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

Samples/Misc.

Acceptable for ZN Case

City of Scottsdale
Water Resources Administration
9379 E. San Salvador
Scottsdale, AZ 85258

Submit Final Report prior to Impact plans

Doug Mann 2.25.16

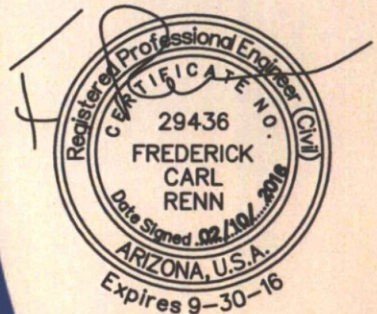
January 29, 2016
Revised February 3, 2016
Revised February 10, 2016

Scottsdale Entrada

64th Street and McDowell Road

PRELIMINARY

SEWER REPORT



Scottsdale, Arizona

CVL CONSULTANTS

Prepared for:
SunChase Holdings, Inc.
5665 N. Scottsdale Road
Suite 135
Scottsdale, Arizona 85250
Contact: Todd Tupper
480.398.2626

Prepared by:
CVL Consultants
4550 N 12th Street
Phoenix, AZ 85014
Contact: Fred Renn, PE
602.264.6831

Job # 1.01.0254303

5-ZN-2016
2/18/16

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1.0 INTRODUCTION

SunChase Holdings, Inc. plans to redevelop 23 acres of nearly 28 acres of land formerly known as the Scottsdale Auto Park into the mixed use development of Scottsdale Entrada. Currently, SunChase Holdings has prepared four development alternatives (one Base and three Options) that are being considered. The property is located on the northeast corner of 64th Street and McDowell Road in Scottsdale, Arizona. This report calculates the wastewater flows for four proposed alternatives and analyzes the option that will generate the greatest flow in detail.

2.0 SITE DESCRIPTION

Scottsdale Entrada is a 23 acre property located on the northeast corner of 64th Street and McDowell Road in Scottsdale, Arizona in Section 34, Township 2 North, Range 4 East of the Gila River Baseline and Meridian, Maricopa County, Arizona. The property slopes from the northwest to the southeast and ranges in elevation from approximately 1280 to 1270 feet above mean sea level (MSL). The property is bounded by residential property to the north, the Crosscut Canal to the east, McDowell Road to the south and 64th Street to the west (see Figure 1).

The existing improvements are to be demolished and a mixed use center is to be constructed. As the name suggests, the former Scottsdale Auto Park property was the location of a number of automobile dealerships. The property is comprised eight separate parcels with improvements included: showrooms, retail stores, automotive centers, offices, storage warehouses and parking lots and driveways. The parcel and building areas of each parcel are presented in Table 1.

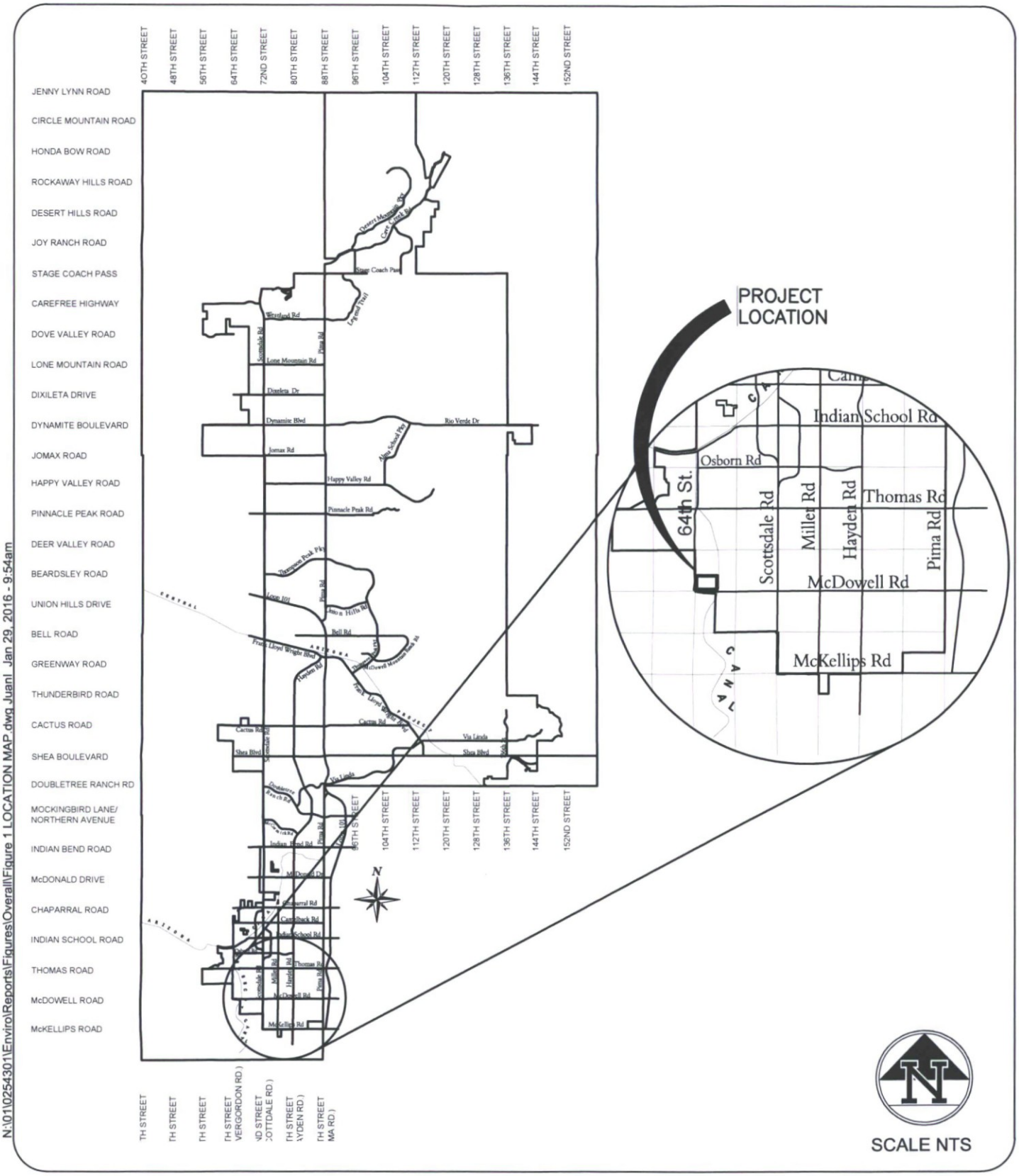
Table 1 - Existing Land Use Areas[1]

Parcel No.	Land Area		Floor Space
	(sf)	(ac)	(sf)
129-09-003V	178,552	4.10	53,520
129-09-003P	178,683	4.10	22,137
129-09-003N	170,450	3.91	36,554
129-09-003Q	111,034	2.55	27,537
129-09-003T	86,205	1.98	21,692
129-09-003U	69,217	1.59	0
129-09-003W[2]	377,889	8.68	1
129-09-003S	37,723	0.87	0
Subtotal	**1,209,753**	**27.77**	**161,441**
Open Space[2]	198,100	4.55	0
Net Total		**23.22**	**161,441**

[1] *Reference: Maricopa County Assessor's Parcel Map/Property Data*
[2] *Approximatey 4.55 acres of Parcel 129-09-003W along the northern boundary of the property is to remain as open space.*

3.0 DEVELOPMENT ALTERNATIVES

Four development alternatives are currently being evaluated (see Appendix A). Table 2 summarizes the uses for each alternative.



N:\01\0254301\Enviro\Reports\Figures\Overall\Figure 1 LOCATION MAP.dwg, Juanl, Jan 29, 2016 - 9:54am

CITY OF SCOTTSDALE LOCATION MAP	SCOTTSDALE ENTRADA	JOB NO 1.01.0254301
4550 NORTH 12TH STREET PHOENIX, ARIZONA 85014 TELEPHONE (602) 264-6831	COE & VAN LOO PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE	FIGURE 1

Table 2 – Proposed Land Use Floor Space[1]

Land Use	Base (sf)	Option 1 (sf)	Option 2 (sf)	Option 3 (sf)	Land Area (ac)
Retail	10,600	14,400	42,671	6,120	--
Office	371,620	566,256	391,932	272,700	--
High Density Condos	572,155	338,249	572,008	831,100	--
Hotel	152,396	123,452	179,548	165,268	--
Restaurant	2,100	6,400	6,565	6,120	--
TOTAL	**1,108,871**	**1,048,757**	**1,192,724**	**1,281,308**	**23.22**

[1]*Reference: See Appendix A*

4.0 EXISTING SEWER

Existing sewer locations in the vicinity of the property are shown on Figure 2. Information for these sewers was obtained from City of Scottsdale quarter section maps. The McDowell Road sewer line was recently relined with PVC and a portion of the Scottsdale Road sewer was recently replaced due a collapse of the existing line. As-built drawings were not obtained for this evaluation. These sewers are described below.

An existing 8-inch vitrified clay (VCP) gravity sewer is located within on the east side of the property within an easement on the property. This sewer serves a handful of residences located to the north. This sewer flows south to an existing 10-inch gravity sewer located in McDowell Road. This existing on-site sewer may need to be rerouted in order to maintain service to the existing residents to the north prior to construction of the proposed development.

An existing 10-inch gravity sewer is located in McDowell Road on the south side of the site. This sewer flows east to Scottsdale Road where it connects to an existing 12-inch sewer that flows south to McKellips Road and then east to Miller Road. At Miller Road the 12-inch sewer discharges to a 36-inch sewer, which ultimately conveys sewage to the 91st Avenue wastewater treatment plant.

An existing 18-inch sewer is located at the intersection of McDowell and Scottsdale Roads that flows east in McDowell Road to Miller Road where it discharges to the aforementioned 36-inch sewer. This sewer is not connected to the existing 10-inch McDowell sewer that serves the property.

5.0 DESIGN CRITERIA

Wastewater generation rates for the proposed development were calculated based on the design criteria provided in the *City of Scottsdale Design Standards and Policies Manual (January 2010)* and *City of Scottsdale Draft Water Reuse Master Plan (February 2013).* These criteria are presented in Table 3.

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SCALE NTS

EXISTING SEWER SYSTEM

SCOTTSDALE ENTRADA

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE

JOB NO 1.01.0254301

FIGURE 2

Table 3 – City of Scottsdale Wastewater Design Criteria

Description	Criteria
Design Requirement	Peak Flow[1]
Sewer Capacity	d/D ≤ 0.65[1]
Manning's Coefficient	0.013[1]
Minimum Velocity	2.5 fps when flowing full[1]
Maximum Velocity	10 fps[1]
Average Day Flow (Mixed Use)	1,447 gpad[2]
Peak Flow (Mixed Use)	ADF x 4.5[3]
Average Day Flow (Retail)	561 gpad[2]
Peak Flow (Retail)	ADF x 3.0[1]

[1]*Reference City of Scottsdale Design Standards and Policies Manual (January 2010).*
[2]*Reference: City of Scottsdale Draft Water Reuse Master Plan (February (2013).*
[3]*Assumed based on weighted average of City of Scottsdale Design Standards and Policies Manual (January 2010) peaking factors.*

6.0 WASTEWATER FLOW ESTIMATES

A land use option has not been selected at this time. The intent of this analysis is to perform the water analysis for the alternative that generates the most wastewater. Based on an e-mail from Doug Mann of the City of Scottsdale on January 28, 2016, a mixed use unit factor of 1,447 gallons per acre per day (gpad) was applied to each of the four alternatives making the estimated wastewater generation rates the same for each alternative. Once the acreages for each land use type are determined, applicable unit factors can be applied to each land use type for a more accurate estimation. A retail unit factor 561 gpad was assumed for the former Scottsdale Auto Park.

Table 4 summarizes the estimated wastewater generation rates for each alternative and the estimated wastewater generation rate from the former Scottsdale Auto Park. Calculations for the wastewater generation rates are presented in Appendix B. As shown, the wastewater generation rates are the same for each alternative.

Table 4 – Wastewater Generation Estimates

Alternative	Average Day Flow (gpd)	Peak Flow (gpd)
Base	33,599	151,197
Option 1	33,599	151,197
Option 2	33,599	151,197
Option 3	33,599	151,197
Former Auto Park	10,228	30,683
Net Increase	**23,372**	**120,514**

7.0 OFF-SITE SEWER CAPACITY ANALYSIS

Base information was obtained from the City's sewer quarter section maps the locations and diameters of the existing sewers are shown on Figure 2. Based on the invert elevations shown on

the quarter section maps, a negative slope was found between MH-6 and MH-8 (no invert elevations were given for MH-7). In order to verify if a negative slope exists, CVL surveyed the rim and invert elevations of MH-5, MH-6, MH-7 and MH-8. The survey found that there was no negative slope between the manholes in question. However, rim and invert elevations were found to be vastly different than the Scottsdale quarter section invert elevations by factors that ranged from over 6 feet higher at MH-5 to 1.5 to 1.75 feet higher at MH-8. CVL was later informed by Doug Mann of the City of Scottsdale on February 9, 2016 that the quarter section elevations cannot be relied upon to perform an accurate analysis. He stated that some of the elevations are on the old NAVD29 datum and some are on the NAVD88 datum. The datum for the survey was NAVD88. He recommends that any utility elevations be field verified in order to perform an accurate analysis of the existing sewer capacity. Therefore, until this action is undertaken, CVL cannot perform an accurate analysis of the existing sewer's capacity.

CVL to provide All Necessary surveys.

The City of Scottsdale provided the results of the existing flows from their sewer system model to CVL for the 10-inch McDowell Road reach and a portion of the 12-inch Scottsdale Road reach of the sewer system. This information is provided in Appendix C. Current land uses that contribute flow to this reach are mixed. It is anticipated that this area may be redeveloped in the near future to primarily commercial with some residential uses. The estimated wastewater flow from the redevelopment compared to the existing flow from the Scottsdale model is provided in in Appendix D. Table 5 summarizes the peak capacity that is necessary in the 10-inch McDowell Road sewer based on existing and future conditions.

Table 5 – Peak Flow Analysis

Scenario	Peak Flow (gpd)	
Existing[1]	180,000	--
Scottsdale Entrada[2]	151,197	151,197
Future McDowell Rd Redevelopment[3]	--	649,416
Total	**331,197**	**800,613**

[1] *Provided by City of Scottsdale model analysis.*
[2] *See Appendix B and C.*
[3] *See Appendix C.*

8.0 CONCLUSIONS

1. The property is served via an existing 10-inch gravity sewer that flows east in McDowell Road and then flows south in Scottsdale Road via a 12-inch gravity sewer.

2. An existing 8-inch gravity sewer flows south along the east side of the property that serves residences to the north. This sewer may need to be relocated once an alternative is selected for Scottsdale Entrada.

3. The estimated average day flow is 33,599 gpd and the estimated peak flow 151,197gpd. These flows are the same for all four development alternatives.

4. The estimated average day flow for the former Scottsdale Auto Park is 10,228 gpd and the estimated peak flow is 30,683 gpd.

5. The estimated net increase in flow contributions from Scottsdale Entrada over that of the former Scottsdale Auto Park is 23,372 gpd for average day flow and the peak flow is 120,514 gpd.

6. The capacity of the the 10-inch McDowell Road and 12-inch Scottsdale cannot be determined based on the existing record information. Each manhole along the reach will need to be survey before the capacities of these sewers can be determined with any accuracy.

7. Projected peak flow from Scottsdale Entrada combined with existing peak flow based on the Scottsdale model is 331,197 gpd.

8. If the McDowell Road corridor is redeveloped in the future the combined peak flows from Scottsdale Entrada and the future development is estimated to be 800,613 gpd.

9. Based on the above information the City of Scottsdale will review and authorize off-site capacity in the 10-inch McDowell Road sewer.

APPENDIX A

DEVELOPMENT ALTERNATIVES

64TH & MCDOWELL

SITE PLAN OPTIONS BASE + 1-3

NOVEMBER 30, 2015

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT BASE	SF	UNITS
Residential	572,155	560
Office	371,620	
Retail	10,600	
Restaurant	2,100	
Hotel	152,396	284
Total	1,108,871	

64th St & McDowell

Site Plan Options Base + 1-3

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Base Option

0' 37.5' 75' 150'

NORTH

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 1	SF	UNITS
Residential	338,249	333
Office	566,256	
Retail	14,400	
Restaurant	6,400	
Hotel	123,452	228
Total	1,048,757	

64th St & McDowell
Site Plan Options Base + 1-3
SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Option 1
0' 37.5' 75' 150'

NORTH

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 2	SF	UNITS
Residential	572,008	560
Office	391,932	
Retail	42,671	
Restaurant	6,565	
Hotel	179,548	176
Total	1,192,724	

64th St & McDowell
Site Plan Options Base + 1-3
SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Option 2

0' 37.5' 75' 150'

NORTH

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 3	SF	UNITS
Residential	831,100	812
Office	272,700	
Retail	6,120	
Restaurant	6,120	
Hotel	165,268	308
Total	1,281,307	

64th St & McDowell

Site Plan Options Base + 1-3

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Option 3

0' 37.5' 75' 150'

NORTH

APPENDIX B

WASTEWATER GENERATION CALCULATIONS

WASTEWATER GENERATION RATES
SCOTTSDALE ENTRADA

WASTEWATER GENERATION RATES - BASE							
Proposed Development							
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
Retail	10,600	--	--	--	--	--	--
Office	371,620	--	--	--	--	--	--
HD Condos	572,155	--	560	--	--	--	--
Hotel	152,396	--	284	--	--	--	--
Restaurants	2,100	--	--	--	--	--	--
	1,108,871	23.22	--	1,447	33,599	4.5	151,197
Existing Development							
Parcel No.	**Land Area**		**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
129-09-003V	178,552	4.10	--	561	2,300	3.0	6,899
129-09-003P	178,683	4.10	--	561	2,301	3.0	6,904
129-09-003N	170,450	3.91	--	561	2,195	3.0	6,586
129-09-003Q	111,034	2.55	--	561	1,430	3.0	4,290
129-09-003T	86,205	1.98	--	561	1,110	3.0	3,331
129-09-003U	69,217	1.59	--	561	891	3.0	2,674
129-09-003W	179,789	4.13	--	0	0	3.0	0
129-09-003S	37,723	0.87	--	0	0	3.0	0
	1,011,653	23.22			10,228		30,683
NET INCREASE					**23,372**		**120,514**

WASTEWATER GENERATION RATES
SCOTTSDALE ENTRADA

WASTEWATER GENERATION RATES - OPTION 1							
Proposed Development							
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
Retail	14,400	--	--	--	--	--	--
Office	566,256	--	--	--	--	--	--
HD Condos	338,249	--	560	--	--	--	--
Hotel	123,452	--	284	--	--	--	--
Restaurant	6,400	--	--	--	--	--	--
	1,048,757	23.22	--	1,447	33,599	4.5	151,197
Existing Development							
Parcel No.	**Land Area**		**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
129-09-003V	178,552	4.10	--	561	2,300	3.0	6,899
129-09-003P	178,683	4.10	--	561	2,301	3.0	6,904
129-09-003N	170,450	3.91	--	561	2,195	3.0	6,586
129-09-003Q	111,034	2.55	--	561	1,430	3.0	4,290
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129-09-003U	69,217	1.59	--	561	891	3.0	2,674
129-09-003W	179,789	4.13	--	0	0	3.0	0
129-09-003S	37,723	0.87	--	0	0	3.0	0
	1,011,653	23.22			10,228		30,683
NET INCREASE					**23,372**		**120,514**

WASTEWATER GENRATION RATES
SCOTTSDALE ENTRADA

WASTEWATER GENERATION RATES - OPTION 2							
Proposed Development							
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
Retail	42,671	--	--	--	--	--	--
Office	391,932	--	--	--	--	--	--
HD Condos	572,008	--	560	--	--	--	--
Hotel	179,548	--	284	--	--	--	--
Restaurant	6,565	--	--	--	--	--	--
	1,192,724	23.22	--	1,447	33,599	4.5	151,197
Existing Development							
Parcel No.	**Land Area**		**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
129-09-003V	178,552	4.10	--	561	2,300	3.0	6,899
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129-09-003U	69,217	1.59	--	561	891	3.0	2,674
129-09-003W	179,789	4.13	--	0	0	3.0	0
129-09-003S	37,723	0.87	--	0	0	3.0	0
	1,011,653	23.22			10,228		30,683
NET INCREASE					**23,372**		**120,514**

WASTEWATER GENRATION RATES
SCOTTSDALE ENTRADA

WASTEWATER GENERATION RATES - OPTION 3							
Proposed Development							
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
Retail	6,120	--	--	--	--	--	--
Office	272,700	--	--	--	--	--	--
HD Condos	831,100	--	560	--	--	--	--
Hotel	165,268	--	284	--	--	--	--
Restaurant	6,120	--	--	--	--	--	--
	1,281,308	23.22	--	1,447	33,599	4.5	151,197
Existing Development							
Parcel No.	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADF**	**PF**	**PDF**
	(sf)	**(ac)**	**(no.)**	**(gpad)**	**(gpd)**		**(gpd)**
129-09-003V	178,552	4.10	--	561	2,300	3.0	6,899
129-09-003P	178,683	4.10	--	561	2,301	3.0	6,904
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129-09-003W	179,789	4.13	--	0	0	3.0	0
129-09-003S	37,723	0.87	--	0	0	3.0	0
	1,011,653	23.22			10,228		30,683
NET INCREASE					**23,372**		**120,514**

APPENDIX C

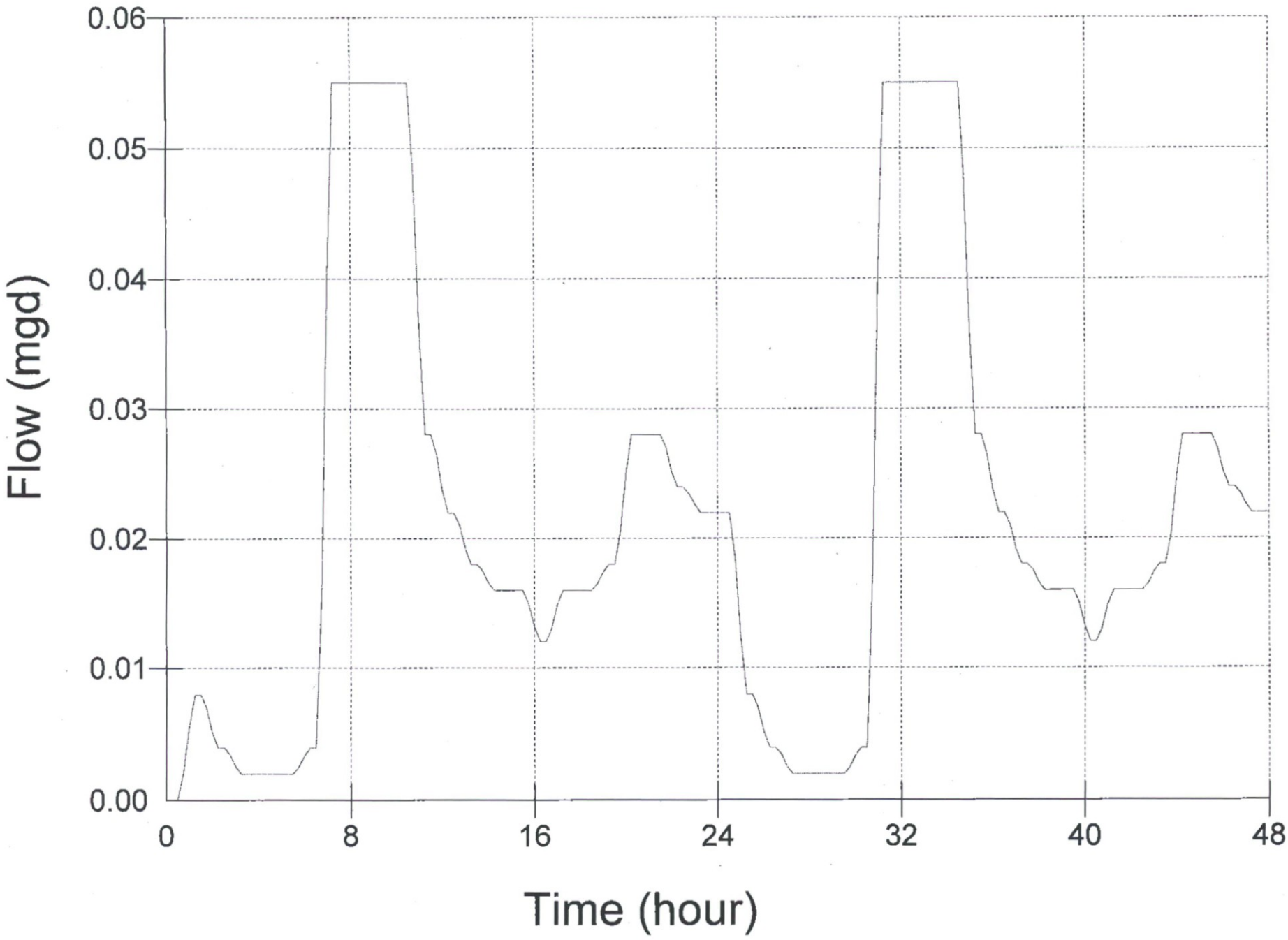
EXISTING OFF-SITE WASTEWATER FLOW

City of Scottsdale Sewer Model
Existing Flow

Run No.	Cumulative Peak Flow (MGD)	Diameter (in)	Location
UND538	0.055	8	E side of Site
POW-025P	0.18	10	SEC of Site and McDowell Rd
POW-020P	0.18	10	McDowell Rd
POW-019P	0.18	10	McDowell Rd
POW-018P	0.18	10	McDowell Rd
POW-017P	0.18	10	McDowell Rd
POW-016P	0.18	10	McDowell Rd
POW-013P	0.35	12	Scottsdale Rd

Based on model graphs provided by Doug Mann, City of Scottsdale, May 27, 2014.

Gravity Main UND538 [2035 DWF]



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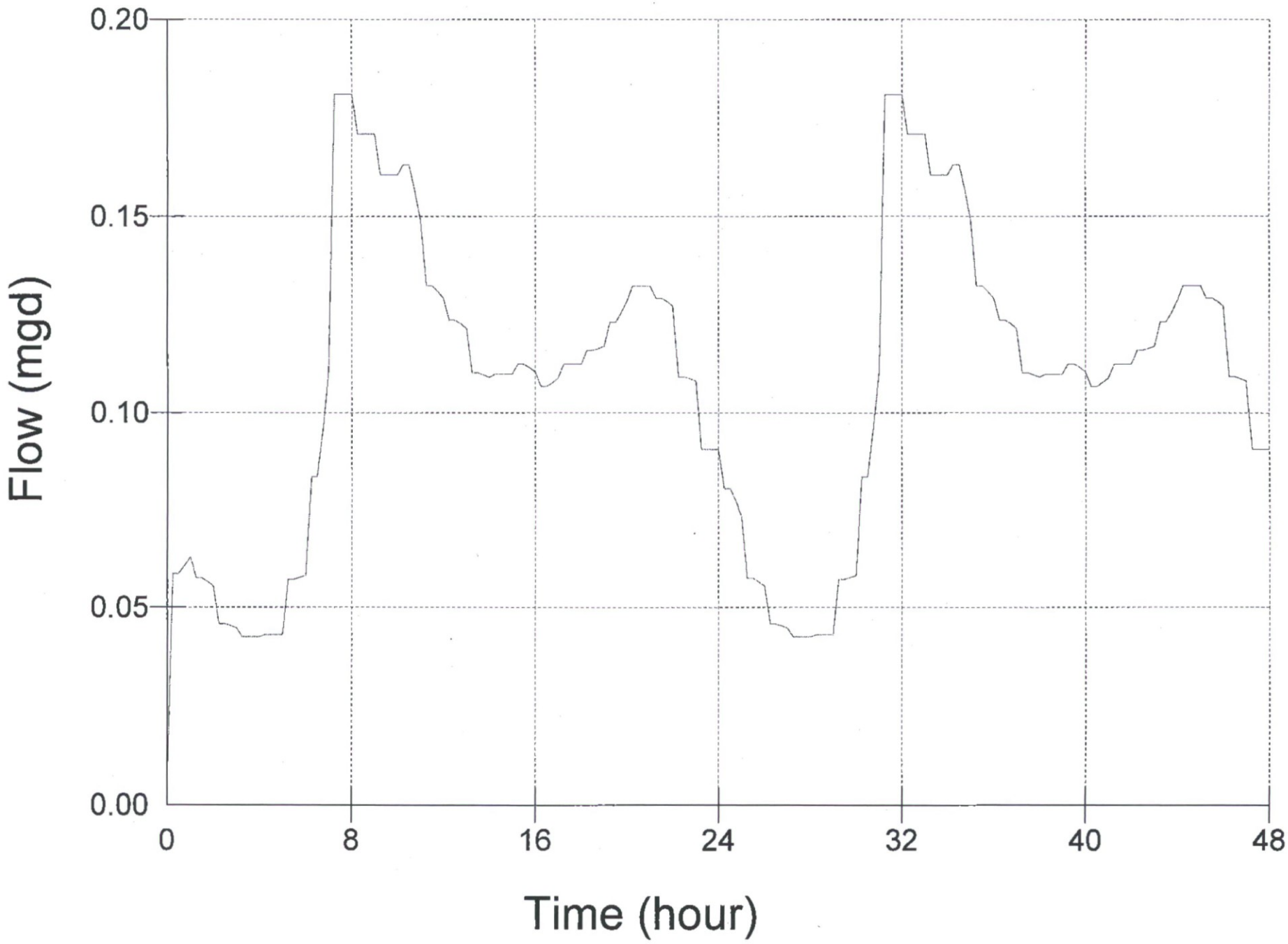

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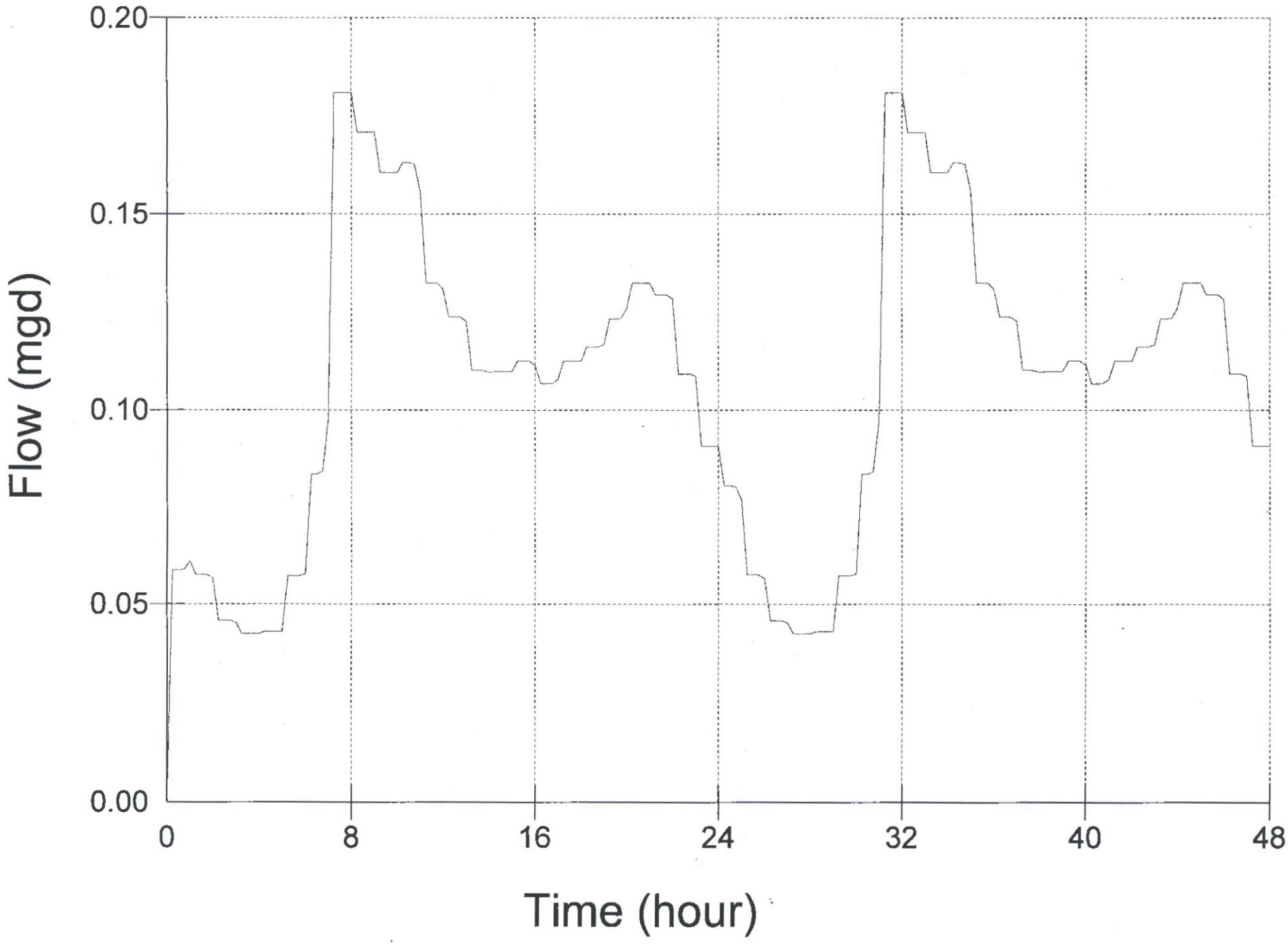

