Archaeological Resources

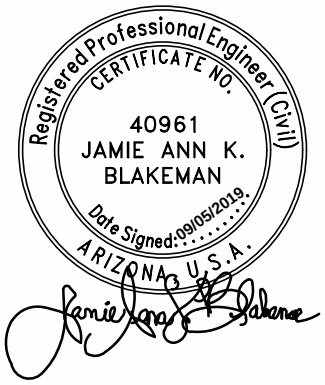
Airport Vicinity Development Checklist

Parking Study

Trip Generation Comparison

Parking Master Plan

To:	Bill Borders Museum Square	**Date:**	September 5, 2019
From:	Jamie Blakeman, PE, PTOE		
Job Number:	19.5004		
RE:	Museum Square Traffic Impact & Mitigation Analysis - UPDATE		



Memorandum

INTRODUCTION

Lōkahi, LLC (Lōkahi) has prepared this document as an update to the original Museum Square Traffic Impact and Mitigation Analysis (TI&MA) dated August 10, 2018. The development is generally located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way in Scottsdale, Arizona. This update elaborates on the changes since the August 10, 2018 TI&MA.

The proposed development will be comprised of the following land uses:

- Residential Building #1
  The proposed eleven (11) story Residential Building #1 will be located on the southeast corner of Goldwater Boulevard and 2nd Street and will include:
  - 61 residential units
    - 17 one (1) bedroom units
    - 31 two (2) bedroom units
    - 13 three (3) bedroom units

- Residential Building #2
  The proposed thirteen (13) story Residential Building #2 building will be located northeast of the intersection of Goldwater Boulevard and 70th Street and will include:
  - 83 residential units
    - 27 one (1) bedroom units
    - 38 two (2) bedroom units
    - 18 three (3) bedroom units

600 n. 4th street, suite d
phoenix, az 85004
480.536.7150
www.lokahigroup.com

- Residential Building #3
  The proposed twelve (12) story Residential Building #3 will be located on the northwest corner of Goldwater Boulevard and Marshall Way and will include:
  - 110 residential units
    - 71 one (1) bedroom units
    - 39 two (2) bedroom units

- Residential Building #4
  The proposed six (6) story Apartment/Condo Complex will be located on the northeast corner of Marshall Way and 2nd Street and will include:
  - 92 residential units
    - 58 one (1) bedroom units
    - 34 two (2) bedroom units

- Museum Square Hotel
  The proposed thirteen (13) story Museum Square Hotel will be located in the northwest corner of 2nd Street and Marshall Way. The proposed Museum Square Hotel will include:
  - 190 keys
  - 7,000 – 8,000 sf (square feet) of conference/meeting space
  - a spa consisting of 4 treatment rooms
  - a fitness center
  - 5,000 – 6,000 sf of restaurant space

See **Attachment A** for the proposed site plan.

TRIP GENERATION

Trip Generation – Loloma Mixed-Use Development

On February 11, 2002, a Traffic Impact Analysis was completed for the proposed Loloma Mixed-Use development. Details of this development is described in the August 10, 2018 Museum Square TI&MA.

As reported in Table 4 of the Loloma Mixed-Use Development Project Trip Generation, and also shown in **Table 1** below, the project was anticipated to generation 4,348 daily trips, of which 228 occurred in the AM peak hour, and 447 in the PM peak hour.

Table 1 –Trip Generation – Loloma

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1,115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
			Total	4,348	228	69	159	447	186	261

Trip Generation – Museum Square (August 10, 2018)

In the Museum Square TI&MA, dated August 10, 2018, the proposed development included the following land uses:

- 61 units (11 stories) Residential Building #1
- 79 units (13 stories) Residential Building #2
- 77 units (12 stories) Residential Building #3
- 80 units (4 to 6 stories) Residential Building #4
- 190 rooms Hotel
- 22,500 square feet Museum (Expansion)

The trip generation was calculated utilizing the Institute of Transportation Engineers (ITE) publication entitled *Trip Generation, 9th Edition*. The total trips generated by the proposed development is shown in **Table 2**.

Table 2 –Trip Generation –Museum Square (8/10/18)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	23	1000 SF GFA	0	2	1	1	8	1	7
			Total	3,221	194	81	113	244	134	110

Trip Generation – Museum Square (Current)

Since the August 10, 2018 TI&MA, the ITE *Trip Generation, 10th Edition* was released. Therefore, the trip generation for the proposed Museum Square development was calculated utilizing this 10th Edition.

The ITE rates and equations are based on studies that measured the trip generation characteristics for various types of land uses. The rates and equations are expressed in terms of trips per unit of land use type. This publication is the standard for the transportation engineering profession.

The proposed Museum Square development includes the following uses:

Residential Building #1 (61 units)	Land Use 222 – MultiFamily Housing (High-Rise)
Residential Building #2 (83 units)	Land Use 222 – MultiFamily Housing (High-Rise)
Residential Building #3 (110 units)	Land Use 222 – MultiFamily Housing (High-Rise)
Residential Building #4 (92 units)	Land Use 221 – MultiFamily Housing (Mid-Rise)
Hotel (190 rooms)	Land Use 310 – Hotel

The total trip generation for the proposed Museum Square development is shown in **Table 3** below.

Table 3 –Trip Generation – Museum Square (Current)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	500	32	8	24	41	25	16
Multifamily Housing (High-Rise)	222	254	Dwelling Units	1,213	84	20	64	95	58	37
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
			Total	3,432	206	82	124	253	143	110

TRIP GENERATION COMPARISON

A comparison between the trips generated by the previously approved Loloma Mixed-Use Development and the proposed Museum Square development is shown in **Table 4**.

Table 4 – Trip Generation Comparison - Loloma vs. Museum Square (Current)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
Total - Loloma				4,348	228	69	159	447	186	261
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	500	32	8	24	41	25	16
Multifamily Housing (High-Rise)	222	254	Dwelling Units	1,213	84	20	64	95	58	37
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Total - Museum Square (Current)				3,432	206	82	124	253	143	110
Difference				-916	-22	13	-35	-194	-43	-151
% Difference				-21%	-10%	19%	-22%	-43%	-23%	-58%

The proposed Museum Square Museum Square development will produce 916 (21%) fewer weekday daily trips, 22 (10%) fewer trips during the AM peak hour, and 194 (43%) fewer trips during the PM peak hour.

Additionally, a comparison between the trips generated by the Museum Square TI&MA, dated August 10, 2018 versus the most recent site plan for the Museum Square development is shown in **Table 5**. Detailed trip generation calculations are provided in **Attachment B**.

Table 5 – Trip Generation Comparison - Museum Square (8/10/2018) vs. (Current)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	23	1000 SF GFA	0	2	1	1	8	1	7
Total - Museum Square (8/10/2018)				3,221	194	81	113	244	134	110
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	500	32	8	24	41	25	16
Multifamily Housing (High-Rise)	222	254	Dwelling Units	1,213	84	20	64	95	58	37
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Total - Museum Square (Current)				3,432	206	82	124	253	143	110
Difference				211	12	1	11	9	9	0
% Difference				7%	6%	1%	10%	4%	7%	0%

SUMMARY

This report is an update to the Museum Square Traffic Impact and Mitigation Analysis, dated August 10, 2018. This report provides updated trip generation calculations for the proposed development and provides a comparison to the previously approved use.

The proposed development will be comprised of the following land uses:

- 61 units (11 stories) Residential Building #1
- 83 units (13 stories) Residential Building #2
- 110 units (12 stories) Residential Building #3
- 92 units (6 stories) Residential Building #4
- 190 rooms Hotel

A comparison between the trips generated by the build out under the previously approved Loloma Mixed-Use Development versus the proposed Museum Square development was calculated.

	Weekday	AM Peak Hour			PM Peak Hour		
	Total	Total	In	Out	Total	In	Out
Loloma Mixed-Use Development	4,348	228	69	159	447	186	261
Museum Square (Current)	3,432	206	82	124	253	143	110
Difference	-916	-22	13	-35	-194	-43	-151
% Difference	-21%	-10%	19%	-22%	-43%	-23%	-58%

The table above indicates that the proposed Museum Square development will produce 916 (21%) fewer weekday daily trips, 22 (10%) fewer trips during the AM peak hour, and 194 (43%) fewer trips during the PM peak hour.

Additionally, a comparison between the trips generated by the prior Museum Square site plan (8/10/18) versus the most recent site plan was calculated.

	Weekday	AM Peak Hour			PM Peak Hour		
	Total	Total	In	Out	Total	In	Out
Museum Square TI&MA, Dated August 10,2018	3,221	194	81	113	244	134	110
Museum Square (Current)	3,432	206	82	124	253	143	110
Difference	211	12	1	11	9	9	0
% Difference	7%	6%	1%	10%	4%	7%	0%

Although there is a slight increase in trips generated by the current proposed Museum Square development in comparison to the, the recommendations in the Museum Square Traffic Impact and Mitigation Analysis, dated August 10, 2018, are maintained.

ATTACHMENT A – PROPOSED SITE PLAN

EXISTING RESIDENTIAL

EXISTING MUSEUM

E. 1ST STREET

MUSEUM SQUARE PLAZA

HOTEL

EXISTING THEATER

RESIDENTIAL BUILDING #4

E. 2ND STREET

DROP OFF

SHARED ACCESS

E. 2ND STREET

RESIDENTIAL BUILDING #1

ARTIST SCHOOL

DROP OFF

PLAZA

RESIDENTIAL BUILDING #2

N. MARSHALL WAY

Bishop Lane

N. SCOTTSDALE ROAD

SOUTH GARDEN

RESIDENTIAL BUILDING #3

N. GOLDWATER BOULEVARD

0' 30' 60' 120' 180'

scale: 1" = 60'

ATTACHMENT B – TRIP GENERATION

Museum Square (Current)

Completed: TG 9/5/2019
Checked: GT 9/5/2019

Trip Generation Calculations - 10th Edition

221 - Multifamily Housing (Mid-Rise) - Apartments

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	5.44	50%	50%	0.36	26%	74%	0.44	61%	39%	501	251	250	34	9	25	41	26	15	Average
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	1.27	50%	50%	0.06	26%	74%	0.15	61%	39%	117	59	58	6	2	4	14	9	5	Minimum
Multifamily Housing (Mid-Rise)	221	92	Dwelling Units	12.50	50%	50%	1.61	26%	74%	1.11	61%	39%	1,150	575	575	149	39	110	103	63	40	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Multifamily Housing (Mid-Rise)	**221**	**92**	**Dwelling Units**	**T=5.45(X)-1.75**	**50%**	**50%**	**Ln(T)=0.98Ln(X)-0.98**	**26%**	**74%**	**Ln(T)=0.96Ln(X)-0.63**	**61%**	**39%**	**500**	**250**	**250**	**32**	**8**	**24**	**41**	**25**	**16**	**Equation**

Multifamily Housing (Mid-Rise)	Standard Deviation	2.03	0.19	0.19	
	Number of Studies	27	53	60	
	Average Size	205	207	208	

222 - Multifamily Housing (High-Rise) - Apartments

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Multifamily Housing (High-Rise)	222	254	Dwelling Units	4.45	50%	50%	0.31	24%	76%	0.36	61%	39%	1,131	566	565	79	19	60	92	57	35	Average
Multifamily Housing (High-Rise)	222	254	Dwelling Units	2.77	50%	50%	0.18	24%	76%	0.23	61%	39%	704	352	352	46	12	34	59	36	23	Minimum
Multifamily Housing (High-Rise)	222	254	Dwelling Units	6.45	50%	50%	0.48	24%	76%	0.53	61%	39%	1,639	820	819	122	30	92	135	83	52	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Multifamily Housing (High-Rise)	**222**	**254**	**Dwelling Units**	**T=3.94(X)+211.81**	**50%**	**50%**	**T=0.28(X)+12.86**	**24%**	**76%**	**T=0.34(X)+8.56**	**61%**	**39%**	**1,213**	**606**	**607**	**84**	**20**	**64**	**95**	**58**	**37**	**Equation**

Multifamily Housing (Mid-Rise)	Standard Deviation	0.83	0.08	0.06	
	Number of Studies	11	25	25	
	Average Size	414	372	372	

310 - Hotel

Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Rate	% In	% Out	Rate	% In	% Out	Rate	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Hotel	310	190	Rooms	8.36	50%	50%	0.47	59%	41%	0.60	51%	49%	1,589	795	794	90	54	36	114	59	55	Average
Hotel	310	190	Rooms	5.31	50%	50%	0.2	59%	41%	0.26	51%	49%	1,009	505	504	38	23	15	50	26	24	Minimum
Hotel	310	190	Rooms	9.53	50%	50%	0.84	59%	41%	1.06	51%	49%	1,811	906	905	160	95	65	202	104	98	Maximum
Land Use	ITE Code	Qty	Unit	Weekday			AM Peak Hour			PM Peak Hour			Weekday			AM Peak Hour			PM Peak Hour			
				Equation	% In	% Out	Equation	% In	% Out	Equation	% In	% Out	Total	In	Out	Total	In	Out	Total	In	Out	
Hotel	**310**	**190**	**Rooms**	**T=11.29(X)-426.97**	**50%**	**50%**	**T=0.50(X)-5.34**	**59%**	**41%**	**T=0.75(X)-26.02**	**51%**	**49%**	**1,719**	**860**	**859**	**90**	**54**	**36**	**117**	**60**	**57**	**Equation**

Hotel	Standard Deviation	1.86	0.14	0.22	
	Number of Studies	6	25	28	
	Average Size	146	178	183	

ATTACHMENT C – 8/10/18 MUSEUM SQUARE TI&MA

Museum Square
Traffic Impact and Mitigation Analysis

Prepared for:

Macdonald Development Corporation
3225 N. Central Avenue, Suite 100
Phoenix, AZ 85012

Prepared by:

J2 Engineering and Environmental Design
4649 E. Cotton Gin Loop, Suite B2
Phoenix, AZ 84040

EXPIRES 6·30·19

Project Number: 171070
August 10, 2018

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1. Introduction to Summary

1.1. Purpose of Report and Study Objectives

J2 Engineering and Environmental Design was retained by Macdonald Development Corporation to complete a Traffic Impact and Mitigation Analysis for the proposed Museum Square. The development is generally located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way, the northeast corner of Marshall Way and 1st Street (the proposed Canopy by Hilton development) and the Scottsdale Museum of the West in Scottsdale, Arizona. The objective of this Traffic Impact and Mitigation Analysis is to analyze the traffic related impacts of the proposed development to the adjacent roadway network. See **Figure 1** for vicinity map.

The proposed development will include four residential buildings, a hotel, and expansion of the Scottsdale Museum of the West. See **Figure 2** for the proposed land uses.

1.2. Executive Summary

This report presents the analyses and the results of a traffic study prepared for the proposed Museum Square development. The proposed mixed-use development will be generally be located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way, the northeast corner of Marshall Way and 1st Street (the proposed Canopy by Hilton development) and the Scottsdale Museum of the West in Scottsdale, Arizona.

The proposed development will be comprised of the following land uses:

- 61 units (11 stories) Residential Building #1
- 79 units (13 stories) Residential Building #2
- 77 units (12 stories) Residential Building #3
- 80 units (4 to 6 stories) Residential Building #4
- 190 rooms Hotel
- 22, 500 square feet Museum (Expansion)

The above does not include the proposed Canopy by Hilton or the existing developments to remain (Stagebrush Theatre, Scottsdale Artists' School, and Scottsdale Museum of the West). A separate TI&MA was prepared for the Canopy by Hilton, which included trip generation calculations and comparisons. The trip generation from the May 29, 2018 TI&MA for the proposed Canopy by Hilton are included in the year 2025 analyses.

