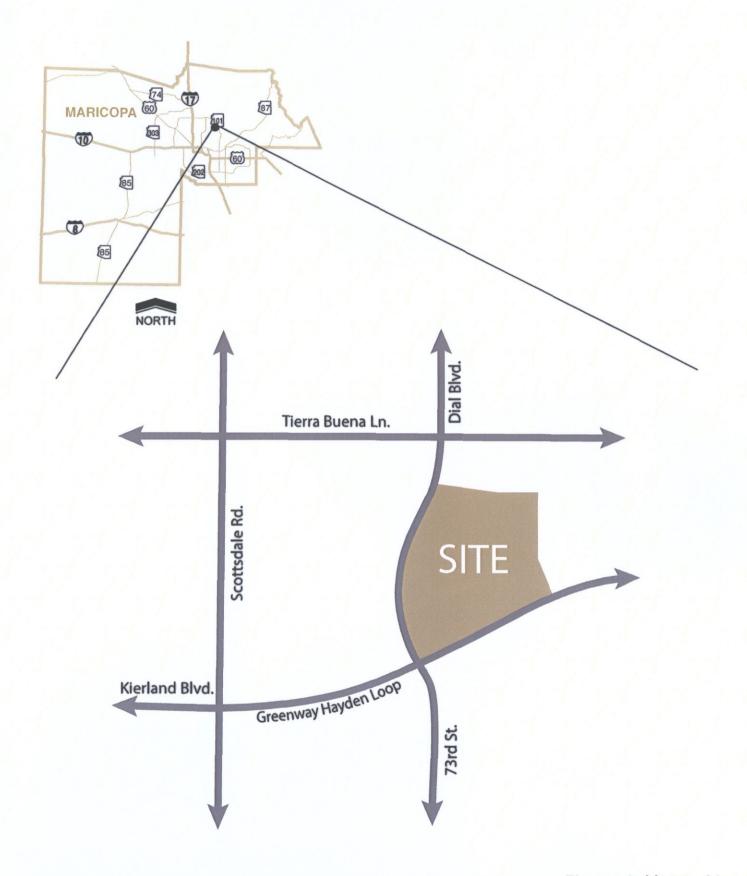


Figure 1: Vicinity Map



#### **EXISTING CONDITIONS**

#### **EXISTING LAND USE**

The proposed District at the Quarter complex ("District") will redevelop is the 130,000-SF International Cruise & Excursions, Inc. (ICE) offices at 15501 North Dial Boulevard in Scottsdale. The site is on the northeast corner of the signalized intersections of Greenway-Hayden Loop at Dial Boulevard/73<sup>rd</sup> Street and consists of two parcels that front Greenway-Hayden Loop.

The District will be located is an already highly-developed commercial and residential area of Scottsdale. On the other corners of the same intersection on which the District will be located are the Scottsdale Quarter development (southwest), a dense, multi-story, mixed-use development; a substantial, single-story industrial-flex complex (southeast); and Zocallo Plaza, a 23,300 retail center (northwest). To the east of the site is a 13,300-SF industrial-flex complex with another 21,100-SF industrial-flex building to the north. Across Dial Boulevard are the four-story Liv apartments. To the north of the Liv apartments is an Extended Stay America hotel.

#### EXISTING ROADWAY NETWORK

The existing roadway network within the study area includes Scottsdale Road, Dial Boulevard/73rd Street, Greenway-Hayden Loop, and Tierra Buena Lane.

Scottsdale Road is a north-south roadway that begins to the south as Rural Road in Chandler at Commonwealth Street just south of Chandler Boulevard. Traveling northbound, Rural Road is renamed Scottsdale Road at Rio Salado Parkway on the south side of the Salt River in Tempe and is again renamed to Tom Darlington Drive in the Town of Carefree, where it terminates at Cave Creek Road. Scottsdale Road provides access to the Pima Freeway (State Route Loop 101 to the west and south), Red Mountain Freeway (State Route 202), and the Superstition Freeway (US Route 60). Per the City of Scottsdale's Street Classification Map, Scottsdale Road is a six-lane major urban arterial with a 24-foot center raised median. Within the vicinity of the site, Scottsdale Road is currently comprised of three (3) through lanes in both directions with a raised median. Scottsdale Road is currently posted at 45 miles per hour (mph) within the vicinity of the proposed site.

**Dial Boulevard** is the northerly extension of **73<sup>rd</sup> Street**, which is a north-south roadway that begins to the south at Thunderbird Road/Redfield Road. Traveling northbound, 73<sup>rd</sup> Street weaves around the west side of the Scottsdale Airpark, crosses Greenway-Hayden Loop and becomes Dial Boulevard, where it passes the subject site, and continues north until terminating at Paradise Lane. Dial Boulevard/73<sup>rd</sup> Street is a 2- lane minor urban collector. Dial Boulevard/73<sup>rd</sup> Street has a posted speed limit of 30 mph within the vicinity of the site.

**Greenway-Hayden Loop** is a connector roadway that aligns with Kierland Boulevard, which is a collector roadway that was constructed along the original section-line alignment of Greenway Road on the west side of Scottsdale Road in Phoenix. Beginning at Scottsdale Road, Greenway-Hayden Loop is a 6-lane minor urban arterial roadway with within the vicinity of the site with a raised center median that varies from approximately



28 feet to 18 feet. Greenway-Hayden Loop has a posted speed limit of 40 mph within the vicinity of the site.

**Tierra Buena Lane** is a local commercial/industrial roadway that begins in Phoenix at 71<sup>st</sup> Street, is stop-controlled as it crosses Scottsdale Road, and extends east into Scottsdale, ending at 76<sup>th</sup> Street. Tierra Buena Lane has a posted speed limit of 30 mph.

#### **EXISTING INTERSECTION CONFIGURATIONS**

The intersection of **Scottsdale Road and Greenway-Hayden Loop/Kierland Boulevard** is a signalized four-legged intersection. All approaches have dual left turn lanes operating with protected-only phasing. The other lanes on these approaches are configured as follows:

- Northbound and southbound: 3 throughs, 1 right.
- Eastbound and westbound: 2 throughs, 1 shared through/right.

The intersection of *Dial Boulevard*/73<sup>rd</sup> Street and Greenway-Hayden Loop is a signalized four-legged intersection. The other lanes on these approaches are configured as follows:

- Northbound and southbound: 1 left (permissive) 1 through, 1 right.
- Eastbound: 1 left (permissive-protected), 2 throughs, 1 shared through/right (merges left beyond intersection).
- · Westbound: 1 left (permissive-protected), 2 throughs, 1 right.

The intersection of *Dial Boulevard and Tierra Buena Lane* is a four-legged all-way stop-controlled (AWSC) intersection. All approaches are configured with 1 left turn lane and 1 shared through/right turn lane.

Figure 2 depicts existing lane configurations and traffic controls of the study intersections.

#### **EXISTING TRAFFIC VOLUMES**

Field Data Services (FDS) conducted intersection turning movement counts at the study intersections on Tuesday, January 26, 2016. The existing hourly traffic counts used for the time periods in this study are shown on **Figure 3**. The intersection turning movement counts for the recorded volumes are provided in **Appendix B**.

#### LEVEL OF SERVICE ANALYSIS

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



Peak hour capacity analyses were 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), using Traffix software. The overall and approach levels of service are reported for signalized intersections. The resulting levels of service for the existing conditions are summarized in

Table 1 – Intersection LOS Criteria

Level of	Control Delay (s	econds/vehicle)
Service	Signalized	Unsignalized
Α	≤ 10	≤ 10
В	> 10-20	> 10-15
С	> 20-35	> 15-25
D	> 35-55	> 25-35
E	> 55-80	> 35-50
F	> 80	> 50

Source: Exhibit 18-4 and Exhibit 19-1, Highway Capacity Manual 2010
\*In addition, any movement that operates with a volume-to-capacity ratio greater than 1 (V:C.1), is considered to be operating at LOS F, no matter the control delay.

Table 2. The existing conditions analyses have been included in Appendix C.

Table 2 – Existing (2016) Level-of-Service Summary

	Table 2 Existing (2010	1 Ector of Coltino Caminary				
ID	Intersection	Stop Control	Approach	AM(PM) LOS Existing		
1	Scottsdale Road and Greenway-Hayden Loop/Kierland Boulevard*	Signal	NB SB EB WB	B(C) B(C) D(E) D(D)		
			Overall	<u>C(C)</u>		
2	Dial Boulevard/73rd Street and Greenway-Hayden Loop	Signal	NB SB EB WB	D(C) D(D) D(D) C(C)		
			Overall	<u>C(C)</u>		
3	Dial Boulevard and Tierra Buena Lane	All-Way Stop	NB SB EB WB	A(A) A(A) A(A) A(A)		
	· 		Overall	A(A)		

<sup>\*</sup> This intersection was analyzed using existing phasing provided by the City. The phasing is not strict NEMA phasing, which is needed for the HCM 2010 method; thus the LOS's shown are from a method used by the Synchro software.

A review of the results of the Level of Service analysis of existing conditions summarized in **Table 2** reveals that all study intersections currently operate at overall LOS C or better during the peak hours. The eastbound Kierland Boulevard approach to Scottsdale Road operates at poor levels of service (LOS E) during the PM peak hour with the existing signal timing.



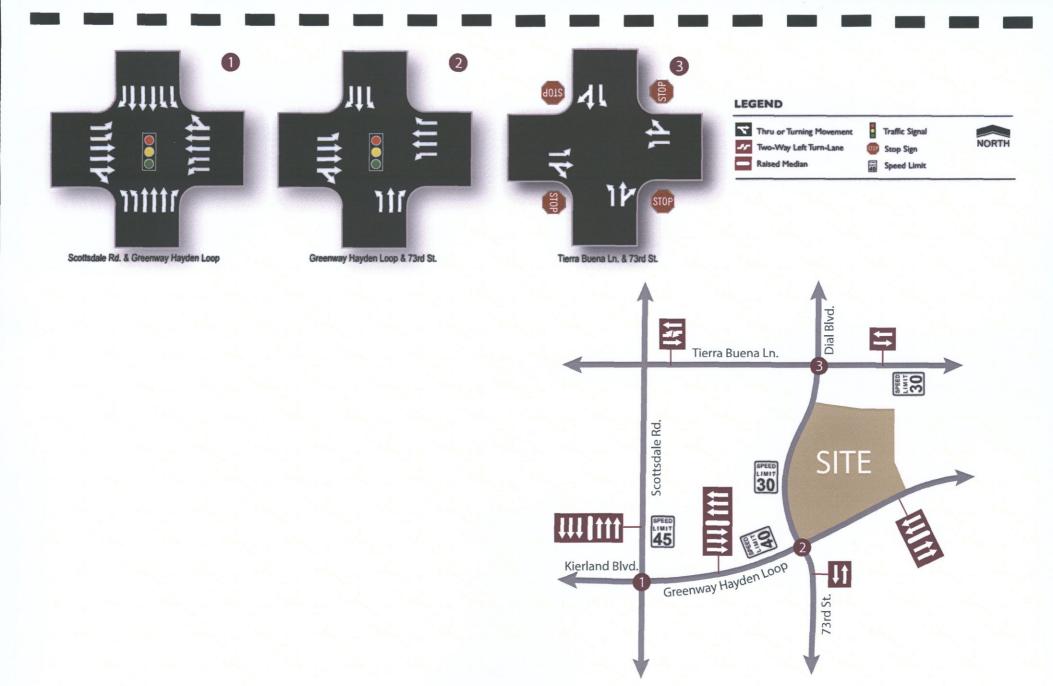


Figure 2: Existing Lane Configurations and Traffic Controls



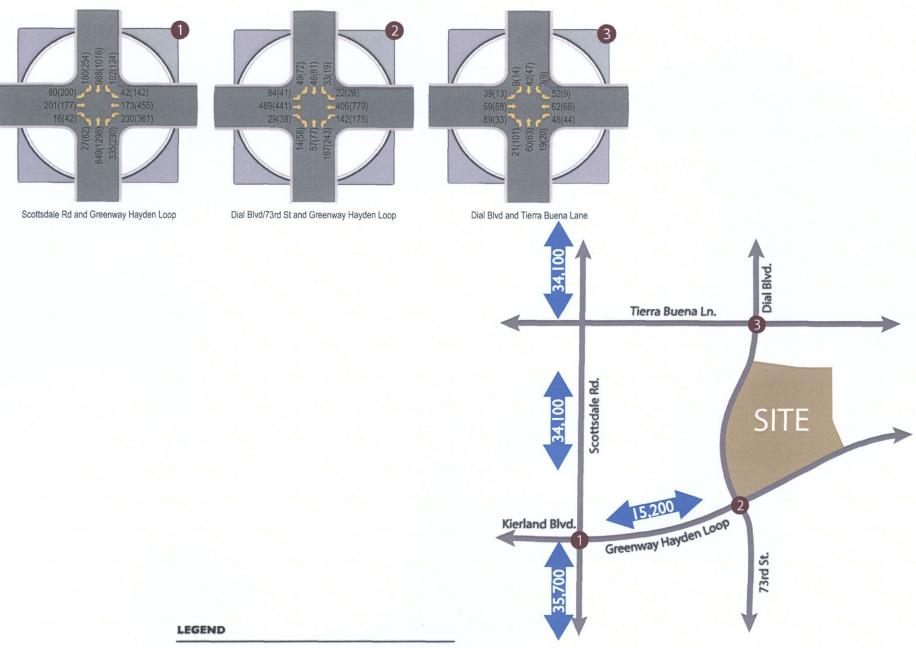


Figure 3: Existing Traffic Volumes

Revised 5/27/16 jfs

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

- Daily Traffic Volumes (2014)





#### CRASH ANALYSIS

City staff provided crash listings for the existing study intersections for the three year period 2013 through 2015<sup>1</sup>. Listings showing a total of 34 incidents were provided. None of the 34 incidents resulted in fatal injuries. All but one of the 34 incidents were reported at the intersection of Scottsdale Road and Greenway-Hayden Loop. The crash listings provided to CivTech and then consolidated can be found in **Appendix B**.

<u>Dial Boulevard and Tierra Buena Lane</u>. At the intersection of Dial Boulevard and Tierra Buena Lane no incidents were reported during the analysis period.

<u>Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop</u>. During the analysis period, just a single angle crash involving southbound and eastbound vehicles occurred at the signalized intersection of Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop. Occurring on April 3, 2015, just before 6 PM, there were no injuries. The eastbound driver disregarded the traffic signal.

<u>Scottsdale Road and Greenway-Hayden Loop/Kierland Boulevard</u>. At the intersection of Scottsdale Road and Greenway-Hayden Loop, 33 intersection-related crashes were recorded during the analysis period. These are summarized in **Table 3**.

Table 3 – 2011-13 Crash Summary: Scottsdale & Greenway-Hayden/Kierland

	Direction	2013	2014	2015	Total
Type of Crash/Incident	i i	Ī			
Single-Vehicle	All-	1			
Angle	All	1	4		5
Left Turn	EB & WB			1	1
Rear-End (EB rear-ends occur in Phoenix)	NB	3	2	2	7
	SB	6	3	1	10
	WB	1 ]	1 1		2
Sideswipe, Same Direction	NB	1			1
	SB	1 ]			1
Other/Unknown				}	5
Hit-and-Run		1	2	2	5
Crash/Incident Severity*					
Property Damage Only (PDO)		7	9	5	21
Possible/Unknown Injury		5	2	3	10
Injury		2			2
Total by Year	i i	14	11	8	33

<sup>\*</sup>Numbers represent crashes, not the numbers of vehicles involved or persons injured.

A review of the data presented in **Table 3** reveals that 19 of the 33 collisions at the intersection were rear-end type collisions. A total of five angle collisions occurred in all directions during the period, four of those in 2014, none in 2015. There are no other obvious patterns of treatable collisions. Of the five other/unknown incidents, one involved

<sup>&</sup>lt;sup>1</sup> While CivTech's engineer requested, and the City graciously provided, crash listings from 2011 through 2015, crash analysis typically considers only the latest three year (or 36 months) of data available. For example, the crash experience traffic signal warrant in the *Manual on Uniform Traffic Control Devices* does not consider crash experience for more than three years prior to a study. Also, in mid-2011, there were some changes made in the way certain collisions types were defined. CivTech considers this another valid reason for not addressing the older information received.



north- and southbound vehicles colliding as they both turned in Greenway-Hayden Loop (reported as an "angle" collision), another was an opposite-direction sideswipe with the vehicles traveling at right angles to each other, another was a left turn crash involving two vehicle traveling in the same direction, one was a rear-to-rear crash, and the last was reported as an "other" type of collision.

More than 63% of the incidents (21 of 33) resulted in no reported injuries and property damage only. Only two incidents, both in 2013, resulted in reported injuries. In another ten incidents, there were unknown or only possible injuries. During the period, there were five hit-and-run incidents.

Of 34 reported crashes at the three existing study intersections, 33 occurred at the intersection of Scottsdale Road and Greenway-Hayden Loop. From the above review of crash data at this intersection, it can be concluded that there are no obvious crash patterns that stand out and could be treated with any type of low-cost mitigation measures that could be implemented by the City.



#### PROPOSED DEVELOPMENT

The proposed District at the Quarter development is an apartment complex proposed for the northeast corner of the signalized intersection of Dial Boulevard/73<sup>rd</sup> Street and Greenway-Hayden Loop. The site consists of two parcels that front Greenway-Hayden Loop. The layout of the proposed development is illustrated in **Figure 4**. It is expected to be opened and built out year in 2017.

**Existing Land Use and Floor Areas** 

The project will redevelop the site of the existing 130,000-SF International Cruise & Excursions, Inc. (ICE) offices at 15501 North Dial Boulevard. The facility is a single-user office building.

**Proposed Development** 

The proposed redevelopment project is expected to consist of two buildings, designated as A and B on a new site plan dated August 3, 2016. (The prior TIMA was based on a preliminary plan from September 2015.) Building A is the southern of the two and will have 328 dwelling units on four floors, including seven optional live/work units on the ground floor, a 7,855-SF clubhouse, a 7,035-SF quality restaurant, and a 5,354-SF fitness center, the latter two of which are expected to be open to the public. Building B will have 290 dwelling units, also on four floors. The complex will, thus, have a total of 622 dwelling units.

#### SITE ACCESS

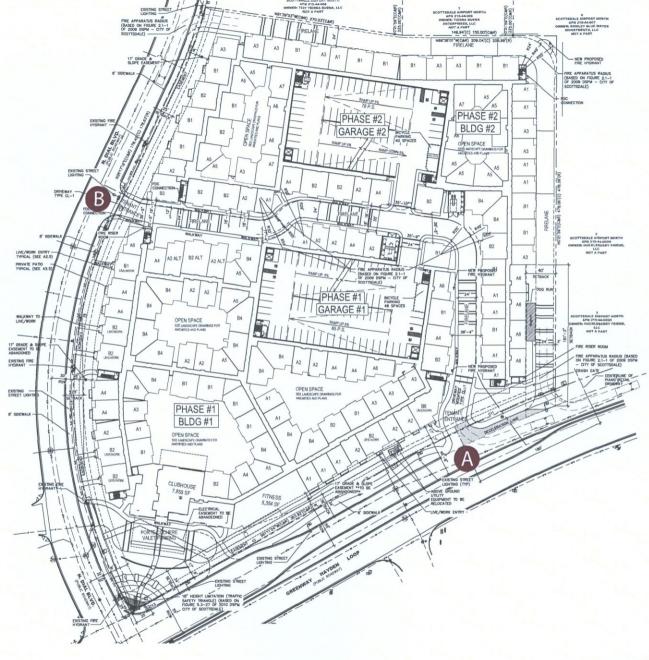
As shown in **Figure 4**, access to the dwellings and restaurant will be via two new site accesses, one each from Greenway-Hayden Loop and Dial Boulevard. Access for residents and diners to two planned parking garages will be via two new site accesses, one each from Greenway-Hayden Loop and Dial Boulevard. Another new driveway on Dial Boulevard nearer the adjacent intersection will serve as a valet parking area for the restaurant, fitness center, and clubhouse. A second new driveway on Greenway-Hayden Loop will serve a fire lane around the complex that will re-use the existing northern site access to Dial Boulevard. Two other accesses, including the existing ICE main driveway, will be closed.

Access A will be a new driveway on Greenway-Hayden Loop. Access A will be restricted by the existing median in Greenway-Hayden Loop to right-in/right-out movements only. It will be located approximately 900 feet (on-center) east of Dial Boulevard and 180 feet west of the next nearest existing driveway on the north side of Greenway-Hayden Loop. It will be constructed with a deceleration lane that will provide 90 feet (4 vehicles) of queue storage.

Access B will be the new, full-movement, main entrance to the site on Dial Boulevard. It will be located approximately 660 feet north of Greenway-Hayden Loop. All movements will be permitted at this driveway. The next nearest driveways to Access B will be the northern Zocallo Plaza driveway on the west side of Dial Boulevard approximately 220 feet to the south and the existing northern site driveway approximately 24 feet to the north.

"Access C" in the prior submittal was an existing driveway on Dial Boulevard near the northern boundary of the site. On the current site plan it will no longer serve residents, being used only for a fire lane that continues around the complex. A new driveway on Dial Boulevard will serve as a valet parking area for the restaurant, fitness center, and clubhouse. This driveway will have a turnaround area and an emergency access-only driveway from Green-Hayden Loop. Since valet driveway volumes will be low and the other two driveways are for a fire lane, only Access A and B are considered in the analysis. Access to the parking structures will be from the drive aisle that connects Accesses A and B, an aisle that will also serve as a fire lane between the buildings.













#### TRIP GENERATION ESTIMATION AND COMPARISON

The potential trip generation for the proposed development was estimated utilizing the Institute of Transportation Engineers (ITE) *Trip Generation Manual*, 9th Edition and Trip Generation Handbook, 2nd Edition. The 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.

**Table 4** is a detail trip generation for the existing and proposed uses of the development site. Since trips were not recorded at the existing site driveways, rates as found in the Trip Generation Manual were used to estimate existing trips generated by ICE. CivTech came to understand that the ICE facility is a call center for one or more vacation clubs (Sears Vacation Club being one); therefore, "by-employee" rates were used because they yielded a higher trip generation, which presents a somewhat more favorable result for the developer.)

Table 4 – Trip Generating Potential of Existing and Proposed Development

ITE 2		1 2 3 4		AN	1 Distrib	ution	PM	Distribu	tion
Land Use LUC	ITE Land Use Name	Quantity (	Jnits*	. In		Out	ln	ij	Out
Current Use		-							
Offices 715	Single Tenant Office Building	1,200 (	Employee	es 899	%	11%	15	%	85%
Proposed Use									
Apartments 223	Mid-Rise Apartments	622	DUs	319	6	69%	58	%	42%
Fitness Center 492	Health/Fitness Club	5.354	KSF	509	6	50%	57	%	43%
Restaurant 931	Quality Restaurant	7.035	KSF	759	%	25%	67	%	33%
14日本語第17日的語	ADT SEE	To 150	AM Pea	k Hour		april 100	PM Pe	ak Hour	1 125 Mg 1 1 1 1
Land Use	Avg Rate Total	Avg Rate	_ln	Out	Total	Avg Rate	- In	Out	Total
Current Use							-		
Offices	2.59 3,114	0.52	551	68	619	0.47	84	479	563
Proposed Use									
Apartments	6.72 4,180	0.43*	83	186	269	0.46*	167	121	288
Fitness Center	32.93 178	1.41	4	4	8	3.53	11	8	19
Restaurant	89.95 634	0.81	5	1	6_	7.49	36	17	53_
Totals	4,992		92	191	283		214	146	360
Differences	1,878		-459	123	-336		130	-333	-203

\* KSF=1,000 SF; DUs=Dwelling Units

\*Note: Average rates were calculated by generating trips using equations for and dividing by total number of dwelling units. (See below.)

CALCULATIONS (Equations shown only where available)								
Land Use Daily AM Peak Hour PM Peak Hour								
Offices [ITE LUC 715]	$T_{Day} = 1,200 \times 2.59 = 3,114$	T <sub>AM</sub> = 1,200 x 0.52 = 619	$T_{PM} = 1,200 \times 0.47 = 563$					
Apartments [ITE LUC 223]	$T_{Day} = 622 \times 6.72 = 4,180$	$T_{AM} = 622 \times 0.41 + 13.06 = 269$	$T_{PM} = 622 \times 0.48 - 11.07 = 288$					
Health/Fitness Club [ITE LUC 492]	$T_{Day} = 5.354 \times 32.93 = 178$	T <sub>AM</sub> = 5.354 x 1.41 = 8	$T_{PM} = 5.354 \times 3.53 = 19$					
Quality Restaurant [ITE LUC 931]	$T_{Day} = 7.035 \times 89.95 = 634$	$T_{AM} = 7.035 \times 0.81 = 6$	$T_{PM} = 7.035 \times 7.49 = 53$					

A review of the trip generation detailed in **Table 4** reveals that the proposed development is expected to generate a total of 4,992 trips daily, with 283 trips (92 in/191 out) during the AM peak hour and 360 trips (214 in/146 out) during the PM peak hour. Overall, the development could generate a net of 1,878 more trips each day than the current office use with 336 fewer during the AM peak hour and 203 fewer during the PM peak hour. These trips, the majority of which are typically considered commuter trips to and from places of employment are in the opposite direction of those currently being generated by the office building, which are also commuter trips. This is, of course, due to the office building being



an employment use, which brings commuter trips into the site from residential uses in the morning and sends them back to those residential uses in the afternoon.

#### TRIP DISTRIBUTION AND ASSIGNMENT

Daily trips for residential uses were distributed to the roadway network based on the Maricopa Association of Governments' (MAG) estimate of population within a 10-mile radius of the site. This radius is based on the average trip length between residential and employment land uses as discussed in the *NPTS Urban Travel Patterns* report (December 1999). The projected distribution of population was used as a base for determining the trip distribution of trips generated by the site. The distribution was adjusted to major travel routes to and from the site around Scottsdale Municipal Airport. **Table 5** summarizes and **Figure 5** illustrates the trip distribution percentages applied in the analyses. In addition, **Figure 5** shows how residents might pass through the study intersection of Dial Boulevard and Tierra Buena Lane to and from destinations that are north of the complex. Distribution calculations and a summary of the socioeconomic data are included in **Appendix D**.

Table 5 – Trip Distribution

Roadway	Direction(s) (To/From)	Trip Distribution			
Scottsdale Road, north of Frank Lloyd Wright Boulevard	North	10%			
Scottsdale Road, south of Greenway-Hayden Loop	South/Southwest	35%			
73 <sup>rd</sup> Street, south of Greenway-Hayden Loop	South/Southeast	8%			
Frank Lloyd Wright Boulevard, east of Greenway-Hayden Loop	Northeast	10%			
Frank Lloyd Wright Boulevard, west of Scottsdale Road	Northwest	18%			
Kierland Boulevard, west of Scottsdale Road	West/Southwest	14%			
Total	All	100%			

The percentages shown in **Table 5** and **Figure 5** were applied to the trips generated to determine the site traffic at the intersections within the study area. Site generated turning movements are depicted in **Figure 6**.

#### FUTURE BACKGROUND TRAFFIC

Historical daily traffic volumes were taken from the City of Scottsdale traffic count website to estimate an average annual growth rate. Average daily traffic volumes on Scottsdale Road, from Thunderbird Road to Greenway-Hayden Loop, were considered. This location experienced an average annual increase of daily traffic of 2.0 percent from 2012 to 2014. Therefore, a 2.0 percent annual growth rate was applied to the volumes at the study intersections to obtain the future background traffic volumes. Growth rate calculations and Scottsdale historical counts can be found in **Appendix E**. The opening year background traffic volumes are illustrated in **Figure 7**.

#### TOTAL TRAFFIC

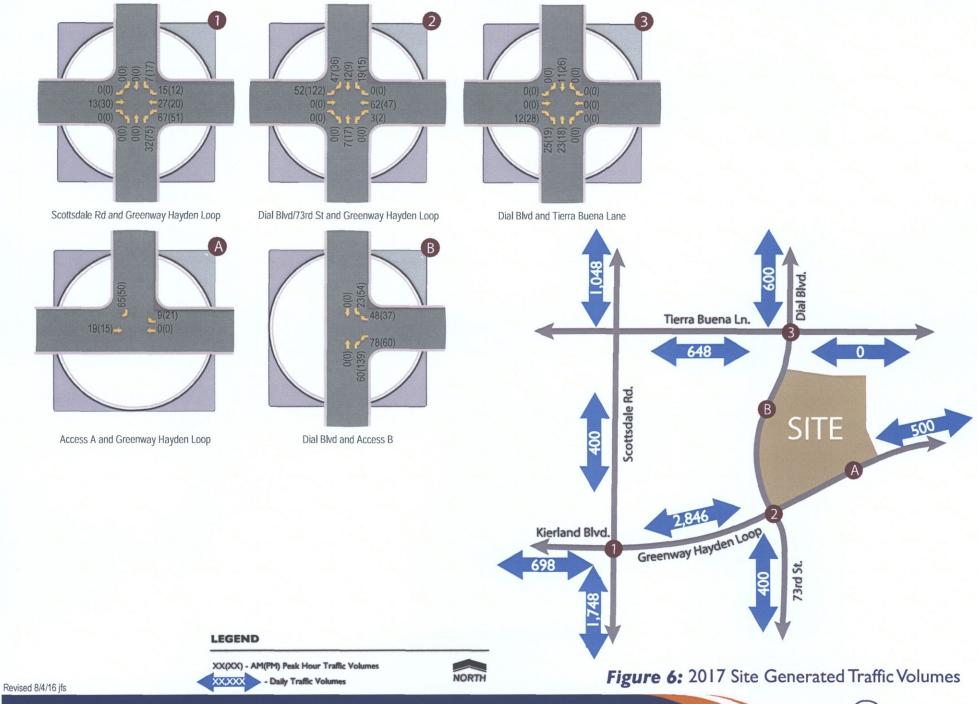
Total traffic was determined by adding the site generated traffic to the projected background traffic for horizon year 2017. Total AM and PM peak hour traffic for horizon year 2017 is shown in **Figure 8**.

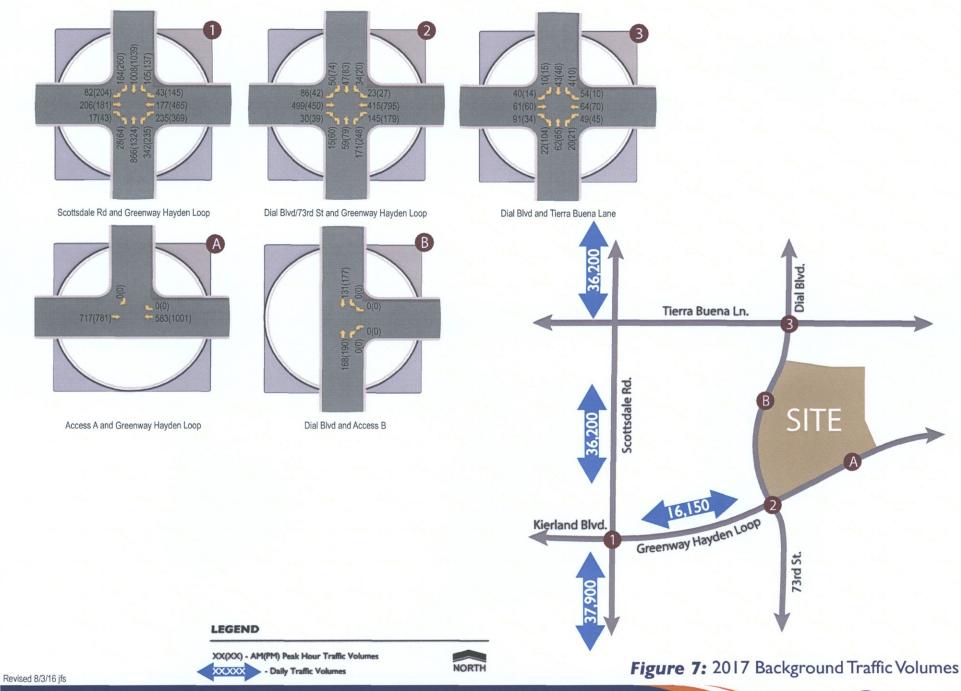




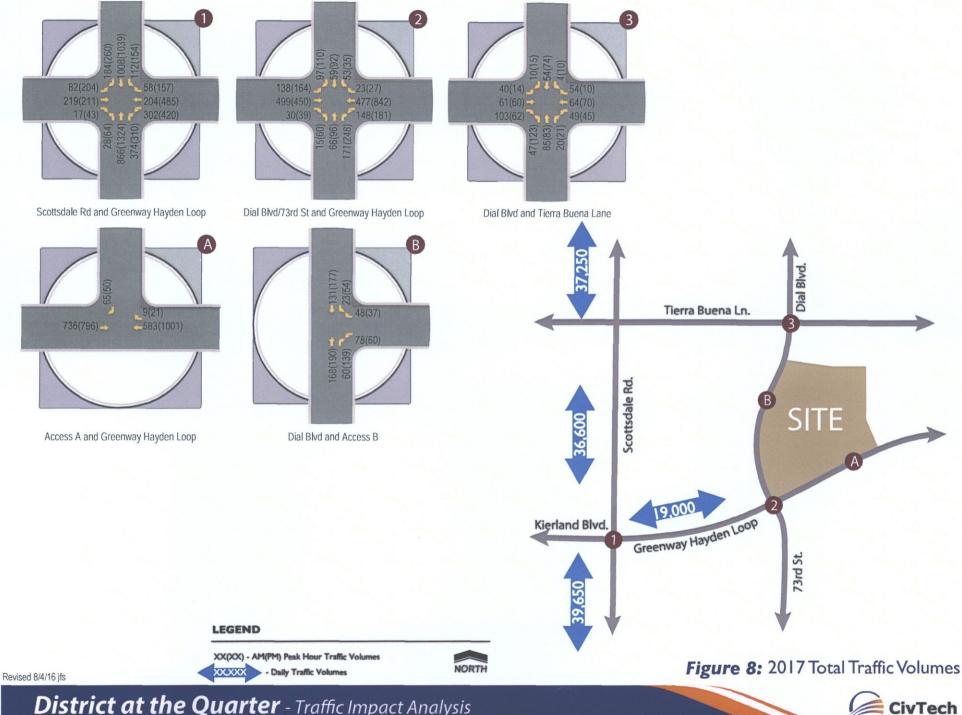
Figure 5: Trip Distribution











#### TRAFFIC IMPROVEMENT AND MITIGATION ANALYSIS

#### LEVEL OF SERVICE ANALYSIS

The capacity analysis of future conditions was performed using the method described previously. For purposes of this TIMA, two analyses were performed for each peak hour in 2017. Results of the 2017 level-of-service analyses are shown in **Table 6** for the 2017 build-out/opening year. The analyses are based on the proposed lane configurations and traffic controls depicted in **Figure 9**. The output sheets for year 2017 are included in **Appendix F**.

Table 6 – 2017 Opening Year Level-of-Service Summary

	Table 0 - 2017 Opening Teal Level-01-Service Sulfilliary								
				AM(PM)	AM(PM)				
ID.	Intersection	Stop Control	Approach	LOS Background	LOS Total				
	Scottsdale Road and Greenway-Hayden	Cianal	NB SB EB	B(C) B(C)	B(C) C(C)				
1	Loop/Kierland Boulevard*	Signal	WB	D(E) D(D)	D(E) D(E)				
			Overall	C(C)	B(C)				
	Dial Boulevard/73rd	_	NB CB	D(D)	D(D)				
2	Street and Greenway-Hayden	Signal	SB EB	D(D) D(D)	D(D) D(D)				
			WB	C(C)	C(C)				
	Loop		Overall	D(C)	D(C)				
		All-Way Stop	NB	A(A)	A(A)				
<b> </b>	Dial Boulevard and		SB	A(A)	A(A)				
3	Tierra Buena Lane		EB WB	A(A) A(A)	A(A) A(A)				
			Overall	A(A)	A(A)				
	Greenway-Hayden	One-Way	SB Right	()	B(C)				
4	Loop and Access A	Stop (SB)	Worse	()	B(C)				
	Dial Boulevard and	One-Way	SB Left	()	A(A)				
5	Access B	Stop (WB)	WB	()	B(B)				
		- 35 ( )	Worse	()	<u>B(B)</u>				

<sup>\*</sup> See note at Table 2.

A review of the results of the level of service analysis of opening year 2017 conditions summarized in **Table 6** reveals that all study intersections are expected to operate at overall LOS D or better during the peak hours without or with the proposed development. The eastbound Kierland Boulevard approach to Scottsdale Road is expected to continue to operate with delays at LOS E during the PM peak hour with the existing signal timing. With the addition of site traffic, the westbound Greenway-Hayden Loop approach to Scottsdale Road is also expected to operate with delays at LOS E during the PM peak hour with the same signal timing. The City of Scottsdale may consider modifying signal timing at this intersection to improve levels of service on the east- and westbound approaches.



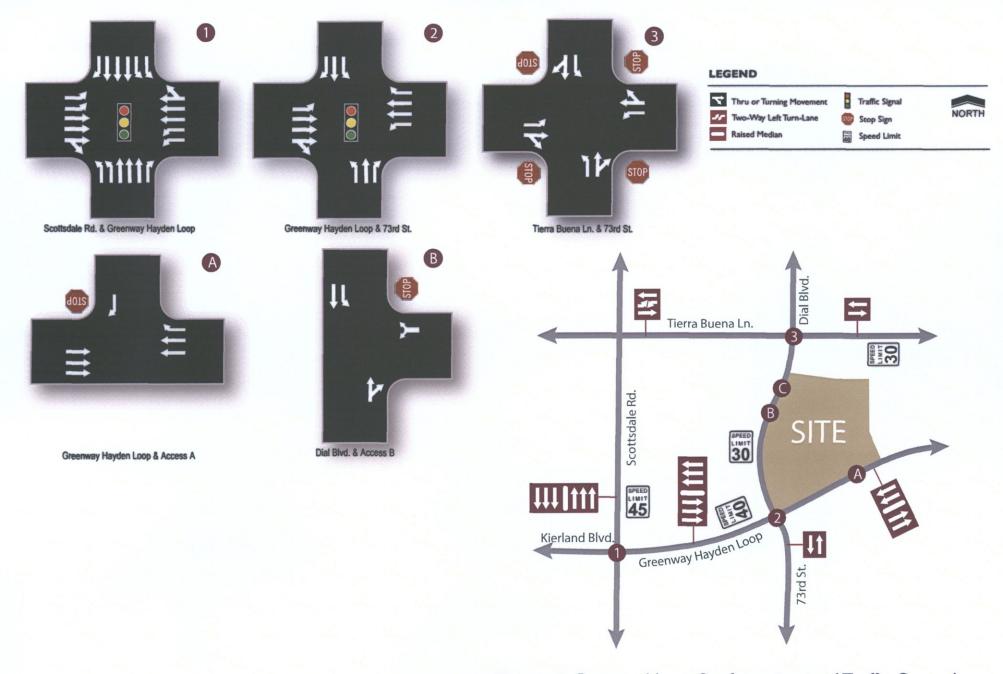


Figure 9: Proposed Lane Configurations and Traffic Controls



#### **LEFT TURN DECELERATION LANES**

Dial Boulevard currently provides approximately 40 feet of pavement (as measured from face-of-curb to face-of-curb in midblock). A continuous two-way left-turn lane (CTWLTL) has been provided north of the junction area of its intersection with Greenway-Hayden Loop. It is expected that the existing CTWLTL would be sufficient to serve the site accesses proposed along Dial Boulevard. As noted, the accesses along Greenway-Hayden Loop will be right-in/right-out only and will not need left turn lanes. Therefore, no left turn lane warrant analysis is required here.

#### RIGHT TURN DECELERATION LANES

The site plan shows that a right turn lane is planned into the residents-only access on Greenway-Hayden Loop. No right turn lane is proposed for the fire lane where it accesses Greenway-Hayden Loop. Thus, the need for right-turn deceleration lanes into the site accesses proposed for Dial Boulevard are considered here.

City of Scottsdale's *Design Standards & Policies Manual* (DSPM) Section 5-3.206 establishes the criteria for deceleration lanes. Copies of the applicable standards are provided in **Appendix G** for reference. New deceleration lanes have a standard storage length of 150 feet with a 100-foot storage length minimum. Deceleration lanes are required approaching all new driveways on major arterials and approaching new commercial/retail driveways on minor arterials. A deceleration lane on minor arterials or collectors is needed if the following criteria are met:

- ◆ At least 5,000 vehicles per day are expected to use the through street;
- The 85<sup>th</sup> percentile speed of the through street is at or above 45 mph for a 2-lane road or 35 mph for other roadways.
- At least 30 vehicles are expected to perform right-turns into the driveway during a 1-hour period.

Daily bi-directional traffic volume counts were not conducted on Dial Boulevard; however, it is assumed that future ADT on Dial Boulevard could exceed 5,000 vpd. (CivTech assumed in its approved March 2014 traffic study for the last expansion of the nearby Scottsdale Quarter that 73<sup>rd</sup> Street south of Greenway-Hayden Loop would exceed 5,000 vpd. While such volumes south of Greenway-Hayden Loop does not automatically mean similar volumes would travel Dial Boulevard.) CivTech estimated from the volumes entering and exiting Dial Boulevard at its intersection with Tierra Buena Lane that approximately 3,000 vpd currently travel along Dial Boulevard adjacent to the site.

The posted speed limit of Dial Boulevard adjacent to the site is 30 mph, which generally represents the 85<sup>th</sup> percentile speed. (With a traffic signal that favors Greenway-Hayden Loop and an all-way stop condition at Tierra Buena Lane, there is not a lot of distance for vehicles to attain a higher speed along Dial Boulevard.) Therefore, the speed limit criterion is not met.

The study driveways on Dial Boulevard are anticipated to experience more than 30 vehicles turning right into the site during at least one of the peak hours.



Thus, since only two of the three criteria are met, right-turn deceleration lanes are not required by DSPM Section 5-3.206 on Dial Boulevard approaching the site driveways.

#### **QUEUE STORAGE ANALYSIS**

A new right turn deceleration lane is proposed for Access A of the District at the Quarter development, the resident-only access on Greenway-Hayden Loop. The primary purpose of this analysis is to confirm the adequacy of the storage capacity for this planned turn lane.

The Synchro 9 analysis provides 95<sup>th</sup> percentile vehicle queues. The 95<sup>th</sup> percentile queue length are often used as a recommendation for minimum turn lane storage. For dual turn lanes, the software applies lane utilization factors and provides the longest queue length for a single turn lane, not an average per-lane queue length. **Table 7** summarizes the planned storage capacities, the longest 95<sup>th</sup> percentile per-lane queues for the with-development condition in the 2017 build-out year, and the recommended turn lane queue storage requirements.

Table 7 – 2017 Queue Storage Lengths (in Feet)

ID	Intersection	Control	Movement	Planned Storage	Longest 95 <sup>th</sup> %ile Q (with Dev)	Recommended Storage (if diff from existing)
4	Access A and Greenway- Hayden Loop	1-Way Stop (SB)	WB right	65'	<25	N/A

A review of the queue storage analysis summarized in **Table 7** reveals that the existing turn lane storage capacities in and around the District at the Quarter development can accommodate anticipated queuing in up to 95% of situations.

#### SITE ACCESS DESIGN

It is recommended that all site be designed to meet the standards established by the City of Scottsdale in its *Design Standards and Policies Manual, 2010 Update*. The driveway types typically required on major urban arterial roadways such as Scottsdale Road are CH-2 and CH-3, which provide one ingress lane and two egress lanes. None of the new proposed site driveways is, however, located on a major arterial roadway. Therefore, the CL-1 two-way commercial driveway is recommended for Access A on Greenway-Hayden Loop, Access B on Dial Boulevard, for the valet parking driveway on Dial Boulevard, and for the fire lane driveway to Greenway-Hayden Loop near the eastern boundary of the property. Copies of the applicable driveway standards are provided in **Appendix G** for reference. Since there are no resident-only accesses and there is a continuous drive aisle from Access A to Access B, turnarounds for errant vehicles, as requested by the City via a comment, are no longer warranted.