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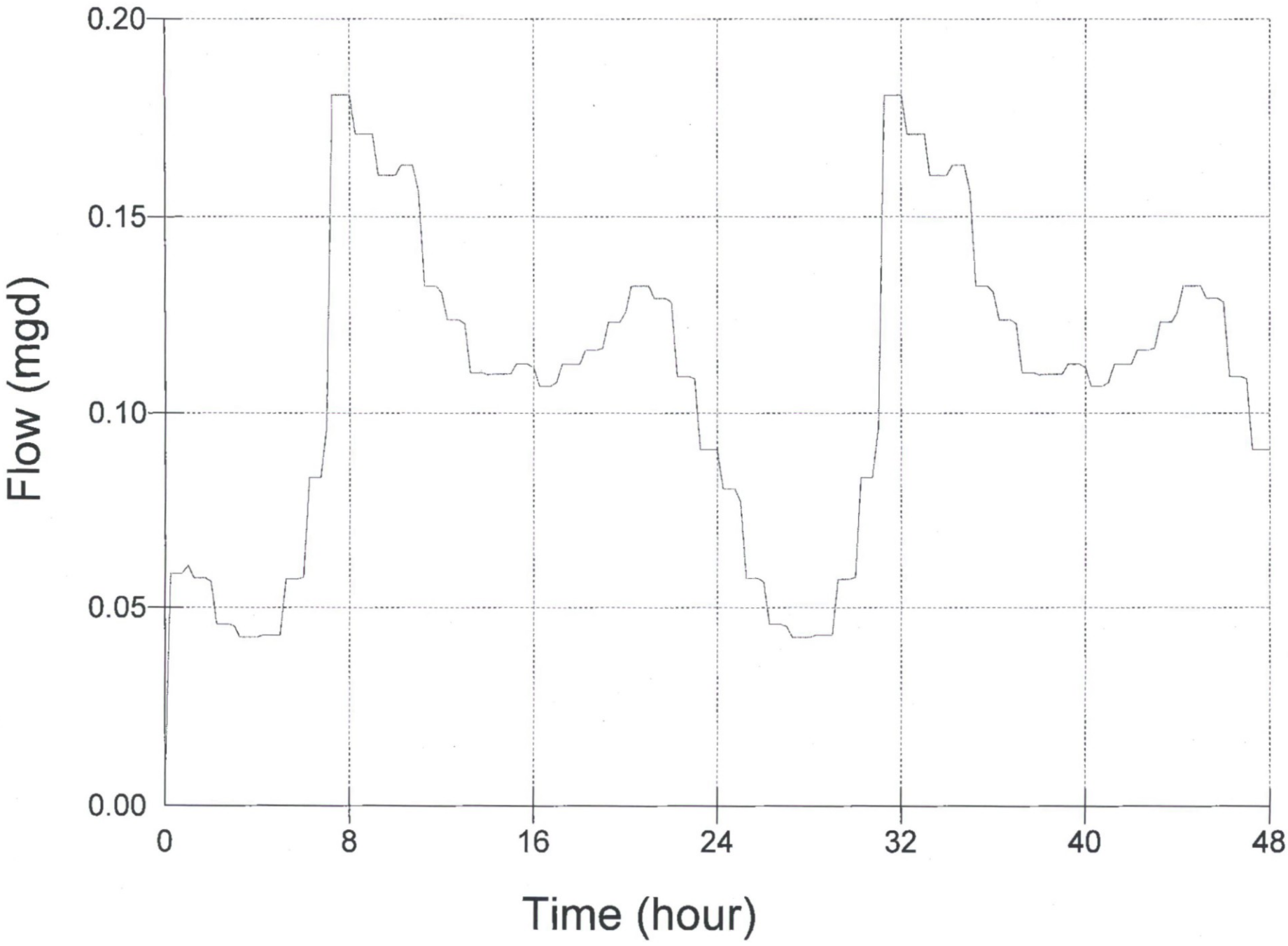

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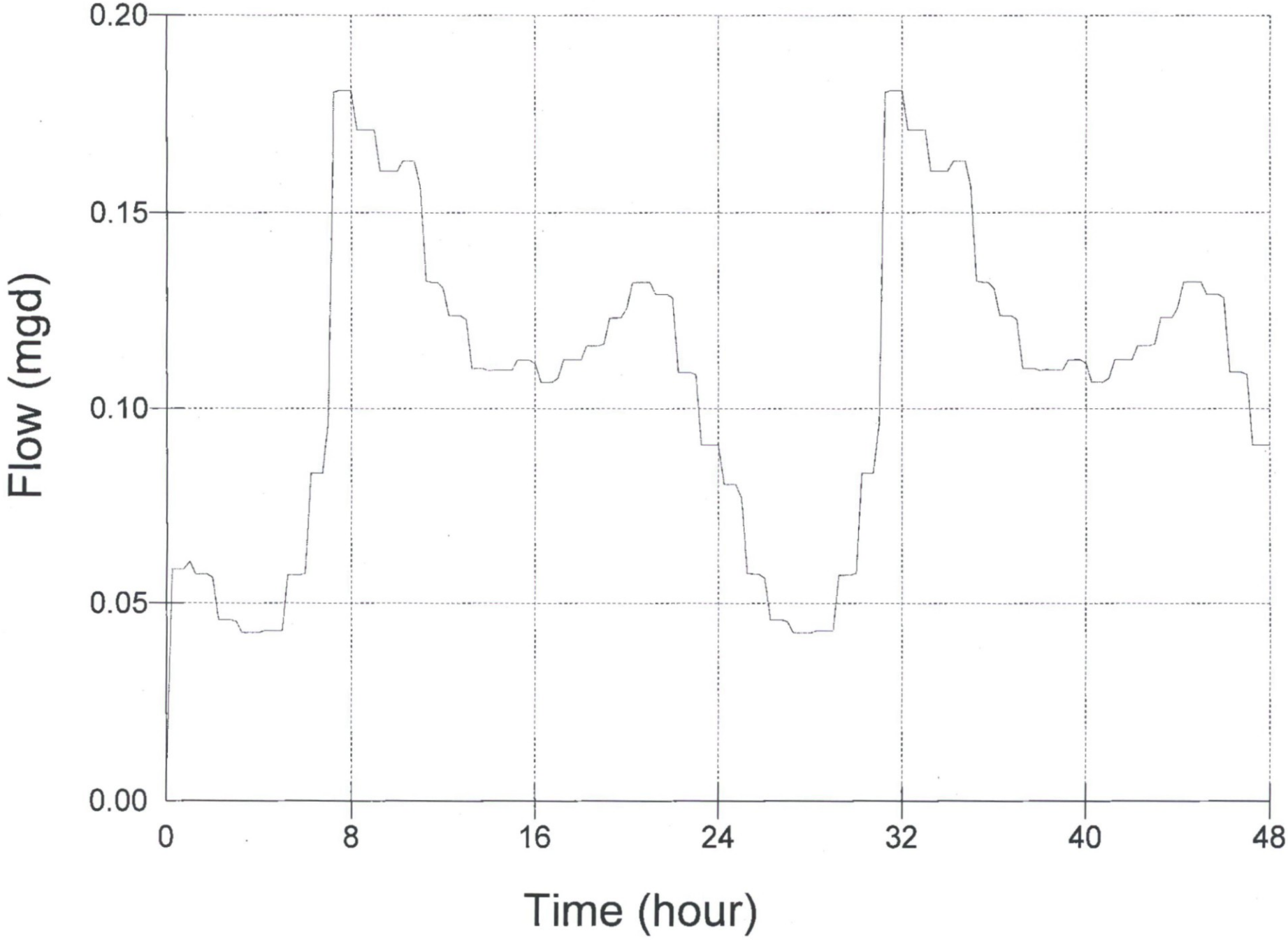

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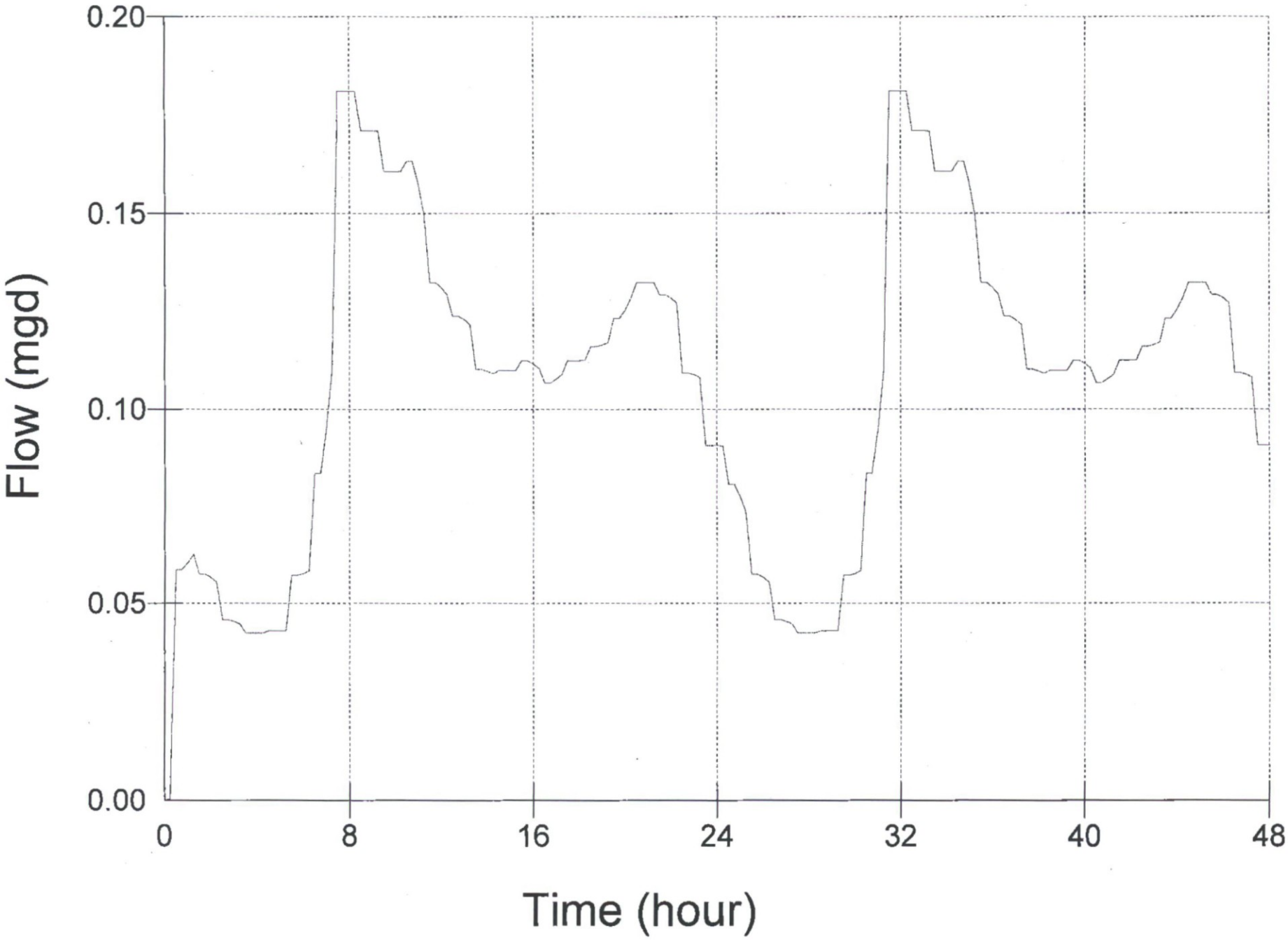
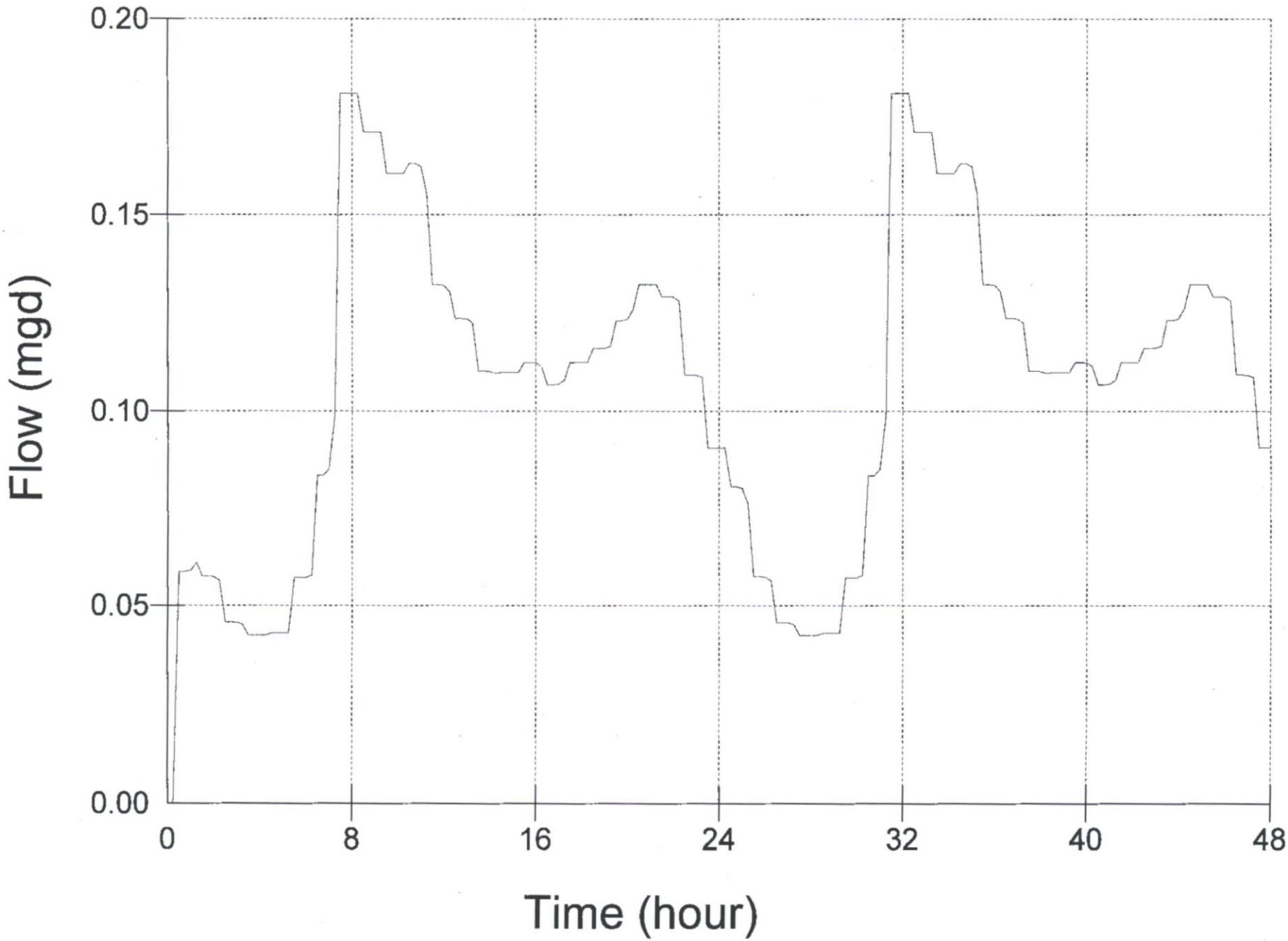
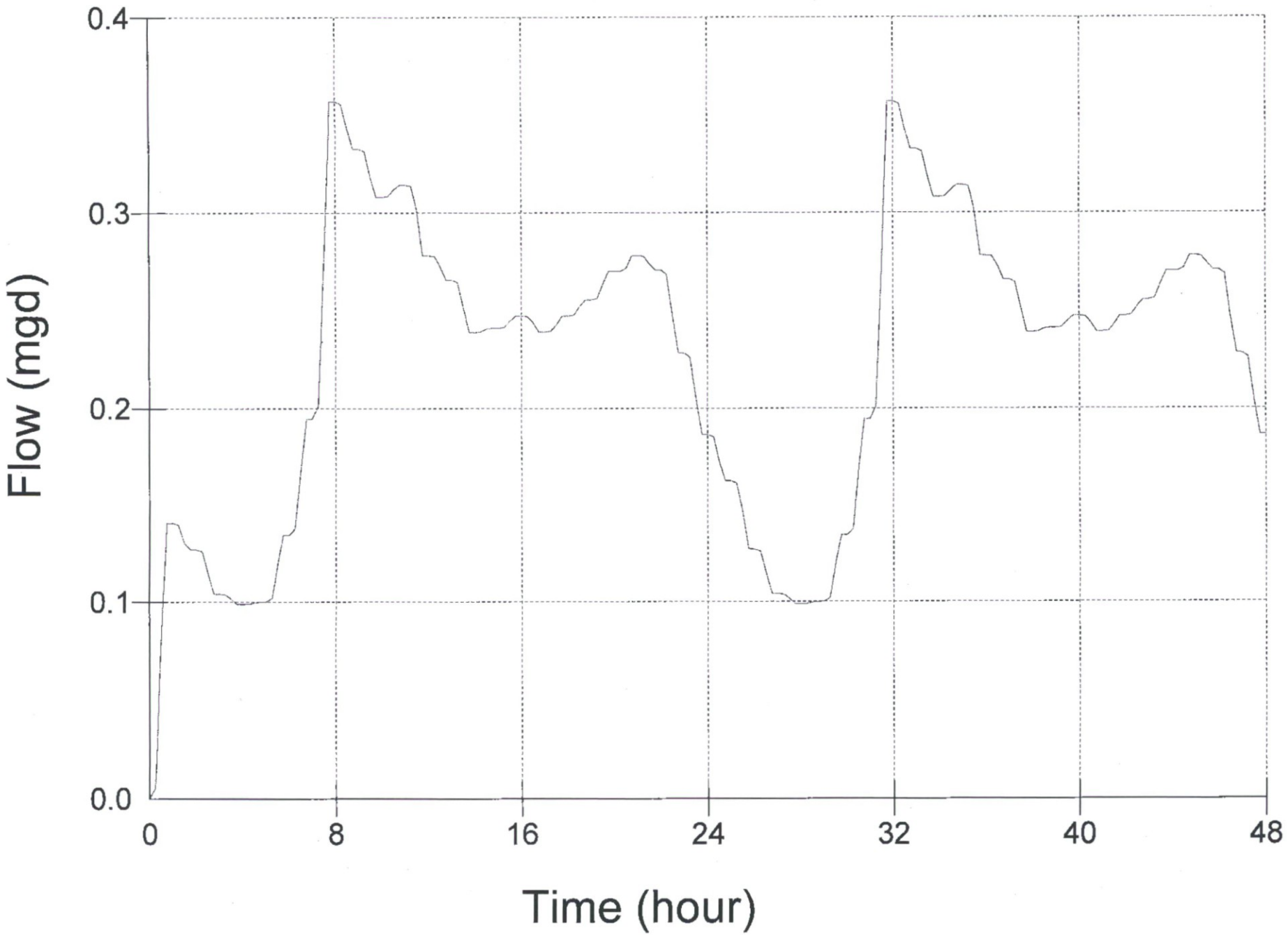


Gravity Main POW-016P [2035 DWF]



Gravity Main POW-013P [2035 DWF]




MODELLED SEWER LINE
UNID 53°0
POW - 025P
20P
19P
18P
17P
16P
13P

McDowell Road Projected Wastewater Flows

Coe and Van Loo Consultants, Inc

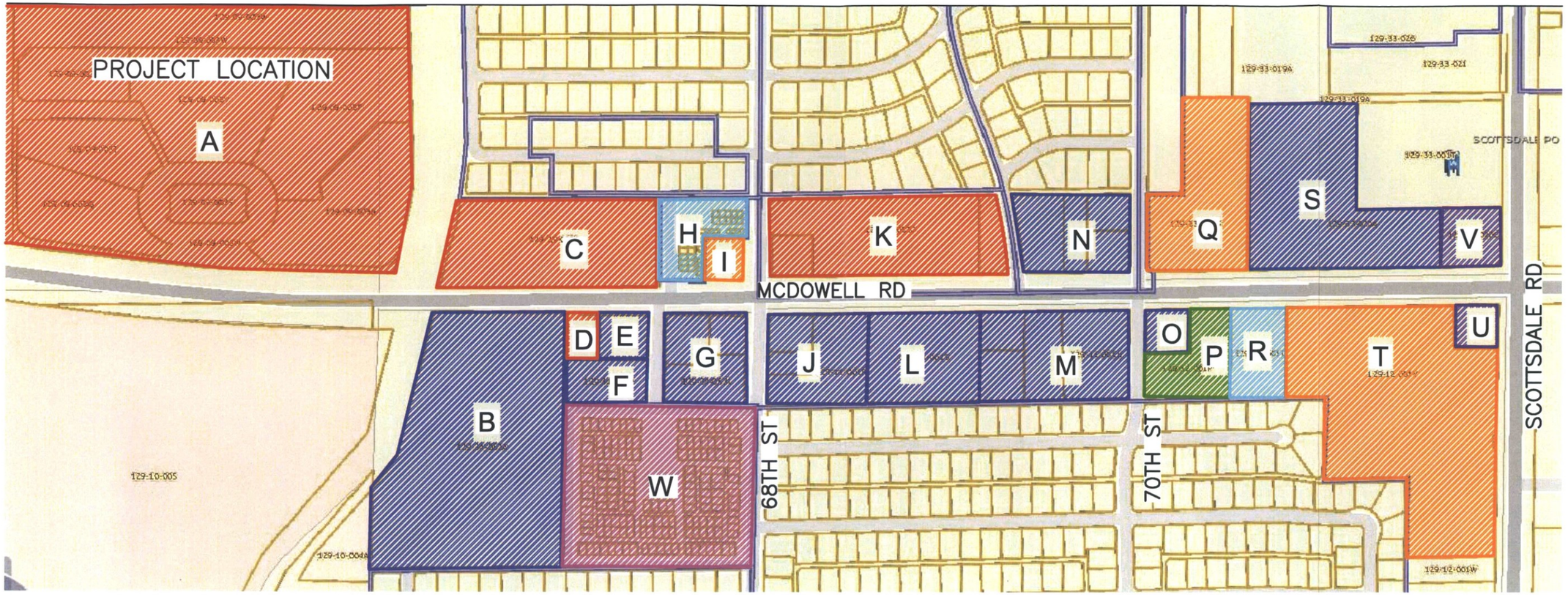
Parcel	Area (ac)	Existing Land Use	Existing Peak Hour Flow (gpd)	Future Land Use	DU's	Unit Flow (gpad) [3]	Peaking Factor [4]	Future Peak Flow (gpd)
A	23.22	Not in Use	--	Scottsdale Entrada		1,447	4.5	151,197
B	11.50	Dealership	--	Commercial		1,173	3	40,469
C	4.99	Not in Use	--	Residential [2]	154	7,715	4	154,000
D	0.39	Not in Use	--	Commercial		1,173	3	1,372
E	0.57	Dealership	--	Commercial		1,173	3	2,006
F	0.95	Dealership	--	Commercial		1,173	3	3,343
G	1.91	Dealership	--	Commercial		1,173	3	6,721
H	0.49	Office Space	--	Commercial		1,173	3	1,724
I	0.47	Gas Station	--	Commercial		1,173	3	1,654
J	2.43	Dealership	--	Commercial		1,173	3	8,551
K	4.64	Not in Use	--	Residential [2]	150	8,082	4	150,000
L	2.67	Dealership	--	Commercial		1,173	3	9,396
M	3.53	Dealership	--	Commercial		1,173	3	12,422
N	2.40	Dealership	--	Commercial		1,173	3	8,446
O	0.52	Dealership	--	Commercial		1,173	3	1,830
P	1.45	Hotel	--	Commercial		1,173	3	5,103
Q	3.83	Commercial	--	Commercial		1,173	3	13,478
R	1.30	Office Space	--	Commercial		1,173	3	4,575
S	6.35	Dealership	--	Commercial		1,173	3	22,346
T	10.45	Commercial	--	Commercial		1,173	3	36,774
U	0.52	Bank	--	Commercial		1,173	3	1,830
V	0.96	Bank	--	Commercial		1,173	3	3,378
W	7.30	Residential	--	Residential [2]	160	5,479	4	160,000
		TOTAL	**180,000 [1]**					**800,613**
							w/o Scottsdale Entrada	**649,416**

[1] Based on modeled existing peak flows in the 10-inch McDowell Road sewer provided by the City of Scottsdale .

[2] Calculated assuming 2.5 persons per DU, 100 gpcd.

[3] Reference: COS Reuse Master Plan (2013).

[4] Reference: COS Design Standards and Policies Manual (2010).



PARCEL	LAND USE	AREA
A	NOT IN USE	20.40 ac
B	DEALERSHIP	11.50 ac
C	NOT IN USE	4.99 ac
D	NOT IN USE	0.39 ac
E	DEALERSHIP	0.57 ac
F	DEALERSHIP	0.95 ac
G	DEALERSHIP	1.91 ac
H	OFFICE SPACE	0.49 ac
I	GAS STATION	0.47 ac
J	DEALERSHIP	2.43 ac
K	NOT IN USE	4.64 ac

PARCEL	LAND USE	AREA
L	DEALERSHIP	2.67 ac
M	DEALERSHIP	3.53 ac
N	DEALERSHIP	2.40 ac
O	DEALERSHIP	0.52 ac
P	HOTEL	1.45 ac
Q	COMMERCIAL	3.83 ac
R	OFFICE SPACE	1.30 ac
S	DEALERSHIP	6.35 ac
T	COMMERCIAL	10.45 ac
U	BANK	0.52 ac
V	BANK	0.96 ac
W	RESIDENTIAL	7.30 ac

LEGEND

- NOT IN USE
- DEALERSHIP
- RESIDENTIAL
- OFFICE SPACE
- COMMERCIAL
- HOTEL
- BANK

SCALE NTS

64TH STREET AND MCDOWELL

EXISTING LAND USE

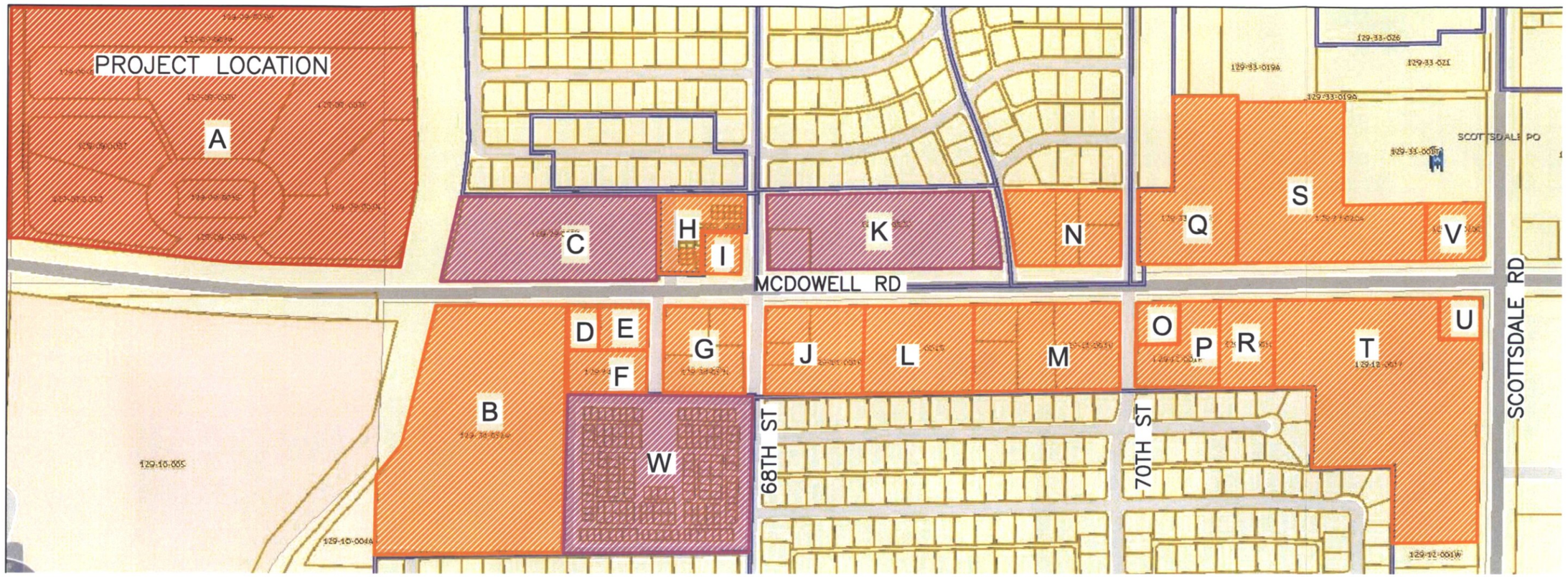
COE & VAN LOO
PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE
4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

JOB NO
1.01.0254301

FIGURE
1

APPENDIX D

PROJECTED OFF-SITE WASTEWATER FLOW



PARCEL	LAND USE	AREA
A	PROJECT LOCATION	20.40 ac
B	COMMERCIAL	11.50 ac
C	RESIDENTIAL	4.99 ac
D	COMMERCIAL	0.39 ac
E	COMMERCIAL	0.57 ac
F	COMMERCIAL	0.95 ac
G	COMMERCIAL	1.91 ac
H	COMMERCIAL	0.49 ac
I	COMMERCIAL	0.47 ac
J	COMMERCIAL	2.43 ac
K	RESIDENTIAL	4.64 ac

PARCEL	LAND USE	AREA
L	COMMERCIAL	2.67 ac
M	COMMERCIAL	3.53 ac
N	COMMERCIAL	2.40 ac
O	COMMERCIAL	0.52 ac
P	COMMERCIAL	1.45 ac
Q	COMMERCIAL	3.83 ac
R	COMMERCIAL	1.30 ac
S	COMMERCIAL	6.35 ac
T	COMMERCIAL	10.45 ac
U	BANK	0.52 ac
V	BANK	0.96 ac
W	RESIDENTIAL	7.30 ac

LEGEND

- PROJECT LOCATION
- RESIDENTIAL
- COMMERCIAL

SCALE NTS

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64TH STREET AND MCDOWELL

COE & VAN LOO
PLANNING•ENGINEERING•LANDSCAPE ARCHITECTURE

FUTURE LAND USE

4550 NORTH 12TH STREET
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

JOB NO
1.01.0254301

FIGURE
2

Acceptable For ZN CASE

City of Scottsdale
Water Resources Administration
9379 E. San Salvador
Scottsdale, AZ 85258

Submit FINAL REPORTS Prior to Imprvmt plans.
Doug Mann 2-25-16

WATER REPORT

PRELIMINARY

February 5, 2016

Revised February 10, 2016

Scottsdale Entrada

64th Street and McDowell Road

Scottsdale, Arizona

CVL CONSULTANTS

Job # 1.01.0254303

Prepared for:
SunChase Holdings, Inc.
5665 N. Scottsdale Road
Suite 135
Scottsdale, Arizona 85250
Contact: Todd Tupper
480.398.2626

Prepared by:
CVL Consultants
4550 N 12th Street
Phoenix, AZ 85014
Contact: Fred Renn, PE
602.264.6831

5-ZN-2016
2/18/16

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APPENDICES

1.0 INTRODUCTION

SunChase Holdings, Inc. plans to redevelop 23 acres of nearly 28 acres of land formerly known as the Scottsdale Auto Park into the mixed use development of Scottsdale Entrada. Currently, SunChase Holdings has prepared four development alternatives (one Base and three Options) that are being considered. The property is located on the northeast corner of 64th Street and McDowell Road in Scottsdale, Arizona. This report calculates the water demands for four proposed alternatives and analyzes the option that will generate the greatest demand in detail.

2.0 SITE DESCRIPTION

Scottsdale Entrada is a 23 acre property located on the northeast corner of 64th Street and McDowell Road in Scottsdale, Arizona in Section 34, Township 2 North, Range 4 East of the Gila River Baseline and Meridian, Maricopa County, Arizona. The property slopes from the northwest to the southeast and ranges in elevation from approximately 1280 to 1270 feet above mean sea level (MSL). The property is bounded by residential property to the north, the Crosscut Canal to the east, McDowell Road to the south and 64th Street to the west (see Figure 1).

The existing improvements are to be demolished and a mixed use center to be constructed. As the name suggests, the former Scottsdale Auto Park property was the location of a number of automobile dealerships. The property is comprised eight separate parcels with improvements typical of an automobile dealership. These improvements included: showrooms, retail stores, automotive centers, offices, storage warehouses and parking lots and driveways. The parcel and building areas of each parcel are presented in Table 1.

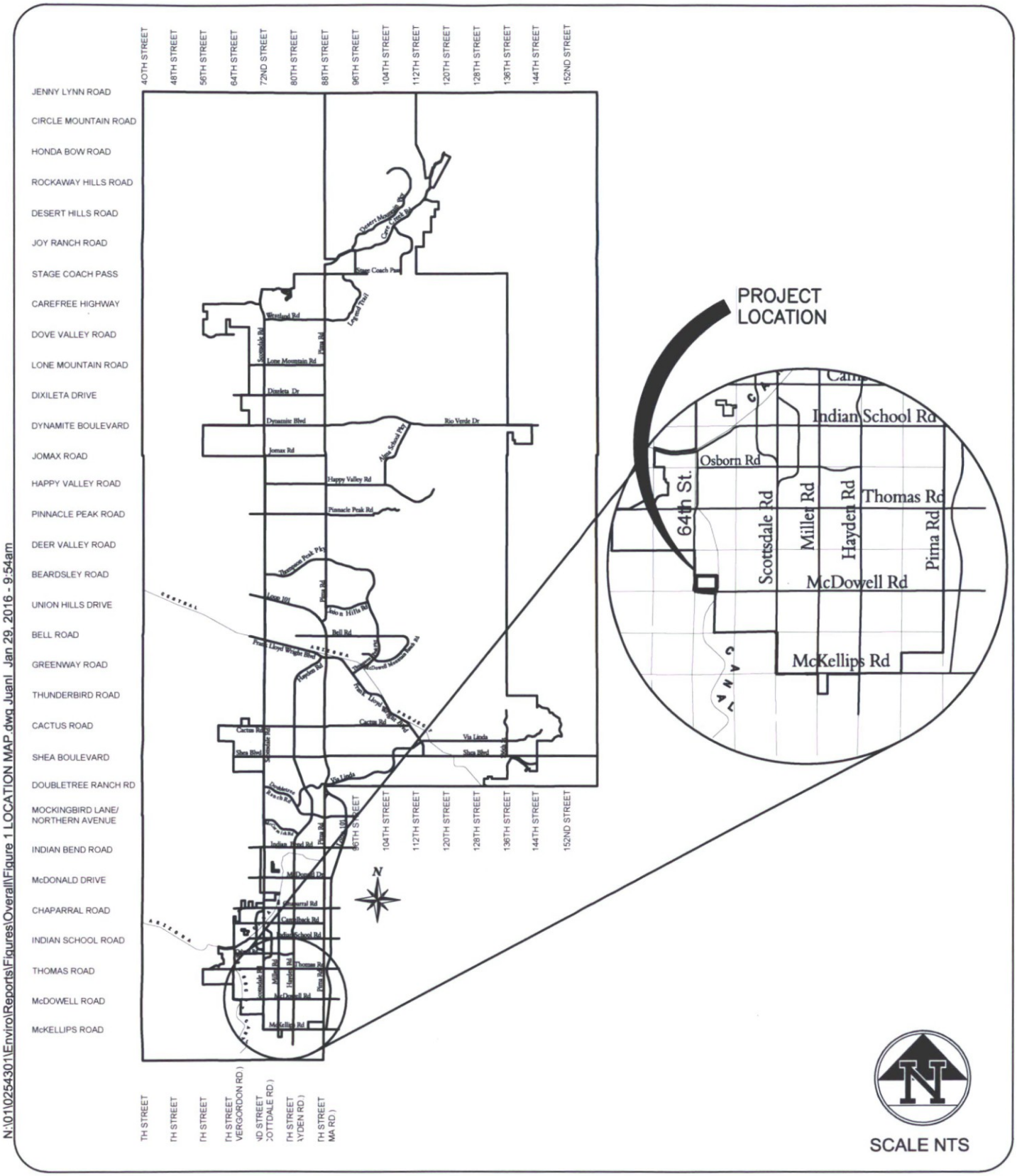
Table 1 - Existing Land Use Areas[1]

Parcel No.	Land Area		Floor Space
	(sf)	(ac)	(sf)
129-09-003V	178,552	4.10	53,520
129-09-003P	178,683	4.10	22,137
129-09-003N	170,450	3.91	36,554
129-09-003Q	111,034	2.55	27,537
129-09-003T	86,205	1.98	21,692
129-09-003U	69,217	1.59	0
129-09-003W[2]	377,889	8.68	1
129-09-003S	37,723	0.87	0
TOTAL	**1,209,753**	**27.77**	**161,441**
Open Space[2]	198,100	4.55	0
Net Total		**23.22**	**161,441**

[1] *Reference: Maricopa County Assessor's Parcel Map/Property Data*
[2] *Approximatey 4.55 acres of Parcel 129-09-003W along the northern boundary of the property is to remain as open space.*

3.0 DEVELOPMENT ALTERNATIVES

Four development alternatives are currently being evaluated (see Appendix A). Table 2 summarizes the uses for each alternative.