This Traffic Impact and Mitigation Analysis includes:

- Level of service analysis of existing conditions for the weekday AM and PM peak hours
- Trip Generation for the proposed development
- Trip Generation comparison to the Loloma Mixed-Use Development
- Trip Generation comparison to the existing zoning
- Level of service analysis for the opening year (2025) weekday AM and PM peak hours
    - 2025 No Build
    - 2025 Build

The following are the 21 intersections included in this study:

- Scottsdale Road and 1st Avenue (1)
- Goldwater Boulevard and Main Street (2)
- Marshall Way and Main Street (3)
- Scottsdale Road and Main Street (4)
- Goldwater Boulevard and Alley (5)
- Underground Parking Garage and Alley (6)
- Marshall Way and Alley (7)
- Goldwater Boulevard and 1st Street (8)
- Marshall Way and 1st Street (9)
- Driveway A and 1st Street (10)
- Scottsdale Road and 1st Street (11)
- Goldwater Boulevard and 2nd Street (12)A
- Driveway B and 2nd Street (13)
- Driveway C and 2nd Street (14)
- Driveway D and 2nd Street (15)
- Marshall Way and 2nd Street (16)
- Scottsdale Road and 2nd Street (17)
- Goldwater Boulevard and 70th Street (18)
- Marshall Way and Driveway E (19)
- Goldwater Boulevard and Marshall Way (20)
- Goldwater Boulevard and Scottsdale Road (21)

Existing Capacity Analysis

The AM and PM peak hour existing conditions capacity analysis were completed for the twenty-one (21) existing study intersections. The following intersections currently operate with movements at a LOS E or F:

Scottsdale Road and 1st Avenue (1) – Stop Controlled

- EB Shared Left-Through-Right PM peak hour operates at LOS E
- WB Shared Left-Through-Right PM peak hour operates at LOS E

Goldwater Boulevard and Scottsdale Road (21) – Signalized

- EB Left AM peak hour operates at LOS E
- EB Shared Through-Right AM peak hour operates at LOS E

Trip Generation

The trip generation for the previously approved Loloma Mixed-Use Development is shown below per the report dated February 11, 2002.

Trip Generation – Loloma Mixed-Use Development

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1,115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
			Total	4,348	228	69	159	447	186	261

The trip generation under the existing zoning and the proposed Museum Square development were calculated. With approximately 7.4 acres and a 1.3 base gross floor area, approximately 418,200 square feet can be developed on this site along with 369 residential dwelling units.

Trip Generation – Existing Zoning

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
			Total	14,109	605	386	219	1,324	584	740

The potential development under the existing zoning generates 14,109 weekday daily trips, with 605 trips during the AM peak hour, and 1,324 trips during the PM peak hour.

Trip Generation – Museum Square

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total				3,221	194	81	113	244	134	110

The proposed Museum Square development is anticipated to generate, 3,221 weekday trips, with 194 trips occurring during the AM peak hour and 244 trips occurring during the PM peak hour.

Trip Generation Comparison

A comparison between the trips generated by the build out under the previously approved Loloma Mixed-Use Development versus the proposed Museum Square development was calculated.

Trip Generation Comparison (Loloma Mixed-Use Development vs. Proposed)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
Total - Loloma Mixed-Use Development				4,348	228	69	159	447	186	261
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-1,127	-34	12	-46	-203	-52	-151
% Difference				-26%	15%	17%	29%	-45%	-28%	-58%

Table 9 shows that the proposed mixed-use Museum Square development will produce 1,127 (26%) fewer weekday daily trips will occur, 34 (15%) fewer trips during the AM peak hour, and 203 (45%) fewer trips during the PM peak hour.

Additionally, a comparison between the trips generated by the build out under the existing zoning with a 209,100 sf of retail, 209,100 sf of office space, and 369 residential units versus the proposed Museum Square development was calculated.

Trip Generation Comparison (Existing Zoning vs. Proposed)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
Total - Existing Zoning				14,109	605	386	219	1,324	584	740
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-10,888	-411	-305	-106	-1,080	-450	-630
% Reduction				77%	68%	79%	48%	82%	77%	85%

The proposed Museum Square development is anticipated to generate 10,888 (77%) fewer weekday daily trips, 411 (68%) fewer trips during the AM peak hour, and 1,080 (82%) fewer trips during the PM peak hour.

Future Conditions

Year 2025 (opening year) analyses were completed without the build out, as well as with the build out of the proposed development. Based on the MAG model, an annual growth rate of 1.0% was applied along Goldwater Boulevard. Additionally, the traffic volumes of known future developments were added and distributed throughout the studied roadway network. These developments include, Canopy by Hilton, and The Goldwater.

Canopy by Hilton

Based on the May 29, 2018 TI&MA for Canopy by Hilton, this proposed development will be located on the northeast corner of Marshall Way and 1st Street. It will be comprised of a 176 room hotel with a fitness center, pool and spa, café, bar, and 4,130 sf of conference/meeting space.

Trip Generation – Canopy by Hilton

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Hotel (Proposed)	310	176	Rooms	1,472	83	49	34	106	54	52

The Goldwater

Based on the December 15, 2017 TI&MA for The Goldwater, this proposed development will be located on the southeast corner of Goldwater Boulevard and 70th Street. It will be comprised of 40 residential units, a 2,500 sf restaurant, and a 5,500 sf office space. Additionally, there will be three (3) owner owned guest casitas.

Trip Generation – The Goldwater

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	43	Dwelling Units	234	16	4	12	19	12	7
General Office Building	710	5.5	1000 SF GFA	54	6	5	1	6	1	5
High-Turnover (Sit-Down) Restaurant	932	2.5	1000 SF GLA	280	25	14	11	24	15	9
			Total	568	47	23	24	50	28	22

As stated in **Section 3.1.2** the City of Scottsdale has considered the installation of a traffic signal at this intersection as 2nd Street has been identified as the main east-west bicycle corridor through Old Town Scottsdale and efforts are in place to connect it to the Camelback path east of Miller Road. The traffic signal has also been requested by area merchants and residents to improve bicycle and pedestrian access across Goldwater Boulevard, and this is also consist with the Holly Street plan.

Therefore, the 2025 no build and build capacity analyses were completed with a traffic signal at the intersection of Goldwater Boulevard and 2nd Street (12).

Year 2025

Capacity analyses were completed for both the AM and PM peak hours for year 2025, without the build out of the proposed Museum Square development, as well as with the build out.

All movements operate at a LOS D or better, or are maintained at the no build level of service, with the exception of the following:

Goldwater Boulevard and 2nd Street (12) – Stop Controlled

- EB Shared Left-Through-Right AM and PM peak hour operates at LOS F
- WB Shared Left-Through-Right AM and PM peak hour operates at LOS E and F, respectively

With the build out of Museum Square, it is recommended that signal timing splits and offsets of all adjacent and nearby intersections be updated to efficiently service future traffic patterns.

Goldwater Boulevard and 2nd Street (12) – Stop Controlled
For the intersection of Goldwater Boulevard and 2nd Street (12), capacity analyses were completed as a two-way stop controlled intersection, as it exists today, as well as with the installation of a traffic signal. With the combination of the increased traffic volumes and pedestrian volumes with the build out of the proposed Museum Square, the stop-controlled movements operate at LOS E and F.

Additionally, there were a total of 28 angle collisions between April 2015 to April 2018. Of which 12 occurred between April 2015 and April 2016, 12 occurred between April 2016 and April 2017, and 4 occurred between April 2017 and April 2018. As stated in the Manual of Uniform Traffic Control Devices Section 4C.08.B under the traffic signal warrant section, based on crash experience, "the need for a traffic control signal shall be considered if…five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage." Although a formal traffic signal warrant analysis has not been completed for this intersection as part of this study, based on the crash data it appears that this criteria is met for two of the three years analyzed.

Therefore, it is recommended with the build out of Museum Square that a traffic signal be installed at the intersection of Goldwater Boulevard and 2nd Street (12). As previously stated, the City of Scottsdale has considered the installation of a traffic signal at this intersection. If the traffic signal has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Goldwater Boulevard Pedestrian Hybrid Beacon
The City of Scottsdale has also considered the installation of a pedestrian hybrid beacon along Goldwater Boulevard approximately 300 feet west of Marshall Way to assist with pedestrian and bicycle crossings and in response to requests from area residents.

Similar to the traffic signal at Goldwater Boulevard and 2nd Street (12), if the pedestrian hybrid beacon has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Multi Modal Circulation
The Museum Square development encourages alternative modes of transportation including, movement by foot, bicycle, scooters, and/or trolley. Museum Square has been intentionally designed to embrace an active street frontage reinforcing the Old Town pedestrian environment and encouraging walkability and social interaction.

These alternative means of transportation are inherent to downtown mixed-use areas with nearby restaurants, retail, and cultural destinations. In addition to the Gallery District located to the north of the proposed development, guests will be within walking distance to significant destinations such as, Museum of the West, the Scottsdale Artists' School, Scottsdale Historical Museum, Scottsdale Stadium, Scottsdale Fashion Square Mall and Scottsdale Waterfront.

Shading of the pedestrian realm along the street frontages and internal connection points will be provided by a variety of structures and/or desert appropriate trees. Additionally, Museum Square intends to provide a multi-use public space located northeast of the proposed hotel. This multi-use space will provide its guests outdoor dining, shaded areas, patios, terraces, and a sculpture garden.

2. Proposed Development

The study area is located in the City of Scottsdale, Arizona. It is approximately two and one-third miles west of State Route Loop 101 (SR 101L), and approximately three and two-third miles north of State Route Loop 202 (SR 202L). See **Figure 1** for a vicinity map.

The proposed Museum Square development is generally located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way, the northeast corner of Marshall Way and 1st Street (the proposed Canopy by Hilton development) and the Scottsdale Museum of the West in Scottsdale, Arizona.

The proposed development will be comprised of the following land uses:

- **Residential Building #1**
  The proposed eleven (11) story Residential Building #1 will be located on the southeast corner of Goldwater Boulevard and 2nd Street and will include:
  - **61 residential units**
    - 18 one (1) bedroom units
    - 43 two (2) bedroom units.

  The main access to the underground parking garage will be at the entry courtyard located on 2nd Street approximately 300 feet west of Marshall Way. A secondary access will be provided along Marshall Way (approximately 340 feet south of 2nd Street) just south of the Scottsdale Artists' School.

- **Residential Building #2**
  The proposed thirteen (13) story Residential Building #2 building will be located northeast of the intersection of Goldwater Boulevard and 70th Street and will include:
  - **79 residential units**
    - 23 one (1) bedroom units
    - 56 two (2) bedroom units

  Similar to Residential Building #1, the main access to the underground parking garage will be at the entry courtyard located on 2nd Street approximately 300 feet west of Marshall Way. A secondary access will be provided along Marshall Way (approximately 340 feet south of 2nd Street) just south of the Scottsdale Artists' School.

- **Residential Building #3**
  The proposed twelve (12) story Residential Building #3 will be located on the northwest corner of Goldwater Boulevard and Marshall Way and will include:
  - **77 residential units**
    - 22 one (1) bedroom units
    - 55 two (2) bedroom units

  The main access to the underground parking garage will be located along Marshall Way (approximately 340 feet south of 2nd Street) just south of the Scottsdale Artist School. A secondary access will be located at the entry courtyard located off 2nd Street approximately 300 feet west of Marshall Way.

- **Residential Building #4**
  The proposed Apartment/Condo Complex will be located on the northeast corner of Marshall Way and 2nd Street and will include:
  - **80 residential units**
    - 48 one (1) bedroom units
    - 32 two (2) bedroom units

  The main access to the underground parking garage will be provided along 1st Street approximately 100 feet east of Marshall Way.

- **Hotel**
  The proposed thirteen (13) story Hotel will be located in the northwest corner of 2nd Street and Marshall Way. The proposed Hotel will include:
  - **190 keys**
  - 7,000 – 8,000 sf (square feet) of conference/meeting space
  - a spa consisting of 4 treatment rooms
  - a fitness center
  - 5,000 – 6,000 sf of restaurant space

  The access to the Hotel will be located at the entry courtyard located along 2nd Street approximately 300 feet west of Marshall Way. The Hotel drop-off will be located along 2nd Street approximately 220 feet west of Marshall Way.

- **Scottsdale Museum of the West**
  A 22,500 sf expansion of the Scottsdale Museum of the West is anticipated in the future and is included in this traffic analysis.

The proposed **Canopy by Hilton** development, located on the northeast corner of Marshall Way and 1st Street is also included in the proposed Museum Square development. This development is comprised of a 176 room hotel with a fitness center, pool and spa, café, bar, and 4,130 sf of conference/meeting space. A separate Traffic Impact and Mitigation Analysis (TI&MA) was completed for this parcel on May 29, 2018. The Canopy by Hilton development was included in the year 2025 analyses based on the May 29, 2018 TI&MA calculations. See **Appendix H** for the Canopy by Hilton TI&MA.

Situated within the proposed development are the 3,632 sf Stagebrush Theatre located on the northeast corner of Goldwater Boulevard and 2nd Street; the 15,002 sf Scottsdale Artists' School located on the southwest corner of Marshall Way and 2nd Street; and, the 57,806 sf Scottsdale Museum of the West located on the west side of Marshall Way at 1st Street which are all planned to remain.

There are four (4) proposed access points to the Museum Square development, one (1) along 1st Street, two (2) along 2nd Street, and one (1) along Marshall Way.

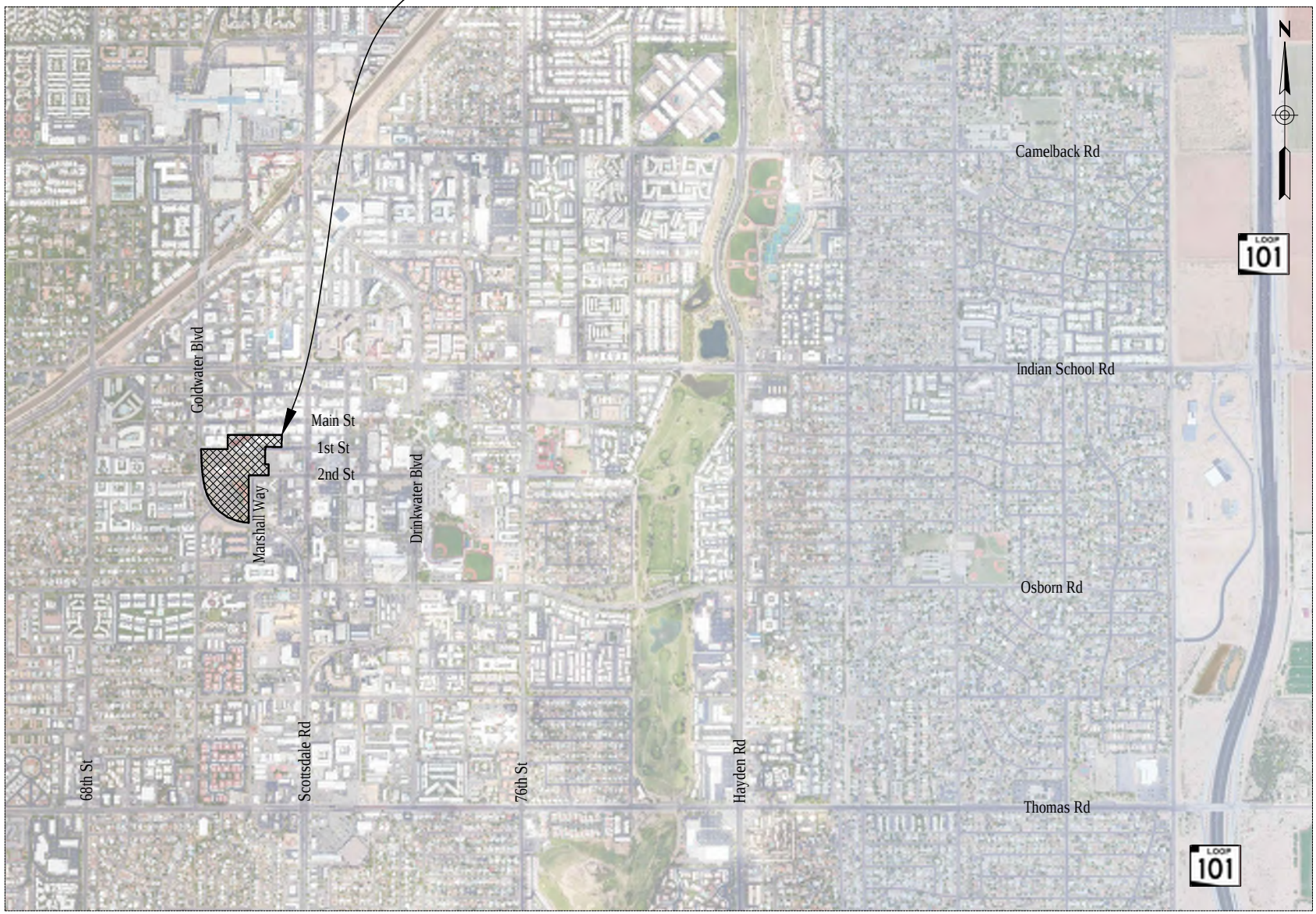
Driveway F and 1st Street (22) is located approximately 100 feet east of Marshall Way. The proposed driveway will form a T-intersection and will be a full access driveway allowing all movements into and out of the site. This driveway will allow for access to an underground parking garage for residents of Residential Building #4.