<u>Review of Valet Parking Area Driveway</u>. With low peak hour volumes expected at the Dial Boulevard driveway serving the valet parking area for the restaurant, fitness center, and clubhouse, CivTech did not conduct a level of service analysis for the driveway. However, CivTech considers a review of its location in relation to the signalized



intersection of Dial Boulevard and Greenway-Hayden Loop and the conformance of the driveway locations to City guidelines to be of value.

The City of Scottsdale's Design Standards and Policies Manual, 2010 Update (see **Appendix G**) indicates that indicate that standard driveway spacing along a minor collector roadway, such as Dial Boulevard, the standard spacing is 165 feet.

The proposed valet parking area driveway to Dial Boulevard will be located approximately 270 feet north of the intersection, which exceeds the City's standard driveway spacing of 165 feet. The new driveway will approximately align with a driveway across Dial Boulevard that serves the Zocallo Plaza. The existing ICE main driveway, which will be closed, is offset approximately 40 feet to the north on the Zocallo Plaza driveway on the east side of Dial Boulevard. Therefore, the new driveway and this southern Zocallo Plaza driveway will form a four-legged intersection with Dial Boulevard. This should be an improvement over the existing condition, where there is a potential for left turning vehicles exiting the two offset intersections simultaneously to conflict. The Zocallo Plaza driveway is on the outside of a curve, which gives drivers exiting to Dial Boulevard and entering from northbound Dial Boulevard a natural advantage in terms of sight distance. Adequate sight distances as discussed in the next section, especially for existing drivers to see vehicles approaching from the right/north, should be provided from the new driveway, which is on the inside of a curve. The Zocallo Plaza driveway is currently—and the proposed valet parking driveway will be—beyond the 95 feet of storage provided for both southbound right- and left-turn movements approaching Greenway-Hayden Loop. A review of the Synchro analysis in **Appendix F** reveals the maximum 95<sup>th</sup> percentile queue for the southbound left turn lane is 3.5 vehicles during the AM peak hour, or 100 feet for 4 whole vehicles; therefore, the existing storage effectively meets the need; nor is it expected that the new valet parking driveway would conflict with gueued southbound vehicles waiting to turn left onto Greenway-Hayden Loop. The maximum right turn queue is expected to be just over 6 vehicles (150 to 175 feet). While this may extend beyond the available 95 feet of storage, it would not extend back into the southern Zocallo Plaza driveway.

#### SIGHT DISTANCE ANALYSIS

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

Sight distance should be provided at the proposed access based on the standards provided in the City of Scottsdale's Design Standards and Policies Manual, 2010 Update.

Adjacent to the site, Dial Boulevard was constructed with horizontal curvature at a relatively flat grade; therefore, the only impediments to the site distance would be existing structures and landscaping. Existing sight distance was not measured at the site access



points. The developer should ensure that adequate sight distance is provided at the intersections to allow safe left and right turning movements from the development and left turns into the development from Dial Boulevard. Landscaping should be maintained at a maximum of three feet in height. To maintain sight distance, tree branches should be trimmed lower than seven feet and maintained to meet current acceptable landscape requirements.

Figures depicting the method and sight distance requirements are provided in the City of Scottsdale's *Design Standards and Policies Manual, 2010 Update.* Copies of the applicable standards are provided in **Appendix G** for reference.



#### CONCLUSIONS AND RECOMMENDATIONS

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

- ◆ The proposed development is expected to generate a total of 4,992 trips daily, with 283 trips (92 in/191 out) during the AM peak hour and 360 trips (214 in/146 out) during the PM peak hour. Overall, the development could generate a net of 1,878 more trips each day than the current office use with 336 fewer during the AM peak hour and 203 fewer during the PM peak hour. These trips, the majority of which are typically considered commuter trips to and from places of employment, are in the opposite direction of those currently being generated by the office building.
- Of 34 reported crashes at the three existing study intersections, 33 occurred at the intersection of Scottsdale Road and Greenway-Hayden Loop. From the above review of crash data at this intersection, it can be concluded that there are no obvious crash patterns that stand out and could be treated with any type of low-cost mitigation measures that could be implemented by the City.
- All study intersections currently operate at overall LOS D or better during the peak hours. The eastbound Kierland Boulevard approach to Scottsdale Road operates at poor levels of service (LOS E or F) in the PM peak hour with the existing signal timing.
- Right-turn deceleration lanes are not required by City of Scottsdale's Design Standards and Polices Manual Section 5-3.206 on Dial Boulevard approaching the site driveways.
- In 2017, with the proposed development, all signalized intersections are anticipated to operate at overall LOS D or better during both peak hours. The eastbound Kierland Boulevard approach to Scottsdale Road is expected to continue to operate with delays at LOS E during the PM peak hour with the existing signal timing. With the addition of site traffic, the westbound Greenway-Hayden Loop approach to Scottsdale Road is also expected to operate with delays at LOS E during the PM peak hour with the same signal timing. The City of Scottsdale may consider modifying signal timing at this intersection to improve levels of service on the east- and westbound approaches.
- ♦ The queue storage analysis revealed that the existing turn lane storage capacities in and around the District at the Quarter development can accommodate anticipated queuing in up to 95% of situations.
- ♦ It is recommended that the proposed site driveway be designed to meet the standards established by the City of Scottsdale in its Design Standards and Policies Manual, 2010 Update. A CL-1 two-way commercial driveway is recommended for Accesses A and B, for the valet parking driveway on Dial Boulevard, and for the fire lane driveway to Greenway-Hayden Loop near the eastern boundary of the property. Since there are no resident-only accesses and there is a continuous drive aisle from Access A to Access B, turnarounds for errant vehicles, as requested by the City via a comment, are no longer warranted.
- ♦ The proposed valet parking area driveway to Dial Boulevard will be located approximately 270 feet north of the intersection, which exceeds the City's standard driveway spacing of 165 feet for a minor collector roadway as required by the City's 2010 Design Standards and Policies Manual.



Dial Boulevard was constructed with horizontal curvature at a relatively flat grade; therefore, the only impediments to the sight distance would be existing structures and landscaping. The developer should ensure that adequate sight distance is provided at the intersections to allow safe left and right turning movements from the development and left turns into the development from Dial Boulevard. Landscaping should be maintained at a maximum of three feet in height. To maintain sight distance, tree branches should be trimmed lower than seven feet and maintained to meet current acceptable landscape requirements.



### **LIST OF REFERENCES**

- A Policy on Geometric Design of Highways and Streets, American Association of State Highway and Transportation Officials, Washington, D.C., 2001.
- Design and Safety of Pedestrian Facilities, Institute of Transportation Engineers, Washington, D.C., March 1998.
- Design Standards and Policies Manual, 2006 Update, City of Scottsdale
- Highway Capacity Manual. Transportation Research Board, National Research Council, Washington, D.C., 2010.
- Manual of Uniform Traffic Control Devices. U.S. Department of Transportation, Federal Highways Administration, Washington, D.C., 2003.
- Street Classification Map, City of Scottsdale website.
- Transportation and Land Development, Stover, V. G. and Koepke, F. J., Institute of Transportation Engineers, Washington, D.C, 1988.
- Trip Generation 8th Edition, Institute of Transportation Engineers, Washington, D.C, 2008.
- Design Standards & Policies Manual Section 5: Transportation Impact Studies, City of Scottsdale, Arizona, January 2010.



# **TECHNICAL APPENDICES**

APPENDIX A: REVIEW COMMENTS

APPENDIX B: TRAFFIC COUNT AND COLLISION DATA

APPENDIX C: EXISTING PEAK HOUR ANALYSIS

APPENDIX D: TRIP DISTRIBUTION CALCULATIONS

APPENDIX E: BACKGROUND GROWTH RATE CALCULATIONS

APPENDIX F: 2017 PEAK HOUR ANALYSIS

APPENDIX G: CITY OF SCOTTSDALE DESIGN STANDARDS AND POLICIES



# APPENDIX A

**REVIEW COMMENTS** 





# REPORT REVIEW

REPORT TITLE: District at the Quarter Traffic Impact Mitigation Analysis

**REPORT DATE:** March 2016

PREPARED BY: Erica Eggen, CivTech.

CASE #: 8-ZN-2016

**REVIEWED BY:** John Bartlett

**REVIEW DATE:** May 2016

## **COMMENTS:**

- 1. Page 6/Appendix The northbound and southbound left-turns at Dial Boulevard and Greenway-Hayden Loop have permitted-protected phasing. Update analysis as necessary.
- 2. Provide 24-hour volumes for Dial Boulevard and Greenway-Hayden Loop on all volume figures.
- 3. Page 14 Does the existing office use have 1,200 employees? Using square footage would be more appropriate unless the office is a call center type of use that has more employees than a typical office.
- 4. Figure 6 There should be no left-turns assigned at Access A as they are prohibited by the raised median along Greenway-Hayden Loop.
- 5. Page 20 The LOS for the southbound approach at the intersection of Dial Boulevard and Greenway-Hayden Loop improves with the addition of site traffic in the AM peak hour. How does the LOS improve with additional traffic? Have adjustments been made to the signal timing? If so, document that adjustments were made and why, i.e. to improve a specific movement.
- 6. Page 24 Access A is recommended to provide one-way ingress only access. The driveway should provide ingress and egress, right-in/right-out only movements.
- 7. Page 24 Provide a turnaround on-site at Access A to prevent vehicles from backing onto Greenway-Hayden Loop Road
- 8. Page 24 Access C is recommended to provide one-way ingress only access. The driveway should provide ingress and egress movements. If the driveway is gated (labeled "resident only") a location for vehicles that cannot access the gate to turn around must be provided so that vehicles do not back onto Dial Boulevard.
- 9. Page 2, 26 Access B should be a CH-2 type driveway providing one ingress lane and two egress lanes with the median offset appropriately (not centered in driveway as shown on site plan).

# District at the Quarter

## CivTech, Inc.

## **Review Comments & Responses**

1st Submittal

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

Reviewer Name, Agency: John Bartlett, City of Scottsdale

ltem	Review Comment	(Code) & Response
	Page 2, 26 - Access B should be a CH-2 type driveway providing one	
1	ingress lane and two egress lanes with the median offset appropriately (not centered in driveway as shown on site plan).	analyses and fure lane configuration figure have been recised to reflect this.
A ROLL OF THE PARTY OF	รู้เพรที่เหลือดสมเมาที่สามา แพน หลือสาครั้ง และสอด และ และสามารถสอดสายสามารถสามารถสามารถสามารถสามารถสามารถสามาร	(1) Access C is an existing driveway that will serve only a fire lane around
	should provide ingress and egress.	the site; since it will carry no residential traffic, no recommendation is made as to the type of driveway it should be. Per an above response, Access A will now provide both ingress and egress.
1	Appendix - Provide trip generation calculations for proposed and existing land uses.	(1) The calculations are now shown below Table 4.

Reviewed Date: 05/12/16 CivTech Received Date: 05/12/16 CivTech Entered Date: 05/12/16 CivTech Response Date: 08/04/16

### **APPENDIX B**

TRAFFIC COUNT AND COLLISION DATA



# 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. Veracitytrafficgroup

N-S STREET: Scottsdale Rd.

DATE: 01/26/2016

LOCATION: Scottsdale

E-W STREET: Greenway-Hayden Loop/

DAY: TUESDAY

PROJECT# 16-1017-002

Kierland Blvd.

	NC	RTHBO	UND	SC	UTHBO	JND	E	ASTBOL	IND	W	ESTBOL	JND	
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 1	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL
6:00 AM										_			
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	150	52	21	185	15	14	27	2	36	19	7	532
7:15 AM	6	154	62	14	214	40	16	40	4	37	36	3	626
7:30 AM	4	175	80	28	194	31	23	50	4	38	46	7	680
7:45 AM	7	250	106	28	238	43	20	54	4	48	33	9	840
8:00 AM	6	195	88	26	247	40	27	54	4	80	55	8	830
8:15 AM	10	228	73	20	243	45	14	43	6	46	44	11	783
8:30 AM	4	176	68	28	260	52	19	50	2	56	41	14	770
8:45 AM	6	216	76	30	228	49	50	50	3	53	39	14	814
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	47	1544		195		315		368	29		313	73	5875
Approach %	2.14	70.31	27.55	8.41	78.01	13.58	31.55	63.45	5.00	50.51	40.13	9.36	
App/Depart	2196	/	1800	2319	/	2232	580	/	1168	780	/	675	

AM Peak Hr Begins at: 745 AM

PEAK

Volumes 27 849 335 102 988 180 80 201 16 230 173 42 3223 Approach 6 2.23 70.11 27.66 8.03 77.80 14.17 26.94 67.68 5.39 51.69 38.88 9.44

PEAK HR.

0.959

FACTOR:

CONTROL: Signalized

COMMENT 1: GPS:

33.625615, -111.925816

### **Intersection Turning Movement**

# FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 y veracitytrafficgroup

N-S STREET: Scottsdale Rd. DATE: 01/26/2016 LOCATION: Scottsdale E-W STREET: Greenway-Hayden Loop/ DAY: TUESDAY PROJECT# 16-1017-002

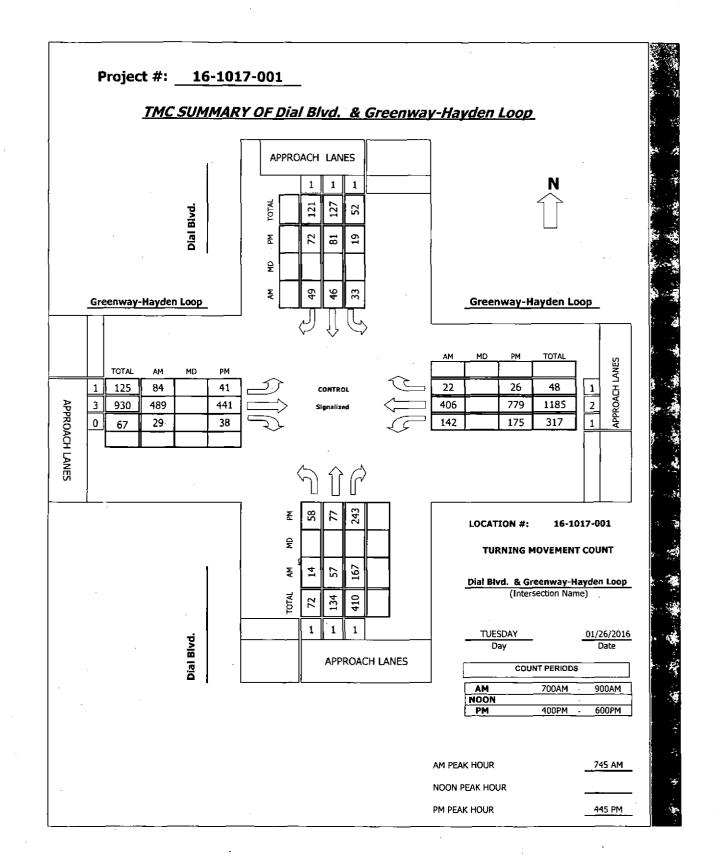
	NO	RTHBOL	JND	SO	UTHBOL	JND	EA	STBOU	ND	W	ESTBOU	ND	
LANES:	NL 2	NT 3	NR 1	SL 2	ST 3	SR 1	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	16	274	48	33	193	43	51	42	14	81	100	38	933
4:15 PM	14	359	51	39	252	61	38	51	18	77	71	38	1069
4:30 PM	12	311	51	28	252	58	41	29	11	98	107	28	1026
4:45 PM	18	299	56	38	242	58	48	47	10	104	102	23	1045
5:00 PM	15	343	63	25	287	55	41	31	16	88	106	44	1114
5:15 PM	20	383	58	36	266	63	67	51	10	77	125	32	1188
5:30 PM	9	273	53	35	223	78	44	48	6	92	122	43	1026
5:45 PM	11	315	61	35	228	51	39	34	10	79	82	25	970
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
OTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
olumes	115	2557	441	269	1943	467	369	333	95	696	815	271	8371
oproach %	3.69	82.14	14.17	10.04	72.53	17.43	46.30	41.78	11.92	39.06	45.74	15.21	
pp/Depart	3113	/	3197	2679	1	2734	797	1	1043	1782	/	1397	

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes		2557			1943			333		696		271	
Approach %	3.69	82.14	14.17	10.04	72.53	17.43	46.30	41.78	11.92	39.06	45.74	15.21	
App/Depart	3113	/	3197	2679	/	2734	797	/	1043	1782	/	1397	
				0.000									

App/Depart	3113 /	319/ 20/9		2/34 /9/		1043 1702		1397		
PM F	Peak Hr Begins at:	445 PM								
PEAK Volumes Approach %	62 1298 3.90 81.64	230 134 14.47 9.53	1018 72.40	254   200 18.07   47.73	177 42.24	42 361 10.02 37.68	455 47.49	142 43 14.82	73	
PEAK HR. FACTOR:	0.862	1	0.958	1	0.818	1	0.932	0.9	920	
CONTROL: COMMENT 1 GPS:	Signalized : 0 33.625615, -11	11.925816								

# Intersection Turning Movement Prepared by:

# FIELD DATA SERVICES OF ARIZONA, INC. 520,318,6745



#### **Intersection Turning Movement** Prepared by:

# FIELD DATA SERVICES OF ARIZONA, INC. Veracitytrafficgroup

N-S STREET: Dial Blvd.

DATE: 01/26/2016 LOCATION: Scottsdale

E-W STREET: Greenway-Hayden Loop

DAY: TUESDAY

PROJECT# 16-1017-001

	NC	RTHBO	UND	SC	UTHBO	UND	E	ASTBOL	IND	W	ESTBOL	JND	
LANES:	NL 1	NT 1	NR 1	SL 1	ST 1	SR 1	EL 1	ET 3	ER 0	WL 1	WT 2	WR 1	TOTAL
6:00 AM									-			-	
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	2	20	3	9	8	5	92	5	20	66	6	240
7:15 AM	5	7	36	2	10	5	3	111	6	38	73	1	297
7:30 AM	3	5	31	7	8	5	16	142	9	33	90	6	355
7:45 AM	3	21	53	15	12	20	18	140	3	35	89	7	416
8:00 AM	2	12	40	6	10	15	24	123	7	35	110	4	388
8:15 AM	4	8	36	9	14	8	29	108	11	34	102	4	367
8:30 AM	5	16	38	3	10	6	13	118	8	38	105	7	367
8:45 AM	7	14	40	8	6	5	23	129	14	38	94	11	389
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													
					-		-	-	===	140	1455	14/0	TOTAL
TAL	NL.	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTA

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	33	85	294	53	79	72	131	963	63	271	729	46	2819
Approach %	8.01	20.63	71.36	25.98	38.73	35.29	11.32	83.23	5.45	25.91	69.69	4.40	
App/Depart	412	/	262	204	/	413	1157	/	1310	1046	/	834	

AM Peak Hr Begins at: 745 AM

Volumes | 14 57 167 | 33 46 49 84 489 29 142 406 22 | 1538 | Approach % | 5.88 23.95 70.17 | 25.78 35.94 38.28 | 13.95 81.23 4.82 | 24.91 71.23 3.86 |

PEAK HR. FACTOR:

0.773

0.935

0.950 0.924

CONTROL: 33.626207, -111.922366

COMMENT 1:

Signalized

#### **Intersection Turning Movement**

## FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745 **Vveracitytrafficgroup**

N-S STREET: Dial Blvd. DATE: 01/26/2016 LOCATION: Scottsdale DAY: TUESDAY E-W STREET: Greenway-Hayden Loop PROJECT# 16-1017-001 NORTHBOUND SOUTHBOUND WESTBOUND EL ET ER WL WT WR TOTAL ST SR

	LANES.	1	1	T	1	1	1	1	3	U	1	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	19	14	53	6	11	27	14	121	13	38	181	6	503
	4:15 PM	21	19	58	3	7	18	9	110	9	44	172	6	476
	4:30 PM	11	13	64	8	15	24	10	88	5	37	206	5	486
	4:45 PM	14	23	59	2	19	16	11	105	13	40	181	4	487
	5:00 PM	21	25	65	4	10	20	11	114	11	67	211	7	566
	5:15 PM	16	15	59	7	18	18	12	117	11	30	188	7	498
	5:30 PM	7	14	60	6	34	18	7	105	3	38	199	8	499
	5:45 PM	13	8	34	6	15	23	16	82	7	25	151	6	386
	6:00 PM													
	6:15 PM													
	6:30 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	122	131	452	42	129	164	90	842	72	319	1489	49	3901
Approach %	17.30	18.58	64.11	12.54	38.51	48.96	8.96	83.86	7.17	17.18	80.18	2.64	
App/Depart	705	/	270	335	/	520	1004	/	1336	1857	/	1775	

PM Peak Hr Begins at: 445 PM

Volumes | 58 77 243 | 19 81 72 | 41 441 38 | 175 779 26 | 2050 Approach % | 15.34 20.37 64.29 | 11.05 47.09 41.86 | 7.88 84.81 7.31 | 17.86 79.49 2.65 PEAK HR. 0.905 FACTOR: 0.851

CONTROL: 33.626207, -111.922366

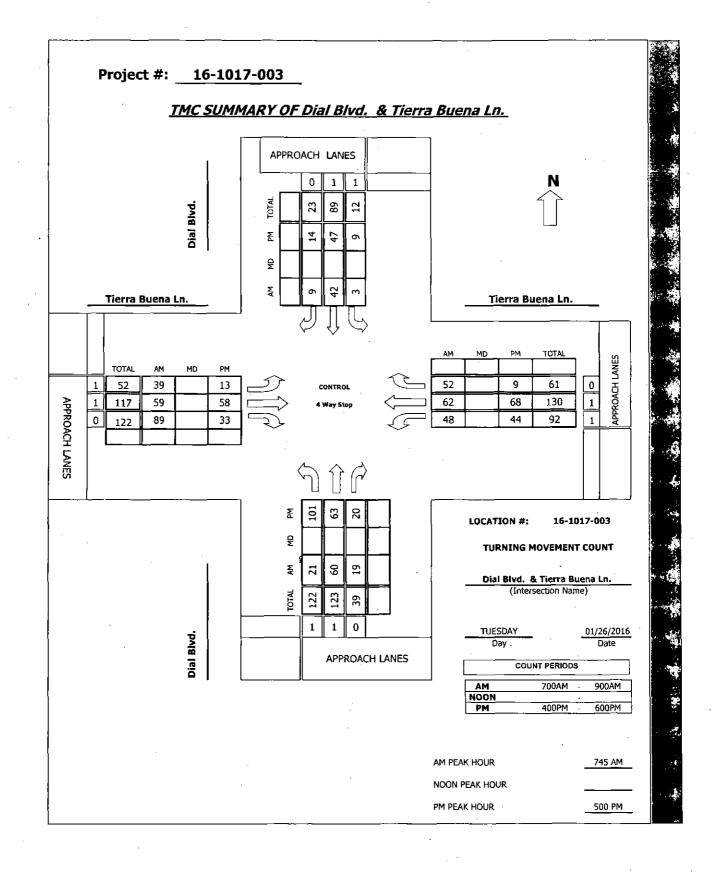
COMMENT 1: 0

6:45 PM

Signalized

# Intersection Turning Movement Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6748



#### **Intersection Turning Movement** Prepared by:

# FIELD DATA SERVICES OF ARIZONA, INC. Veracitytrafficgroup

N-S STREET: Dial Blvd.

DATE: 01/26/2016

LOCATION: Scottsdale

E-W STREET: Tierra Buena Ln.

DAY: TUESDAY

PROJECT# 16-1017-003

	NC	RTHBO	UND	SC	UTHBO	UND	E	ASTBOU	IND	W	ESTBOL	JND	
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTA
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	4	3	3	0	4	2	7	16	13	6	5	0	63
7:15 AM	2	4	3	0	7	2 2	8	15	7	5	8	0	61
7:30 AM	2	5	4	1	4	2	9	13	17	2	5	0	64
7:45 AM	4	18	4	2	7	2	14	18	13	24	22	14	142
8:00 AM	5	18	7	0	10	4	12	22	20	19	29	34	180
8:15 AM	5	8	3	0	11	1	7	14	35	4	7	3	98
8:30 AM	7	16	5 2	1	14	2	6	5	21	1	4	1	83
8:45 AM	8	14	2	3	8	5	13	19	18	1	7	0	98
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	37	86	31	7	65	20	76	122	144	62	87	52	789
Approach %	24.03	55.84	20.13	7.61	70.65	21.74	22.22	35.67	42.11	30.85	43.28	25.87	
App/Depart	154	/	214	92	/	271	342	/	160	201	/	144	

AM Peak Hr Begins at: 745 AM

PEAK

Volumes 21 60 19 3 42 9 39 59 89 48 62 52 503 Approach % 21.00 60.00 19.00 5.56 77.78 16.67 20.86 31.55 47.59 29.63 38.27 32.10

PEAK HR.

FACTOR:

0.833

0.699

CONTROL: 33.629305, -111.922130

COMMENT 1:

#### **Intersection Turning Movement**

# FIELD DATA SERVICES OF ARIZONA, INC. 520.316.6745

N-S STREET: Dial Blvd.

COMMENT 1: 0

4 Way Stop

DATE: 01/26/2016

LOCATION: Scottsdale

E-W STREET: Tierra Buena Ln.

DAY: TUESDAY

PROJECT# 16-1017-003

	NO	RTHBOL	JND	SO	UTHBOL	JND	EA	STBOU	ND	WI	ESTBOU	ND	
LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	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	14	12	3	2	17	4	6	9	5	15	20	4	111
4:15 PM	15	18	4	1	11	6	5	11	5	8	11	3	98
4:30 PM	14	16	1	1	14	5	4	7	9	12	10	4	97
4:45 PM	11	16	6	1	9	4	2	7	10	10	16	1	93
5:00 PM	33	20	1	2	16	4	1	14	6	5	24	1	127
5:15 PM	19	15	3	3	15	3	2	13	8	14	17	1	113
5:30 PM	30	16	4	2	8	0	3	12	12	14	14	4	119
5:45 PM	19	12	12	2	8	7	7	19	7	11	13	3	120
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													
OTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
olumes	155	125	34	14	98	33	30	92	62	89	125	21	878
proach %	49.36	39.81	10.83	9.66	67.59	22.76	16.30	50.00	33.70	37.87	53.19	8.94	
pp/Depart	314	/	176	145	/	249	184	/	140	235	/	313	
PM Pe	ak Hr Be	gins at:	500	PM									
EAK													
olumes	1 101	63	20	9	47	14	13	58	33	44	68	9	479
pproach %	54.89				67.14			55.77		36.36		7.44	
TALK LUB													
AK HR.	1	0.053			0.795			0.788	- 1		0.945	1	0.943
CTOR:	1	0.852	- 1		0.795	- 1		0.700			0.943	- 1	0.943

# CITY OF SCOTTSDALE

# '13 -'14 COLLISION SUMMARY

REPORT#	DATE TIME YYMMDD HHMW	NORTH / SOUTH ST.	TYPE	EAST WEST ST.	TYPE		INJ. : #1	\$EV #2		. COND. #2	VIOL #1	ATION #2		ION #2			MANNER OF COLLISION	COMMENTS	
14-07626	140403 1751	DIAL	BL	GREENWAY HAYDEN LOOP		AT	1	1	0	0	6	ì	ı	1	ЕВ	SB	2		

#### **KEY**

INJURY SEVERITY: 1=NO INJURY, 2=POSSIBLE INJURY, 3=NON-INCAPACITATING INJURY, 4=INCAPACITATING INJURY, 5=FATAL INJURY, 99=NOT REPORTED / UNKNOWN PHYSICAL CONDITION: 0≠NO APPARENT INFLUENCE, 1≠ILLNESS, 2=PHYSICAL IMPAIRMENT, 3=FELL ASLEEP / FATIGUED 4=ALCOHOL, 5=DRUGS, 6=MEDICATIONS, A=NO TEST GIVEN, B=TEST GIVEN, C=TEST REFUSED, D=TESTING UNKNOWN, 97=OTHER, 99=UNKNOWN

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

ACTION: 1=GOING STRAIGHT AHEAD, 2=SLOWING IN TRAFFICWAY, 3=STOPPED IN TRAFFICWAY, 4=MAKING LEFT TURN, 5=MAKING RIGHT TURN, 5=MAKING U-TURN, 7=OVERTAKING/PASSING, 8=CHANGING LANES, 9=NEGOTIATING A CURVE, 10=BACKING, 11=AVOIDING VEH/OBJ/PED/CYCLIST/ANIMAL, 12=ENTERING PARKING POSITION, 13=LEAVING PARKING POSITION, 14=PROPERLY PARKED, 15=IMPROPERLY PARKED, 16=DRIVERLESS MOVING VEHICLE, 17=CROSING ROAD, 18=WALKING WITH TRAFFIC, 19=WALKING AGAINST TRAFFIC, 20=STANDING, 21=LYING, 22=GETTING ON OR OFF VEHICLE, 23=WORKING ON/PUSHING VEHICLE, 24=WORKING ON ROAD, 37=OTHER, 99=UKNOWN

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

TOTAL

# **CITY OF SCOTTSDALE**

# '13 -'15 COLLISION SUMMARY

REPORT#		TIME D HHMM	NORTH / SOUTH ST.	TYPE	EAST WEST ST.	TYPE	DIR FROM	DIST	INJ. #1		PHYS #1			LATION #2		TION #2	TRAV #1 #		MANNER OF COLLISION	COMMENTS
14-21999	141012	1049	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		2	1	6	0	2	1	1	3	NB	NB	4	DUI
13-25480	131105	1030	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		99	1	99	0	2	1	1	3	SB	SB	4	
13-28953	131216	1222	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		99	1	99	0	2	1	1	3	WB	WB	4	HIT AND RUN
13-16071	130715	0928	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		3	3	0	0	6	1	1	1	SB	EB	2	MULTI VEH 3
13-18579	130815	1341	SCOTTSDALE	RD	GREENWAY HAYDEN		AT		1	2	0	0	2	1	1	3	SB	SB	4	
14-18383	140826	1254	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		1	1	0	0	2	1	1	3	SB	SB	4	
13-28626	131212	1910	SCOTTSDALE	RD	GREENWAY HAYDEN		AT		1	1	0	0	4	1	1	1	SB	SB	4	
14-24315	141110	1737	SCOTTSDALE	RD	GREENWAY HAYDEN	RD	AT		1	1	99	0	2	1	2	3	WB	WB	4	MULTI VEH 4
14-09785	140430	2045	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		1	1	0	0	2	1	1	1	NB	WB	2	
14-12484	140606	1100	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		1	1	0	0	6	1	1	1	WB	SB	2	
14-14983	140710	1315	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		99	1	99	0	99	1	99	3	SB	SB	4	HIT AND RUN
14-26529	141209	1510	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		1	1	0	0	2	1	1	3	SB	SB	4	
13-18116	130809	1330	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	S	101	1	1	0	0	2	1	1	1	NB	NB	4	
14-03638	140213	1300	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		1		99	0	2	1	13	14	SB	NB	9	HIT AND RUN
13-06127	130315	1756	SCOTTSDALE	RD	GREENWAY HAYDEN		AT		1	1	0	0	2	1	1	3	NB	NB	4	
13-07115	130327	0810	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		1	1	0	0	12	1	8	1	SB	SB	6	
13-03557	130213	0933	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		N	123	1	2	0	0	2	1	1	3	SB	SB	4	
13-11636	130518	1824	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		1	1	4	0	2	1	1	2	NB	NB	4	DUI
13-19264	130823	1720	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		2	2	0	0	4	1	1	3	SB	SB	4	
13-22456	131001	0927	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		1	1	0	0	12	1	8	1	NB	NB	6	
14-01368	140117	1840	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		1	1	0	0	97	1	5	1	SB	WB	2	
13-04246	130221	1551	SCOTTSDALE	RD	GREENWAY HAYDEN	Е	101		3		0		2		8		EB		1	

REPORT #	DATE YYMMD	TIME D HHMM	NORTH / SOUTH ST.	TYPE	EAST WEST ST.	TYPE	DIR FROM	DIST FROM			PHYS #1		VIOI #1				TRAV. DIF #1 #2	MANNER OF COLLISION	COMMENTS
(14-03989)	( <u>140219)</u>	0955,	(SCOTTSDALE)	RD	GREENWAY HAYDEN		(AT)		(i)	(1)	(0)	(0)	<u>(6)</u>	Û	(j)	(i)	NB) (EB)	(2)	MULTI VEH 3)
(14-08769)	(140418)	(1110)	SCOTTSDALE!	RD)	(GREENWAY HAYDEN)		(AT)		Û	(i)	(0)	(0)	121	(Ii	(Ī)	2	(NB) (NB)	<b>3</b> .	:Мกฏีบไกล์หมัง)
13-28959	131216	1333	SCOTTSDALE	RD	GREENWAY HAYDEN LOOP		AT		1	1	0	0	4	1	I	2	SB SB	4	
15-28007	151222	1815	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	ΑТ		I	I	0	0	2	I	8	1	WB EB	3	
15-13235	150612	1657	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	ΑT		1	I	0	0	12	1	8	1	NB NB	3	
15-05789	150311	1339	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		ι	1	0	0	2	1	I	3	NB NB	4	
15-04377	150221	2217	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	ΑT		1	ı	Û	0	4	I	1	1	NB NB	4	
<b> 5-03757</b>	150213	1825	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	ΑТ		1	2	0	0	4	1	2	3	SB SB	4	
5-27599	151217	1213	SCOTTSDALE	RÐ	GREENWAY HAYDEN	LOOP	AT		ı	ì	0	0	20	1	5	4	NB SB	2	
15-20815	150923	1326	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	ΑT		99	ł	99	0	99	1	ı	4	WB NB	7 -	HIT AND RUN
15-20700	150922	0440	SCOTTSDALE	RD	GREENWAY HAYDEN	LOOP	AT		99	1	99	0	6	i	1	4	NB WB	97	HIT AND RUN

#### KEY

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

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

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

### **APPENDIX C**

**EXISTING PEAK HOUR ANALYSIS** 



Lanes, Volumes, Timings

16-110 District at the Quarter

1: Scottsdale Road & Greenway Hayden Loop

EBT NBT ane Group WBL WBT WBR NBL SBT Lane Configurations Traffic Volume (vph) 201 240 Future Volume (vph) 80 201 16 230 173 42 27 849 335 102 988 180 1900 1900 Ideal Flow (yphpl) 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 Lane Util Factor 0.97 0.91 0.97 0.91 0.91 0.97 1.00 0.97 0.91 0.91 0.91 1.00 0.989 0.971 0.850 0.850 0.950 0.950 FII Protected 0.950 0.950 Sald. Flow (prot) 5029 3433 0.950 3433 3433 4938 3433 5085 1583 5085 Flt Permitted 0.950 0.950 0.950 Satd, Flow (perm) 3433 0 , 3433 4938 3433 3433 Right Turn on Red Yes Yes Yes Yes Sald, Flow (RTOR) 196 Link Speed (mph) 40 40 45 45 Link Distance (ft) 1500 700 1000 17.0 Travel Time (s) 25.6 10.6 15.2 Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 0.92 87 17 250 188 923 111 1074 Adj. Flow (vph) 218 46 29 364 196 Shared Lane Traffic (%) 87 235 250 234 29 923 364 111 1074 0 Lane Group Flow (vph) n 196 Enter Blocked Intersection No No No No No No Νo No No ' No - No No Right Left Left Right Left Left Right Left Left Left Lane Alignment Left Right Median Width(It) 24 Link Offset(ft) Crosswalk Width(fl) Two way Left Turn Lane Headway Factor 1.00 1.00 1.00 71.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 Turning Speed (mph) 15 15 9 15 15 Number of Detectors Detector Template Left Thru Left Left Right Left Right 20 100 100 100 100 Leading Detector (ft) 20 20 Traiting Detector (fl) 0 0 0 0 Detector 1 Position(ft) Ō n 0 a Detector 1 Size(ft) 20 20 20 20 CI+Ex CI+Ex-CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Type Detector 1 Channel 0.0 Detector 1 Extend (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Detector 1 Queue (s) .0.0 0.0 0.0 0.0 Detector 1 Delay (s) 0.0 0.0 0.0 Detector 2 Position(ft) 94 94 94 94 Delector 2 Size(ft) CI+Ex CI+Ex CI+Ex Detector 2 Type CI+Ex Detector 2 Channel 0.0 0.0 Detector 2 Extend (s) 0.0 0.0 Turn Type Prot NA ΝÄ NΑ NA Perm Protected Phases 4 8 6 5 Permitted Phases Detector Phase Switch Phase 4.0 8.0 4.0 8.0 4.0 20.0 20.0 4.0 20.0 20.0 Minimum Initial (s)

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16-110 District at the Quarter 5/27/2016

1: Scottsdale Road & Greenway Hayden Loop

	•	<b>→</b>	*	1	•	•	1	Ť	~	-	<b>↓</b>	4
Lane Group	EBL	EBT	EBR"	÷₩BL	WBT	WaR	NBL	NBT	NBR -	SBL	SBT	SBR
Lane Configurations	ሻሻ	445		77	<del>111</del>		ሻሻ	<b>+++</b>	7	ሻሻ	444	
Traffic Volume (vph)	200	177	42	361	455	142	62	1298	230	134	1018	254
Future Volume (vph)	. 200	177	42	361	455	142	62	1298	230	134	1018	254
Ideal Flow (vohpl) */	1900	1900	1900	1900	1900	1900	r 1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
Frt	2 2 1 7 3	0.971		5 2	0.964		,		0.850			0.850
FII Protected	0.950			0.950			0.950			0.950		
Sald Flow (prot)	3433	4938	. 0	-3433	4902	0	3433	5085	1583	3433	5085	1583
FIt Permitted	0.950			0.950			0.950			0.950		
Sald: Flow (perm)	3433	4938	Ô	3433	4902	. 0	3433	. 5085	1583	3433	5085	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	1.14	43			60		1	·	249		<del></del>	276
Link Speed (mph)		40			40			45			45	
Link Distance (fi)	4.5.1	1500			995 .	<del>,</del> -	-	700		1 -	.1000	
Travel Time (s)		25.6			17.0			10.6			15.2	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	217	192	46	392	495	154	67	1411	250	146	1107	276
Shared Lane Traffic (%)			-,-	-9			3	- ,,-				
Lane Group Flow (vph)		238	0	392	649	0	67	1411	250	146	1107	276
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No -	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	A	24			24			-24		-	24	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16 %		·	16	-		16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1:00	1.00
Turning Speed (mph)	15		9	15	<u></u>	9	15		9	15		9
Number of Detectors	.5.1	2						2		<del></del>		
Detector Templale	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	- 100		20	100	20	20	100	20
Trailing Detector (ft)	0	0	1	0	Ö		0	0	0	Ō.	0	<u>_</u>
Detector 1 Position(ft)	0	<u> </u>		0	0		- 0	· ō	0	0	ŏ	<del></del> -
Delector 1 Size(ft)	20	6		20	6		20		20	20	6	20
Delector 1 Type	, CI+Ex	CI-Ex .		CI+Ex	CI+Ex.		CI+Ex	CI+Ex	CIŦĒX	CI+Ex.	CI+Ex	CIFEX
Delector 1 Channel	<u> </u>	<u> </u>	*****	_ON_EX			<u> </u>	Or CA	OI: CA	OI LA	OI LA	- Oliver
Delector 1 Extend (s)	70.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Delector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	". 0.0		> 0.0	0.0-	-00	0.0	1,00	0.0
Detector 2 Position(ft)	16. 0.0	94			94		<u>. 0.0</u>	94		0.0	94	0.0
Detector 2 Size(fi)		6			6			6			. 6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex		•	CHEx	
Delector 2 Type  Delector 2 Channel		CITEX		,	CITEX			CITEX	1	<del></del>	CHEX	
Delector 2 Extend (s)		0.0		- 1	0.0			0.0	<del></del> -	<del></del>	0.0	
Delector 2 Extend (s)	Prot	NA		Prof	NA		Prot	NA		Prot	NA	Perm
									Perm			Perm
Protected Phases	4	7		8	3		6	1_	<del></del>	2	5	
Permilled Phases			er franc			<del></del>		<del></del> _				5
Delector Phase	4	7		8	3		6	1	1	2	5	5
Switch Phase				<u> </u>								لنيب
Minimum Initial (s)	4.0	8.0		4.0	8.0		4.0	20.0	20.0	4.0	20.0	20.0

Existing PM.syn CivTech Synchro 9 Report Page 1P Lanes, Volumes, Timings

16-110 District at the Quarter 5/27/2016

1: Scottsdale Road & Greenway Hayden Loop

	1	$\rightarrow$	*	1	<b>—</b>	*	1	1	-	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.2	33.0		11.0	33.0		11.0	39.0	39.0	11.0	39.0	39.0
Total Split (s)	18.2	40.0		18.2	40.0		18.0	43.8	43.8	18.0	43.8	43.8
Total Split (%)	15.2%	33.3%		15.2%	33.3%		15.0%	36.5%	36.5%	15.0%	36.5%	36.5%
Maximum Green (s)	14.2	33.0		14.2	33.0		14.0	36.8	36.8	14.0	36.8	36.8
Yellow Time (s)	3.0	4.3		3.0	4.3		3.0	4.8	4.8	3.0	4.8	4.8
All-Red Time (s)	1.0	2.7		1.0	2.7		1.0	2.2	2.2	1.0	2.2	2.2
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)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	0.2	0.2	1.0	0.2	0.2
Recall Mode	None	None		None	None		Max	C-Max	C-Max	Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		19.0			19.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	12.7	9.9		12.1	9.4		14.0	61.9	61.9	14.0	61.9	61.9
Actuated g/C Ratio	0.11	0.08		0.10	0.08		0.12	0.52	0.52	0.12	0.52	0.52
v/c Ratio	0.24	0.55		0.72	0.55		0.07	0.35	0.37	0.28	0.41	0.22
Control Delay	49.8	55.5		61.0	43.7		47.8	18.2	3.0	50.4	19.0	3.0
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	49.8	55.5		61.0	43.7		47.8	18.2	3.0	50.4	19.0	3.0
LOS	D	E		E	D		D	В	Α	D	В	A
Approach Delay		53.9			52.7			14.6			19.2	
Approach LOS		D			D			В			В	

Intersection Summary

Area Type: Other
Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 1:NBT and 5:SBT, Start of Green

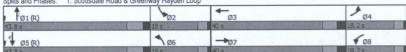
Natural Cycle: 95

Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.72

Intersection Signal Delay: 25.3 Intersection LOS: C

Intersection Capacity Utilization 54.0% Analysis Period (min) 15

Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop



ICU Level of Service A

Existing AM.syn CivTech Synchro 9 Report Page 2A Lanes, Volumes, Timings

16-110 District at the Quarter 5/27/2016

1: Scottsdale Road & Greenway Hayden Loop

	1	$\rightarrow$	*	1	<b>←</b>	*	4	1	1	1	<b></b>	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.2	33.0		11.0	33.0		11.0	39.0	39.0	11.0	39.0	39.0
Total Split (s)	22.0	34.0		22.0	34.0		11.0	50.0	50.0	14.0	53.0	53.0
Total Split (%)	18.3%	28.3%		18.3%	28.3%		9.2%	41.7%	41.7%	11.7%	44.2%	44.2%
Maximum Green (s)	18.0	27.0		18.0	27.0		7.0	43.0	43.0	10.0	46.0	46.0
Yellow Time (s)	3.0	4.3		3.0	4.3		3.0	4.8	4.8	3.0	4.8	4.8
All-Red Time (s)	1.0	2.7		1.0	2.7		1.0	2.2	2.2	1.0	2.2	2.2
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)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	0.2	0.2	1.0	0.2	0.2
Recall Mode	None	None		None	None		Max	C-Max	C-Max	Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		19.0			19.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	11.0	9.5		20.8	19.3		7.0	57.7	57.7	10.0	60.7	60.7
Actuated g/C Ratio	0.09	0.08		0.17	0.16		0.06	0.48	0.48	0.08	0.51	0.51
v/c Ratio	0.69	0.55		0.66	0.77		0.34	0.58	0.28	0.51	0.43	0.29
Control Delay	64.2	48.3		48.3	46.1		59.1	24.5	3.5	59.4	20.2	3.2
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.2	48.3		48.3	46.1		59.1	24.5	3.5	59.4	20.2	3.2
LOS	Е	D		D	D		E	С	Α	E	С	Α
Approach Delay		55.9			46.9			22.8			20.9	
Approach LOS		E			D			С			С	

Intersection Summary

Area Type: Other
Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 1:NBT and 5:SBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

Maximum vic Ratio: 0.77

Intersection Signal Delay: 30.7

Intersection Capacity Utilization 64.9%

ICU Level of Service C

Analysis Period (min) 15

 Splits and Phases:
 1: Scottsdale Road & Greenway Hayden Loop

 PØ1 (R)
 Ø2
 Ø3
 Ø4

 50 s
 14 s
 34 s
 22 s

 4
 Ø5 (R)
 Ø6
 Ø7
 Ø8

Existing PM.syn CivTech Synchro 9 Report Page 2P HCM 2010 Signalized Intersection Summary 1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter 5/27/2016

HCM 2010 analysis expects strict NEMA phasing.