N:\01\0254301\Enviro\Reports\Figures\Overall\Figure 1 LOCATION MAP.dwg Juanl Jan 29, 2016 - 9:54am

CITY OF SCOTTSDALE LOCATION MAP	SCOTTSDALE ENTRADA	JOB NO 1.01.0254301
4550 NORTH 12TH STREET PHOENIX, ARIZONA 85014 TELEPHONE (602) 264-6831	COE & VAN LOO PLANNING • ENGINEERING • LANDSCAPE ARCHITECTURE	FIGURE 1

INCLUDE EXHIBIT OF EXMETERS / SERIAL #s / SIZES

Table 2 – Proposed Land Use Floor Space[1]

Land Use	Base (sf)	Option 1 (sf)	Option 2 (sf)	Option 3 (sf)	Land Area (ac)
Retail	10,600	14,400	42,671	6,120	--
Office	371,620	566,256	391,932	272,700	--
Residential	572,155	338,249	572,008	831,100	--
Hotel	152,396	123,452	179,548	165,268	--
Restaurant	2,100	6,400	6,565	6,120	--
TOTAL	**1,108,871**	**1,048,757**	**1,192,724**	**1,281,308**	**23.22**

[1]*Reference: See Appendix A*

4.0 EXISTING WATER UTILITIES

Existing waterline locations in the vicinity of the property are shown on Figure 2. Information for these waterlines was obtained from City of Scottsdale quarter section maps. The physical condition of the existing waterlines was not investigated, and as-built drawings were not obtained for this evaluation. These waterlines are described below.

As shown on Figure 2, existing 12-inch water mains are located in 64th Street and McDowell Road. Additionally, 6-inch and 8-inch water mains serve the former dealerships within the site. Both the existing on-site and off-site lines are noted as being asbestos cement (ACP) waterlines. It is assumed that the on-site waterlines will require removal and disposal in accordance with Maricopa County and OSHA requirements prior to construction of the proposed development.

5.0 DESIGN CRITERIA

Water demands for the Scottsdale Entrada were calculated based on the design criteria provided in the *City of Scottsdale's Design Standards and Policies Manual (January 2010).* These criteria are presented Table 3.

Table 3 – City of Scottsdale Water Design Criteria

Description	Criteria
Maximum Headloss	10 ft Head/1,000 ft pipe length
Maximum Velocity	<5.0 ft/s
Maximum Fire Flow Velocity	<10.0 ft/s
Sizing Capacity	Larger of PHD or MDD + FF
Design Pressure	50 to 120 psi
Fire Flow Pressure	30 psi
Average Day Demand (Retail)	ADD = 0.8 gpd/sf
Average Day Demand (Office)	ADD = 0.6 gpd/sf
Average Day Demand (Residential)	ADD = 185.3 gpd/room
Average Day Demand (Resort Hotel)	ADD = 446.3 gpd/room
Average Day Demand (Restaurant)	ADD = 1.3 gpd/sf
Maximum Day Demand	MDD = ADD x 2.0
Peak Hour Demand	PHD = ADD x 3.5
Fire Flow Demand	International Fire Code

N:\01\02543011\Enviro\Reports\Water\Figure 2 EXISTING WATER SYSTEM.dwg CassandraA Feb 05, 2016 - 12:06pm

LEGEND

EX. WATERLINE (SIZE PER PLAN)

VALVE

CAP

FIRE HYDRANT

SCALE NTS

FIGURE 2	JOB NO 1.01.0254301	EXISTING WATER SYSTEM
		4550 NORTH 12TH STREET PHOENIX, ARIZONA 85014 TELEPHONE (602) 264-6831

SCOTTSDALE ENTRADA

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6.0 WATER DEMAND ESTIMATES

A land use option has not been selected at this time. The intent of this analysis is to perform the water analysis for the alternative that generates the most water demand. Table 4 summarizes the estimated demands for each alternative. Calculations for the demands are presented in Appendix B.

Table 4 - Water Demand Estimates

Alternative	Average Day Demand	Maximum Day Demand		Peak Hour Demand		Fire Flow	MDD + FF
	(gpd)	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)	(gpm)
Pre-Existing	17,091	34,183	24	59,820	42	1,500	1,524
Base	488,387	976,774	678	1,709,355	1,187	2,500	3,178
Option 1	537,141	1,074,282	735	1,879,993	1,306	2,250	2,984
Option 2	483,835	967,671	672	1,693,424	1,176	3,000	3,672
Option 3	498,744	997,487	693	1,745,603	1,212	3,000	3,693

As shown the alternative with the greatest demands is Option 3. Therefore, Option 3 will be the focus of further analysis in this report. The net increase in demand for Option 3 over the Pre-Existing Demand is shown in Table 5.

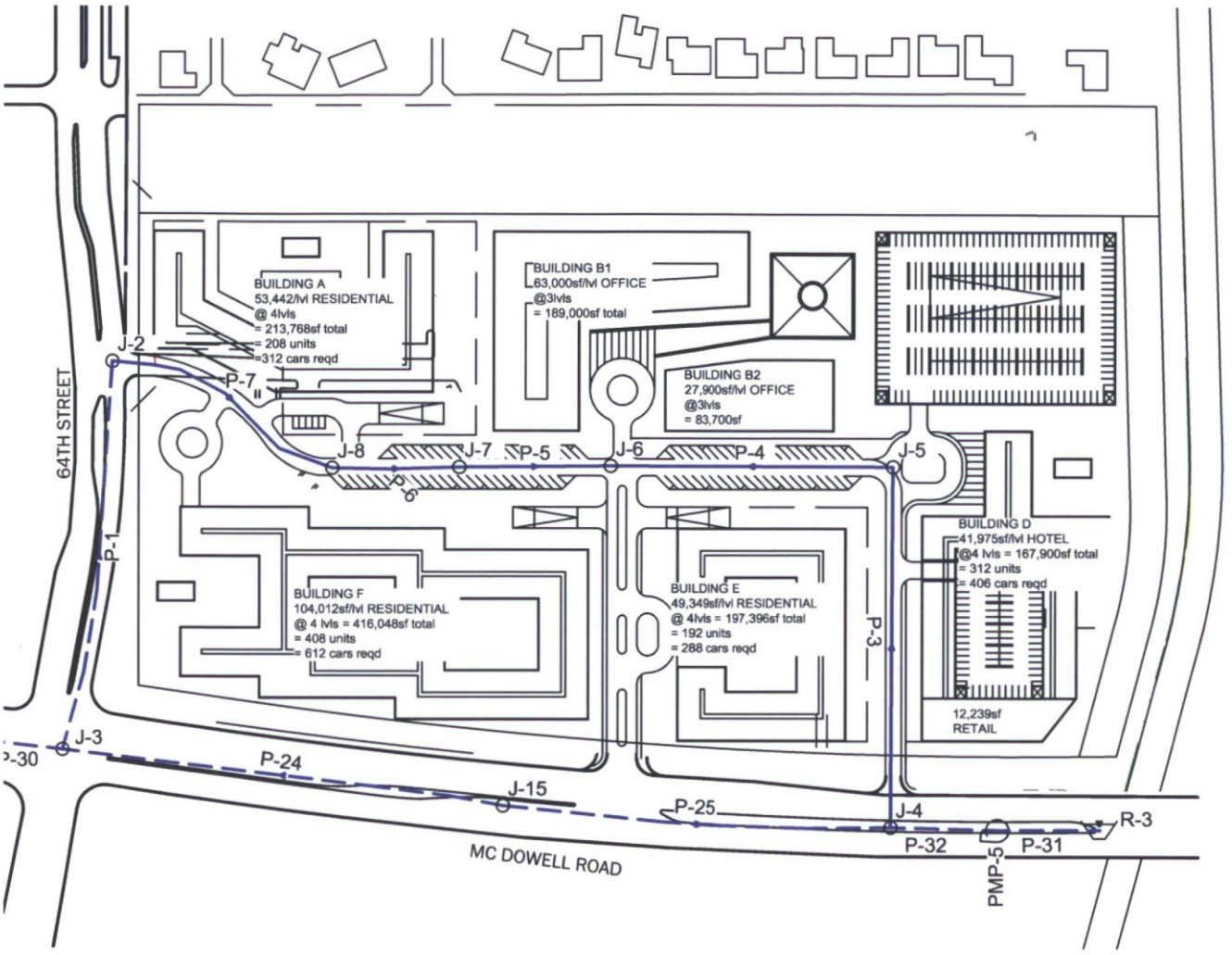
Table 5 – Water Demand Net Increase – Option 3

Alternative	Average Day Demand	Maximum Day Demand		Peak Hour Demand		Fire Flow	MDD + FF
	(gpd)	(gpd)	(gpm)	(gpd)	(gpm)	(gpm)	(gpm)
Option 3	498,744	997,487	693	1,745,603	1,212	3,000	3,693
Pre-Existing	17,091	34,183	24	59,820	42	1,500	1,524
Net Increase	**481,652**	**963,305**	**669**	**1,685,783**	**1,171**	**1,500**	**2,169**

7.0 MODELING RESULTS

The water system was modeled utilizing WaterCAD®. Flow and pressure information required for the model was obtained by performing hydrant testing in the vicinity of the site. The hydrant testing and WaterCAD® results are provided in Appendix C and D, respectively.

The proposed development would be served with water by providing a 12-inch loop through the property that would connect to the existing 12-inch water main in 64th Street and to the existing 12-inch water main in McDowell Road as shown on Figure 3. Based on the results of the flow testing, a static pressure of 72 psi is available. The tallest buildings are proposed to be 4-stories in height; therefore, water pressures at each floor were determined. For the purposes of this analysis it was assumed that each floor would be 14 feet in height. The modeling results are summarized in Tables 6 and 7.



LEGEND

EXISTING 12" WATERLINE

PROPOSED 12" WATERLINE

R-1 RESERVOIR ID

J-1 JUNCTION ID

PMP-1 PUMP ID

SCALE 1" = 3,000'

FIGURE 3

4550 North 12th Street
Phoenix, Arizona 85014
Phone 602-264-6831
http://www.cvlci.com

SCOTTSDALE ENTRADA

WATER SYSTEM LAYOUT

CVL CONSULTANTS

1.01.0245301

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Table 6 – WaterCAD® Analysis Results – Option 3

Demand Scenario	Demand (gpm)	Pressure (psig)				Max. Velocity (fps)	Pipe ID
		Ground	2nd Floor	3rd Floor	4th Floor		
ADD	346						
J-5		74.8	68.7	62.6	56.5		
J-6		73.9	67.8	61.7	55.6	0.98	P-28
J-7		70.5	64.4	58.3	52.2		
J-8		67.9	61.8	55.7	***49.6***		
MDD	693						
J-5		74.3	68.2	62.1	56		
J-6		73.4	67.3	61.2	55.1	1.96	P-28
J-7		69.9	63.8	57.7	51.6		
J-8		67.3	61.2	55.1	***49.0***		
PHD	1,212						
J-5		72.9	66.8	60.7	54.6		
J-6		72.0	65.9	59.8	53.7	3.42	P-28
J-7		68.6	62.5	56.4	50.3		
J-8		66.0	59.9	53.8	***47.7***		

Bold Italics = *Do not meet minimum pressure requirement of 50 psi assuming each story is 14 feet in height.*

Table 7 – Fire Flow WaterCAD® Analysis Results – Option 3

Applied Nodes	MDD +FF (gpm)	Pressure (psig)		Velocity (fps)	
		Minimum[1]	Node	Maximum	Pipe
J-5	3,690	52.0	J-2	6.42	P-3
J-6	3,690	51.3	J-8	5.64	P-3
J-7	3,690	50.9	J-8	5.25	P-3
J-8	3,690	50.6	J-8	5.55	P-1

[1] *Fourth floor pressure at the node with the lowest pressure during max day plus fire flow is 32.3 psi. The required 30 psi can be met for fourth floor elevations for all nodes within the proposed development.*

As shown, the results indicate that during maximum day demand plus fire flow; the nodes within the proposed development (Nodes J-5, J-6, J-7 and J-8) meet the City's minimum pressure requirement of 30 psi on all floors. At peak hour demand minimum pressure is greater than 50 psi requirement on all floors except for the fourth floor at J-8 where the pressure slightly below the 50 psi requirement.

It is noted that the City's maximum velocity requirements of less than 5 fps for peak hour demand and less than 10 fps for maximum day demand plus fire flow were not exceeded for any of the modeled scenarios.

8.0 CONCLUSIONS

1. The property is served via existing off-site 12-inch ACP water mains in 64th Street and McDowell Road, and on-site via a network of 6-inch and 8-inch ACP waterlines.

2. The existing on-site water lines will require removal and disposal in accordance with Maricopa County and OSHA requirements.

3. The average day demand for Option 3 is projected to be 498,744 gpd, and the maximum day and peak hour demands are estimated at 693 gpm and 1,212 gpm respectively.

4. The net increase in the average day demand of Option 3 over the pre-existing average day demand of the former Scottsdale Auto Park is 483,685 gpd, and the maximum day and peak hour demand net increases are estimated at 672 gpm and 1,176 gpm, respectively.

5. Based on the assumption that the proposed structures will be sprinklered buildings of Type 1A or Type 1B construction, the estimated fire flow requirement for the proposed development is 3,000 gpm.

6. A 12-inch water line will need to be constructed onsite to provide a loop through the proposed development.

7. Based on recent flow testing, a static pressure of 72 psi is available from the existing 12-inch system.

8. The City's minimum pressure requirement of 30 psi is achieved for Option 3 on all floors of the proposed development for the maximum day plus fire flow demand scenario.

9. The City's minimum pressure requirement of 50 psi is achieved on all floors for all the demand scenarios except the fourth floor at Node J-8 on the northwest corner of the site for Option 3. At this location the pressures are slightly less than the 50 psi requirement. It is noted that the story heights were conservatively estimated at 14 feet and it is likely the City would like grant a waiver of the pressure requirement at this location or the floor heights could be reduced.

APPENDIX A

DEVELOPMENT ALTERNATIVES

64TH & MCDOWELL

SITE PLAN OPTIONS BASE + 1-3

NOVEMBER 30, 2015

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT BASE	SF	UNITS
Residential	572,155	560
Office	371,620	
Retail	10,600	
Restaurant	2,100	
Hotel	152,396	284
Total	1,108,871	

64th St & McDowell

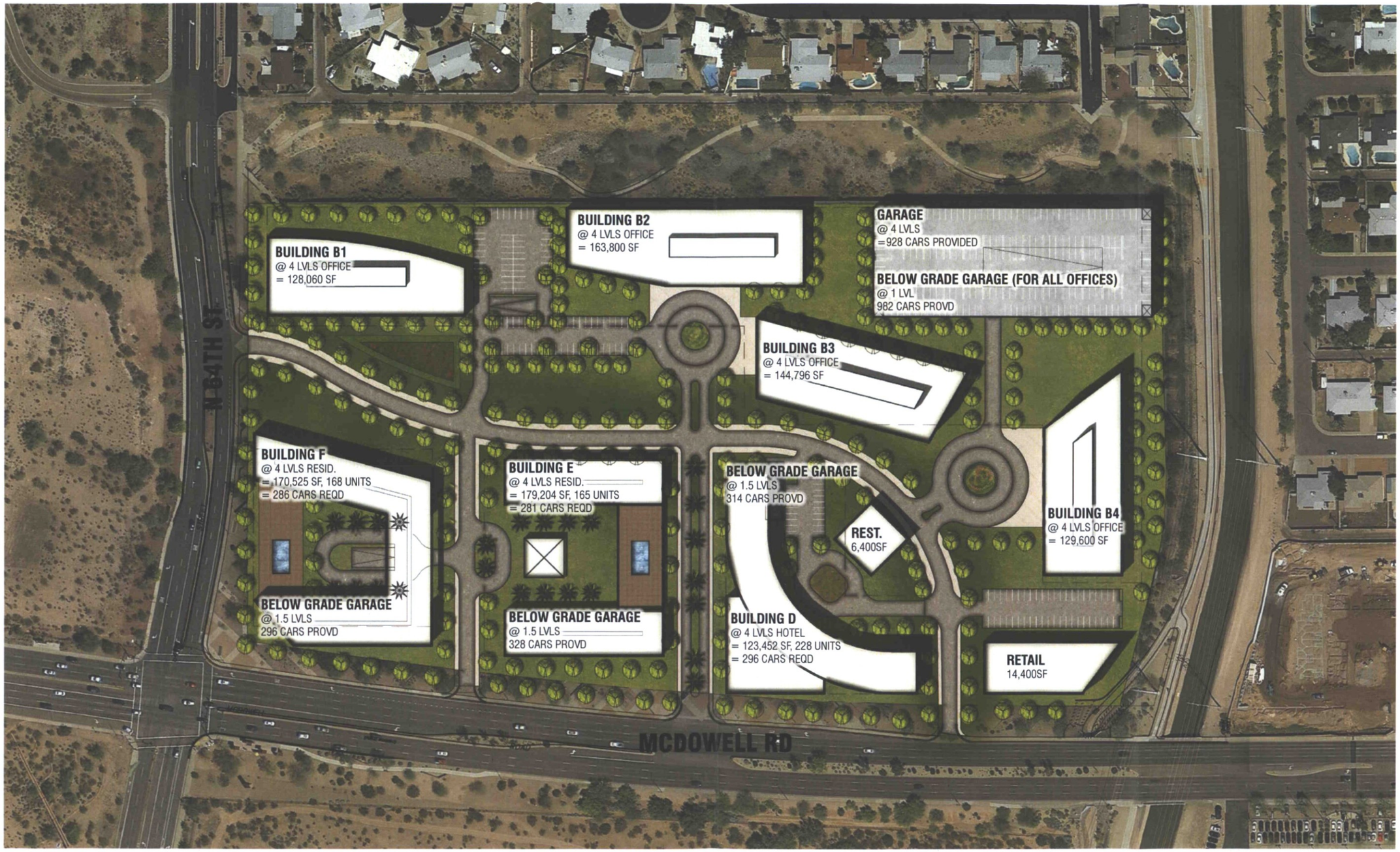
Site Plan Options Base + 1-3

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Base Option

0' 37.5' 75' 150'

NORTH



NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 1	SF	UNITS
Residential	338,249	333
Office	566,256	
Retail	14,400	
Restaurant	6,400	
Hotel	123,452	228
Total	1,048,757	

64th St & McDowell

Site Plan Options Base + 1-3

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Option 1

0' 37.5' 75' 150'

NORTH

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 2	SF	UNITS
Residential	572,008	560
Office	391,932	
Retail	42,671	
Restaurant	6,565	
Hotel	179,548	176
Total	1,192,724	

64th St & McDowell

Site Plan Options Base + 1-3

Option 2

0' 37.5' 75' 150'

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

NORTH

NELSEN PARTNERS
ARCHITECTS & PLANNERS

SUNCHASE HOLDINGS, INC

SUMMARY OPT 3	SF	UNITS
Residential	831,100	812
Office	272,700	
Retail	6,120	
Restaurant	6,120	
Hotel	165,268	308
Total	1,281,307	

64th St & McDowell

Site Plan Options Base + 1-3

SCOTTSDALE, AZ | #31377 | NOVEMBER 30, 2015

Option 3

0' 37.5' 75' 150'

NORTH

APPENDIX B

WATER DEMAND CALCULATIONS

WATER DEMAND CALCULATIONS
SCOTTSDALE ENTRADA

WATER DEMANDS - BASE

Proposed Development

Land Use	Floor Space	Land Area	Rooms	Unit Factor	ADD	MDD PF	MDD		PHD PF	PHD		FF[1]	MDD + FF	Lgest Bldg Floor Space
	(sf)	(ac)	(no.)	(gpd/unit)	(gpd)		(gpd)	(gpm)		(gpd)	(gpm)	(gpm)	(gpm)	(sf)
Retail	10,600	--	--	0.8	8,480	2.0	16,960	11.8	3.5	29,680	20.6	--	--	10,600
Office	371,620	--	--	0.6	222,972	2.0	445,944	309.7	3.5	780,402	541.9	--	--	179,860
Residential	572,155	--	560	227.6	127,456	2.0	254,912	177.0	3.5	446,096	309.8	--	--	218,750
Hotel	152,396	--	284	446.3	126,749	2.0	253,498	176.0	3.5	443,622	308.1	--	--	152,396
Restaurants	2,100	--	--	1.3	2,730	2.0	5,460	3.8	3.5	9,555	6.6			2,100
	1,108,871	23.22			488,387		976,774	678.3		1,709,355	1187.1	2,500	3,178	

Pre-Existing Development

Parcel No.	Land Area		Rooms	Unit Factor	ADD	MDD PF	MDD		PHD PF	PHD		FF[2]	MDD + FF	Lgest Bldg Floor Space
	(sf)	(ac)	(no.)	(gpd/unit)	(gpd)		(gpd)	(gpm)		(gpd)	(gpm)	(gpm)	(gpm)	(sf)
129-09-003V	178,552	4.10	--	1,027.0	4,210	2.0	8,419	5.8	3.5	14,734	10.2	--	--	53,295
129-09-003P	178,683	4.10	--	1,027.0	4,213	2.0	8,426	5.9	3.5	14,745	10.2	--	--	11,954
129-09-003N	170,450	3.91	--	1,027.0	4,019	2.0	8,037	5.6	3.5	14,065	9.8	--	--	21,526
129-09-003Q	111,034	2.55	--	1,027.0	2,618	2.0	5,236	3.6	3.5	9,162	6.4	--	--	18,705
129-09-003T	86,205	1.98	--	1,027.0	2,032	2.0	4,065	2.8	3.5	7,113	4.9	--	--	13,751
129-09-003U	69,217	1.59	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003W[3]	179,467	4.12	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003S	37,723	0.87	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
	1,011,331	23.22			17,091		34,183	23.7		59,820	41.5	1,500	1,524	
NET INCREASE					**471,296**		**942,592**	**655**		**1,649,536**	**1,145.5**	**1,000**	**1,655**	

[1]Per 2012 IFC Type 1A and 1B construction are assumed for the proposed development. The largest building is a 218,750 sf, 4-story, sprinklered, residential building. FF = 5,000 gpm/2 = 2,500 gpm.

[2]Per 2012 IFC Type 1A and 1B construction are assumed for the existing development. The largest building is 53,295 sf at APN 129-09-003V, assumed to be sprinklered . FF = 1,500 gpm minimum.

[3]Approximatey 4.55 acres of Parcel 129-09-003W along the northern boundary of the property is to remain as open space.

WATER DEMAND CALCULATIONS
SCOTTSDALE ENTRADA

WATER DEMANDS - OPTION 1														
Proposed Development														
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADD**	**MDD PF**	**MDD**		**PHD PF**	**PHD**		**FF[1,2]**	**MDD + FF**	**Lgest Bldg Floor Space**
	(sf)	**(ac)**	**(no.)**	**(gpd/unit)**	**(gpd)**		**(gpd)**	**(gpm)**		**(gpd)**	**(gpm)**	**(gpm)**	**(gpm)**	**(sf)**
Retail	14,400	--	--	0.8	11,520	2.0	23,040	16.0	3.5	40,320	28.0	--	--	14,400
Office	566,256	--	--	0.6	339,754	2.0	679,507	471.9	3.5	1,189,138	825.8	--	--	163,800
Residential	338,249	--	333	227.6	75,791	2.0	151,582	105.3	3.5	265,268	184.2	--	--	179,204
Hotel	123,452	--	228	446.3	101,756	2.0	203,513	141.3	3.5	356,147	247.3	--	--	123,452
Restaurant	6,400	--	--	1.3	8,320	2.0	16,640	11.6	3.5	29,120	20.2	--	--	6,400
	1,048,757	23.22			537,141		1,074,282	734.5		1,879,993	1305.6	2,250	2,984	
Pre-Existing Development														
Parcel No.	**Land Area**		**Rooms**	**Unit Factor**	**ADD**	**MDD PF**	**MDD**		**PHD PF**	**PHD**		**FF[1,2]**	**MDD + FF**	**Lgest Bldg Floor Space**
	(sf)	**(ac)**	**(no.)**	**(gpd/unit)**	**(gpd)**		**(gpd)**	**(gpm)**		**(gpd)**	**(gpm)**	**(gpm)**	**(gpm)**	**(sf)**
129-09-003V	178,552	4.10	--	1,027.0	4,210	2.0	8,419	5.8	3.5	14,734	10.2	--	--	53,295
129-09-003P	178,683	4.10	--	1,027.0	4,213	2.0	8,426	5.9	3.5	14,745	10.2	--	--	11,954
129-09-003N	170,450	3.91	--	1,027.0	4,019	2.0	8,037	5.6	3.5	14,065	9.8	--	--	21,526
129-09-003Q	111,034	2.55	--	1,027.0	2,618	2.0	5,236	3.6	3.5	9,162	6.4	--	--	18,705
129-09-003T	86,205	1.98	--	1,027.0	2,032	2.0	4,065	2.8	3.5	7,113	4.9	--	--	13,751
129-09-003U	69,217	1.59	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003W[3]	179,467	4.12	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003S	37,723	0.87	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
	1,011,331	23.22			17,091		34,183	23.7		59,820	41.5	1,500	1,524	
NET INCREASE					**520,050**		**1,040,099**	**711**		**1,820,173**	**1,264.0**	**750**	**1,461**	
[1]Per 2012 IFC Type 1A and 1B construction are assumed for the proposed development. The largest building is a 179,204 sf, 4-story, sprinklered, residential building. FF = 4,500 gpm/2 = 2,250 gpm .														
[2]Per 2012 IFC Type 1A and 1B construction are assumed for the existing development. The largest building is 53,295 sf at APN 129-09-003V, assumed to be sprinklered . FF = 1,500 gpm minimum.														

WATER DEMAND CALCULATIONS
SCOTTSDALE ENTRADA

WATER DEMANDS - OPTION 2														
Proposed Development														
Land Use	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADD**	**MDD PF**	**MDD**		**PHD PF**	**PHD**		**FF[1,2]**	**MDD + FF**	**Lgest Bldg Floor Space**
	(sf)	**(ac)**	**(no.)**	**(gpd/unit)**	**(gpd)**		**(gpd)**	**(gpm)**		**(gpd)**	**(gpm)**	**(gpm)**	**(gpm)**	**(sf)**
Retail	42,671	--	--	0.8	34,137	2.0	68,274	47.4	3.5	119,479	83.0	--	--	16,886
Office	391,932	--	--	0.6	235,159	2.0	470,318	326.6	3.5	823,057	571.6	--	--	280,332
Residential	572,008	--	560	227.6	127,456	2.0	254,912	177.0	3.5	446,096	309.8	--	--	318,208
Hotel	179,548	--	176	446.3	78,549	2.0	157,098	109.1	3.5	274,921	190.9	--	--	179,548
Restaurant	6,565	--	--	1.3	8,535	2.0	17,069	11.9	3.5	29,871	20.7	--	--	6,565
	1,192,724	23.22			483,835		967,671	672.0		1,693,424	1176.0	3,000	3,672	
Pre-Existing Development														
Parcel No.	**Floor Space**	**Land Area**	**Rooms**	**Unit Factor**	**ADD**	**MDD PF**	**MDD**		**PHD PF**	**PHD**		**FF[1,2]**	**MDD + FF**	**Lgest Bldg Floor Space**
	(sf)	**(ac)**	**(no.)**	**(gpd/unit)**	**(gpd)**		**(gpd)**	**(gpm)**		**(gpd)**	**(gpm)**	**(gpm)**	**(gpm)**	**(sf)**
129-09-003V	178,552	4.10	--	1,027.0	4,210	2.0	8,419	5.8	3.5	14,734	10.2	--	--	53,295
129-09-003P	178,683	4.10	--	1,027.0	4,213	2.0	8,426	5.9	3.5	14,745	10.2	--	--	11,954
129-09-003N	170,450	3.91	--	1,027.0	4,019	2.0	8,037	5.6	3.5	14,065	9.8	--	--	21,526
129-09-003Q	111,034	2.55	--	1,027.0	2,618	2.0	5,236	3.6	3.5	9,162	6.4	--	--	18,705
129-09-003T	86,205	1.98	--	1,027.0	2,032	2.0	4,065	2.8	3.5	7,113	4.9	--	--	13,751
129-09-003U	69,217	1.59	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003W[3]	179,467	4.12	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003S	37,723	0.87	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
	1,011,331	23.22			17,091		34,183	23.7		59,820	41.5	1,500	1,524	
NET INCREASE					**466,744**		**933,488**	**648**		**1,633,604**	**1,134**	**1,500**	**1,783**	

[1]Per 2012 IFC Type 1A and 1B construction are assumed for the proposed development. The largest building is a 318,208 sf, 4-story, sprinklered, residential building. FF = 6,000 gpm/2 = 3,000 gpm.

[2]Per 2012 IFC Type 1A and 1B construction are assumed for the existing development. The largest building is 53,295 sf at APN 129-09-003V, assumed to be sprinklered . FF = 1,500 gpm minimum.

[3]Approximatey 4.55 acres of Parcel 129-09-003W along the northern boundary of the property is to remain as open space.

WATER DEMAND CALCULATIONS
SCOTTSDALE ENTRADA

WATER DEMANDS - OPTION 3

Proposed Development

Land Use	Floor Space	Land Area	Rooms	Unit Factor	ADD	MDD PF	MDD		PHD PF	PHD		FF[1,2]	MDD + FF	Lgest Bldg Floor Space
	(sf)	(ac)	(no.)	(gpd/unit)	(gpd)		(gpd)	(gpm)		(gpd)	(gpm)	(gpm)	(gpm)	(sf)
Retail	6,120	--	--	0.8	4,896	2.0	9,792	6.8	3.5	17,136	11.9	--	--	6,120
Office	272,700	--	--	0.6	163,620	2.0	327,240	227.3	3.5	572,670	397.7	--	--	189,000
Residential	831,100	--	812	227.6	184,811	2.0	369,622	256.7	3.5	646,839	449.2	--	--	420,000
Hotel	165,268	--	308	446.3	137,460	2.0	274,921	190.9	3.5	481,111	334.1	--	--	165,268
Restaurant	6,120	--	--	1.3	7,956	2.0	15,912	11.1	3.5	27,846	19.3	--	--	6,120
	1,281,308	23.22			498,744		997,487	692.7		1,745,603	1212.2	3,000	3,693	

Pre-Existing Development

Parcel No.	Land Area		Rooms	Unit Factor	ADD	MDD PF	MDD		PHD PF	PHD		FF[1,2]	MDD + FF	Lgest Bldg Floor Space
	(sf)	(ac)	(no.)	(gpd/unit)	(gpd)		(gpd)	(gpm)		(gpd)	(gpm)	(gpm)	(gpm)	(sf)
129-09-003V	178,552	4.10	--	1,027.0	4,210	2.0	8,419	5.8	3.5	14,734	10.2	--	--	53,295
129-09-003P	178,683	4.10	--	1,027.0	4,213	2.0	8,426	5.9	3.5	14,745	10.2	--	--	11,954
129-09-003N	170,450	3.91	--	1,027.0	4,019	2.0	8,037	5.6	3.5	14,065	9.8	--	--	21,526
129-09-003Q	111,034	2.55	--	1,027.0	2,618	2.0	5,236	3.6	3.5	9,162	6.4	--	--	18,705
129-09-003T	86,205	1.98	--	1,027.0	2,032	2.0	4,065	2.8	3.5	7,113	4.9	--	--	13,751
129-09-003U	69,217	1.59	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003W[3]	179,467	4.12	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
129-09-003S	37,723	0.87	--	0.0	0	2.0	0	0.0	3.5	0	0.0	--	--	--
	1,011,331	23.22			17,091		34,183	23.7		59,820	41.5	1,500	1,524	
NET INCREASE					**481,652**		**963,305**	**669**		**1,685,783**	**1,171**	**1,500**	**2,169**	

[1]Per 2012 IFC Type 1A and 1B construction are assumed for the proposed development. The largest building is a 420,000 sf, 4-story, sprinklered, residential building. FF = 6,000 gpm/2 = 3,000 gpm.

[2]Per 2012 IFC Type 1A and 1B construction are assumed for the existing development. The largest building is 53,295 sf at APN 129-09-003V, assumed to be sprinklered . FF = 1,500 gpm minimum.

[3]Approximatey 4.55 acres of Parcel 129-09-003W along the northern boundary of the property is to remain as open space.