Driveway C and 2nd Street (14) is located approximately 300 feet west of Marshall Way. This driveway will provide access to a surface parking lot to the north as well as to the 190 key hotel. Additionally, this driveway will provide access to Residential Buildings #1, #2, and #3, and to the Scottsdale Artists' School to the south. This will be a full access driveway allowing all movements into and out of the site.

Driveway D and 2nd Street (15) is located approximately 220 feet west of Marshall Way. This driveway will provide access to the Hotel drop-off.

Marshall Way and Driveway E (19) is located approximately 340 feet south of 2nd Street. This driveway will provide access to Residential Buildings #1, #2, and #3, and to the Scottsdale Artists' School. This driveway forms a t-intersection and will be a full access driveway allowing all movements into and out of the site.

See **Figure 2** and **Appendix A** for the proposed site plan.



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Vicinity Map

Figure 1

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PROJECT NO. 171070	DRAWN BY TG		
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3. Area Conditions

The development is generally located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way, the northeast corner of Marshall Way and 1st Street (the proposed Canopy by Hilton development) and the Scottsdale Museum of the West in Scottsdale, Arizona.

3.1. Study Area

Sections 3.1 and **3.2** provide detailed descriptions of the study roadway segments and intersections. See **Figure 3** for the proposed study area.

3.1.1. Study Roadway Segments

Goldwater Boulevard, generally runs north-south and provides three (3) through lanes in the southbound direction in the southbound direction of travel, and two (2) through lanes in the northbound direction of travel, with a raised landscaped median. There is a posted speed limit of 35 miles per hour (mph). According to *The Scottsdale Master Transportation Plan,* dated July 2016, Goldwater Boulevard is classified as a couplet. The City of Scottsdale's *2016 Average Daily Segment Traffic (ADT) Volumes* map reports an ADT of 12,000 vehicles per day along Goldwater Boulevard between Indian School Road and Osborn Road.

Marshall Way, runs north-south and provides one (1) through lane for each direction of travel. There is an unposted speed limit of 25 mph. On street parallel parking is currently provided on the east and west sides of Marshall Way.

Scottsdale Road, located east of the proposed development, runs north-south and provides two (2) through lanes for each direction of travel, with a flush median. On-street parallel and angled parking is intermittently provided along both the east and west sides of Scottsdale Road. There is a posted speed limit of 25 miles per hour mph. The City of Scottsdale classifies Scottsdale Road as a major collector within the study area, according to *The Scottsdale Master Transportation Plan,* dated July 2016. The City of Scottsdale's *2016 Average Daily Segment Traffic (ADT) Volumes* map reports an ADT of 23,500 vehicles per day along Scottsdale Road between Indian School Road and Osborn Road.

Main Street, located north of the proposed development, runs east-west and provides one (1) through lane in each direction of travel. There is an unposted speed limit of 25 mph. On-street angled parking is currently provided on the north and south sides of Main Street.

1st Street, borders the proposed development on the north, runs east-west and provides one (1) through lane in each direction of travel. There is an unposted speed limit of 25 mph. On-street parking is currently provided on the north and south sides of 1st Street east of Marshall Way. East

of Goldwater Boulevard 1st Street provides access to the Gateway at Main Street Plaza condominium building and terminates approximately 230' east of Goldwater Boulevard.

2nd Street, runs east-west through the proposed development and provides one (1) through lane in each direction of travel. There is an unposted speed limit of 25 mph. On-street parallel parking and bike lanes are currently provided on the north and south sides of 2nd Street, between Goldwater Boulevard and Scottsdale Road.

3.1.2. Study Intersections

Scottsdale Road and 1st Avenue (1) currently operates as a two-way stop controlled intersection, with the stop control on the eastbound and westbound approaches. The northbound and southbound approaches provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane. The eastbound and westbound approaches provides one (1) shared left-through-right turn lane.

Goldwater Boulevard and Main Street (2) currently operates as a signalized intersection. The northbound approach provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane. The southbound approach provides one (1) dedicated left turn lane, two (2) through lanes, and one (1) shared through-right turn lane. The eastbound and westbound approaches provides one (1) shared left-through-right turn lane.

Marshall Way and Main Street (3) currently operates as a four-way stop-controlled single lane roundabout. There is one (1) approach lane for each direction of travel.

Scottsdale Road and Main Street (4) currently operates as a signalized intersection. The northbound and southbound approaches provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane. The eastbound and westbound approaches provides one (1) shared left-through-right turn lane.

Goldwater Boulevard and Alley (5) currently operates as a stop controlled T-intersection, with stop control on the westbound approach. The northbound approach provides one (1) through lane and one (1) shared through-right turn lane. The southbound approach provides three (3) through lanes and is a separated from the northbound approach by a landscaped median. The westbound approach provides one (1) shared left-right turn lane.

Underground Parking Garage and Alley (6) currently operates as a stopped controlled T-intersection, with stop control on the northbound approach. The south leg serves as an access to an underground parking garage. The eastbound approach provides one (1) shared through-right turn lane. The westbound approach provides one (1) shared left turn-through lane.

Marshall Way and Alley (7) currently operates as a two-way stopped controlled intersection, with unposted stop controls on the eastbound and westbound approaches. All four approaches provides one (1) shared left-through-right turn lane.

Goldwater Boulevard and 1st Street (8) currently operates as stop controlled intersection, with stop control on the eastbound and westbound approaches. The northbound approach provides one (1) shared left turn-through lane, and one (1) shared through-right turn lane. The southbound approach provides one (1) shared left turn-through lane, one (1) through lane, and one (1) shared through-right turn lane. The eastbound approach provides one (1) shared left-through-right turn lane. The westbound approach provides one (1) shared left-through lane and one (1) dedicated right turn lane.

Marshall Way and 1st Street (9) currently operates as a stop controlled T-intersection, with stop control on the westbound approach. The northbound approach provides one (1) shared through-right turn lane. The southbound approach provides one (1) shared left-through turn lane. The westbound approach provides one (1) shared left-right turn lane.

Driveway A and 1st Street (10) currently operates as a stop controlled T-intersection, with an unposted stop control on the southbound approach. The north leg serves as access to the second floor of an existing above grade parking garage. The southbound approach provides one (1) shared left-right turn lane. The eastbound approach provides one (1) shared left turn-through lane. The westbound approach provides one (1) shared through-right turn lane.

Scottsdale Road and 1st Street (11) currently operates as a signalized intersection. The northbound approach provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane. The southbound approach provides one (1) dedicated left turn lane, two (2) through lanes, and one (1) dedicated right turn lane. The eastbound and westbound approaches provides one (1) shared left-through-right turn lane.

Goldwater Boulevard and 2nd Street (12) currently operates as a two-way stop controlled intersection, with stop control on the eastbound and westbound approaches. The northbound approach provides one (1) dedicated left turn lane, one (1) through lane, and one shared through-right turn lane. The southbound approach provides one (1) dedicated left turn lane, two (2) through lanes, and one (1) shared through-right turn lane. The eastbound and westbound approaches provides one (1) shared left-through-right turn lane.

The City of Scottsdale has considered the installation of a traffic signal at this intersection as 2nd Street has been identified as the main east-west bicycle corridor through Old Town Scottsdale and efforts are in place to connect it to the Camelback path east of Miller Road. The traffic signal has also been requested by area merchants and residents to improve bicycle and pedestrian access across Goldwater Boulevard, and this is also consist with the Holly Street plan.

If the traffic signal has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Driveway B and 2nd Street (13) currently operates as a stop controlled T-intersection, with an unposted stop control on the northbound approach. The northbound approach provides one (1) shared left-right turn lane. The eastbound approach provides one (1) shared through-right turn lane. The westbound approach provides one (1) shared left turn-through lane.

Driveway C and 2nd Street (14) currently operates as a stop controlled T-intersection, with an unposted stop control on the northbound approach. The northbound approach provides one (1) shared left-right turn lane. The eastbound approach provides one (1) shared through-right turn lane. The westbound approach provides one (1) shared left turn-through lane.

Driveway D and 2nd Street (15) currently operates as a stop controlled intersection, with an unposted stop control on the northbound and southbound approaches. All approaches provides one (1) shared left-through-right turn lane.

Marshall Way and 2nd Street (16) currently operates as a four-way stop controlled intersection. . All approaches provides one (1) shared left-through-right turn lane.

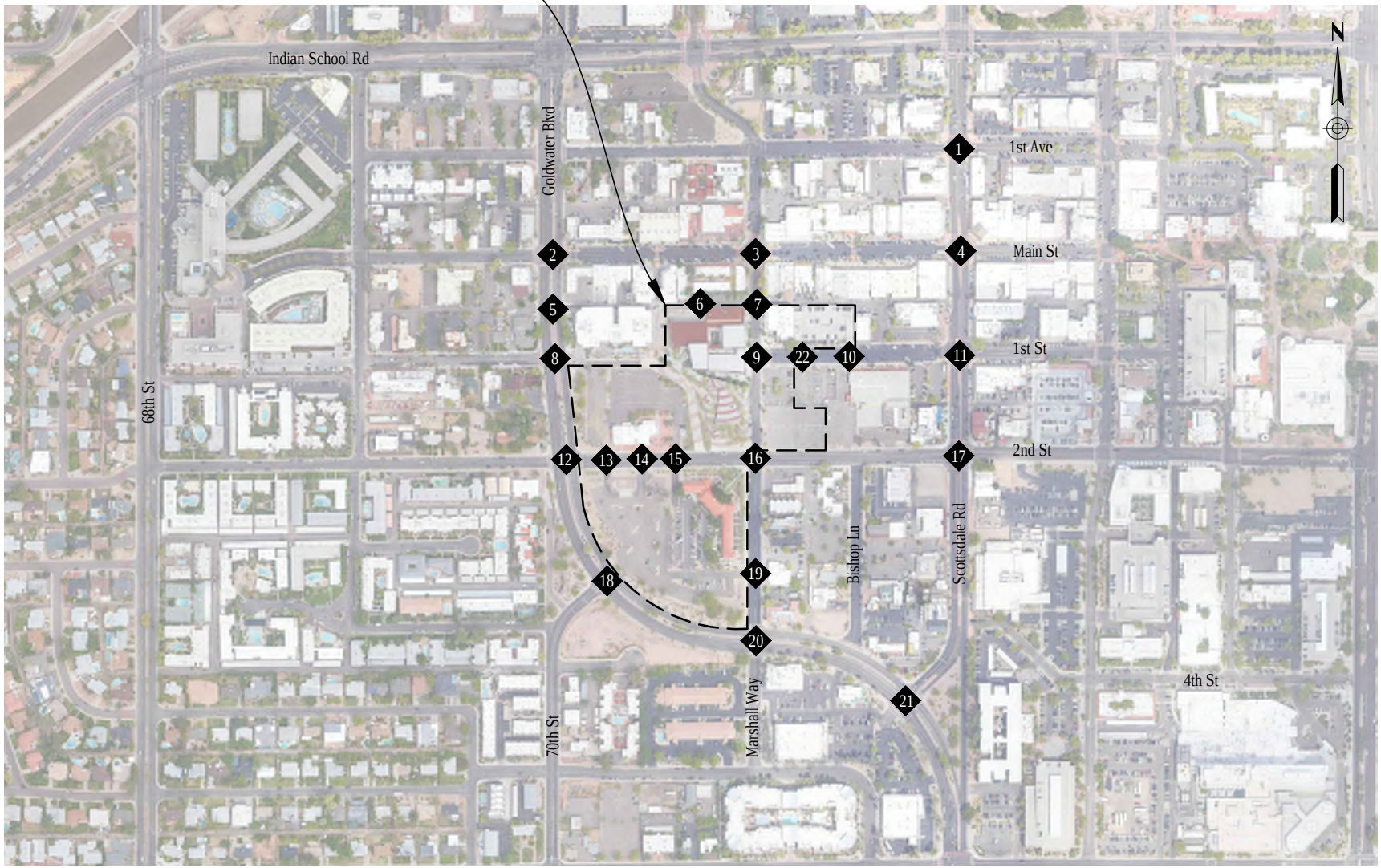
Scottsdale Road and 2nd Street (17) currently operates as a signalized intersection. The northbound and southbound approaches provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane. The eastbound approach provides one (1) dedicated left turn lane, one (1) through lane, and one (1) dedicated right turn lane. The westbound approach provides one (1) shared left-through-right turn lane.

Goldwater Boulevard and 70th Street (18) currently operated as a one-way stop controlled T-intersection, with stop control on 70th Street. The northbound approach (Goldwater Boulevard) provides one (1) dedicated left turn lane and two (2) though lanes. The southbound approach provides two (2) through lanes and one (1) shared through-right turn lane. The eastbound approach (70th Street) provides one (1) left turn and one (1) right turn lane.

Marshall Way and Driveway E (19) currently operates as a one-way stop controlled T-intersection, with stop control for the eastbound approach. The northbound approach provides one (1) shared left turn-through lane. The southbound approach provides one (1) shared through-right turn lane. The westbound approach provides one (1) shared left-right turn lane.

Goldwater Boulevard and Marshall Way (20) currently operates as a two-way stop controlled intersection, with stop control on the northbound and southbound approaches. The northbound approach provides one (1) shared left-through-right turn lane. The southbound approach provides one (1) shared left turn-through lane and one (1) dedicated right turn lane. The eastbound approach provides one (1) dedicated left turn lane, two (2) through lanes, and one (1) shared through-right turn lane. The westbound approach provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane.

Goldwater Boulevard and Scottsdale Road (21) currently operates as a signalized intersection. The northbound approach (Scottsdale Road) provides one (1) dedicated left turn lane, and one (1) shared through-right turn lane. The southbound approach (Scottsdale Road) provides one (1) dedicated left turn lane and one (1) shared left-through-right turn lane. The eastbound approach (Goldwater Boulevard) provides one (1) dedicated left turn lane, two (2) through lanes, and one (1) shared through-right turn lane. The westbound approach (Goldwater Boulevard) provides one (1) dedicated left turn lane, one (1) through lane, and one (1) shared through-right turn lane.