HCM 2010 Signalized Intersection Summary
1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter

HCM 2010 analysis expects strict NEMA phasing.

Existing AM.syn CivTech Synchro 9 Report Page 3A Existing PM.syn CivTech Synchro 9 Report Page 3P Lanes, Volumes, Timings

Switch Phase Minimum Initial (s)

5.0 5.0

16-110 District at the Quarter 5/27/2016

2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

Lane Group Lane Configurations ኻ ተተቡ Traffic Volume (vph) Future Volume (vph) 84 489 29 142 406 22 57 167 33 46 Ideal Flow (vphpl) 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 1900 Lane Util. Factor 1.00 0.91 0.91 1.00 0.95 1.00 1.00 1.00 1.00 1.00 1.00 Frt 0.850 0.991 Flt Protected 0.950 0.950 0.950 0.950 1770 1770 1770 1770 Satd. Flow (prot) Flt Permitted 0.496 0.427 0.724 0.717 1336 924 1349 Satd. Flow (perm) 795 Right Turn on Red Yes Yes Yes Yes Satd. Flow (RTOR) 182 40 40 30 30 Link Speed (mph) 995 1030 922 1086 Link Distance (ft) 17.0 17.6 21.0 24.7 Travel Time (s) Peak Hour Factor 0.92 0.92 0.92 0.92 0.92 Adj. Flow (vph) 91 532 32 154 441 24 15 62 182 50 53 Shared Lane Traffic (%) Lane Group Flow (vph) 91 564 0 154 441 24 15 62 182 36 50 53 Enter Blocked Intersection No No No No No No No Lane Alignment Right Right Right Left Right Left Left Left Left Left Left Left 12 Median Width(ft) 12 12 12 Link Offset(ft) 0 0 0 Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) 15 15 15 15 Number of Detectors **Detector Template** Left Thru Left Thru Right Left Thru Right Left Thru Right 20 100 100 Leading Detector (ft) Trailing Detector (ft) Detector 1 Position(ft) Detector 1 Size(ft) 20 6 20 6 20 20 6 20 20 6 20 CI+Ex CI+Ex CI+Ex Detector 1 Type CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex CI+Ex Detector 1 Channel 0.0 0.0 0.0 0.0 0.0 Detector 1 Extend (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 Detector 1 Queue (s) 0.0 0.0 0.0 0.0 0.0 Detector 1 Delay (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 94 94 94 94 Detector 2 Position(ft) Detector 2 Size(ft) 6 CI+Ex CI+Ex CI+Ex CI+Ex Detector 2 Type Detector 2 Channel 0.0 0.0 0.0 0.0 Detector 2 Extend (s) NA Perm NA NA NA Turn Type pm+pt Protected Phases 4 8 2 6 Permitted Phases Detector Phase 4 3 8 2 6

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5.0 5.0

5.0

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5.0

Lanes, Volumes, Timings

2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter 5/27/2016

	1	$\rightarrow$	*	1	<b>←</b>	*	1	1	-	1	<b></b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*5	ተተኩ		*5	<b>^</b>	7	75	1	7	ሻ	<b>†</b>	7
Traffic Volume (vph)	41	441	38	175	779	26	58	77	243	19	81	72
Future Volume (vph)	41	441	38	175	779	26	58	77	243	19	81	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util, Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	ALC: NO	0.988				0.850			0.850	250000		0.850
Flt Protected	0.950			0.950			0.950			0.950	and the same	
Satd. Flow (prot)	1770	5024	0	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.307			0.436			0.638			0.656	1000	
Satd. Flow (perm)	572	5024	0	812	3539	1583	1188	1863	1583	1222	1863	1583
Right Turn on Red		-	Yes			Yes		1000	Yes	1 80 80 80	1000	Yes
Satd. Flow (RTOR)		12	MANUAL PROPERTY.			55			264			91
Link Speed (mph)		40			40	- 00		30	201		30	01
Link Distance (ft)	DESCRIPTION OF THE PARTY OF THE	995	Elizabeth .	IS SECURE	1030	ENTRA ELL		922			1086	
Travel Time (s)	THE REAL PROPERTY.	17.0			17.6	ATTENDED		21.0			24.7	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	479	41	190	847	28	63	84	264	21	88	78
Shared Lane Traffic (%)	40	413	41	130	041	20	03	04	204	21	00	70
Lane Group Flow (vph)	45	520	0	190	847	28	63	84	264	21	88	78
Enter Blocked Intersection	No	No	No	No	No No	No	No	No.	No.	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	12	rigiit	Leit	12	Right	Leit	12	right	Leit	12	Right
Link Offset(ft)		0			0	SECTION		0			0	
Crosswalk Width(ft)	UNIVERSE OF THE	16			16			16	atro artistic		16	ESSENTED AS
Two way Left Turn Lane		10			10	Marie Principle	ASSESSED FOR STATE	10			10	
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.00	9	15	1.00	9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100	HINDA	20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6	No. of Contract of	20	6	20	20	6	20	20	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel	CITEX	CITEX	abames.	CITEX	CITEX	CITEX	CITEX	CITEX	CITEX	CITEX	CITEX	CITEX
Detector 1 Extend (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	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)									- 1-			
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	ENDERSON-CO	94	NOTICE AND ADDRESS OF		94			94			94	ADDICE STREET
Detector 2 Size(ft)		6			6			BESSELLE SHIELDA			RESERVED FOR STOLE	
Detector 2 Type		CI+Ex	-		CI+Ex			CI+Ex			CI+Ex	CONTRACTOR OF THE PARTY OF THE
Detector 2 Channel												
Detector 2 Extend (s)		0.0			0.0		_	0.0			0.0	_
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

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16-110 District at the Quarter 5/27/2016

Synchro 9 Report

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2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

	1	-	1	1	-	4	1	1	-	1	Ţ	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.5	31.5		9.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Total Split (s)	18.0	45.0		28.0	55.0	55.0	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	15.0%	37.5%		23.3%	45.8%	45.8%	39.2%	39.2%	39.2%	39.2%	39.2%	39.2%
Maximum Green (s)	13.5	40.5		23.5	50.5	50.5	42.5	42.5	42.5	42.5	42.5	42.5
Yellow Time (s)	3.5	3.5		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	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
Total Lost Time (s)	4.5	4.5	Art at	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead		Lag	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	3.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		16.0			16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Flash Dont Walk (s)		11.0			11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)		0			0	0	0	0	0	0	0	0
Act Effct Green (s)	87.0	80.7		101.5	90.7	90.7	9.5	9.5	9.5	9.5	9.5	9.5
Actuated g/C Ratio	0.72	0.67		0.85	0.76	0.76	0.08	0.08	0.08	0.08	0.08	0.08
v/c Ratio	0.13	0.17		0.19	0.16	0.02	0.14	0.42	0.62	0.34	0.34	0.25
Control Delay	2.2	4.0		2.7	4.5	0.1	52.7	60.4	17.1	59.9	57.4	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.2	4.0		2.7	4.5	0.1	52.7	60.4	17.1	59.9	57.4	4.4
LOS	A	Α		Α	Α	A	D	E	В	E	E	A
Approach Delay		3.7			3.9			29.5			37.9	
Approach LOS		Α			Α			С			D	

Intersection Summary

Area Type: Other
Cycle Length: 120

Actuated Cycle Length: 120

Offset: 47 (39%), Referenced to phase 4:EBTL and 8:WBTL, Start of Green

Natural Cycle: 75

Control Type: Actuated-Coordinated

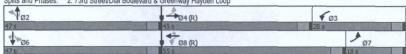
Maximum vic Ratio: 0.62

Intersection Signal Delay: 10.6
Intersection Capacity Utilization 37.7%

Intersection LOS: B
ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop



Existing AM.syn
CivTech

Lanes, Volumes, Timings

16-110 District at the Quarter 5/27/2016

2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

	•	$\rightarrow$	*	1	-	*	1	1	1	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	9.5	22.5		9.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.5
Total Split (s)	15.0	38.0		37.0	60.0	60.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	12.5%	31.7%		30.8%	50.0%	50.0%	37.5%	37.5%	37.5%	37,5%	37.5%	37.5%
Maximum Green (s)	10.5	34.0		32.5	55.5	55.5	40.5	40.5	40.5	40.5	40.5	40.5
Yellow Time (s)	3.5	3.0		3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	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
Total Lost Time (s)	4.5	4.0		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead		Lag	Lead	Lead						
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	1.0		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)					16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Flash Dont Walk (s)					11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)					0	0	0	0	0	0	0	0
Act Effct Green (s)	74.6	68.9		99.1	90.4	90.4	11.9	11.9	11.9	11.9	11.9	11.9
Actuated g/C Ratio	0.62	0.57		0.83	0.75	0.75	0.10	0.10	0.10	0.10	0.10	0.10
v/c Ratio	0.11	0.18		0.22	0.32	0.02	0.53	0.45	0.67	0.17	0.48	0.33
Control Delay	9.1	19.5		3.6	6.0	0.5	66.4	57.5	14.5	50.4	58.4	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	9.1	19.5		3.6	6.0	0.5	66.4	57.5	14.5	50.4	58.4	10.7
LOS	Α	В		Α	A	Α	E	E	В	D	Е	В
Approach Delay		18.7			5.4			31.2			37.6	
Approach LOS		В			Α			С			D	

Intersection Summary

Area Type: Other
Cycle Length: 120

Actuated Cycle: 75

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.67

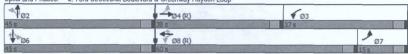
Intersection Signal Delay: 16.2

Intersection LOS: B

Intersection Capacity Utilization 46.8%

Analysis Period (min) 15

Splits and Phases: 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop



Existing PM.syn CivTech Synchro 9 Report Page 5P HCM 2010 Signalized Intersection Summary 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter 5/27/2016

	1	$\rightarrow$	*	1	-	*	1	<b>†</b>	1	1	1	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	19	ተተኩ		*5	<b>†</b> †	7	ኻ	<b>†</b>	7	7	<b>†</b>	7
Traffic Volume (veh/h)	84	489	29	142	406	22	14	57	167	33	46	49
Future Volume (veh/h)	84	489	29	142	406	22	14	57	167	33	46	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	91	532	32	154	441	24	15	62	182	36	50	53
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	1500000
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	872	1656	99	970	1489	666	212	264	224	187	264	224
Arrive On Green	0.11	0.11	0.11	0.41	0.42	0.42	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	4908	293	1774	3539	1583	1286	1863	1583	1131	1863	1583
Grp Volume(v), veh/h	91	366	198	154	441	24	15	62	182	36	50	53
	1774	1695	1811	1774	1770	1583	1286	1863	1583	1131	1863	1583
Grp Sat Flow(s), veh/h/ln	0.0	11.9	12.1	0.0	9.9	1.1	1.2	3.5	13.4	3.5	2.8	3.6
Q Serve(g_s), s			Marketin Company	000000000000000000000000000000000000000	9.9		4.1	3.5	13.4	7.0	2.8	3.6
Cycle Q Clear(g_c), s	0.0	11.9	12.1	0.0	9.9	1.1	1.00	3.5	1.00	1.00	2.0	1.00
Prop In Lane	1.00		0.16	1.00	1489			264	224	187	264	224
Lane Grp Cap(c), veh/h	872	1144	611	970		666	212		0.81	0.19	0.19	0.24
V/C Ratio(X)	0.10	0.32	0.32	0.16	0.30	0.04	0.07 485	0.24 660	561	427	660	561
Avail Cap(c_a), veh/h	872	1144	611	970	1489	666		1.00		1.00		1.00
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00		1.00		1.00	
Upstream Filter(I)	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.1	40.6	40.7	10.1	23.0	20.4	47.2	45.7	50.0	48.9	45.4	45.7
Incr Delay (d2), s/veh	0.0	0.7	1.3	0.1	0.5	0.1	0.1	0.5	6.9	0.5	0.3	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	1.9	5.7	6.3	2.3	4.9	0.5	0.5	1.9	6.3	1.1	1.5	1.6
LnGrp Delay(d),s/veh	16.1	41.3	42.0	10.2	23.5	20.5	47.4	46.2	56.9	49.4	45.8	46.3
LnGrp LOS	В	D	D	В	С	С	D	D	E	D	D	
Approach Vol, veh/h		655			619			259			139	
Approach Delay, s/veh		38.0			20.1		-	53.8			46.9	and the same of th
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				7-140
Phs Duration (G+Y+Rc), s		21.5	53.5	45.0		21.5	43.5	55.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		42.5	23.5	40.5		42.5	13.5	50.5				
Max Q Clear Time (q_c+l1), s		15.4	2.0	14.1		9.0	2.0	11.9				
Green Ext Time (p_c), s		1.6	0.6	3.5		1.6	0.5	3.0				
Intersection Summary			A FINAL SAN									
HCM 2010 Ctrl Delay			34.6									
HCM 2010 LOS			C									

Existing AM.syn Synchro 9 Report CivTech Synchro 9 Report Page 6A

HCM 2010 Signalized Intersection Summary 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter 5/27/2016

	•	-	*	1	-	1	4	1	1	1	<del> </del>	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	4	ተተጉ		7	44	i#	7	1	7	ሻ	<b>↑</b>	1
Traffic Volume (veh/h)	41	441	38	175	779	26	58	77	243	19	81	72
Future Volume (veh/h)	41	441	38	175	779	26	58	77	243	19	81	72
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	45	479	41	190	847	28	63	84	264	21	88	78
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	1
Cap, veh/h	536	1354	115	940	1637	732	251	367	312	224	367	312
Arrive On Green	0.08	0.09	0.09	0.41	0.46	0.46	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	4777	404	1774	3539	1583	1215	1863	1583	1029	1863	1583
Grp Volume(v), veh/h	45	338	182	190	847	28	63	84	264	21	88	78
Grp Sat Flow(s),veh/h/ln	1774	1695	1791	1774	1770	1583	1215	1863	1583	1029	1863	1583
Q Serve(g_s), s	0.0	11.2	11.4	0.0	20.3	1.2	5.5	4.5	19.3	2.1	4.8	5.0
Cycle Q Clear(g_c), s	0.0	11.2	11.4	0.0	20.3	1.2	10.3	4.5	19.3	6.7	4.8	5.0
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	536	961	508	940	1637	732	251	367	312	224	367	312
V/C Ratio(X)	0.08	0.35	0.36	0.20	0.52	0.04	0.25	0.23	0.85	0.09	0.24	0.2
Avail Cap(c_a), veh/h	536	961	508	940	1637	732	422	629	534	368	629	534
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	34.0	44.1	44.2	13.3	22.8	17.6	44.9	40.5	46.4	43.3	40.6	40.7
Incr Delay (d2), s/veh	0.1	0.9	1.8	0.1	1.2	0.1	0.5	0.3	6.3	0.2	0.3	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	1.3	5.4	5.9	3.4	10.1	0.5	1.9	2.4	9.0	0.6	2.5	2.3
LnGrp Delay(d),s/veh	34.1	45.0	45.9	13.4	24.0	17.7	45.5	40.8	52.7	43.5	40.9	41.
LnGrp LOS	С	D	D	В	C	В	D	D	D	D	D	[
Approach Vol, veh/h		565			1065			411			187	
Approach Delay, s/veh		44.4			21.9			49.1			41.3	
Approach LOS		D			С			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		28.2	53.8	38.0		28.2	31.8	60.0				
Change Period (Y+Rc), s		4.5	4.5	4.0		4.5	4.5	4.5				
Max Green Setting (Gmax), s		40.5	32.5	34.0		40.5	10.5	55.5				
Max Q Clear Time (g_c+I1), s		21.3	2.0	13.4		8.7	2.0	22.3				
Green Ext Time (p_c), s		2.4	0.6	1.0		2.6	0.4	6.5				
Intersection Summary												PA SIN
HCM 2010 Ctrl Delay			34.3									

Existing PM.syn CivTech

HCM 2010 LOS

Synchro 9 Report Page 6P Lanes, Volumes, Timings 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter 5/27/2016

	1	-	1	1	-	*	1	1	-	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	1		7	1>		ሻ	4		ኻ	1	
Traffic Volume (vph)	39	59	89	48	62	52	21	60	19	3	42	9
Future Volume (vph)	39	59	89	48	62	52	21	60	19	3	42	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.910		Take the	0,931			0.963			0.973	
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	1770	1695	0	1770	1734	0	1770	1794	0	1770	1812	0
FIt Permitted	0.950	10.000		0.950			0.950			0.950		
Satd. Flow (perm)	1770	1695	0	1770	1734	0	1770	1794	0	1770	1812	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		876			924			1086	9 000		897	
Travel Time (s)		19.9			21.0			24.7			20.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	64	97	52	67	57	23	65	21	3	46	10
Shared Lane Traffic (%)												
Lane Group Flow (vph)	42	161	0	52	124	0	23	86	0	3	56	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Internation Cummon.	NAME OF TAXABLE PARTY.										-	NAME OF TAXABLE PARTY.

Intersection Summary
Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.7%
Analysis Period (min) 15

ICU Level of Service A

Lanes, Volumes, Timings 3: Dial Boulevard & Tierra Buena Lane 16-110 District at the Quarter 5/27/2016

Synchro 9 Report

Page 7P

	1	$\rightarrow$	7	1	<b>←</b>	1	1	1	1	1	+	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	7	1		7	4		7	1>		ሻ	7	
Traffic Volume (vph)	0	2	1	2	3	0	4	2	1	0	2	1
Future Volume (vph)	0	2	1	2	3	0	4	2	1	0	2	1
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.950						0.950			0.950	
Flt Protected				0.950			0.950					MANUFACTURE STATE
Satd. Flow (prot)	1863	1770	0	1770	1863	0	1770	1770	0	1863	1770	0
Flt Permitted				0.950			0.950					
Satd. Flow (perm)	1863	1770	0	1770	1863	0	1770	1770	0	1863	1770	0
Link Speed (mph)		30			30			30			30	
Link Distance (ft)		876			924			1086			897	
Travel Time (s)		19.9			21.0			24.7			20.4	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	2	1	2	3	0	4	2	1	0	2	1
Shared Lane Traffic (%)												
Lane Group Flow (vph)	0	3	0	2	3	0	4	3	0	0	3	0
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Sign Control		Stop			Stop			Stop			Stop	
Intersection Summary												
Area Type: O Control Type: Unsignalized	ther								The Part of			

Control Type: Unsignalized Intersection Capacity Utilization 13.3% Analysis Period (min) 15

ICU Level of Service A

Existing AM.syn CivTech

Synchro 9 Report Page 7A Existing PM.syn CivTech

16-110 District at the Quarter 5/27/2016

3: Dial Boulevard & Tierra Buena Lane

Intersection												
Intersection Delay, s/veh	8.7											
Intersection LOS	A											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	39	59	89	0	48	62	52	0	21	60	19
Future Vol, veh/h	0	39	59	89	0	48	62	52	0	21	60	19
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mymt Flow	0	42	64	97	0	52	67	57	0	23	65	21
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach		EB				WB				NB		
Opposing Approach		WB				EB				SB		
Opposing Lanes		2				2				2		
Conflicting Approach Left		SB				NB				EB		
Conflicting Lanes Left		2				2				2		
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		2				2				2		
HCM Control Delay		8.7				8.7				8.9		
HCM LOS		Α				Α				Α		

			-			NAME OF TAXABLE PARTY.			Name and Address of the Owner, where the Owner, which is the Owner, which is the Owner, where the Owner, which is the Owner, whic	, Management
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2		
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%		
Vol Thru, %	0%	76%	0%	40%	0%	54%	0%	82%		
Vol Right, %	0%	24%	0%	60%	0%	46%	0%	18%		
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop		
Traffic Vol by Lane	21	79	39	148	48	114	3	51		
LT Vol	21	0	39	0	48	0	3	0		
Through Vol	0	60	0	59	0	62	0	42		
RT Vol	0	19	0	89	0	52	0	9		
ane Flow Rate	23	86	42	161	52	124	3	55		
Geometry Grp	7	7	7	7	7	7	7	7		
Degree of Util (X)	0.038	0.127	0.067	0.211	0.082	0.167	0.006	0.084		
Departure Headway (Hd)	6.014	5.341	5.656	4.731	5.676	4.852	6.078	5.449		
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		
Cap	594	670	633	758	631	739	588	655		
Service Time	3.76	3.087	3.394	2.469	3,415	2.591	3.828	3.199		
HCM Lane V/C Ratio	0.039	0.128	0.066	0.212	0.082	0.168	0.005	0.084		
HCM Control Delay	9	8.9	8.8	8.7	8.9	8.6	8.9	8.7		
HCM Lane LOS	A	A	Α	Α	Α	Α	A	Α		montant
HCM 95th-tile Q	0.1	0.4	0.2	0.8	0.3	0.6	0	0.3		

Existing AM.syn CivTech Synchro 9 Report Page 8A HCM 2010 AWSC 3: Dial Boulevard & Tierra Buena Lane 16-110 District at the Quarter 5/27/2016

Intersection Intersection Delay, s/veh	7.3											
Intersection LOS	Α.									100000	63754	
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	0	2	1	0	2	3	0	0	4	2	1
Future Vol., veh/h	0	0	2	1	0	2	3	0	0	4	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	2	1	0	2	3	0	0	4	2	1
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach		EB				WB				NB		
Opposing Approach		WB				EB				SB		
Opposing Lanes	marker sold of	2		CONTRACTOR OF THE PARTY OF THE		2				2	RELIEB COLOR	
Conflicting Approach Left		SB		2000		NB				EB		
Conflicting Lanes Left		2				2				2		and the same
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		2				2				2		
HCM Control Delay		7			-040	7.5				7.5		
HCM LOS		Α				A				Α		
Lane		NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2			
Vol Left, %		100%	0%	0%	0%	100%	0%	0%	0%			
Vol Thru, %		0%	67%	100%	67%	0%	100%	100%	67%			
Vol Right, %		0%	33%	0%	33%	0%	0%	0%	33%			
Sign Control		Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop			
Traffic Vol by Lane		4	3	0	3	2	3	0	3			
LT Vol		4	0	0	0	2	0	0	0			
Through Vol		0	2	0	2	0	3	0	2			
RT Vol		0	1	0	1	0	0	0	1			
Lane Flow Rate		4	3	0	3	2	3	0	3			
Geometry Grp		7	7	7	7	7	7	7	7			
Degree of Util (X)		0.006	0.004	0	0.004	0.003	0.004	0	0.004			
Departure Headway (Hd)		5.051	4.318	4.556	4.323	5.055	4.555	4.553	4.32			
Convergence, Y/N		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes			
Cap		712	833	0	831	711	789	0	832			
		2.758	2.024	2.265	2.032	2.763	2.263	2.261	2.027			
Service Time												
Service Time HCM Lane V/C Ratio		0.006	0.004	0	0.004	0.003	0.004	0	0.004			
Service Time HCM Lane V/C Ratio HCM Control Delay		0.006 7.8	7	7.3	7	7.8	7.3	7.3	7			
Service Time HCM Lane V/C Ratio HCM Control Delay HCM Lane LOS		0.006									(5) (5)	A Septim

Existing PM.syn CivTech

Synchro 9 Report Page 8P

HCM 2010 AWSC

16-110 District at the Quarter

3: Dial Boulevard & Tierra Buena Lane

5/27/2016

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	3	42	9
Future Vol, veh/h	0	3	42	9
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	3	46	10
Number of Lanes	0	1	1	0
Approach		SB		
Opposing Approach		NB		
Opposing Lanes		2		
Conflicting Approach Left		WB		
Conflicting Lanes Left		2		
Conflicting Approach Right		EB		
Conflicting Lanes Right		2		
HCM Control Delay		8.7		
HCM LOS		A		
Lane		-		

HCM 2010 AWSC

Existing PM.syn CivTech 16-110 District at the Quarter

3: Dial Boulevard & Tierra Buena Lane

5/27/2016

Intersection								
Intersection Delay, s/veh								
Intersection LOS								
Movement	SBU	SBL	SBT	SBR			0.000	OF THE STREET,
Traffic Vol, veh/h	0	0	2	1				
Future Vol, veh/h	0	0	2	1				
Peak Hour Factor	0.92	0.92	0.92	0.92				
Heavy Vehicles, %	2	2	2	2				
Mvmt Flow	0	0	2	1				
Number of Lanes	0	1	1	0				
							í	
Approach		SB						
Opposing Approach		NB						iv au
Opposing Lanes		2						
Conflicting Approach Left		WB						
Conflicting Lanes Left		2						
Conflicting Approach Right		EB						
Conflicting Lanes Right		2						
HCM Control Delay		7						
HCM LOS		Α						
Lane	Name of Street			OCCUPANT NAME OF THE OWNER, OWNER, OWNER, OWNER, OWNER,	NAME OF TAXABLE PARTY.	NACO STATE OF THE PARTY OF	NI SHE	THE COLUMN

## **APPENDIX D**

TRIP DISTRIBUTION CALCULATIONS



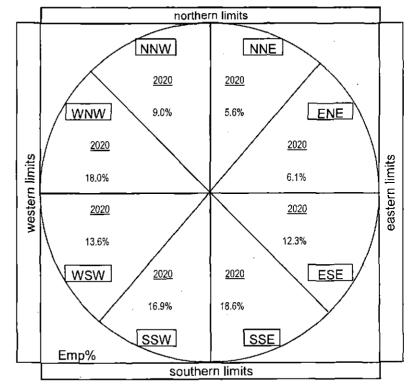
	2020				
Quadrant	Employment	Percent			
North Northwest	40,863	9.0%			
North Northeast	25,306	5.6%			
North	66,169	14.6%		1	
East Northeast	27,534	6.1%			
East Southeast	55,939	12.3%			
East	83,473	18.4%			
South Southeast	84,559	18.6%			
South Southwest	76,625	16.9%			
South	161,183	35.5%	,		
West Southwest	61,806	13.6%			
West Northwest	81,994	18.0%			
West	143,800	31.6%			
Totals	454,625	100.1%			

Radii

Population radius: Employment radius:

0 miles

10 miles



AZ	e radiu MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	Appendix D
NE							ESE							
229	SC	14,579	16,506	20%	2,916	3,301	230	SC	36,850	49,197	20%	7,370	9,839	
230	SC	36,850	49,197	50%	18,425	24,599	247	SC	48,204	50,778	25%	12,051	12,695	
231	CO	718	727	30%	215	218	248	SC	27,822	28,456	80%	22,258	22,765	
247	SC	48,204	50,778	10%	4,820	5,078	249	SC	8,687	9,250		8,687	9,250	
250	FH	11,569	11,573	10%	1,157	1,157	250	FH	11,569	11,573	15%	1,735	1,736	
	-	-	-		.,	-	264	SA	25,587	49,905	15%	3,838	7,486	
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	m ENE				27,534	34,353	Froi	m ESE				55,939	63,770	Distribution
Fron	n East											83,473	98,123	ا≝ا

RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	Appendix D
NW					-		NNE							
209	SC	5,450	6,483	20%	1,090	1,297	209	SC	5,450	6,483	30%	1,635	1,945	
218	PH	4,504	4,879	30%	1,351	1,464	229	SC	14,579	16,506	70%	10,205	11,554	
219	PH	6,394	10,551	80%	5,115	8,441	230	SC	36,850	49,197	30%	11,055	14,759	
227	PH	16,077	18,036	30%	4,823	5,411	247	SC	48,204	50,778	5%	2,410	2,539	
228	PH	33,621	42,763	80%	26,897	34,210		-	-	-		-		
246	PH	31,742	31,757	5%	1,587	1,588		-	-	-		-	-	
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From	NNW				40,863	52,410	From	n NNE				25,306	30,797	Distribution - Employment
	North				40,000	02,410	110	II IAIAL				66,169	83,207	St

RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	Appendix D
SSE							SSW							
247	SC	48,204	50,778	50%	24,102	25,389	246	PH	31,742	31,757	25%	7,936	7,939	
248		27,822	28,456	20%	5,564	5,691	247	SC	48,204	50,778	10%	4,820	5,078	
263	SC	31,399	31,383		31,399	31,383	261	PH	35,618	35,610	40%	14,247	14,244	
264	SA	25,587	49,905	25%	6,397	12,476	262	PA	7,707	8,734		7,707	8,734	
272	SC	56,988	56,913	30%	17,096	17,074	271	PH	50,862	50,850	60%	30,517	30,510	
	-	-	-		-	-	272	SC	56,988	56,913	20%	11,398	11,383	
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Ero	m SSE				84,559	92,013	From	n SSW				76,625	77,888	Distribution
	South				04,009	32,013	1101	11 3344				161,183	169,901	st

	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	RAZ	MPA	2020 Employment	2030 Employment	% of TAZ	2020 Adjusted	2030 Adjusted	Appendix D
SW							WNW							1
242	PH	9,341	9,284	50%	4,671	4,642	217	PH	11,907	14,741	10%	1,191	1,474	
244	PH	16,551	16,428	80%	13,241	13,142	219	PH	6,394	10,551	10%	639	1,055	l
245	PH	17,221	17,152	80%	13,777	13,722	225	PH	48,176	55,429	50%	24,088	27,715	
246	PH	31,742	31,757	50%	15,871	15,879	226	PH	22,773	23,681	80%	18,218	18,945	
261	PH	35,618	35,610	40%	14,247	14,244	227	PH	16,077	18,036	70%	11,254	12,625	
	-	-	-		-	-	228	PH	33,621	42,763	50%	16,811	21,382	
	-	-	-		-	-	245	PH	17,221	17,152	20%	3,444	3,430	1
	-	-	-		-	-	246	PH	31,742	31,757	20%	6,348	6,351	
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	WSW				61,806	61,629	From	WNW				81,994	92,977	Distribution
From	West											143,800	154,606	1 🔅

## **APPENDIX E**

**BACKGROUND GROWTH RATE CALCULATIONS** 



# **Background Traffic Calculations**

Location of counts: Scottsdale Road, Thunderbird to Greenway Hayden Loop

Source(s): City of Scottsdale Traffic Count Website

http://www.scottsdaleaz.gov/transportation/studies-reports/traffic-volume

				Expansion
			Avg Growth	Factor to
	Year_	Volume	Rate to 2014	2014
Beginning	2014	35,700		
End	2012	34,300	2.0%	1.041

Growth Rate Used 2.0% Per-Year Multiplier 1.020

Expansion	
Factor(s)	
1.000	
1.020	<- Expansion factor to opening
1.040	
1.061	
1.082	
1.104	
1.126	
1.149	
1.172	
1.195	
1.219	
1.243	
1.268	
1.294	
1.319	
1.346	-
1.373	
1.400	
1.428	
1.457	
1.486	
	Factor(s) 1.000 1.020 1.040 1.061 1.082 1.104 1.126 1.149 1.172 1.195 1.219 1.243 1.268 1.294 1.319 1.346 1.373 1.400 1.428 1.457



### **APPENDIX F**

**2017 PEAK HOUR ANALYSIS** 



2017 AM Peak Hour: Background (Without Site) Volumes
1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

			*	-	-	_	7	ı		*	+	4
Lane Group	5 E01	ENEBT.	EBR	WBL	∂WBT&	WBR:	NBL	**NBT:	⊕NBR	SBL	SET SET S	SBR
Lane Configurations	ሽካ	ተተቡ		77	ተተኩ		ሻሻ	<b>ተ</b> ቀተ	7	ሻሻ	ተተተ	. 1
Traffic Volume (vph)	÷_; €829	206	¥-€117~	235	17.7	43	28	B66	342	105	1008	184
Future Volume (vph)	82	206	117	235	177	43	28	866	342	105	1008	184
Ideal Flow (vphpl)	7 1900	1900	1900	1900-	1900	1900	1900	1900	1900	11900	1900	1900
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
Frt 28 x 2 4438 4 4 4 5 5	70 - 20	0.946	1.7	1.70	. 0.97.15.	YC:25	Acres and	6. 17.	0.850	-4	7.	0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prof) 3000	3433	4811	0	3433	4938	. ** 0	3433	5085	1563	3433	5085	1583
Flt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	4 3433	7.4811	74 0	3433	4938	0	3433	5085	1583	3433	50857	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Said: Flow (RTOR)	- 0.4	1197	14 TO	27 7 2	47	rain. Santana		7.	372		3330	200
Link Speed (mph)		40			40			45			45	
Link Distance (ft)	internation of the Party	1500			995		April man	700	100	in te	. ₹1000	7
Travel Time (s)		25.6			17.0			10.6			15.2	· · · · · · · · · · · · · · · · · · ·
Peak Hour Factor	0.92	0.92	0.92	. 0.92	0.92	0.92	0.92	. 0.92	0.92	0.92	0.92	0.92
Adi. Flow (vph)	89	224	127	255	192	47	30	941	372	114	1096	200
Shared Lane: Traffic (%)		140	क्टंड्र स्ट्रांक	177							\$ 20.77	
Lane Group Flow (vph)	89	351	0	255	239	0	30	941	372	114	1096	200
Enter Blocked Intersection	C. No	Z.No	ZZ No		- No	No-	No.	No	No	No.	No.	No
Lane Afignment	Left	Left	Right	Left	Lett	Right	Left	Left	Right	Left	Left	Right
Median Width (ft)	34 1	. 24			24		212	. 24			. 24.	77.3
Link Offset(ft)		0	C		0			0			0	
Crosswalk Width(ft) : Neith	9. 6. 1	V-216 3	100 B 2 1	चन हुन्दु,क	₹ 16 -	E CITE	BART VO	14.164	্ডাল হ	7		
Two way Left Turn Lane		<u> </u>					. <del> </del>	. در تازیستانی				
Headway Factor	1.00	5.00.	± 1.00	1.00	1.00	1:00	1.00	41.00	1,00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	Te de 12	77.2			777	د مشموریت - ورو شا	~ 1	7.	7. <b>m</b> 7. g 7		7777	
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	_~=100 V		20	100.3	15 6 30 100	20	100	20	· + 20	100	₹20
Trailing Detector (ft)	0	0		0	0		0	0		0	0	0
Detectors Position(ft)	, Orange						0.7	::::ō:				Õ
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1 Type	*CI+Ex		3 E 2 E	CI+Ex "	CIFEX		Cl+Ex		CITEX	CI+Ex.	CI+Ex -	
Detector 1 Channel			# 14 A T 144	<u></u>	<u> </u>	are and are after	Oi, LA	OI, CA		OI-CA.	Or CA	(O) CA
Detector, 1 Extend (s):	0.07	0.0	agaign samp	.0.0	0.0		- 0.0	0.0	0.0	0.0	0.0	45 0 0
Detector 1 Queue (s)	0.0	0.0	<u> </u>	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)		TF-0.05		7 0.0			0.0	. 00	0.0	0.0		V 10.0
	(200 <u>0</u> , 1 <b>0.</b> 0.5)	94	**	-0.0	94			94	0.0		94	
Detector 2 Position(ft)	212 8 4 7				6 :				w 1	<del></del>	6	7 T
Detector 2 Size(ft)		سعدت الاراء بسنا	1000	حث بالم	CI+Ex			CI+Ex	*		CI+Ex	
Detector 2 Type	-	CI+Ex	مست بشامات	TO 1 1980	UITEX			, GITER		-		122.279
Detector 2 Channel		•		<i>3</i>						<u> </u>	0.0	
Detector 2 Extend (s)	~~~	0.0		er andre	0.0		(-B-2)	0.0				- B 2
Turn:Type ( x - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Prol*	· NA		Prot	NA.	أكسينا	Prot:	, NA	Perm		i FNA	Perm
Protected Phases	4 	<del>/-</del>	7 E. W	8	3		. 6			2_	- , -, 5	~~~;
Permitted Phases	5	11:		Same in	_ بند مث		-4					وسيد
Detector Phase	4	7	-	- 8		1, t part = :	6_	1 1176 \$76	1 200 - 100	2	5	5
Switch Phase Minimum Initial (s)	(F)		17.12		فرينته	أستند	۔ زیانات	عد ند حد		فربنت	ت نیت	أروسك
	4.0	8.0		4.0	8.0		4.0	20.0	20.0	4.0	20.0	20.0

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Synchro 9 Report Page 1A 2017 PM Peak Hour: Background (Without Site) Volumes

1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

		<b>→</b>	*	- ₹	-	•	7	ı		*	+	*
ane Group	EBL.	Eβ	e i EBR	WBL	WBT.	₹.WBR	- NBL-	NBT	NBR /	SBL	SBT	*/SBR
Lane Configurations	آوار	411		777	<b>↑</b> ↑↑		ሻሻ	<b>^</b>	7	PP	<b>^^</b>	7
Traffic Volume (vph)	204	181	43	369	465	145	. 64	1324	235	137	<b>1039</b>	260
Future Volume (vph)	204	181	43	369	465	145	64	1324	235	137	1039	260
deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	>1900	.1900
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	1 00	0.97	0.91	1.00
Ert Start		0.971			0.964			200	0.B50	وهريا ريا	, Y4.,	0.850
FII Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	4938	0		4902	. 0	3433	5085	1583		5085	1583
FIt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	3433	4938	0.	3433	4902.	0	3433	5085	1583.	3433	_50B5	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			29 m			10	- ساه سنة	ر د محدسات	249			<u>. 5</u> 283
Link Speed (mph)		40			40	,		45			45	
Link Distance (ft)		1500		7 d. r	" 995	- Carlo 10	<b>1</b>	700			=1000	
Travel Time (s)		25.6			17.0			10.6			15.2	
Peak Hour Factor	0.92		0.92	0.92		∿ 0.92	0.92	0.92	0.92			+ 0.92
Adj. Flow (vph)	222	197	47	401	505	158	70	1439	255	149	1129	283
Shared Lane Traffic (%)						4					7.7	
Lane Group Flow (vph)	222	244	0	401	663	0	70	1439	255	149	1129	283
Enter Blocked Intersection	· No	No	No	No	No:	, No.	No.	. No	· · · No.	. No	, No	- No
Lane Alignment	Leit	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	is.	24			24		1000	.24		3	24	
Link Offset(fl)		0			0			0			0	
Crosswalk Width(ft)		16	7 1 Page 19		167	C26 27	F 1	16	110	\$ 10.00	் <sub>&gt;</sub> −16	100
Two way Left Turn Lane									_			
Headway Factor	1.00.	1.00	1,00		1.00	1.00	1.00	1.00		92.1.00	ر 1.00 درد	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2			2		35 114	2	715	7 7		· 1
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	. 20	100	Iź	1, 20	100		-, 20	100	20	æ. 20.	100	20
Trailing Delector (ft)	0	0		0	0		0	0	0	0	0	ö
Detector 1 Position(ft)	ō	0		-4 <u>-4</u> -60	ć O .				1,100	0.	. 0	0
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	6	20
Detector 1-Type	CI+Ex-	CI+Ex	্ৰাম্য ক	CI+Ex ·	CI+Ex:	£.,	CI+Ex	CI+Ex.	CI+Ex-	CI+Ex	CI+Ex	- CI+Ex
Delector 1 Channel												
Detector, 1 Extend (s)	0.0	1 0.0		0.0	0.0		0.0	0.0	* 0.0	0.0	- 0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0	100	0.0	₹ 50.0₹	ಗರ್ಷ್ ಪ್ರಾಗ್ನೆಗಳು ವಿವಾಸಕ್ಕ್ ಕಾ	0.0	00	্ল 0.0 ⊃	0.0	0.0	0.0
Detector 2 Position(ft)		94			94			94			94	
Detector 2 Size(ft)	<u> </u>	- 6			6	100		6.		1.37	. 6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	
Delector 2 Channel		र्जा के ज	रक स्टा	7-37-7			7				· · · · ·	2
Detector 2 Extend (s)	····	0.0		o, Tirahiman	0.0	***************************************		0.0			0.0	افتنسينهم
Turn Type	Prot	NA.	<del></del>	Prot	u o NA∷	a 7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Prot	NA NA	Perm	Prot .	NA NA	Perm
Protected Phases	4	7		8	3	البينا هزا سلوجيت				2	5	
Permitted Phases	هياً، سفقها م	Tari in				#	6	11.3	12.	35		, <sub>10</sub> , 5
Detector Phase	4	7		8	3		6	1	1	2	5	5
Switch Phase	de la	500 A	R. C.,	900 B	इंट्रॉड		TANCE.	3. 7	3.4	<u>, 1977</u>	1 -2 (14)	E V
Minimum Initial (s)	4.0	8.0		4.0	8.0	<u> </u>	4.0	20.0	20.0	4.0	20.0	20.0

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16-110 District at the Quarter Lanes, Volumes, Timings

Minimum Split (s)         10.2         33.0         11.0         39.0         11.0         39.0           Total Split (s)         18.2         40.0         18.2         40.0         18.2         40.0         18.0         43.9           Total Split (s)         15.2%         33.3%         15.2%         33.3%         15.0%         36.5%           Maximum Green (s)         14.2         33.0         14.2         33.0         14.3         30.0         4.3           All-Red Time (s)         1.0         2.7         1.0         2.7         1.0         2.7         1.0         2.2           Lost Time Adjust (s)         0.0 <th>1</th> <th>1</th> <th><b>&gt;</b></th> <th><math>\downarrow</math></th> <th>4</th>	1	1	<b>&gt;</b>	$\downarrow$	4
Total Split (s)	NOR.	18R 3*	SBL	SBT.	SBI
Total Split (%) 152% 33 3% 152% 33 3% 15.0% 36.5% Maximum Green (s) 14.2 33.0 14.2 33.0 14.0 36.8 Yellow Time (s) 3.0 4.3 3.0 4.3 3.0 4.8 All-Red Time (s) 1.0 2.7 1.0 2.2 1.0 2.7 1.0 2.2 Lost-Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 1.0 1	39.0	39.0	11.0	39.0	39.
Maximum Green (s)       14.2       33.0       14.2       33.0       14.0       36.8         Yellow Time (s)       3.0       4.3       3.0       4.3       3.0       4.8         All-Red Time (s)       1.0       2.7       1.0       2.7       1.0       2.0         Clost Time Adjust (s)       0.0	43.8	43.8	18.0	43.8	43.
Yellow Time (s)       3.0       4.3       3.0       4.3       3.0       4.8         All-Red Time (s)       1.0       2.7       1.0       2.7       1.0       2.0       0.2       2.0       1.0       2.0       1.0       0.0       2.0       1.0       0.0       2.0       1.0       0.0       2.0       1.0       0.0       2.0       1.0       0.0       2.0       1.0       1.0       1.0       0.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0       1.0	36.5%	5%	5.0%	36.5%	- 36.59
All-Red Time (s)			14.0	36.8	36.
Cost Time Adjust (s)	4.8	4.8	3.0	4.8	
Intersection   Inte	2.2	2.2	1.0	2.2	2.
Ead   Lag   Lead   Lag	0.0	0.0	0.0	0.0	0.
Lead-Lag Optimize?  Vehicle Extension (s) 1.0	7.0	7.0	4.0	7.0	7.
Vehicle Extension (s) 1.0 2.0 1.0 2.0 1.0 0.2 lecal Mode None None None None None Nane Max C-Max Nak Time (s) 7.0 7.0 7.0 7.0 lesh Dont Walk (s) 19.0 19.0 18.0 ledestrian Calls (#hir) 9. 9. 9. 9. 14.0 61.2 lected Green (s) 13.4 10.5 12.3 9.4 14.0 61.2 lectualed gC Ratio 0.11 0.99 0.10 0.08 0.12 0.12 lectualed gC Ratio 0.12 0.96 0.10 0.08 0.12 0.12 lectualed gC Ratio 0.13 0.96 0.07 0.36 lectualed gC Ratio 0.12 0.91 0.99 0.10 0.08 0.12 0.12 lectualed gC Ratio 0.12 0.91 0.99 0.10 0.08 0.12 0.12 lectualed gC Ratio 0.12 0.91 0.90 0.10 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	Lead	ead 👯	Lag	Lead	Lea
Recall Mode   None   None   None   None   None   Nax C-Max   Nax Time (s)   7.0					
Malk Time (s)       7.0       7.0       7.0       1.0         Lesh Dont Walk (s)       19.0       19.0       18.0       19.0       18.0         Jedestrian Calls (#hin)       0        0       0       0       0       0       0       0       0       0       0       0       0       0       0       0        0       <	0.2	0.2	1.0	0.2	Ω.
Nak Time (s)       7.0       7.0       7.0         lesh Dont Walk (s)       19.0       19.0       18.0         redestrian Calls (#hir)       9.       0.       0.       0.         cetualed (GC Ratio       0.11       0.09       0.10       0.08       0.12       0.51         vic Ratio       0.23       0.6       0.73       0.6       0.07       0.51         vic Ratio       0.2       0.6       0.73       0.6       0.07       0.0         color of Delay       48.8       40.9       61.2       43.9       47.9       18.9         Dos       0	C-Max	Max	Max	C-Max	C-Ma
Tesh Donf Walk (s)		7.0		7.0	7.
cct Effot Green (s)       134       10.5       12.3       9.4       14.0       61.2         cctualed g/C Ratio       0.11       0.99       0.10       0.98       0.12       0.51         vic Ratio       0.23       0.66       0.73       0.56       0.07       0.36         control Delay       48.8       40.9       61.2       43.9       47.9       18.9         Dueue Delay       0.0	18.0	18.0		18.0	18.
Control Delay	- 0	-0		. 0	13.7
### ### ##############################	61.2	61.2	14.0	61.2	61.
Control Delay	0.51	0.51	0.12	-∞-0.51	0.5
Dueue Delay	0.38	0.38	0.28	0.42	0.2
Cital Delay	3.1	3.1	50.5	19.7	3.
OS D D E D D B Approach Delay. 32.5 52.8 15.1 Approach LOS D D D B D D D D D D D D D D D D D D D		0.0	0.0	0.0	a.
Approach Delay. 42.5 52.8 15.1 Approach LOS D D B Intersection Summary  Other Dycle Length: 120 Disset: 0 (0%), Referenced to phase 1.NBT and S:SBT, Start of Green Valural Cycle: 95 Control Type: Actuated-Coordinated Maximum vic Raibo: 0.73 Intersection Signal Delay: 25.27 Intersection Capacity Utilization 54.5% Analysis Period (min):151	32: 3.1	3.1	50.5	19.7	. 3.
Approach LOS D D B  ntersection Summary  Crea Type: Other  Syde Length: 120  Actuated Cycle Length: 120  Offset: 0 (0%), Referenced to phase 1.NBT and S.SBT, Start of Green  Valural Cycle: 95  Loutrol Type: Actuated-Coordinated  Maximum v6 Ratio: 0.73  ntersection Signal Delay: 25.27  Intersection Capacity Utilization 54.5%  Analysis Period (min):155	A	A	Ď	8	
ntersection Summary  Area Type: Other  Dycle Length: 120  Actuated Cycle Length: 120  Identification (Special Condition of	4 C.	$C_{n} \subset \mathbb{R}^{n}$	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	19.8	1,349
Area Type: Other  Tycle Length: 120  Tycle Length: 120  Tyse: Q (0%), Referenced to phase 1.NBT and 5:SBT, Start of Green  Talural Cycle: 95  Control Type: Actualed-Coordinated   Asximum v. Ratio: 0.73  Intersection Signal Delay: 25.2: Intersection LOS: C.  Telephone Type: Actual Delay: 25.2: Intersection Copacity Utilization 54.5% ICU Level of Service A  Analysis Period (min):15.5				В	
Victe Length: 120 clusted Cycle Length: 120 firset: 0 (0%), Referenced to phase 1.NBT and SISBT, Start of Green fatural Cycle: 95 control Type: Actuated-Coordinated seximum v/c Rabio: 0.73 filersection Signal Delay: 25.2 filersection Capacity Utilization 54.5% intersection Capacity Utilization 54.5% inalysis Period (min): 155	A ROY	1.0	Vita 2		- je -
Interestion Copacity Utilization 54 5%  Interestion Copacity Utilization 54 5%  Intersection Capacity Utilization 54 5%					
Offset: 0 (0%), Referenced to phase 1.NBT and S.SBT, Start of Green Jatural Cycle: 95 Jointol Type: Actuated-Coordinated: Jaximum w/c Raibo: 0.73 Intersection Signal Delay: 25.27 Intersection Capacity Utilization 54.5% ICU Level of Service A Malysis Period (min):15.57		- 10 m			120
latural Cycle: 95 Centrol Type: Actualed-Coordinated ₹ Asximum v6: Ratio: 0.73 Intersection Signal Delay: 25.2 Intersection Capacity Utilization 54.5% ICU Level of Service A Analysis Period (min):15.5					
ontrol Type: Actualed-Coordinated  Jaximum v/c Raiso: 0.73  ntersection Signal Delay: 25.2  Intersection Capacity Utilization 54.5%  ICU Level of Service A  Analysis Period (min): 15.5	7.5		1	100	19
Maximum v/c Rabo: 0.73 nitersection Signal Delay: 25.2 nitersection Capacity Utilization 54.5% ICU Level of Service A Analysis Period (min):155					
ntersection Signal Delay: 25.2* Intersection LOS: C. antersection Capacity Utilization 54.5% ICU Level of Service A. Analysis Period (min):15.15*					
ntersection Capacity Utilization 54 5% ICU Level of Service A Analysis Penod (min) 15%					
Analysis Penod (min) 155	.mp1;	1.7		1	Name of
1					
2-11- and Channel A. Canthodolo Dond R. Grannyay Haydon Land	£ 4				
<u>→</u>			7	<b>)</b>	
1 01 (R) 02 03	enter sold	S. 125-1	200	24 2843	
43.8 S ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) ( ) (	1	and	10a	S.R. S. D.	