APPENDIX C

FLOW TESTING RESULTS

E·J Flow Tests

FLOW TESTING SERVICES

Flow Test Summary

EJ Flow Tests Project Name:	64th Street and McDowell Road
EJ Flow Tests Project No.:	14056
Project Address:	East McDowell Road & North 64th Street, Scottsdale, Arizona 85257
Date of Flow Test:	April 25, 2014
Time of Flow Test:	7:40 AM
Data is Current and Reliable Until:	October 25, 2014

Raw Test Data:

Static Pressure: (measured in pounds per square inch)	72.0 psi HGL 1436
Residual Pressure: (measured in pounds per square inch)	62.0 psi HGL 1413
Pitot Pressure: (measured in pounds per square inch)	22.0 psi
Number of Outlets Flowed:	2
Fire Hydrant Orifice Diameter: (measured in inches)	2.5 inches
Coefficient of Discharge: (0.9 smooth/round outlet, 0.8 square/sharp outlet, 0.7 square/raised outlet)	0.9
Flowing GPM: (measured in gallons per minute)	1,575
GPM at 20 PSI:	3,835

Data with minimum safety factor of: 10% :

Static Pressure: (measured in pounds per square inch)	64.8 psi
Residual Pressure: (measured in pounds per square inch)	54.8 psi
Main Size: (measured in inches)	12
Approximate Distance Between Hydrants: (measured in feet)	800 ft
Approx. Static/Residual Hydrant Elevation: (measured above sea level)	1,281 ft
Approx. Flow Hydrant Elevation: (measured above sea level)	1,273 ft
Flowing GPM: (measured in gallons per minute)	1,575
GPM at 20 PSI:	3,539

Conducted by/Witnessed by/City Forces Contacted:

Conducted by:	Cesar R. & Austin G. (EJ Flow Tests) 623.999.7637
Witnessed by:	Phil Cipolla (City of Scottsdale) 602.828.0847
City Forces Contacted:	City of Scottsdale (Permit #: C45027)

Flow Test Vicinity Map (No Scale)

APPENDIX D

WATERCAD® MODELING RESULTS

(option 3)

FlexTable: Reservoir Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,280.00	172	1,280.00
R-3	1,280.00	173	1,280.00

FlexTable: Junction Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,291.00	0	1,445.87	67.0
J-3	1,285.00	0	1,445.91	69.6
J-4	1,273.00	0	1,445.91	74.8
J-5	1,273.00	104	1,445.85	74.8
J-6	1,275.00	114	1,445.84	73.9
J-7	1,283.00	0	1,445.84	70.5
J-8	1,289.00	128	1,445.84	67.9
J-15	1,279.02	0	1,445.91	72.2

FlexTable: Pipe Table

Active Scenario: Average Day Demand

Label	Start Node	Stop Node	Diameter (in)	Length (ft)	Hazen-Williams C	Flow (gpm)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-1	J-2	J-3	12.0	553	140.0	-157	0.000	0.44
P-3	J-4	J-5	12.0	508	130.0	188	0.000	0.53
P-4	J-5	J-6	12.0	400	130.0	85	0.000	0.24
P-5	J-6	J-7	12.0	211	130.0	-29	0.000	0.08
P-6	J-7	J-8	12.0	178	130.0	-29	0.000	0.08
P-7	J-8	J-2	12.0	353	130.0	-157	0.000	0.44
P-24	J-3	J-15	12.0	621	140.0	15	0.000	0.04
P-25	J-15	J-4	12.0	548	140.0	15	0.000	0.04
P-29	R-2	PMP-4	12.0	70	130.0	172	0.000	0.49
P-30	PMP-4	J-3	12.0	198	130.0	172	0.000	0.49
P-31	R-3	PMP-5	12.0	65	130.0	173	0.000	0.49
P-32	PMP-5	J-4	12.0	189	130.0	173	0.000	0.49

FlexTable: Pump Table

Active Scenario: Average Day Demand

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-4	1,279.50	Pump Definition - 1	On	1,279.99	1,445.93	172	165.94
PMP-5	1,279.50	Pump Definition - 1	On	1,279.99	1,445.93	173	165.94

FlexTable: Reservoir Table

Active Scenario: Max Day Demand

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,280.00	344	1,280.00
R-3	1,280.00	345	1,280.00

FlexTable: Junction Table

Active Scenario: Max Day Demand

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,291.00	0	1,444.70	66.5
J-3	1,285.00	0	1,444.84	69.2
J-4	1,273.00	0	1,444.84	74.3
J-5	1,273.00	207	1,444.63	74.3
J-6	1,275.00	227	1,444.59	73.4
J-7	1,283.00	0	1,444.60	69.9
J-8	1,289.00	255	1,444.60	67.3
J-15	1,279.02	0	1,444.84	71.7

FlexTable: Pipe Table

Active Scenario: Max Day Demand

Label	Start Node	Stop Node	Diameter (in)	Length (ft)	Hazen-Williams C	Flow (gpm)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-1	J-2	J-3	12.0	553	140.0	-314	0.000	0.89
P-3	J-4	J-5	12.0	508	130.0	376	0.000	1.07
P-4	J-5	J-6	12.0	400	130.0	169	0.000	0.48
P-5	J-6	J-7	12.0	211	130.0	-58	0.000	0.17
P-6	J-7	J-8	12.0	178	130.0	-58	0.000	0.17
P-7	J-8	J-2	12.0	353	130.0	-314	0.000	0.89
P-24	J-3	J-15	12.0	621	140.0	31	0.000	0.09
P-25	J-15	J-4	12.0	548	140.0	31	0.000	0.09
P-29	R-2	PMP-4	12.0	70	130.0	344	0.000	0.98
P-30	PMP-4	J-3	12.0	198	130.0	344	0.000	0.98
P-31	R-3	PMP-5	12.0	65	130.0	345	0.000	0.98
P-32	PMP-5	J-4	12.0	189	130.0	345	0.000	0.98

FlexTable: Pump Table

Active Scenario: Max Day Demand

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-4	1,279.50	Pump Definition - 1	On	1,279.98	1,444.91	344	164.94
PMP-5	1,279.50	Pump Definition - 1	On	1,279.98	1,444.91	345	164.93

FlexTable: Reservoir Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,280.00	602	1,280.00
R-3	1,280.00	604	1,280.00

FlexTable: Junction Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Demand (gpm)	Hydraulic Grade (ft)	Pressure (psi)
J-2	1,291.00	0	1,441.76	65.2
J-3	1,285.00	0	1,442.16	68.0
J-4	1,273.00	0	1,442.15	73.2
J-5	1,273.00	362	1,441.55	72.9
J-6	1,275.00	398	1,441.45	72.0
J-7	1,283.00	0	1,441.46	68.6
J-8	1,289.00	447	1,441.46	66.0
J-15	1,279.02	0	1,442.15	70.6

FlexTable: Pipe Table

Active Scenario: Peak Hour

Label	Start Node	Stop Node	Diameter (in)	Length (ft)	Hazen-Williams C	Flow (gpm)	Headloss Gradient (ft/ft)	Velocity (ft/s)
P-1	J-2	J-3	12.0	553	140.0	-549	0.001	1.56
P-3	J-4	J-5	12.0	508	130.0	658	0.001	1.87
P-4	J-5	J-6	12.0	400	130.0	296	0.000	0.84
P-5	J-6	J-7	12.0	211	130.0	-102	0.000	0.29
P-6	J-7	J-8	12.0	178	130.0	-102	0.000	0.29
P-7	J-8	J-2	12.0	353	130.0	-549	0.001	1.56
P-24	J-3	J-15	12.0	621	140.0	54	0.000	0.15
P-25	J-15	J-4	12.0	548	140.0	54	0.000	0.15
P-29	R-2	PMP-4	12.0	70	130.0	602	0.001	1.71
P-30	PMP-4	J-3	12.0	198	130.0	602	0.001	1.71
P-31	R-3	PMP-5	12.0	65	130.0	604	0.001	1.71
P-32	PMP-5	J-4	12.0	189	130.0	604	0.001	1.71

FlexTable: Pump Table

Active Scenario: Peak Hour

Label	Elevation (ft)	Pump Definition	Status (Initial)	Hydraulic Grade (Suction) (ft)	Hydraulic Grade (Discharge) (ft)	Flow (Total) (gpm)	Pump Head (ft)
PMP-4	1,279.50	Pump Definition - 1	On	1,279.93	1,442.36	602	162.43
PMP-5	1,279.50	Pump Definition - 1	On	1,279.94	1,442.34	604	162.40

FlexTable: Reservoir Table

Active Scenario: Max Day Demand + FF

Label	Elevation (ft)	Flow (Out net) (gpm)	Hydraulic Grade (ft)
R-2	1,280.00	344	1,280.00
R-3	1,280.00	345	1,280.00

Fire Flow Node FlexTable: Fire Flow Report

Active Scenario: Max Day Demand + FF

Label	Fire Flow (Needed) (gpm)	Flow (Total Available) (gpm)	Pressure (Residual Lower Limit) (psi)	Pressure (Calculated Residual) (psi)	Pressure (Calculated Zone Lower Limit) (psi)	Junction w/ Minimum Pressure (Zone)	Velocity of Maximum Pipe (ft/s)	Pipe w/ Maximum Velocity	Satisfies Fire Flow Constraints?
J-2	3,000	3,001	20.0	50.5	51.6	J-8	6.31	P-1	True
J-8	3,000	3,256	20.0	50.6	51.1	J-2	5.55	P-1	True
J-7	3,000	3,001	20.0	53.1	50.9	J-8	5.25	P-3	True
J-3	3,000	3,001	20.0	55.0	52.5	J-2	5.32	P-29	True
J-6	3,000	3,228	20.0	56.5	51.3	J-8	5.64	P-3	True
J-15	3,000	3,001	20.0	56.9	52.9	J-2	5.25	P-31	True
J-5	3,000	3,208	20.0	58.1	52.0	J-2	6.42	P-3	True
J-4	3,000	3,001	20.0	60.2	53.0	J-2	5.34	P-31	True

Pump Definition Detailed Report: Pump Definition - 1

Element Details			
ID	45	Notes	
Label	Pump Definition - 1		

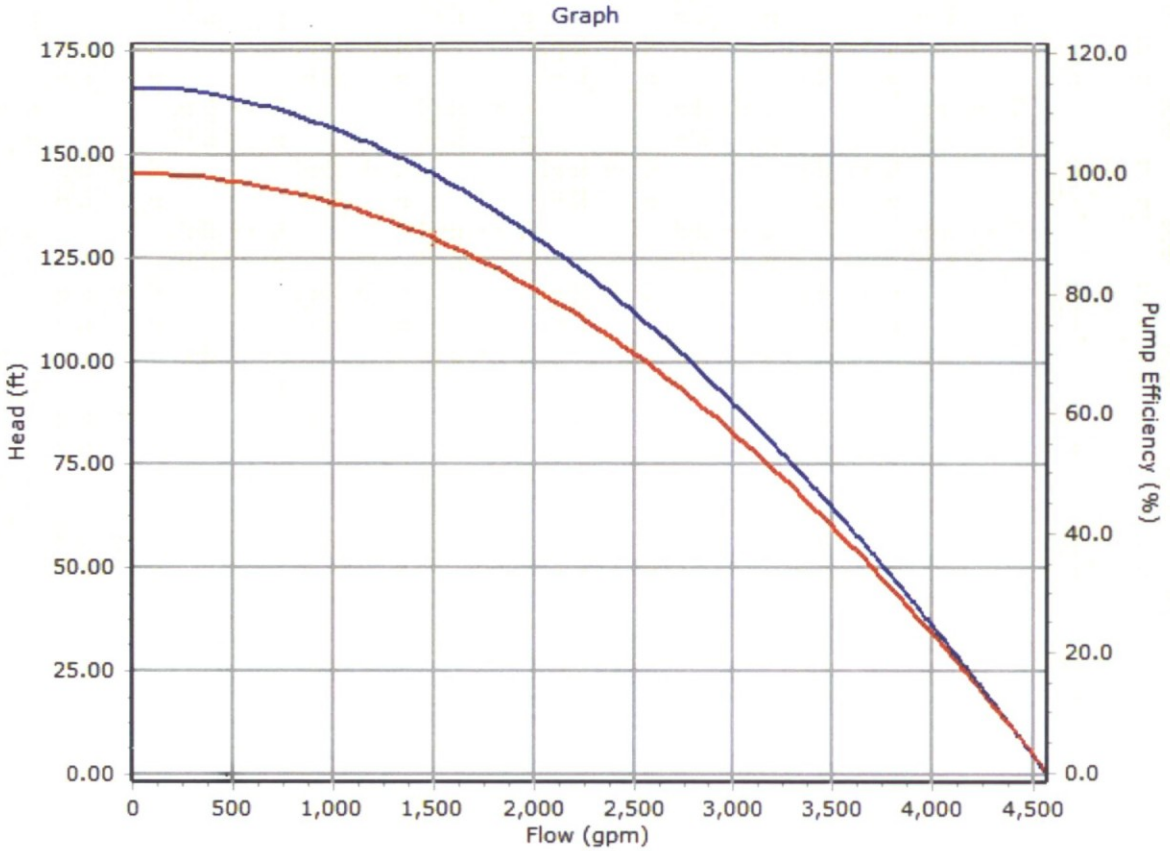
Pump Curve

Flow (gpm)	Head (ft)
0	166.32
1,575	143.22
3,835	46.20

Pump Efficiency Type			
Pump Efficiency Type	Best Efficiency Point	Motor Efficiency	100.0 %
BEP Efficiency	100.0 %	Is Variable Speed Drive?	False
BEP Flow	0 gpm		

Transient (Physical)			
Inertia (Pump and Motor)	0.000 lb·ft²	Specific Speed	SI=25, US=1280
Speed (Full)	0 rpm	Reverse Spin Allowed?	True

Pump Definition Detailed Report: Pump Definition - 1



Case file Copy

Plan #
Case # 5-ZN-2016
Q-S #
X Accepted
☐ Corrections
DG 3/8/16
Reviewed By Date

PRELIMINARY DRAINAGE REPORT

February 05, 2016

SCOTTSDALE ENTRADA

Scottsdale, Arizona

Prepared for:
SunChase Holdings, Inc.
5665 N. Scottsdale Road, Suite. 135
Scottsdale, AZ 85250
Phone: (480) 398-2626
Contact: Todd Tupper

Prepared by:
Coe & Van Loo Consultants, Inc.
4550 N 12th Street
Phoenix, AZ 85014
Contact: Heidi Tilson
602.285.4870

Job #:1-01-0254301

Registered Professional Engineer (Civil)
CERTIFICATE NO.
53941
DOUGLAS A.
JONES
Date Signed 2/05/2016
ARIZONA, U.S.A.
Expires 12-31-2018

CVL CONSULTANTS

5-ZN-2016
2/18/16

PRELIMINARY DRAINAGE REPORT

FOR

SCOTTSDALE ENTRADA

CITY OF SCOTTSDALE, ARIZONA

February 05, 2016

Prepared for:

SunChase Holdings, Inc.

5665 N. Scottsdale Road, Suite 135

Scottsdale, Arizona 85250

(480) 398-2626

Prepared by:

Coe & Van Loo Consultants, Inc.

4550 N. 12th Street

Phoenix, AZ 85014

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Preliminary Drainage Report

Scottsdale Entrada

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Appendices

Plates

1.0 INTRODUCTION

1.1 SCOPE

Coe & Van Loo Consultants, Inc. (CVL) has been contracted by SunChase Holdings, Inc. to provide engineering services in support of the proposed improvements of Scottsdale Entrada, (the site). Please see Figure 1 for the Vicinity Map. The purpose of this report is to provide hydrologic analysis for the proposed development. In addition, this report addresses on-site drainage and storm-water storage retention requirements.

This report is focused on providing preliminary design information, evaluation and analysis for statistical flood events up to and including the 100-year storm. The scope of this assessment does not include, neither did CVL's client request that, evaluation of storm-water runoff resulting from events exceeding the 100-year storm. Hence, it should be noted that a storm event exceeding the 100-year frequency may cause or create the risk of greater flood impact than is addressed and presented in this assessment.

The procedures used herein are derived from, and performed with, currently accepted engineering methodologies and practices. Additionally, the criteria for this evaluation are designed to conform to currently applicable ordinances, regulations and policies as set forth by the Maricopa County.

On-Site Detention Basins of sufficient volume to detain the rainfall excess from 100-year storm are provided for the site area. Additionally, no special conditions exist for this project.

1.2 REGULATORY JURISDICTION

The development is designed to meet the City of Scottsdale Design Standards and Policies Manual [1] with accordance to the Maricopa County drainage requirements as stated in the Flood Control District of Maricopa County (FCDMC), Drainage Design Manuals for Maricopa County, Arizona, Volume I, Hydrology [2], Volume II, Hydraulics [3], and Drainage Policies and Standards Manual for Maricopa County, Arizona [4].

2.0 LOCATION

The site is located within the City of Scottsdale, Maricopa County, Arizona. The site is bordered on the north by Regional Detention Basins, on the south by E McDowell Road, on the west by N 64th Street and on the east by the Arizona Cross Cut Canal. The site is located within the Southwest quarter of Section 34, Township 2 North, Range 4 East of the Gila and Salt River Base and Meridian, Maricopa County, Arizona (Figure 1).

3.0 SITE DESCRIPTION AND PROPOSED DEVELOPMENT

3.1 EXISTING SITE DESCRIPTION

The overall site is roughly rectangular in shape and comprised of approximately 23 acres. The site currently consists of the Scottsdale Auto Park, and is completely covered in impervious material. On the existing site, the majority of runoff drains into the regional detention basins north of the site. The remainder of the site currently drains to the southeast corner of the site.

3.2 PROPOSED DEVELOPMENT

The proposed development consists of a hotel with retail, offices, and commercial buildings. This site will include less impervious area than the existing site. Runoff shall continue to drain to the detention basins north of the site.

4.0 FLOOD ZONE INFORMATION

The Maricopa County, Arizona and Incorporated Areas Flood Insurance Rate Map (FIRM), panel numbers 04013C2230L, Map Revised October 16, 2013 [5], indicate the majority of the site falls within Zone "X" (unshaded). The west side of the site falls within a Zone "X" (shaded). The east side of the site falls within a Zone "A".

Zone "X" (unshaded) is defined by FEMA as:

> "The areas of minimal flood hazard, which are the areas outside the SFHA and higher than the elevation of the 0.2-percent-annual-chance flood"

Zone "X" (shaded) is defined by FEMA as:

> "Areas of 0.2% annual chance flood; areas of 1% annual chance flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 1% annual chance flood."

Zone "A" is defined by FEMA as:

> "Areas subject to inundation by the 1-percent-annual-chance flood event generally determined using approximate methodologies. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown. Mandatory flood insurance purchase requirements and floodplain management standards apply"

Refer to Figure 2 for a copy of the Flood Insurance Rate Map (FIRM).

5.0 Management of Off-Site Runoff

5.1 Off-Site Hydrology

Off-site flows are currently conveyed around the site through the detention basin north of the site. These basins will not be affected by the development. The improvements made to the site will not affect the current management of the off-site runoff. No updated off-site management is required for this site.

6.0 Management of On-Site Runoff

6.1 On-site Hydrology

The on-site hydrology is based on the Rational Method in accordance with the *Flood Control District of Maricopa County Drainage Design Manual, Volume I, Hydrology* [2] as recommended by the City of Scottsdale [1]. The on-site delineations are based on layout and elevation points provided for the preliminary site design.

6.2 On-site Runoff Management Plan

The onsite drainage concept will provide proper retention for the 100-year 2-hour storm as required by the City of Scottsdale [1]. The drainage sub-basins are delineated using the building layout and elevation points provided. The 100 year runoff coefficient is based on the City of Scottsdale design manual [1]. Therefore, 0.86 was used as the runoff coefficient of the entire site (value for Commercial sites). For comparison, the same area is also shown using a runoff coefficient of 0.95 to reflect the likely existing conditions calculated using the same method as the proposed condition. There is also an existing conditions volume required from the Oak Street Drainage Report, 1998 [6], which references the Oak Street Alternative CLOMR, 1997 [7]. See Appendix A for these calculations.

The Detention Volume provided will not change with this proposed development. The value shown of 7.11 acre-ft. is taken from the Oak Street Alternative CLOMR [7]. The volume required in the basin was calculated to be 3.30 acre-ft. using a HEC-1 model.

The volume provided in the basin is 7.11 acre-ft. The volume currently utilized in this basin is 3.30 acre-ft. The proposed volume to be utilized in this basin is 4.53 acre-ft. Based on the stage-storage relationship from the Oak Street Alternative CLOMR, this proposed volume of 4.53 acre-ft. corresponds to a water surface elevation of 1268 feet.

During final engineering flow paths, storm drains and pipe sizing will be provided as necessary to convey the flow into the retention.

7.0 Storm Water Pollution Prevention Plan

During final engineering design, the Storm Water Pollution Prevention Plan (SWPPP) will be prepared and submitted for approval.

8.0 Summary and Conclusions

1. The retention basins are designed to retain storm water from the 100-year, 2-hour storm.
2. Required storage volumes will be lower than for the existing conditions site, but the provided volumes are not affected by the proposed development.

3. Off-site flows do not affect the site, no improvements are required.
4. According to the FIRM panel number 04013C 2230L, Map Revised: October 16, 2013, the majority of the site is located in Zone "X" (unshaded), with the eastern side being in a Zone "A" floodplain.

9.0 REFERENCES

[1] City of Scottsdale, "Design Policies and Standards Manual," 2010.

[2] Flood Control District of Maricopa County, "Drainage Design Manual for Maricopa County, Arizona, Volume I, Hydrology," Revised December 4, 2015.

[3] Flood Control District of Maricopa County, Arizona, "Draft Drainage Design Manual for Maricopa County, Volume II, Hydraulics," Revised December 4, 2015.

[4] Flood Control District of Maricopa County, "Drainage Policies and Standards," Revised December 4, 2015.

[5] Federal Emergency Management Agency (FEMA), "National Flood Insurance Program, Flood Insurance Rate Map, Maricopa County, Arizona and Incorporated Areas, Panel Numbers 04013C2230L," Revised October 16, 2013.

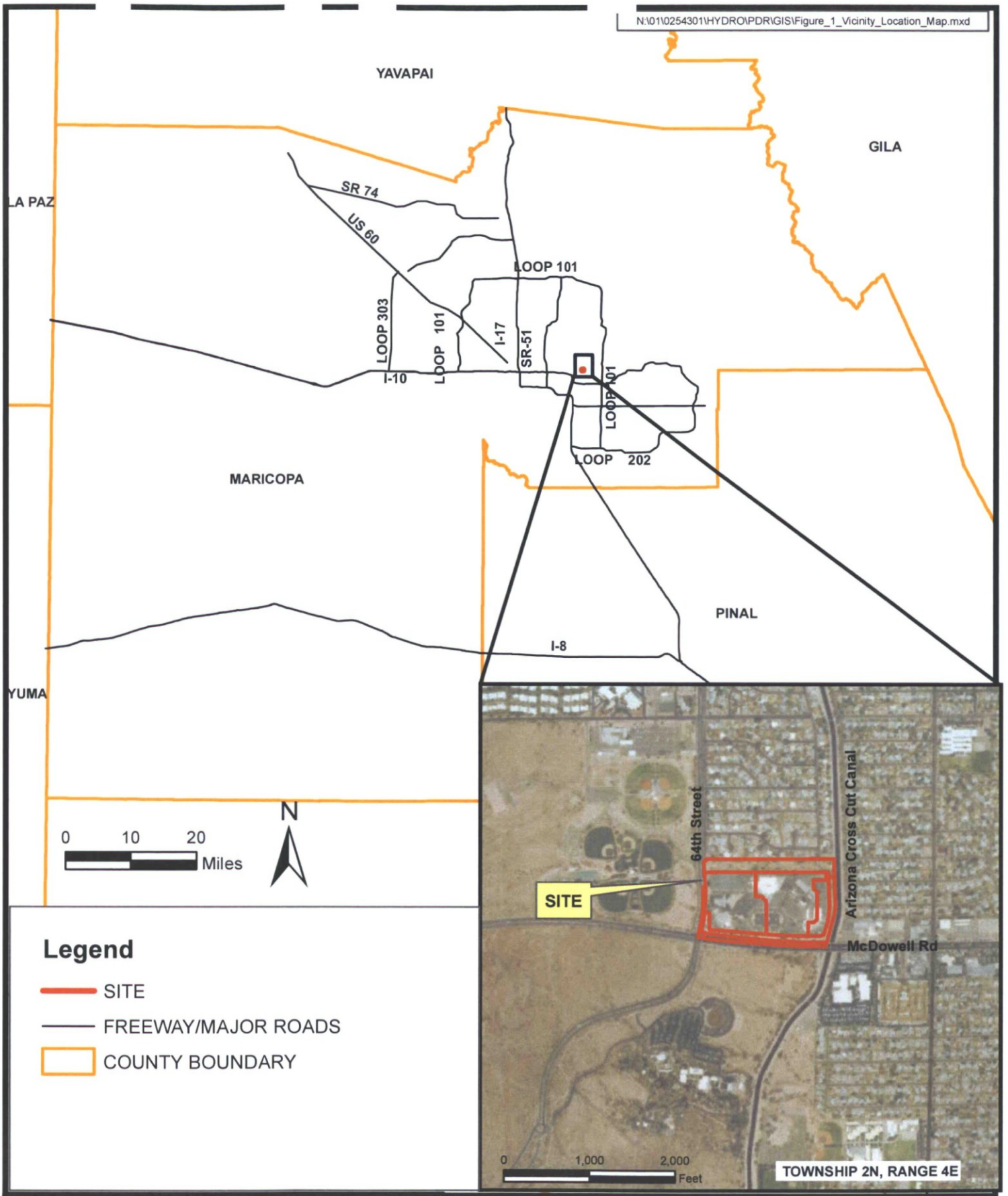
[6] EEC/MKE, "Drainage Report for Oak Street Storm Drain," 1998.

[7] Kimley-Horn and Associates, "Oak Street Alternative CLOMR, STP Papago Regional Flood Control Project," 1997.

[8] Van Loo & Patel Consulting Engineers, "Grading and Drainage Plans for the Scottsdale Auto Park," 1987.

FIGURES

CVL



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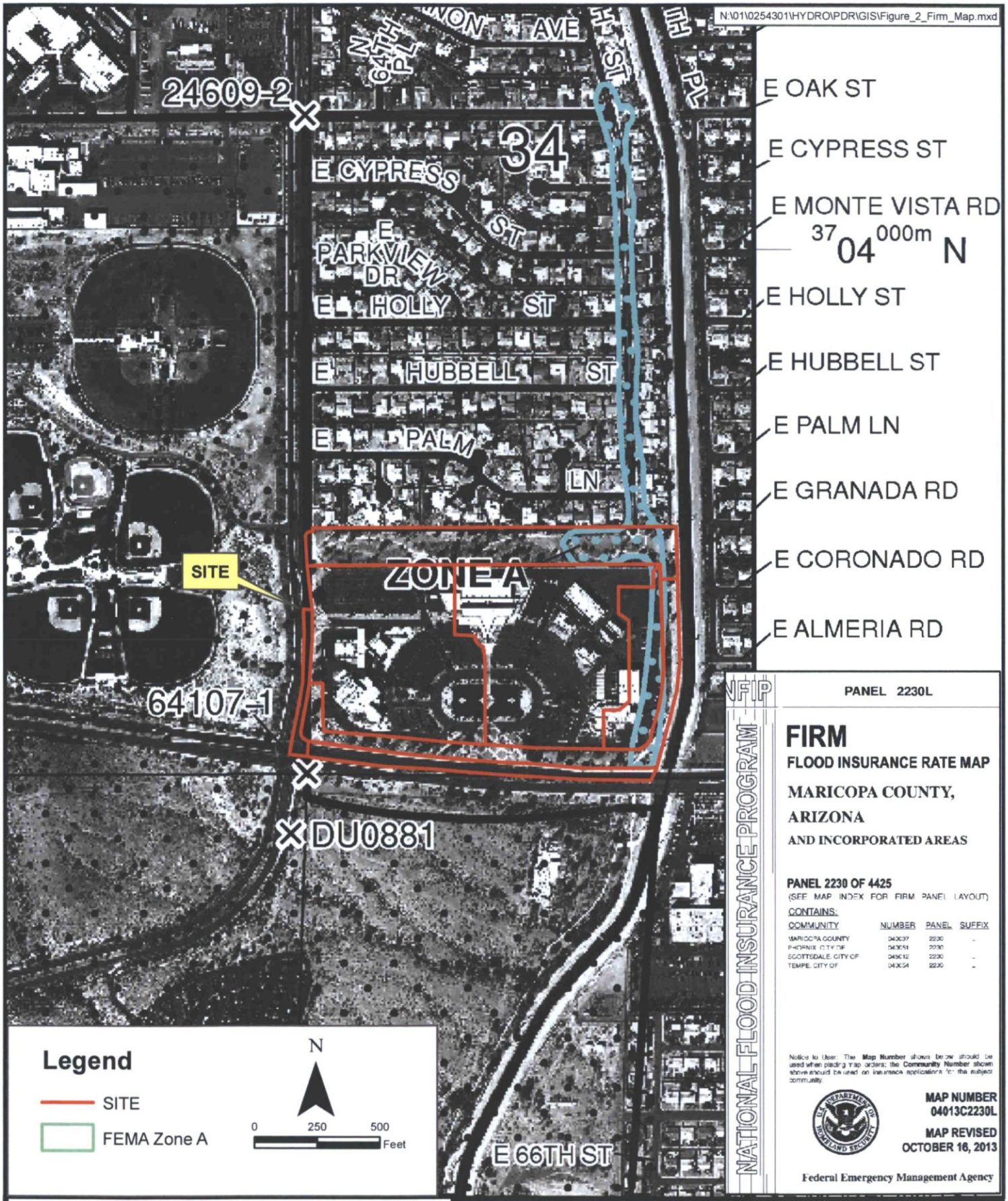
PHOENIX, ARIZONA 85014
TELEPHONE (602) 264-6831

SCOTTSDALE ENTRADA

VICINITY & LOCATION MAP

JOB NO. 01-0254301

FIGURE 1



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SCOTTSDALE ENTRADA

JOB NO. 01-0254301

FLOOD INSURANCE RATE MAP

FIGURE 2

APPENDICES

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APPENDIX A

ON-SITE HYDROLOGY

CVL

NOAA Atlas 14, Volume 1, Version 5
Location name: Scottsdale, Arizona, US*
Latitude: 33.4667°, Longitude: -111.9411°
Elevation: 1279 ft*
* source: Google Maps

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sarah Dietz, Sarah Heim, Lillian Hiner, Kazungu Maitaria, Deborah Martin, Sandra Pavlovic, Ishani Roy, Carl Trypaluk, Dale Unruh, Fenglin Yan, Michael Yekta, Tan Zhao, Geoffrey Bonnin, Daniel Brewer, Li-Chuan Chen, Tye Parzybok, John Yarchoan