J2 engineering and environmental design 4649 east cotton gin loop, suite B2 phoenix, arizona 85040 phone: 602.438.2221 www.j2design.us		Study Area	Figure 3
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3.2. Study Area Land Use

Located in Old Town Scottsdale, the land use of the surrounding area includes mixed uses - office, restaurant, retail, and other uses. North of the proposed development is the City of Scottsdale's Arts District. The proposed development is located in Old Town Scottsdale, characterized by the higher density mix-use development, availability of on-street parking and multiple modes of transportation.

3.3. Site Accessibility

3.3.1. Roadway System

The study area is located in the City of Scottsdale, Arizona approximately two and one-third miles west of the SR 101L and three and two-third miles north of SR 202L. Scottsdale's street network is generally built as a one-mile grid system. Within the near vicinity of the proposed site there is a well-developed roadway network which include the Goldwater Boulevard and Drinkwater Boulevard couplet system. The surrounding roadway network provides convenient access to SR 101L freeway interchanges.

3.3.2. Pedestrian Facilities

Located in Old Town Scottsdale, there are continuous sidewalks provided along Goldwater Boulevard, Marshall Way, Scottsdale Road, Main Street, 1st Street, 2nd Street, along with other surrounding roadways. Marked crosswalks are provided at nearby signalized intersections, including Goldwater Boulevard and Main Street, and along Scottsdale Road at Main Street, 1st Street, 2nd Street, and Goldwater Boulevard. The two-way stop controlled intersection of Scottsdale Road and 1st Avenue provides marked crosswalks. Additionally, the four-way stop controlled intersection of Marshall Way and 2nd Street provides marked crosswalks.

Access to the Arizona Canal Trail is located approximately one-half mile northwest of the proposed development. The Arizona Canal Trail provides paved and unpaved pathways that follow the Arizona Canal through Scottsdale, Phoenix, Glendale, and Peoria. Approximately one mile east of the proposed site is the Indian Bend Wash Greenbelt where there are shared use paths along with other pedestrian amenities.

3.3.3. Bicycle Facilities and Shared-Use Paths

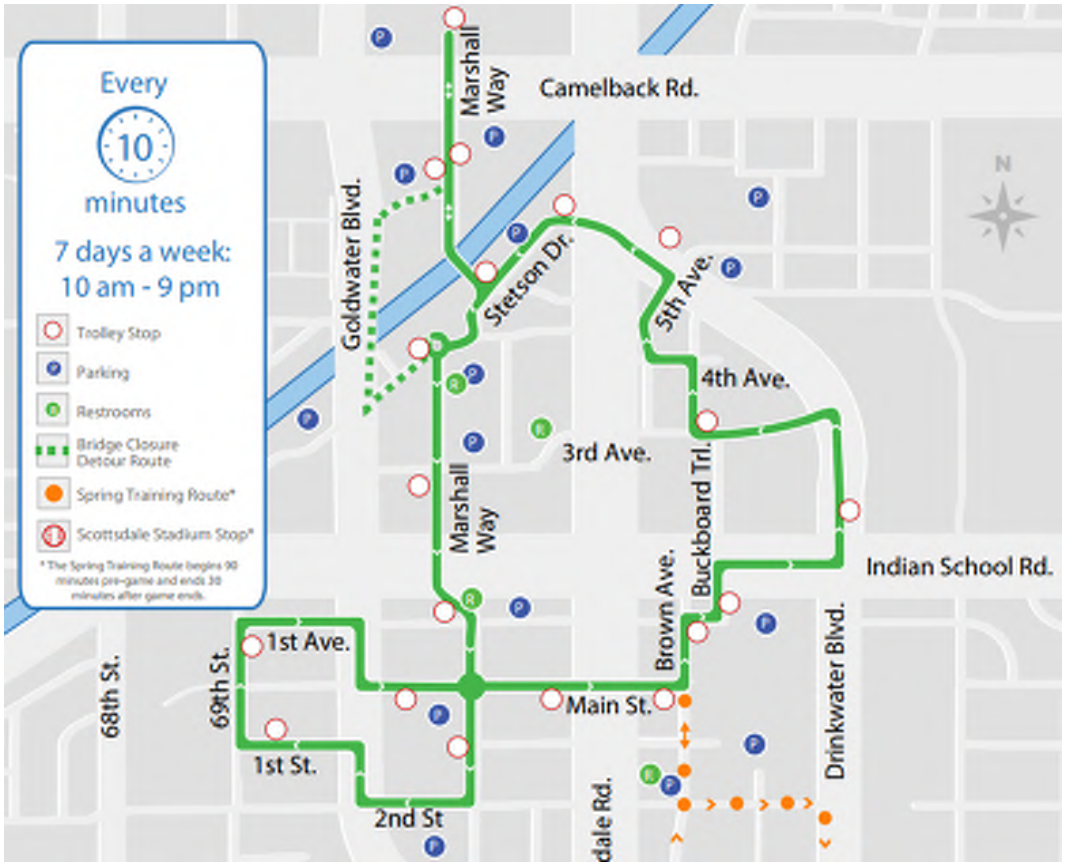
Bike lanes are provided along 2nd Street between Goldwater Boulevard and Scottsdale Road. The City has identified 2nd Street as the main east-west bike corridor through this area of Old Town and are currently working to connect it to the Camelback path located east of Miller Road. Additionally, according to Maricopa Association of Government (MAG) bike map, Marshall Way is also identified as a bike route. These bicycle facilities routes provide access to multi-use trails along the Arizona Canal to the west and along the Indian Bend Wash Greenbelt to the east.

3.3.4. Transit Facilities

The City of Scottsdale provides five trolley routes. The Downtown Route circulates around the Downtown Scottsdale area, including along Goldwater Boulevard, Marshall Way, Main Street, 1st Street, and 2nd Street. A trolley stop is located on Marshall Way at the intersection of Marshall Way and 1st Street. This trolley route operates every 10 minutes between 10 am and 9pm daily. See **Figure 4**.

A southbound trolley layout (pull out) is provided on Marshall Way just north of 2nd Street.

Figure 4 – City of Scottsdale Trolley Downtown Route



There are two existing bus routes in the area, Valley Metro's Route 41 and 72. Valley Metro's Route 41 runs east-west just north of the proposed Museum Square. This route runs along Indian School Road, with stops at Goldwater Boulevard and Scottsdale Road. Valley Metro's Route 72 runs north-south along Scottsdale Road, with stops at 2nd Street and Main Street.

3.4. Collision History

3.4.1. Crash Data

The most recent 3-year collision history, from April 2015 to April 2018, was obtained from the City of Scottsdale. See **Appendix B** for collision data. The data included the following intersections:

- Scottsdale Road and 1st Avenue (1)
- Goldwater Boulevard and Main Street (2)
- Marshall Way and Main Street (3)
- Scottsdale Road and Main Street (4)
- Goldwater Boulevard and 1st Street (8)
- Marshall Way and 1st Street (9)
- Scottsdale Road and 1st Street (11)
- Goldwater Boulevard and 2nd Street (12)
- Marshall Way and 2nd Street (16)
- Scottsdale Road and 2nd Street (17)
- Goldwater Boulevard and 70th Street (18)
- Goldwater Boulevard and Marshall Way (20)
- Goldwater Boulevard and Scottsdale Road (21)

Scottsdale Road and 1st Avenue (1)
During the three-year period, there were a total of 15 crashes, of which 1 was a non-incapacitating injury, 1 possible injury, 2 were unknown, with the remaining being property damage only. There were a total of 5 rear end, 3 angle, 2 single vehicle, 2 sideswipe same direction, 2 other, and 1 rear to rear crash.

Goldwater Boulevard and Main Street (2)
During the three-year period, there were a total of 8 crashes, of which 2 resulted in a non-incapacitating injuries, with the remaining being property damage only. There were a total of 2 angel, 2 rear to side, 1 single vehicle, 1 left turn, 1 rear end, and 1 sideswipe same direction crash.

Marshall Way and Main Street (3)
During the three-year period, there were a total of 3 crashes, of which 1 was a non-incapacitating injury, 1 was unknown, with the remaining crash being property damage only. There were a total of 2 rear-to-side, and 1 single vehicle crash.

Scottsdale Road and Main Street (4)
During the three-year period, there were a total of 17 crashes, of which 1 was an incapacitating injury, 2 non-incapacitating injuries, 4 were unknown, with the remaining being property damage only. There were a total of 8 rear ends, 3 angle, 3 side swipe same direction, 1 single vehicle, 1 left turn, and 1 other crash.

Goldwater Boulevard and 1st Street (8)
During the three-year period, there were a total of 3 crashes, of which 1 was an incapacitating injury, and the remaining 2 crashes resulted in property damage only. There were a total of 1 angle, 1 sideswipe same direction, and 1 sideswipe opposite direction crash.

Marshall Way and 1st Street (9)
During the three-year period, 1 crash occurred, which resulted in property damage only. This was a result of a rear-to-side crash.

Scottsdale Road and 1st Street (11)
During the three-year period, there were a total of 7 crashes, of which 1 resulted in a possible injury, with the remaining being property damage only. There were a total of 4 rear ends, 1 angle, 1 sideswipe same direction, and 1 rear to side crashes.

Goldwater Boulevard and 2nd Street (12)
During the three-year period, there were a total of 32 crashes, of which 1 was an incapacitating injury, 7 non-incapacitating injuries, 6 possible injuries, 1 unknown injury, with the remaining being property damage only. There were a total of 28 angle, 2 head on, 1 left turn, and 1 sideswipe same direction crashes.

*As discussed in **Section 3.1.2**, the City of Scottsdale intends on installing a traffic signal at this intersection, which should minimize the number of angle collisions. For this two-way stop controlled intersection, the angle crashes are mainly occurring when eastbound and westbound stop-controlled drivers attempt to turn onto Goldwater Boulevard. Located on a curve, it is also recommended that the sight distance be verified at this intersection. The proposed Museum Square development is not anticipated to negatively impact or result in an increase in potential collisions at this intersection.*

Marshall Way and 2nd Street (16)
During the three-year period, there were a total of 2 crashes, of which 1 was an incapacitating injury, and the other crash resulted in property damage only. There were a total of 2 angle crashes.

Scottsdale Road and 2nd Street (17)
During the three-year period, there were a total of 13 crashes, of which 1 was an incapacitating injury, 2 possible injuries, with the remaining being property damage only. There were a total of 6 angle, 5 rear end, 1 other, and 1 single vehicle crashes.

Five (5) of the six (6) angle crashes involved southbound vehicles disregarding the traffic signal, and colliding with east and westbound vehicles. Due to these angle crashes involving southbound vehicles, it is recommended for the City to investigate potential improvements that may reduce these types of crashes. Potential improvements may include evaluating the signal timing of the yellow and all-red phases, verifying the sight visibility of the existing signal heads, providing an

additional traffic signal head for the southbound approach, etc. The proposed Museum Square development is not anticipated to negatively impact or result in an increase in potential collisions at this intersection.

Goldwater Boulevard and 70th Street (18)
During the three-year period, there were a total of 2 crashes, of which both resulted in property damage only. There were a total of 1 angle and 1 sideswipe same direction crash.

Goldwater Boulevard and Marshall Way (20)
During the three-year period, there was 1 crash, which resulted in an incapacitating injury. The crash occurred due to an improper left turn.

Goldwater Boulevard and Scottsdale Road (21)
During the three-year period, there was a total of 27 crashes, which resulted in 1 non-incapacitating injury, 5 possible injuries, 1 unknown injury, with the remaining being property damage only. There were a total of 12 rear ends, 6 sideswipe same direction, 3 angle, 3 left turn, 2 single vehicle, and 1 head on crash.

3.4.2. Collision Rates

The City of Scottsdale's *2016 Traffic Volume and Collision Rate Data* report provides collision rate and traffic volume information on major roadway segments and at major intersections within the City. Segment collisions are collisions that occur on a major street more than 100 feet from the major intersections that define the segment, including at minor intersections within the segment. Intersection collisions are collisions that occur at or within 100 feet of a major intersection.

The collision rates and city-wide rankings for the study roadway segments are shown in **Table 1.** The City of Scottsdale's *2016 Traffic Volume and Collision Rate Data* did not report any data for the study intersections; therefore, only segment collision rates were reported.

Table 1 – Collision Rates - Study Roadway Segments

Segment	From	To	Collision Rate	Rank
Goldwater Boulevard	Scottsdale Road	Indian School Road	8.29	1
Scottsdale Road	Osborn Road	Indian School Road	7.11	4
2016 City of Scottsdale Average Segment Collision Rate			1.50	

4. Existing Conditions

4.1. Existing Land Use

The existing site is primarily comprised of at grade parking lots. The 3,632 sf Stagebrush Theatre located on the northeast corner of Goldwater Boulevard and 2nd Street, the 15,002 sf Scottsdale Artists' School located on the southwest corner of Marshall Way and 2nd Street, and the 57,806 sf Scottsdale Museum of the West located on the west side of Marshall Way at 1st Street is planned to remain. The proposed Canopy by Hilton, located on the northeast corner of Marshall Way and 1st Street, which was formerly occupied by the Arizona School of Real Estate is also included in this study.

4.2. Existing Traffic Counts

A local data collection firm, Field Data Services of Arizona, Inc., was utilized to collect traffic counts. On Tuesday, September 19, 2017, turning movement counts were obtained from 7:00 to 9:00 am and from 4:00 to 6:00 pm at the following locations:

- Goldwater Boulevard and Main Street (2)
- Marshall Way and Main Street (3)
- Scottsdale Road and Main Street (4)
- Marshall Way and 1st Street (9)
- Scottsdale Road and 1st Street (11)
- Goldwater Boulevard and 2nd Street (12)
- Marshall Way and 2nd Street (16)
- Scottsdale Road and 2nd Street (17)

Additionally, on Tuesday, September 19, 2017, bi-directional tube counts for 24-hours in 15-minute intervals were collected along the following three (3) roadway segments:

- Marshall Way north of 1st Street
- Marshall Way south of 1st Street
- 1st Street east of Marshall Way

On Tuesday, March 20, 2018, Field Data Services of Arizona, Inc. was utilized to collect additional turning movement counts from 7:00 to 9:00 am and from 4:00 to 6:00 pm at the following locations:

- Scottsdale Road and 1st Avenue (1)
- Goldwater Boulevard and Alley (5)
- Underground Parking Garage and Alley (6)
- Goldwater Boulevard and 1st Avenue (1)
- Goldwater Boulevard and Alley (5)
- Alley and Underground Parking Garage (6)
- Marshall Way and Alley (7)
- Goldwater Boulevard and 1st Street (8)
- 2nd Street and Driveway B (13)
- 2nd Street and Driveway C (14)
- 2nd Street and Driveway B (15)
- Goldwater Boulevard and 70th Street (18)
- Marshall Way and Driveway E (19)
- Goldwater Boulevard and Marshall Way (20)
- Goldwater Boulevard and Scottsdale Road (21)

Additionally, bi-direction tube counts for 24 –hours in 15-minute intervals were collected on March 20, 2018, along the following three (3) roadway segments:

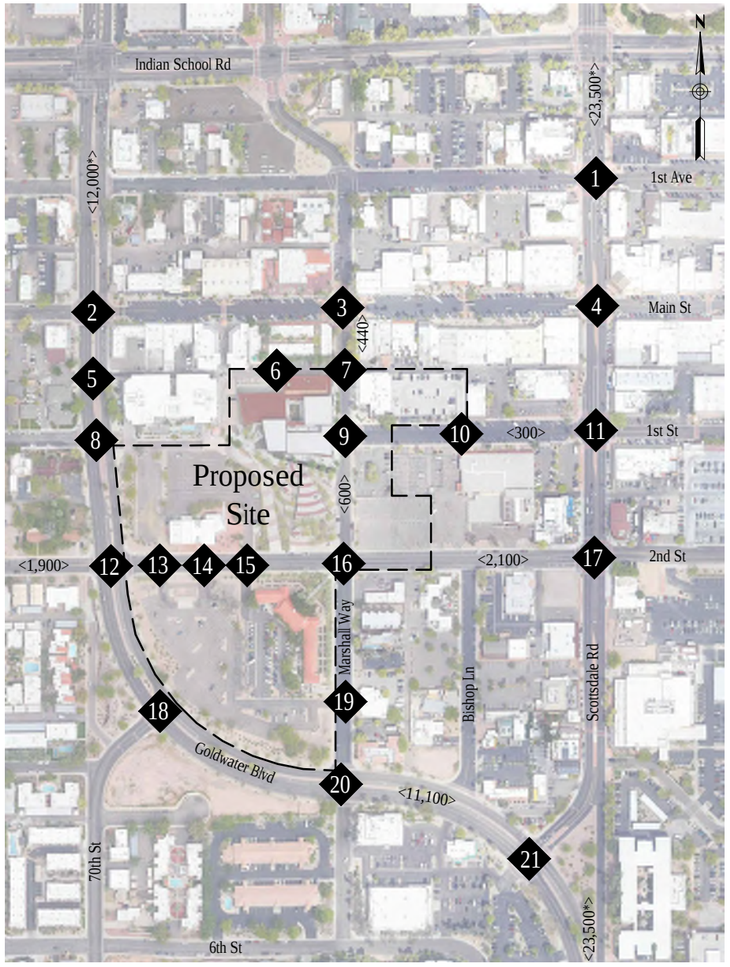
- 2nd Street west of Goldwater Boulevard
- 2nd Street east of Bishop Lane
- Goldwater Boulevard west of Bishop Lane

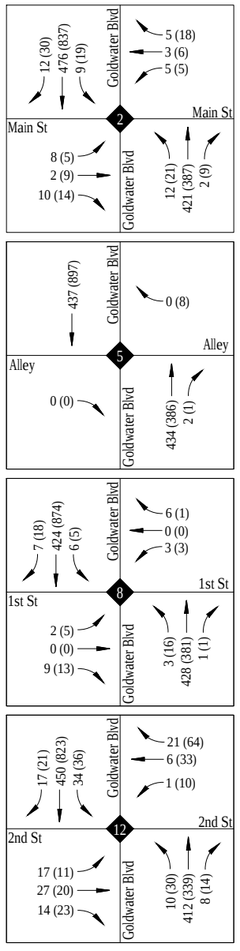
See **Appendix C** for detailed traffic count data.