1 Ø1 (R)	<b>√</b> <sub>Ø2</sub>	<b>←</b> 23	<b>≯</b> <sub>04</sub>
43.8 S A	但多人	和是一个人	18.23
₩ 95 (R)	<b>↑</b> ø6	<b>→</b> <sub>07</sub>	€08
	100000		11.2至于美国

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Synchro 9 Report Page 2A 2017 PM Peak Hour: Background (Without Site) Volumes 1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

Minimum Spili (s)		•	<b>→</b>	¥ 💉	←	4 9	†	~	-	<b>↓</b>	1
Total Split (s)	Lane Group	EBL	3EBT	EBR WBL	WBT V	VAR NACT	NBT ?	NBR	SBL	SBT.	SBF
Total Splif (%)	Minimum Split (s)	10.2	33.0	11.0	33.0	11.0	39 0	39.07	11.0	39.0	39 (
Grial Splif (%)	Total Split (s)	22.0	34.0	22.0	34.0	11.0	50.0	50.0	14.0	53 0	53.
Maximum Green (s)       18.0       27.0       18.0       27.0       7.0       43.0       43.0       10.0       46.0       46.0         Vellow Time (s)       3.0       4.3       3.0       4.3       3.0       4.8       48       3.0       48.0       48		18.3%	28.3%	18.3%	28.3%	9.2%	741.7%	41.7%	11.7%	44.2%	44.29
All-Red Time (s)		18.0	27.0	18.0	27.0	7.0	43.0	43.0	10.0	46.0	46.9
Lost Time Adjust (s) 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	Yellow Time (s)	3.0	4.3	3.0	4 3	3.0	4.8	4.8	3.0	4.8	4.
Total Lost Time (s)	All-Red Time (s)	1.0	2.7	1.0		1.0	2.2	2.2	1.0	2.2	2.
Lead   Lag   Lead   Lag   Lead   Lag   Lead   Lag   Lead   Lag   Lead   Lag   Lead   Lead   Lag   Lead   Lead   Lag   Lead   L	Lost Time Adjust (s)	r 0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	
Leaf-Lag Optimize?  Vehicle Extension (S): 1.0, 1.2.0	Total Lost Time (s)	4.0	7.0	4.0	7.0	4.0	7.0	7.0	4.0	70	7.0
Vehicle Extension (s)         1.0         42.0         1.0         2.0         1.0         0.2         0.2         1.0         0.2         0.2         0.0         0.2         0.0         0.2         0.0         0.2         0.0         0.2         0.0         0.0         0.0         7.0	Lead/Lag	Lag	Lead	Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lea
Recall Mode   None   None   None   None   Max   C-Max   C-Max   C-Max   C-Max   C-Max   Walk Time (s)   7.0   7.	Lead-Lag Optimize?										
Walk Time (s)       7.0	Vehicle Extension (s)	1.0,		1.0	2.0	1.04	0.2	0.2	1.0	0.2	0.
Flash Dent Walk (s)	Recall Mode	None		None		Max	C-Max	C-Max	Max	C-Max	C-Ma
Pedestrian Calls (#/inf)	Walk Time (s)					المائية المساور والمائية المائية المائ	7.0	· 70		7.0	77.0
Act Effet Green (s) 11 2 9.6 21.2 19.6 7.0 57.2 57.2 10.0 60.2 60 Activated giC Ratio 0.09 0.08 0.18 0.16 0.06 0.08 0.08 0.50 0.0 60 40 0.00 0.70 0.56 0.09 0.08 0.18 0.16 0.06 0.78 0.35 0.50 0.89 0.50 0.4 0.0 0.0 0.78 0.35 0.59 0.28 0.52 0.44 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.					19.0		18.0	18.0		18.0	18.0
Actuated g/C Ratio 0.09 0.08 0.16 0.16 0.06 0.48 0.48 0.08 0.50 0.00 (C Ratio 0.70 0.56 0.66 0.78 0.35 0.59 0.29 0.52 0.44 0.3 0.00 0.00 0.00 0.00 0.00 0.00	Pedestrian Calls (#/hr)		. 0		0		0	0			) ۾ <del>جي</del>
v/c Ratio     0.70     0.56     0.66     0.78     0.35     0.59     0.29     0.52     0.44     0.50       Conviol Delay     54.1     28.7     48.2     46.0     59.4     25.1     3.8     59.7     20.7     3       Queue Delay     0.0<	Act Effct Green (s)										60.3
Control Delay 64.1 48.7 48.2 46.0 59.4 25.1 3.8 59.7 20.7 3  Queue Delay 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.										0.50	0.51
Queue Delay       0.0											0.3
Total Delay											3.:
LOS E D D D D E C A E C Approach Deley 56.0: 46.6 233.4 21.3 Approach Deley 56.0: 46.6 233.4 21.3 Approach LOS E D C C C Intersection Summary											0.1
Approach Deley		64:1						3.8_	59.7		<b>∵</b> 3.
Approach LOS E D C C InterSection Summary Area Type: Other Cycle Length: 120 Cycle 195 Control Type: Actuated Coordinated Maximum vice Ratio: 0.78 Intersection Signal Delay: 31.0 Intersection Signal Delay: 31.0 Intersection Capacity Utilization 65.9% Cicu Level of Service C Analysis Penod (min): 15 Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop		Ε.		D				A	E		
Intersection Summary Area Type: Other Cycle Length: 120 Actuated Cycle Length: 120 Actuated Cycle Length: 120 Natural Cycle: 95 Control Type: Actuated Coordinated Maximum Vet Ratic: 0.78 Intersection Signal Delay: 31.0 Intersection Capacity Utilization 65.9% (CU Level of Service C Analysis Penod (min): 15 Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop			56.0	فتنا في من المناسب	46.8		: 23.4.2			21:3	
Area Type: Other Cycle Length: 120  Actuated Cycle Length: 120 Offset: 0 (03); Referenced to phase 1:NBT and 5:SBT. Start of Green.  Natural Cycle: 95 Control Type: Adulated Coordinated  Maximum v6. Ratic: 0.78 Intersection Signal Delay: 31.0 Intersection Capacity Utilization 65.9% Icu Level of Service C Analysis Penod (min): 15  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop	Approach LOS		E		D		Ç			C	
Cycle Length: 120 Actuated Cycle Length: 120 Offset: 0 (0 M), Referenced to phase 1:NBT and 6:SBT. Start of Green Natural Cycle: 95 Control Type: Actuated-Coordinated Maximum vic Ratic: 0.78 Intersection Signal Delay: 31:0 Intersection Capacity Utilization 65:9% ICU Level of Service C Analysis Penod (min): 15.*  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop	Intersection Summary		14 g ,	والقوافظ إنسال والمراقا	1314-			12. At	( = , < ) e	i seri	7.7
Actuated Cycle Length: 120 Offset: 0 (03s), Referenced to phase 1:NBT and 6:SBT, Start of Green Natural Cycle: 95 Control Type: Actuated-Coordinated Maximum vic Ratio: 0.78 Intersection Signal Delay: 31.0 Intersection Capacity Utilization 65.9% Analysis Period (min): 15 Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop	Агеа Туре:	Other									
Offset: 0 (0%): Referenced to phase 1:NBT and 6:SBT, Start o: Green Natural Cycle: 95 Control Type: Actuated-Coordinated Maximum vic Ratio: 0:78 Intersection Signal Delay: 31:0 Intersection Capacity Utilization 65.9% Intersection Capacity Utilization 65.9% Intersection Control Type: Country Control Cycle Capacity Cycle Cycle Capacity Cycle Capacity Cycle Cycl		<u> </u>				سنحسب بثلاث				* 13 13 14	<u> </u>
Natural Cycle: 95 Control Type: Adulated Coordinated Maximum v6 Ratic: 0.78 Intersection Signal Delay: 31.0 Intersection COS: C Intersection Copacity Utilization 65.9% ICU Level of Service C Analysis Penod (min) 15 Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop			·			**************************************				···	
Control Type: Acluased-Coordinated  Maximum vic Ratic: 0.78  Intersection Signal Delay: 31.0  Intersection Capacity Utilization 65.9%  ICU Level of Service C  Analysis Period (min): 15  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop  I/Ø1 (R)  Ø2 Ø3  Ø4		d to phase 1:	NBT and 5:	SBT, Starl or, Gr	een :	نشارات المثاث			1.00	أسام والعالم	
Maximum vic Railio: 0.78 Intersection Signal Delay; 31.0 Intersection Capacity Utilization 66.9% Intersection Capacity Utilization 66.9% ICU Level of Service C Analysis Penod (min): 15  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop				german turi i germaner sen						. 357.16	
Intersection Signal Delay 31.0 Intersection LOS: C Intersection Capacity Utilization 65.9% ICU Level of Service C Analysis Penod (min) 15  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop		pordinated		كمنت سيدا حب		غديند أكسيك					411.2
Intersection Capacity Utilization 65.9% ICU Level of Service C Analysis Period (min) 15  Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop  Par (R)  O4		nance section		erine Berga, in order de		en	e manual production and				
Analysis Penod (min) 15 Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop							والمناط والمع		er indian	1	197 <u>-</u>
Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop				)ا •	U Level of S	ervice C		<b>ya</b> jangan			
1/Ø1(R) 02 03 04	Analysis Period (min) 15	ــ فشنست	2 -			<u> </u>			علالا سحد	استثنت	
	Splits and Phases: 1; S	cottsdale Ro	ad & Green	way Hayden Loc	ıp.						
	<b>+</b>				-	•			<b>*</b>		
	/ ľØ1(R) 50 • • • • • • • • • • • • • • • • • • •	on a second control	Tarbura s kell				ton una li	de de	04		SWIZ I

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2017 AM Peak Hour: Background (Without Site) Volumes 1: Scottsdale Road & Greenway Hayden Loop 16-110 District at the Quarter HCM 2010 Signalized Intersection Summary HCM-2010 analysis expects strict NEMA phasing Synchro 9 Report

2017 PM Peak Hour: Background (Without Site) Volumes
1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter HCM 2010 Signalized Intersection Summary

ICM 2010 analysis expects strict NEMA phasing.

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Synchro 9 Report Page 3P 2017 AM Peak Hour: Background (Without Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	•	$\rightarrow$	*	1	<b>←</b>	1	4	1	-	1	1	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	ň	ተተጉ		7	44	7	ሻ	<b>†</b>	7	7	<b>↑</b>	7
Traffic Volume (vph)	86	499	30	145	415	23	15	59	171	34	47	50
Future Volume (vph)	86	499	30	145	415	23	15	59	171	34	47	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.991				0.850			0.850			0.850
Flt Protected	0.950			0.950			0.950			0.950		MINISTER STATE OF THE PERSONS AND ADDRESS AND ADDRESS OF THE PERSONS AND ADDRESS AND ADDRE
Satd. Flow (prot)	1770	5040	0	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.491			0.421			0.724			0.715		
Satd. Flow (perm)	915	5040	0	784	3539	1583	1349	1863	1583	1332	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)		8	100			55			186	and had		91
Link Speed (mph)		40			40			30			30	
Link Distance (ft)	Ellering	995			1030			922			1086	
Travel Time (s)		17.0			17.6			21.0			24.7	STATE OF THE PARTY OF
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	542	33	158	451	25	16	64	186	37	51	54
Shared Lane Traffic (%)	33	342	33	100	401	20						
Lane Group Flow (vph)	93	575	0	158	451	25	16	64	186	37	51	54
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	Leit	12	ragin	Leit	12	ragin	Leit	12	rugiit	Lon	12	rtigitt
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
		10			10			10			10	autominion)
Two way Left Turn Lane Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15	1.00	9	15	1.00	9	15	1.00	9	15	1.00	9
Number of Detectors	15	2	3	1	2	1	13	2	1	1	2	1
	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Detector Template Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
	0	0		0	0	0	0	0	0	0	0	0
Trailing Detector (ft) Detector 1 Position(ft)	0	0	FEED 18-1032	0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
	CI+Ex	CI+Ex	See	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Type Detector 1 Channel	CITEX	CITEX		CITEX	CITEX	CITLA	CITLA	OITLA	OILLA	OILEX	OILLA	OI.LX
	0.0	0.0	WEST BLOOM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	94		0.0	94	0.0	0.0	94	0.0	0.0	94	0.0
Detector 2 Position(ft)	Annual State of State				94			6			6	
Detector 2 Size(ft)		6						CI+Ex			CI+Ex	
Detector 2 Type		CI+Ex			CI+Ex		NAME OF TAXABLE PARTY.	CI+EX			CI+EX	
Detector 2 Channel								0.0			0.0	
Detector 2 Extend (s)		0.0			0.0		-	0.0	- 0		NA	D
Turn Type	pm+pt	NA		pm+pt	NA	Perm	Perm	NA	Perm	Perm		Perm
Protected Phases	7	4		3	8			2			6	Name and A
Permitted Phases	4			8		8	2		2	6		6
Detector Phase	7	4		3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

CivTech, Inc. 2017 Background AM.syn Synchro 9 Report Page 4A 2017 PM Peak Hour: Background (Without Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	1	$\rightarrow$	*	1	<b>←</b>	4	4	1	1	-	<b></b>	1
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*5	ተተጐ		*5	<b>^</b>	7	7	<b>*</b>	7	ሻ	<b>†</b>	7
Traffic Volume (vph)	42	450	39	179	795	27	60	79	248	20	83	74
Future Volume (vph)	42	450	39	179	795	27	60	79	248	20	83	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Util, Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt		0.988				0.850			0.850			0.850
Flt Protected	0.950			0.950	all transferences		0.950	201610/20190000		0.950		
Satd. Flow (prot)	1770	5024	0	1770	3539	1583	1770	1863	1583	1770	1863	1583
Flt Permitted	0.304	0021		0.440			0.631			0.648		
Satd. Flow (perm)	566	5024	0	820	3539	1583	1175	1863	1583	1207	1863	1583
Right Turn on Red	000	0024	Yes	020	0000	Yes	1110	1000	Yes	1201	1000	Yes
Satd, Flow (RTOR)		14	163			55			270			91
Link Speed (mph)		40			40	30		30	210		30	31
Link Distance (ft)		995			1030			922		III. STANISH	1086	CONTROL OF THE PARTY OF THE PAR
								21.0			24.7	
Travel Time (s)	0.00	17.0	0.00	0.00	17.6	0.00	0.00		0.00	0.00		0.00
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	489	42	195	864	29	65	86	270	22	90	80
Shared Lane Traffic (%)												
Lane Group Flow (vph)	46	531	0	195	864	29	65	86	270	22	90	80
Enter Blocked Intersection	No	No	No	No	No	No	No	No	No	No	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		12			12			12			12	
Link Offset(ft)		0			0			0			0	
Crosswalk Width(ft)		16			16			16			16	
Two way Left Turn Lane												
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9	15		9	15		9
Number of Detectors	1	2		1	2	1	1	2	1	1	2	1
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	20	100		20	100	20	20	100	20	20	100	20
Trailing Detector (ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Position(ft)	0	0		0	0	0	0	0	0	0	0	0
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Detector 1 Type	CI+Ex	CI+Ex		CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex
Detector 1 Channel		- Company of the Comp										
Detector 1 Extend (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 2 Position(ft)	0.0	94	E SALTICULARIO		94			94		-	94	NAME OF TAXABLE PARTY.
Detector 2 Size(ft)	3705300330	6			6		500	6		NEW YORK	6	
Detector 2 Type		CI+Ex			CI+Ex			CI+Ex			CI+Ex	, HE SOURCE STORY
		CITEX		50 FK	CITEX			OITEX			OITEX	
Detector 2 Channel		0.0			0.0			0.0			0.0	A COLUMN
Detector 2 Extend (s)	am let	NA		pmint	NA	Perm	Perm	NA	Perm	Perm	NA	Perm
Turn Type	pm+pt		7. 5	pm+pt		reill	renil		reiill	renill	6	rem
Protected Phases	7	4		3	8			2	^	6	b	
Permitted Phases	4			8		8	2		2			6
Detector Phase	7	4		3	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	5.0	4.0		5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

CivTech, Inc. 2017 Background PM.syn Synchro 9 Report Page 4P 2017 AM Peak Hour: Background (Without Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	•	-	•	1	-	•	1	Ť	. /	-	¥	4
ane Groups	SA EBL	EBT2	MEBR ?	F2WBE <sup>2</sup>	≤ WBT	WOR	NBL	SNBT	NBR	ST SEL	SBT	SBR
Minimum Split (s)						·f*31.5	31.5		31.5	31,5	31:5	31.5
Total Split (s)	22.0	42.0		29.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0
Total Split (%)	£18.3%	∄:35.0% <u>s</u>	Q-1-	24.2%	40.8%	-40.8%	40.8%	40.8%	~40.8% -	40.8%	.40.8%	
Maximum Green (s)	17.5	38.0		24.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5
Yellow Time (s)	温温35	3.3.3.0.	د اور در دوستان	3.5	3.5	3.5	3.5	3.5	35	3.5	3.5	3.5
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost-Time Adjust (s)	0.0	i)U.0		00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.0		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
	Lag	Lead		Lag	Lead	Lead -			1		14.	
Lead-Lag Optimize?												
Vehicle Extension (s)	Sec. 25 3.0	VP 31.0 %	40.3	3.0	£ 33.0°.	₹3.0	∧; 3.0 <u>-</u>		3.0	3.0	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)						- 16.0.		16.0	16.0	16.0	.16.0	16.0
Flash Dont Walk (s)					11.0	11.0_	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	12.01	3 - 17	الله الم	و و ال	0.	0	0	0		. 0	0	0
Act Effet Green (s)	89.9	84.3		101.4	90.8	90.8	9.6	9.6	9.6	9.6	9.6	9.6
	2.0:75		Sec. 32.	0.B4	0.76	0.76	0.08	. 0.08	0.08	0.08	0.08	0.09
v/c Ratio	0.13	0.16		0.21	0.17	0.02	0.15	0.43	0.62	0.35	0.34	0.26
Control Delay . K. St.	2,1	4.0.		2.8	4.5			60.5	16.9	59.9	57.3	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
Total Delay	21.	<u>- 240</u>	A. 4 Jan. 4		4.5	0.2	52.8	60.5		59.9	57.3.	75.6
LOS	A	A		A	. <u> </u>	A	<u>D</u>	E	В	E	Ε.	A
Approach Delay	فانت	3.8%	de Product		<u>⊬ .~ 3.93</u>	n (2. 3		29.5			.30.3	1 2 1
Approach LOS		A			A			Ü			U	
ntersection Summary, 45,			V A	· 100		A CONTRACT	1.44	- 44		14 E 3 Mg	1	
Area Type: C	Olher											
Cycle Length: 120				de Arter	1-196	.,,,,,	and and				· · · · · · · · · · · · ·	
Actuated Cycle Length: 120												
Offset: 49 (41%), Referenced	to phase	4 EBTL a	nd_8:WB	TL, Start	of Green						2	7.1
Natural Cycle: 75												
Control Type: Actuated-Coor	dinated ,	234	and the same	7					1381		40	7. 3.
Maximum v/c Ratio: 0.62												
Intersection Signal Delay: 10			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			n'LOS B				<u> </u>		
Intersection Capacity Utilizal					CU Level	of Service	Α	<b></b> .				
Analysis Period (min) 15.5.			3.3	<u> </u>		ميوردو تبن والشعيدية			-		(	100 TA
Splits and Phases: 2: 73rd	Street/Di	al Bouleva	rd & Gree	enway H	ayden Lo	OD CO						
44.	-		T	Æ		•			$\top$			
102	Prid Lake		BO SACE A	704	(R)	20 E#3 E VA	S. Burellook	nes al co	<b>√</b> Ø	3	Carrier -	812
7.53		AL PERSON NAMED IN	23[P**/] S	<u> </u>		Trans.		# 1 201 20	<b>29.5</b>	J	Albert Ball	#1,2:
<b>№</b> Ø6			ı l	₹ Ø8	(R)					J 07	,	1

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Synchro 9 Report

2017 PM Peak Hour: Background (Without Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	*	-	<b>→</b> ✓		•	1	Ť		-	Į.	4
Lane Group	· EBL	FEBT	EBR 🕸 WB	LTYWBT	WBR	. NBL ,	. NBT	, NBR	SBL	SBT	SBF
Minimum Split (s)	9.5	- 22.5	19	5 31.5	31.5	31.5	31.5	31.5	31.5	31/5	315
Total Split (s)	14.0	51.0	24.	61.0	61.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	11.7%	42.5%	20.09	6 50.8%	50.8%	37.5% •	37.5%	37.5%	.37.5%	37.5%	37.5%
Maximum Green (s)	9.5	47.0	19.		56.5	40.5	4D.5	40.5	40.5	40.5	40.5
Yellow Time (s)	3.5	3.0	3.	5 3.5	3.5	. 3.5	3.5	3-3.5	3.5	₹₹3:5	<u>∵</u> 73′:
All-Red Time (s)	1.0	1.0	1.		1.0	1.0	1.0	1.0	1.0	1.0	1.0
ost Time Adjust (s)	3,7100	0.0	0.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.5	4.0	4.		4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lag	Lead	هایر ک	Lead	Lead		3	705 D			3.
Lead-Lag Optimize?											
Vehicle Extension (s)	3.0	1,0	· 5 3.1	3.0	3.0	3.0	3.0	3.0.5	/ · . 3.0	3.0	3.0
Recall Mode	None	C-Max	Non	e C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)	1 - 7	واستداروا		16.0°	16.0	16.0	16.0	16.0	16.0	3.16.0	16.0
Flash Dont Walk (s)				11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)	1 0			0	0	0	,0	0,	. 0	ş. 0	7.7.0
Act Effct Green (s)	86.4	81.0	98.9	90.5	90.5	12.1	12.1	12.1	12.1	12.1	12.1
Actuated g/C Ratio -	0.72	0.68	0.8	0.75	0.75	0.10	± 0.10	0.10	0.10	0.10	0.10
//c Ratio.	0.10	0.16	0.2		0.02	0.55	0.46	0.67	0.18	0.48	0.33
Control Delay	2.1	3.3	3.	5.9	. , 0.5	67.2	57.4	14.3	., 150.5	58.2	- 11.2
Queue Delay	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.1	3'3'	3.	3° 40° 75.9°	. 0.5	67.2	57:4	14.3	50.5	₹: 58.2°	11.2
OS	A	Α		A	A	E	E	В	D	E	В
Approach Delay		3.2		€ 25.4	. 14/ 144	AL	31.3	A 45	24.1	37:7	+135
Approach LOS		A		A			Ç			D	
ntersection Summary		1. 11. 14	1 4 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4.	18 24	<b>ኤ</b> /ተነዓ	1.11	1.00	STEEL ST	A	
Area Type:	Other		Sandara des se estimatadas	ما لاستخطاعا الم				تعقمانات و	े जिलाक स्टब्स	न वेस विशेषका <u>त्र</u> ा	لفأمضونتمون
Cycle Length: 120 Actuated Cycle Length: 1	70				عد ما در سم				المناه الما		
Offset: 45 (38%), Referer		AFBTICA	A DUMBET OF				ानग्रह हुन		4 (FE)	Tarritati	5 77 B
	nced to phase	4:EBIL'B	NO 6:VVB IL, SI	art or Greei	1 3	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	بالمشائمة		4 3 3 3	4.	10 11
Natural Cycle: 75						لمفتحات		STATE OF THE PERSON NAMED IN		- E E I C - E E	
Control Type: Actualed-C	oordinated ,	نسند نسا	A. Sirela		-لنشعف				35 W.		100
Maximum v/c Ratio, 0.67	490	300 may 1	PRINTER.		Trans.	ارسن سقط الس		. دو ماردي ساسور		1878-F.	market a
ntersection Signal Delay				Intersection			نسبنت		187	\$300	40.5
Intersection Capacity Util				ICU Level			erer er			,	<del>-</del> <del></del>
Analysis Period (min) 15	ف ساحنت	7 1		والتعاشين		4			فسسم	15	لنستف
on in				110 4001	1						
	3rd Street/Di	al Ronleva	rd & Greenway	Hayden Lo	юр ,			<del>, .</del>			
4fi								- 1	_		

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Syrichro 9 Report Page 5P

	•	$\rightarrow$	*	*	<b>←</b>	*	1	1	1	1	1	4
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	ተተኩ		7	44	7	7	4	7	7	1	7
Traffic Volume (veh/h)	86	499	30	145	415	23	15	59	171	34	47	50
Future Volume (veh/h)	86	499	30	145	415	23	15	59	171	34	47	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	THE SER	1.00	1.00	E SEE	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	542	33	158	451	25	16	64	186	37	51	54
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	926	1553	94	988	1312	587	215	269	229	188	269	229
Arrive On Green	0.12	0.10	0.10	0.43	0.37	0.37	0.14	0.14	0.14	0.14	0.14	0.14
Sat Flow, veh/h	1774	4904	296	1774	3539	1583	1284	1863	1583	1125	1863	1583
Grp Volume(v), veh/h	93	373	202	158	451	25	16	64	186	37	51	54
Grp Sat Flow(s), veh/h/ln	1774	1695	1810	1774	1770	1583	1284	1863	1583	1125	1863	1583
Q Serve(q_s), s	0.0	12.3	12.4	0.0	11.0	1.2	1.3	3.7	13.7	3.6	2.9	3.6
Cycle Q Clear(g_c), s	0.0	12.3	12.4	0.0	11.0	1.2	4.2	3.7	13.7	7.3	2.9	3.6
Prop In Lane	1.00		0.16	1.00	STATE OF THE PARTY OF	1.00	1.00	STATE OF THE PARTY	1.00	1.00	SECONT.	1.00
Lane Grp Cap(c), veh/h	926	1074	573	988	1312	587	215	269	229	188	269	229
V/C Ratio(X)	0.10	0.35	0.35	0.16	0.34	0.04	0.07	0.24	0.81	0.20	0.19	0.24
Avail Cap(c_a), veh/h	926	1074	573	988	1312	587	505	691	587	443	691	587
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	15.9	42.2	42.3	10.3	27.2	24.1	47.0	45.5	49.8	48.7	45.2	45.5
Incr Delay (d2), s/veh	0.0	0.8	1.5	0.1	0.7	0.1	0.1	0.5	6.8	0.5	0.3	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	2.0	5.9	6.5	2.4	5.5	0.6	0.5	1.9	6.4	1.1	1.5	1.6
LnGrp Delay(d),s/veh	15.9	43.0	43.7	10.4	27.9	24.3	47.2	45.9	56.6	49.2	45.5	46.0
LnGrp LOS	В	D	D	В	C	C	D	D	E	D	D	D
Approach Vol., veh/h	A SIGNAL	668		ALEX IV	634			266	SHADING		142	
Approach Delay, s/veh		39.5	ACRES CONTRACTOR		23.4			53.5			46.7	
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8	EP DINES		NO. 10 15 15 15 15 15 15 15 15 15 15 15 15 15	10000
Assigned Phs	MARINE .	2	3	4		6	7	8		A SEA		BIL.
Phs Duration (G+Y+Rc), s		21.8	56.2	42.0		21.8	49.2	49.0				
Change Period (Y+Rc), s		4.5	4.5	4.0		4.5	4.5	4.5				
Max Green Setting (Gmax), s		44.5	24.5	38.0		44.5	17.5	44.5				
Max Q Clear Time (g_c+l1), s		15.7	2.0	14.4		9.3	2.0	13.0				
Green Ext Time (p_c), s		1.7	0.7	1.2		1.7	0.6	3.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.3									
HCM 2010 LOS			D									

	•	$\rightarrow$	*	1	←	*	1	1	1	1	1	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	*	ተተጉ		7	<b>^</b>	7	75	<b>^</b>	79	7	<b></b>	7
Traffic Volume (veh/h)	42	450	39	179	795	27	60	79	248	20	83	74
Future Volume (veh/h)	42	450	39	179	795	27	60	79	248	20	83	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	(
Ped-Bike Adj(A pbT)	1.00		1.00	1.00	SE STATE	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	46	489	42	195	864	29	65	86	270	22	90	80
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	579	1870	159	835	1666	745	254	375	319	226	375	319
Arrive On Green	0.07	0.13	0.13	0.30	0.47	0.47	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	4776	406	1774	3539	1583	1210	1863	1583	1021	1863	1583
Grp Volume(v), veh/h	46	346	185	195	864	29	65	86	270	22	90	80
Grp Sat Flow(s), veh/h/ln	1774	1695	1791	1774	1770	1583	1210	1863	1583	1021	1863	1583
Q Serve(g_s), s	0.0	11.0	11.2	0.0	20.5	1.2	5.7	4.6	19.7	2.2	4.9	5.1
Cycle Q Clear(q_c), s	0.0	11.0	11.2	0.0	20.5	1.2	10.6	4.6	19.7	6.9	4.9	5.1
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	579	1328	702	835	1666	745	254	375	319	226	375	319
V/C Ratio(X)	0.08	0.26	0.26	0.23	0.52	0.04	0.26	0.23	0.85	0.10	0.24	0.25
Avail Cap(c_a), veh/h	579	1328	702	835	1666	745	419	629	534	365	629	534
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.90	0.90	0.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.8	36.6	36.7	13.6	22.2	17.1	44.7	40.1	46.2	43.0	40.2	40.3
Incr Delay (d2), s/veh	0.1	0.4	0.8	0.1	1.2	0.1	0.5	0.3	6.4	0.2	0.3	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	1.1	5.3	5.7	3.5	10.2	0.5	2.0	2.4	9.2	0.6	2.5	2.3
LnGrp Delay(d),s/veh	24.8	37.0	37.5	13.8	23.4	17.2	45.2	40.4	52.6	43.2	40.6	40.7
LnGrp LOS	C	D	D	В	С	В	D	D	D	D	D	
Approach Vol, veh/h		577			1088			421			192	
Approach Delay, s/veh		36.2			21.5			49.0			40.9	
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8		6 S S S S	H 17 5 2 18	S45E5
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		28.6	40.4	51.0		28.6	30.4	61.0				
Change Period (Y+Rc), s		4.5	4.5	4.0		4.5	4.5	4.5				
Max Green Setting (Gmax), s		40.5	19.5	47.0		40.5	9.5	56.5				
Max Q Clear Time (g_c+l1), s		21.7	2.0	13.2		8.9	2.0	22.5				
Green Ext Time (p_c), s		2.4	0.6	1.1		2.7	0.4	6.7				
Intersection Summary												
HCM 2010 Ctrl Delay			31.9				-					
HCM 2010 LOS			C									

CivTech, Inc. 2017 Background PM.syn Synchro 9 Report Page 6P

CivTech, Inc. 2017 Background AM.syn Synchro 9 Report Page 6A 2017 AM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter Lanes, Volumes, Timings

ane Uil Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	ane Configurations	7			٦	- fa		ኘ	1>		7	1,	
deal Flow (yphp)	raffic Volume (vph) ੂਣ	40 8	61,	91	49 .	. 64	64	22	62.	20	4	43_7	1
ane Util Factor 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.0	uture Volume (vph)	40	61	91	49	64	64	22	62	20	4	43	1
Til Potected 0.950	deal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900,	1900	1900	1900	1900	190
It Protected	ane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Said: Flow (prof)	1777年18月1日	7	0.910	T.	177 T. T. T. T.	0.925	عسنده		0.963	- 22.5	1-3	0.972	777
Remilled	It Protected	0.950									0.950		
Satilific Flow (perm) 1770 1695 0 1770 1723 0 7770 1794 0 1770 1811   Ink Speed (mph) 30 30 30 30 30 30 30 30   Ink Distance (ft) 876 924 1086 897   Iravel Time (s) 199 092 092 092 092 092 092 092 092 092 0	Satd. Flow (prot)	.c. 1770	1695	`_0	1770	1723	0	.1770	1794	0	÷ 1770 :	1811	1.
Ink Speed (mph)     30     30     30     30       Ink Distance (ft)     876     924     1086     897       Iravel Time (s)     19.9     21.0     24.7     20.4       26k Hour Factor     0.92<	It Permilled	0.950			0.950						0.950		
Ink Distance (ft)	Satd. Flow (perm)	1770	1695	0	1770	1723		1770	1794	0	1770	1811	A 2 14
Travel Time (s) 19.9 21.0 22.0 92 0.92 0.92 0.92 0.92 0.92 0.92	ink Speed (mph)		30						30			30	
Construction   Cons	ink Distance (ft)		876	1 1 N	3.3	924	361562		1086			897	
Adj Flow (yzh)													
Shared Lane Traffic (%)   43   165   0   53   140   0   24   89   0   4   58   58   58   58   58   58   58		. 0.92	0.92;	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	. 0.9
ane Group Flow (vph) 43 165 0 53 140 0 24 89 0 4 58  nier Blocked Intersection No		43	66	99	53	70	70	24	67	22	4	47	1
No   No   No   No   No   No   No   No		**************************************		11.		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1					4.1		
ane Alignment     Left     Left     Left     Left     Right     Left     Right     Left     Right     Left     Right     Left     Right       Median Width(ff)     12     12     12     12       Ink Offset(ft)     0     0     0     0       Crosswalk Width(ft)     16     18     16       Iwo way Left Turn Lane     100				0					89	. 0	4_		
Median Width(ff)     12     12     12       Jink Offset(ff)     0     0     0     0       Crosswalk Width(ff)     16     18     16       Its wo way Left Turn Lane     100     <			.∡Z NO.			No.	Man						
Ink Offset(ft)     0     0     0     0       Crosswalk Width(ft)     16     16     16       Inc way Left Turn Lane     16     10     100		Left	Left	Right	Left		Right	Left		Right	Left		Rig
Crosswalk With(ft)   16		The second	12			!÷12		عظم بعبث	12			12	
Iwo way Left Turn Lane       100 100 100 100 100 100 100 100 100 100			0_						0			0	
leadway Factor     100 100 100 100 100 100 100 100 100 100		21 2 3 4	. 16 €	7		16	1		16		1	~ 16.	4
Turning Speed (mph) 15 9 15 9 15 9 15 Stop. Stop. Stop. Stop. Stop.													
Sign Control Stop Stop Stop Stop			1.00%	表1.00。		1.00	1.00		1.00	1.00		1.00	. : 1.0
niersection Summary (1994)		15		9			9			9	15		
	Sign.Control	134 CF 144	Slop	O. A. Market	\$ V.	_2Stop_:	<u> </u>	1000	Stop	3,77	خندت	Slop:	
	ntersection Summary	STATE OF THE	37.70	78.86		ad States State	S. S. S.	4 2 4 6	1.144	1		T. 7739.	13-4F
Iron Turon, A. College, A. C. College, A. C. College, A. C. College, A. C.	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	Other T.	18 1	J 26 - 1		-319 E	2 3				To Alexander		17.4

2017 PM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter Lanes, Volumes, Timings

Lane Configurations Traffic Volume (vph) Future Volume (vph) 60 34 45 70 10 104 65 Ideal Flow (vphpl) 1900 1900 1900 Lane Util, Factor 1,00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 0.963 1.00 0.946 0 965 Fit Protected 0.950 Sald. Flow (prol) 1770 Fit Permitted 0.950 0.950 0.950 0.950 Sald. Flow (perm) Link Speed (mph) Link Distance (ft) 19.9 21.0 24.7 Travel Time (s) 20.4 0.92 0.92 0.92 0.92 0.92 . . 0.92 . . . 0.92 Peax Hour Factor Adj. Flow (vph) Adj. Flow (vph)
Shared Lane Traffic (%)

5 102 87 Enter Blocked Intersection No , No Lane Alignment Right Left Right Median Width(ff) Link Offset(ft) Crosswalk Width(ft) Two way Left Turn Lane Headway Factor Turning Speed (mph) 15 Sign Control Stop Stop Area-Type: Other Control Type: Unsignalized

CivTech, Inc. 2017 Background AM.syn. Synchro 9 Report Page 7A CivTech, Inc. 2017 Background PM.syn

Intersection Capacity Utilization 28.3% Analysis Period (min) 15

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2017 AM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

Intersection						13 13	F 10 10 10 10 10 10 10 10 10 10 10 10 10	
Intersection Delay, s/veh	8.9							
Intersection LOS	A			15.50	September 1			

Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations		7	1>			7	1>			7	1	
Traffic Vol, veh/h	0	40	61	91	0	49	64	64	0	22	62	20
Future Vol, veh/h	0	40	61	91	0	49	64	64	0	22	62	20
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mymt Flow	0	43	66	99	0	53	70	70	0	24	67	22
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach	98 99 93	EB		26.00	SALES WES	WB				NB		STATES
Opposing Approach		WB				EB				SB		
Opposing Lanes		2				2				2		
Conflicting Approach Left		SB				NB				EB		
Conflicting Lanes Left		2				2		SEVER ETG		2		THE SE
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		2				2				2		
HCM Control Delay		8.9				8.8				9		
HCM LOS		Α				A		No.		A	Hall St	1016

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	
Vol Left, %	100%	0%	100%	0%	100%	0%	100%	0%	
Vol Thru, %	0%	76%	0%	40%	0%	50%	0%	81%	
Vol Right, %	0%	24%	0%	60%	0%	50%	0%	19%	
Sign Control	Stop								
Traffic Vol by Lane	22	82	40	152	49	128	4	53	
LT Vol	22	0	40	0	49	0	4	0	
Through Vol	0	62	0	61	0	64	0	43	
RT Vol	0	20	0	91	0	64	0	10	
Lane Flow Rate	24	89	43	165	53	139	4	58	
Geometry Grp	7	7	7	7	7	7	7	7	
Degree of Util (X)	0.04	0.134	0.069	0.219	0.084	0.187	0.007	0.088	
Departure Headway (Hd)	6.068	5.393	5.695	4.772	5.705	4.851	6.135	5.498	
Convergence, Y/N	Yes								
Cap	589	662	628	750	627	737	581	649	
Service Time	3.82	3.144	3.438	2.514	3.451	2.596	3.893	3.255	
HCM Lane V/C Ratio	0.041	0.134	0.068	0.22	0.085	0.189	0.007	0.089	
HCM Control Delay	9.1	9	8.9	8.9	9	8.7	8.9	8.8	
HCM Lane LOS	A	A	A	A	A	A	A	A	
HCM 95th-tile Q	0.1	0.5	0.2	0.8	0.3	0.7	0	0.3	

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2017 PM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