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.179 (0.151-0.217)	0.235 (0.198-0.284)	0.320 (0.269-0.385)	0.385 (0.322-0.461)	0.473 (0.389-0.564)	0.542 (0.440-0.643)	0.611 (0.487-0.723)	0.683 (0.535-0.808)	0.778 (0.593-0.922)	0.851 (0.636-1.01)
10-min	0.273 (0.230-0.331)	0.357 (0.302-0.432)	0.487 (0.409-0.586)	0.586 (0.490-0.702)	0.720 (0.592-0.859)	0.825 (0.669-0.979)	0.930 (0.741-1.10)	1.04 (0.814-1.23)	1.18 (0.902-1.40)	1.29 (0.968-1.54)
15-min	0.339 (0.285-0.409)	0.443 (0.375-0.535)	0.604 (0.507-0.726)	0.727 (0.607-0.870)	0.893 (0.734-1.06)	1.02 (0.830-1.21)	1.15 (0.918-1.36)	1.29 (1.01-1.52)	1.47 (1.12-1.74)	1.61 (1.20-1.91)
30-min	0.456 (0.384-0.551)	0.596 (0.505-0.721)	0.813 (0.683-0.977)	0.978 (0.817-1.17)	1.20 (0.989-1.43)	1.38 (1.12-1.64)	1.55 (1.24-1.84)	1.73 (1.36-2.05)	1.98 (1.51-2.34)	2.16 (1.61-2.57)
60-min	0.564 (0.476-0.682)	0.738 (0.625-0.892)	1.01 (0.845-1.21)	1.21 (1.01-1.45)	1.49 (1.22-1.77)	1.70 (1.38-2.02)	1.92 (1.53-2.27)	2.15 (1.68-2.54)	2.45 (1.86-2.90)	2.68 (2.00-3.18)
2-hr	0.654 (0.562-0.777)	0.848 (0.726-1.01)	1.14 (0.973-1.34)	1.36 (1.15-1.60)	1.66 (1.39-1.95)	1.89 (1.56-2.21)	2.13 (1.73-2.49)	2.38 (1.89-2.77)	2.70 (2.10-3.16)	2.96 (2.25-3.48)
3-hr	0.708 (0.604-0.844)	0.909 (0.779-1.09)	1.20 (1.02-1.43)	1.42 (1.21-1.69)	1.74 (1.45-2.06)	2.00 (1.64-2.35)	2.27 (1.83-2.66)	2.54 (2.02-2.98)	2.93 (2.25-3.44)	3.24 (2.43-3.82)
6-hr	0.853 (0.743-0.999)	1.08 (0.946-1.27)	1.39 (1.21-1.62)	1.64 (1.41-1.90)	1.97 (1.68-2.27)	2.24 (1.87-2.57)	2.51 (2.07-2.89)	2.79 (2.25-3.22)	3.18 (2.50-3.67)	3.48 (2.68-4.04)
12-hr	0.958 (0.841-1.11)	1.21 (1.06-1.41)	1.54 (1.35-1.78)	1.80 (1.56-2.07)	2.14 (1.84-2.46)	2.41 (2.04-2.76)	2.68 (2.24-3.08)	2.96 (2.44-3.40)	3.33 (2.68-3.84)	3.62 (2.86-4.21)
24-hr	1.16 (1.04-1.29)	1.47 (1.31-1.65)	1.90 (1.70-2.13)	2.25 (2.00-2.51)	2.72 (2.41-3.04)	3.10 (2.72-3.45)	3.49 (3.05-3.88)	3.89 (3.37-4.34)	4.45 (3.81-4.96)	4.89 (4.15-5.47)
2-day	1.25 (1.12-1.40)	1.60 (1.44-1.79)	2.10 (1.88-2.35)	2.50 (2.23-2.79)	3.06 (2.71-3.41)	3.50 (3.08-3.91)	3.97 (3.48-4.44)	4.45 (3.87-4.99)	5.13 (4.41-5.76)	5.68 (4.83-6.40)
3-day	1.32 (1.18-1.48)	1.69 (1.52-1.90)	2.22 (1.99-2.49)	2.65 (2.37-2.96)	3.26 (2.89-3.63)	3.74 (3.29-4.17)	4.25 (3.72-4.75)	4.79 (4.16-5.36)	5.55 (4.76-6.21)	6.17 (5.24-6.92)
4-day	1.39 (1.25-1.56)	1.78 (1.59-2.00)	2.35 (2.10-2.62)	2.81 (2.50-3.13)	3.46 (3.06-3.85)	3.98 (3.51-4.43)	4.54 (3.97-5.06)	5.14 (4.45-5.73)	5.98 (5.12-6.67)	6.66 (5.64-7.45)
7-day	1.54 (1.38-1.72)	1.97 (1.76-2.20)	2.59 (2.32-2.90)	3.10 (2.76-3.47)	3.82 (3.38-4.26)	4.40 (3.88-4.90)	5.01 (4.39-5.59)	5.67 (4.92-6.33)	6.59 (5.64-7.36)	7.33 (6.21-8.21)
10-day	1.67 (1.50-1.87)	2.14 (1.92-2.40)	2.83 (2.52-3.15)	3.37 (3.01-3.76)	4.14 (3.67-4.61)	4.76 (4.19-5.30)	5.41 (4.74-6.03)	6.10 (5.30-6.80)	7.07 (6.06-7.88)	7.84 (6.66-8.76)
20-day	2.06 (1.85-2.29)	2.64 (2.38-2.94)	3.49 (3.13-3.88)	4.13 (3.69-4.58)	4.99 (4.44-5.53)	5.65 (5.01-6.27)	6.32 (5.58-7.02)	7.00 (6.16-7.79)	7.92 (6.90-8.83)	8.63 (7.46-9.63)
30-day	2.40 (2.15-2.67)	3.09 (2.77-3.43)	4.07 (3.64-4.51)	4.81 (4.30-5.33)	5.81 (5.17-6.43)	6.58 (5.83-7.27)	7.37 (6.50-8.14)	8.16 (7.17-9.03)	9.24 (8.05-10.2)	10.1 (8.70-11.2)
45-day	2.78 (2.51-3.10)	3.59 (3.23-3.98)	4.72 (4.25-5.25)	5.57 (4.99-6.17)	6.67 (5.96-7.40)	7.50 (6.69-8.33)	8.35 (7.41-9.26)	9.19 (8.11-10.2)	10.3 (9.03-11.5)	11.1 (9.70-12.4)
60-day	3.09 (2.79-3.42)	3.99 (3.59-4.42)	5.24 (4.72-5.80)	6.15 (5.53-6.81)	7.34 (6.58-8.13)	8.22 (7.34-9.10)	9.10 (8.09-10.1)	9.96 (8.82-11.0)	11.1 (9.76-12.3)	11.9 (10.4-13.3)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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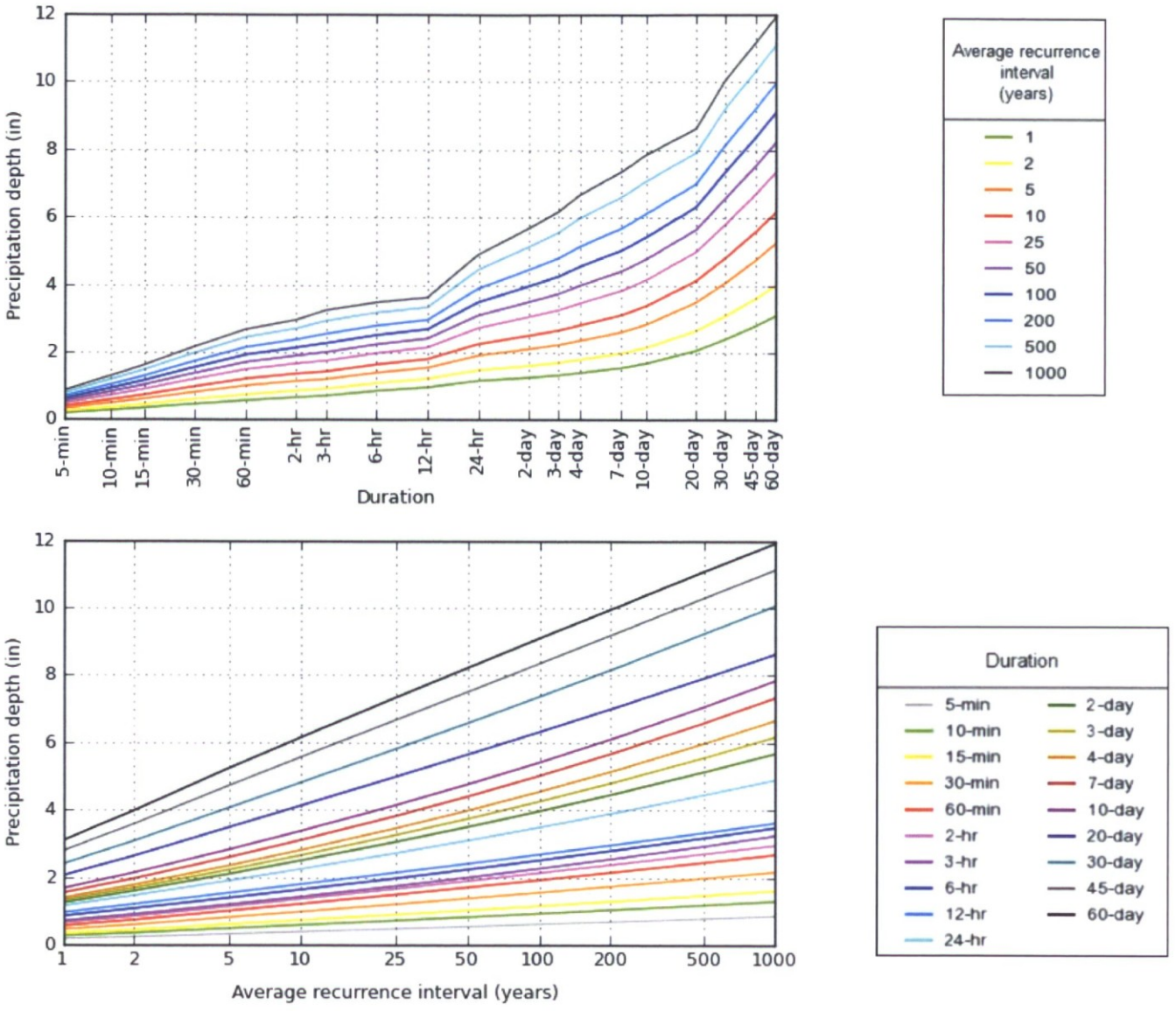
PF graphical

PDS-based depth-duration-frequency (DDF) curves
Latitude: 33.4667°, Longitude: -111.9411°



NOAA Atlas 14, Volume 1, Version 5

Created (GMT): Thu Jan 28 23:32:19 2016

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Maps & aerials

Small scale terrain

Large scale terrain

Large scale map

Large scale aerial

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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

Scottsdale Entrada
100-yr 2-hr Detention Basin Summary

Drainage[1] Sub-Basin ID	Area (acre)	Precipitation (in)	C-Value (100-year)	First Flush Volume (acre-ft)	Volume Required V_{req}[3] (acre-ft)	Entire Site Impervious Comparison	Existing Condition V_{req}[4] (acre-ft)	Total[2] V_P (Basin R-1) (acre-ft)
C-1	10.04	2.13	0.86	0.36	1.53	1.69		
C-2	10.35	2.13	0.86	0.37	1.58	1.75		
C-3	2.39	2.13	0.86	0.09	0.37	0.40		
LS-1	5.23	2.13	0.45	0.10	0.42	0.42		7.1
LS-2	3.45	2.13	0.45	0.06	0.28	0.28		
ST-1	0.47	2.13	0.95		0.08	0.08		
ST-2	1.68	2.13	0.95		0.28	0.28		
	TOTAL VOLUME REQUIRED FOR SITE:				4.53	4.90	3.30	7.1

Reference: Drainage Policies and Standards for Maricopa County, Arizona, Draft January 2013.
Drainage Design Manual for Maricopa County, Arizona, Hydrology, August, 2013.
Design Standards and Policies Manual, City of Scottsdale, January, 2010

Notes:

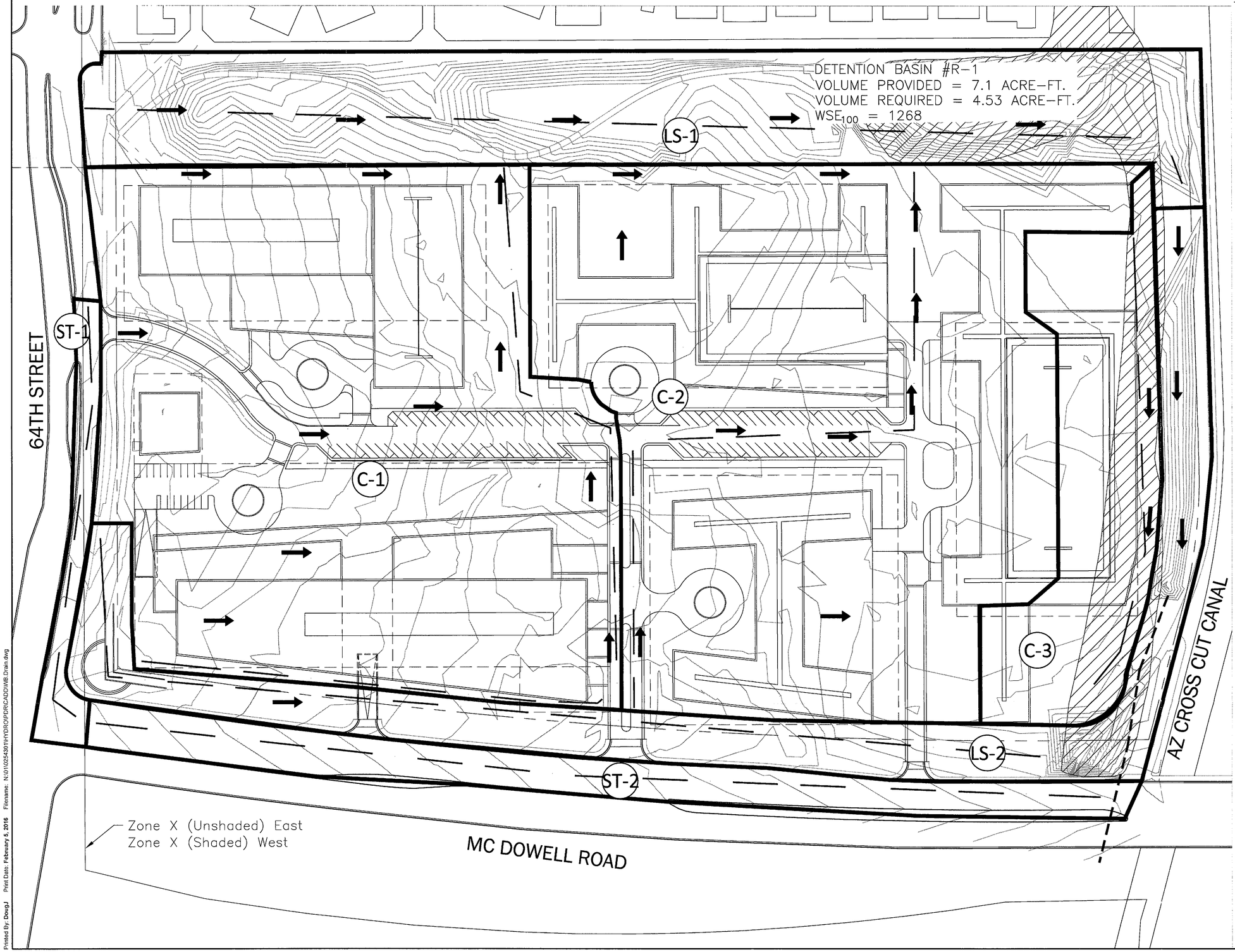
1. Drainage sub-basin delineated as shown in Drainage Map (Plate 1).
2. Oak Street Alternative CLOMR, (Kimley-Horn and Associates, Inc., 1997)
3. V_{req} = A x C x (P/12) = volume required for retention/detention in acre-ft.
4. Ex. V_{req} from Drainage Report for Oak Street Storm Drain 58th Street to Indian Bend Wash, EEC/MKE, 1998, pp 243

Plate

PLATE 1

Drainage Map

CVL



LEGEND:

- DRAINAGE AREA BOUNDARY
- C-1 DRAINAGE AREA IDENTIFICATION
- DIRECTION OF ON-SITE RUNOFF
- 1268 EXISTING CONTOURS
- SUBBASIN FLOWPATH
- FEMA ZONE A FLOODPLAIN

60' 30' 0 60'

SCALE: 1" = 60'

CVL CONSULTANTS
4550 North 12th Street
Phoenix, Arizona 85014
602-264-6831
www.cvlci.com

DATE

REVISION

NO.

Coe & Van Loo Consultants, Inc.

DRAINAGE MAP

SCOTTSDALE ENTRADA

SCOTTSDALE, ARIZONA

PRELIMINARY

SHEET
OF

Design: D.J. Drawn: D.J.

CVL Contact:

CVL Project #: 01-0254301

CVL File #:

PROJECT NO. 0254301

Call at least two full working days before you begin excavation.
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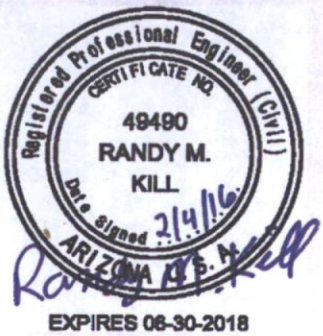
BURGESS & NIPLE
Engineers ■ Architects ■ Planners

64th St & McDowell Road
Draft Traffic Impact Study

Prepared for SunChase Holdings, Inc.

January 2016



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Introduction

SunChase Holdings, Inc. proposes to develop approximately 23.5 acres of the former Scottsdale Auto Park dealership site as a mix-use residential, office, retail, hotel and restaurant development. The site is located in the northeast corner of 64th Street and McDowell Road in the City of Scottsdale, Arizona, as illustrated in **Figure 1**. Burgess & Niple has been retained to prepare a Traffic Impact Study in accordance with the Category 2 study guidelines of the Design Standards & Policies Manual, Section 5-1, Transportation Impact Studies, 2004 Update.

Figure 1 – Study Area

The objectives of this Traffic Impact Study are to:

- Analyze existing traffic conditions
- Estimate new traffic generated by the proposed mix-use development
- Distribute and assign new traffic to adjacent street network
- Determine the need for auxiliary lanes at study intersections
- Evaluate operation of adjacent street network with the new site
- Recommend traffic control measures at study intersections
- Evaluate historical collision data on adjacent street network

The proposed development is shown conceptually on **Figure 2** and includes the following site accesses:

- McDowell Road and Main Access (aligns with existing main entrance to the former dealerships)
- Two additional access points (at Road A and Road B) onto McDowell Road
- 64th Street Access and Road A (aligns with existing dealership access)

Figure 2 – Conceptual Site Plan

Executive Summary

McDowell Road and 64th Street

This existing signalized intersection will operate at an acceptable overall LOS C or better in 2025 with the proposed site. It is recommended that the northbound right turn storage length on 64th Street be increased from 215' to 315' and the southbound right turn storage length be increased from 150' to 165', as shown on **Figure 3**. Additionally, it is recommended the existing median between 64th Street and Main Access intersections on McDowell Road be modified to provide equal storage lengths for the westbound left turn lane at 64th Street and the eastbound left turn lane at Main Access.

McDowell Road and Main Access

This T-intersection warrants a traffic signal at the build-out year 2025 or sooner. The 2025 analyses of this signalized intersection indicate that it will operate at an acceptable LOS C or better during all three analyzed peak hours. It is recommended that this intersection be monitored to determine at what phase of the development a signal is warranted at this location.

It is recommended the southbound left and right turn length storages be provided at 170' and 50', respectively. Additionally, as stated above, it is recommended the existing median between 64th Street and Main Access intersections on McDowell Road be modified to provide equal storage lengths for the westbound left turn lane at 64th Street and the eastbound left turn lane at Main Access.

64th Street and Road A

This T-intersection operates at an acceptable LOS C or better as unsignalized in 2025, with the exception of the westbound left-turn movement which operates at lower LOC E only during the PM peak hour. The southbound left turn storage length of 100' is sufficient. It is recommended that an exclusive northbound right turn deceleration lane be provided on 64th Street at Road A with a minimum of 50' of storage. Additionally, it is recommended the westbound left and right turn storage lengths on Road A are provided at 75' and 50', respectively.

Road A and Road B at McDowell Road

It is recommended that a minimum of 50' of storage be provided for the southbound right turn lanes at the two right-in-right-out access points on Road A and Road B at McDowell Road. Exclusive westbound right turn lanes on McDowell Road at Road A and Road B are not required as a result of the operational analysis.

Figure 3 – Recommended Storage Lengths

Existing Conditions

Existing Land Use

The existing vacant site is currently zoned for commercial uses (C-4) and was formerly occupied by car dealerships with total existing building area of 155,900 square feet. The trip generation for the previous site was determined using ITE Land Use Code 841 and is provided in **Table 1**.

Table 1 – Trip Generation for Former Site

	AM Peak Hour		PM Peak Hour		Weekday	Saturday Peak Hour		Saturday
	In	Out	In	Out		In	Out	
Automobile Sales (ITE Land Use Code 841)	224	75	163	245	5,036	620	620	4,626

Existing Roadway Characteristics

The primary roadways serving the site are McDowell Road and 64th Street. McDowell Road is an east-west 6-lane arterial with raised landscape medians. There is an existing median break, located approximately 700'east of 64th Street, which served as main full access to the former dealership site. Additionally, an approximately 700-feet long westbound

right-turn deceleration lane exists on McDowell Road from the main full access to the former dealership site to the intersection with 64th Street. Posted speed limit on McDowell Road is 45mph.

64th Street is a 4-lane north-south minor arterial with raised landscaped medians. An existing median break is located approximately 470' north from McDowell Road and provides a full access to the site. Posted speed limit is 35 mph. 64th Street serves as a divider between the City of Scottsdale and City of Phoenix city limits.

The intersection of McDowell Road and 64th Street is controlled by a traffic signal while the two existing full access intersections into the site are controlled by stop signs. Exclusive right and left turn lanes are provided at this intersections as well as at each existing site access intersection along McDowell Road and 64th Street with exception of northbound right turn lane at the site intersection with 64th Street.

Typical ¼-mile or ½-mile signal spacing exist within the City of Scottsdale in the vicinity of the site, with signals at 68th Street, 70th Street, Scottsdale Road, 74th Street, Miller Road, 77th Street, and Hayden road to the east and at Oak Street, Thomas Street, and Indian School to the north. Closest signals to the west and the south (City of Phoenix) are located approximately 1 mile from the McDowell Road/64th Street intersection at 54th Street and Moreland Street, respectively.

Existing Transit, Pedestrian and Bicycle Facilities

Two existing bus routes are currently operating along McDowell Road in the site vicinity. Valley Metro's local bus service (Route 17) runs along McDowell Road with closest stops at 44th Street to the west and at Scottsdale Road to the east. Second local bus service (Route 56) is provided from Galvin Parkway turning east on McDowell Road with closest stops at Desert Botanical Garden/Galvin Parkway to the south and at Scottsdale Road/McDowell Road to the east.

According to the Maricopa Association of Government Regional Bike Map, the City of Phoenix provides bike lanes along three legs of the McDowell Road/64th Street intersection, i.e. the north leg (64th Street), the south leg (Galvin Parkway), and the west leg of McDowell Road. No designated bike lanes exists along the site frontage on the east leg of McDowell Road. Additionally, the City of Scottsdale maintains a paved multi-use path along Arizona Cross Cut Canal (the eastern site border) as well as along the northern border of the existing site. Attached sidewalks are also provided along the site frontage on McDowell Road and 64th Street.

Existing Traffic Counts

Traffic Research and Analysis, Inc. was retained to obtain daily traffic counts for the adjacent to site segments of McDowell Road and 64th Street as well as turning movement counts at the intersection of McDowell Road and 64th Street. The traffic counts were collected beginning Thursday, December 10, 2015 through Saturday, December 12, 2015. Existing morning (AM), evening (PM), and Saturday traffic volumes are illustrated in **Figure 4** through **Figure 6**, respectively. Traffic count data is also presented in the **Appendix**.

Horizon Years

Category 2 study is based on traffic conditions for the build-out or completion year of the development, which according to the developer is year 2025.

Annual Growth Rate (Background Traffic)

Burgess & Niple reviewed the 2035 MAG model. The model showed negative growth within the study area. The historical traffic counts from the City of Scottsdale were then reviewed. According to this data McDowell Road and 64th

Street traffic experience net annual decrease from 2000 to 2012. Although two different sources indicated decrease in traffic volumes, a conservative approach was taken and "zero" growth factor was utilized.

Figure 4 – Existing AM Peak Traffic Volumes

Figure 5 – Existing PM Peak Traffic Volumes

Figure 6 – Existing Saturday Peak Traffic Volumes

Proposed Development

The proposed site is located on the vacant former auto dealership site. The surrounding land consists primarily of single-family residential properties to the north and the east. Desert Botanical Garden is located south of the site with access to Galvin Parkway (south leg of 64th Street/McDowell intersection) and no direct access to McDowell Road. The City of Phoenix park land is located to the west. The proposed conceptual plan is a mixture of residential, office, retail, hotel and restaurant parcels. Four conceptual site plans are being presented by SunChase Holdings, Inc. as part of Rezoning Development process. Burgess & Niple has evaluated trip generation scenarios associated with each of the proposed site plans and in coordination with the City of Scottsdale chose one that best represents the potential traffic impacts on the nearby area. This conceptual site plan (Option 1) with its internal roadways is shown on **Figure 2.** It is anticipated that the site will be fully developed in 2025. The **Appendix** contains trip generation for the remaining three site plans.

Land Uses

The site occupies approximately 30 acres. The following are the assumed land uses for the development plan:

Building B1 (4-level office)	128,060	square feet (SF)
Building B2 (4-level office)	163,800	SF
Building B3 (4-level office)	144,796	SF
Building B4 (4-level office)	129,600	SF
Building D (4-level hotel)	228	rooms
Building E (4-level residential)	165	dwelling units (DU)
Building F (4-level office)	168	DU
Retail (shopping center)	14,400	SF
Restaurant (assumed as high-turnover sit-down)	6,400	SF

Trip Generation

The traffic volumes generated by the proposed development were estimated using the Institute of Transportation Engineer's (ITE) *Trip Generation Manual, 9th Edition.* The ITE data is based on studies that measured the trip generation characteristics for various types of land uses. The rates are expressed in terms of vehicular trips per unit of land use. **Table 2** and **Table 3** summarize the expected number of trips for each parcel during the Weekday and Saturday, respectively.

Table 2 - Trip Generation for Weekday

Description	Units	Amount	ITE Land Use Code	AM		PM		Weekday
				In	Out	In	Out	
Office (Building B1)	SF	128,060	710	205	28	38	184	1,584
Office (Building B2)	SF	163,800	710	250	34	45	217	1,910
Office (Building B3)	SF	144,796	710	226	31	41	200	1,740
Office (Building B4)	SF	129,600	710	207	28	38	186	1,599
Hotel (Building D)	Rooms	228	310	71	50	70	67	1,862
Residential (Building E)	DU	165	230	13	64	61	30	994
Residential (Building F)	DU	168	230	13	65	62	30	1,010
Shopping Center (Retail)	SF	14,400	820	30	18	79	85	1,927
Restaurant (High-Turnover Sit-Down)	SF	6,400	932	38	31	38	25	814
Total Trips for Weekday				1053	349	472	1024	13,440

Table 3 - Trip Generation for Saturday						
Description	Units	Amount	ITE Land Use Code	Peak Hour		Saturday Day
				In	Out	
Office (Building B1)	SF	128,060	710	30	25	316
Office (Building B2)	SF	163,800	710	38	32	402
Office (Building B3)	SF	144,796	710	34	29	356
Office (Building B4)	SF	129,600	710	30	26	318
Hotel (Building D)	Rooms	228	310	91	71	1,867
Residential (Building E)	DU	165	230	49	41	1,030
Residential (Building F)	DU	168	230	49	42	1,040
Shopping Center (Retail)	SF	14,400	820	129	119	2,725
Restaurant	SF	6,400	932	48	42	1,014
Total Trips for Saturday				498	427	9,068

Internal Capture

Given the mix-use nature of the proposed development which includes office, retail, restaurant, residential and hotel components, it is expected that several of the estimated trips will be internal to the development. Based on *the NCHRP Report 684 – Enhancing Internal Trip Capture Estimation of Mixed-Use Developments*, the internal capture rates for trip origins and trip destinations within a multi-use development were applied for weekday AM and PM hours. Since Saturday Peak Hour rates were not available, it was assumed that the Saturday peak internal capture rate was the same as the PM peak hour. **Table 4** summarizes the trip reductions for the internal capture rate. Supporting calculations are presented in the **Appendix.**

Table 4 – Trip Generation with Internal Capture Reduction									
Description	Reduced AM Peak Hour			Reduced PM Peak Hour			Reduced Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Office (Buildings B1, B2, B3, B4)	880	120	1,000	154	752	906	126	107	233
Hotel (Building D)	71	49	120	50	48	97	64	51	115
Residential (Buildings E, F)	26	127	153	73	36	108	58	49	107
Shopping Center	19	12	31	55	60	115	91	84	174
Restaurant	27	22	49	22	15	37	28	25	53
Total Trips After Internal Capture Reduction	1023	330	1,353	354	911	1263	367	316	682

Pass-By Trip Reduction

A number of the trips generated by the retail and restaurant components are expected to be pass-by trips coming from travelers passing the site on their way to their actual destination. Both the McDowell Road corridor and 64th Street are convenient and popular commuter routes within the cities of Phoenix and Scottsdale. Based on research and guidance from the ITE *Trip Generation Handbook*, the following pass-by rates were assumed:

- Shopping Center: 25% in Weekly PM and Saturday peak hours
- High-Turnover (Sit-Down) Restaurant: 30% in Weekly PM and Saturday peak hours

Table 5 summarizes the pass-by reductions taken for this development. The adjusted assigned site trip volumes used for analysis are illustrated in **Figure 7** through **Figure 9**, for the morning (AM), evening (PM), and Saturday peak, respectively.

Table 5 – Trip Generation with Pass-By Reduction									
	Total AM Peak Hour			Total PM Peak Hour			Total Saturday Peak Hour		
	In	Out	Total	In	Out	Total	In	Out	Total
Trip Trips After Internal Capture Reduction	5	5	5	354	911	1,263	5	5	5
Shopping Center Pass-By Reduction	-	-	-	14	14	28	22	22	44
Restaurant Pass-By Reduction	-	-	-	6	6	12	8	8	16
Total External Trips	5	330	335	333	892	1,223	336	288	622

Trip Distribution

The trip distribution procedure determines the general pattern of travel for vehicles entering and leaving the proposed development. For this study, the trips will be distributed using existing traffic count data as well as the general knowledge of the major destinations in the area. The assumed trip distribution shown on **Figure 7** through **Figure 9** was determined according to the following:

- 20% to/from the north on 64th Street
- 20% to/from the south on 64th Street
- 30% to/from the east on McDowell Road
- 30% to/from west on McDowell Road

The site traffic will utilize the Main Access as well as the two additional right-in-right-out access points onto McDowell Road. Additional full access is provided via 64th Street.

Total (Background + Site) Future Traffic

The total future volumes used for analysis are illustrated in **Figure 10** through **Figure 12**. These total volumes were obtained by adding the 2025 (same as existing 2015) background volumes and the total adjusted site trips.

Figure 7 – Site AM Peak Traffic Volumes

Figure 8 – Site PM Peak Traffic Volumes

Figure 9 – Site Saturday Peak Traffic Volumes

Figure 10 – Total 2025 AM Peak Traffic Volumes

Figure 11 – Total 2025 PM Peak Traffic Volumes

Figure 12 – Total 2025 Saturday Peak Traffic Volumes

No Build Traffic Analysis

To evaluate the proposed development's impacts on the study intersection of McDowell Road and 64th Street, a "no build" analysis was conducted using 2025 background volumes (no site trips). Analysis was conducted utilizing *HCS 2010* software using methodologies from the *Highway Capacity Manual* (HCM). This manual measures the average delay per vehicle to determine the Level-Of-Service (LOS) for signalized and unsignalized intersections. LOS A represents the best operation with least delay, while LOS F represents the worst operation. City of Scottsdale considers LOS D or better an acceptable operation for the overall intersection and LOS E or better an acceptable operation of intersection approaches and turning movements during the peak hours.

Under the No Build analysis, the existing intersection lane configurations were not modified, however, signal timing and cycle lengths were optimized. The No Build analysis results for the AM, PM and Saturday peak are illustrated in **Table 6.** The LOS, delay (sec/veh), volume-to-capacity ratios [v/c] are reported from *HCS 2010* output,

Table 6 – 2025 No Build Level-Of-Service Results

McDowell Road and 64th Street Intersection

	Overall LOS	Eastbound McDowell Road			Westbound McDowell Road			Northbound 64th Street			Southbound 64th Street		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour	B (18.6)	B (13.8) [0.75]	B (17.2) [0.51]	B (12.6) [0.02]	B (12.1) [0.62]	C (22.8) [0.81]	B (12.5) [0.27]	C (20.3) [0.06]	C (22.8) [0.42]	B (15.2) [0.16]	B (17.1) [0.36]	C (20.6) [0.56]	B (14.5) [0.52]
		B (16.2)			C (20.0)			C (20.9)			B (17.9)		
PM Peak Hour	C (25.1)	B (18.1) [0.79]	C (27.4) [0.73]	B (17.7) [0.21]	C (21.4) [0.77]	C (26.3) [0.54]	B (19.0) [0.26]	C (22.8) [0.19]	C (30.1) [0.65]	C (22.6) [0.60]	C (30.2) [0.69]	C (26.7) [0.46]	B (16.2) [0.33]
		C (24.7)			C (24.4)			C (27.0)			C (24.8)		
Saturday Peak	B (15.5)	B (10.3) [0.57]	B (13.2) [0.35]	A (8.8) [0.04]	B (11.1) [0.21]	B (16.4) [0.44]	B (11.9) [0.23]	B (18.1) [0.19]	C (22.2) [0.39]	B (19.0) [0.41]	B (18.0) [0.30]	C (20.9) [0.24]	B (16.3) [0.47]
		B (12.2)			B (15.2)			C (20.5)			B (18.1)		

Outputs from *HCS 2010* are provided in the **Appendix**. The signalized intersection of McDowell Road and 64th Street and all movements and approaches operate at LOS C or better in 2025 during all three peak hours.

Signal Warrant Analysis

The Manual on Uniformed Traffic Control Devices (MUTCD) published by the United States Department of Transportation is a source used in determining the need for traffic signal installation through the United Stated. This document establishes nine (9) separate, related sets of criteria termed "warrants". If none of the warrants is satisfied then a signal should not be installed. If one or more of the warrants is satisfied, then a signal might be appropriate if the signal is shown to improve the overall safety and/or operation of the intersection.

The MUTCD process was utilized to determine if a signal is warranted with the proposed development at the intersection of McDowell Road and Main Access. Only three (Warrant 1, Warrant 2, and Warrant 3) of the nine MUTCD

warrants use estimated vehicular traffic volumes to provide an indication of the need for a traffic signal at a particular location. **Table 7** summarizes the results of the signal warrant analysis for Warrants 1 through 3 with the detailed signal warrant analyses provided in the **Appendix**.

Table 7 – Signal Warrant Analysis

McDowell Road and Main Access	FULL VALUES	REDUCED * (70% FACTOR)
# 1A – MINIMUM VEHICULAR VOLUME	YES (12 HOURS)	YES (17 HOURS)
# 1B – INTERRUPTION OF CONTINUOUS TRAFFIC	YES (17 HOURS)	YES (17 HOURS)
# 2 - FOUR HOUR VEHICULAR VOLUME	YES (16 HOURS)	YES (17 HOURS)
# 3 - PEAK HOUR VOLUME	YES (13 HOURS)	YES (16 HOURS)

* The reduced (70% factor) hourly volumes were applied per MUTCD because the major-street speed exceed 40 mph.

This analysis indicates that the future intersection of McDowell Road and Main Access will warrant a traffic signal in year 2025 with full build-out of the site. It is likely that a traffic signal is warranted with a partial build-out of the development. At this time no information is available on development phasing and opening year. It is recommended that this intersection be monitored to determine when a traffic signal is warranted.