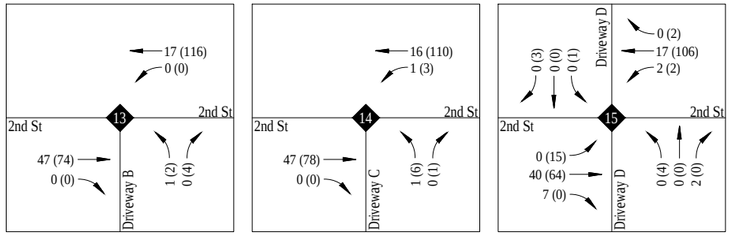
The turning movement counts were then analyzed for the highest 1-hour within each time period. The following peak hours were analyzed throughout this study.

- AM Peak Hour 7:45 am – 8:45 am
- PM Peak Hour 4:30 pm – 5:30 pm

The City of Scottsdale seasonal adjustment factors were used to adjust the traffic counts based on the month the counts were taken. See **Figure 5** for the existing adjusted AM and PM peak hour traffic volumes.

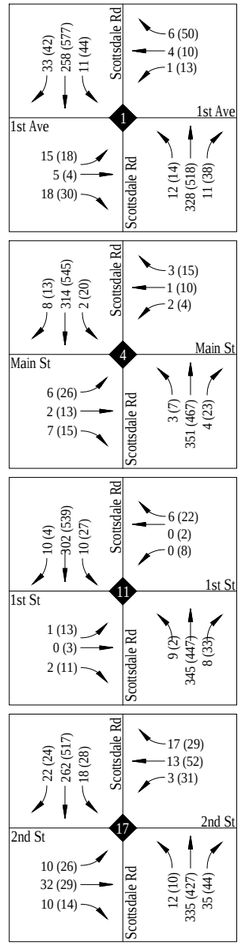


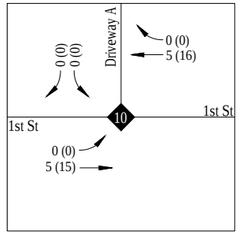


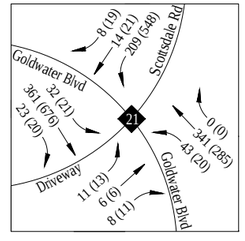


Legend

AM (PM)	Existing Peak Hour Traffic Volumes
X	Intersection
<ADT>	Average Daily Traffic Volumes
*	ADT obtained from City of Scottsdale 2016 Segment Traffic Volumes







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www.j2design.us

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DATE JUNE 2018 | CHECKED BY JB

Existing Traffic Volumes

Figure 5

4.3. Existing Capacity Analysis

The existing conditions capacity analysis was completed for the twenty-one (21) existing study intersections listed in **Section 3.1.2**. The capacity and level of service for the study area intersections were evaluated using the methodology presented in the *2010 Highway Capacity Manual*. Traffic analysis software, Synchro Version 9.2, was used to perform the analyses using the existing Peak Hour Factor (PHF) from the traffic counts, and the existing signal timing provided by the City of Scottsdale. See **Appendix D** for the existing signal timing.

Table 2 is from the *2010 Highway Capacity Manual* Exhibit 19-1, which lists the Level of Service (LOS) thresholds for two-way stop-controlled intersections. **Table 3** is from the *2010 Highway Capacity Manual* Exhibit 18-4, which lists the LOS thresholds for signalized intersections.

Table 2 – LOS Criteria for Unsignalized Intersections

LOS	Control Delay (s/veh)
A	0 - 10
B	> 10–15
C	> 15-25
D	> 25-35
E	> 35-50
F	> 50

Table 3 – LOS Criteria for Signalized Intersections

LOS	Control Delay per Vehicle (s/veh)
A	≤ 10
B	> 10-20
C	> 20-35
D	> 35-55
E	> 55-80
F	> 80

The existing AM and PM peak hour level of service and delay for the unsignalized intersections is shown in **Table 4**. Additionally, the existing AM and PM peak hour level of service and delay for signalized intersections is shown in **Table 5**.

It should be noted for the intersection of Goldwater Boulevard and Scottsdale Road (21), the 2010 HCM methodology does not estimate the delay for an approach that provides a dedicated left turn lane and a shared left-through-right turn lane. Therefore, the delay for the shared left-through-right turn lane was reported based on Synchro methodology.

See **Figure 6** for the existing AM and PM peak hour capacity analysis. The detailed capacity analysis sheets can be found in **Appendix E**.

Table 4 – Existing Level of Service and Delay for Unsignalized Intersections

Intersection	Existing Conditions			
	AM PEAK		PM PEAK	
Unsignalized Intersections	LOS	DELAY	LOS	DELAY
Scottsdale Road and 1st Avenue (1)				
Eastbound Shared Left-Through-Right	B	11.7	E	39.5
Westbound Shared Left-Through-Right	B	11.2	E	41.5
Northbound Left	A	8.1	B	10.2
Southbound Left	A	7.7	A	9.2
Main Street and Marshall Way (3)				
Eastbound Shared Left-Through-Right	A	6.9	A	7.3
Westbound Shared Left-Through-Right	A	7.1	A	7.3
Northbound Shared Left-Through-Right	A	6.9	A	7.1
Southbound Shared Left-Through-Right	A	7.0	A	7.3
Goldwater Boulevard and Alley (5)				
Eastbound Right	A	0.0	A	0.0
Westbound Right	A	0.0	A	9.8
Underground Parking Garage and Alley (6)				
Westbound Shared Left-Through	A	7.2	A	7.2
Northbound Shared Left-Right	A	8.5	A	8.5
Marshall Way and Alley (7)				
Eastbound Shared Left-Through-Right	A	8.6	A	9.4
Westbound Shared Left-Through-Right	A	0.0	A	9.9
Northbound Shared Left-Through-Right	A	7.3	A	7.4
Southbound Shared Left-Through-Right	A	7.3	A	7.4
Goldwater Boulevard and 1st Street (8)				
Eastbound Shared Left-Through-Right	A	9.9	B	12.5
Westbound Shared Left-Through	B	11.3	B	10.8
Westbound Right	A	9.9	A	9.7
Northbound Left	A	8.7	A	9.7
Southbound Left	A	8.4	A	8.3
Marshall Way and 1st Street (9)				
Westbound Shared Left-Right	A	8.7	A	9.0
Southbound Shared Left-Through	A	0.0	A	7.3
1st Street and Driveway A (10)				
Eastbound Shared Left-Through	A	0.0	A	0.0
Southbound Shared Left-Right	A	0.0	A	0.0
Goldwater Boulevard and 2nd Street (12)				
Eastbound Shared Left-Through-Right	C	16.0	C	16.6
Westbound Shared Left-Through-Right	B	11.8	C	15.0
Northbound Left	A	8.9	A	9.4
Southbound Left	A	8.5	A	8.2
2nd Street and Driveway B (13)				
Westbound Shared Left-Through	A	0.0	A	0.0
Northbound Shared Left-Right	A	8.9	A	9.2
2nd Street and Driveway C (14)				
Westbound Shared Left-Through	A	7.3	A	7.4
Northbound Shared Left-Right	A	9.0	A	9.7

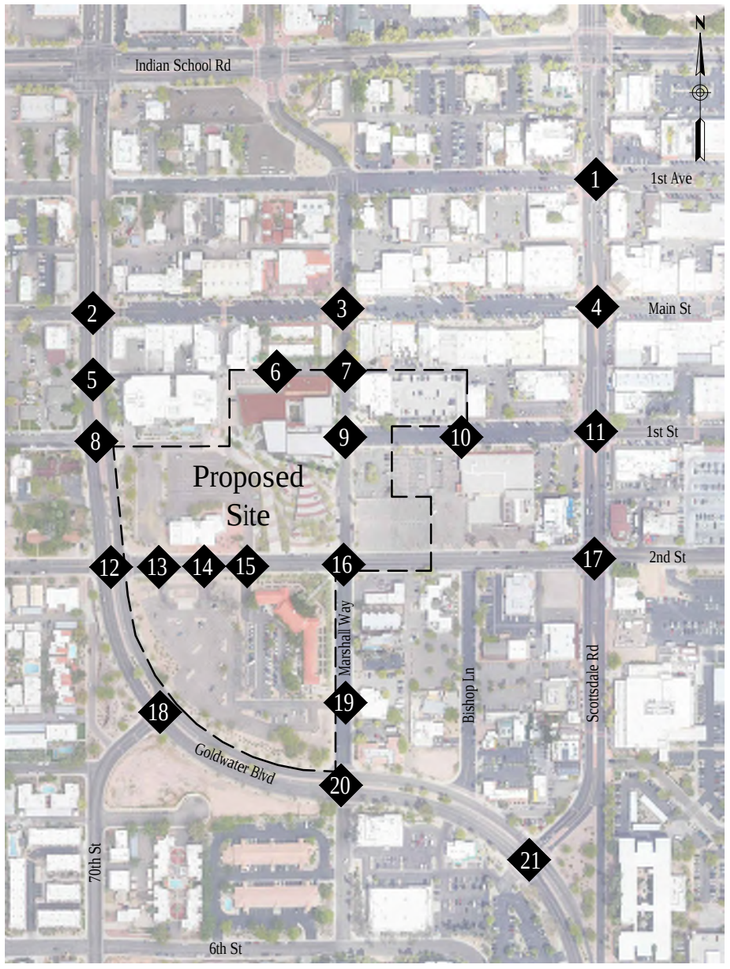
Table 4 – Existing Level of Service and Delay for Unsignalized Intersections - Continued

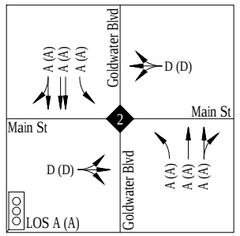
Intersection	Existing Conditions			
	AM PEAK		PM PEAK	
Unsignalized Intersections	LOS	DELAY	LOS	DELAY
2nd Street and Driveway D (15)				
Eastbound Shared Left-Through-Right	A	0.0	A	7.5
Westbound Shared Left-Through-Right	A	7.3	A	7.4
Northbound Shared Left-Through-Right	A	8.6	B	10.3
Southbound Shared Left-Through-Right	A	0.0	A	9.3
Marshall Way and 2nd Street (16)				
Eastbound Shared Left-Through-Right	A	7.5	A	7.4
Westbound Shared Left-Through-Right	A	7.2	A	7.7
Northbound Shared Left-Through-Right	A	7.1	A	7.4
Southbound Shared Left-Through-Right	A	7.1	A	7.4
Goldwater Boulevard and 70th Street (18)				
Northwestbound Left	B	10.3	B	13.9
Northeastbound Left	C	15.6	D	25.6
Northeastbound Right	B	10.8	B	13.0
Marshall Way and Driveway E (19)				
Eastbound Shared Left-Right	A	8.5	A	8.8
Northbound Shared Left-Through	A	7.3	A	7.3
Goldwater Boulevard and Marshall Way (20)				
Eastbound Left	A	8.2	A	8.0
Westbound Left	B	10.1	B	12.1
Northbound Shared Left-Through-Right	C	16.1	C	22.7
Southbound Left	B	14.5	C	15.7
Southbound Shared Through-Right	A	9.6	C	15.5

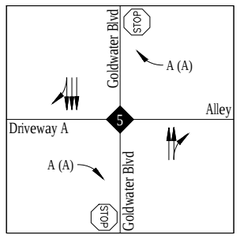
Table 5 – Existing Level of Service and Delay for Signalized Intersections

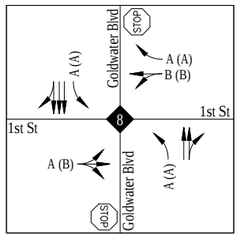
Intersection	Existing Conditions			
	AM PEAK		PM PEAK	
Signalized Intersections	LOS	DELAY	LOS	DELAY
Goldwater Boulevard and Main Street (2)				
Overall	A	3.5	A	4.2
Eastbound Shared Left-Through-Right	D	52.5	D	51.8
Westbound Shared Left-Through-Right	D	52.2	D	52.1
Northbound Left	A	1.8	A	2.7
Northbound Through	A	1.9	A	2.0
Northbound Shared Through-Right	A	1.8	A	2.0
Southbound Left	A	1.9	A	2.2
Southbound Through	A	1.7	A	2.2
Southbound Shared Through-Right	A	1.8	A	2.3
Scottsdale Road and Main Street (4)				
Overall	A	1.8	A	4.0
Eastbound Shared Left-Through-Right	C	26.6	C	21.5
Westbound Shared Left-Through-Right	C	26.4	C	21.1
Northbound Left	A	0.0	A	0.2
Northbound Through	A	0.2	A	0.4
Northbound Shared Through-Right	A	0.2	A	0.5
Southbound Left	A	1.6	A	3.6
Southbound Through	A	2.0	A	4.6
Southbound Shared Through-Right	A	2.0	A	4.6
Scottsdale Road and 1st Street (11)				
Overall	A	0.5	A	1.7
Eastbound Shared Left-Through-Right	C	29.5	C	26.7
Westbound Shared Left-Through-Right	C	32.4	C	26.8
Northbound Left	A	0.0	A	0.0
Northbound Through	A	0.2	A	0.3
Northbound Shared Through-Right	A	0.2	A	0.4
Southbound Left	A	0.0	A	0.1
Southbound Through	A	0.1	A	0.2
Southbound Right	A	0.0	A	0.0
Scottsdale Road and 2nd Street (17)				
Overall	A	4.1	A	5.1
Eastbound Left	C	26.0	C	24.9
Eastbound Through	C	26.6	C	25.0
Eastbound Right	C	26.2	C	24.8
Westbound Shared Left-Through-Right	C	26.5	C	26.8
Northbound Left	A	1.8	A	2.2
Northbound Through	A	2.2	A	2.8
Northbound Shared Through-Right	A	2.2	A	2.8
Southbound Left	A	0.1	A	0.2
Southbound Through	A	0.2	A	0.4
Southbound Shared Through-Right	A	0.2	A	0.4
Goldwater Boulevard and Scottsdale Road (21)				
Overall	B	16.5	C	25.2
Eastbound Left	E	55.7	D	52.0
Eastbound Shared Through-Right	E	56.0	D	52.4
Westbound Left	D	51.3	D	44.6
Westbound Shared Left-Through-Right*	D	54.4	D	48.9
Northbound Left	A	6.0	B	16.5
Northbound Through	A	5.4	B	12.5
Southbound Left	A	6.1	B	14.0
Southbound Through	A	5.2	B	13.6
Southbound Shared Through-Right	A	5.3	B	13.9