Intersection												
Intersection Delay, s/veh	9											
Intersection LOS	A							9-316				
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Lane Configurations		37	1>			*5	1>			ሻ	12	
Traffic Vol, veh/h	0	14	60	34	0	45	70	10	0	104	65	21
Future Vol, veh/h	0	14	60	34	0	45	70	10	0	104	65	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mymt Flow	0	15	65	37	0	49	76	11	0	113	71	23
Number of Lanes	0	1	1	0	0	1	1	0	0	1	1	0
Approach		EB				WB				NB		
Opposing Approach		WB				EB				SB		
Opposing Lanes		2				2				2		
Conflicting Approach Left		SB				NB				EB		
Conflicting Lanes Left		2				2				2		
Conflicting Approach Right		NB				SB				WB		
Conflicting Lanes Right		2				2				2		
HCM Control Delay		8.8				9			and the same of th	9.3		
HCM LOS		A				A				A		
Lane		NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2			2000000
Vol Left. %		100%	0%	100%	0%	100%	0%	100%	0%			
Vol Thru, %		0%	76%	0%	64%	0%	88%	0%	76%		AND RESIDENCE	554260
Vol Right, %		0%	24%	0%	36%	0%	12%	0%	24%	THE RESERVE		STATE OF
Sign Control		Stop			1.051							
Traffic Vol by Lane		104	86	14	94	45	80	10	63			MARKET STATE
LT Vol	100000	104	0	14	0	45	0	10	0			
Through Vol		0	65	0	60	0	70	0	48			maneral Supple
RT Vol		0	21	0	34	0	10	0	15			
Lane Flow Rate		113	93	15	102	49	87	11	68			No. of Concession, Name of Street, or other Designation, Name of Street, or other Designation, Name of Street,
Geometry Grp		7	7	7	7	7	7	7	7			
Degree of Util (X)		0.181	0.133	0.025	0.147	0.08	0.128	0.018	0.1	and the state of the last		
Departure Headway (Hd)		5.78	5.106	5.939	5.181	5.91	5,318	5.931	5.259			
Convergence, Y/N		Yes										
		610	700	601	600	605	672	602	670			

619 700 601 690 605 672 602 679

3.526 2.851 3.69 2.932 3.66 3.069 3.686 3.014

A A A A A A A

8.8 8.6

9.8 8.6 8.8 8.8 9.2 8.9

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Page 8A

Cap

Service Time

HCM Lane V/C Ratio

HCM Control Delay

HCM Lane LOS

HCM 95th-tile Q

Synchro 9 Report Page 8P 2017 AM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

Intersection Delay, s/veh											
Intersection LOS . "	1.45	XXI-	2.			in the la		4 17.	1,50	. 4	
Movement	(SBU SIX)	BELG S	SBTO	PSBR 海	100	6 m 12		196 19. 1	847	A Care	4
Lane Configurations		*	₽-								
	0	44.6		10	a tilyritig	وبليك أن	2. 2. 5.	246	يثث يعدا	11/20/18	
Future Vol, veh/h	0	4	43	10							
Peak Hour Factor 🖫 💮 🙀	0.92	1.92 🗽	,0 92	0.92						وقعلها أأسلهم	
Heavy Vehicles, %	2	2	2	2							
Mymt Flow	2.0	4::	47.	<u> 11 - 1</u>			- 2fic.	_ نے ایک			
Number of Lanes	0	1	1	0							
Approach - No.	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	SB 🗱	1.4.	1 1 P	4 4 19	430±2	200	SA POTE	1	14.7	
Opposing Approach		NB		_							_
Opposing Lanes 🚁 🚖 🐝	1.0	2.00		je i							
Conflicting Approach Left		WB									
Conflicting Lanes Left	5-14	12 -	أريتهج			Y -					
Conflicting Approach Right		EØ									
Conflicting Lanes Rights 4.4.	Section 3	. 2	3		77157						
HCM Control Delay		8.8		-							

2017 PM Peak Hour: Background (Without Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

Intersection	NESSE SE	
Intersection Delay, s/veh		AND THE PARTY OF T
Intersection LOS \$	10 10 10 10 10 10 10 10 10 10 10 10 10 1	
THE TACKSON LOOK IN THE	بمثار وحضفات بالنباب معقندا مصادر	The state of the s
C		
	SBU-SBL SBT SBR	2000年代表现在1000年的1900年代,1900年代,1900年代的1900年代,
Lane Configurations	<u> </u>	
Traffic Vol, veh/h		
Future Vol., veh/h	0 10 48 15	
Peak Hour Factor	0.92 0.92 0.92 0.92	
Heavy Vehicles, %	2 2 2 2	
Mymt Flow	7 (52 0 ) 1170 (52 ) 186	
Number of Lanes	0 1 1 0	
Approach	gram - Massy Sand A. S. S.	
Opposing Approach	NB	
Opposing Lanes	2" 2" 5" 5"	
Conflicting Approach Left	WB	
Conflicting Lanes Left	7 7 7 2 2 7 7 2 3 1 2	
Conflicting Approach Righ	EB	
Conflicting Lanes Right	7 7 7 2 2 2 3 7 7 7 1	
HCM Control Delay	8.6	
HCM LOS?	चित्रपुरक्षाच्यावस्थाक्ष्याच्याक्ष्याच्याः	

2017 AM Peak Hour: Total (With Site) Volumes 1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

•	-	-	•	1	-	•	1	Ť	-	1	¥	4
Lane Group # 15 17 18	EBL		» EBR		S.WBT.	≯, WBR i≹	* NBD*	ANBT 1	NBR	SBL.	SBT	SBR
Lane Configurations	<u> </u>	444		ሻሻ	444		14.4	ተተተ	î*	ሻሻ	<b>†††</b>	7
Traffic Volume (vph)	82	219	17	302	204	58	28	866	374	्र <u>ची</u> 12न	1008	. 184
Future Volume (vph)	82	219	17	302	204	58	28	866	374	112	1008	184
Ideal Flow (vphpl)	1900	1900		1900	1900	1900 -	1900	1900	1900	1900		1900
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
<u> </u>	40 69 yr	0.989			0.967				0.850		3	0.850
Fit Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3433	5029	0	3433	4917	0	3433	5085	1583	<u>- 3433`</u>	5085 .	1583
FIt Permitted	0.950			0.950			0.950			0.950		
Satd: Flow (perm)	3433 -	5029	0	3433	4917	0_	3433	5085	1583	3433 .	5085	1583
Right Tum on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	Sec. 16	ু 10:	1500 -3	S 83 V	- 59	\$ 15 PER	William III	to const	407	:		200
Link Speed (mph)		40			40			45			45	
Link Distance (ft)		:1500			995			700			1000	
Travel Time (s)		25.6			17.0			10.6	-		15.2	
Peak Hour Factor	0.92		0.92		0.92		0.92		-0.92	0.92	0.92	0.92
Adj. Flow (vph)	89	238	18	328	222	63	30	941	407	122	1096	200
Shared Lane Traffic (%) 👌	1000	نينت	خوتنت	4	ب أست	10.114	منتك ساما	ن ليبخك	أنس يتبسنم	i	يعت الأثاب	เมา
Lane Group Flow (vph)	89	256	0	320	285	0	30	941	407	122	1096	200
Enter Blocked Intersection :			No	No.	No	No	No	No	No	No.	No	No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		24		h	. 24 -	7-1- 12:	1000	.24	2000	-1.	. 24-	<u>0.5.45</u>
Link Offset(ft)		0_			0			0			0_	
Crosswalk Width(ft)	الما المراوية	16.	وممتزا		16.			16		<i></i>	. 16	<u>,                                    </u>
Two way Left Turn Lane								eren eren eren eren eren eren eren eren	THE COUNTY IS		gr	2.
Headway Factor	1:00 <	1.00		1.00	1.00	1:00	1.00	11.00	11.00	1.00	1.00	1.00
Turning Speed (mph)	15		9	15		9 	15		9_,	15 *********		9
Number of Detectors		نگ مت	T.	<u> 1</u> .	ـــــــــــــــــــــــــــــــــــــ	2-1-2-1	1.		11			
Detector Template	Left	Thru		Left	Thru		Left	Thru	Right	Left	Thru	Right
Leading Delector (ft)		100	ينه المد		100		20	100	20	20	€ <b>₹,100</b> °	20
Trailing Delector (ft)	0	0		0	0		0	0		0	0	
Delector 1 Position (ft)			7		<u> </u>	4 4	0	0	0	. وكيك	0	0
Delector 1 Size(ft)	20	6		20	6	Alberta Land	20	6	20	20 Tali ETT	- b	20
Detector 1 Type 6	CI+Ex	CI+Ex		CI+Ex	CI+EX_	14.	LI+EX	CI+Ex	CĮ+Ex	U+DI.	CI+Ex.	CITEX
Detector 1 Channel			******					<del></del>		T (0.0°	T-66	
Detector 1 Extend (s)	0.05	0.0		0.0	0.0	- 0.4414	0.0	0.0	0.0	0.0	0.0	0.0
Delector 1 Queue (s)	0.0	0.0	1874	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	94		0.0	94		0.0	0.0 94	0.0	- 10.0	.00	0.0
Detector 2 Position(ft)			<del></del>	<del>_</del>	94	14-5-	m				94	·,
Detector 2 Size(ft)	المستخدمة	6						6_			6	
Defector 2 Type	7 X 7 7 4 2	CI+Ex	F: 17 - 12 - 12 - 14		CI+Ex	1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -		CI+Ex			CI+Ex	
Delector 2 Channel	Gen (X				حمر واستدر	1	- 2 55		تنات ن	<u> </u>	للتح إنساسا	1
Delector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot	NA:	£ 31.	. Prot	NA,		Prot	NA	Perm :	Prot		Perm
Protected Phases	4	7		8	3	- 100	- 6			,2		
Permitted Phases	*	<u> ت</u>	-		$CC_{i}$	4	وينشف		تلكنة	شر تست		5
Delector Phase	4			8	3_	· v	6	1		2	5	5
Switch Phase	<u> </u>	ندو يسمد		6-7 X	الإنتاك	لنستفييت		النبازيب	<u> 25. j</u>	1	أعيارك سه	2.4
Minimum Initial (s)	4.0	0.8		4.0	8.0		4.0	20.0	20.0	4.0	20.0	20.0

CivTech, Inc. 2017 Total AM:syn Synchro 9 Report Page 1A 2017 PM Peak Hour: Total (With Site) Volumes

1: Scottsdale Road & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	_		*	*		•	7	ı		-	*	•
ane Group 🐔 💝	EBL	EBT	FEBR.	Wel	WBT:	TWBR "	⇒NBL ,	sNBT∗*	NBR	A SBE.	* SBT :	SBR
Lane Configurations	ሻሻ	<u> 111</u>		1,4	<b>^</b> ^		10	444	7	1,1	<b>*</b>	7
Traffic Volume (vph)	204	211	43	420	485 7	्र. 157 ĕ	64	1324	310*	154	1039	260
Future Volume (vph)	204	211	43	420	485	157	64	1324	310	154	1039	260
Ideal Flow (vphol)	1900	,1900	1900	1900,	1900	1900.	- 1900	1900	1900	1900	1900	1900
Lane Util. Factor	0.97	0.91	0.91	0.97	0.91	0.91	0.97	0.91	1.00	0.97	0.91	1.00
Fit Time Time	·· • • • •	0.974	7.75	3	0.963				0.850			. 0.850
Fit Protected	0 950			0.950			0.950			0.950		
Sato. Flow (prot)	3433	4953	0.	. 3433	4897	0₩	3433	5085₫	1583	3433	5085	1583
Flt Permitted	0.950			0 950			0.950			0.950		
Satd. Flow (perm)	3433	4953	0	3433	4897	0	3433	5085	1583	3433	5385	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)	7	34			63		क कर	ুলালুলালুলালুলালুলালুলালুলালুলালুলালুলা	329		15.67	283
Link Speed (mph)		40			40			30			30	
Link Distance (ft)	4. 4	1500	7 7	<b>5</b>	995	जर है।		700		2. 2.7	- 1000 ×	B) , e( )
Travel Time (s)		25.6			17.0			15.9			22.7	
Peak Hour Factor	0.92	0 92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	1,0.92	0.92
Adj. Flow (vph)	222	229	47	457	527	171	70	1439	337	167	1129	283
Shared Larie Traffic (%)	-	18 K 1			and the second	7 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	مرتب است. در در د		1 30 5	4		Ly In
Lane Group Flow (vph)	222	276	0	457	698	0	70	1439	337	167	1129	283
Enter Blocked Intersection	No.	. No	No "	No.	No.7	No		No.	No	No.	No.	
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width (ft)		24	12 Miles	~ <u>5,5 5</u> ,	24	,	सम्बद्ध	124:	ار <u>ي،</u> ا	~`` <del></del>	24	ليوست
Link Offset(ft)		0		- <u> </u>	0			0			0	
Crosswalk Width(ft)		16	*	7	16	er e	· F	16.	مناريع لا	7 7 7 7	<u>. 16</u> 7	7.77
Two way Left Turn Lane			····						·	·		
Headway Factor	1 00	71.00	100	ਜ਼ਰੂ1.00 <sup>ਦ</sup>	7.1100	F1 00"	√1100∃	4,1100°	1.00	71007	T1100 E	₹31.00°
Turning Speed (mph)	15			15		9	15		9	15		9
Number of Detectors	কুল স্থানীয়			3T	2.	<del></del>	ŢŢ.	77027	Taño	18	2.3	<u>ाक्त</u>
Detector Template	Left	Thru		Left	سم <i>نڌ سفيندن</i> Thru		Left	iiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiiii	Right	Left	Thru	Right
Leading Detector (ft)	20	~-100	27.73	20	100	-,	20	100	20	- 20.	100	20
Trailing Detector (ft)	0	D	حاملته در حات	0	0		0	0	0	0	0	0
Defector 1 Position(ft)	, <del></del>	:			The Aligna	7.7.434	r€: 0	ಗ್ರಾಕ <b>ಿ</b>	7770	. 0	<del></del>	<u>0</u>
Detector 1 Size(ft)	20	6		20	6		20	6	20	20	<del></del>	20
Detector 1 Type	CI+Ex-	CI+Ex '	,	CIFEX	CITEX		CI+Ex	CILES .	(CI∓EX.)	CI+EX	CI+Ex	TCI+EX
Detector 1 Channel	CITEX	CITEX.		UITEX.	CIVEX F		CITEX	CITEX	CIVILAS	UITEX.	CITEX	CITEX
Detector 1 Extend (s)	0.0	T 700		0.0	2.00	E-17.31 2	f 0.0	0.0	0.0	0.0	0.0	33°0.0
Detector 1 Queue (s)		0.0	<u> </u>		0.0		0.0		0.0	0.0	0.0	0.0
	0.0 0.0:			0.0	:::0.0	<del></del>	0.0	0.0 •••••••••••••••••••••••••••••••••••	0.0			
Detector 1 Delay (s)		0.0		0.0			· 0.0		0.0%	0.0	/5 0.0	0.0
Detector 2 Position(ft)		94			94			94 767			94_	- Transit
Detector 2 Size(") -			شسنست		- 1 6						<u>6</u>	
Detector 2 Type		CI+Ex		an Marie and	CI+Ex	THE R. CHARLES	·	CI+Ex	and the same of the same		CI+Ex	<del></del>
Delector 2 Channel		al s	نسفند أنت		المتاريخ عفرت		أعادا أأأ		ستسحد	<u> </u>	نيت	4
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	Prot :	NA.		·ieRroi -	, NA			NA:	Perm:	Prot		Perm
Protected Phases	4_	7		8	3		6	1		2	5	
Permitted Phases		- 4						Andreas C	1		14 T	5
Detector Phase	4	7		. 8	3		6	1	1	2	5	5
Switch Phase			378,37		2 775		r.		1.150			
Minimum Initial (s)	4.0	8.0		4.0	8.0		4.0	20.0	20.0	4.0	20.0	20.0
					_							

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 1P 2017 AM Peak Hour: Total (With Site) Volumes 1: Scottsdale Road & Greenway Hayden Loop 16-110 District at the Quarter Lanes, Volumes, Timings

	1	$\rightarrow$	*	1	<b>—</b>	*	1	1	1	1	1	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.2	33.0		11.0	33.0		11.0	39.0	39.0	11.0	39.0	39.0
Total Split (s)	18.2	40.0		18.2	40.0		18.0	43.8	43.8	18.0	43.8	43.8
Total Split (%)	15.2%	33.3%		15.2%	33.3%		15.0%	36.5%	36.5%	15.0%	36.5%	36.5%
Maximum Green (s)	14.2	33.0		14.2	33.0		14.0	36.8	36.8	14.0	36.8	36.8
Yellow Time (s)	3.0	4.3		3.0	4.3		3.0	4.8	4.8	3.0	4.8	4.8
All-Red Time (s)	1.0	2.7		1.0	2.7		1.0	2.2	2.2	1.0	2.2	2.2
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)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	0.2	0.2	1.0	0.2	0.2
Recall Mode	None	None		None	None		Max	C-Max	C-Max	Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		19.0			19.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	15.3	10.4		15.1	10.2		14.0	58.5	58.5	14.0	58.5	58.5
Actuated g/C Ratio	0.13	0.09		0.13	0.08		0.12	0.49	0.49	0.12	0.49	0.49
v/c Ratio	0.20	0.58		0.76	0.61		0.07	0.38	0.42	0.30	0.44	0.23
Control Delay	46.9	55.7		59.5	43.5		47.9	20.6	3.4	50.8	21.5	3.4
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	46.9	55.7		59.5	43.5		47.9	20.6	3.4	50.8	21.5	3.4
LOS	D	Е		Е	D		D	С	A	D	С	Α
Approach Delay		53.5			52.1			16.1			21.4	
Approach LOS		D			D			В			С	

Intersection Summary

Area Type: Other
Cycle Length: 120

Actuated Cycle Length: 120

Actuated Cycle Length: 120

Offset: 0 (0%), Referenced to phase 1:NBT and 5:SBT, Start of Green

Natural Cycle: 95

Control Type: Actuated-Coordinated

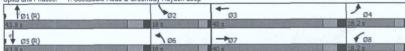
Maximum vic Ratio: 0.76

Intersection Signal Delay: 27.4

Intersection Capacity Utilization 56.4%

Analysis Period (min) 15

Splits and Phases: 1: Scottsdale Road & Greenway Hayden Loop



CivTech, Inc. 2017 Total AM.syn Synchro 9 Report Page 2A 2017 PM Peak Hour: Total (With Site) Volumes 1: Scottsdale Road & Greenway Hayden Loop 16-110 District at the Quarter Lanes, Volumes, Timings

	,	$\rightarrow$	*	1	-	-	1	Ť	1	-	+	4
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Minimum Split (s)	10.2	33.0		11.0	33.0		11.0	39.0	39.0	11.0	39.0	39.0
Total Split (s)	22.0	34.0		22.0	34.0		11.0	50.0	50.0	14.0	53.0	53.0
Total Split (%)	18.3%	28.3%		18.3%	28.3%		9.2%	41.7%	41.7%	11.7%	44.2%	44.2%
Maximum Green (s)	18.0	27.0		18.0	27.0		7.0	43.0	43.0	10.0	46.0	46.0
Yellow Time (s)	3.0	4.3		3.0	4.3		3.0	4.8	4.8	3.0	4.8	4.8
All-Red Time (s)	1.0	2.7		1.0	2.7		1.0	2.2	2.2	1.0	2.2	2.2
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)	4.0	7.0		4.0	7.0		4.0	7.0	7.0	4.0	7.0	7.0
Lead/Lag	Lag	Lead		Lag	Lead		Lag	Lead	Lead	Lag	Lead	Lead
Lead-Lag Optimize?												
Vehicle Extension (s)	1.0	2.0		1.0	2.0		1.0	0.2	0.2	1.0	0.2	0.2
Recall Mode	None	None		None	None		Max	C-Max	C-Max	Max	C-Max	C-Max
Walk Time (s)		7.0			7.0			7.0	7.0		7.0	7.0
Flash Dont Walk (s)		19.0			19.0			18.0	18.0		18.0	18.0
Pedestrian Calls (#/hr)		0			0			0	0		0	0
Act Effct Green (s)	11.2	10.4		21.4	20.6		7.0	56.2	56.2	10.0	59.2	59.2
Actuated g/C Ratio	0.09	0.09		0.18	0.17		0.06	0.47	0.47	0.08	0.49	0.49
v/c Ratio	0.69	0.60		0.75	0.78		0.35	0.60	0.37	0.58	0.45	0.31
Control Delay	64.1	51.6		68.8	56.5		59.4	26.0	3.9	61.8	21.4	3.3
Queue Delay	0.0	0.0		0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	51.6		68.8	56.5		59.4	26.0	3.9	61.8	21.4	3.3
LOS	E	D		E	E		E	С	Α	E	C	Α
Approach Delay		57.2			61.4			23.2			22.4	
Approach LOS		E			E			С			C	

Intersection Summary

Area Type: Other
Cycle Length: 120
Actuated Cycle Length: 120
Offset: 0 (0%), Referenced to phase 1:NBT and 5:SBT, Start of Green
Natural Cycle: 95
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.78
Intersection Signal Delay: 35.0
Intersection Capacity Utilization 67.0%
ICU Level of Service C
Analysis Period (min) 15

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 2P

CM 2010 analysis expects smct NEMA phasing	2017 AM Peak Hour: Total (With Site) Volumes : Scottsdale Road & Greenway Hayden Loop	16-110 District at the Quarter HCM 2010 Signalized Intersection Summary
	CM 2010 analysis expects strict NEMA phasing	
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2017 PM Peak Hour: Total (With Site) Volumes

1: Scottsdale Road & Greenway Hayden Loop

1: Scottsdale Road & Greenway Hayden Loop

1: Scottsdale Road & Greenway Hayden Loop

HCM 2010 analysis expects strict NEMA phasing

Synchro 9 Report Page 3A

CivTech, Inc. 2017 Total AM.syn CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 3P 2017 AM Peak Hour: Total (With Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter
Lanes, Volumes, Timings

	•	<b>→</b>	*	•	•	4	1	Ť	1	<b>/</b>	ţ	1
ane Group	EBL :	EBT∈ж	FEBR X	WBL	ã WeT⊨	WBR	3NBL~		NBR.	SBE 3	.aSB⊺.	SBR
Lane Configurations	<u> </u>	ተታኩ		**	<b>^</b>	74	- ኝ	<b>†</b>	7	Ŋ	<b>†</b>	7
Traffic Volume (von)	138	499	30	148	- 477	23	15	66	17.1	53.	- 59	97,
Future Volume (vph)	138	499	30	148	477	23	15	66	171	53	59	97
ideal Flow (vphpl)	1900 .	1900	1900		1900	: 1900 ·		1900 -		1900	1900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Fit		0.991	T		- منشده سناف	0.850			0.850		485.4.4.54	0.850
Fit Protected	0.950			0.950			0.950			0.950		
Sald. Flow (prot)	1770	5040	0	1770	3539	1583	1770	1863	1583	1770	1853	-1583
Fit Permitted	0.455			0.422			0.715			0.707		
Sald, Flow (perm)	848	5040	0	786	3539	1583	1332	1863	1583	1317	1863	1583
Right Turn on Red			Yes			Yes			Yes			Yes
Sald, Flow (RTOR)		B	-			55	-		186			105
Link Speed (mph)		40			40			30_			30	
Link Distance (ft)	النات	995	4	<u> </u>	½ <b>420</b>		المستند	922	11.24	-		
Travel Time (s)		17.0			7.2			21.0			12.3	
Peak Hour Factor	0.92		0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92;	
Adj. Flow (vph)	150	542	33	161	518	25	16	. 72	186	58	64	105
Shared Lane Traffic (%)	ے بڑا دی۔	_2	A STATE OF	غدي سخا			<u>. 1 3 </u>				ا الله	
Lane Group Flow (vph)	150	575	- U	161	518	25	16	72	186	58	64	105
Enter Blocked Intersection	No:		ر No.	No .	¥ No :	No_	No	No.	No:	No	, No	∴.No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)	9	12			12			12	فدة خست		12	الثاريس
Link Offset(ft)	nangara ar	0	1,50 = 805;	orașe de la compa	0 	gent arm; me		0	· · · · · · · · · · · · · · · · · · ·		0	
Crosswelk Width(ft) 1	مر بالمناسب	16	العجستية	, y , y	12-10-	عقب د	التسي	·; 16		عداندات	16	أسسندته
Headway Factor	TO Minn's		1.00	1.00".	1'00'	ž. 1.00 .	1.00	100	7°1′00°	1.00	1.00	1.00
Turning Speed (mph)	1.00	Juliu e	9	15			15	1.00	1.00	15	_,1.00	41.00
Number of Detectors	15 5.7 11€	2	receive	10 to 10 to	ું. ે <b>2</b> ેં	79 <b>7</b> 91	10	a- 2 (	erarenta Erarenta	707 (S	3°	
Delector Template	امانده دنيق Left	خنت وتنهو	S. 18 18. 1	Left	یک در شدند Thru	Right	Left	ندک نما Thru	Right	Left	<u>A⊷⊹ A'</u> Thru	Picht
Leading Delector (ft)	20	Thru 100	MATERIAL SECTION	20		- Kigiit	20		17 20 3	20	100	Right 20
Trailing Detector (ft)	0	ر موالست.	Carlotte St.	0	0	20	~ 20	0	ت باعداد د 0	0	0	20
Detector 1 Position(ft)			ಇಲ್ಲ	77. TE 10. T	~ःर <b>े</b> प	0		. Zi Š	at any serious	07.	∵∵ n⊤	mail: in
Detector 1 Size(ft)	20	6		20	6	20	20	6	20	20	6	20
Defector:1 Type		-rCl+Ex ∔	2 - 74 E	CI+Ex	CI+Ex	CI+Ex	CI+Ex .		CI+Ex.	CI+Ex4	CI+Fx	ČI+Ex
Detector 1 Channel			الدلمسونة			2.2.			91.			
Delector 1 Extend (s)	0.0	0.0	gram yr.	0.0	:0.0:	0.0	70.0	0.0	0.0	0.0	~."0.0."·	0.0
Delector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.0	0.04		€ 0.0	0.0	0.0 -	0.0	0.0	0.0.	0.0	0.0	0.0
Detector 2 Position(ft)	- 1	94	ه در دا. پرتوانس		94	a. by		94			94	
Detector 2 Size(ft)		T. €.			6			6-	E. William	7-3-1	6	ž
Detector 2 Type	/	CI+Ex		internation .	CI+Ex	of the second		CI+Ex		-	CI+Ex	and from the goal
Detector 2 Channel	20 × 12		57		77.	- H		200	्राहरू	ar Turz		3 32
Detector 2 Extend (s)		0.0			0.0			0.0			0.0	
Turn Type	`- pm+pt*	NA.	- 7ath	pm+pt	NA.	Perm	Perm	- NA	Perm	Perm	. NA	Perm
Protected Phases	7	4		3	8			2			6	
Permitted Phases	```4	e de la companya de		8.7	West of the	. 8	2	CTET.	2	6	77	В.
Detector Phase	7	4		. 3	- 8	8	2	2	2	6	6	6
Switch Phase	V K	en <del>en e</del> n en En en en	100		13.7	7	in and the	,	v. 1911			
Minimum Initial (s)	5.0	4.0		50	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

CivTech, Inc 2017 Total AM.syn Synchro 9 Report Page 4A 2017 PM Peak Hour: Total (With Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop 16-110 District at the Quarter
Lanes, Volumes, Timings

	•	-	•	1	_	•	1	Ť	1	-	+	4
Lane Group · · · · · · · · · · · · · · · · · · ·	ւ⊭ EBL	es EBT₁ °	EBR	_WBL∂;	- WBT	WBR:	» NBL	₁ NBTé	NDR -	SBL:	SBT.	S8F
Lane Configurations	٦	<b>††</b> ‡		_ <u>`</u>	<b>^</b>	1	3	<b>†</b>	1	٦	1	7
Traffic Volume (vph)	164	450	39	. 181	342:	27	-60	96	248	35	92	110
Future Volume (vph)	164	450	39	181	842	27	60	96	248	35	92	110
Ideal Flow (vphpl)	1900	1900	F 1900	1900	1900	1900	1900	1900	1900	1900	51900	1900
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Ent-Biographic Control (1985)	Action of the	0.988				0.850		- Co	0.850			0.850
Flt Prolected	0.950			0.950	, man 19,7% .		0.950		inger of the race	0.950		
Satd. Flow (prot)	1770	5024	5 30 3	1770	3539	1583	1770	1863	1583	1770	1863	1583
Fit Permilled	0.279	/		0.437			0.594			0.577		**
Satd. Flow (perm)	520	5024	F 6 7	B141	3539	1583	~1106 <sup>©</sup>	1863	1583	1075	e.1863	3 15B3
Right Turn on Red		washings . the	Yes		MITMENT O . W	Yes		Laur raine	Yes			Yes
Sald, Flow (RTOR)	- 100 P	14	W		· ·	. 55	* . #v3		270	77.75		120
Link Speed (mph)		40			40			30			30	
Link Distance (ft)		995			420	,,-		922 :			542	
Travel Time (s)	p I i Cripton	17.0		ر داد این سیست	7.2			21.0			12.3	مسسسة والمقد
Peak Hour Factor	.0.92.	0.92	- 0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	178	489	42	197	915	29	65	104	270	38	100	120
Shared Lane Traffic (%)					-111	7.00	grečie:	g Time	5.5	wy. Til n	1-0-1	ran Fá
Lane Group Flow (vph)	178	531	0	197	915	29	65	104	270	38	100	120
Enler, Blocked Intersection	No.	Nô.	- No	No.	No-	No	- No	No.	- No	No	. No	. No
Lane Alignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Right
Median Width(ft)		······································	<del></del>	grating for	12.7			: रहेर्न्थ	771 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- Same	12	77.
Link Offset(ft)			i . Singa maini								0	المرستست
Crosswalk Width(ft)	377	16	green.		7-16	أأنه أدتينا		ా. 16_:	entre de la companya		- 4616	इन्हर्भ न्य
Two way Left Turn Lane	- /10	Zalad as A. Tunio		-			Patential Princip		الكائنيسانة المد		- XIV	
Headway Factor	1.00		1.00	1.00	1710d #L	2100	100	1.00	1.00	.7.1(00)	"" "no	00.1
Turning Speed (mph)	15		9	15		9	15		9 -	15	11YE-	9
Number of Detectors	san Gr	1 2	3 55.	10 VIT	7.	70.015	7,100	F. 2"	1	- 1	2	ាលាទាំ
Detector Template	Left	Thru		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Leading Detector (ft)	₹″ <sup>3</sup> 207	100	The second	20	100-	20	20	7.100	20	20	100	
Trailing Detector (ft)	0	0	2	0	0	ii	0		····- ~ <u>~~</u>		0	0
Detector 1 Position(fl)	• n	77.0				~ O.	ŢŢŢŎŗĢ	ാട് വ	ី កំ។		ខ្€ារិ∩`	ل ستريد
Detector 1 Size(fi)	20	6	<del> </del>	20		20	20		20	20	6	20
Detector 1 Type	CI+Ex	CI+Ex	7	Cl+Ex	CI÷Ex <sup>®</sup>	Cl+Ex	CI+Ex	CITEX	CI+Ex=x	CI+Ex.	CI+Ex	CI+Ex
Detector 1 Channel			-		<u> </u>			ATT TOTAL	., ., ., ., ., .,		0,,,,,,	
Detector 1 Extend (s)	0.0	0.0	12.22.00	0.0	700	0.0	0.0	0.0	0.0	60.0	75 T 0.0	T (00
Detector 1 Queue (s)	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector 1 Delay (s)	0.05	0.0		0.0	- 0.0	0.0	0.0	0.0	€ 0.0	0.0	0.0	0.0
Detector 2 Position(ft)	2.2.2	94		and Control	94	M		94			94	
Detector 2 Size(ft)	·····			شخصا تست	6	والمرسوان	777		3777		45 <u>.</u>	3000
Detector 2 Type		CI+Ex		a min a sina	CI+Ex		3	CI+Ex			CI+Ex	and the second of
Detector 2 Channel		V LX	<del>_</del>	8852152	CI.LX		1450	· · · · · ·	T. 170	المستحدث	VI LA	
Delector 2 Extend (s)	تتعالفها بسعدانا	0.0	feed to the	سيسب والوابات	0.0			0.0		Aprile	0.0	فللفا المساسد
Turn Type	pm+pt	NA		om+of	0.0 NA	Perm	Perm	- NA-	Tooms 'S	Perm	NA.	Perm
Protected Phases		NP.	¥	biii.∡hi∵		:EAIII	- Filli		Penny	Leilit	*****	- Ferm
	grasori.	າະກຸສະສ		· — 3	8 8875	Ser 1027	en Gra	2 د جورها در	on, view	7.0		6
Permitted Phases	*	ۇرۇمە			أعرضات	75. ' <b>D</b>	ر ۲ شیب	بلآي جوب		6	1	100.0
Delector Phase		4							🚣 .		<u> </u>	
Switch Phase		يكريخ مسنسس		ئىر ئىسا	أحراحه		بالمراجعة عما		ڪر بند	ندغ صف	ما الع بوسمه	أرفع سنت
Minimum Initial (s)	5.0	4.0		5.0	5.0	5.0	5.0	50	5.0	5.0	5.0	5.0

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 4P 2017 AM Peak Hour: Total (With Site) Volumes
2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

	•	-	<b>&gt;</b>	•	-	4	<b>\</b>	Ť		-	ţ	1
Lane Group	EBL	F EBIC	<b>₹EBR</b>	*Well*	Z-WBT	· WBR	NBL	NBT.	<b></b> NBR∜	SBL	SBT	SBR
Minimum Split (s)	9.5	22.5	1 (2.14)	9.5	£ 31'5	31.5	2 31.5	31.5	31.5		31.5	31:5
Total Split (s)	23.0	45.0		28.0	50.0	50.0	47.0	47.0	47.0	47.0	47.0	47.0
Total Split (%)	£ 19.2%					41.7%					39.2%	39.2%
Maximum Green (s)	18.5	41.0		23.5	45.5	45.5	42.5	42.5	42.5	42.5	42.5	42.5
Yellow Time (s)	73.5	3.0	<del></del>	3.5		3.5	3.5		3.5		3.5	
All-Red Time (s)	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost-Time Adjust (s)	1.00€				-to: 0.03		0.0	0.0	0.0	0.00	0.0	
Total Lost Time (s)	4.5	4.0		4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Lead/Lag	Lau	Lead		Lag	· Lead -	Lead		1	rail Print	224 45.5		
Lead-Lag Optimize?												
Vehicle Extension (s)	3.0	1.0 \$	12.75	3.0	3.0	3.0	ີ 3.0	3.0	3.0	3.05	3.0	3.0
Recall Mode	None	C-Max		None	C-Max	C-Max	None	None	None	None	None	None
Walk Time (s)		Section in the second section in the section in the second section in the section i	3,31-3	73 30	15.0	16.0	16.0	16.0	. 16.D	16.0	16.0	e≅ =16.0
Flash Dont Walk (s)					11.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
Pedestrian Calls (#/hr)			4 W		0	. 0	-0	- 0	0		- 0	0
Act Effct Green (s)	90.6	84.9		100.3	89.4	89.4	10.7	10.7	10.7	10.7	10.7	10.7
Actuated g/C Ratio	0.76	0.71	74	0.84	0.74	3 0.74	0.09	-0.09	0.09	- 0.09	0.09	0.09
v/c Ratio	0.22	0.16		0.21	, 0.20	0.02	0.13	0.43	0.60	0.49	0.39	0.44
Control Delay	2.5	3.1		3.2	5.1	0.2	50.8	58.7	15.4	65.1	56.9	15.2
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	2.6	3.1	16 m	3.2 .	5.1	0.2	50.8	:58.7	a 15.4	65:1 <sub>F</sub>	56.9	15.2
LOS	Α	Α		Α	Α	A	D	Е	В	E	E	В
Approach Delay		3.0.,	rit Lin	learn	4,5	· · · · ·		28.8	· . · · · · · · · · · · · · ·		39.7	
Approach LOS		A			Α			C			۵	
intersection Summary A.S.	1	神色为种。	112.65	4.10	* J	15.	in Jaco		Se liery	<b>7</b> (	14	443 IZ4
	Other											
Cycle Length: 120	7 × *			مسئدسي		-20					0.100	
Actualed Cycle Length: 120							-					
Offsel: 47 (39%), Reference	d to phase	4:EBTL a	nd 8:WB	L. Start	of Green		174.5	45.45	- 1		7.0	
Natural Cycle: 75									-			
Control Type: Actuated Coo	rdinated -	1 3		14.					9 ,542		4	4
Maximum v/c Ratio: 0.60												
Intersection Signal Delay 1	1:5	1 10 0		ln ت	lersection	n LOS: 8	* * * * * * * * * * * * * * * * * * * *			TATE OF	- American	
Intersection Capacity Utiliza				ic	U Level	of Service	A					
Analysis Period (min) 15	, A		بالعاشد	. <u> </u>	. خانس	د ساند		#			1	
Splits and Phases: 2: 73n	d Street/Dia	al Bouleva	ard & Gree	enway H	ayden Lo	ор						
• f <sub>Ø2</sub>				<b>À</b> ₩ (R)					1			
57.5 770 27 4 5 5 5	<b>4</b> 3 3 7	2	19. <b>46</b> .s	<u>-</u> - ((\)	4.2			<b>医</b>		1 10010	(**)	V 35
•				<del>-</del>						1		

CivTech, Inc. 2017 Total AM.syn

Synchro 9 Report Page 5A 2017 PM Peak Hour: Total (With Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop

16-110 District at the Quarter Lanes, Volumes, Timings

•	_		7 6	•	•	1	T	-	-	¥	4
Lane Group	EBL"	EBT	EBRWBL	WBT	1	A NBL	¥ NBT	NBR-	V SBL	SBT	; SBF
Minimum Split (s)	495	22.5	34 9.5	31.5	31.5	31.5	331.5	31.5	31.5	±331.5	31.
Total Split (s)	14.0	51.0	24.0	61.0	61.0	45.0	45.0	45.0	45.0	45.0	45.0
Total Split (%)	11.7%	42.5%	20.0%	50.8%	50.8%	37.5%	37.5%	37 5% -	37:5%	37.5%	37.59
Maximum Green (s)	9.5	47.0	19.5	56.5	56.5	40.5	40.5	40.5	40.5	40.5	40.
Yellow Time (s)	3.5	3.0	3.5	3.5	3.5	3.5.	3.5	3.5	3.5	3.5	3.
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	15.0.D.	0.0	0.0	0.0	0.0	0.0	0.0	20.0	0.0	£ a 0.0 :	- 0.0
Total Lost Time (s)	4.5	4.0	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
ead/Lag	Lag	Lead	Lag	Lead	Lead		ы			100	33.8
ead-Lag Optimize?											
/ehicle Extension (s)	3.0	1.0	3.0	3.0	30	3.0	3.0	3.0	13.0	3.0	3.0
Recall Mode	None	C-Max	None	C-Max	C-Max	None	None	None	None	None	Моле
Valk Time (s)	مان المان والمستوات والمان والمان والمان والمان والم	1.22	Andria a S	16.0	16.0	7.,16.0	. 16.0	16.0	16.0	₹ - 16.0 ·	: 16 (
lash Dont Walk (s)				1,1.0	11.0	11.0	11.0	11.0	11.0	11.0	11.0
edestrian Calls (#/hr)			X 7 7 7 2 1 1	70		7.0	0	0.	0,	0	<u> </u>
Act Effct Green (s)	83.8	76.4	98.3	85.9	85.9	12.7	12.7	12.7	12.7	12.7	12.7
Actualed g/C Ratio	0.70	0.64	+ 0.82	0.72		0.11		0.11	0.11		0.11
v/c Ratio	0.40	0.17	0.24	0.36	0.03	0.56	0.53	0.66	0.34	0.51	0.44
Control Delay	16.5	13.8	3.9	7.6	0.6	67.9	59.7		55.1"	58.8	13.3
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	16.5	13.8	739	7.6	0.6	67.9	59.7	13.8	56.1	₹58.8 ×	· 13.3
LOS	В	В	A.	A	Ā	Е	E	В	E	E	В
Approach Delay	Tage of the same	14.5		6.8	-		32.7	,	inde Saladaha.	- 37.2 s	
Approach LOS		В		A	145c		C			D	
Intersection Summary 🦮	e chere	, A.	- CO	( C	MA C		<b>4</b> 1 5	ng a	-1-2	The stan	6 4
Area Type:	Other										
Cycle Length: 120		المستثن سن			No. 1		- 10		4.0		
Actuated Cycle Length: 12	0										
Offset: 0 (0%), Reference	to phase 4:	EBTL and	8:WBTL Start o	f Green 1	4	ist.		7.	7.5	Service Land	
Natural Cycle: 75					THE REAL PROPERTY.				4.4.4.		
Control Type: Actuated Co	ordinated		de la company	100	.ξο~ε. <sup>27</sup>	-		5	7.75	,	17.75
Maximum v/c Ratio: 0.66		***************************************						·		** ***	
Intersection Signal Delay:	16.5	7.7.7		itersection	i LOS B	TE 22	77.5.	1.0		6 A 7	77.75
Intersection Capacity Utilia					of Service		~ . <del></del>			ر شبط الله الرابط الم	
Analysis Period (min) 15 .		45.5	Chesas de	3.		217	3 1 cm	24	e achie	35	7415
										•	
	ara Street/Dia	ai Ronjeva	rd & Greenway H	rayden Lo	ю .						
<b>-</b> 1,02			704 (R)						<b>√</b> Ø3		
15 30 (3.16)	1	1 25	151990 A	and the second	144	文, 流流,	100	7 2	95	State of the state of	$\Delta \Gamma$

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CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 5P 2017 AM Peak Hour: Total (With Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop 16-110 District at the Quarter HCM 2010 Signalized Intersection Summary

	*	<b>→</b>	*	1	-	4	1	1	1	1	1	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBF
Lane Configurations	٦	ተተጉ		3	<b>^</b>	7"	ሻ	<b>↑</b>	7	ሻ	1	7
Traffic Volume (veh/h)	138	499	30	148	477	23	15	66	171	53	59	9
Future Volume (veh/h)	138	499	30	148	477	23	15	66	171	53	59	9
Number	7	4	14	3	8	18	5	2	12	1	6	11
Initial Q (Qb), veh	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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	150	542	33	161	518	25	16	72	186	58	64	108
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	1
Cap, veh/h	903	1676	101	960	1342	600	202	275	233	186	275	233
Arrive On Green	0.12	0.11	0.11	0.40	0.38	0.38	0.15	0.15	0.15	0.15	0.15	0.15
Sat Flow, veh/h	1774	4904	296	1774	3539	1583	1211	1863	1583	1117	1863	1583
Grp Volume(v), veh/h	150	373	202	161	518	25	16	72	186	58	64	105
Grp Sat Flow(s), veh/h/ln	1774	1695	1810	1774	1770	1583	1211	1863	1583	1117	1863	1583
Q Serve(q s), s	0.0	12.2	12.3	0.0	12.8	1.2	1.4	4.1	13.6	5.8	3.6	7.3
Cycle Q Clear(q_c), s	0.0	12.2	12.3	0.0	12.8	1.2	5.1	4.1	13.6	9.9	3.6	7.3
Prop In Lane	1.00	12.2	0.16	1.00	12.0	1.00	1.00		1.00	1.00	0.0	1.00
Lane Grp Cap(c), veh/h	903	1158	619	960	1342	600	202	275	233	186	275	233
V/C Ratio(X)	0.17	0.32	0.33	0.17	0.39	0.04	0.08	0.26	0.80	0.31	0.23	0.45
Avail Cap(c_a), veh/h	903	1158	619	960	1342	600	452	660	561	417	660	56
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1,00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.89	0.89	0.89	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.8	40.4	40.5	10.4	27.1	23.5	47.4	45.4	49.4	49.8	45.2	46.7
Incr Delay (d2), s/veh	0.1	0.7	1.2	0.1	0.8	0.1	0.2	0.5	6.1	0.9	0.4	1.4
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(95%),veh/ln	6.5	9.6	10.3	4.5	10.6	1.0	0.9	3.9	10.5	3.3	3.5	5.9
LnGrp Delay(d),s/veh	17.8	41.1	41.8	10.5	27.9	23.6	47.6	45.9	55.6	50.7	45.6	48.
LnGrp LOS	В	D	D	В	С	C	D	D	E	D	D	[
Approach Vol, veh/h		725			704			274	Development of	S. 1988.0	227	TO SHELL
Approach Delay, s/veh		36.5			23.8			52.6			48.1	, and the same
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.2	52.8	45.0		22.2	47.8	50.0				
Change Period (Y+Rc), s	6055	4.5	4.5	4.0		4.5	4.5	4.5				
Max Green Setting (Gmax), s		42.5	23.5	41.0	1	42.5	18.5	45.5				
Max Q Clear Time (q_c+l1), s		15.6	2.0	14.3	1000	11.9	2.0	14.8				
Green Ext Time (p_c), s		2.1	0.8	1.2		2.1	0.8	3.5				and the same of th
Intersection Summary							1000					
HCM 2010 Ctrl Delay			35.5									
HCM 2010 LOS			D									