Build Traffic Analysis

The Build traffic analysis analyzes the total future traffic incorporating the trips generated by the proposed development and the background trips. *HCS 2010* was also used in this analysis. The Build analysis assumed the existing intersection lane configurations were not modified, however the signal timing and cycle lengths were optimized. The proposed site full access points on McDowell Road (Main Access) and 64th Street (Road A Access) were also analyzed. McDowell Road and Main Access intersection was initially analyzed as unsignalized and as expected it operated at an unacceptable LOS F. It was then analyzed as signalized. The operational results for the three study intersections for the three peak hours are illustrated in **Table 8**. The LOS, delay, and volume-to-capacity ratios (v/c) are reported from the *HCS 2010* output which are provided in the **Appendix.**

Table 8 – 2025 Build Level-Of-Service Results

McDowell Road and 64th Street Intersection (Signalized)

	Overall LOS	Eastbound McDowell Road			Westbound McDowell Road			Northbound 64th Street			Southbound 64th Street		
		LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
AM Peak Hour	C (22.2)	C (21.4) [0.85]	C (21.3) [0.66]	B (14.2) [0.02]	B (16.6) [0.80]	C (26.2) [0.83]	B (13.6) [0.28]	C (23.4) [0.07]	C (27.4) [0.60]	B (18.3) [0.37]	C (21.3) [0.56]	C (23.3) [0.55]	B (15.6) [0.52]
		C (21.3)			C (23.2)			C (24.2)			C (20.4)		
PM Peak Hour	C (34.4)	C (24.5) [0.90]	D (39.1) [0.84]	C (24.0) [0.23]	D (48.8) [0.93]	C (30.0) [0.23]	C (20.5) [0.75]	C (29.8) [0.59]	D (41.1) [0.85]	C (23.9) [0.53]	D (54.4) [0.85]	C (33.9) [0.53]	C (20.9) [0.40]
		D (35.1)			C (33.3)			C (34.1)			C (34.9)		
Saturday Peak	B (16.4)	B (11.5) [0.64]	B (14.6) [0.42]	A (9.5) [0.04]	B (12.1) [0.34]	B (18.2) [0.52]	B (12.9) [0.26]	B (17.8) [0.19]	C (22.2) [0.44]	B (18.6) [0.47]	B (17.8) [0.35]	C (20.4) [0.25]	B (15.4) [0.47]
		B (13.6)			B (16.6)			C (20.3)			B (17.5)		

McDowell Road and Main Access Intersection (Signalized)							
	Overall LOS	Eastbound McDowell Road		Westbound McDowell Road		Southbound Main Access	
		LT	TH	TH	RT	LT	RT
AM Peak Hour	B (14.1)	D (54.1) [0.99]	A (2.2) [0.28]	B (11.1) [0.68]	A (7.3) [0.19]	C (28.5) [0.64]	B (18.0) [0.23]
		B (17.3)		B (10.8)		C (23.8)	
PM Peak Hour	B (10.2)	A (7.8) [0.40]	A (6.3) [0.57]	B (11.5) [0.57]	A (8.0) [0.08]	C (21.0) [0.80]	B (17.6) [0.51]
		A (6.4)		B (11.3)		C (21.0)	
Saturday Peak	A (5.6)	A (3.1) [0.29]	A (2.1) [0.25]	A (6.0) [0.34]	A (4.8) [0.06]	C (27.2) [0.59]	C (21.0) [0.28]
		A (2.2)		A (5.9)		C (24.4)	

64th Road and Road A Intersection (Unsignalized)				
	Overall LOS	Westbound Road A		Southbound 64th Street
		LT	RT	LT
AM Peak Hour	C (16.1)	C (24.4) [0.16]	B (10.6) [0.07]	B (10.8) [0.20]
PM Peak Hour	C (23.7)	E (38.0) [0.46]	B (14.1) [0.26]	B (11.7) [0.09]
Saturday Peak	B (12.8)	C (16.4) [0.09]	B (10.4) [0.07]	A (9.4) [0.06]

McDowell Road and Road A Intersection (Unsignalized)*			
			Southbound Road A
			TH / RT
AM Peak Hour			- / C (19.1) [0.12]
			C (19.1)
PM Peak Hour			- / B (15.0) [0.2]
			B (15.0)
Saturday Peak			- / B (11.9) [0.06]
			B (11.9)

McDowell Road and Road B Intersection (Unsignalized)*			
			Southbound Road B
			TH / RT
AM Peak Hour			- / C (17.6) [0.11]
			C (17.6)
PM Peak Hour			- / C (17.1) [0.24]
			C (17.1)
Saturday Peak			- / B (12.0) [0.06]
			B (12.0)

*HCS module for two-way stop-controlled intersection only allows input of 2 thru lanes on major street, therefore these analyses could only be performed with 2 thru lanes for each travel direction on McDowell Road.

The signalized intersection of McDowell Road and 64th Street will operate at an acceptable LOS D or better under Build Conditions during the 2025 AM, PM and Saturday peak hour with existing intersection lane configurations. The signalized intersection of McDowell Road and Main Access will operate at LOS C or better during all three peak hours. Although the westbound left turn movement at the unsignalized intersection of 64th Street and Road A operates at LOS E during the PM peak hour, the overall intersection as well as all approaches operate at acceptable LOS C or better during all three peak hours.

Collision Analysis

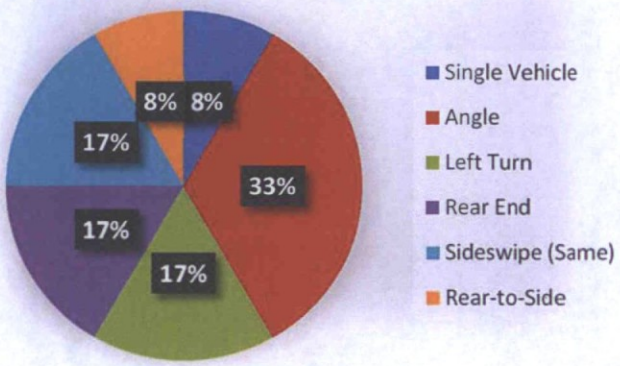
Burgess & Niple obtained the most recent 3-year collision history (2012-2014) near the intersection of McDowell Road and 64th Street. This data included crashes at the intersection as well as its proximity along McDowell Road and 64th Street (also recorded as Galvin Parkway). There were a total of 12 crashes reported, with five crashes each in 2012 and 2013 and only two in 2014. The intersection collisions are summarized in the charts and **Table 9.** Collision summaries indicate that majority of the collisions were angle type. Improper turning and speeding accounted for more than half of the crashes. Four of the crashes (33%) resulted in incapacitating injuries and one (8%) in non-incapacitating injury. Additionally, one collision involved alcohol-impaired driver and one ill-impaired driver who failed to keep his vehicle in proper lane striking another vehicle.

Twelve collisions for the 3-year period for the analyzed intersection of McDowell Road and 64th Street is very small with the latest 2014 data only documenting two crashes. For an intersection of this size and traffic volume, twelve crashes in 3-year period is unusually low.

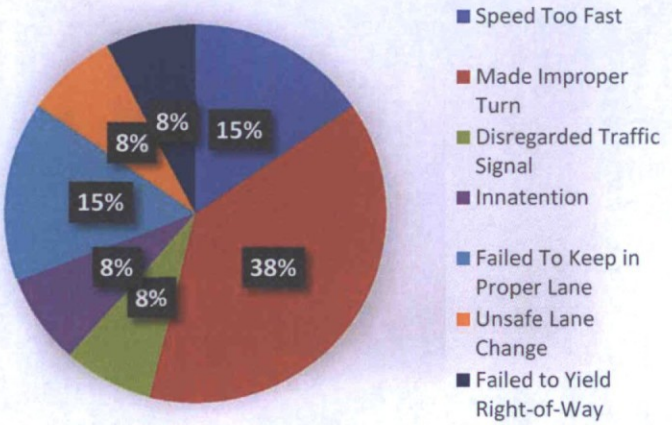
Every two years the City of Scottsdale publishes Traffic Volume and Collision Rate Data report for major intersections and major roadway segments within the city. According to the latest 2014 document, the following 10-year statistics exist for intersections and segments within the study area, listed in **Table 10**.

The intersection of McDowell Road and 64th Street as well as the two analyzed segments of McDowell Road and 64th Street have lower collision rates than the citywide averages for intersections and segments within the city. Additionally, historical data indicates general downward trends within the study area.

Collisions by Manner of Collision



Collisions by Violation



Collisions by Severity

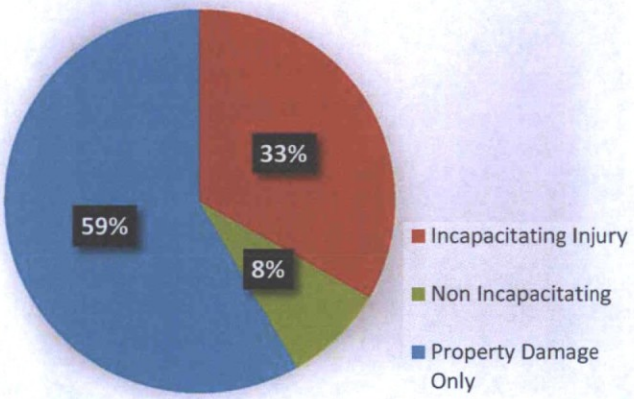


Table 9 - Collision by Type and Direction				
	McDowell Road		64th Street	
Manner of Collision	EB	WB	NB	SB
Single Vehicle	0	0	0	1
Angle	1	0	2	1
Left Turn	0	0	0	2
Rear End	0	2	0	0
Sideswipe (Same)	2	0	0	0
Rear-to-Side	1	0	0	0
Total	4	2	2	4

Table 10 - Collision Rate Comparison by Year							
		2014	2012	2010	2008	2006	2004
Intersection	Citywide	0.57	0.52	0.48	0.53	0.64	0.66
	McDowell Road and 64th Street Intersection	0.13	0.12	0.18	0.16	0.22	0.22
Segment	Citywide	1.35	1.31	1.27	1.28	1.87	1.84
	McDowell Road between 64th and 68th Streets	0.36	0.89	0.31	0.71	1.03	1.07
	64th Street between McDowell Road and Oak Street	0	0	0.30	0	1.00	0.67

Turn Lane Length Analysis

The existing right and left turn lanes at the three study intersections were evaluated to determine the storage requirements with the proposed site in year 2025. HCS Software estimates 95th percentile queue lengths. The required storage lengths were determined based on the highest peak turning volumes. Average passenger vehicle length is assumed to be 25'.

McDowell Road and Main Access

The required southbound left turn storage length was determined based on the highest peak turning volumes of 276 vehicles per hour (vph). The 95th percentile queue during the PM peak hour is 6.8 vehicles per lane, hence a total required storage is 170'.

The existing westbound right turn storage length is approximately 120'. The required length was determined based on the highest AM peak right turning volumes of 157 vph. The 95th percentile queue during the AM and PM peak hours is 1.6 vehicles per lane, hence the available storage of 120' is sufficient.

Same procedure was used to calculate all other storage lengths at study intersections. Recommended storage length are shown in **Table 11** and on **Figure 13**.

Table 11- Recommended Storage Lengths

Intersection/ Turn Lane		2025 Design Volumes (vph)			Highest 95th Percentile Queue (length)	Existing Storage	Recommended Storage
		AM	PM	Saturday			
McDowell Road and Main Access	EB LT	**419**	147	148	12.3 (308')	120'	*
	WB RT	**157**	55	56	1.6 (41.6')	120'	No change
	SB LT	103	**276**	78	6.8 (170')	N/A	170'
	SB RT	86	**230**	94	0.1 (3')	N/A	50'
McDowell Road and Road A	SB RT	34	**92**	31	0.75 (19')	N/A	50'
McDowell Road and Road B	SB RT	34	**92**	31	0.91 (24')	N/A	50'
McDowell Road and 64th Street	NB RT	179	**380**	188	12.5 (313')	215'	315'
	SB LT	184	**213**	129	6.2 (155')	210'	No change
	SB RT	**314**	264	245	6.6 (165')	150'	165'
	EB LT	348	**371**	301	10.5 (265')	280'	No change
	WB LT	330	**388**	137	19 (475')	280'	*
	WB RT	184	**199**	156	6.4 (160')	700'	No change
64th Street and Road A	SB LT	**157**	55	55	0.76 (19')	100'	No change
	NB RT	**157**	55	56	0.54 (14')	None	50'
	WB LT	34	**92**	31	2.23 (56')	N/A	75'
	WB RT	52	**138**	47	1.02 (27')	N/A	50'

*Due to proximity of the Main Access and 64th Street intersections with McDowell Road, a possibility of extending the eastbound left turn bay at Main Access and the westbound left turn bay at 64th Street is limited. Dual left turn lanes were considered, however left turn signal phasing must be changed from permissive + protective to protective only, which reduces signal operations at these locations. It is recommended that the existing median be modified to provide equal storage capacity for these two back-to-back left turn bays.

Figure 13 – Recommended Storage Lengths

Conclusions and Recommendations

McDowell Road and 64th Street

This existing signalized intersection will operate at an acceptable overall LOS C or better in 2025 with the proposed site. It is recommended that the northbound right turn storage length on 64th Street be increased from 215' to 315' and the southbound right turn storage length be increased from 150' to 165'. Additionally, it is recommended the existing median between 64th Street and Main Access intersections on McDowell Road be modified to provide equal storage lengths for the westbound left turn lane at 64th Street and the eastbound left turn lane at Main Access.

McDowell Road and Main Access

This T-intersection warrants a traffic signal at the build-out year 2025 or sooner. The 2025 analyses of this signalized intersection indicate that it will operate at an acceptable LOS C or better during all three analyzed peak hours. It is recommended that this intersection be monitored to determine at what phase of the development a signal is warranted at this location.

It is recommended the southbound left and right turn length storages be provided at 170' and 50', respectively. Additionally, as stated above, it is recommended the existing median between 64th Street and Main Access intersections on McDowell Road be modified to provide equal storage lengths for the westbound left turn lane at 64th Street and the eastbound left turn lane at Main Access.

64th Street and Road A

This T-intersection operates at an acceptable LOS C or better as unsignalized in 2025, with the exception of the westbound left-turn movement which operates at lower LOC E only during the PM peak hour. The southbound left turn storage length of 100' is sufficient. It is recommended that an exclusive northbound right turn deceleration lane be provided on 64th Street at Road A with a minimum of 50' of storage. Additionally, it is recommended the westbound left and right turn storage lengths on Road A are provided at 75' and 50', respectively.

Road A and Road B at McDowell Road

It is recommended that a minimum of 50' of storage be provided for the southbound right turn lanes at the two right-in-right-out access points on Road A and Road B at McDowell Road.

Exclusive westbound right turn lanes on McDowell Road at Road A and Road B are not required as a result of the operational analysis.

Traffic Counts

Client:	Burgess & Niple	Site Ref:	1
File Number:	1504818	Direction:	EB
Route:	E MCDOWELL RD	Latitude:	33.4657
Location:	E of N 64TH ST	Longitude:	-111.9420

Count Date	12/10/2015		12/11/2015		12/12/2015												Average		
Count Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
00:00	29	258	32	247	52	203											38	236	
00:15	31	203	31	233	55	198											39	211	
00:30	19	232	32	278	53	228											35	246	
00:45	20	205	25	241	31	218											25	221	
01:00	16	198	18	222	33	218											22	213	
01:15	10	192	28	212	24	229											21	211	
01:30	15	221	12	281	30	221											19	241	
01:45	14	227	22	232	31	258											22	239	
02:00	15	264	11	220	33	203											20	229	
02:15	9	284	11	305	26	226											15	272	
02:30	15	272	13	284	18	231											15	262	
02:45	18	278	8	300	15	252											14	277	
03:00	8	244	14	292	19	238											14	258	
03:15	9	250	12	316	23	204											15	257	
03:30	10	339	9	372	16	226											12	312	
03:45	19	358	22	361	21	203											21	307	
04:00	20	365	18	340	11	213											16	306	
04:15	25	469	33	410	20	213											26	364	
04:30	44	386	47	382	20	182											37	317	
04:45	51	437	51	447	32	187											45	357	
05:00	59	418	53	411	27	206											46	345	
05:15	70	486	61	447	67	200											66	378	
05:30	135	475	132	334	65	170											111	326	
05:45	138	405	145	349	72	216											118	323	
06:00	130	380	141	277	72	147											114	268	
06:15	158	309	114	267	66	150											113	242	
06:30	188	230	163	233	102	160											151	208	
06:45	242	198	234	207	103	178											193	194	
07:00	234	209	191	180	91	161											172	183	
07:15	251	164	286	194	90	179											209	179	1688
07:30	264	146	276	149	128	201											223	165	1650
07:45	253	173	281	151	156	175											230	166	
08:00	265	172	251	164	129	168											215	168	
08:15	228	149	249	163	137	134											205	149	
08:30	220	143	252	155	165	151											212	150	
08:45	225	149	244	141	156	154											208	148	
09:00	220	124	207	145	139	140											189	136	
09:15	203	133	189	155	166	160											186	149	
09:30	195	128	185	162	167	165											182	152	
09:45	211	150	217	173	195	138											208	154	
10:00	199	119	184	166	170	125											184	137	
10:15	209	84	193	162	166	128											189	125	
10:30	202	99	193	123	182	113											192	112	
10:45	192	102	200	136	204	97											199	112	
11:00	233	72	251	115	203	88											229	92	
11:15	225	77	233	96	213	113											224	95	
11:30	223	64	236	77	210	99											223	80	
11:45	221	40	264	65	257	73											247	59	
Totals	**5990**	**11080**	**6074**	**11372**	**4461**	**8540**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**5508**	**10331**	
Day Total	**17070**		**17446**		**13001**		**0**		**0**		**0**		**0**		**0**		**15839**		
AM Pct	35.1%		34.8%		34.3%												34.8%		
Peak Hour	7:15	16:45	7:15	16:30	11:45	14:15											11:45	16:45	
Peak Volume	1033	1816	1094	1687	886	947											941	1406	
P.H.F	0.9745	0.9342	0.9563	0.9435	0.8619	0.9395											0.9508	0.9307	

Client:	Burgess & Niple	Site Ref:	1
File Number:	1504819	Direction:	WB
Route:	E MCDOWELL RD	Latitude:	33.4657
Location:	E of N 64TH ST	Longitude:	-111.9420

Count Date	12/10/2015		12/11/2015		12/12/2015												Average	
Count Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
00:00	27	249	35	271	61	234											41	251
00:15	28	210	28	286	45	229											34	242
00:30	20	221	20	291	62	222											34	245
00:45	13	258	27	220	35	202											25	227
01:00	22	233	25	285	43	223											30	247
01:15	13	258	10	271	30	245											18	258
01:30	16	225	23	280	28	202											22	236
01:45	8	233	14	280	36	230											19	248
02:00	15	258	25	297	29	227											23	261
02:15	14	245	13	286	54	205											27	245
02:30	17	292	20	338	49	225											29	285
02:45	14	289	15	279	37	245											22	271
03:00	9	276	14	316	32	244											18	279
03:15	13	301	15	301	28	215											19	272
03:30	14	309	10	366	31	238											18	304
03:45	11	268	22	293	16	212											16	258
04:00	18	315	24	352	21	198											21	288
04:15	24	284	23	330	23	212											23	275
04:30	30	305	27	287	22	217											26	270
04:45	39	286	34	326	18	195											30	269
05:00	40	350	46	333	35	231											40	305
05:15	69	353	81	325	31	265											60	314
05:30	99	355	86	327	39	315											75	332
05:45	108	257	91	295	59	216											86	256
06:00	141	296	135	280	43	246											106	274
06:15	160	283	185	291	66	247											137	274
06:30	256	259	213	218	85	199											185	225
06:45	314	173	295	185	78	183											229	180
07:00	348	195	330	232	96	171											258	199
07:15	419	157	383	192	81	167											294	172
07:30	495	166	436	175	126	150											352	164
07:45	476	143	415	157	144	136											345	145
08:00	394	163	361	159	126	140											294	154
08:15	352	119	319	162	126	116											266	132
08:30	314	121	278	120	130	104											241	115
08:45	289	110	270	107	159	115											239	111
09:00	218	101	225	127	147	93											197	107
09:15	204	124	206	146	154	109											188	126
09:30	217	106	232	112	145	120											198	113
09:45	193	113	233	113	177	124											201	117
10:00	223	92	190	102	161	87											191	94
10:15	170	97	215	92	191	110											192	100
10:30	194	86	186	93	177	96											186	92
10:45	217	67	200	116	187	88											201	90
11:00	201	61	199	89	207	89											202	80
11:15	184	54	211	84	200	92											198	77
11:30	190	56	241	70	221	78											217	68
11:45	246	33	237	55	214	53											232	47
Totals	**7096**	**9805**	**6923**	**10712**	**4305**	**8560**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**6108**	**9692**
Day Total	**16901**		**17635**		**12865**		**0**		**0**		**0**		**0**		**0**		**15800**	
AM Pct	42.0%		39.3%		33.5%												38.7%	
Peak Hour	7:15	16:45	7:15	15:30	11:45	17:15											7:15	16:45
Peak Volume	1784	1344	1595	1341	899	1042											1285	1220
P.H.F	0.9010	0.9465	0.9146	0.9160	0.9605	0.8270											0.9120	0.9180

Client:	Burgess & Niple	Site Ref:	2
File Number:	1504822	Direction:	NB
Route:	N 64TH ST	Latitude:	33.4671
Location:	N of E MCDOWELL RD	Longitude:	-111.9434

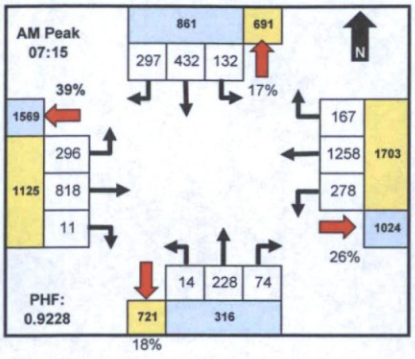
Count Date	12/10/2015		12/11/2015		12/12/2015												Average	
Count Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
00:00	21	175	30	150	47	171											33	165
00:15	22	138	28	183	37	141											29	154
00:30	14	170	24	172	45	159											28	167
00:45	12	183	19	146	34	141											22	157
01:00	15	145	13	144	35	152											21	147
01:15	9	138	19	149	26	152											18	146
01:30	15	164	11	150	34	134											20	149
01:45	7	186	6	175	18	141											10	167
02:00	13	159	11	152	15	147											13	153
02:15	8	144	8	140	13	144											10	143
02:30	14	166	5	202	16	157											12	175
02:45	15	194	8	185	23	186											15	188
03:00	2	177	3	208	11	143											5	176
03:15	7	169	7	238	10	174											8	194
03:30	12	215	15	171	11	143											13	176
03:45	8	197	10	194	10	128											9	173
04:00	7	224	15	219	6	115											9	186
04:15	15	237	11	269	11	115											12	207
04:30	8	233	16	269	10	136											11	213
04:45	24	219	28	247	19	132											24	199
05:00	32	267	27	255	12	127											24	216
05:15	41	276	46	243	20	146											36	222
05:30	54	256	69	220	29	143											51	206
05:45	75	227	88	236	33	166											65	210
06:00	81	226	74	159	24	138											60	174
06:15	105	183	87	193	26	161											73	179
06:30	143	194	128	142	57	144											109	160
06:45	178	165	147	157	63	129											129	150
07:00	153	160	129	131	65	125											116	139
07:15	167	136	178	140	62	165											136	147
07:30	195	114	175	113	80	153											150	127
07:45	194	82	218	126	103	111											172	106
08:00	175	124	189	109	81	97											148	110
08:15	186	99	158	116	96	120											147	112
08:30	168	98	174	87	100	98											147	94
08:45	181	107	148	80	124	113											151	100
09:00	136	77	129	98	101	88											122	88
09:15	148	71	156	104	107	100											137	92
09:30	133	103	138	128	109	87											127	106
09:45	161	92	165	129	115	115											147	112
10:00	131	93	109	103	111	102											117	99
10:15	138	84	150	119	123	95											137	99
10:30	148	64	133	114	118	91											133	90
10:45	155	62	175	110	134	85											155	86
11:00	153	45	138	70	142	86											144	67
11:15	156	54	216	68	149	82											174	68
11:30	148	32	144	58	170	74											154	55
11:45	176	37	195	55	163	62											178	51
Totals	**4159**	**7161**	**4170**	**7426**	**2948**	**6114**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3759**	**6900**
Day Total	**11320**		**11596**		**9062**		**0**		**0**		**0**		**0**		**0**		**10659**	
AM Pct	36.7%		36.0%		32.5%												35.3%	
Peak Hour	7:30	17:00	7:15	16:15	11:15	14:30											11:15	17:00
Peak Volume	750	1026	760	1040	653	660											671	854
P.H.F	0.9615	0.9293	0.8716	0.9665	0.9547	0.8871											0.9424	0.9632

	21441	21424	16754

Client:	Burgess & Niple	Site Ref:	2
File Number:	1504823	Direction:	SB
Route:	N 64TH ST	Latitude:	33.4671
Location:	N of E MCDOWELL RD	Longitude:	-111.9434

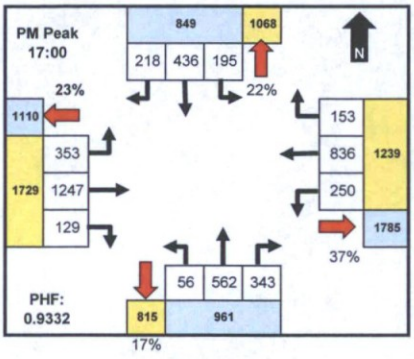
Count Date	12/10/2015		12/11/2015		12/12/2015												Average	
Count Time	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
00:00	19	125	19	130	47	100											28	118
00:15	18	138	18	120	45	85											27	114
00:30	18	135	20	148	53	119											30	134
00:45	13	134	15	122	30	129											19	128
01:00	12	144	15	131	34	87											20	121
01:15	10	131	14	106	28	131											17	123
01:30	8	127	16	153	23	101											16	127
01:45	7	152	18	139	22	140											16	144
02:00	15	143	5	124	30	109											17	125
02:15	9	143	8	147	26	131											14	140
02:30	7	138	10	144	32	101											16	128
02:45	14	147	7	147	33	191											18	162
03:00	8	158	7	149	22	114											12	140
03:15	4	141	4	167	15	142											8	150
03:30	8	148	12	171	17	142											12	154
03:45	10	169	5	190	11	118											9	159
04:00	9	203	7	195	10	106											9	168
04:15	9	221	16	189	13	123											13	178
04:30	19	192	18	184	14	146											17	174
04:45	28	209	18	195	13	141											20	182
05:00	23	258	29	212	15	144											22	205
05:15	38	275	28	234	19	143											28	217
05:30	52	225	46	232	17	140											38	199
05:45	46	225	56	196	26	123											43	181
06:00	84	184	63	199	32	142											60	175
06:15	71	202	62	191	30	174											54	189
06:30	120	167	111	137	40	113											90	139
06:45	177	102	174	121	42	124											131	116
07:00	175	96	151	117	42	95											123	103
07:15	210	82	173	131	63	115											149	109
07:30	240	74	239	81	60	94											180	83
07:45	282	94	210	99	50	107											181	100
08:00	222	83	229	74	71	132											174	96
08:15	224	108	188	66	60	140											157	105
08:30	189	54	182	73	79	49											150	59
08:45	155	86	146	76	87	65											129	76
09:00	116	63	122	84	84	61											107	69
09:15	128	80	140	66	80	72											116	73
09:30	114	104	129	60	105	85											116	83
09:45	102	79	102	79	98	90											101	83
10:00	114	87	103	76	105	59											107	74
10:15	96	79	104	65	85	85											95	76
10:30	100	55	109	83	84	97											98	78
10:45	100	55	88	63	96	67											95	62
11:00	125	43	133	42	95	94											118	60
11:15	134	49	128	67	110	95											124	70
11:30	125	38	120	50	106	67											117	52
11:45	130	39	149	37	116	49											132	42
Totals	**3937**	**6184**	**3766**	**6062**	**2415**	**5277**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**3373**	**5841**
Day Total	**10121**		**9828**		**7692**		**0**		**0**		**0**		**0**		**0**		**9214**	
AM Pct	38.9%		38.3%		31.4%												36.6%	
Peak Hour	7:30	17:00	7:30	17:00	11:15	14:45											7:30	16:45
Peak Volume	968	983	866	874	432	589											692	803
P.H.F	0.8582	0.8936	0.9059	0.9338	0.9310	0.7709											0.9571	0.9233

Intersection TMC: 1504826
Count Date: 12/10/2015



	From North				From East				From South				From West				INTSEC
	64TH ST				MCDOWELL RD				64TH ST				MCDOWELL RD				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
7:00	23	85	70	0	51	261	37	0	1	34	22	0	74	176	1	0	835
7:15	37	82	71	0	59	318	38	0	2	59	22	0	62	200	4	0	954
7:30	37	103	86	0	83	317	44	0	3	66	20	0	84	199	3	0	1045
7:45	28	133	71	0	66	358	39	0	1	42	19	0	85	241	2	0	1085
8:00	30	114	69	0	70	265	46	0	8	61	13	0	65	178	2	0	921
8:15	17	103	72	0	72	259	42	0	6	65	21	0	78	182	6	0	923
8:30	28	90	66	0	49	215	37	0	3	44	23	0	83	166	8	0	812
8:45	23	74	42	0	47	206	37	0	5	44	26	0	94	174	7	0	779
Total	223	784	547	0	497	2199	320	0	29	415	166	0	625	1516	33	0	7354
Pk Hr																	7:15 AM
Pk Vol	132	432	297	0	278	1258	167	0	14	228	74	0	296	818	11	0	4005
PHF	0.892	0.812	0.863	0.000	0.837	0.878	0.908	0.000	0.438	0.864	0.841	0.000	0.871	0.849	0.688	0.000	0.923

100%



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
16:00	47	69	62	0	33	219	34	0	14	105	72	0	71	249	13	0	988
16:15	41	77	81	0	27	213	31	0	16	144	90	0	79	307	9	0	1115
16:30	57	68	60	0	39	214	33	0	16	126	74	0	75	290	13	0	1065
16:45	52	85	54	0	54	201	34	0	19	125	90	0	77	269	14	0	1074
17:00	54	100	58	0	55	207	47	0	15	172	76	0	67	307	34	0	1192
17:15	49	133	74	0	71	216	39	0	16	153	107	0	106	289	27	0	1280
17:30	48	99	36	0	68	238	33	0	14	124	81	0	94	359	33	0	1227
17:45	44	104	50	0	56	175	34	0	11	113	79	0	86	292	35	0	1079
Total	392	735	475	0	403	1683	285	0	121	1062	669	0	655	2362	178	0	9020
Pk Hr																	5:00 PM
Pk Vol	195	436	218	0	250	836	153	0	56	562	343	0	353	1247	129	0	4778
PHF	0.903	0.820	0.736	0.000	0.880	0.878	0.814	0.000	0.875	0.817	0.801	0.000	0.833	0.868	0.921	0.000	0.933

100%

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM	7:15 AM	4005	7:45 AM	1085	0.923
MID					
PM	5:00 PM	4778	5:15 PM	1280	0.933

Peak Hour Statistics by Approach

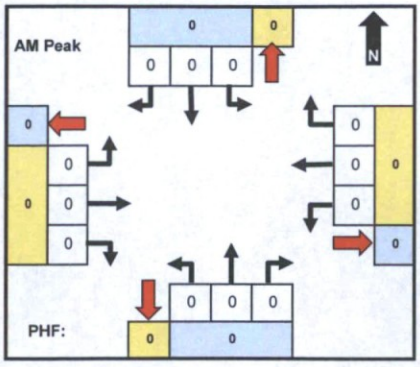
Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM	7:30 AM	863	0.930	7:15 AM	1703	0.920	7:30 AM	325	0.883	7:00 AM	1131	0.862
MID												
PM	5:00 PM	849	0.829	4:45 PM	1263	0.931	4:45 PM	992	0.899	5:00 PM	1729	0.889

Comments

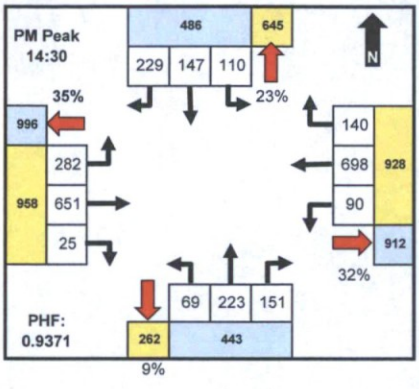
Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	1554	1360	3016	1905	610	1314	2174	2775
MID	0	0	0	0	0	0	0	0
PM	1602	2002	2371	3423	1852	1316	3195	2279

Intersection TMC: 1504827
Count Date: 12/12/2015



	From North				From East				From South				From West				INTSEC
	64TH ST				MCDOWELL RD				64TH ST				MCDOWELL RD				
Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pk Hr																	
Pk Vol																	
PHF																	



Time	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	LT	Thru	RT	Ped	TOTAL
14:00	24	33	43	0	28	152	33	0	13	41	32	0	73	147	15	0	634
14:15	24	36	59	0	27	158	19	0	11	38	39	0	75	148	9	0	643
14:30	25	32	46	0	26	162	35	0	10	47	37	0	75	160	6	0	661
14:45	40	46	75	0	19	177	41	0	11	49	34	0	72	179	8	0	751
15:00	21	25	48	0	23	196	33	0	30	68	49	0	51	171	4	0	719
15:15	24	44	60	0	22	163	31	0	18	59	31	0	84	141	7	0	684
15:30	34	37	61	0	19	187	29	0	6	44	34	0	43	154	13	0	661
15:45	19	31	60	0	27	144	22	0	15	42	25	0	57	153	7	0	602
Total	211	284	452	0	191	1339	243	0	114	388	281	0	530	1253	69	0	5355
Pk Hr																	2:30 PM
Pk Vol	110	147	229	0	90	698	140	0	69	223	151	0	282	651	25	0	2815
PHF	0.688	0.799	0.763	0.000	0.865	0.890	0.854	0.000	0.575	0.820	0.770	0.000	0.839	0.909	0.781	0.000	0.937

100%

Intersection Statistics

Per	Peak Hour	Pk Hr Vol	Peak Intvl	Pk Intv Vol	PHF
AM					
MID					
PM	2:30 PM	2815	2:45 PM	751	###

Peak Hour Statistics by Approach

Per	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF	Peak Hour	Vol	PHF
AM												
MID												
PM	2:45 PM	515	###	2:45 PM	940	###	2:30 PM	443	###	2:00 PM	967	###

Comments

Approach & Departure Volumes (No Peds)

Per	Approach	Depart	Approach	Depart	Approach	Depart	Approach	Depart
AM	0	0	0	0	0	0	0	0
MID	0	0	0	0	0	0	0	0
PM	947	1161	1773	1745	783	544	1852	1905