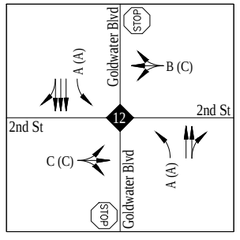
*Results from Synchro LOS and Delay Methodology

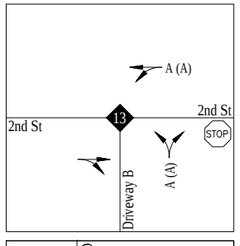


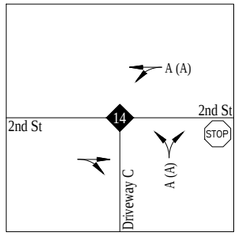


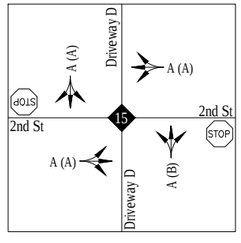


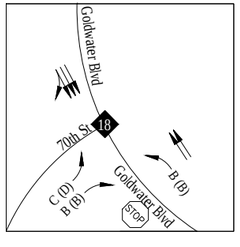






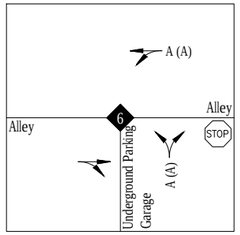


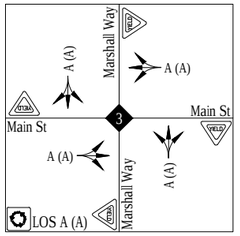


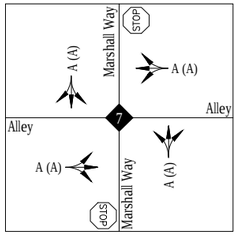


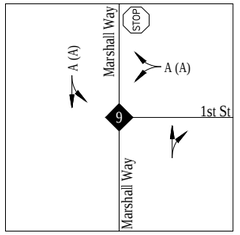
Legend

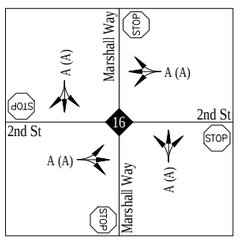
AM (PM)	Existing Peak Hour Capacity Analysis (HCM Methodology)
AM* (PM)*	Existing Peak Hour Capacity Analysis (Synchro Methodology)
X	Intersection
	Lane Configuration

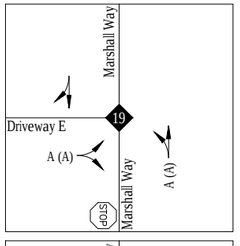


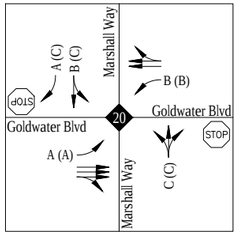


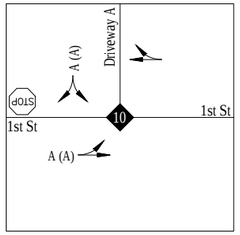


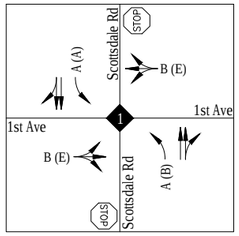


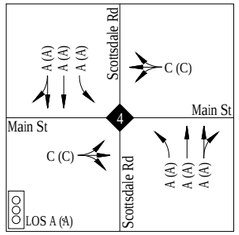


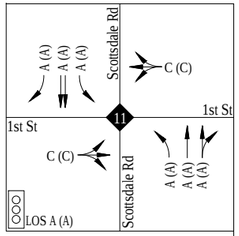


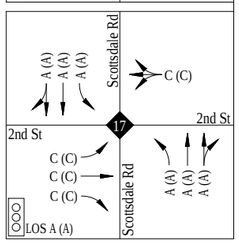


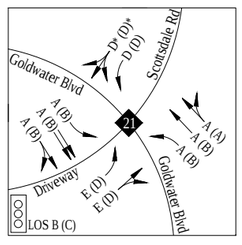












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Existing Capacity Analysis

Figure 6

5. Projected Traffic

5.1. Trip Generation

5.1.1. Trip Generation (Loloma Mixed-Use Development)

On February 11, 2002, a Traffic Impact Analysis was completed for the proposed Loloma Mixed-Use development. This development is bound on the west and south by Goldwater Bouelvard, on the north by Main Street, and on the east by Marshall Way. This previously approved development consisted of the following land uses:

- 142 units — Low Rise Apartments
- 53 units — Lofts
- 53 units — Condo/Townhouse
- 5 units — Artist Studios (Residences)
- 2,695 square feet — Artist Studios (Work Space)
- 12,815 square feet — Specialty Retail Space
- 2,981 square feet — Plaza Restaurant
- 20,000 square feet — Cultural Facility (Museum)
- 25,000 square feet — Cultural Facility (Museum Expansion)

As reported in Table 4 of the Loloma Mixed-Use Development Project Trip Generation, and also shown in **Table 6** below, the project was anticipated to generation 4,348 daily trips, of which 228 occurred in the AM peak hour, and 447 in the PM peak hour. See **Appendix F** for a copy of the Loloma Mixed-Use Development Traffic Impact Analysis.

Table 6 – Trip Generation – Loloma Mixed–Use Development

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1,115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
			Total	4,348	228	69	159	447	186	261

5.1.2. Trip Generation (Existing Zoning)

The trip generation under the existing zoning and the proposed Museum Square development were calculated. With approximately 7.4 acres and a 1.3 base gross floor area, approximately 418,200 sf can be developed on this site along with 369 residential dwelling units. The 418,000 sf was split between retail and office. Therefore, 209,100 sf of retail and 209,100 sf of office space, along with 369 residential units were used to calculate the trip generation for the existing zoning. See **Table 7** below. See **Appendix G** for detailed trip generation calculations.

Table 7 – Trip Generation – Existing Zoning

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
			Total	14,109	605	386	219	1,324	584	740

5.1.3. Trip Generation (Proposed Development)

The proposed Museum Square development will include the following land uses:

- 61 units (11 stories) Residential Building #1
- 79 units (13 stories) Residential Building #2
- 77 units (12 stories) Residential Building #3
- 80 units (4 to 6 stories) Residential Building #4
- 190 rooms Hotel
- 22, 500 square feet Museum (Expansion)

The above does not include the proposed Canopy by Hilton or the existing developments to remain (Stagebrush Theatre, Scottsdale Artists' School, and Scottsdale Museum of the West). As mentioned previously a separate TI&MA was prepared for the Canopy by Hilton, which included trip generation calculations and comparisons. The trip generation from the May 29, 2018 TI&MA for the proposed Canopy by Hilton are included in the year 2025 analyses.

Table 8 shows the trip generation calculation for the proposed Museum Square development (excluding the Canopy by Hilton and the existing developments to remain). Detailed trip generation calculations can be found in **Appendix G.**

Table 8 – Trip Generation – Museum Square

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total				3,221	194	81	113	244	134	110

5.2. Trip Generation Comparison

A comparison between the trips generated by the previously approved Loloma Mixed-Use Development and the proposed Museum Square development is shown in **Table 9** below.

Table 9 – Trip Generation Comparison (Loloma Mixed-Use Development vs. Museum Square)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
Total - Loloma Mixed-Use Development				4,348	228	69	159	447	186	261
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-1,127	-34	12	-46	-203	-52	-151
% Difference				-26%	15%	17%	29%	-45%	-28%	-58%

Table 9 shows that the proposed mixed-use Museum Square development will produce 1,127 (26%) fewer weekday daily trips will occur, 34 (15%) fewer trips during the AM peak hour, and 203 (45%) fewer trips during the PM peak hour.

A comparison between the trips generated by the existing zoning and the proposed Museum Square development is shown in **Table 10**.

Table 10 – Trip Generation Comparison (Existing Zoning vs. Museum Square)

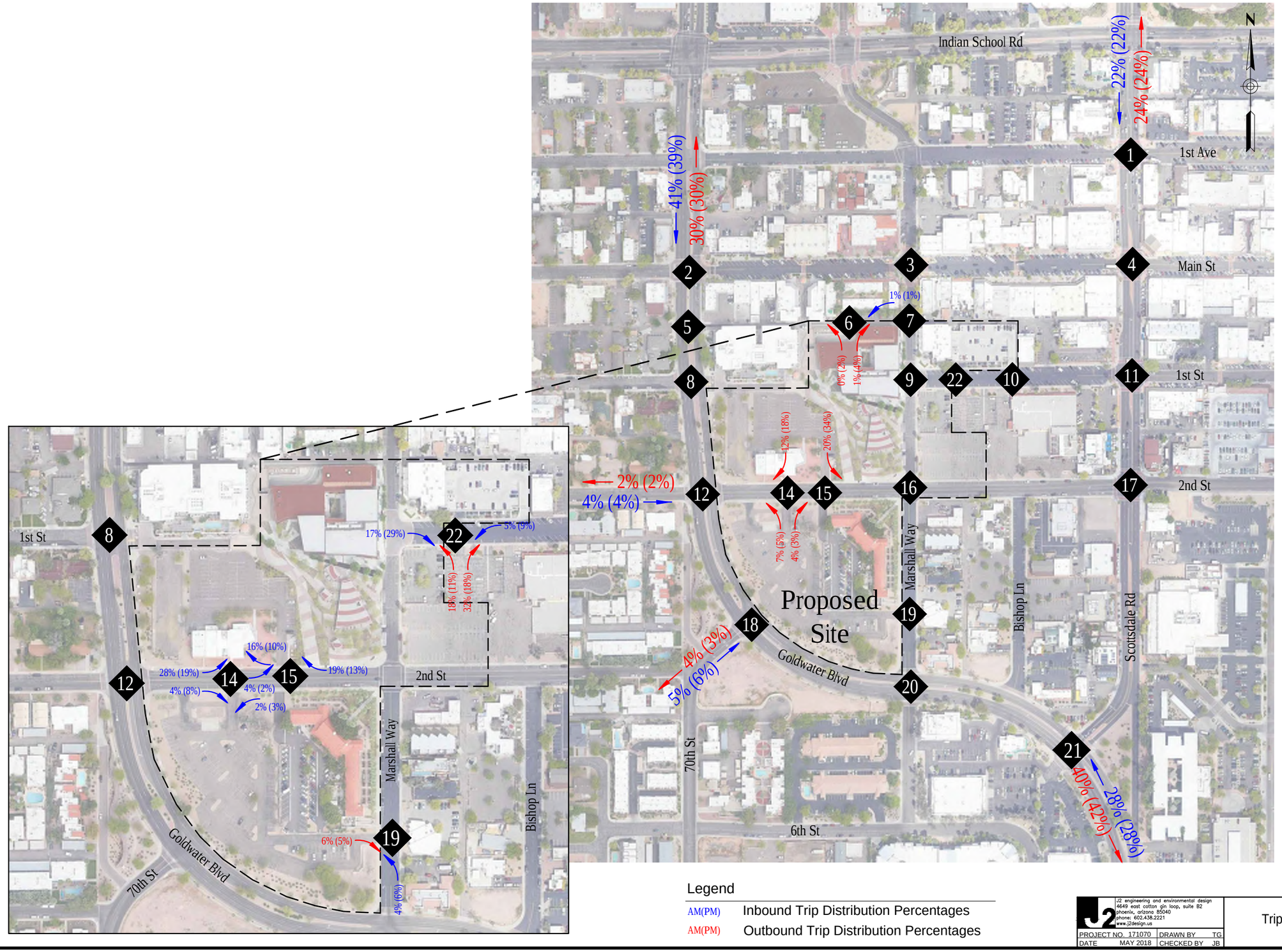
Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
Total - Existing Zoning				14,109	605	386	219	1,324	584	740
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-10,888	-411	-305	-106	-1,080	-450	-630
% Reduction				77%	68%	79%	48%	82%	77%	85%

The above comparison shows that the proposed mixed-use Museum Square development will produce 10,888 (77%) fewer weekday daily trips will occur, 411 (68%) fewer trips during the AM peak hour, and 1,080 (82%) fewer trips during the PM peak hour.

5.3. Trip Distribution and Assignment

The trip distribution procedure determines the general pattern of travel for vehicles entering and leaving the proposed development. The trip distribution for the proposed Museum Square development is based on the distribution of the existing traffic. This project is being developed in an urban area, so it can be assumed that the travel patterns are well established and the existing trip distribution applies to future development. The trip distribution is shown in **Figure 7**.

The trip assignment was generally based on proximity of the driveways, permitted turn movements, as well as ease and probability of use. The site generated traffic volumes are shown in **Figure 8**.