CivTech, Inc. 2017 Total AM.syn Synchro 9 Report Page 6A 2017 PM Peak Hour: Total (With Site) Volumes 2: 73rd Street/Dial Boulevard & Greenway Hayden Loop 16-110 District at the Quarter HCM 2010 Signalized Intersection Summary

	۶	-	*	1	-	*	4	1	1	1	+	1
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	7	ተተጉ		7	11	74	37	1	7	7	1	7
Traffic Volume (veh/h)	164	450	39	181	842	27	60	96	248	35	92	110
Future Volume (veh/h)	164	450	39	181	842	27	60	96	248	35	92	110
Number	7	4	14	3	8	18	5	2	12	1	6	16
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
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	178	489	42	197	915	29	65	104	270	38	100	120
Adj No. of Lanes	1	3	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	560	1870	159	830	1666	745	244	380	323	218	380	323
Arrive On Green	0.07	0.13	0.13	0.30	0.47	0.47	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	4776	406	1774	3539	1583	1156	1863	1583	1004	1863	1583
Grp Volume(v), veh/h	178	346	185	197	915	29	65	104	270	38	100	120
Grp Sat Flow(s), veh/h/ln	1774	1695	1791	1774	1770	1583	1156	1863	1583	1004	1863	1583
Q Serve(a s), s	0.0	11.0	11.2	0.0	22.1	1.2	6.0	5.6	19.6	4.0	5.4	7.8
Cycle Q Clear(g_c), s	0.0	11.0	11.2	0.0	22.1	1.2	11.4	5.6	19.6	9.6	5.4	7.8
Prop In Lane	1.00		0.23	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	560	1328	702	830	1666	745	244	380	323	218	380	323
V/C Ratio(X)	0.32	0.26	0.26	0.24	0.55	0.04	0.27	0.27	0.84	0.17	0.26	0.37
Avail Cap(c_a), veh/h	560	1328	702	830	1666	745	398	629	534	352	629	534
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.4	36.6	36.7	13.8	22.7	17.1	45.0	40.3	45.8	44.3	40.2	41.1
Incr Delay (d2), s/veh	0.3	0.4	0.8	0.1	1.3	0.1	0.6	0.4	5.9	0.4	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(95%),veh/ln	9.1	8.7	9.4	6.5	16.6	1.0	3.5	5.3	14.1	2.0	5.1	6.3
LnGrp Delay(d),s/veh	35.7	37.0	37.5	14.0	24.0	17.2	45.6	40.6	51.7	44.7	40.5	41.8
LnGrp LOS	D	D	D	В	C	В	D	D	D	D	D	
Approach Vol, veh/h		709			1141			439			258	
Approach Delay, s/veh		36.8			22.1			48.2			41.8	
Approach LOS		D			C			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		29.0	40.0	51.0		29.0	30.0	61.0				
Change Period (Y+Rc), s		4.5	4.5	4.0		4.5	4.5	4.5				
Max Green Setting (Gmax), s		40.5	19.5	47.0		40.5	9.5	56.5				
Max Q Clear Time (g_c+l1), s		21.6	2.0	13.2		11.6	2.0	24.1				
Green Ext Time (p_c), s		2.8	1.0	1.1		3.1	0.7	7.1				
Intersection Summary	6									13/20	Deb.	
HCM 2010 Ctrl Delay			32.7									
HCM 2010 LOS			C									

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 6P 2017 AM Peak Hour: Total (With Site) Volumes 3: Diál Boulevard & Tierra Buena Lane

16-110 District at the Quarter Lanes, Volumes, Timings

Lane Configurations	*	Î÷		×	₽.		7	1.		*	Ť.	
(raffic Volume (vph)	40°s	. ₹.61	103	49 .	64	54	47	85	20	- 4	54°.	
Future Volume (vph)	40	61	103	49	64	54	47	85	20	4	54	
deal Flow (vonel)	1900	1900	₹1900°	1900	1900	1900	1900	¥1900	1900	1900	1900	TT 190
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.0
Fri to Copye a to Consul	200710	0.906		-3	0.931	25.00	18.00	0.971		عداد	0.976	770
Fit Protected	0.950			0.950			0.950			0.950		
Sald. Flow (prot)	1770	1688	J. 30	£1770 <sup>™</sup>	1734	0	1770	~ 1809	0	1770	1818	- T
FIt Permitted	0.950			0.950			0.950			0.950		
Satd. Flow (perm)	1770	1688	0	2.1770	1734	0	1770	1809	/ j. 0%	> 1770	1818	- T
Link Speed (mph)		30			30			30			30	
Lirik Distance (ft)		876	25.51	-13	924			235	alan sa		897	
Travel Time (5)		19.9			21.0			5.3			20.4	
Peak Hour Factor	0.92	0.92	- 0.92	₹0.92	0.92	0.92	0.92	-0.92	0.92	0.92	0.92	0.5
Adj. Flow (vph)	43	66	112	53	70	59	. 51	92	22	4	59	1
Shared Lane Traffic (%)	18 X 1	2.	1	2. 2					- 100 m			The second
Lane Group Flow (vph)	43	178	0	53	129	0	51	114	0	4	70	
Enter Blocked Intersection	No.	S No.	No.	No	No.	No.	No	No	No	, No	. No	- ' T
ane Afignment	Left	Left	Right	Left	Left	Right	Left	Left	Right	Left	Left	Rig
Median Width(ft)	2.75	12	- T	77/2007	12 *			12	برد بدو		12	
Link Offset(ft),		0			0			0			0	
Crosswalk Width(ft)	17 June 4	16		Color of	. 16	77.23		16			16	-274
Two way Left Turn Lane												
Headway Factor	1.00	1.00%	:×1 00	1.00	1.00	1.00	.1.00	1.00	1.00	1 <u>.00</u>	1.00	1.0
Turning Speed (mph)	15		9	15		9	15		9	15		
Sign Control		Slop	موان دا ال	6.176	Stop			Stop			Stop	
ntersection; Summary 4,33	Carolina Const		Mary 17	erestes.	4 30 3		1.076	-C.96	N. S.	1. 2.	2-11-11-11	100
many and the state of the state	Other			-94-3-5 11		70 11 10 2	-		ere delicale		-	4.7
Area Type Control Type: Unsignalized	Outer	F. 20 16.	333 7		غائنىت	4.1.4		بسسائلت			1	

2017 PM Peak Hour: Total (With Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter Lanes, Volumes, Timings

Lane Configurations Traffic Volume (vph)   14 Ideal Flow (vphpi)   1900 Lane Util Factor   1,00 Fit   770 Fit Protected   0,950 Said: Flow (prot)   1770 Fit Permitted   0,950 Said: Flow (prot)   1770 Link Speed (mph) Link Ostances (t)   1770 Link Speed (mph) Link Ostances (t)   1770 Link Speed (mph)   15 Shared Lane Traffic (%)   15 Shared Lane Traffic (%)   15 Enter Blocked Intersection   No Lane Alignment   Left Median With(ff)   15 Link Offset(ff)	60 1900 1.00 0.924 1721 -1721 30 876 19.9 0.92 65	1.00	45 1900 2 1.00 0.950 1770 0.950 1770	70 1900 1,00 0,981 1827 1827 30 924, 21.0	1.00	123 1900 1.00 0.950 (770 0.950 1770	83 1900 1.00 0.969 1805 1805 30 234 5.3	1.00	10 1900 1.00 0.950 1770 0.950	74 1900 1.00 0.975	1.0 1.00 1.0 2.2 2.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3
Future Volume (vph)	60 1900 1.00 0.924 1721 1721 30 876 19.9 0.92 65 132	62 1900 1.00 0 0 0 0.92 67 0	45 1900 = 1.00 1.00 0.950 1770 0.950 1770 = 0.92 49	70 1900 1.00 0.981 1827 30 924, 21.0 0.92	1900 1900 1.00 0	123 1900 1.00 0.950 1770 0.950 11770 0.92	83 1900 1.00 0.969 1805 30 234 5.3 0.92 90	21 1900 1.00 0 0	1900 1,00 1,00 0,950 1770 0,950 1770 1770	74 1900 1.00 0.975 1816 1816 30 897 20.4 0.92 80	190 1.0 1.0 2.2 2.2 2.3 2.3 2.3 2.3 2.3 2.3 2.3 3.3 3
Ideal Flow (vphpl)   1900	1900 1.00 0.924 1721 -1721 30 876 19.9 0.92 65 132	1900 1.00 0 0 0.92 67 0	1900 = 1.00 1.00 0.950 1770 0.950 1770 0.92 49	1900 1.00 0.981 1827 1827 30 924, 21.0 0.92 76	1900 1.00 0	0.950 0.950 -(770 0.950 1770	1900 1.00 0.959 1805 1805 30 234 5.3 0.92 90	1,00 1,00 0 0	1900 1.00 0.950 1770 0.950 1770	1900 1.00 0.975 1816 30 897: 20.4 0.92 80	190 1.0 1.0 2.2 2.2 0.9
ane Util. Factor 1.00  If   100  If	1.00 0.924 1721 30 876 19.9 0.92 65	0 0 0 0 0 0 67	1.00 0.950 1770 0.950 1770 0.92 49	1.00 0.981; 1827; 30 924; 21.0 0.92; 76	1.00	1.00 0.950 -1770 0.950 -1770	1.00 0.969 1805 30 234 5.3 0.92 90	1.00 2 0 0 0 30 92	1.00 0.950 1770 0.950 1770	1.00 .0.975 .1816 	1.0
int   356 Filt Protected   0 950 Static Flow (prot)   1770 Filt Permitted   0,950 Static Flow (perm)   1770 Link Obstance (t)   15 Shared Lane Traffic (%)   15 Enter Blocked Intersection   No Lane Alignment   Left Median Width(ff)   Link Offset(ff)	0.924 -1721 -1721 -30 -876 -19.9 0.92 -65 	0 0 0 0 92 67 0	0.950 1770 0.950 1770 0.92 49	0.981 1827 1827 30 924, 21.0 0.92 76	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	0.950 -1770 0.950 -1770	0.969 1805 1805 30 234 5.3 0.92 90	0.0092	0.950 1770 0.950 1770	1816 1816 30 897 20.4 0.92 80	0.9
FIF Protected	1721 30 876 19.9 0.92 65	0 0 0 0.92 67 0	1770 0.950 1770 1770 0.92 49	1827 1827 30 924 21.0 0.92 76	0.	0.950 1770 1770	1805 30 234 5.3 0.92		1770 0.950 1770 	1816 30 897 3 20.4 0.92 80	0.9
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Link Distance (t) Fravel Time (s) Peak Hour Factor. 0.92 Adj. Flow (vph) 15 Shared Lane Traffic (%): Lane Group Flow (vph) 15 Enier Blocked Intersection: No Lane Alignment Left Median Width (ff) Link Offset(ff)	876 19.9 0.92 65 132	67 0	49	924, 21.0 0.92 76		0.92	234 5 3 0.92 90		0.92	20.4 0.92 80	0.9
Travel Time (s)   Peak Hour Factor   0.92     Adj Flow (vph)   15     Shared Lane Traffic (%)     Lane Group Flow (vph)   15     Enter Blocked Intersection   No     Lane Alignment   Left     Median Width (ft)     Link Offset(ft)	19.9 0.92 65 132 No	67 0	49	21.0 0.92 76		0.92	0.92 90		0.92	20.4 0.92 80	0.9
Peak Hour Factor         0.92           Adj. Flow (vph)         15           Shared Lane Traffic (%)*         1           Lane Group Flow (vph)         15           Enter Blocked Intersection         No           Lane Alignment         Leff           Median Width(ft)         Left           Link Offset(ft)         Left	0.92 65 132 No	67 0	49	0 92 a 76	0.92 11		0.92 90			0.92 80	1
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Crosswalk Width(ft)	, 16			J. 16		73	16	1100		. 16	30 17
Two way Left Turn Lane											
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Turning Speed (mph) 15		9	15		9_	15		9	15		
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Intersection Summary	2 1 7 1 7	13 E 16	S. S. W.	43.	S 150	A	11.14	J	all of	3.7	A. 20
Area Type: Other		- 2 4		1.		i se			34.4	1	2 9
Control Type: Unsignalized											

CivTech, Inc. 2017 Total AM.syn

Synchro 9 Report Page 7A

CivTech, Inc. 2017 Total PM.syn

Synchro 9 Report Page 7P

2017 AM Peak Hour: Total (With Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

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niersection LOS	A					332	براجيد س سانسه		1	
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iCM Control Detay (CM LOS  ane	9.3 NBLA1 100% 0% 0% Stop	0% 81% 19% Stop 105	100% _0% _0% - Stop _40	0% 37% 63% Stop 164	WBLn1; 100% 00% 0% 5top =	0% 54%; 46% * Stop 118	100% 0% 0%	0% 84% 16% Stop 64	9.4 A	
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ane Service Se	9.3 NSL61 100% 0% 550p 47 0 0 51 7 0.087	0% 81% 19% Stop 105 20 114 7 0.173 5.4711 Yes	100% 0% 0% Stop 40 0 40 0 43 7 0.071 5.879 Yes	0% 37% 63% Stop 164 0 61 103 178 7 0.244 4.933	MBLn1, 100% 100% 0% Stop 49 49 0 53 53 7 0.087 5.914	0% 54%; 46% Siop 118 0 64 54 128 7 0.181	100% 0% 0% Stop 4 0 4 0 4 7 0.008 6,234	0% 84% 16% Slop 64 0 54 10 70 70 70 0.109 5.619	9.4 A	
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CivTech, Inc. 2017 Total AM.syn Synchro 9 Report Page 8A 2017 PM Peak Hour: Total (With Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

ntersection (Care	King and Control	J. L. W.	38		1		district.	- In this state	7.13	1	4
ntersection Delay, s/veh	9.5		_								
ntersection LOS	Α,	رچه درسوري ند خاند و سر			ر دانمها لوسی در	2 - 2	دائيت	Ž.	-Nata diam	1	
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ane Configurations	*	1+			٦	4					<b>P</b>
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future Vol. veh/h	0 14	60	62	0	45	70	10			23	83
eak Hour Factor	0.92 / 0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.	)2	0.92
leavy Vehicles, % .	2 2	2	2	2	2	2	2	2		2	2
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onflicting Approach Right	NB	<del></del> .		· · · · · · · · · · · · · · · · · · ·	SB	rg water common	,	en no 43 kg mg	marindari, et N	/B	۔ وہوں جارے م
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HCM Control Delay	A". A NBLIN				A WBLn1				, 140 <u> </u>	B A	e tracingual
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HCM Control Delay HCM LQS  Lene Joi Left, % Joi Left, %	NBLn1 100%	0% 80%	100%	0% 49%	A WBLn1 100%	0% 88%	100%	0% 83%	e arti	A	
HCM Control Delay HCM LOS  ene /ol Left, % /ol Thru, %	NBLn1 100% 0% 0%	0% 80% 20%	100% 0% 0%	0% 49% 51%	A 100% . 0%:	0% 88% 12%	100% 0% 0%	0% 83% 17%		A	Section 1
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ACM Control Delay ACM LOS  ane /ol Left, % /ol Thru, % /ol Right, % ign Control Traffic Vol by Lane T-Vol	NBLn1 100% 0% 0% Stop 123 123	0% 80% 20% Stop 104	100% 0% 0% Stop 14	0% 49% 51% Stop 122	A 100% 0% Slop 45 45	0% 88% 12% _Slop 80	100% 0% 0% Slop 10	0% 83% 17% Stop 89		A	
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ane  /ol Left, %  /ol Thru, %  /ol Right, %  Sign Control,  Traffic Vol by Lane  T-Vol  Through Vol  T, Vol  ang Flow Rale	NBLn1 100% 0% 0% Stop 123 123	0% 80% 20% Stop 104 0 83 21	100% 0% 0% Stop 14 - 14.	0% 49% 51% Stop 122 4 0 60	A 100% 0% Slop 45 45	0% 88% 12% Slop 80 0	100% 0% 0% Slop 10	0% 83% 17% Stop 89 0		A	
ACM Control Delay ACM LOS  Anne Act Los Act Lo	NBLn1- 100% 0% 0% Stop 123 123 0 134	0% 80% 20% Stop 104 83 21 113	100% 0% 0% Stop 14 14. 0	0% 49% 51% Stop 122 4 0 60 62 133	A WBLn1 100% 0% Slop 45 45 0 0 49	0% 88% 12% Slop 80 70 70 10* 87	100% 0% 0% Slop 10 0 0 11	0% 83% 17% Stop 89 0 74 15 97		A	
ane	NBLn1. 100% 0% 0% Step 123 123 0 0 134 7 0219	0% 80% 20% Stop 104 83 21 113 7 0 165	100% 0% 0% Stop 14 0 0 15 7	0% 49% 51% Stop 122 60 60 62 133	WBEn1 100% 100% 100% 100% 100% 100% 100% 10	0% 88% 12% Slop 80 70 70 67 87	100% 0% 0% Stop 10 0 11 11 7	0% 83% 17% Stop 89 74 15 97 0.147		A	
AcM Control Delay  ACM LOS  Arie  Ar	NBLINI 100% 0% 0% Stop 123 0 0 134 -7 0 2219 5903	0% 80% 20% Stop 104 20 83 21 113 75 0 165 5 257	100% 0% 0% Stop 14 14 0 0.5 15 7 0.026 6.135	0% 49% 51% Stop 122 60 62 133 7 0.194 5.272	WBEn1 100% 100% 100% 100% 100 100 100 100 10	0% 88% 12% Slop 80 70 70 87 0.134 5.544	100% 0% 0% Stop 10 0 11 11 0.018 6.076	0% 83% 17% Slop 89 04 15 97 0.147 5.453		A	
Ame September 1 American Septe	NBLn1, 100% 0% 0% Stop 123 123 0 134 7 0.219 5.903 Yes	0% 80% 20% Stop 104 \$0, 83 -21 113 -7, 0.165 5.257, Yes	100% 0% 0% Slop 14 14 0 0.5 15 7 0.026 6.135 Yes	0% 49% 51% Stop 122 - 0 60 62 133 - 7 0.194 5272 Yes	A WBEn1	0% 88% 12% Slop 80 70 70 87 0.134 5.544 Yes	100% 0% 0% Stop 10 0 11 0.018 6.076 Yes	0% 83% 17% Slop 89 0 74 15 97 0.147 5.453 Yes		A	
ACM Control Delay HCM LOS  AIR STATE OF THE	NBLn1 100% 09% 09% Stop 123 123 0 0 0,04 34 2219 5,903 5,903 7/es	0% 80% 20% Stop 104 0.83 21 113 7 0.165 5.257 Yes 677	100% 0% 0% Stop 14 0 0 15 17 0.026 6.135 Yes 580	0% 49% 51% Stop- 122 - 0 60 62 133 - 7 0.194 5.272 Yes 675	A WBLn1 100% 0% 0% 5100 45 45 0 0 49 5100 36 136 78 580	0% 88% 12% \$100 80 70 70 67 0.134 5.544 Yes 642	100% 0% 0% Stop 10 00 11 7 0.018 6.076 Yes	0% 83% 17% Slop 89 0 74 15 97 0.147 5.453 Yes 652		A	
Action Control Delay ICM LOS  Sare  Vol Left, % Vol. Thru, % Vol. Thrush Vol. Through Vol. Throu	NBLn1- 100% 0% 0% Stop 123 123 0 134 -7 0.219 5,903 Yes 664 3,671	0% 80% 20% Stop 104 0 83 - 21 113 0 165 5 257 Yes - 677 3 026	100% 0% 0% Stop 14 14. 0 0. 15 2. 7 0.026 6.135 Yes 580 3.908	0% 49% 51% Stop 122 0 60 62 133 0.194 5.272 Yes 675 3.045	A 100% 0% 0% 510p 45 45 7 0.083 6 96 96 95 580 3.912	0% 88% 12% \$100 80 70 70 87 0.134 Yes 642 3.319	100% 0% 0% Stop 10 00 11 7 0.018 6.076 Yes 3.857	0% 83% 17% Slop 89 0 74 15 97 0.147 5.453 Yes 652 3.234		A	
Action Control Delay  Action Control Delay  Action Control  Action Control  Action Control  Action Control  Action Control  Action  Ac	NBLn1- 100% 0% 0% 0% 123 123 0 134 7 0.219 5.5003 7es 6.64 3.871 0.222	0% 80% 20% Stop 104 0 0 83 21 113 7 0 165 5 257 677 3 026 0 167	100% 0% 0% Stop 14 0 0.5 15 7 0.026 6.135 Yes 580 3.908 0.026	0% 49% 51% Stop 122 0 60 62 133 0.194 5.272 Yes 875 3.045 0.197	A WBEn1 100% 100% 100% 1500 145 145 17 10.083 16.136 150 3.912 10.084	0% 88% 12% Slop 80 70 70 67 0.134 Yes 642 3.319	100% 0% 0% Stop 10 00 11 7 0.018 6.076 Yes 3.857	0% 83% 17% Slop 89 0 74 15 97 0.147 5.453 Yes 652 3.234		A	
Action Control Delay ICM LOS  Sare  Vol Left, % Vol. Thru, % Vol. Thrush Vol. Through Vol. Throu	NBLn1- 100% 0% 0% Stop 123 123 0 134 -7 0.219 5,903 Yes 664 3,671	0% 80% 20% Stop 104 0 83 - 21 113 0 165 5 257 Yes - 677 3 026	100% 0% 0% Stop 14 14. 0 0. 15 2. 7 0.026 6.135 Yes 580 3.908	0% 49% 51% Stop 122 0 60 62 133 0.194 5.272 Yes 675 3.045	A 100% 0% 0% 510p 45 45 7 0.083 6 96 96 95 580 3.912	0% 88% 12% \$100 80 70 70 87 0.134 Yes 642 3.319	100% 0% 0% Stop 10 00 11 7 0.018 6.076 Yes 3.857	0% 83% 17% Slop 89 0 74 15 97 0.147 5.453 Yes 652 3.234		A	

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 8P 2017 AM Peak Hour: Total (With Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

ানিক্রিক্রনালন কর্ম কর্ম কর্ম কর্ম		2.3	क् सम्ब	Service Service	TEN S	<b>医建设</b>	98. SU	W. 18-18	P COPPER	2091	GE 22 6	THE PERSON
Intersection Delay, s/veh									27.22 27 NO. 10			
Intersection LOS	و يؤم د يد.	7			777			755	T. 530.	$\Sigma^{-1}$		
	-											
Movement A	SBU ∰	SBL.	ASBT/	SBR		1.60	Lar.	a e	1 P 1			(L)
Lane Configurations		3	<b>†</b>									
Traffic Vol. veh/h	0	74	** \54 _**	10				(LT 2.74)	5755	1.5	33, 13	
Future Vol, veh/h	0	4	54	10								
Peak Hour Factor	0.92	0.92	0.92	0.92	<b>3</b> ,	180 1					- '-'2" ¥1.	A.4.
Heavy Vehides, %		2	2	2								
Mymt Flow	"∴ 0 ÷	4	59	11		\$273.4 g				w week		
Number of Lanes	0	1	1	0								
Approach		·S0 *	r wy			750	A P				10 11 8	
Opposing Approach		N8										
Opposing Lanes	2.	. 2	7.3	* )			177	1 4 4	3 3 3	3/2-	30	
Conflicting Approach Left		WB										
Conflicting Lanes Left		. · 2			¥ -,	3	4	, - , - , - , - ,				
Conflicting Approach Right		EB										
Conflicting Lanes Right			1				10	100			3	3 34
HCM Control Delay		9.1									_	

2017 PM Peak Hour: Total (With Site) Volumes 3: Dial Boulevard & Tierra Buena Lane

16-110 District at the Quarter HCM 2010 AWSC

		_
Intersection Delay s/veh		<b>9</b>
Intersection LOS	The state of the s	75
	ر به خود می باده به این به این به این این به این این به این به به این به	
Movement SE	U. SBL SBT SBR	
Lane Configurations	ች <b>*</b>	
Traffic Vol. veh/h	0 101 74 15	7
Future Vol. veh/h	0 10 74 15	
Peak Hour Factor, 2 5,300	2 0.92 0.92 0.92	a.
Heavy Vehicles, %	2 · 2 2 2	
Mymt Flow	0.00 (4) 1.24 (1.80 (1.20 1.6 (1.00 1.20 1.20 1.20 1.20 1.20 1.20 1.20	
Number of Lanes	0 1 -1 0	
Approach	TRESSES TO ME TO THE TRESSES OF THE	<b>1</b> 1
Opposing Approach	NB	
Opposing Lanes		
Conflicting Approach Left	WB	
Conflicting Lanes Left -		3
Conflicting Approach Right	EB	
Conflicting Lanes Right		
HCM Control Delay	9.2	
HCM LOS	A PERSONAL PROPERTY OF THE STATE OF THE STAT	

CivTech, Inc. 2017 Total AM.syn

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CivTech, Inc. 2017 Total PM.syn

Synchro 9 Report Page 9P

2017 AM Peak Hour: Total (With Site) Volumes 4: Greenway Hayden Loop & Access A

16-110 District at the Quarter Lanes, Volumes, Timings

	1	$\rightarrow$	-	•	-	4	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		ተተተ	444			7	
Traffic Volume (vph)	0	736	583	9	0	65	
Future Volume (vph)	0	736	583	9	0	65	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00	
Frt		AS 1193	0.998			0.865	
Flt Protected							
Satd. Flow (prot)	0	5085	5075	0	0	1611	
Flt Permitted							
Satd. Flow (perm)	0	5085	5075	0	0	1611	
Link Speed (mph)		40	40		30		
Link Distance (ft)		420	458		200		
Travel Time (s)		7.2	7.8		4.5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	800	634	10	0	71	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	800	644	0	0	71	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Sign Control		Free	Free		Stop		
		1000	The second second	1707			

ICU Level of Service A

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 22.2%
Analysis Period (min) 15

2017 PM Peak Hour: Total (With Site) Volumes 4: Greenway Hayden Loop & Access A

16-110 District at the Quarter Lanes, Volumes, Timings

	1	$\rightarrow$	<b>—</b>		1	4	
Lane Group	EBL	EBT	WBT	WBR	SBL	SBR	
Lane Configurations		ተተተ	ተተኩ			7	
Traffic Volume (vph)	0	796	1001	21	0	50	
Future Volume (vph)	0	796	1001	21	0	50	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	
Lane Util. Factor	1.00	0.91	0.91	0.91	1.00	1.00	
Frt			0.997			0.865	
Flt Protected							
Satd. Flow (prot)	0	5085	5070	0	0	1611	
Flt Permitted							
Satd. Flow (perm)	0	5085	5070	0	0	1611	
Link Speed (mph)		40	40		30		
Link Distance (ft)		420	312		200		
Travel Time (s)		7.2	5.3		4.5		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	
Adj. Flow (vph)	0	865	1088	23	0	54	
Shared Lane Traffic (%)							
Lane Group Flow (vph)	0	865	1111	0	0	54	
Enter Blocked Intersection	No	No	No	No	No	No	
Lane Alignment	Left	Left	Left	Right	Left	Right	
Median Width(ft)		0	0		0		
Link Offset(ft)		0	0		0		
Crosswalk Width(ft)		16	16		16		
Two way Left Turn Lane							
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00	
Turning Speed (mph)	15			9	15	9	
Sign Control		Free	Free	and di	Stop		
Intersection Summary	SS01351721		A SECTION AND A		THE STATE OF	SCHOOL SECTION	

Area Type: Other
Control Type: Unsignalized
Intersection Capacity Utilization 29.8%
Analysis Period (min) 15

ICU Level of Service A

CivTech, Inc. 2017 Total AM.syn Synchro 9 Report Page 10A CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 10P

2017 AM Peak Hour: Total (With Site) Volumes 4: Greenway Hayden Loop & Access A 16-110 District at the Quarter HCM 2010 TWSC

ntersection	0.6	<b>記録物数を使いた。</b> (8)	134	5860 NOVE	Wegger Added	Marian Sales Line
-					37.7 opia 33.71	7
	EBL PEBT			SBL	SBR S	ok 195 c € >-
Lane Configurations	<u></u>				- F	
raffic Vol. vehin	0.4736	583	9	-1-1-10-6-4-4	<u> 65</u>	
uture Vol. veh/h	0 736	583	99	0	65	Mang with grant or or or or or or or
Conflicting Peds, #/hr.	30A 0	0 - 1		0	0	المعتاد العائديات المسأت
Sign Control	Free Free	Free		Stop	Stop	
RT Channelized	None	The second second	None		None	
Storage Length	المستعملة المستمالة المستملة المستمالة المستمالة المستمالة المستمالة المستمالة المستمالة المستمالة المستمالة ا -	-			0	· <del></del>
Veh in Median Storage,	# 25 22 5 20 0 st. 2 0		<u></u>	0-*-		والمساعدة والمستعارة
Grade, %		0 92		0		YIQ
Peak Hour Factor	92 92 7	92	92	92	92	
Heavy Vehicles, %	2 2	2 Name to the 12 to 12 to 12	40	2	Z	<del></del>
Mvmt Flow 🔬	0 800	5.4	10 <u></u>	ت ـــــــــ	71	
Major/Minor	Majori A	Major2	12 3 Takes	Minor2本	12.04	APPLY TO BE
Conflicting Flow All	- 0		0	-	322	
Stage 1	38 mg 2 7 1 12	Marie Marie 24				te Lachael Co.
Stage 2					-	· · · · · · · · · · · · · · · · · · ·
Critical Howy	Carrier Contract Cont				7.14	- 40
Critical Howy Stg 1	<u> </u>	. سمعة <del>دريست</del> خريستي طوري. -		- :- <del></del>	**************************************	
Critical Howy Stg 2	2. 5. 4				¥	
Follow-up Hdwy		-	-		3.92	
of Cap-1 Maneuver	T 18 10 1 2 2 2 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3 3	THE PERSON AND THE PE	£	0	575 %	🛍 Branch Primers
Stage 1	0 -	aga a'aa ga magaaga i'aa daa aa	a de la companya della companya della companya de la companya della companya dell	0	-	and the second of the second of the second
Stage 2	0.000	54, 21 A. C. J. P.	F # 120 April 19	0	186	
latoon blocked, %			-	برعطہ ۔۔۔سانہ		
Mov Cap-1 Maneuver					575	e w distance
vlov Cap-2 Maneuver			-	-	-	
Stage 1	W		المختصيات ال		2 3 m Fr 3	
Stage 2			-	-	-	
8 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 -	tion of water 356	was the state of	77.77		الترابيعة المستولية	B + 21 4 3 2
		Maria da Militara de Aria de A			and the second	
	EB AV	A THE PART OF THE	SEC. MA	E MSB⊈:	선생님 하루워워다	are the contract of
ICM Control Delay, s.	1. 1944, 10, 13, 13, 13, 14, 14, 14, 14, 14, 14, 14, 14, 14, 14			12.1	يتنف تا	The state of the s
HCM LOS				В	-	
		3 S				
linor Lane/Maior Mymt	S EST WEST WEST	RISBITATE SECRETARIA	) Call	45.3		And Control And Co
Capacity (veh/h)		- W 575	TOTAL STATE	2 1 2 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1	-2 199 (20)
HCM Lane V/C Ratio	e voor Section of the	- 0.123		ن حضين		سانسند سيسان . الس
ICM Control Delay (s)	ভূমন <i>ন</i> ্তেন্ত্র সময়			er presidentes	فاستشاماته ستاك	المتاكم فالكاسان فتستشفها
ICM Control Delay (s) 1	2 1 - 1 2 4 A COLUMN 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	<u> </u>	كني بمنطعت			
ICM S5th %tile Q(veh)	<del>- 19 - 19 - 19 - 19 - 19 - 19 - 19 - 19</del>		- <del> </del>		10.75	200
ICIAI ADMI, WILL ICIAID		<u> </u>	حسنيد لنخت		<del></del>	<u> </u>

Synchro 9 Report Page 11A 2017 PM Peak Hour: Total (With Site) Volumes 4: Greenway Hayden Loop & Access A 16-110 District at the Quarter HCM 2010 TWSC

int Delay, s/veh	0.4						
Movement	EBL	EBT	WBT	WBR /	4"SBL"	ंर्ड SBR	
ane Configurations		<b>1</b> 44	ተተቡ			7	7
raffic Vol, veh/h		796	10013	21	777206	\$50	7. 7. P.
uture Vol, veh/h	0	796	1001	21	0	50	<u>بارد د او دو او این میاده الفداد</u>
onflicting Peds, #/hr	i i i	700 1 722	20.				7. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
Sign Control	Free	Free	Free	Free	Stop	Stop	
T Channelized		None	تعيية بمثاله فضاف	None		None	
Norage Length	شق قد توسسسد شده	<u> </u>		-		0	
en in Median Storage	er Tarin	07.27.11.13	<b>T</b> T 1000	د بد منسك	7.0	ाह्य सम्बद्ध	.నమక్షు ఉందాలో
Grade, %	in et withmen	- 1	د. ۲ <u>سک</u> خه در خه د قدنه ۳ 0		0	ن د وهاد وکنده	
eak Hour Factor	92.*	792	92	92	927	92	TENNING TO THE
leavy Vehicles, %	2	2	2	2		2	
Mymi Flow	€ 10	865		23.23		145 154 Hz	1 1 2 M. 1 10 10 10 10 10 10 10 10 10 10 10 10 1
الما مستمدة والمحامد المراكل	abanian madia and ana			L. 16.		- 1-1-15 P	د دانهای داندند.
najor/Minora	Major1 1	12 h, 5 h of 1 mg 12	× ≦ Major2	7. 7.0	€Мілог2:		Commercial Contraction
Conflicting Flow All	-	0	•	0	-	555	
- Stage 1,		C. C. C.					
Stage 2	-	-	-		-		
Cribcal Howy			्राह्म स्टब्स्ट <del>र</del> ाहर			7 14	
Critical Howy Stg 1	-	-		-			
Critical Howy Stg 2				7 7, 65-7	5-0	in in the second	3.77.37
ollow-up Hdwy		-	-	-		3.92	
ot Cap-1 Maneuver	Ö-	A	1 S 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	4 <b>, 9</b>	0	407	
Slage 1	0	-		-	0	-	·
Stage 2	- 0	1.38	3,450,500,50	100	0		V. C
latoon blocked, %	_ managed_		-				
Nov Cap-1 Maneuver			1. 4. 6. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.			407	Tar and the
Nov Cap-2 Maneuver					<del>-1-4</del>		
Stage 1 14	فالقنيدات استقاله	1971 T. W. C. C. C. San			50000000	7.27.	region of market
Stage 2	or laboration and the	حوشميكنان بناست السبب	<del>alla des d'antes d'alla des al</del>				. 122.50
	and Admin		A Company of the Company	232 B		¥5770	ar consist an
. مسقاف المستعلق بالمستحد			علىمة التصالف		14	الملفنة المسا	
pproach :- h	्रश् <sup>क</sup> र्िEB <sup>™</sup>		WB.	語がします	N. SB. 2	你用色色	SALE OF SERVICE
ICM:Control Delay, s		1	74 st + 70		15.2	12.	
CM LOS					Č		
برايت مشتهر مطالعته		ব্রুলেপ্ট্র		and the same of	5.4	الاستكاستي	THE THE RES
			BITTERS OF THE PERSON OF T		Secretary of the secret		
Inor Cane/Major Mymt	EBION	WBT WBR SBLin1		- N. C.	A 44 A 25 .	The state of the s	
apacity (veh/h)		¥ (1,407					
ICM Lane V/C Ratio		0.134					
(CM Control Delay (s)		~ `* <del>*</del> 152		***	- 10 to 10 t	16 to 17 10 to 24	SOUTH LANDS
ICM Lane LOS		c					
ICM 95th %life O(veh)	· · ·	· 0.5		4.0		A	Section 1

CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 11P 2017 AM Peak Hour: Total (With Site) Volumes 5: Dial Boulevard & Access B

16-110 District at the Quarter Lanes, Volumes, Timings

	•	_	T		*	¥	•
Lane Group 2000 2000	. MBL	WBR	* NBT	NBR	*\$BL	∜SBT.	
Lane Configurations	¥		414		ሻ	<b>^</b>	
Traffic Volume (vph)	78,	48	168	60-	23	131	
Future Volume (vph)	78	48	168	60	23	131	
Ideal Flow (vphpi)	1900		<sup>≇</sup> 1900	1900		<u>. 1</u> 900	
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.95	
Ent. 17	0.949		-0.961.			- Paris	
FIt Protected	0.970				0.950		
Satd. Flow (prot)	17,15	0	3401	0/5	1770	3539	
Flt Permitted	0.970				0.950		
SatdFlow (perm)	1715.	0	÷ 3401	0."	1770	3539	كمريد فللمناء أأأنا المستحرفات المعاليين
Link Speed (mph)	30		30_		- 801037	30	
Link Distance (ft)	333		542		alue ir	309	والمراجع المستعلق والمراجع المراجع المستعلق المس
Travel Time (s)	7.6		12.3			7.0	
Peak Hour Factor		0 92		0.92	0.92		
Adj. Flow (vph)	85	52	183	65	25	142	
Shared Lane Traffic (%)					22.7.2	- 2	The same was a second
Lane Group Flow (vph)	137	0_	248	0	25	142	
Enter Blocked Intersection	, No:	No	No	No.	No	No	E who have the
Lane Alignment	Left	Right	Left	Right	Left	Left	
Median Width(ft)	12		12	~~ 14 <u>~</u>		12	in the second of a second of the second of t
Link Offset(ft)	0		0		:-	0	
Crosswalk Width(ft)	16	- 14-4	16	and the second		16	A Company of the Comp
Two way Left Turn Lane							
Headway Factor		<u>. 1:00</u>	1,00	1.00	1.00	00 اجو	
Turning Speed (mph)	15	9		9	15		
Sign Control	_ Stop:	المت والعلم	Free			Free	. Colombia i la colombia de la colombia del colombia del colombia de la colombia del colombia del colombia de la colombia del c
ntersection Summary	5 T. 12 S	350 °°	3.0. (1)	1		7. P. C.	
Area Type: C	ther.	,	. 0	4 . 1 . 4 . 1	Spanis and	70.72	The second secon
Control Type: Unsignalized							The state of the s
Intersection Capacity Utilizati	on 27.2%				U Level	of Service	∞ A 1.57 €
Analysis Period (min) 15							

2017 PM Peak Hour: Total (With Site) Volumes 5: Dial Boulevard & Access B

16-110 District at the Quarter Lanes, Volumes, Timings

,	•	•	1		<b>&gt;</b>	ŧ	
Lane Group 🛴 🚉 🔭 👵	WBL.	W8R.≇		- NBR	SBL≇		and the second second second second second
Lane Configurations	Y		ተኩ		7	ተተተ	
Traffic Volume (vph)	60	37	190		54		
Future Volume (vph)	60	37	190	139	54	177	
Ideal Flow (vphpl)	1900		1900		1900		
Lane Util. Factor	1.00	1.00	0.95	0.95	1.00	0.91	
Fit : com a line so les	0.949		.0.937,~		1 / 1		
Fit Protected	0.970				0.950		
Sald. Flow (prot)		. 20	3316	0	<u>~</u> 1770 j	5085	
Fit Permilled	0.970				0.950		
Sald, Flow (perm)	1715_	0.,	3316	- 0	1770	5085	
Link Speed (mph)	30		30			30	
Link Distance (fl)	282		542			310	المراجعة ال
Travel Time (s)	6.4		12.3			7.0	
Peak Hour Factor	0.92				0.92		
Adj. Flow (vph)	65	40	207	151	59	192	
Shared Lane Traffic (%)	73.4a			20.75	-15-2		الله فعفت في المرابع ا
Lane Group Flow (vph)	105	0	358	0	. 59	192	
Enter Blocked Intersection	No		No.		No	, No	
Lane Alignment	Left	Right	Left	Right_	Left	Left	
Median Width(ft)	12		12,		and the first	: 12	
Link Offset(h)	0		0			0	
Crosswalk Width(ft)	16		16		(Winds)	16	And the second s
Two way Left Turn Lane							
	1.00	1.00	1.00	1.00		1.00	
Turning Speed (mph)	15	9		9	15		
Sign Control	Stop		Free		water was	Free	Marian Care Comment
Intersaction Summary	- 40		7.3		1, 7		CARL COLLEGE TO THE WAY TO A SECTION
Area Type: C	Other	1	13. 24.				
Control Type: Unsignalized							
Intersection Capacity Utilizat	on 28.6%			IC	U Level o	Servi	CO A Service S
Analysis Period (min) 15							

 CivTech, Inc.
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 2017 Total AM.syn
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CivTech, Inc. 2017 Total PM.syn Synchro 9 Report Page 12P 2017 AM Peak Hour: Total (With Site) Volumes 5: Dial Boulevard & Access B

16-110 District at the Quarter HCM 2010 TWSC

Intersection Int Delay, s/veh 3	.2							
,,								
Movement	WBL	WBR		NBT	NBR	SBL	SBT	
Lane Configurations	A			<b>1</b>		ħ		
Traffic Vol, veh/h	78	48		168	60	23	131	
Future Vol, veh/h	78	48		168	60	23	131	
Conflicting Peds, #/hr	0	0		0	0	0	0	
Sign Control	Stop	Stop		Free	Free	Free	Free	
RT Channelized		None			None		None	
Storage Length	0	-		-	-	0	-	
Veh in Median Storage, #	0	-		0	-		0	
Grade, %	0			0	-	-	0	
Peak Hour Factor	92	92		92	92	92	92	
Heavy Vehicles, %	2	2		2	2	2	2	
Mymt Flow	85	52		183	65	25	142	
Major/Minor	Minor1			Major1		Major2		
Conflicting Flow All	336	124		0	0	248	0	
Stage 1	215			-				
Stage 2	121						-	
Critical Hdwy	6.84	6.94			-	4.14		
Critical Hdwy Stg 1	5.84	-		-	-	-	-	
Critical Hdwy Stg 2	5.84			·				
Follow-up Hdwy	3.52	3.32		-	-	2.22	-	
Pot Cap-1 Maneuver	634	904		-	-	1315		
Stage 1	800				-		-	
Stage 2	891			4				
Platoon blocked, %				-	-		-	
Mov Cap-1 Maneuver	622	904				1315		
Mov Cap-2 Maneuver	622				-			
Stage 1	800							
Stage 2	874	-		-	-	-	-	
					DE WEEK			
Approach	WB			NB		SB		
HCM Control Delay, s	11.3			0		1.2		
HCM LOS	В		-		ALCOHOLD IN		0.000	
Minor Long (Major M.	NBT	NIDDWD! -4	SBL	SBT	Maria Santa			Name of the Party
Minor Lane/Major Mymt		NBRWBLn1		981				
Capacity (veh/h)		- 0.194						
HCM Lane V/C Ratio	-				eminuments	ESCHOOL MICHIGAN		
HCM Control Delay (s)		- 11.3						
HCM Lane LOS	-	- B		-			-	
HCM 95th %tile Q(veh)	Section 5	- 0.7	0.1	-				

2017 PM Peak Hour: Total (With Site) Volumes 5: Dial Boulevard & Access B

16-110 District at the Quarter HCM 2010 TWSC

Intersection	CAT PLAN	Ces application		Carl Ville				Mark Methods and State
Int Delay, s/veh	2.5							
Movement	WBL	WBR		NB.				
Lane Configurations	MA			<b>^</b> 1	,	ሻ	444	
Traffic Vol, veh/h	60	37		19	139	54		
Future Vol, veh/h	60	37		19	139	54	177	
Conflicting Peds, #/hr	0	0			) (	) 0	0	
Sign Control	Stop	Stop		Free	Free	e Free	Free	
RT Channelized		None			- None	-	None	
Storage Length	0	-			-	- 0	-	
Veh in Median Storage, #	0				)		0	
Grade, %	0	-						
Peak Hour Factor	92	92		9:	92	92	92	
Heavy Vehicles, %	2	2			2 2			
Mvmt Flow	65	40		20	151	59	192	
Major/Minor	Minor1		Name of the last	Major		Major2		
Conflicting Flow All	476	179			) (		0	
Stage 1	282	1/9	7070			330	0	
Stage 1 Stage 2	194		SA SE	NAME OF TAXABLE PARTY.				
Critical Hdwy	6.29	6.94	-			4.14		
Critical Hdwy Stg 1	5.84	0.34		SECULIAR DESCRIPTION OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TO THE		4,14	STATISTICS CO.	
Critical Hdwy Stg 2	6.04	Supplemental Control	100000000	CONTRACTOR OF THE PARTY OF				
	3.67	3.32	SHIP SO II			2.22		
Follow-up Hdwy Pot Cap-1 Maneuver	539	833	TO BEEN		-	- 1197		
Stage 1	714	033		SELECTION OF THE PROPERTY OF THE PERSON NAMED IN		1197		
Stage 2	781	-	051605	OUTCOME DESCRIPTION				
Platoon blocked. %	101	STREET, STREET		Secretaria de la compansión de la compan		Samuel Col. Col. Col.		
	512	833		AND DESCRIPTION OF THE PERSON NAMED IN	_	- 1197		
Mov Cap-1 Maneuver	512	033		SERVING GROUP		1107		SERVICE SENSE SENSE SE LES SENSES DE LES SE
Mov Cap-2 Maneuver Stage 1	714		DECEMBER 1				COLUMN TO	
	714			STATE OF THE PARTY OF				
Stage 2	743							
Approach	WB			N	3	SB		
HCM Control Delay, s	12.3		51153		)	1.9		
HCM LOS	В							
Mr. I Main Mr.	NEX	NIDDIMDI -4	ODI	SBT				
Minor Lane/Major Mymt	NBT	NBRWBLn1	SBL					
Capacity (veh/h)		- 600	1197			SECRETARIA DE LOS		
HCM Lane V/C Ratio	-		0.049	-				
HCM Control Delay (s)		- 12.3	8.2					
HCM Lane LOS	-	- B	Α					
HCM 95th %tile Q(veh)		- 0.6	0.2	Below Total				

CivTech, Inc. 2017 Total PM.syn

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# **APPENDIX G**

**DESIGN STANDARDS AND POLICIES** 



# B. Angle of Intersection

A right-angle intersection provides the shortest crossing distance for intersecting traffic streams. It also provides the most favorable condition for drivers to judge the relative position and speed of intersecting vehicles. Where special conditions exist, intersection angles may diverge from a right-angle by a maximum of 2 degrees (up to 4 degrees with approval of the Transportation Department) on arterial streets and major collector streets; and by a maximum of 4 degrees (up to 15 degrees with approval of the Transportation Department) on minor and local collector streets, couplets and local streets.