Trip Generation for Four Proposed Site Plans

Site Plan Base

	LAND USE	SF	DU	AM PEAK HR ADJACENT STREET			PM PEAK HR ADJACENT STREET			WEEKDAY			SATURDAY PEAK			SATURDAY		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
	Mid-Rise Apartment (ITE 223)			14	67	81	64	32	96	535	535	1,070	46	40	86	522	522	1,043
A	Residential Condo/Townhouse (ITE 230)		184	14	70	84	66	33	99	547	547	1,093	52	44	96	545	545	1,090
	Mid-Rise Apartment (ITE 223)			16	79	95	75	37	112	625	625	1,250	55	47	102	613	613	1,225
B1	Residential Condo/Townhouse (ITE 230)		216	16	80	96	76	37	113	629	629	1,257	57	48	105	605	605	1,210
	Mid-Rise Apartment (ITE 223)			12	58	70	56	27	83	465	465	930	41	35	75	454	454	907
B2	Residential Condo/Townhouse (ITE 230)		160	13	62	75	59	29	88	484	484	968	48	41	89	505	505	1,010
C	Hotel (ITE 310)		284	89	62	151	87	83	170	1,160	1,160	2,320	113	89	202	1,163	1,163	2,326
D	General Office Building (ITE 710)	99,285	-	167	23	190	32	157	190	653	653	1,306	23	20	43	122	122	244
E	General Office Building (ITE 710)	92,655	-	158	22	180	31	151	182	619	619	1,239	22	18	40	114	114	228
F	General Office Building (ITE 710)	179,680	-	269	37	306	48	233	281	1,025	1,025	2,049	42	36	78	221	221	442
	Shopping Center Rate (ITE 820)			6	4	10	19	20	39	227	227	453	27	24	51	265	265	530
	Shopping Center Eq (ITE 820)	10,600	-	25	15	40	64	69	133	790	790	1,579	106	97	203	1,124	1,124	2,247
	High-Turnover Restaurant ITE 932)	2,100	-	12	10	23	12	8	21	134	134	267	16	14	30	167	167	333
Totals				**764**	**380**	**1,145**	**475**	**801**	**1,276**	**6,040**	**6,040**	**12,078**	**479**	**407**	**886**	**4,574**	**4,574**	**9,145**

Site Plan Opt 1 (Chosen Site Plan)

	LAND USE	SF	DU	AM PEAK HR ADJACENT STREET			PM PEAK HR ADJACENT STREET			WEEKDAY			SATURDAY PEAK			SATURDAY		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
B1	General Office Building (ITE 710)	128,060	-	205	28	233	38	184	222	792	792	1,584	30	25	55	158	158	316
B2	General Office Building (ITE 710)	163,800	-	250	34	284	45	217	262	955	955	1,910	38	32	70	201	201	402
B3	General Office Building (ITE 710)	144,796	-	226	31	257	41	200	241	870	870	1,739	34	29	63	178	178	356
B4	General Office Building (ITE 710)	129,600	-	207	28	236	38	186	224	799	799	1,599	30	26	56	159	159	318
D	Hotel (ITE 310)		228	71	50	121	70	67	137	932	932	1,863	91	71	162	934	934	1,867
	Mid-Rise Apartment (ITE 223)			12	61	73	58	28	86	480	480	960	42	36	78	468	468	936
E	Residential Condo/Townhouse (ITE 230)		165	13	64	77	61	30	91	497	497	994	49	41	90	515	515	1,030
	Mid-Rise Apartment (ITE 223)			13	61	74	58	29	87	490	490	980	43	36	79	477	477	953
F	Residential Condo/Townhouse (ITE 230)		168	13	65	78	62	30	92	505	505	1,010	49	42	91	520	520	1,040
	Shopping Center Rate (ITE 820)			9	5	14	25	28	53	308	308	615	36	33	69	360	360	720
	Shopping Center Eq (ITE 820)	14,400	-	30	18	48	79	85	164	964	964	1,927	129	119	248	1,363	1,363	2,725
	High-Turnover Restaurant ITE 932)	6,400	-	38	31	69	38	25	63	407	407	814	48	42	90	507	507	1,014
Totals				**1,054**	**349**	**1,403**	**471**	**1,024**	**1,495**	**6,721**	**6,721**	**13,441**	**497**	**428**	**925**	**4,535**	**4,535**	**9,068**

Site Plan Opt 2

	LAND USE	SF	DU	AM PEAK HR ADJACENT STREET			PM PEAK HR ADJACENT STREET			WEEKDAY			SATURDAY PEAK			SATURDAY		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
A	General Office Building (ITE 710)	111,600	-	184	25	209	35	169	204	714	714	1,427	26	22	48	137	137	274
	Mid-Rise Apartment (ITE 223)			19	90	109	86	43	129	720	720	1,440	63	54	117	703	703	1,406
B	Residential Condo/Townhouse (ITE 230)		248	18	89	107	85	42	127	709	709	1,418	62	53	115	665	665	1,330
	Mid-Rise Apartment (ITE 223)			23	114	137	109	53	162	905	905	1,810	79	68	147	885	885	1,769
C	Residential Condo/Townhouse (ITE 230)		312	22	106	128	103	50	153	866	866	1,731	72	61	133	780	780	1,560
D	Hotel (ITE 310)		176	55	38	93	54	52	106	719	719	1,438	70	55	125	721	721	1,441
	High-Turnover Restaurant ITE 932)	6,565	-	39	32	71	39	26	65	417	417	835	49	43	92	520	520	1,040
	Shopping Center Rate (ITE 820)			10	6	16	30	33	63	361	361	721	42	39	81	422	422	844
1	Shopping Center Eq (ITE 820)	16,886	-	33	20	53	87	95	182	1,069	1,069	2,137	143	132	275	1,507	1,507	3,013
	Shopping Center Rate (ITE 820)			7	5	12	23	24	47	273	273	545	32	29	61	319	319	637
2	Shopping Center Eq (ITE 820)	12,755	-	27	17	44	72	79	151	891	891	1,781	119	110	229	1,263	1,263	2,525
	Shopping Center Rate (ITE 820)			8	5	13	23	25	48	278	278	556	33	30	63	326	326	651
3	Shopping Center Eq (ITE 820)	13,030	-	28	17	45	73	80	153	903	903	1,806	121	111	232	1,280	1,280	2,559
Totals		**49,071**		**408**	**353**	**761**	**554**	**597**	**1,151**	**6,338**	**6,338**	**12,674**	**670**	**595**	**1,265**	**7,016**	**7,016**	**14,027**

Site Plan Opt 3

	LAND USE	SF	DU	AM PEAK HR ADJACENT STREET			PM PEAK HR ADJACENT STREET			WEEKDAY			SATURDAY PEAK			SATURDAY		
				ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
	Mid-Rise Apartment (ITE 223)			16	76	92	72	36	108	605	605	1,210	53	45	98	590	590	1,179
A	Residential Condo/Townhouse (ITE 230)		208	16	77	93	74	36	110	608	608	1,216	56	47	103	590	590	1,180
B1	General Office Building (ITE 710)	189,000	-	280	38	318	49	245	294	1,065	1,065	2,130	44	37	81	232	232	464
B2	General Office Building (ITE 710)	83,700	-	146	20	166	29	143	172	573	573	1,147	19	17	36	103	103	206
D	Hotel (ITE 310)		308	96	67	163	94	91	185	1,258	1,258	2,516	123	96	219	1,262	1,262	2,523
	Mid-Rise Apartment (ITE 223)			14	70	84	67	33	100	560	560	1,120	49	41	90	545	545	1,089
E	Residential Condo/Townhouse (ITE 230)		192	15	72	87	69	34	103	568	568	1,135	53	45	98	560	560	1,120
	Mid-Rise Apartment (ITE 223)			31	150	181	143	71	214	1,195	1,195	2,390	105	89	194	1,168	1,168	2,336
F	Residential Condo/Townhouse (ITE 230)		412	27	133	160	129	63	192	1,103	1,103	2,205	87	75	162	960	960	1,920
	Shopping Center Rate (ITE 820)			4	2	6	11	12	23	131	131	261	15	14	29	153	153	306
	Shopping Center Eq (ITE 820)	6,120	-	17	11	28	44	48	92	553	553	1,105	74	68	142	795	795	1,590
	High-Turnover Restaurant ITE 932)	6,120	-	36	30	66	36	24	60	389	389	778	46	40	86	485	485	969
Totals				**638**	**465**	**1,103**	**539**	**692**	**1,231**	**6,209**	**6,209**	**12,417**	**519**	**440**	**959**	**5,194**	**5,194**	**10,388**

Note: Maximum value resulting from use of fitted curve equation and average trip rate was used in this analysis for the worse-case scenario

Internal Capture

Site Plan Opt 1

LAND USE	SF	DU	BEFORE REDUCTION AM PEAK HR ADJ STREET			Internal Capture				REDUCED AM PEAK HR ADJ STREET			BEFORE REDUCTION PM PEAK HR ADJ STREET			Internal Capture				REDUCED PM PEAK HR ADJ STREET			SATURDAY PEAK			REDUCED SATURDAY PEAK		
			ENTER	EXIT	TOTAL	Origin FROM	Destin TO	TOTAL	Rate %	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	Origin FROM	Destin TO	TOTAL	Rate %	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL	ENTER	EXIT	TOTAL
Office	566,256		889	121	1,010	263	10	10	1%	880	120	1,000	161	787	948	42	68	42	4%	154	752	906	132	112	244	126	107	233
Hotel		228	71	50	121	70	1	1	1%	71	49	120	70	67	137	60	40	40	29%	50	48	97	91	71	162	64	51	115
Residential		561	26	129	155	6	2	2	1%	26	127	153	123	60	183	86	75	75	41%	73	36	108	98	83	181	58	49	107
Retail	14,400		30	18	48	17	65	17	35%	19	12	31	79	85	164	49	83	49	30%	55	60	115	129	119	248	91	84	174
Restaurant	6,400	-	38	31	69	20	66	20	29%	27	22	49	38	25	63	26	37	26	41%	22	15	37	48	42	90	28	25	53
Totals			1,054	349	1,403					1,023	330	1,353	471	1,024	1,495					354	910	1,264	497	428	925	367	315	682

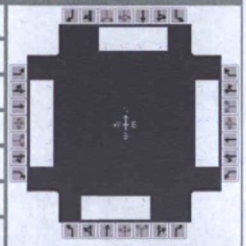
For Trip Origins, Table 105, Page 94, NCHRP Report 684)			
Land Use Pairs		AM	PM
From Office	To Office	0%	0%
	To Retail	28%	20%
	To Restaurant	63%	4%
	To Residential	1%	2%
	To Hotel	0%	0%
From Retail	To Office	29%	2%
	To Retail	0%	0%
	To Restaurant	13%	29%
	To Residential	14%	26%
	To Hotel	0%	5%
From Restaurant	To Office	31%	3%
	To Retail	14%	41%
	To Restaurant	0%	0%
	To Residential	4%	18%
	To Hotel	3%	7%
From Residential	To Office	2%	4%
	To Retail	1%	42%
	To Restaurant	20%	21%
	To Residential	0%	0%
	To Hotel	0%	3%
From Hotel	To Office	75%	0%
	To Retail	14%	16%
	To Restaurant	9%	68%
	To Residential	0%	2%
	To Hotel	0%	0%

For Trip Destinations (Table 106, Page 95, NCHRP Report 684)			
Land Use Pairs		AM	PM
To Office	From Office	0%	0%
	From Retail	4%	31%
	From Restaurant	14%	30%
	From Residential	3%	57%
	From Hotel	3%	0%
To Retail	From Office	32%	8%
	From Retail	0%	0%
	From Restaurant	8%	50%
	From Residential	17%	10%
	From Hotel	4%	2%
To Restaurant	From Office	23%	2%
	From Retail	50%	29%
	From Restaurant	0%	0%
	From Residential	20%	14%
	From Hotel	6%	5%
To Residential	From Office	0%	4%
	From Retail	2%	46%
	From Restaurant	5%	16%
	From Residential	0%	0%
	From Hotel	0%	0%
To Hotel	From Office	0%	0%
	From Retail	0%	17%
	From Restaurant	4%	71%
	From Residential	0%	12%
	From Hotel	0%	0%

HCS 2010 No Build Analysis Output for Year 2025

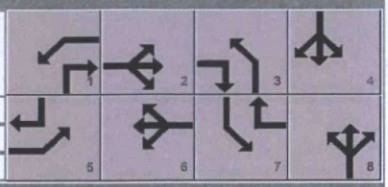
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday AM	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 No Build	Analysis Period	1> 7:00
File Name	2025 No Build AM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	296	818	11	278	1258	167	14	228	74	132	432	297

Signal Information					EB			WB			NB			SB		
Cycle, s	60.0	Reference Phase	2													
Offset, s	0	Reference Point	End	Green	8.8	0.4		19.6	1.3	0.1	9.8					
Uncoordinated	No	Simult. Gap E/W	On	Yellow	4.0	0.0		4.0	4.0	4.0	4.0					
Force Mode	Fixed	Simult. Gap N/S	On	Red	0.0	0.0		0.0	0.0	0.0	0.0					



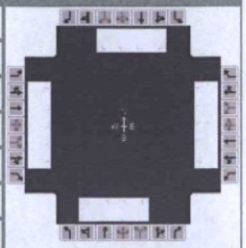
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	13.2	24.0	12.8	23.6	5.3	13.8	9.5	17.9
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	8.7		8.3		2.4	5.7	5.7	11.3
Green Extension Time (g_e), s	0.5	0.0	0.5	0.0	0.0	2.6	0.0	2.6
Phase Call Probability	1.00		0.99		0.22	1.00	0.91	1.00
Max Out Probability	0.00		0.00		0.00	0.00	1.00	0.01

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	322	889	12	302	1367	182	15	248	80	143	470	323
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	6.7	8.3	0.3	6.3	14.5	4.4	0.4	3.7	2.2	3.7	6.9	9.3
Cycle Queue Clearance Time (g_c), s	6.7	8.3	0.3	6.3	14.5	4.4	0.4	3.7	2.2	3.7	6.9	9.3
Green Ratio (*g/C*)	0.48	0.33	0.36	0.47	0.33	0.42	0.19	0.16	0.31	0.29	0.23	0.38
Capacity (*c*), veh/h	432	1728	574	487	1690	672	238	588	497	401	836	619
Volume-to-Capacity Ratio (*X*)	0.746	0.514	0.021	0.620	0.809	0.270	0.064	0.421	0.162	0.358	0.562	0.522
Available Capacity (c_a), veh/h	841	1728	574	910	1690	672	982	1601	947	417	1848	1070
Back of Queue (*Q*), veh/ln (50th percentile)	2.1	2.9	0.1	2.0	5.4	1.4	0.2	1.5	0.7	1.4	2.6	2.9
Queue Storage Ratio (*RQ*) (50th percentile)	0.19	0.00	0.01	0.17	0.00	0.07	0.02	0.00	0.08	0.16	0.00	0.49
Uniform Delay (d_1), s/veh	12.8	16.1	12.5	11.6	18.5	11.5	20.3	22.6	15.1	16.9	20.4	14.2
Incremental Delay (d_2), s/veh	1.0	1.1	0.1	0.5	4.3	1.0	0.0	0.2	0.1	0.2	0.2	0.3
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	13.8	17.2	12.6	12.1	22.8	12.5	20.3	22.8	15.2	17.1	20.6	14.5
Level of Service (LOS)	B	B	B	B	C	B	C	C	B	B	C	B
Approach Delay, s/veh / LOS	16.2	B		20.0	C		20.9	C		17.9	B	
Intersection Delay, s/veh / LOS	18.6						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.2	A	1.5	A	0.8	A	1.3	A

HCS 2010 Signalized Intersection Results Summary

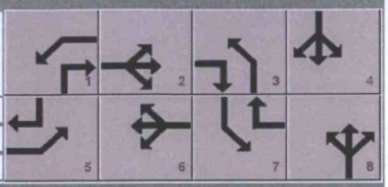
General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday PM	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 No Build	Analysis Period	1> 7:00
File Name	2025 No Build PM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	353	1247	129	250	836	153	56	562	343	195	436	218

Signal Information			
Cycle, s	90.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

	EB			WB			NB			SB		
Green	11.2	3.5		29.0	4.7	2.3	23.3					
Yellow	4.0	0.0		4.0	4.0	0.0	4.0					
Red	0.0	0.0		0.0	0.0	0.0	0.0					



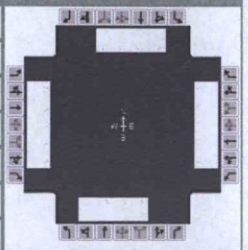
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	18.7	36.5	15.2	33.0	8.7	27.3	11.0	29.6
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	14.0		10.8		4.2	18.7	9.0	11.7
Green Extension Time (g_e), s	0.7	0.0	0.5	0.0	0.1	4.5	0.0	4.6
Phase Call Probability	1.00		1.00		0.78	1.00	1.00	1.00
Max Out Probability	0.00		0.00		0.00	0.00	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	384	1355	140	272	909	166	61	611	373	212	474	237
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	12.0	20.4	5.0	8.8	13.0	6.2	2.2	13.6	16.7	7.0	9.7	8.6
Cycle Queue Clearance Time (g_c), s	12.0	20.4	5.0	8.8	13.0	6.2	2.2	13.6	16.7	7.0	9.7	8.6
Green Ratio (*g*/*C*)	0.50	0.36	0.41	0.45	0.32	0.40	0.31	0.26	0.38	0.34	0.28	0.45
Capacity (*c*), veh/h	487	1869	666	352	1669	644	318	935	617	310	1028	721
Volume-to-Capacity Ratio (*X*)	0.788	0.725	0.211	0.772	0.544	0.258	0.191	0.653	0.604	0.685	0.461	0.329
Available Capacity (c_a), veh/h	950	1869	666	885	1669	644	1330	2171	1167	310	2263	1271
Back of Queue (*Q*), veh/ln (50th percentile)	4.4	8.0	1.8	3.4	5.1	2.3	0.9	5.7	6.0	3.6	4.1	3.0
Queue Storage Ratio (*RQ*) (50th percentile)	0.40	0.00	0.16	0.30	0.00	0.11	0.11	0.00	0.70	0.43	0.00	0.50
Uniform Delay (d_1), s/veh	17.0	24.9	17.0	20.0	25.1	18.1	22.7	29.8	22.3	25.1	26.5	16.1
Incremental Delay (d_2), s/veh	1.1	2.5	0.7	1.4	1.3	1.0	0.1	0.3	0.4	5.1	0.1	0.1
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	18.1	27.4	17.7	21.4	26.3	19.0	22.8	30.1	22.6	30.2	26.7	16.2
Level of Service (LOS)	B	C	B	C	C	B	C	C	C	C	C	B
Approach Delay, s/veh / LOS	24.7	C		24.4	C		27.0	C		24.8	C	
Intersection Delay, s/veh / LOS	25.1						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.5	A	1.2	A	1.3	A	1.2	A

HCS 2010 Signalized Intersection Results Summary

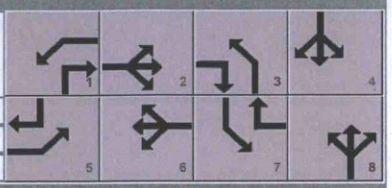
General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Saturday	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 No Build	Analysis Period	1> 7:00
File Name	2025 No Build Saturday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	282	651	25	90	698	140	69	223	151	110	147	229

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	4.8	3.7		20.1	4.3	0.9	10.3					
Yellow	4.0	0.0		4.0	4.0	0.0	4.0					
Red	0.0	0.0		0.0	0.0	0.0	0.0					



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	12.5	27.7	8.8	24.1	8.3	14.3	9.2	15.2
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	8.1		4.0		4.0	7.1	5.2	9.4
Green Extension Time (g_e), s	0.5	0.0	0.1	0.0	0.1	1.8	0.0	1.8
Phase Call Probability	0.99		0.80		0.71	1.00	0.86	1.00
Max Out Probability	0.00		0.00		0.00	0.00	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	307	708	27	98	759	152	75	242	164	120	160	249
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	6.1	5.7	0.5	2.0	6.9	3.6	2.0	3.6	5.1	3.2	2.3	7.4
Cycle Queue Clearance Time (g_c), s	6.1	5.7	0.5	2.0	6.9	3.6	2.0	3.6	5.1	3.2	2.3	7.4
Green Ratio (*g/C*)	0.50	0.40	0.47	0.41	0.33	0.42	0.24	0.17	0.25	0.26	0.19	0.33
Capacity (*c*), veh/h	534	2046	752	466	1730	677	393	619	405	405	673	528
Volume-to-Capacity Ratio (*X*)	0.574	0.346	0.036	0.210	0.439	0.225	0.191	0.391	0.405	0.295	0.237	0.472
Available Capacity (c_a), veh/h	958	2046	752	1000	1730	677	1048	1617	849	430	1671	972
Back of Queue (*Q*), veh/ln (50th percentile)	1.8	1.9	0.2	0.6	2.4	1.2	0.8	1.4	1.7	1.2	0.9	2.4
Queue Storage Ratio (*RQ*) (50th percentile)	0.16	0.00	0.01	0.06	0.00	0.06	0.09	0.00	0.20	0.14	0.00	0.40
Uniform Delay (d_1), s/veh	10.0	12.7	8.7	11.0	15.6	11.1	18.1	22.1	18.7	17.8	20.8	16.0
Incremental Delay (d_2), s/veh	0.4	0.5	0.1	0.1	0.8	0.8	0.1	0.2	0.2	0.1	0.1	0.2
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	10.3	13.2	8.8	11.1	16.4	11.9	18.1	22.2	19.0	18.0	20.9	16.3
Level of Service (LOS)	B	B	A	B	B	B	B	C	B	B	C	B
Approach Delay, s/veh / LOS	12.2	B		15.2	B		20.5	C		18.1	B	
Intersection Delay, s/veh / LOS	15.5						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.1	A	1.0	A	0.9	A	0.9	A

Signal Warrant Analysis

T-Intersection: McDowell Road and Main Access

		ADJUSTED HOURLY VOLUMES			Condition A				Condition B			
COND-ITION	NO. LANE	MAJOR ST 2-WAY	MINOR ST 1-WAY (SB)	MINOR ST 1-WAY	100%		80%		100%		80%	
100%	1		x	x	500	150	400	120	750	75	600	60
	2+	x			600	200	480	160	900	100	720	80
* 70%	1		x	x	350	105	280	84	525	53	420	42
	2+	x			420	140	336	112	630	70	504	56
Mid-1AM												
1AM-2AM												
2AM-3AM												
3AM-4AM												
4AM-5AM		251	17									
5AM-6AM		718	47		x		x					x
6AM-7AM		1589	106		x	x	x	x	x	x	x	x
7AM-8AM		2740	183		x	x	x	x	x	x	x	x
8AM-9AM		2287	153		x	x	x	x	x	x	x	x
9AM-10AM		1661	112		x	x	x	x	x	x	x	x
10AM-11AM		1606	108		x	x	x	x	x	x	x	x
11AM-NOON		1723	115		x	x	x	x	x	x	x	x
N00N-1PM		1836	293		x	x	x	x	x	x	x	x
1PM-2PM		1787	288		x	x	x	x	x	x	x	x
2PM-3PM		2182	348		x	x	x	x	x	x	x	x
3PM-4PM		2345	374		x	x	x	x	x	x	x	x
4PM-5PM		2847	455		x	x	x	x	x	x	x	x
5PM-6PM		3099	495		x	x	x	x	x	x	x	x
6PM-7PM		2128	338		x	x	x	x	x	x	x	x
7PM-8PM		1353	217		x	x	x	x	x	x	x	x
8PM-9PM		1126	182		x	x	x	x	x	x	x	x
9PM-10PM		979	157		x	x	x	x	x	x	x	x
10PM-11PM		746	121		x	x	x	x		x	x	x
11PM-MID		457	71							x		x
HOURS MET					17		17		16		17	
CRITERIA MET					Yes		Yes		Yes		Yes	

* CONDITION IS DETERMINED BY ENVIRONMENT: USE 70% VALUES IF 85 PERCENTILE SPEED EXCEEDS 40 MPH ON THE MAJOR APPROACH OR IF LOCATION IS IN THE BUILT-UP AREA OF AN ISOLATED COMMUNITY WITH A POPULATION OF LESS THAN 10,000.

Major Street: McDowell Road
Minor Street: Main Access

WARRANT #1 (EIGHT-HOUR VEHICULAR VOLUME)

Conditions A OR B are met at the 100% level — **Yes**

OR

Conditions A AND B are each met at the 80% level — **Yes**

WARRANT SATISFIED? ..... — **Yes**

WARRANT #2 (FOUR-HOUR VEHICULAR VOLUME)

Population < 10,000 or Speed above 40 mph on Major street? — **Yes**

If yes, does plot of 2-way Major street volume against highest one-way Minor street volume for each hour plot above lane curve on Fig. 4C-2 for at least four hours? ..... — **Yes**

If no, does plot of 2-way Major street volume against highest one-way Minor street volume for each hour plot above lane curve on Fig. 4C-1 for at least four hours? .....

WARRANT SATISFIED? ..... — **Yes**

WARRANT #3 (PEAK HOUR)

Is this a special case: office complex, manufacturing plants, industrial complex, high-occupancy vehicle facility? ..... — **Yes**

If no, warrant not applied

Total stopped-delay on minor street ≥ 4 veh-hrs for one lane or 5 veh-hrs for two lanes? .....

AND

Volume on same minor street approach ≥ 100 veh/h for one lane or 150 veh/h for two lanes? ..... — **Yes**

AND

Total entering volume serviced ≥ 650 veh/h for intersection with three approaches or 800 veh/h for four approaches? ..... — **Yes**

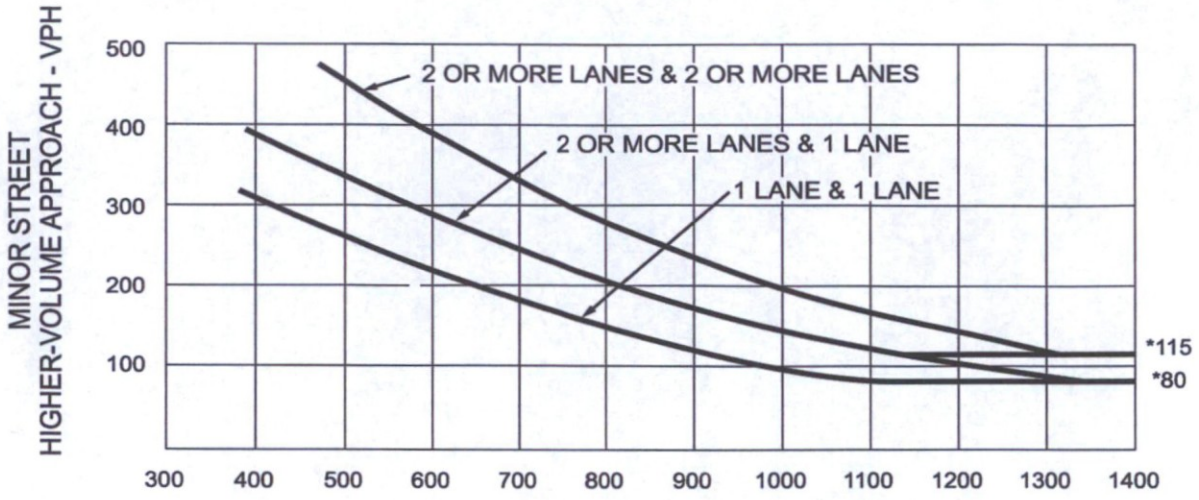
Population < 10,000 or Speed above 40 mph on Major street? — **Yes**

If yes, does plot of 2-way Major street volume against highest one-way Minor street volume for each hour plot above lane curve on Fig. 4C-4 for one hour? .....

If no, does plot of 2-way Major street volume against highest one-way Minor street volume for each hour plot above lane curve on Fig. 4C-3 for one hour? ..... — **Yes**

WARRANT SATISFIED? ..... — **Yes**

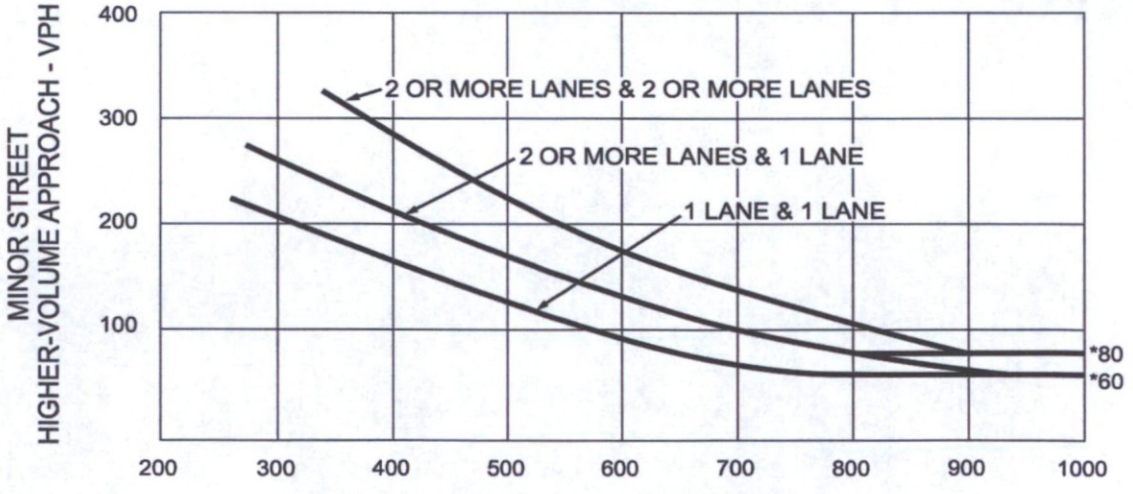
Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

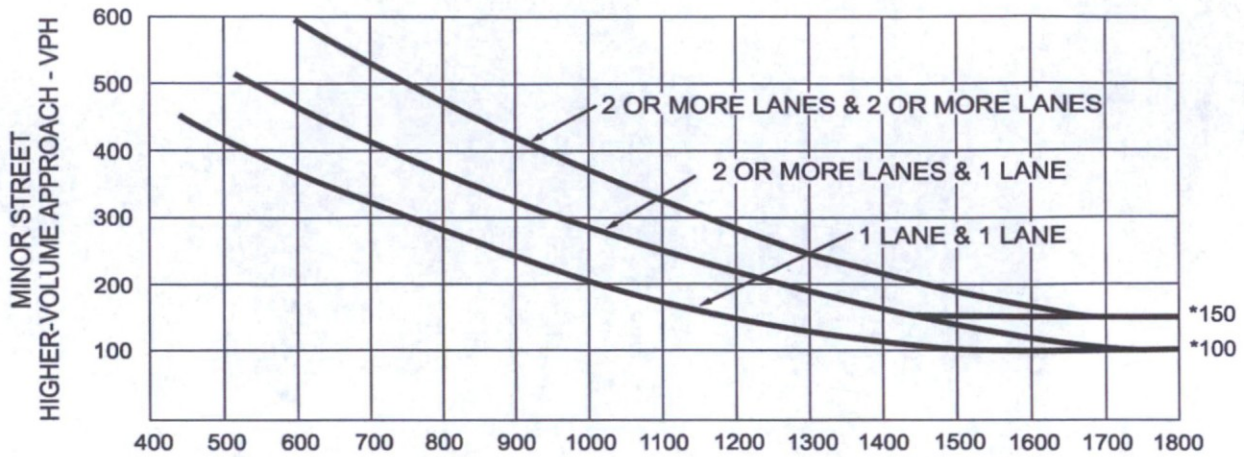
Figure 4C-2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 80 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 60 vph applies as the lower threshold volume for a minor-street approach with one lane.

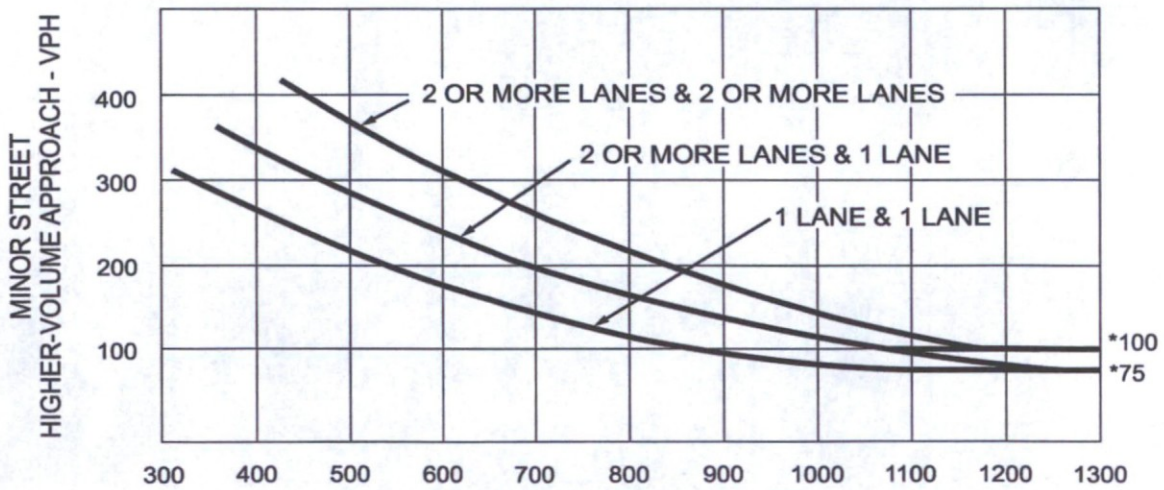
Figure 4C-3. Warrant 3, Peak Hour



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

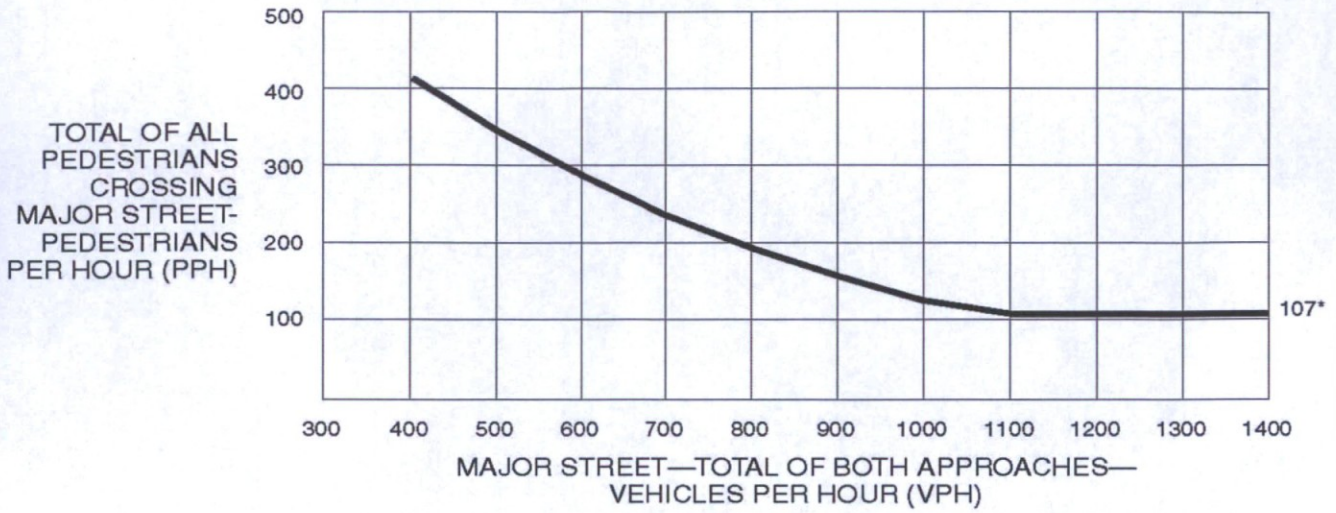
Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4C-5. Warrant 4, Pedestrian Four-Hour Volume

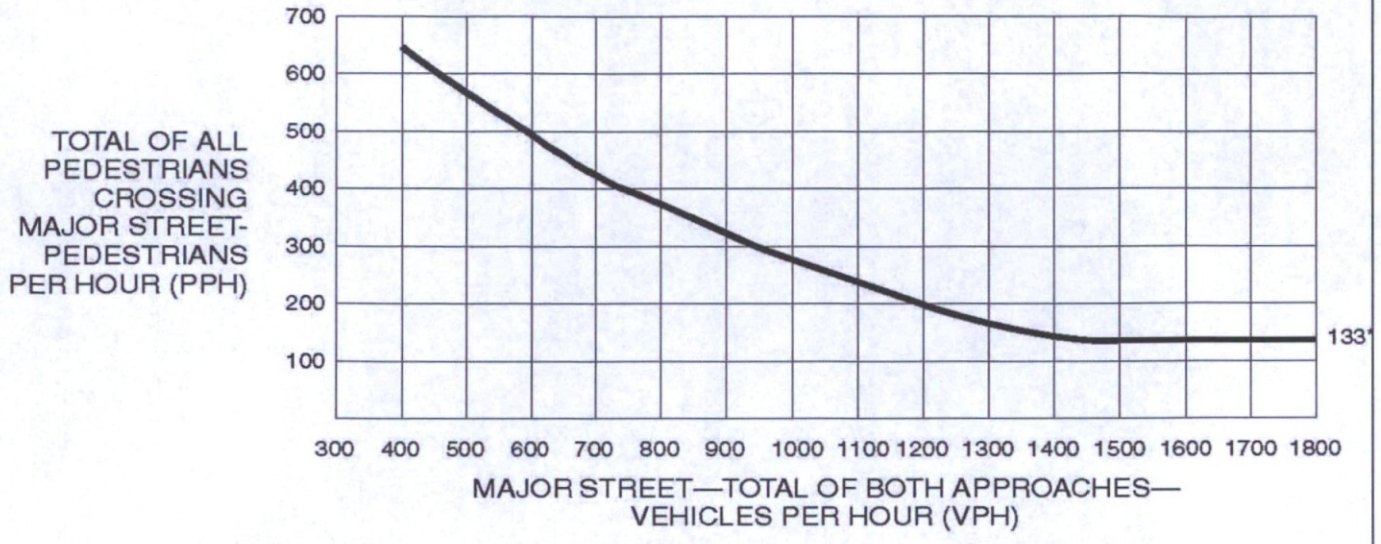


*Note: 107 pph applies as the lower threshold volume.