Legend

AM(PM) Inbound Trip Distribution Percentages

AM(PM) Outbound Trip Distribution Percentages

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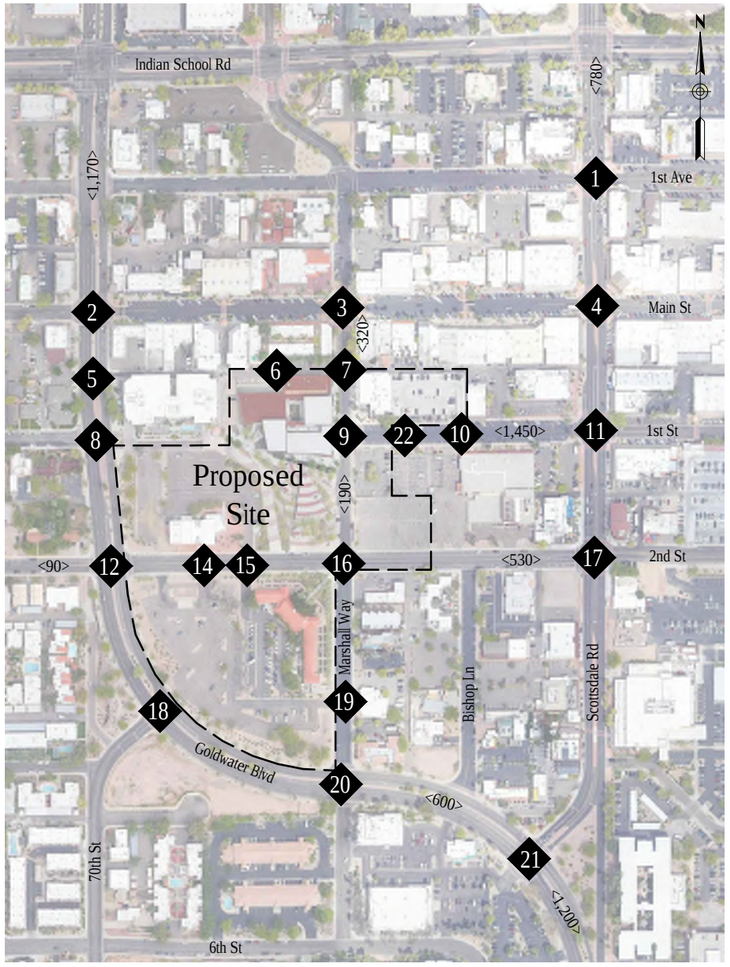
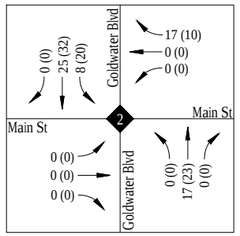
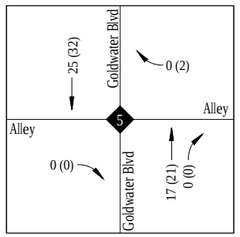
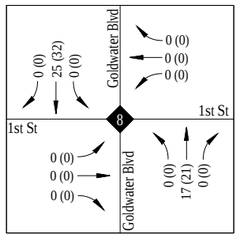
Trip Distribution

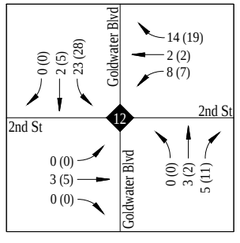
Figure 7

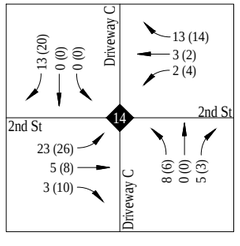


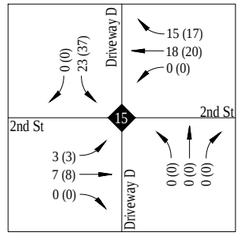


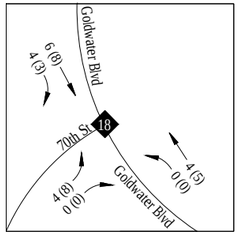






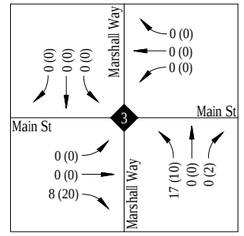


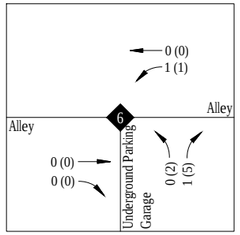


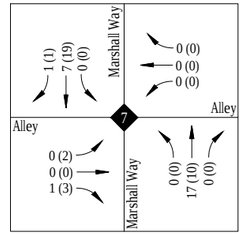


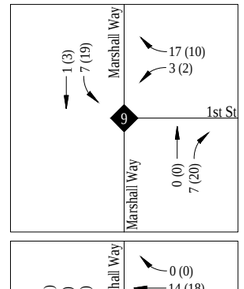
Legend

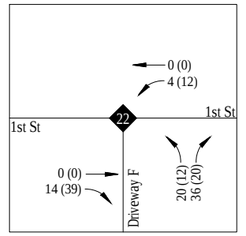
AM (PM)	2025 Site Traffic Volumes
X	Intersection
<ADT>	Average Daily Traffic Volumes

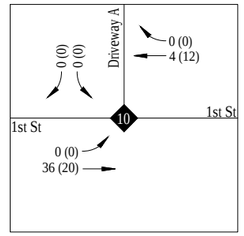


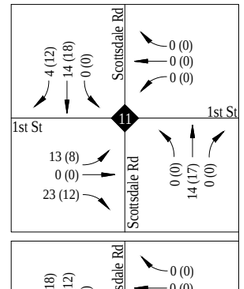


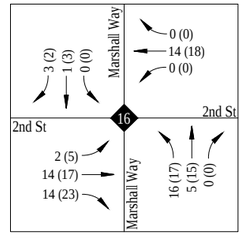


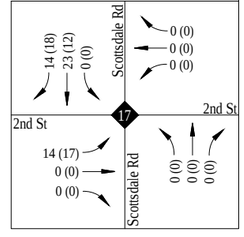


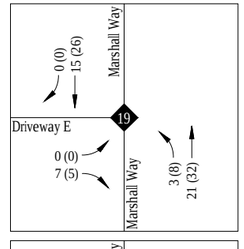


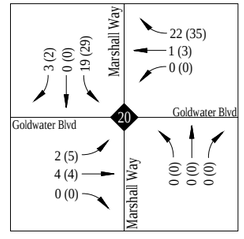


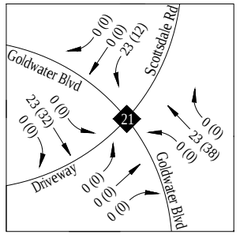












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6. Year 2025 Future Conditions

The proposed Museum Square development is anticipated to be constructed and ready to open in the year 2025. This study analyzes the effects the proposed development will have on the surrounding roadway network during the opening year of 2025.

As stated in **Section 3.1.2** the City of Scottsdale has considered the installation of a traffic signal at this intersection to support bicycle and pedestrian connections, and address requests from area merchants and residents. Additionally, the City of Scottsdale has also considered the installation of a pedestrian hybrid beacon along Goldwater Boulevard approximately 300 feet west of Marshall Way to assist with pedestrian and bicycle crossings.

If the traffic signal and pedestrian hybrid beacon has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Therefore, the 2025 no build and build capacity analyses were completed with a traffic signal at the intersection of Goldwater Boulevard and 2nd Street (12).

6.1. Year 2025 Background Growth

A Maricopa Association of Governments (MAG) traffic projection model was obtained from the City of Scottsdale that included detailed traffic projections within the area of the proposed development. The MAG traffic projection model estimates the Average Daily Traffic (ADT) along Goldwater Boulevard, between Indian School Road and Scottsdale Road, in the year 2035 to be 13,500 vehicles per day. Additionally, the MAG traffic projection model estimates the ADT for the year 2016 along the same segment to be 12,000 vehicles per day. This results in an approximate annual growth rate of 0.62%. As a conservative approach, an annual growth rate of 1.0% was applied along Goldwater Boulevard through year 2025.

Additionally, the traffic volumes of known future developments were added and distributed throughout the studied roadway network. These developments include, Canopy by Hilton, and The Goldwater.

Canopy by Hilton
Based on the May 29, 2018 TI&MA for Canopy by Hilton, this proposed development will be located on the northeast corner of Marshall Way and 1st Street. It will be comprised of a 176 room hotel with a fitness center, pool and spa, café, bar, and 4,130 sf of conference/meeting space. As provided in the May 29, 2018 TI&MA, the trip generation for the proposed Canopy by Hilton is shown in **Table 11** below. See **Appendix H** for the Canopy by Hilton TI&MA.

Table 11 – Trip Generation – Canopy by Hilton

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Hotel (Proposed)	310	176	Rooms	1,472	83	49	34	106	54	52

The Goldwater

Based on the December 15, 2017 TI&MA for The Goldwater, this proposed development will be located on the southeast corner of Goldwater Boulevard and 70th Street. It will be comprised of 40 residential units, a 2,500 sf restaurant, and a 5,500 sf office space. Additionally, there will be three (3) owner owned guest casitas. As provided in the December 15, 2017 TI&MA, the trip generation for The Goldwater is shown in **Table 12** below. See **Appendix I** for The Goldwater TI&MA.

Table 12 – Trip Generation – The Goldwater

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	43	Dwelling Units	234	16	4	12	19	12	7
General Office Building	710	5.5	1000 SF GFA	54	6	5	1	6	1	5
High-Turnover (Sit-Down) Restaurant	932	2.5	1000 SF GLA	280	25	14	11	24	15	9
			Total	568	47	23	24	50	28	22

6.2. Year 2025 Traffic Volumes

6.2.1. Year 2025 No Build Traffic Volumes

The 1% annual growth rate was applied to the traffic volumes along Goldwater Boulevard through the year 2025. Additionally, the traffic volumes associated with the Canopy by Hilton and The Goldwater developments were distributed along the surrounding roadway network. This represents the traffic volumes without the build out of the proposed development. The 2025 background traffic volumes are shown in **Figure 9**.

6.2.2. Year 2025 Build Traffic Volumes

When the site traffic (**Figure 8**) is added to the 2025 background traffic volumes (**Figure 9**), the result is the 2025 build traffic volumes. This represents the traffic volumes with the build out of the proposed development. The year 2025 build traffic volumes are shown in **Figure 10**.

6.2.3. Year 2025 Build Pedestrian Volumes

The proposed Museum Square development intends on attracting and promoting walkability within the surrounding area. Therefore, an increase in pedestrian volumes were accounted for at the intersections of Goldwater Boulevard and 2nd Street (12) and Scottsdale Road and 2nd Street (17).

Using the City of Scottsdale's *Design Standards & Policies Manual,* Figure 5-1.2 Level of Service Default Data, the "moderate" level of pedestrian volumes were incorporated into the year 2025 build capacity analyses. See **Appendix J**. Therefore, a volume of 200 pedestrians per hour were used for the crossings of each leg of the intersections of Goldwater Boulevard and 2nd Street (12) and Scottsdale Road and 2nd Street (17).

6.3. Year 2025 Capacity Analysis

6.3.1. Year 2025 No Build Capacity Analysis

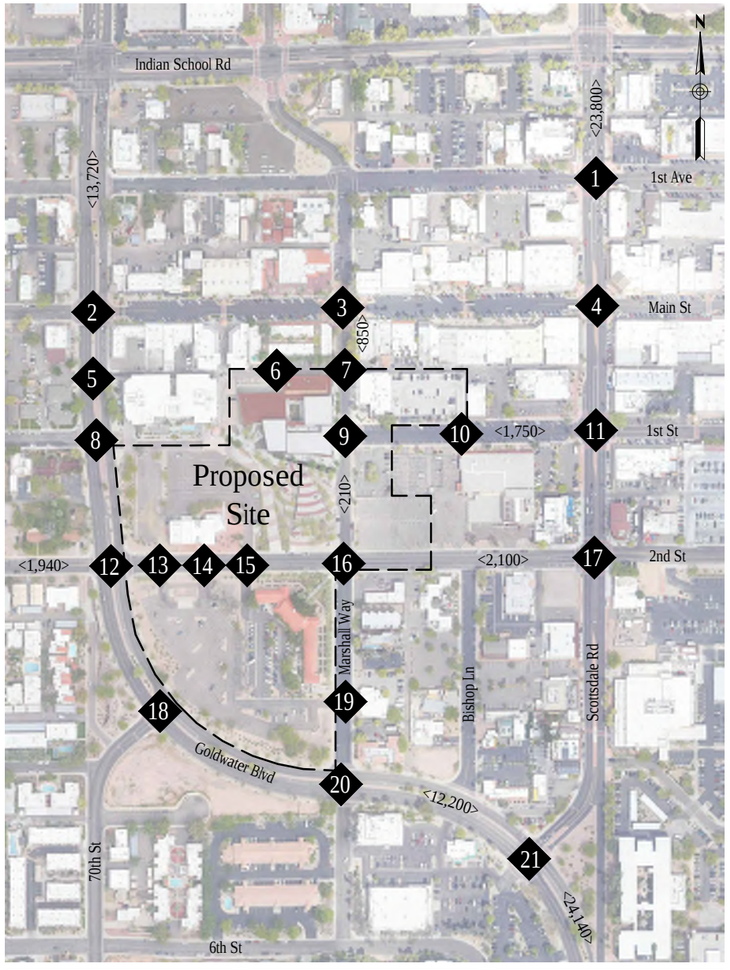
The capacity and level of service for the study area intersections were evaluated for the year 2025 no build traffic volumes. See **Figure 11**. The detailed capacity analysis sheets can be found in **Appendix K**. The signal timing splits were optimized and adjusted for the future traffic volumes, and a PHF of 0.92 was used.

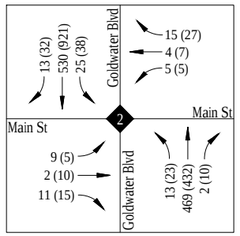
The results of the 2025 no build capacity analysis level of service and delay for each movement of the unsignalized and signalized intersections are shown in **Table 13** and **Table 14**, respectively.

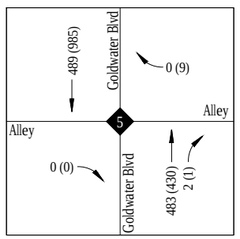
6.3.2. Year 2025 Build Capacity Analysis

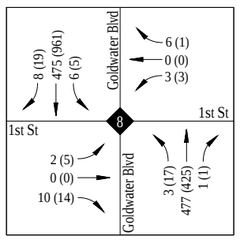
The capacity and level of service for the study area intersections were evaluated for the year 2025 build traffic volumes. See **Figure 12**. The detailed capacity analysis sheets can be found in **Appendix L**. The signal timing splits were optimized and adjusted for the future traffic volumes, and a PHF of 0.92 was used.

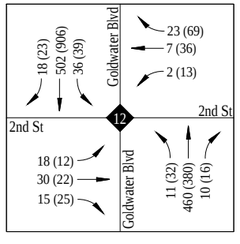
The results of the 2025 build capacity analysis level of service and delay for each movement of the unsignalized and signalized intersections are shown in **Table 13** and **Table 14**, respectively.

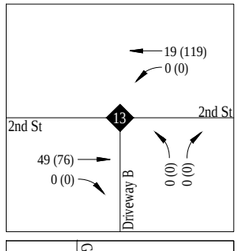


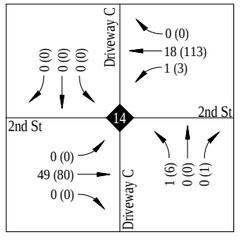


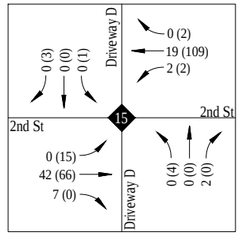


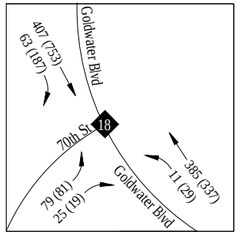






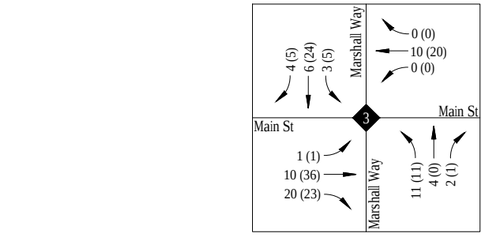


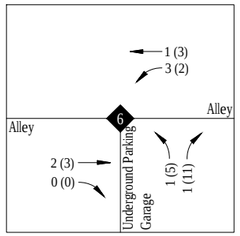


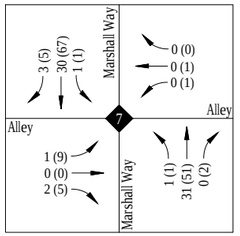


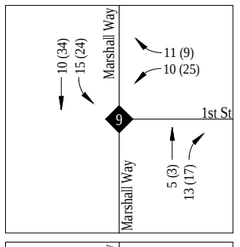
Legend

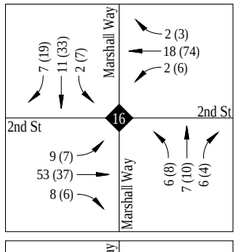
AM (PM)	2025 No Build Peak Hour Traffic Volumes
X	Intersection
<ADT>	Average Daily Traffic Volumes