#### C. Alignment and Profile

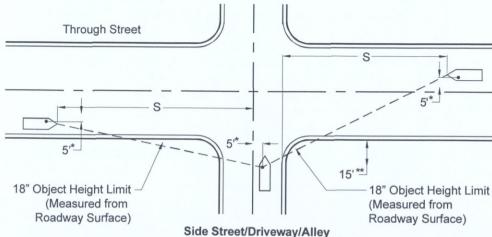
Intersections occurring on horizontal or crest vertical curves are undesirable. When there is latitude in the selection of intersection locations, vertical or horizontal curvature should be avoided. A line or grade change is frequently warranted when major intersections are involved. If a curve is unavoidable, it should be as flat as site conditions permit. Where the grade of the through roadway is steep, flattening through the intersection is desirable as a safety measure.

The maximum profile grade through an intersection is 6 percent for arterials and collector streets and 8 percent for local streets. The intersecting streets' profiles and cross slopes need to be coordinated with one another to ensure a safe and comfortable driving surface. Typically this may mean extending grades through the intersection for approximately 75 feet to 150 feet. Short vertical curves may be necessary in lieu of grade breaks.

#### D. Intersection and Driveway Sight Distance

In order to provide the opportunity for vehicles at an intersection to safely cross or make left or right turns onto a through street, adequate sight distance must be provided. Sight distance must also be provided for left turning traffic turning from the main street as described in AASHTO Intersection Sight Distance Case F. If opposing left turn lanes are present, the opposing left turns must be off-set in a positive way to allow for sight distance when opposing vehicles are present. See Figure 5.3-28 and Figure 5.3-29 for options. Sight distance should be based on the design speed for the roadway. Design speeds for new roadways should conform to those identified in Section 5-3.100 and Appendix 5-3A and Appendix 5-3B. Typically design speeds are 10 m.p.h. higher than the anticipated posted speed limit. The sight distance requirements outlined below are required for all private and public street intersections and at all intersections of driveways onto public or private streets. Internal driveway intersections on private property are excluded from these requirements.

<u>Figure 5.3-26</u> depicts the technique used to determine the driver's eye location and an approaching vehicle; a line is then drawn to connect these 2 points. Continuous unobstructed line of sight must be provided along this line and throughout the approach to the intersection, providing an unobstructed sight triangle to the side street driver. Sight lines are to be drawn on roadway and landscaping plans to represent the areas that must be free of all objects and topography in excess of 18 inches above the roadway surface, however, certain vegetation will be allowed. Vegetation placed within the sight triangle will be of a low variety that remains below 18 inches when mature. Trees can be considered within the triangle as long as the canopies are above 8 feet, they are a single trunk variety, and they are not spaced in a configuration that creates a "picket fence" effect.



(Applies to stop controlled side street or all approaches to a signalized intersection for right-on-red traffic.

- \* 5 feet measured to nearest lane line or centerline.
- \*\*15 feet measured from face-of-curb or edge-of-travelway.
- S = Intersection sight distance in feet on drivers left and right for right turns, left turns and through traffic. (See 2004 AASHTO Geometric Design of Highways and Streets for additional sight distance requirements.)

(See Appendix 5-3A, Appendix 5-3B and Appendix 5-3C for distance S.)

# FIGURE 5.3-26 INTERSECTION & DRIVEWAY DEPARTURE SIGHT DISTANCE REQUIREMENTS

#### 1. Right-Angle Intersections

Right-angle intersections are those whose legs meet at an angle of 88 to 90 degrees. For these right-angle intersections the sight distances shown in Appendix 5-3A, Appendix 5-3B and Appendix 5-3C are to be used with Figure 5.3-26 to calculate the sight triangle. Appendices 5-3A and 5-3B present the intersection sight distances for all street classifications which were determined assuming passenger car traffic. Appendix 5-3C presents the sight distance requirements for varying roadway widths and design speeds for passenger cars, single unit trucks and combination trucks. If high volumes of truck traffic are anticipated, sight distances given in Appendix 5-3C will be used. Sight distances for vehicles turning left from the main street should also be considered and calculated based on the AASHTO Geometric Design of Highways and Streets.

#### 2. Skewed Intersections

For skewed intersections where the intersection angles are less than 88 degrees, sight distances must be calculated in accordance with the procedures described in AASHTO's Geometric Design of Highways and Streets. Skewed intersection design must include appropriate design for pedestrian crossings and the location of curb ramps.

#### 3. Intersections Within or Near a Curve

Sight distance measurements, identified as S in <u>Figure 5.3-26</u>, need to follow the curved street alignment when the intersection is within or near a horizontal curve.

# 4. Traffic Safety Triangles

Traffic Safety Triangles should be used as a means to limit the height of structures, vegetation and other improvements on corner properties immediately adjacent to intersections. Safety triangles are not to be used as a substitute for intersection sight distance! Safety triangles provide additional visibility around corners for all intersection approaches and should be applied to the design of perimeter walls and

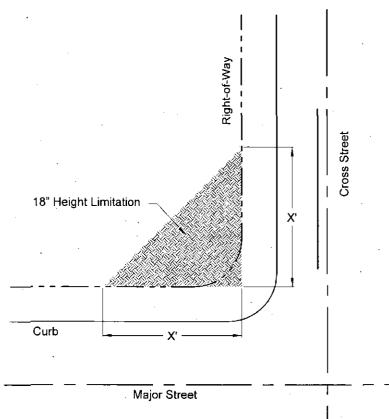
#### **GEOMETRICS**

landscape features. Items within the safety triangle cannot be higher than 18" measured from the roadway surface. Figure 5.3-27 depicts the method used to determine the safety triangle location. The sight distance requirements contained in both Figure 5.3-26 and Figure 5.3-27 are applied at all corner lots.

Section 5-3

# 5. Right-of-Way at Corners

A minimum of 25-foot radius rights-of-way shall be dedicated at street intersections to provide room for traffic control and sight distance.



Major Street Classification	X (in feet)
Parkway, Expressway, Arterials, Major Collector	25
Minor Collector	35
* Local Streets	35 / 60 / 70

<sup>\*</sup> If the standard right-of-way (46 ft. local residential, 60 ft. local collector) is not available, the safety triangle (X) shall measure 60 ft. on local residential streets and 70 ft. on local collector streets from the centerlines of the streets.

#### FIGURE 5.3-27 TRAFFIC SAFETY TRIANGLE ON CORNER PROPERTY

#### E. Auxiliary Lanes

An exclusive turning lane permits separation of conflicting traffic movements and removes turning vehicles from the flow of through traffic. <u>Figure 5.3-28</u> and <u>Figure 5.3-29</u> depict the

Section 5-3 GEOMETRICS

design standards for auxiliary lanes. These standards apply for right and left turn lanes at street intersections and for deceleration lanes at mid-block driveways. The requirement for an auxiliary lane may necessitate additional rights-of-way. Modifications to the storage and transition lengths may be allowed by the Transportation Department where the conditions do not allow the full design standard to be met.

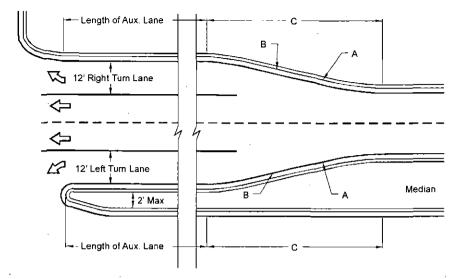
#### 1. Right-Turn Lanes

Right-turn lanes are required at all street intersections on major arterials. Right-turn lanes may be required by the Transportation Department on minor arterial and collector street intersections. The lane lengths should be determined based on the anticipated turning volume and whether there is signalized or unsignalized traffic control. The standard vehicle storage length for a right-turn lane is 150 feet, with a 100-foot minimum length. The taper prior to the storage area shall be accomplished as indicated on Figure 5.3-28 and 29.

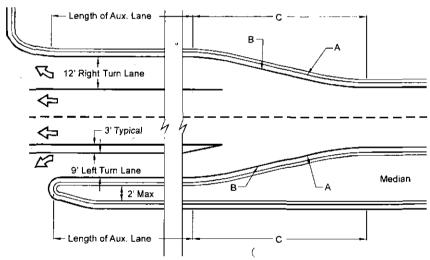
#### 2. Left-Turn Lanes

Left-turn lanes are required at all street intersections on major collectors and arterials. Left-turn lanes may also be required at street intersections on minor collectors based on the projected left-turn volume and conflicting through volume. The lane lengths should be determined based on the anticipated turning volume and whether there is signalized or unsignalized traffic control. For left turn lanes at signalized intersections, dual turn lanes should be considered when the turn volume exceeds 300 vehicles per hour, the opposing through volume exceeds 1,000 vehicles per hour, or the delay to left turning vehicles exceeds 45 seconds. Sight distance must be considered and calculated for these movements based on the AASHTO Policy on Geometric Design in order to determine the allowance of permitted left turns. Guidance for the length of taper, determination of the gap and storage length of the lane can be found in Section 430 of the ADOT Traffic Engineering Policies, Guidelines and Procedures Manual.

# **OPTION 1**



# **OPTION 2**

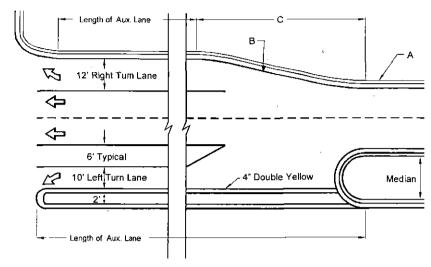


Note: See COS Standard Detail No. 2225 for radius and dimensions noted as A, B, and C. <u>www.ScottsdaleAZ.gov/design/COSMAGSupp.</u>

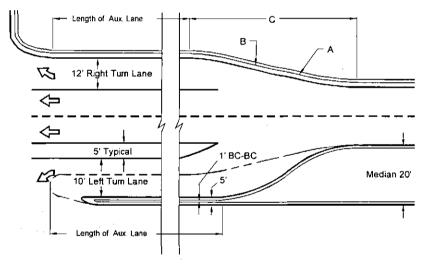
FIGURE 5.3-28 AUXILIARY LANES - OPTIONS 1 & 2

Section 5-3 GEOMETRICS

# **OPTION 3**



# **OPTION 4**



Note: See COS Standard Detail No. 2225 for radius and dimensions noted as A, B, and C. <u>www.ScottsdaleAZ.gov/design/COSMAGSupp.</u>

# FIGURE 5.3-29 AUXILIARY LANES - OPTIONS 3 & 4

# F. Median Design

Raised medians are required on arterial streets and some major collector streets to separate traffic flows, channelize left turns and reduce conflicts. On most collector streets, flush or painted medians provide space between the through traffic lanes for left turning vehicles. Standard median widths are listed for each street classification in <u>Appendix 5-3A</u> and <u>Appendix 5-3B</u> and as shown in <u>Figure 5.3-30</u> through <u>Figure 5.3-34</u>. Variations to these standards may be approved through the master plan process or by the Transportation department.

Land Use	Street Classification	Driveway Type*	Location**
Single Family	Local Residential / Local Collector	S-1	All
	Local Residential / Local Collector	M-1	All
	Minor Collector	Type   Collector   S-1	. All
Multifamily	Major Collector		All
	Minor Arterial / Major Arterial		Right-In, Right-Out
	Minor Arterial / Major Arterial	CH-2, CH-3	Full Access
	Local Commercial	CL-1	All
	Minor Collector / Major Collector	tor S-1  tor M-1  M-2 / CH-1  M-2 / CH-1  M-2 / CH-1  Right- CH-2, CH-3  CL-1  CH-1 Right- CH-2, CH-3  CH-1 Right- CH-2, CH-3  CH-1 Right- CH-2, CH-3  CH-1 Right- CH-1  CH-1 Right- CH-1 Right-	All
Commercial	Minor Arterial / Major Arterial	CH-1	Right-In, Right Out
	Willion Arterial / Iviajor Arterial	CH-2, CH-3	Full Access
	Local Industrial	CL-1	All
	Minor Collector / Major Collector	Collector   S-1   All     Collector   M-1   All     Collector   M-2 / CH-1   All     M-2 / CH-1   All     Arterial   M-2 / CH-3   Full Acces     CH-2	All
industrial	Minor Actorial / Major Actorial		Right-In, Right-Out
	Minor Arterial / Major Arterial	CH-2, CH-3	Full Access

<sup>\*</sup> See City of Scottsdale Standard Details and Figure 5.3-37 through Figure 5.3-43.

#### FIGURE 5.3-35 DRIVEWAY TYPES

#### **DRIVEWAY SPACING**

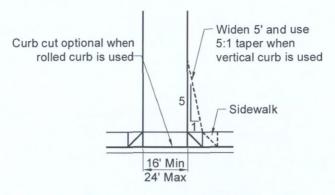
Minimum driveway spacing will generally conform to the following standards. This minimum spacing applies to proposed site driveway separation as well as separation from existing or planned driveways on adjacent parcels.

Street Type	Minimum Distance Driveway Spacing
Local Residential/Local Collector	50 feet
Local Industrial/Local Commercial	165 feet
Minor Collector	165 feet
Major Collector	250 feet
Minor Arterial	330 feet
Major Arterial	500 feet

For sites that have frontage on two streets, primary access should be onto the minor street frontage. A maximum of two driveway openings is permitted to a particular site or parcel from the abutting street(s). The Transportation Department may permit additional driveway entrances when projected travel demands indicate it is in the interests of good traffic operation, and when adequate street frontage exists to maintain the above guidelines.

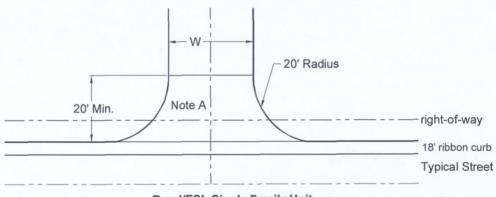
Where new development adjoins other similarly zoned property or compatible land uses, a cross access easement may be required to permit vehicular movement between the parcels and reduce the number of access points required onto the adjacent public street. This may be required regardless of the development status of the adjoining property, unless the cross access is determined to be unfeasible by city staff.

<sup>\*\*</sup> Right-In, Right Out driveways on arterial streets are where left-turns out of the driveway are prohibited by a median or an island. Full access driveways on arterial streets align with an approved median opening. Modifications to these standards are allowed by approval of city staff.



Surban Single Family Unit

NOTE: See COS Standard Details for more specific information.



Rural/ESL Single Family Unit

- W=16' for driveway serving one lot
- W=24' for driveway serving two lots
- Note A: Pavement section-2" A.C/6" A.B.C. Minimum

#### FIGURE 5.3-37 TYPE S-1 DRIVEWAY STANDARDS

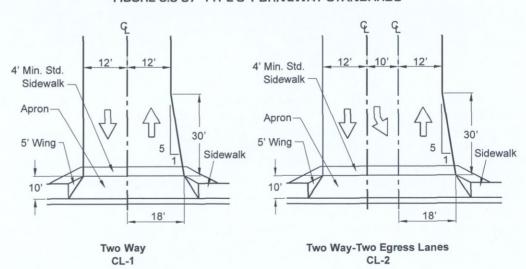


FIGURE 5.3-38 TYPE CL TWO WAY DRIVEWAYS

5' Wing-

10'

One Way Egress CL-4

16'

16' Pavement Width

20 Drivable Surface

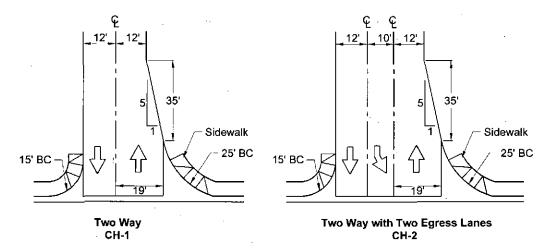
4' Min Standard Sidewalk

Sidewalk

Apron

One Way Ingress CL-3

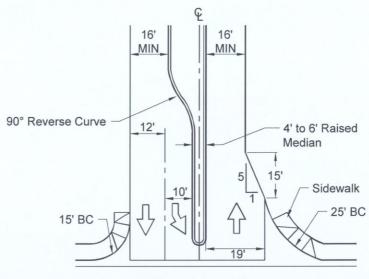
FIGURE 5.3-39 TYPE CL ONE WAY DRIVEWAYS



\*Note: Pedestrian ramps in this figure are illustrative only and should be designed and constructed per COS Supplement to MAG Details.

FIGURE 5.3-40 TYPE CH TWO WAY DRIVEWAYS\*

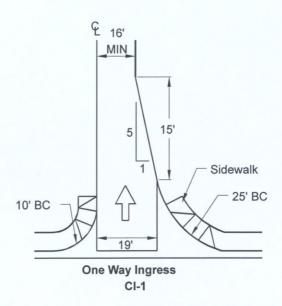
Section 5-3 GEOMETRICS



Two Way Raised Median CH-3

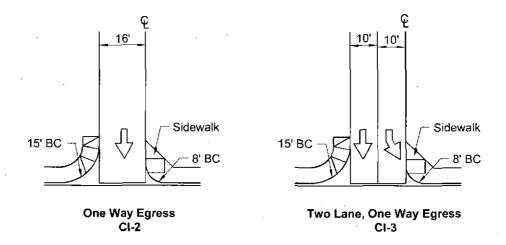
\*Note: Pedestrian ramps in this figure are illustrative only and should be designed and constructed per COS Supplement to MAG Details.

FIGURE 5.3-41 TYPE CH TWO WAY DRIVEWAYS WITH RAISED MEDIAN\*



\*Note: Pedestrian ramps in this figure are illustrative only and should be designed and constructed per COS Supplement to MAG Details.

FIGURE 5.3-42 TYPE CI ONE WAY INGRESS DRIVEWAYS\*



\*Note: Pedestrian ramps in this figure are illustrative only and should be designed and constructed per COS Supplement to MAG Details.

FIGURE 5.3-43 TYPE CLONE WAY EGRESS DRIVEWAYS\*

# **DECELERATION LANES**

<u>Figure 5.3-28</u> and <u>Figure 5.3-29</u> depict the design standards for auxiliary lanes. These standards apply for right and left turn lanes at street intersections and for deceleration lanes at mid-block driveways. The requirement for an auxiliary lane may necessitate additional rights-of-way. The standard storage length for a deceleration lane is 150 feet, with a 100-foot minimum length. Modifications to the design standard are allowed by the Transportation Department where the conditions do not allow the full taper or storage length.

Deceleration lanes are required at all new driveways on major arterials and at new commercial/retail driveways minor arterials. Deceleration lanes for driveways may also be required on collector streets and for non-commercial/retail driveways on minor arterials. The lane length should be based on the distance needed to allow the vehicle to exit the through lane and slow to a 15 m.p.h. travel speed. To determine the need for a deceleration lane on streets classified as a minor arterial or collector, see the following criteria:

- At least 5,000 vehicles per day are expected to use the street;
- The 85<sup>th</sup> percentile traffic speed on the street is at least 35 m,p.h.; or 45 m,p.h. for a 2 lane (1 lane each direction) roadway;
- At least 30 vehicles will make right turns into the driveway during a 1-hour period.

# **SIDEWALKS**

#### A. Sidewalk Standards

Sidewalks adjacent to all city streets are required to meet the standard cross sections contained in <u>Figure 5.3-1</u> through <u>Figure 5.3-21</u> and the Streets Master Plan except as noted below.

Walkways that connect main building entrances to the sidewalks on adjacent streets should have a minimum clear width of six (6) feet - excluding any parking overhangs or other obstructions. The walkway should be continuous between the street and building, and clearly recognizable by both pedestrians and drivers. Wider widths may be required by staff in

5-3.206

5-3.300



# PRELIMINARY WASTEWATER REPORT

**FOR** 

# "DISTRICT AT THE QUARTER"

# NEC OF N. GREENWAY HAYDEN LOOP & N. DIAL BLVD SCOTTSDALE, MARICOPA COUNTY, ARIZONA

# **PREPARED FOR:**

KAPLAN ACQUISITIONS, LLC 7150 EAST CAMELBACK ROAD, SUITE 444 SCOTTDALE, MARICOPA COUNTY, ARIZONA 85251



#### **PREPARED BY:**

BIG RED DOG ENGINEERING | CONSULTING, INC.

2021 E. 5<sup>TH</sup> STREET SUITE 110

AUSTIN, TEXAS 78702

ARIZONA ENGINEERING FIRM NO. 19744

BRD H001.008

Accepted For:

City of Scottsdale Water Resources Department 9379 E. San Salvador Scottsdale, Arizona

By: _	hua	MADO	- CLIDAUTTAL	2 ALICUST	30
Date:	8.2	6.16	— SUBMITTAL	Z - AUGUST A	20.



August 2016

H001.008

City of Scottsdale Planning and Development 7447 E Indian School Rd Scottsdale, AZ 85251

RE:

**Preliminary Engineering Report** 

District at the Quarter

NEC Greenway Hayden Loop & N. Dial Blvd Scottsdale, Maricopa County, Arizona

To Whom It May Concern:

Please let this letter and enclosed report serve as our formal Final Grading and Drainage Report for the proposed development, District at the Quarter, at the northeast corner of N. Greenway Hayden Loop and N. Dial Boulevard. The proposed development will include the demolition of the existing structures followed by the construction of a  $\pm$  620 unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently under as application numbers 3-GP-2016 and 8-ZN-2016.

Comments were issued on June 29, 2016, and are addressed in the Final Grading and Drainage Reports and include with this submittal package.

Please feel free to contact me at 832-730-1901 or at <a href="mailto:Patrick.Byrne@BIGREDDOG.com">Patrick.Byrne@BIGREDDOG.com</a> if you have any questions or concerns in regards to the information contained herein. We appreciate you working with us as we move forward with the associated development.

Sincerely,

**BIG RED DOG Engineering | Consulting** 

atrick Byrne

Patrick Byrne Principal



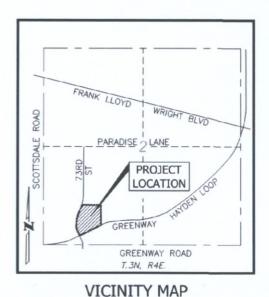
A. INTRODUCTION H001.008

#### 1. Site Location / Description

The subject site associated with this Preliminary Sanitary Report is for a proposed development, District at the Quarter, located at the northeast corner of N. Greenway Hayden Loop and N. Dial Blvd., in the Full Purpose Limits of the City of Scottsdale, AZ (see vicinity map and aerial below). The ±8.84 acre site is currently developed with a ±129,689 SF Office Building / Warehouse space, with associated utilities, desert landscaping, roadways and 4 retention ponds located throughout the site.

The proposed development will include the demolition of all existing structures followed by the construction of a  $\pm 620$  unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as application numbers 3-GP-2016 and 8-ZN-2016.



NOT TO SCALE



#### 2. Purpose / Objective

The purpose of this Preliminary Sanitary Report is to identify and analyze the existing and proposed sanitary utility conditions and characteristics as it relates to the proposed development.

#### **B. DESIGN DOCUMENTATION**

#### 1. Design Criteria

District at the Quarter is to be designed to meet the requirements of the following:

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Preliminary Sanitary Sewer | 4



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- City of Scottsdale Design Standard and Policies Manual (2010)
- MAG Uniform Standard Specifications for Public Work Construction (2016 Rev. to 2015 Ed.)
- City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Work Construction (2015)
- International Fire Code (2012)

#### 2. Methodologies

Design standards were taken from Section 7-1.403 of the City of Scottsdale Design Standards and Policies: Chapter 7 – Wastewater. Average and Peak value factors can be seen on Figure 7.1-2 Average Day Sewer Demand in Gallons.

## C. EXISTING CONDITIONS

# 1. Zoning / Land Use

The ±8.84 acre site is currently zoned (I-1) Industrial Park district and is currently developed with a ± 129,689 SF office building / warehouse, with all associated parking, desert landscaping, utilities, and stormwater retention ponds. The site is currently in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as application numbers 3-GP-2016 and 8-ZN-2016.

#### 2. Existing Topography / Vegetation

The highest elevation point is 1,486 feet, along the northeast property line, with the lowest at 1,477 feet along the southwest property line, above Mean Sea Level. The site generally slopes from northeast to southwest. The site is fully developed but the required landscaping within the parking lots is made up of desert landscape area.

#### 3. Existing Utilities

The existing sanitary system consists of a 15-inch VCP sewer main located northwest of the site and extends along N. Greenway Hayden Loop. A 10-inch VCP sewer main is also located to the west of the site along N. Dial Boulevard. An 8-inch VCP southwest of the site collects the flow and connects it to the 15-inch VCP located along N Greenway Hayden Loop. Two 8-inch VCP mains to the west of the site merge and connect the flow to the 10-inch VCP located along N. Dial Boulevard. Reference the *Existing Conditions* in the Appendix as **Exhibit 2**.

## D. PROPOSED CONDITIONS

#### 1. Proposed Sanitary Layout - Phase 1

Multiple sanitary sewer stubs are proposed in the N. Dial Blvd ROW to the restaurant, and south of the restaurant to the proposed development. The final stub in Phase 1 will occur along the south property line from N. Greenway Hayden Loop to the development. A *Preliminary Sanitary Sewer Layout* is in the Appendix of this report as **Exhibit 3**.

#### 2. Proposed Sanitary Layout - Phase 2

Sanitary lines are proposed in the fire lane along the northern and eastern property lines. These lines will stub from N. Greenway Hayden Loop and N. Dial Blvd. from the proposed lines in the fire



lane, multiple stubs are then proposed to the development. One more stub will occur in N. Dial Blvd. and will tie into the proposed building north of the interior drive aisle. A *Preliminary Sanitary Sewer Layout* is in the Appendix of this report as **Exhibit 3**.

#### 3. Maintenance

Sanitary infrastructure associated with Phase I will solely be service connections to existing lines within N Dial Blvd. and N Greenway Hayden Loop and therefore no public sanitary infrastructure is proposed with Phase I.

Phase II will require public sanitary lines to be installed within the 20' utility easement within the fire lane on the north and east side of the subject site. These lines will convey flows from the Phase II Building to N Dial Blvd. and N Greenway Hayden Loop and will be maintained by the City of Scottsdale.

# **E. COMPUTATIONS**

#### 1. Average Day Sewer Demand and Peak Flow for Existing Building

The calculation for the average day sewer demand and peak flow for existing conditions are based off Design Flows located in Chapter 7 Section 7-1.403. Per the aforementioned table, "office" and "industrial" uses have a flow demand of 0.5 gallons per sf.

Average Day Demand 
$$= \left(\frac{gpd}{sf}\right) * (sf)$$
  
 $= (0.5) * (129,689)$   
 $= 64,845 \text{ gpd}$   
Peak Flow  $= (\text{Peaking Factor}) * (\text{Average Day Demand})$   
 $= (3) * (64,845)$   
 $= 194,535 \text{ gpd}$ 

#### 2. Average Day Sewer Demand and Peak Flow for Phase 1 of Proposed Development.

The proposed development consists of two phases with a total of 620 apartment units. Phase 1 contains 330 apartment units, 5,000 sf of restaurant space, a 5,373 sf fitness center, and 7,000 sf club house. Calculations for the proposed development are based of Design Flows Chapter 7 Section 7-1.403.

#### **Apartment**

Average Day Demand = 
$$\left(100 \frac{gpc}{d}\right) * (Demand Per Unit) * (Units)$$
  
=  $(100) * (2.5) * (330)$   
=  $82,500 \text{ gpd}$   
Peak Flow =  $(Peak Factor) * (Average Day Demand)$   
=  $(4) * (82,500)$   
=  $330,000 \text{ gpd}$ 



#### Restaurant

Average Day Demand = 
$$(\frac{gpd}{sf}) * (sf)$$

$$= (1.2) * (5,000)$$
  
= 6,000 gpd

$$= (6) * (6,000)$$
  
= 36,000 gpd

# **Fitness Center**

Average Day Demand = 
$$\left(\frac{g}{sf}\right) * (sf)$$

$$= (0.4) * (5,373)$$
  
= 2, 149.2 gpd

# **Club House**

Average Day Demand = 
$$\left(\frac{g}{sf}\right) * (sf)$$

$$= (3) * (2,800)$$
  
= 8,400 gpd

#### Combined

$$= 82,500 + 6,000 + 2,149.2 + 2,800$$

$$= 330,000 + 36,000 + 6,447.6 + 8,400$$

= 380,848 gpd

#### 3. Average Day Sewer Demand and Peak Flow for Phase 2 of Proposed Development.

The proposed development consists of two phases with a total of 620 apartment units. Phase 2 contains 290 apartment units, and a 2,500 sf deck club. Calculations for the proposed development are based of Design Flows Chapter 7 Section 7-1.403.



## **Apartment**

Average Day Demand = 
$$\left(100 \frac{gpc}{d}\right) * (Demand Per Unit) * (Units)$$

$$= (100) * (2.5) * (290)$$

$$= 72,500 gpd$$

#### **Deck Club**

Average Day Demand = 
$$\left(\frac{g}{sf}\right) * (sf)$$

$$= (1.2) * (2,500)$$
  
= 3,000 gpd

$$= (6) * (3,000)$$
  
= 18,000 gpd

#### Combined

# 4. Combined Demand for Proposed Development

The combined development consists of 620 Apartment units, a Restaurant, Fitness Center, Club House, and Deck Club.

Average Day Demand = Phase 
$$1 + Phase 2$$

**Peak Flow** = Phase 
$$1 + Phase 2$$

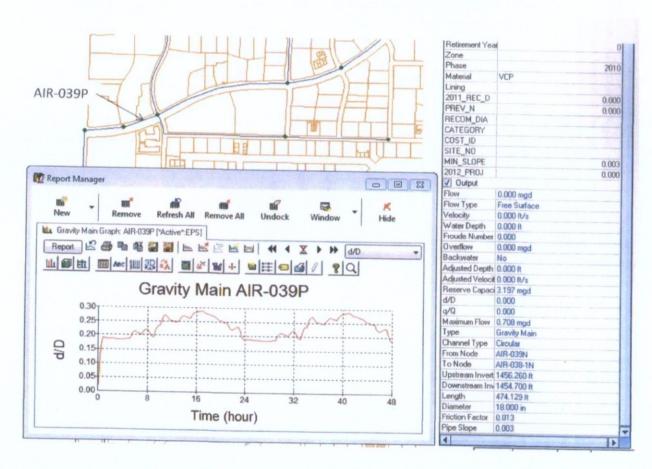
$$= 380,848 + 308,000$$
  
= **688,848 gpd**

# F. DESIGN DOCUMENTATION

Design of the sanitary infrastructure has been done according to The City of Scottsdale Design Standards and Policies Manual: Chapter 7 – Wastewater, as well as Maricopa Associate of Governments (MAG) Uniform Standard Specifications and Details for Public Works Construction. The design complies with pipe size, material, location/placement, design flows and hydraulic requirements, as pointed out in the above references design manuals.

Per coordination with the City of Scottsdale, offsite sanitary sewer analysis is not required.

8-ZN-2016 District at the Quarter – Master Planned Offsite Sewer Flows (2035 DWF)



## **G. SUMMARY**

This Preliminary Sanitary Report outlines the existing and proposed conditions of the ±8.84 acre development located at the northeast corner of N. Greenway Hayden Loop and N. Dial Blvd, to include calculations and infrastructure layout. Current infrastructure has been captured from the City of Scottsdale GIS and design is in accordance with the design manuals referenced in Section H. References.

BIG RED DOG has proposed two stub located at N. Greenway Hayden Loop, as well as four stubs from N. Dial Blvd. The fire lane will contain sanitary lines along the northern and eastern property line with multiple stubs to the proposed buildings.

Demand Scenario					
	Existing Conditions (gpd)	Proposed Conditions (gpd)			
Average Daily Flow	64,845	190,449.2			
Peak Flow	194,535	695,848			

#### H. REFERENCES

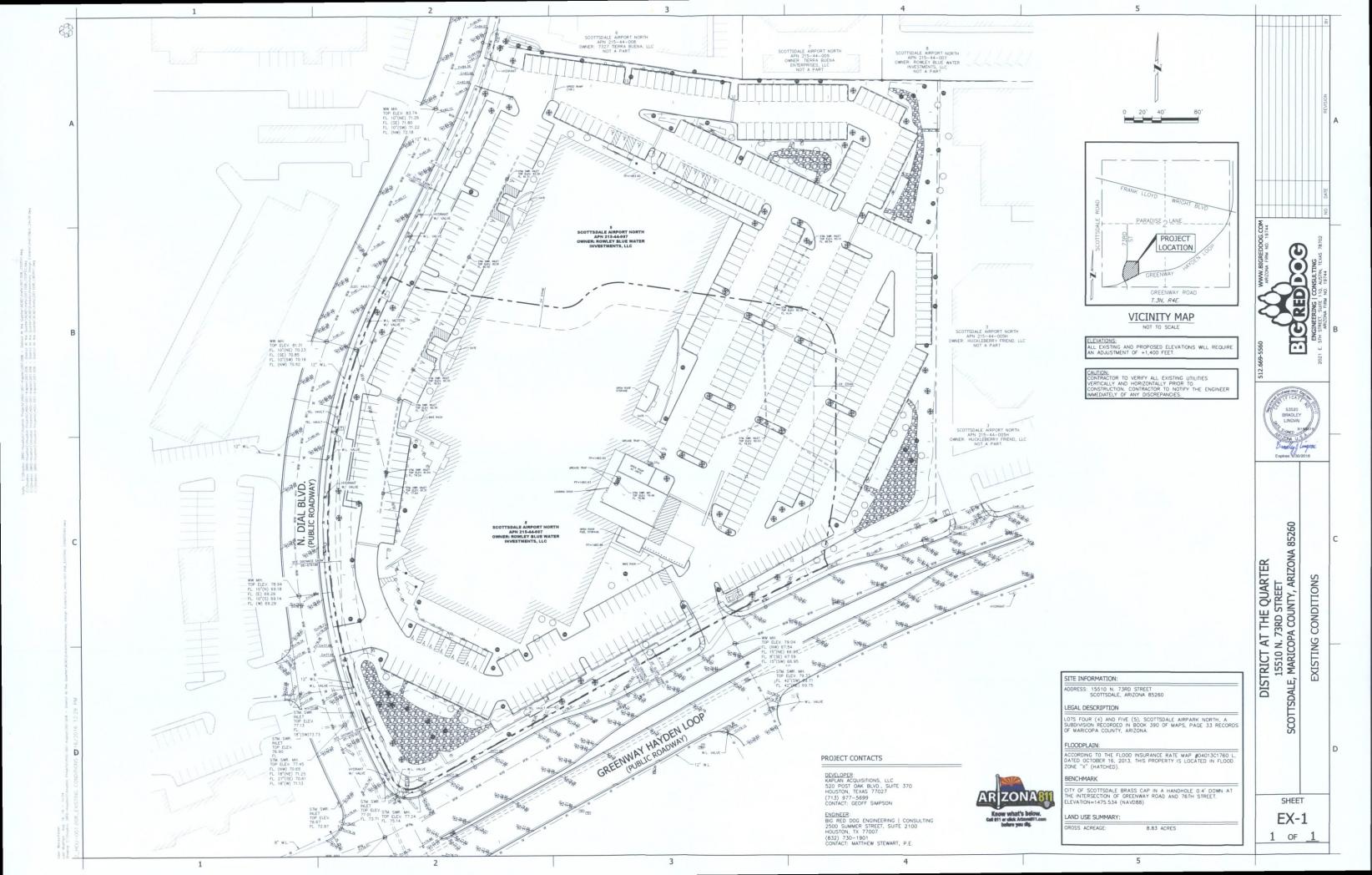
City of Scottsdale, Design Standards and Policies Manual: Chapter 7 – Wastewater – January 2010

MAG Uniform Standard Specifications and Details for Public Works Construction – January 2016

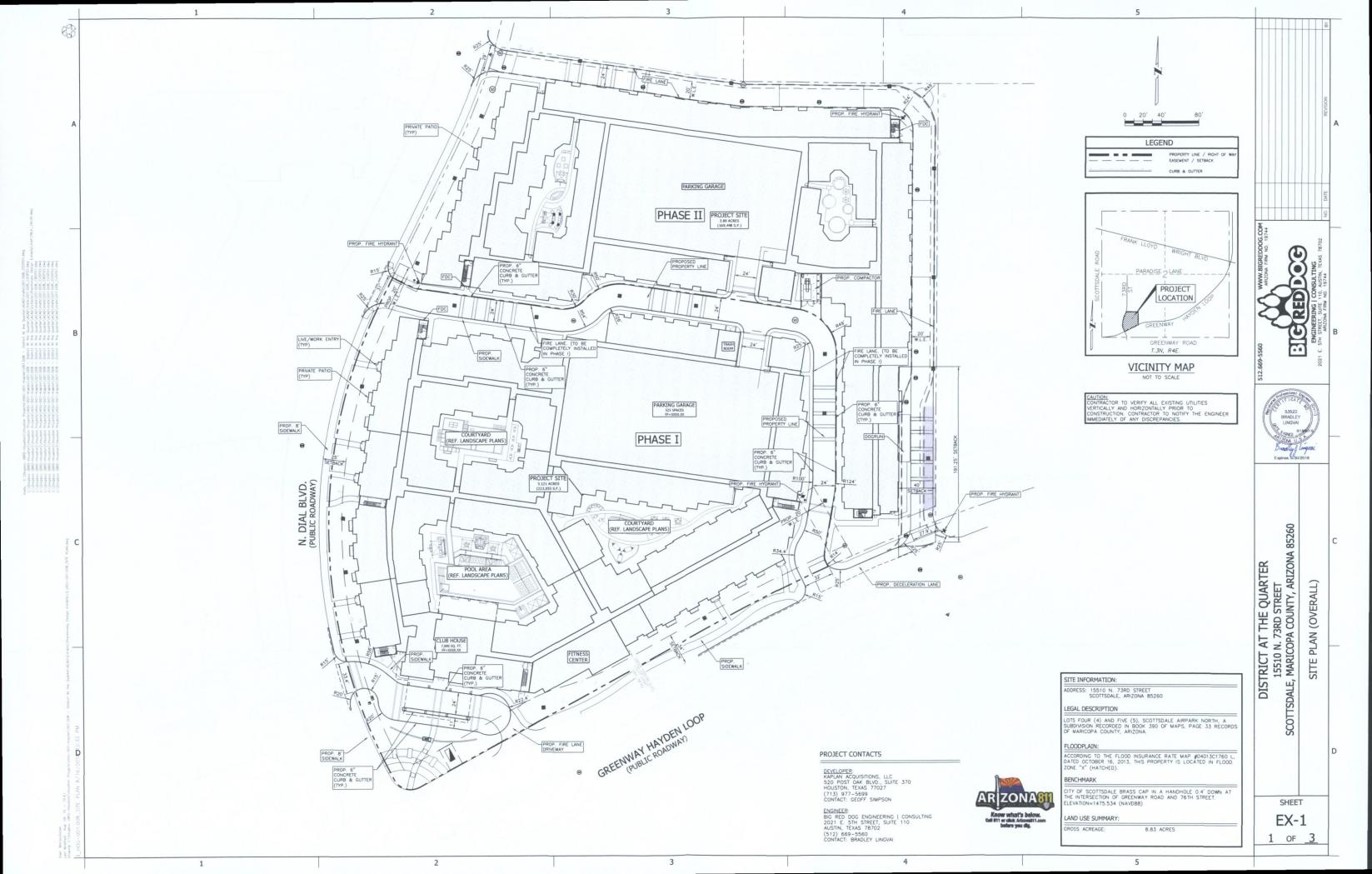
Scottsdale Geographic Information Systems – Water and Sewer Quarter Section Map 35-45

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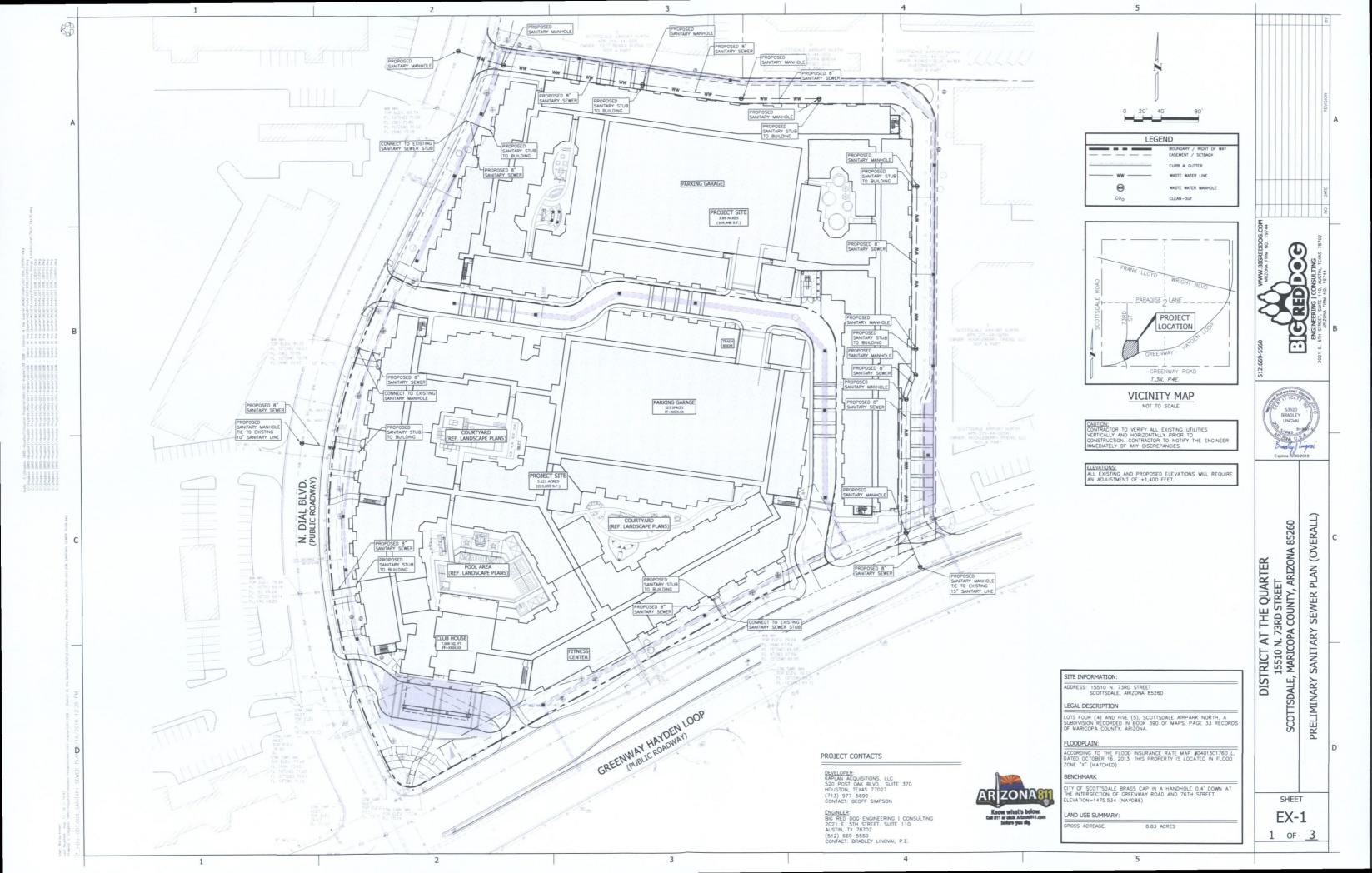