Figure 4C-6. Warrant 4, Pedestrian Four-Hour Volume (70% Factor)

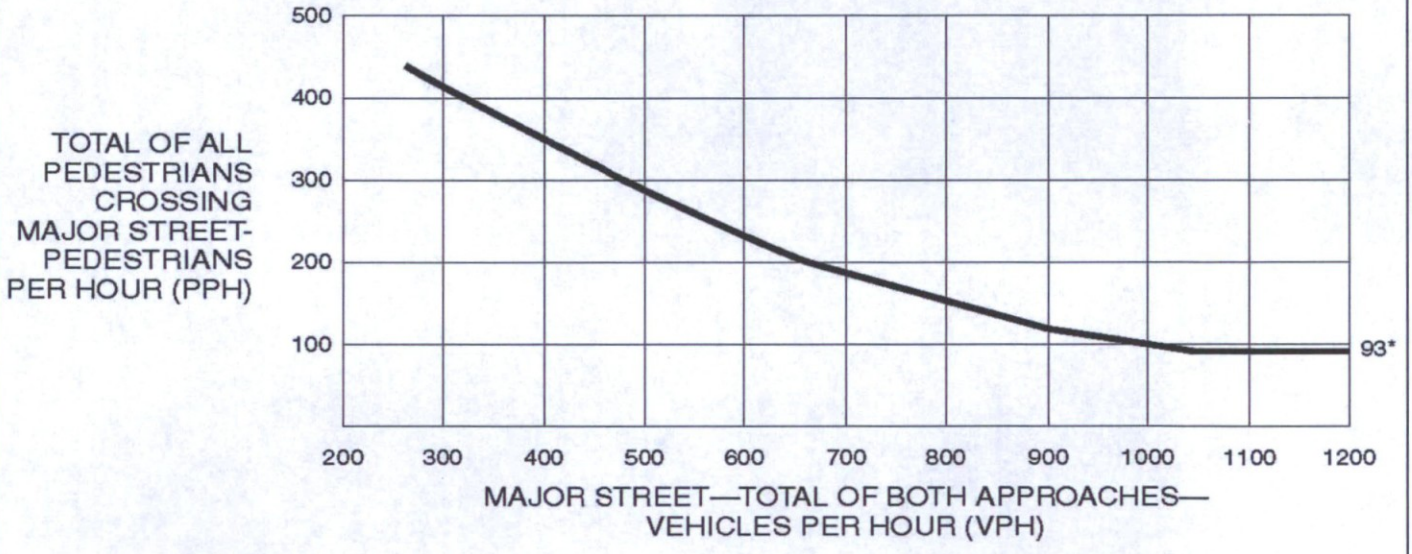
*Note: 75 pph applies as the lower threshold volume.

Figure 4C-7. Warrant 4, Pedestrian Peak Hour



*Note: 133 pph applies as the lower threshold volume.

Figure 4C-8. Warrant 4, Pedestrian Peak Hour (70% Factor)

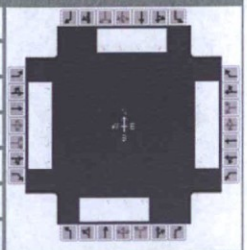


*Note: 93 pph applies as the lower threshold volume.

HCS 2010 Build Analysis Output for Year 2025

HCS 2010 Signalized Intersection Results Summary

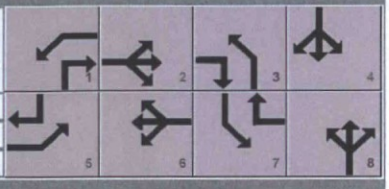
General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday AM	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 Build	Analysis Period	1> 7:00
File Name	2025 Build AM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	348	1080	11	330	1344	184	14	333	179	184	449	314

Signal Information			
Cycle, s	70.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	11.1	0.5	23.7	1.5	1.5	11.7	
Yellow	4.0	0.0	4.0	4.0	4.0	4.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	



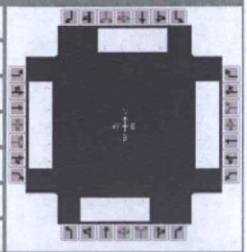
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	15.6	28.2	15.1	27.7	5.5	15.7	11.0	21.1
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	11.2		10.7		2.5	8.5	8.1	13.1
Green Extension Time (g_e), s	0.5	0.0	0.5	0.0	0.0	3.2	0.0	3.2
Phase Call Probability	1.00		1.00		0.26	1.00	0.98	1.00
Max Out Probability	0.02		0.01		0.00	0.04	1.00	0.04

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	378	1174	12	359	1461	200	15	362	195	200	488	341
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	9.2	13.4	0.3	8.7	18.2	5.6	0.5	6.5	6.5	6.1	8.2	11.1
Cycle Queue Clearance Time (g_c), s	9.2	13.4	0.3	8.7	18.2	5.6	0.5	6.5	6.5	6.1	8.2	11.1
Green Ratio (*g/C*)	0.50	0.35	0.37	0.50	0.34	0.44	0.19	0.17	0.33	0.30	0.24	0.41
Capacity (*c*), veh/h	433	1788	592	452	1752	706	233	603	525	361	885	662
Volume-to-Capacity Ratio (*X*)	0.874	0.657	0.020	0.794	0.834	0.283	0.065	0.600	0.371	0.555	0.551	0.516
Available Capacity (c_a), veh/h	631	1788	592	663	1752	706	840	1240	808	361	1523	945
Back of Queue (*Q*), veh/ln (95th percentile)	6.7	8.6	0.2	5.5	11.5	3.4	0.4	4.8	4.0	4.5	5.9	6.6
Queue Storage Ratio (*RQ*) (95th percentile)	0.60	0.00	0.02	0.49	0.00	0.17	0.04	0.00	0.47	0.53	0.00	1.09
Uniform Delay (d_1), s/veh	14.7	19.4	14.1	14.3	21.3	12.6	23.4	27.0	18.1	20.2	23.1	15.4
Incremental Delay (d_2), s/veh	6.8	1.9	0.1	2.3	4.8	1.0	0.0	0.4	0.2	1.1	0.2	0.2
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	21.4	21.3	14.2	16.6	26.2	13.6	23.4	27.4	18.3	21.3	23.3	15.6
Level of Service (LOS)	C	C	B	B	C	B	C	C	B	C	C	B
Approach Delay, s/veh / LOS	21.3	C		23.2	C		24.2	C		20.4	C	
Intersection Delay, s/veh / LOS	22.2						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.3	A	1.6	A	1.0	A	1.3	A

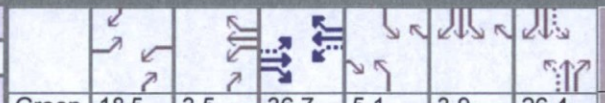
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday PM	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 Build	Analysis Period	1> 7:00
File Name	2025 Build PM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				

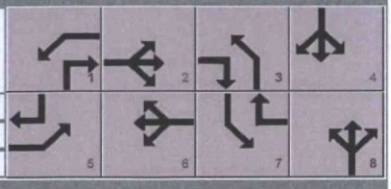


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	371	1339	129	388	1066	199	56	599	380	213	482	264

Signal Information			
Cycle, s	110.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	18.5	3.5	36.7	5.1	3.9	26.4						
Yellow	4.0	0.0	4.0	4.0	0.0	4.0						
Red	0.0	0.0	0.0	0.0	0.0	0.0						



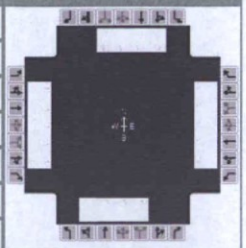
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	22.5	40.7	25.9	44.2	9.1	30.4	13.0	34.3
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	17.7		21.4		4.7	23.3	11.0	15.5
Green Extension Time (g_e), s	0.7	0.0	0.5	0.0	0.1	3.1	0.0	4.8
Phase Call Probability	1.00		1.00		0.84	1.00	1.00	1.00
Max Out Probability	0.00		0.11		0.00	0.56	1.00	0.08

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	403	1455	140	422	1159	216	61	651	413	232	524	287
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	15.7	28.7	6.5	19.4	20.1	9.4	2.7	18.4	21.3	9.0	13.5	13.3
Cycle Queue Clearance Time (g_c), s	15.7	28.7	6.5	19.4	20.1	9.4	2.7	18.4	21.3	9.0	13.5	13.3
Green Ratio (*g/C*)	0.50	0.33	0.38	0.55	0.37	0.45	0.29	0.24	0.44	0.34	0.28	0.44
Capacity (*c*), veh/h	450	1728	612	453	1891	720	269	867	707	271	996	714
Volume-to-Capacity Ratio (*X*)	0.897	0.842	0.229	0.931	0.613	0.300	0.227	0.751	0.584	0.854	0.526	0.402
Available Capacity (c_a), veh/h	1012	1728	612	547	1891	720	728	987	760	271	1116	767
Back of Queue (*Q*), veh/ln (95th percentile)	10.5	17.9	4.5	19.0	12.8	6.4	2.1	13.0	12.5	6.2	9.8	8.5
Queue Storage Ratio (*RQ*) (95th percentile)	0.94	0.00	0.40	1.69	0.00	0.32	0.27	0.00	1.46	0.74	0.00	1.42
Uniform Delay (d_1), s/veh	21.9	34.0	23.2	29.7	28.5	19.4	29.7	38.8	23.3	33.0	33.8	20.8
Incremental Delay (d_2), s/veh	2.6	5.2	0.9	19.1	1.5	1.1	0.2	2.3	0.6	21.4	0.2	0.1
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	24.5	39.1	24.0	48.8	30.0	20.5	29.8	41.1	23.9	54.4	33.9	20.9
Level of Service (LOS)	C	D	C	D	C	C	C	D	C	D	C	C
Approach Delay, s/veh / LOS	35.1	D		33.3	C		34.1	C		34.9	C	
Intersection Delay, s/veh / LOS	34.4						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	3.0	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.6	A	1.5	A	1.4	A	1.3	A

HCS 2010 Signalized Intersection Results Summary

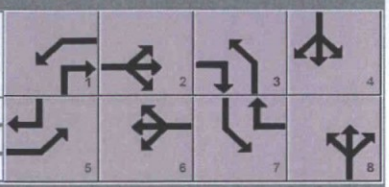
General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Saturday	PHF	0.92
Intersection	64th Street and McDowell I	Analysis Year	2025 No Build	Analysis Period	1> 7:00
File Name	2025 Build Saturday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	301	744	25	137	776	156	69	260	188	129	163	245

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	5.5	3.7	18.7	4.3	1.1	10.7	
Yellow	4.0	0.0	4.0	4.0	0.0	4.0	
Red	0.0	0.0	0.0	0.0	0.0	0.0	



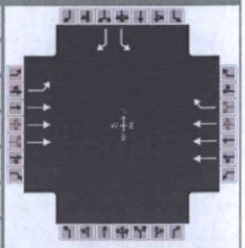
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6	3	8	7	4
Case Number	1.1	3.0	1.1	3.0	1.1	3.0	1.1	3.0
Phase Duration, s	13.2	26.4	9.5	22.7	8.3	14.7	9.4	15.8
Change Period, ($Y+R_c$), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Max Allow Headway (*MAH*), s	3.0	0.0	3.0	0.0	3.1	3.2	3.1	3.2
Queue Clearance Time (g_s), s	8.7		5.2		3.9	8.4	5.7	9.7
Green Extension Time (g_e), s	0.5	0.0	0.2	0.0	0.1	2.1	0.0	2.1
Phase Call Probability	1.00		0.92		0.71	1.00	0.90	1.00
Max Out Probability	0.00		0.00		0.00	0.00	1.00	0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	3	8	18	7	4	14
Adjusted Flow Rate (*v*), veh/h	327	809	27	149	843	170	75	283	204	140	177	266
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725	1610	1810	1725	1610	1810	1809	1610	1810	1809	1610
Queue Service Time (g_s), s	6.7	7.0	0.6	3.2	8.0	4.2	1.9	4.2	6.4	3.7	2.5	7.7
Cycle Queue Clearance Time (g_c), s	6.7	7.0	0.6	3.2	8.0	4.2	1.9	4.2	6.4	3.7	2.5	7.7
Green Ratio (*g/C*)	0.49	0.37	0.44	0.40	0.31	0.40	0.25	0.18	0.27	0.27	0.20	0.35
Capacity (*c*), veh/h	515	1933	716	439	1617	648	399	643	434	404	712	563
Volume-to-Capacity Ratio (*X*)	0.636	0.418	0.038	0.339	0.522	0.261	0.188	0.439	0.471	0.347	0.249	0.473
Available Capacity (c_a), veh/h	899	1933	716	934	1617	648	1054	1603	861	421	1671	990
Back of Queue (*Q*), veh/ln (95th percentile)	3.6	4.2	0.3	1.9	5.1	2.5	1.3	3.0	3.9	2.5	1.7	4.5
Queue Storage Ratio (*RQ*) (95th percentile)	0.32	0.00	0.03	0.17	0.00	0.12	0.17	0.00	0.45	0.30	0.00	0.75
Uniform Delay (d_1), s/veh	11.0	14.0	9.4	11.9	16.9	12.0	17.7	22.0	18.3	17.6	20.4	15.2
Incremental Delay (d_2), s/veh	0.5	0.7	0.1	0.2	1.2	1.0	0.1	0.2	0.3	0.2	0.1	0.2
Initial Queue Delay (d_3), 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
Control Delay (*d*), s/veh	11.5	14.6	9.5	12.1	18.2	12.9	17.8	22.2	18.6	17.8	20.4	15.4
Level of Service (LOS)	B	B	A	B	B	B	B	C	B	B	C	B
Approach Delay, s/veh / LOS	13.6	B		16.6	B		20.3	C		17.5	B	
Intersection Delay, s/veh / LOS	16.4						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.9	C	2.9	C	3.4	C	3.4	C
Bicycle LOS Score / LOS	1.1	A	1.1	A	1.0	A	1.0	A

HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday AM	PHF	0.92
Intersection	Main Access and McDowel	Analysis Year	2025 Build	Analysis Period	1> 7:00
File Name	2025 Build AM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	419	1024			1790	157				103		86

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

							1	2	3	4		
Green	9.2	33.0	5.8	0.0	0.0	0.0	5	6	7	8		
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	0.0	0.0	0.0	0.0	0.0	0.0						

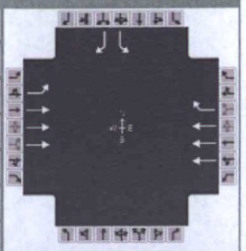
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				9.0
Phase Duration, s	13.2	50.2		37.0				9.8
Change Period, (*Y*+*Rc*), s	4.0	4.0		4.0				4.0
Max Allow Headway (*MAH*), s	3.0	0.0		0.0				3.2
Queue Clearance Time (g_s), s	10.9							5.6
Green Extension Time (g_e), s	0.0	0.0		0.0				0.1
Phase Call Probability	1.00							0.97
Max Out Probability	1.00							1.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	455	1113			1946	171				112		93
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725			1725	1610				1810		1610
Queue Service Time (g_s), s	8.9	3.8			16.3	3.2				3.6		2.8
Cycle Queue Clearance Time (g_c), s	8.9	3.8			16.3	3.2				3.6		2.8
Green Ratio (*g*/*C*)	0.74	0.77			0.55	0.55				0.10		0.25
Capacity (*c*), veh/h	462	3985			2847	886				175		403
Volume-to-Capacity Ratio (*X*)	0.987	0.279			0.683	0.193				0.640		0.232
Available Capacity (c_a), veh/h	462	3985			2847	886				211		435
Back of Queue (*Q*), veh/ln (95th percentile)	12.3	0.4			7.9	1.6				2.8		1.7
Queue Storage Ratio (*RQ*) (95th percentile)	2.55	0.00			0.00	0.33				0.00		0.00
Uniform Delay (d_1), s/veh	15.9	2.0			9.7	6.8				26.1		17.9
Incremental Delay (d_2), s/veh	38.2	0.2			1.4	0.5				2.4		0.1
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	54.1	2.2			11.1	7.3				28.5		18.0
Level of Service (LOS)	D	A			B	A				C		B
Approach Delay, s/veh / LOS	17.3	B		10.8	B		0.0			23.8	C	
Intersection Delay, s/veh / LOS	14.1						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.6	A	2.2	B	3.3	C	3.3	C
Bicycle LOS Score / LOS	1.4	A	1.7	A				F

HCS 2010 Signalized Intersection Results Summary

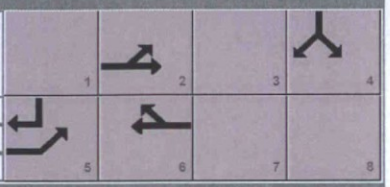
General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Weekday PM	PHF	0.92
Intersection	Main Access and McDowel	Analysis Year	2025 Build	Analysis Period	1> 7:00
File Name	2025 Build PM Weekday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	147	1785			1349	55				276		230

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	5.6	29.9	12.6	0.0	0.0	0.0
Yellow	4.0	4.0	4.0	0.0	0.0	0.0
Red	0.0	0.0	0.0	0.0	0.0	0.0



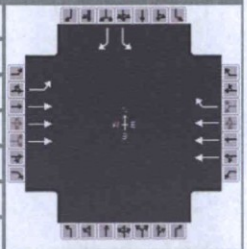
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				9.0
Phase Duration, s	9.6	43.4		33.9				16.6
Change Period, ($Y+R_c$), s	4.0	4.0		4.0				4.0
Max Allow Headway (*MAH*), s	3.0	0.0		0.0				3.2
Queue Clearance Time (g_s), s	4.2							11.4
Green Extension Time (g_e), s	0.2	0.0		0.0				1.1
Phase Call Probability	0.93							1.00
Max Out Probability	0.00							0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	160	1940			1466	60				300		250
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725			1725	1610				1810		1610
Queue Service Time (g_s), s	2.2	12.3			11.9	1.2				9.4		7.7
Cycle Queue Clearance Time (g_c), s	2.2	12.3			11.9	1.2				9.4		7.7
Green Ratio (*g/C*)	0.62	0.66			0.50	0.50				0.21		0.30
Capacity (*c*), veh/h	398	3402			2576	801				379		487
Volume-to-Capacity Ratio (*X*)	0.401	0.570			0.569	0.075				0.792		0.513
Available Capacity (c_a), veh/h	1118	3402			2576	801				1086		1116
Back of Queue (*Q*), veh/ln (95th percentile)	0.9	4.4			6.3	0.6				6.8		0.1
Queue Storage Ratio (*RQ*) (95th percentile)	0.19	0.00			0.00	0.13				0.00		0.00
Uniform Delay (d_1), s/veh	7.5	5.6			10.6	7.9				22.5		17.3
Incremental Delay (d_2), s/veh	0.2	0.7			0.9	0.2				1.4		0.3
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	7.8	6.3			11.5	8.0				23.9		17.6
Level of Service (LOS)	A	A			B	A				C		B
Approach Delay, s/veh / LOS	6.4	A		11.3	B		0.0			21.0	C	
Intersection Delay, s/veh / LOS	10.2						B					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.7	A	2.2	B	3.3	C	3.3	C
Bicycle LOS Score / LOS	1.6	A	1.3	A				F

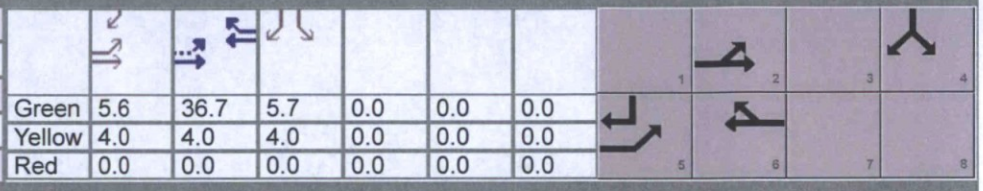
HCS 2010 Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	B&N			Duration, h	0.25
Analyst	MS	Analysis Date	Jan 7, 2016	Area Type	Other
Jurisdiction	City of Scottsdale	Time Period	Saturday	PHF	0.92
Intersection	Main Access and McDowel	Analysis Year	2025 Build	Analysis Period	1> 7:00
File Name	2025 Build Saturday.xus				
Project Description	64th Street/McDowell Road TIS				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	148	912			978	56				94		78

Signal Information			
Cycle, s	60.0	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	No	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	5.6	36.7	5.7	0.0	0.0	0.0						
Yellow	4.0	4.0	4.0	0.0	0.0	0.0						
Red	0.0	0.0	0.0	0.0	0.0	0.0						

Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2		6				4
Case Number	1.0	4.0		7.3				9.0
Phase Duration, s	9.6	50.3		40.7				9.7
Change Period, (*Y*+*Rc*), s	4.0	4.0		4.0				4.0
Max Allow Headway (*MAH*), s	3.0	0.0		0.0				3.2
Queue Clearance Time (g_s), s	3.5							5.2
Green Extension Time (g_e), s	0.3	0.0		0.0				0.4
Phase Call Probability	0.93							0.96
Max Out Probability	0.00							0.00

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2			6	16				7		14
Adjusted Flow Rate (*v*), veh/h	161	991			1063	61				102		85
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1810	1725			1725	1610				1810		1610
Queue Service Time (g_s), s	1.5	3.3			6.0	0.9				3.2		2.7
Cycle Queue Clearance Time (g_c), s	1.5	3.3			6.0	0.9				3.2		2.7
Green Ratio (*g*/*C*)	0.74	0.77			0.61	0.61				0.10		0.19
Capacity (*c*), veh/h	564	3991			3164	984				173		304
Volume-to-Capacity Ratio (*X*)	0.285	0.248			0.336	0.062				0.591		0.279
Available Capacity (c_a), veh/h	1459	3991			3164	984				1025		1062
Back of Queue (*Q*), veh/ln (50th percentile)	0.2	0.2			1.4	0.2				1.4		0.9
Queue Storage Ratio (*RQ*) (50th percentile)	0.03	0.00			0.00	0.05				0.00		0.00
Uniform Delay (d_1), s/veh	3.0	1.9			5.7	4.7				26.0		20.8
Incremental Delay (d_2), s/veh	0.1	0.1			0.3	0.1				1.2		0.2
Initial Queue Delay (d_3), s/veh	0.0	0.0			0.0	0.0				0.0		0.0
Control Delay (*d*), s/veh	3.1	2.1			6.0	4.8				27.2		21.0
Level of Service (LOS)	A	A			A	A				C		C
Approach Delay, s/veh / LOS	2.2	A		5.9	A		0.0			24.4	C	
Intersection Delay, s/veh / LOS	5.6						A					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	0.6	A	2.2	B	3.3	C	3.3	C
Bicycle LOS Score / LOS	1.1	A	1.1	A				F

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*Weekday AM Peak*

Site Information

Intersection	*McDowell Road and Road A*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *McDowell Road* | North/South Street: *Road A*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1127*			*1913*	*105*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1127*	*0*	*0*	*1913*	*105*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*1*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						*34*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*34*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*1*
Configuration						*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								*R*
v (veh/h)								*34*
C (m) (veh/h)								*290*
v/c								*0.12*
95% queue length								*0.39*
Control Delay (s/veh)								*19.1*
LOS								*C*
Approach Delay (s/veh)	--	--				*19.1*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*Weekday PM Peak*

Site Information

Intersection	*McDowell Road and Road A*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *McDowell Road* | North/South Street: *Road A*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*2061*			*1312*	*37*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*2061*	*0*	*0*	*1312*	*37*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*1*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						*92*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*92*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*1*
Configuration						*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								*R*
v (veh/h)								*92*
C (m) (veh/h)								*453*
v/c								*0.20*
95% queue length								*0.75*
Control Delay (s/veh)								*15.0*
LOS								*B*
Approach Delay (s/veh)	--	--				*15.0*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information		Site Information	
Analyst	MS	Intersection	McDowell Road and Road A
Agency/Co.	B&N	Jurisdiction	City of Scottsdale
Date Performed	1/7/2016	Analysis Year	2025 Build
Analysis Time Period	Saturday Peak		

Project Description 64th Street/McDowell Road TIS

East/West Street: McDowell Road | North/South Street: Road A

Intersection Orientation: East-West | Study Period (hrs): 0.25

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		1006			1002	37
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	1006	0	0	1002	37
Percent Heavy Vehicles	2	--	--	0	--	--
Median Type	Raised curb					
RT Channelized			0			0
Lanes	0	2	0	0	2	0
Configuration		T			T	TR
Upstream Signal		1			1	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						31
Peak-Hour Factor, PHF	1.00	1.00	1.00	1.00	1.00	1.00
Hourly Flow Rate, HFR (veh/h)	0	0	0	0	0	31
Percent Heavy Vehicles	0	0	0	2	0	2
Percent Grade (%)		0			0	
Flared Approach		N			N	
Storage		0			0	
RT Channelized			0			0
Lanes	0	0	0	0	0	1
Configuration						R

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								R
v (veh/h)								31
C (m) (veh/h)								554
v/c								0.06
95% queue length								0.18
Control Delay (s/veh)								11.9
LOS								B
Approach Delay (s/veh)	--	--				11.9		
Approach LOS	--	--				B		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*AM Peak*

Site Information

Intersection	*McDowell Road and Road B*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *McDowell Road* | North/South Street: *Road B*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1443*			*1823*	*52*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1443*	*0*	*0*	*1823*	*52*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*1*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						*34*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*34*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*1*
Configuration						*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								*R*
v (veh/h)								*34*
C (m) (veh/h)								*319*
v/c								*0.11*
95% queue length								*0.35*
Control Delay (s/veh)								*17.6*
LOS								*C*
Approach Delay (s/veh)	--	--				*17.6*		
Approach LOS	--	--				*C*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/21/2016*
Analysis Time Period	*Weekday PM Peak*

Site Information

Intersection	*McDowell Road and Road B*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *McDowell Road* | North/South Street: *Road B*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1932*			*1561*	*18*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1932*	*0*	*0*	*1561*	*18*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*1*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						*92*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*92*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*1*
Configuration						*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								*R*
v (veh/h)								*92*
C (m) (veh/h)								*388*
v/c								*0.24*
95% queue length								*0.91*
Control Delay (s/veh)								*17.1*
LOS								*C*
Approach Delay (s/veh)	--	--				*17.1*		
Approach LOS	--	--				*C*		

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/21/2016*
Analysis Time Period	*Saturday Peak*

Site Information

Intersection	*McDowell Road and Road B*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *McDowell Road* | North/South Street: *Road B*

Intersection Orientation: *East-West* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Eastbound			Westbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1060*			*1037*	*19*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1060*	*0*	*0*	*1037*	*19*
Percent Heavy Vehicles	*2*	--	--	*0*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*0*	*0*	*2*	*0*
Configuration		*T*			*T*	*TR*
Upstream Signal		*1*			*1*	

Minor Street	Northbound			Southbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)						*31*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*0*	*0*	*31*
Percent Heavy Vehicles	*0*	*0*	*0*	*2*	*0*	*2*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*0*	*0*	*1*
Configuration						*R*

Delay, Queue Length, and Level of Service

Approach	Eastbound	Westbound	Northbound			Southbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration								*R*
v (veh/h)								*31*
C (m) (veh/h)								*548*
v/c								*0.06*
95% queue length								*0.18*
Control Delay (s/veh)								*12.0*
LOS								*B*
Approach Delay (s/veh)	--	--				*12.0*		
Approach LOS	--	--				*B*		

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TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*Weekday AM Peak*

Site Information

Intersection	*64th Street and Road A*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *Road A* | North/South Street: *64th Street*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*708*	*157*	*157*	*913*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*708*	*157*	*157*	*913*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*34*		*52*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*34*	*0*	*52*
Percent Heavy Vehicles	*2*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*157*	*34*		*52*			
C (m) (veh/h)		*774*	*219*		*694*			
v/c		*0.20*	*0.16*		*0.07*			
95% queue length		*0.76*	*0.54*		*0.24*			
Control Delay (s/veh)		*10.8*	*24.4*		*10.6*			
LOS		*B*	*C*		*B*			
Approach Delay (s/veh)	--	--	*16.1*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*Weekday PM Peak*

Site Information

Intersection	*64th Street and Road A*
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *Road A* | North/South Street: *64th Street*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*1114*	*55*	*55*	*867*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*1114*	*55*	*55*	*867*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*92*		*138*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*92*	*0*	*138*
Percent Heavy Vehicles	*2*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*55*	*92*		*138*			
C (m) (veh/h)		*593*	*198*		*534*			
v/c		*0.09*	*0.46*		*0.26*			
95% queue length		*0.31*	*2.23*		*1.02*			
Control Delay (s/veh)		*11.7*	*38.0*		*14.1*			
LOS		*B*	*E*		*B*			
Approach Delay (s/veh)	--	--	*23.7*					
Approach LOS	--	--	*C*					

TWO-WAY STOP CONTROL SUMMARY

General Information

Analyst	*MS*
Agency/Co.	*B&N*
Date Performed	*1/7/2016*
Analysis Time Period	*Saturday Peak*

Site Information

Intersection	
Jurisdiction	*City of Scottsdale*
Analysis Year	*2025 Build*

Project Description *64th Street/McDowell Road TIS*

East/West Street: *Road A* | North/South Street: *64th Street*

Intersection Orientation: *North-South* | Study Period (hrs): *0.25*

Vehicle Volumes and Adjustments

Major Street	Northbound			Southbound		
Movement	1	2	3	4	5	6
	L	T	R	L	T	R
Volume (veh/h)		*661*	*55*	*56*	*505*	
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*661*	*55*	*56*	*505*	*0*
Percent Heavy Vehicles	*0*	--	--	*2*	--	--
Median Type	*Raised curb*					
RT Channelized			*0*			*0*
Lanes	*0*	*2*	*1*	*1*	*2*	*0*
Configuration		*T*	*R*	*L*	*T*	
Upstream Signal		*0*			*0*	

Minor Street	Eastbound			Westbound		
Movement	7	8	9	10	11	12
	L	T	R	L	T	R
Volume (veh/h)				*31*		*47*
Peak-Hour Factor, PHF	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*
Hourly Flow Rate, HFR (veh/h)	*0*	*0*	*0*	*31*	*0*	*47*
Percent Heavy Vehicles	*2*	*0*	*0*	*0*	*0*	*0*
Percent Grade (%)		*0*			*0*	
Flared Approach		*N*			*N*	
Storage		*0*			*0*	
RT Channelized			*0*			*0*
Lanes	*0*	*0*	*0*	*1*	*0*	*1*
Configuration				*L*		*R*

Delay, Queue Length, and Level of Service

Approach	Northbound	Southbound	Westbound			Eastbound		
Movement	1	4	7	8	9	10	11	12
Lane Configuration		*L*	*L*		*R*			
v (veh/h)		*56*	*31*		*47*			
C (m) (veh/h)		*880*	*347*		*716*			
v/c		*0.06*	*0.09*		*0.07*			
95% queue length		*0.20*	*0.29*		*0.21*			
Control Delay (s/veh)		*9.4*	*16.4*		*10.4*			
LOS		*A*	*C*		*B*			
Approach Delay (s/veh)	--	--	*12.8*					
Approach LOS	--	--	*B*					