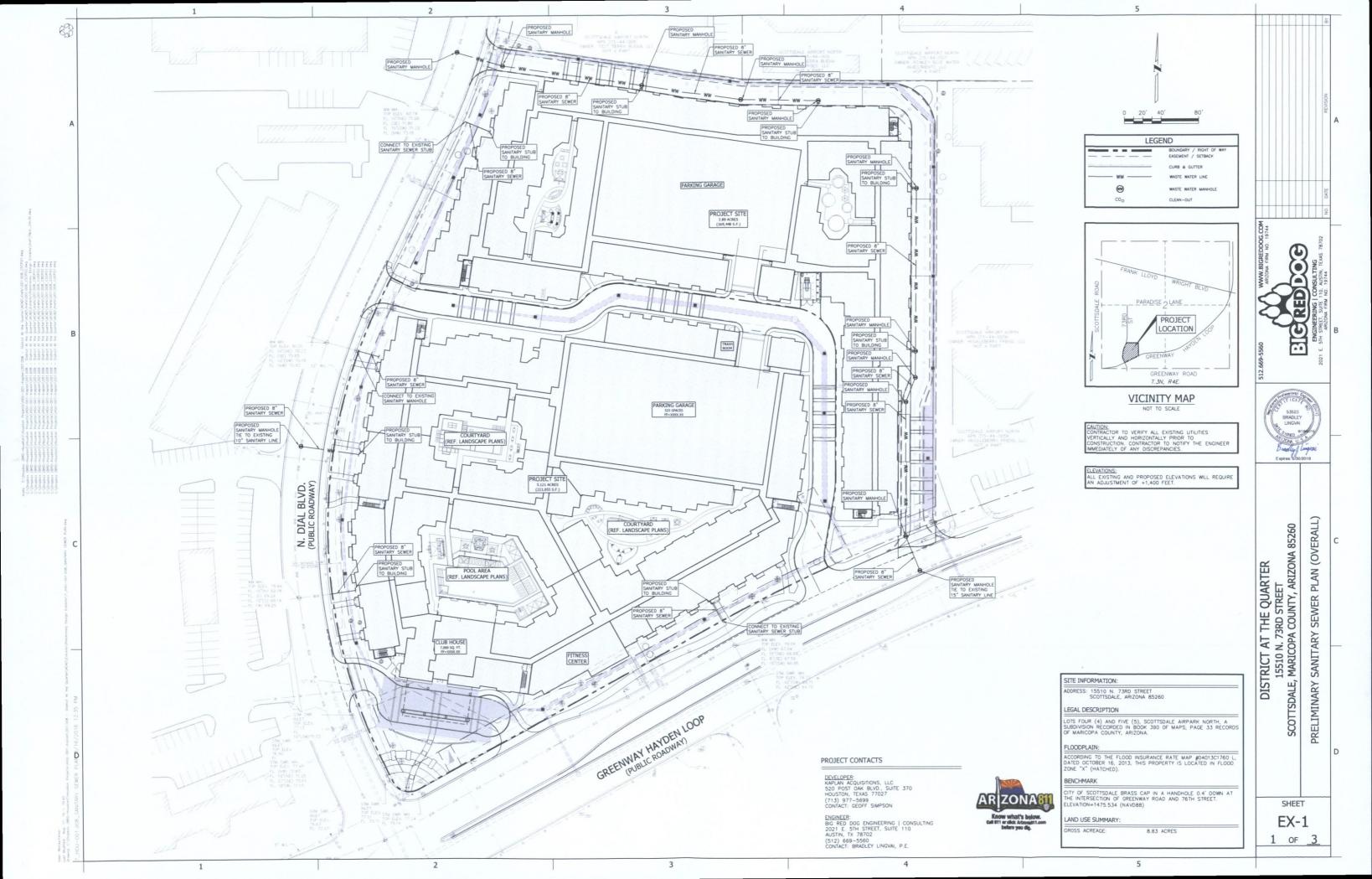
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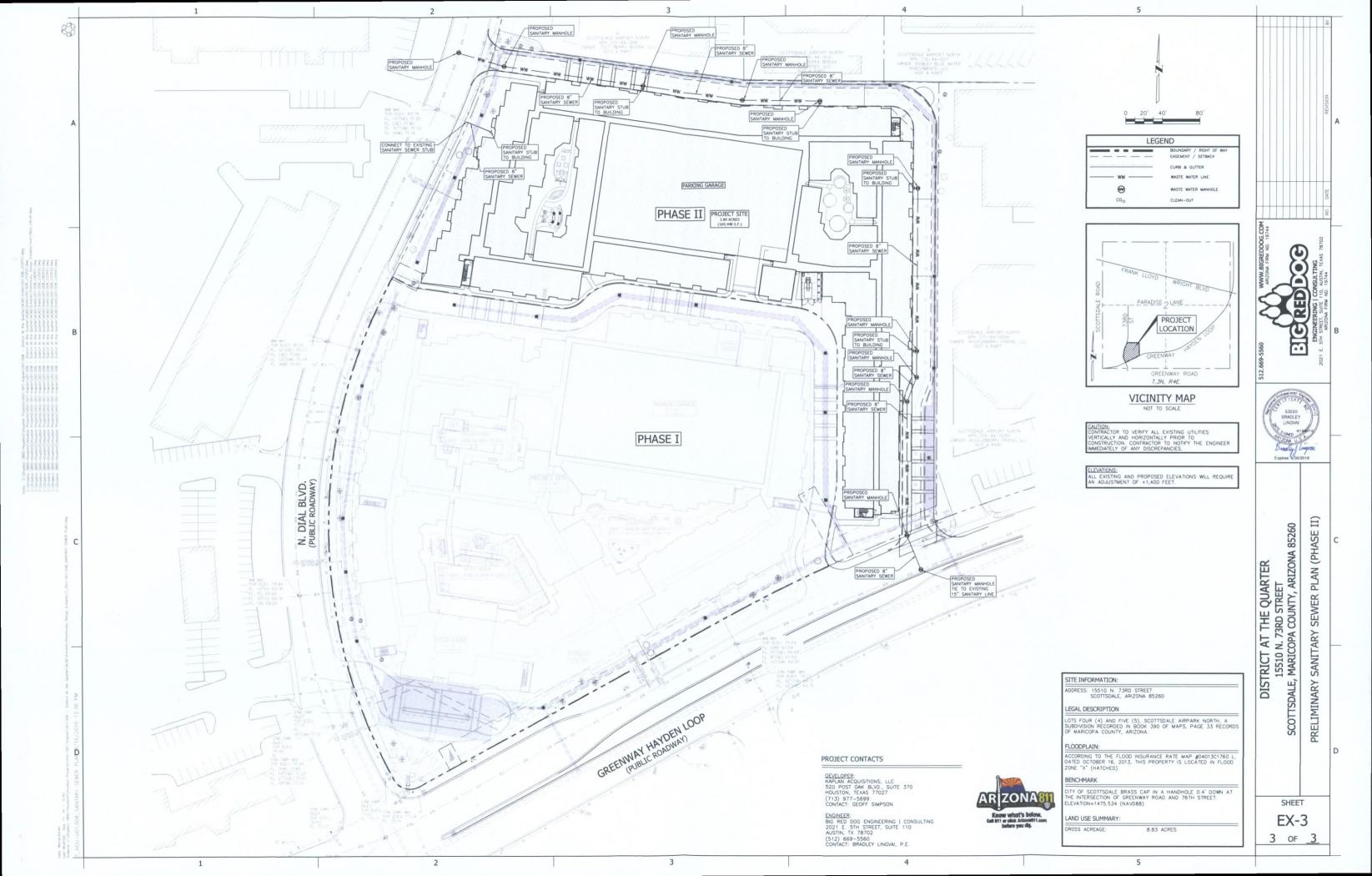


# Preliminary Sanitary Sewer, 4

- EX 1 | OVERALL SANITARY LAYOUT
- EX 2 | PHASE I SANITARY LAYOYUT
- EX 3 | PHASE II SANITARY LAYOUT









BRADLEY LINGVAI

Expires: 6/30/2018



## PRELIMINARY WATER REPORT

**FOR** 

"DISTRICT AT THE QUARTER"

NEC OF N. GREENWAY HAYDEN LOOP & N. DIAL BLVD SCOTTSDALE, MARICOPA COUNTY, ARIZONA

#### PREPARED FOR:

KAPLAN ACQUISITIONS, LLC 7150 EAST CAMELBACK ROAD, SUITE 444 SCOTTDALE, MARICOPA COUNTY, ARIZONA 85251

## **PREPARED BY:**

BIG RED DOG ENGINEERING | CONSULTING, INC.
2021 E. 5<sup>TH</sup> STREET SUITE 110
AUSTIN, TEXAS 78702
ARIZONA ENGINEERING FIRM NO. 19744
BRD H001.008

## **Accepted For:**

City of Scottsdale
Water Resources Department
9379 E. San Salvador
Scottsdale, Arizona

**AUGUST 2016** 

Date: 8,26,16





June 1, 2016

City of Scottsdale Planning and Development 7447 E Indian School Rd Scottsdale, AZ 85251

RF:

**Preliminary Engineering Reports** 

District At Quarter

NEC Greenway Hayden Loop & N Dial Blvd Scottsdale, Maricopa County, Arizona

To Whom It May Concern:

Please let this letter and enclosed report serve as our formal Preliminary Basis of Design for the proposed development, District at the Quarter, at the northeast corner of N Greenway Hayden Loop and N Dial Boulevard. The proposed development will include the demolition of the existing structures followed by the construction of a  $\pm$  620 unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently under as application numbers 3-GP-2016 and 8-ZN-2016.

The 1<sup>st</sup> round of comments from the aforementioned cases have been received by the owner and design team and have been addressed accordingly. From our correspondence, it is our understanding that the preliminary reports which were previously submitted by a different engineer did not receive any comments. However, since the reports have been submitted, the owner has changed architects and engineers on the design team. Because of this, and since the site plan has changed to address the aforementioned comments (including changing from a podium style deal to a wrap-style deal), we have prepared new reports under Big Red Dog.

Please feel free to contact me at 832-730-1901 or at <a href="mailto:Patrick.Byrne@BIGREDDOG.com">Patrick.Byrne@BIGREDDOG.com</a> if you have any questions or concerns in regards to the information contained herein. We appreciate you working with us as we move forward with the associated development.

Sincerely,

BIG RED DOG Engineering | Consulting Texas Engineering Firm No. F-15415

Patrick Byrne

Patrick Byrne Principal

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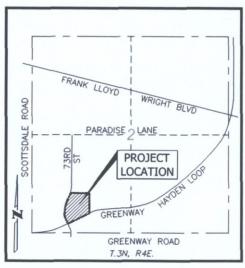
A. INTRODUCTION H001.008

#### 1. Site Location / Description

The subject site associated with this Preliminary Water Report is for a proposed development, District at the Quarter, located at the northeast corner of N. Greenway Hayden Loop and N. Dial Blvd., in the Full Purpose Limits of the City of Scottsdale, AZ (see vicinity map and aerial below). The  $\pm 8.84$  acre site is currently developed with a  $\pm 129,689$  SF Office Building / Warehouse space, with associated utilities, desert landscaping, roadways and 4 retention ponds located throughout the site.

The proposed development will include the demolition of all existing structures followed by the construction of a  $\pm 620$  unit multi-story apartment complex which will be composed of (2) buildings wrapped around (2) structural parking garages along with all associated grading, drainage, utility, landscape, and hardscape improvements.

The subject site is currently zoned Industrial Park (I-1) and is in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as application numbers 3-GP-2016 and 8-ZN-2016.







#### 2. Purpose / Objective

The purpose of this Preliminary Water Report is to identify and analyze the existing and proposed water demand and system conditions and characteristics as they relate to the proposed development.

#### **B. DESIGN DOCUMENTATION**

#### 1. Design Criteria

District at the Quarter is to be designed to meet the requirements of the following:

- City of Scottsdale Design Standard and Policies Manual (2010)
- MAG Uniform Standard Specifications for Public Work Construction (2016 Rev. to 2015 Ed.)
- City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Work Construction (2015)
- International Fire Code (2012)

#### 2. Methodology & Software

The proposed water system for District at the Quarter was modeled using WaterCAD version 8i. The model was set up and analyzed based on the impact of the proposed water demand on the existing conditions observed from the existing conditions fire flow test. The proposed water system (Phase II) is designed to be looped and running along the northern and eastern property lines under the proposed fire lane within a proposed 20' public water line easement per COS requirement. The proposed water system is to be connected to the existing 12" PVC water line located at the south of the site and the existing 12" APC water line located west of the site.

The proposed development, District at the Quarter, consists of two 4-stories buildings; Building I is 107,982 sf and Building II is 124,021 sf. The area of the largest building is used to calculate the fire flow area. The fire flow area was calculated bases on the sum of the floor areas of all floors and the calculated fire flow area was used to determine the fire flow demand by referencing the 2012 IFC – B105.1. The **Table 1.0** below provides the Fire Flow Calculation.

Table 1.0 - Fire Flow Calculation

		<u>De</u>	scription
В	uilding I	10	7,982 SF
В	uilding II	12	4,021 SF
Largest	Building	Ви	ilding II
		Building II	
Floor Level	Bui	lding Construction Type	Floor Area
1 <sup>st</sup> Floor		I-A	27,150 SF
2 <sup>nd</sup> Floor		I-A	27,150 SF
3 <sup>rd</sup> Floor 4 <sup>th</sup> Floor 1 <sup>st</sup> Floor 2 <sup>nd</sup> Floor		I-A	27,150 SF
		I-A	27,150 SF
		V-A	96,871 SF
		V-A	96,871 SF
3 <sup>rd</sup> Floor		V-A	96,871 SF
4 <sup>th</sup> Floor		V-A	96,871 SF
		Total Fire Flow Area =	496,084 SF
Fire Flow Demand (2012 IFC - B105.1) =			8,000 gpm
Fire Flow Do	emand (7	5% Allowed Reduction) =	2,000 gpm

A pump (PMP-1) is set up to replicate the existing water pressure on the project site based on the Hydrant Flow Test Report by Arizona Flow Testing, LLC in the water model. Four different simulations of the water model were generated as required by the COS DSPM (2010). The **Table 2.0** below provides the description of each simulation. The *Reports and Diagrams* have been included in the Appendix as *Exhibit 2*.

Table 2.0 - Water Model Simulations

	Description
Average Day Demand	Calculated the Average Day Demand of the entire site using Figure
	6.1-2 COS DSPM (2010). The demand is assigned to the junction, J-
	5, which is the furthest junction from the water source.
Maximum Day Demand	Calculated the Maximum Day Demand of the entire site using 2
	times the Average Day Demand. The demand is assigned to the
	junction, J-5, which is the furthest junction from the water source.
Peak Hour Demand	Calculated the Peak Hour Demand of the entire site using 3.5 times
	the Average Day Demand. The demand is assigned to the junction,
	J-5, which is the furthest junction from the water source.
Maximum Day Demand with Fire Flow	Calculated the Maximum Day Demand with Fire Flow of the entire
	site using the Maximum Day Demand plus the Fire-Flow Demand
	for the largest building The demand is assigned to the junction,
	J-5, which is the furthest junction from the water source.

#### C. EXISTING CONDITIONS

#### 1. Zoning / Land Use

The 8.84 acre site is currently zoned (I-1) Industrial Park district and is currently developed with a  $\pm$  129,689 SF office building / warehouse, with all associated parking, desert landscaping , utilities, and Stormwater retention ponds. The site is currently in the process of being rezoned to Planned Unit Development (PUD). The associated General Plan Amendment and Rezoning Applications are currently underway as applications numbers 3-GP-2016 and 8-ZN-2016.

#### 2. Topography / Vegetation/ Landforms

The site is currently fully developed and operating as a 129,689 SF mixed office/warehouse building with all associated parking, desert landscape areas, utilities, and Stormwater retention ponds. The site currently drains from the northeast to the southwest, and eventually into one of four retention ponds located throughout the property.

### 3. Location / Description of Utilities

The City of Scottsdale is the water provider for the subject site. There is an existing 12" APC water line located west of the site within N. Dial Boulevard and an existing 12" PVC water line located at the south of the site within E. Greenway Hayden Loop. The 12" APC domestic water service lead for the existing development is connecting to the 12" ACP water line within N. Dial Boulevard. There are existing water valves on both existing water lines which help minimize the water stoppage area during construction. Reference the *Existing Conditions* in the Appendix as *Exhibit 3*.

#### 4. Fire Flow Results

A hydrant flow test was performed by Arizona Flow Testing, LLC on December 8, 2015. The flow test was being conducted at the northeast corner of North Greenway Hayden Loop and N. Dial Boulevard. The **Table 1.0** below provides the flow test data with 12 PSI safety factor. The *Hydrant Flow Test Report* is included in the Appendix as *Exhibit 4*.

Table 1.0 - Flow Test Data (with 12 PSI Safety Factor)

Static Pressure =	72.0 PSI
Residual Pressure =	48.0 PSI
Flowing GPM =	2,866 GPM
Maximum Day Demand with Fire Flow =	4,351 GPM

#### D. PROPOSED CONDITIONS

#### 1. Utility Layout

The proposed project will be constructed in phases (Phase I and Phase II). Each phase is being designed to function independently in regards to all utility services.

Phase I will include the building and garage at the southwest corner of the site. Water service is available to Phase I of the project from the existing 12" APC water line within N Dial Boulevard and/or an existing 12" PVC water line within E Greenway Hayden Loop. No public water lines are proposed with Phase I with exception to a hydrant at the southeast corner of the proposed building. This hydrant will insure the proposed fire lane which will be built as part of Phase I will comply with fire hydrant spacing requirements (1 hydrant every 700 LF). This aforementioned hydrant will obtain service from the 12" PVC water line within E Greenway Hayden Loop and will be located within an easement accordingly. With the addition of this hydrant, as well as the existing hydrants along E Greenway Hayden Loop and N Dial Blvd, there will be adequate fire protection for all of Phase I.

In order to comply with hydrant spacing requirements, Phase II will require a 12" ductile iron public water line be extended within the fire lane on the north and east sides of the development. Two connections will be proposed to form a loop from the existing mains within the ROW. The first connection will be to the existing 12" PVC pipe near the southeast corner of the site within Greenway Hayden Loop and the second connection will be the existing 12" ACP located at the northwest corner of the site within N. Dial Boulevard. The proposed 12" water line will be located within a proposed 20' water line easement along with proposed 8" sanitary sewer line.

There will be two water line connections for the proposed development, District at the Quarter, and the proposed water line is designed to be 12" Ductile Iron Pipe. The first connection is to the existing 12" PVC Pipe located at the southeast corner of the site on Greenway Hayden Loop and the

second connection is to the existing 12" ACP Pipe located at the northwest corner of the site on N. Per Section B.2, the area of the largest building (Building II) is used to calculate the fire flow area. The fire flow area was calculated bases on the sum of the floor areas of all doors and the calculated fire flow area was used to determine the fire flow demand by referencing the 2012 IFC – B105.1.

The final submittal will provide the service connections, domestic and landscape meter, fire riser room, and the locations and size of the fire line. The *Preliminary Water Line Plan* has been included in the Appendix as *Exhibit 5*.

### 2. Water Zone

The project site is located within Pressure Zone 3 per Figure 6.1-3 Pressure Zone Map in the COS DSPM (2010).

#### 3. Maintenance

The proposed water system is designed to be public and the City of Scottsdale is to be fully responsible for any maintenance for the system. Once meter locations are proposed and finalized, the project owner will be responsible for all improvements after the associated water meters.

#### **E. COMPUTATIONS**

## 1. Water Demand for Existing Development

The land use for existing development is considered as industrial and office use. Based on Figure 6.1-2 in the COS DSPM (2010), the demand for the industrial use is  $1,027 \frac{gpd}{acre}$  and the demand for the office use is  $0.6 \frac{gpd}{sf}$ .

#### **Average Day Demand**

Figure 6.1-2 COS DSPM (2010)

= 
$$\left(\frac{\text{gpd}}{\text{acres}} \times \text{acres}\right) + \left(\frac{\text{gpd}}{\text{sf}} \times \text{sf}\right)$$
  
= =  $(1,027 \times 8.34) + (0.6 \times 129,689)$   
= **86,892 gpd or 60.34 gpm**

#### **Maximum Day Demand**

Section 6-1.404 COS DSPM (2010)

#### **Peak Hour Demand**

Section 6-1.404 COS DSPM (2010)

#### Maximum Day Demand with Fire Flow

Fire Flow (75% Allowed deduction per 2012 IFC – B105.2) (Type IB Building) = Fire Flow (gpm)  $\times$  75% = 6,000  $\times$  75%

= 1,500 gpm

#### **Maximum Day Demand with Fire Flow**

= Maximum Day Demand (gpm) + Fire Flow(gpm) = 121 + 1,500 = **1,621 gpm** 

## 2. Water Demand for Proposed Development

The proposed development, District at the Quarter, consist a multi-family apartment with 620 units, 5,000 SF of restaurant and 14,873 SF of commercial. The land use is considered as "High Density Condominium/Residential", "Restaurant" and the demand is  $185.3 \frac{\text{gal}}{\text{unit}}$  based on Figure 6.1-2 in the COS DSPM (2010).

#### **Average Day Demand**

Figure 6.1-2 COS DSPM (2010)

=
$$\left(\frac{\text{gpd}}{\text{unit}} \times \text{units}\right) + \left(\frac{\text{gpd}}{\text{sf}} \times \text{sf}\right) + \left(\frac{\text{gpd}}{\text{sf}} \times \text{sf}\right)$$
  
= $(185.3 \times 620) + (1.3 \times 5,000) + (0.8 \times 14,873)$   
= 133,284 gpd or 92.58 gpm

### **Maximum Day Demand**

Section 6-1.404 COS DSPM (2010)

= 2 × Average Day Demand (gpd) = 2 × 133,284 = 266,568 gpd or 185.15 gpm

#### **Peak Hour Demand**

Section 6-1.404 COS DSPM (2010)

= 3.5 × Average Day Demand (gpd) = 3.5 × 133,284 = 466,494 gpd or 324.02 gpm

#### Maximum Day Demand with Fire Flow

Fire Flow (75% Allowed deduction per 2012 IFC – B105.2)

(Type IA and V-A Building)

= Fire Flow (gpm)  $\times$  75%

 $= 8,000 \times 75\%$ 

= 2,000 gpm

Maximum Day Demand with Fire Flow

= Maximum Day Demand (gpm) + Fire Flow(gpm)

= 185 + 2,000

= 2,185 gpm

Table 3.0 - Demand Comparison: Existing Development vs. Proposed Development

	Existing Development (gpm)	Proposed Development (gpm)
Average Day Demand	60.34	92.58
Maximum Day Demand	120.68	185.15
Peak Hour Demand	211.20	324.02
Maximum Day Demand with Fire Flow	1,622.00	2,185.15

#### F. SUMMARY

The proposed water system for the District at the Quarter is designed to meet all the city's design standards and policies. Phase I of the development will include the installation of (1) new fire hydrant and the associated service taps/meters. Phase II will include the installation of a second hydrant as well as  $\pm$  1035 LF of 12" Ductile Iron Pipe which will form a loop between the 12" PVC water line within North Greenway Hayden Loop and the 12" APC water line located within N. Dial Blvd. The water model hydraulic results show all pressures and head losses meet the City of Scottsdale's Design and Policy Requirements.

Table 2.0 - Water Model Hydraulic Results

	Proposed Condition	<u>City of Scottsdale</u> <u>Design Requirements</u>	Criteria Met (Y or N)
Minimum Residual Pressure (Average Day Demand)	70 psi	50 psi (Min.)	Υ
Maximum Static Pressure (Average Day Demand)	74 psi	120 psi (Max.)	Υ
Minimum Pressure (Maximum Day Demand with Fire Flow)	54 psi	30 psi (Min.)	Y
Maximum Headloss (Maximum Day Demand with Fire Flow)	8.69 ft / 1,000 ft	10 ft / 1,000 ft	Y

In summary, due to the change in use from office space to dense residential, the proposed water demand for the District at the Quarter is higher than the existing conditions. However, the proposed water system is designed to meet the pressure requirements in Section 6-1.406 COS DSPM (2010).

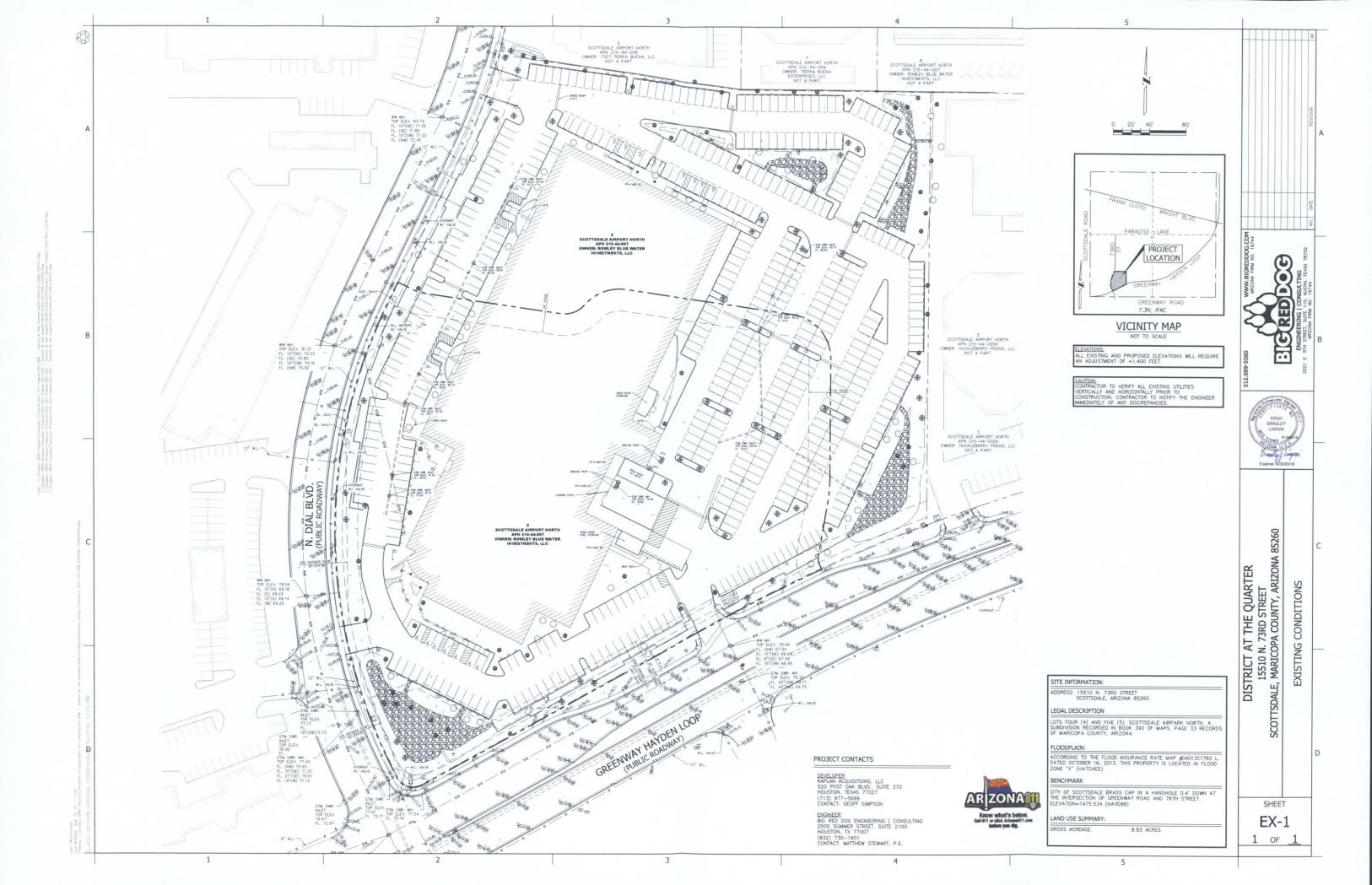
## H. References

- City of Scottsdale Design Standard and Policies Manual January 2010
- MAG Uniform Standard Specifications for Public Work Construction January 2016
- City of Scottsdale Supplement to MAG Uniform Standard Specifications for Public Work Construction - 2015
- International Fire Code 2012

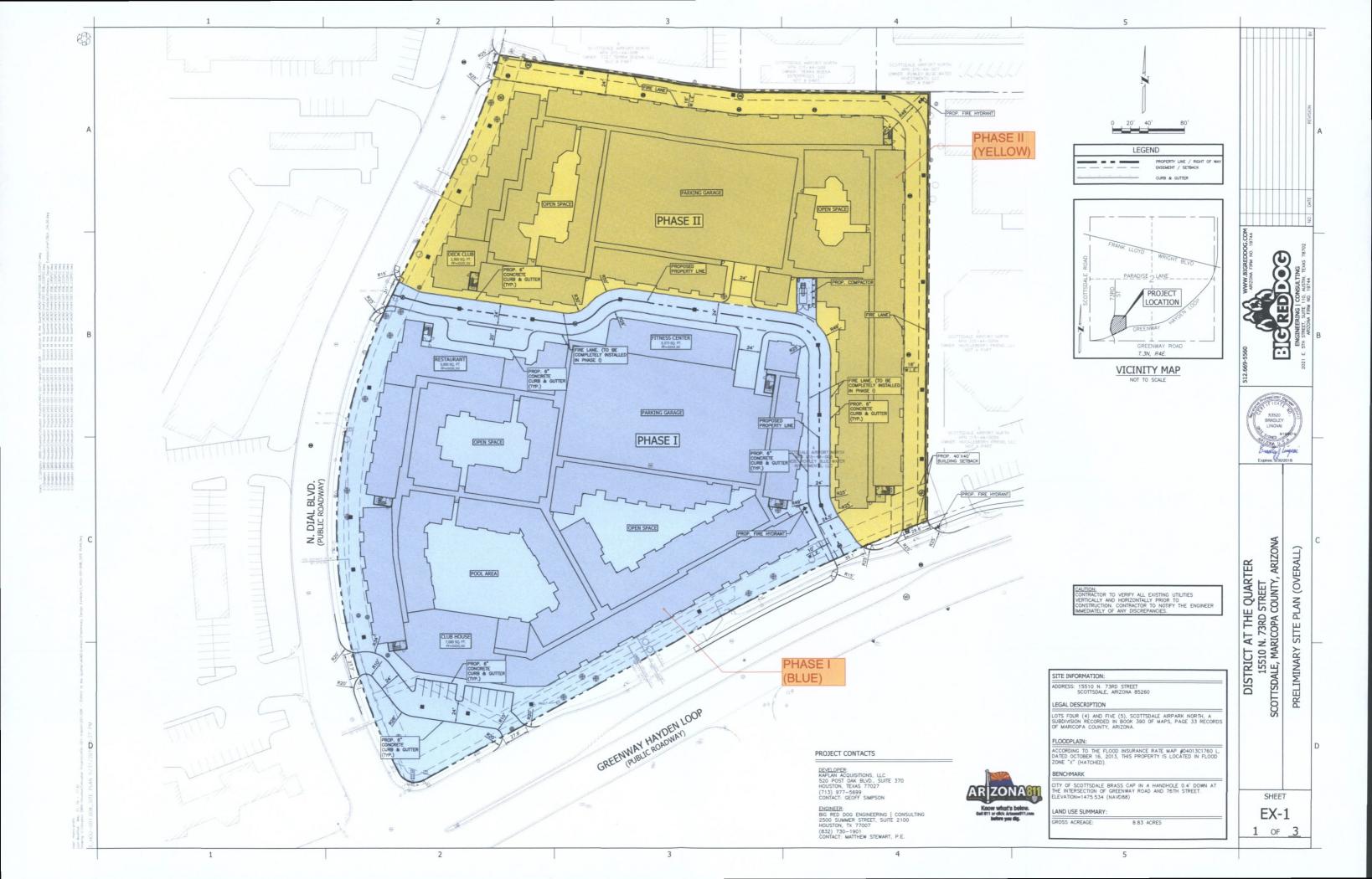
Aerial Map | 1

C. (propor (867-rivation) Visuation Projects) Vibin-Ob1-rispian (301.008 - District At the Guarter ACAD (viets) (301.008, C59902 deg C. (propos (867-rivation) Visuation Projects) Vibin-Ob1-Kapian (301.008 - District At the Quarter (ACAD) Emblits) Prefirming v. Disspir Emblish (Viref (186., 24s.24.deg

Existing Conditions | 2

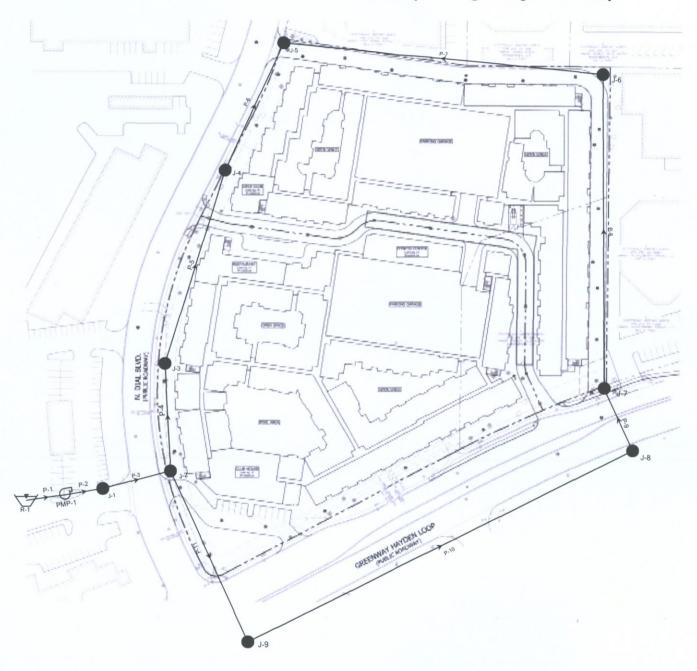


Overall Site Plan & Phasing Plan | 3



Reports & Diagram | 4

# FlexTable: Juntion Table (Average Day Demand)



## FlexTable: Reservoir Table (Average Day Demand)

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)	
R-1	1,480.00	1,480.00	-93	93	

## FlexTable: Junction Table (Average Day Demand)

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,646.20	72
J-2	1,479.25	0	1,646.20	72
J-3	1,480.00	0	1,646.20	72
J-4	1,480.00	0	1,646.20	72
J-5	1,484.50	93	1,646.19	70
J-6	1,484.36	0	1,646.20	70
J-7	1,480.64	0	1,646.20	72
J-8	1,480.00	0	1,646.20	72
J-9	1,475.80	0	1,646.20	74

## FlexTable: Pipe Table (Average Day Demand)

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	93	0.02	0.00	0.000
P-2	48.0	1	Glass	140.0	93	0.02	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	93	0.00	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	74	0.21	0.00	0.018
P-5	12.0	300	Asbestos Cement	140.0	74	0.21	0.01	0.018
P-6	12.0	215	Asbestos Cement	140.0	74	0.21	0.00	0.018
P-7	8.0	467	Ductile Iron	130.0	-18	0.12	0.01	0.011
P-8	8.0	473	Ductile Iron	130.0	-18	0.12	0.01	0.011
P-9	8.0	91	Ductile Iron	130.0	-18	0.12	0.00	0.011
P-10	12.0	633	PVC	150.0	-18	0.05	0.00	0.001
P-11	12.0	266	Asbestos Cement	140.0	-18	0.05	0.00	0.001

# FlexTable: Reservoir Table (Maximum Day Demand)

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-185	185

# FlexTable: Juntion Table (Maximum Day Demand)

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,645.95	72
J-2	1,479.25	0	1,645.95	72
J-3	1,480.00	0	1,645.94	72
J-4	1,480.00	0	1,645.92	72
J-5	1,484.50	185	1,645.91	70
J-6	1,484.36	0	1,645.93	70
J-7	1,480.64	0	1,645.95	72
J-8	1,480.00	0	1,645.95	72
J-9	1,475.80	0	1,645.95	74

## FlexTable: Pipe Table (Maximum Day Demand)

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	185	0.03	0.00	0.000
P-2	48.0	1	Glass	140.0	185	0.03	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	185	0.01	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	149	0.42	0.01	0.065
P-5	12.0	300	Asbestos Cement	140.0	149	0.42	0.02	0.065
P-6	12.0	215	Asbestos Cement	140.0	149	0.42	0.01	0.065
P-7	8.0	467	Ductile Iron	130.0	-37	0.23	0.02	0.040
P-8	8.0	473	Ductile Iron	130.0	-37	0.23	0.02	0.040
P-9	8.0	91	Ductile Iron	130.0	-37	0.23	0.00	0.039
P-10	12.0	633	PVC	150.0	-37	0.10	0.00	0.004
P-11	12.0	266	Asbestos Cement	140.0	-37	0.10	0.00	0.005

## FlexTable: Reservoir Table (Peak Hour Demand)

Label	Elevation (ft)	Hydraulic Grade (ft)	Flow (In net) (gpm)	Flow (Out net) (gpm)
R-1	1,480.00	1,480.00	-324	324

## FlexTable: Junction Table (Peak Hour Demand)

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,645.33	72
J-2	1,479.25	0	1,645.33	72
J-3	1,480.00	0	1,645.29	72
J-4	1,480.00	0	1,645.24	71
J-5	1,484.50	324	1,645.20	70
J-6	1,484.36	0	1,645.25	70
J-7	1,480.64	0	1,645.30	71
J-8	1,480.00	0	1,645.31	72
J-9	1,475.80	0	1,645.32	73

## FlexTable: Pipe Table (Peak Hour Demand)

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	324	0.06	0.00	0.000
P-2	48.0	1	Glass	140.0	324	0.06	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	324	0.01	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	260	0.74	0.03	0.182
P-5	12.0	300	Asbestos Cement	140.0	260	0.74	0.05	0.183
P-6	12.0	215	Asbestos Cement	140.0	260	0.74	0.04	0.182
P-7	8.0	467	Ductile Iron	130.0	-64	0.41	0.05	0.112
P-8	8.0	473	Ductile Iron	130.0	-64	0.41	0.05	0.112
P-9	8.0	91	Ductile Iron	130.0	-64	0.41	0.01	0.113
P-10	12.0	633	PVC	150.0	-64	0.18	0.01	0.012
P-11	12.0	266	Asbestos Cement	140.0	-64	0.18	0.00	0.013

# FlexTable: Reservoir Table (Maximum Day Demand with Fire Flow)

Label	Elevation	Hydraulic Grade	Flow (In net)	Flow (Out net)	
	(ft)	(ft)	(gpm)	(gpm)	
R-1	1,480.00	1,480.00	-2,185	2,185	

## FlexTable: Juntion Table (Maximum Day Demand with Fire Flow)

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-1	1,480.00	0	1,612.79	57
J-2	1,479.25	0	1,612.79	58
J-3	1,480.00	0	1,611.67	57
J-4	1,480.00	0	1,609.79	56
J-5	1,484.50	2,185	1,608.45	54
J-6	1,484.36	0	1,610.24	54
J-7	1,480.64	0	1,612.06	57
J-8	1,480.00	0	1,612.41	57
J-9	1,475.80	0	1,612.66	59

## FlexTable: Pipe Table (Maximum Day Demand with Fire Flow)

Label	Diameter (in)	Length (User Defined) (ft)	Material	Hazen-Williams C	Flow (gpm)	Velocity (ft/s)	Headloss (ft)	Headloss Gradient (ft/1000ft)
P-1	48.0	1	Glass	140.0	2,185	0.39	0.00	0.000
P-2	48.0	1	Glass	140.0	2,185	0.39	0.00	0.000
P-3	100.0	1	Asbestos Cement	140.0	2,185	0.09	0.00	0.000
P-4	12.0	179	Asbestos Cement	140.0	1,754	4.98	1.12	6.257
P-5	12.0	300	Asbestos Cement	140.0	1,754	4.98	1.88	6.257
P-6	12.0	215	Asbestos Cement	140.0	1,754	4.98	1.35	6.257
P-7	8.0	467	Ductile Iron	130.0	-431	2.75	1.79	3.841
P-8	8.0	473	Ductile Iron	130.0	-431	2.75	1.82	3.841
P-9	8.0	91	Ductile Iron	130.0	-431	2.75	0.35	3.841
P-10	12.0	633	PVC	150.0	-431	1.22	0.26	0.409
P-11	12.0	266	Asbestos Cement	140.0	-431	1.22	0.12	0.464

# **Arizona Flow Testing LLC**

#### HYDRANT FLOW TEST REPORT

Project Name: District at the Quarter

**Project Address:** Greenway Hayden & 73rd Street, Scottsdale, Arizona, 85260

Arizona Flow Testing Project No.: 15158 Client Project No.: 4686 Flow Test Permit No.: C49288

Date and time flow test conducted: December 8, 2015 at 8:30 AM

Data is current and reliable until: June 8, 2016

Conducted by: Floyd Vaughan - Arizona Flow Testing, LLC (480-250-8154) Witnessed by: Phil Cipolla – City of Scottsdale-Inspector (602-828-0847)

#### **Raw Test Data**

Static Pressure: 84.0 PSI (Measured in pounds per square inch)

Residual Pressure: 60.0 PSI (Measured in pounds per square inch)

Pitot Pressure: 23.0 PSI (2½- inch)

23.0 PSI (4-inch)

(Measured in pounds per square inch)

Diffuser Orifice Diameter:

One (2 ½-inch) (Measured in inches) One (4-inch)

Coefficient of Diffuser: .9

Flowing GPM: 2.866 GPM

(Measured in gallons per minute) 805 GPM + 2,061 GPM = 2,866GPM

GPM @ 20 PSI:

4,867 GPM

#### Data with 12 PSI Safety Factor

Static Pressure: 72.0 PSI (Measured in pounds per square inch)

Residual Pressure: 48.0 PSI (Measured in pounds per square inch)

Scottsdale requires a maximum Static Pressure of 72 PSI for AFES Design.

Distance between hydrants: Approx. 200 Feet

Main size: Not Provided

Flowing GPM: 2,866 GPM

GPM @ 20 PSI: 4,351 GPM

#### **Flow Test Location**

North



Flow Fire Hydrant

North 73rd Street/ Dial Blvd.

Pressure Fire Hydrant

North Greenway Hayden Loop

Project Site

Greenway Hayden Loop & 73rd Street

# Preliminary Water Line Plan | 5

EX - 1 | OVERALL WATER LAYOUT

EX - 2 | PHASE I WATER LAYOUT

EX - 3 | PHASE II WATER LAYOUT