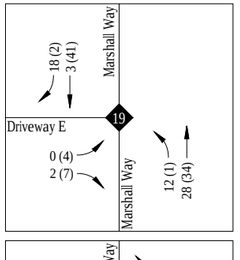


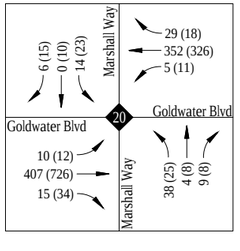


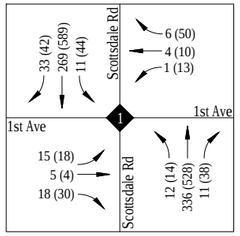


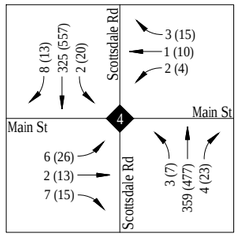


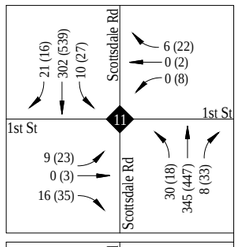


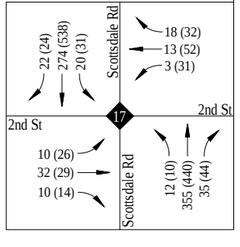


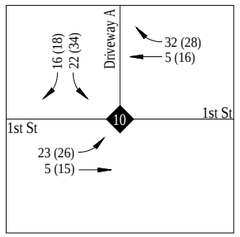


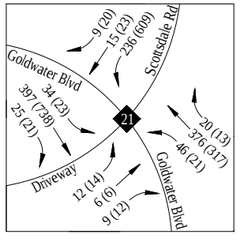












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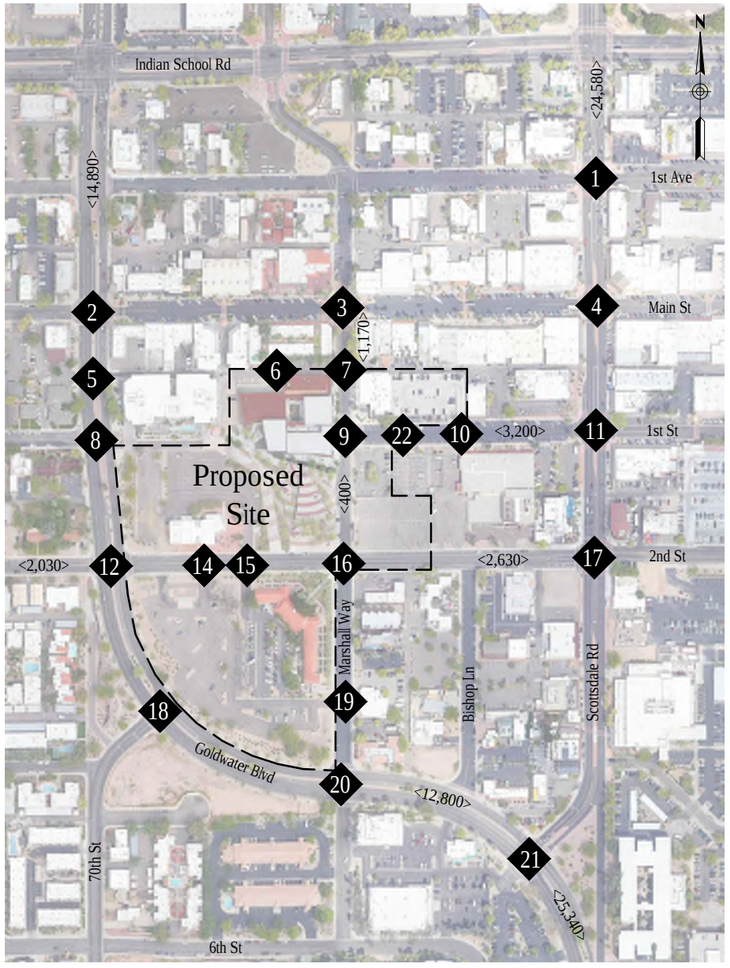
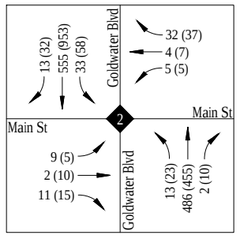
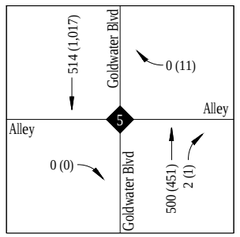
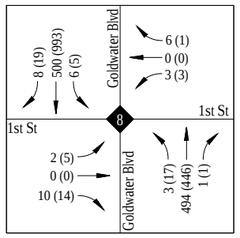
2025 No Build Traffic Volumes

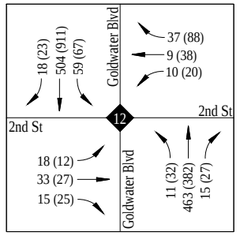
Figure 9

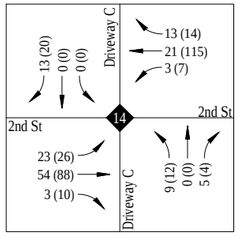


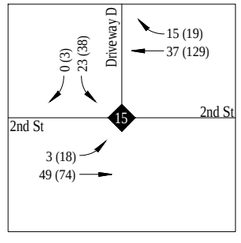


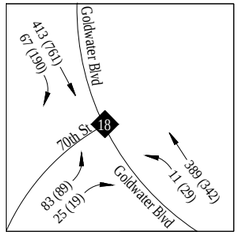






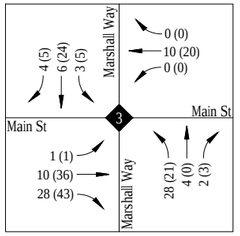


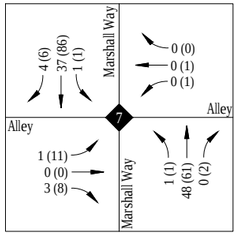


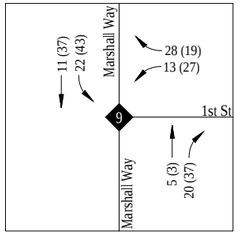


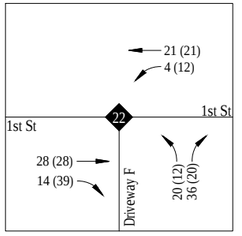
Legend

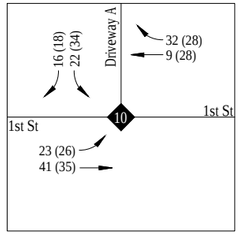
AM (PM)	2025 Build Peak Hour Traffic Volumes
X	Intersection
<ADT>	Average Daily Traffic Volumes

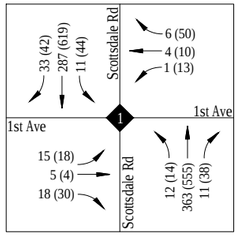


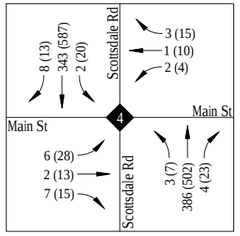


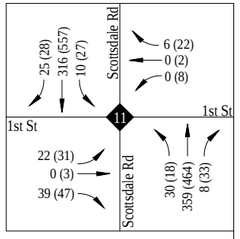


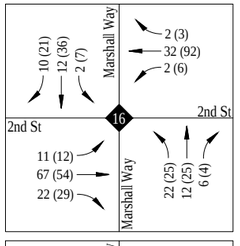


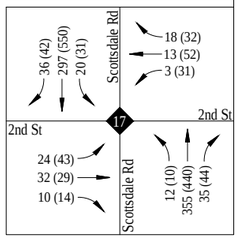


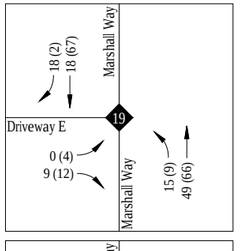


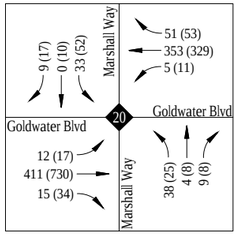


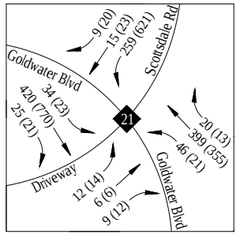












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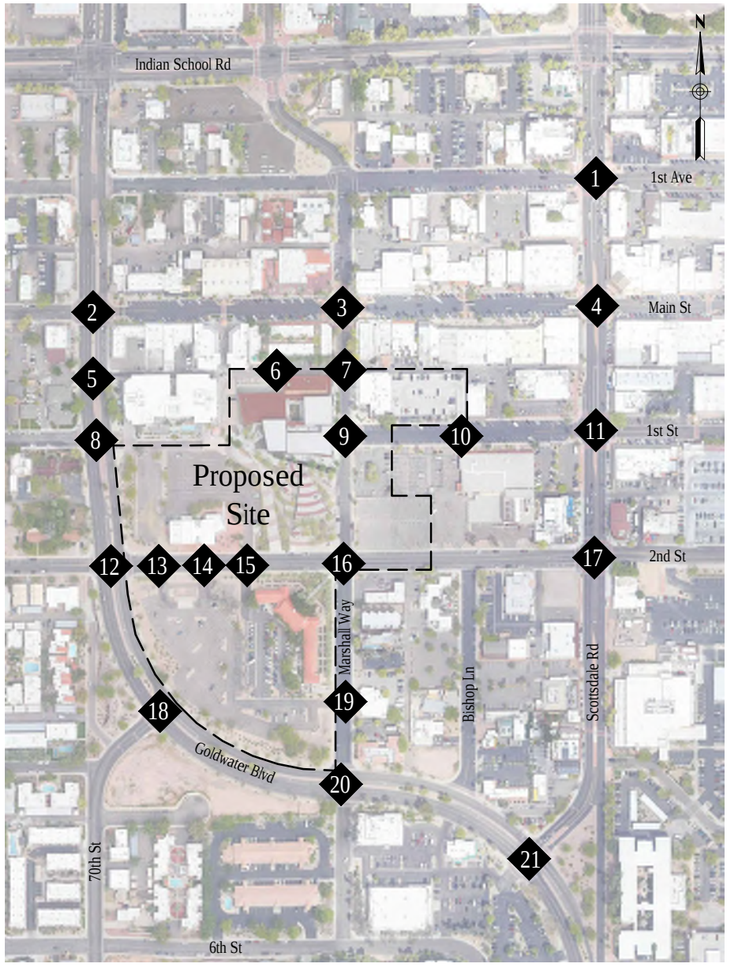
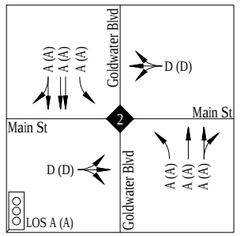
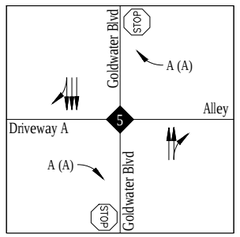
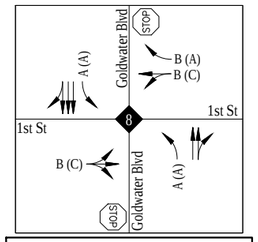
2025 Build Traffic Volumes

Figure 10

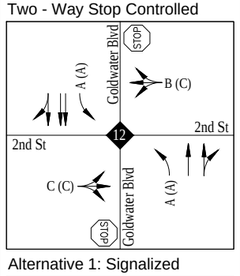




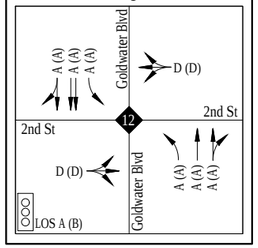


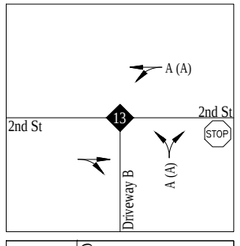


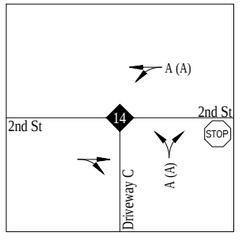
Two - Way Stop Controlled

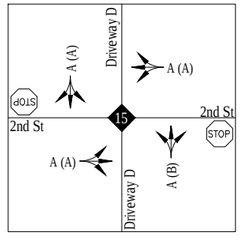


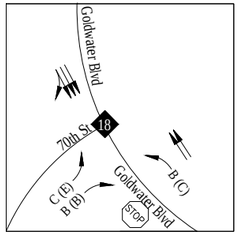
Alternative 1: Signalized











Legend

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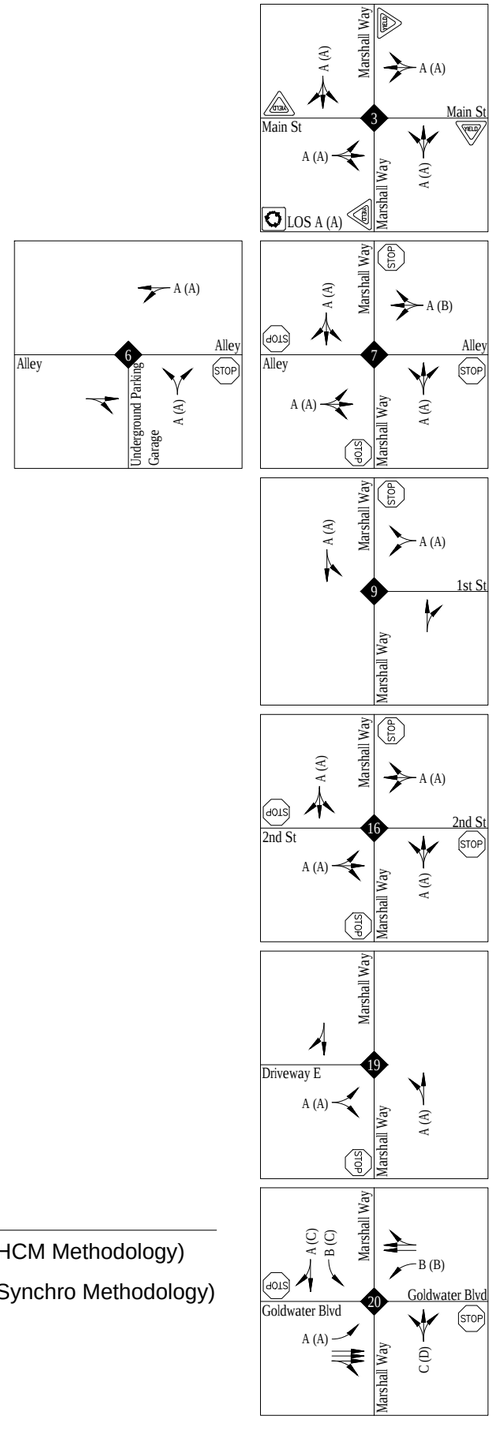
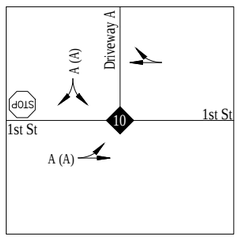
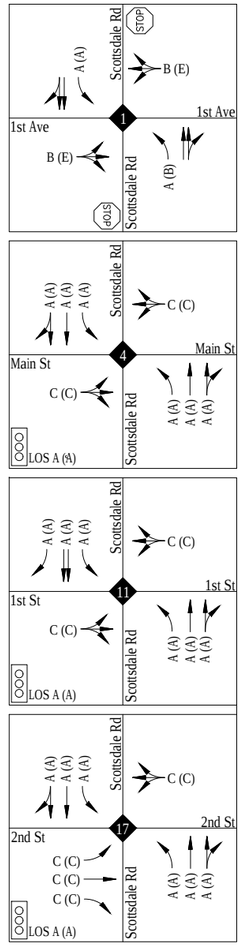
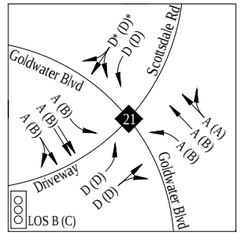
AM* (PM)*	2025 No Build Peak Hour Capacity Analysis (Synchro Methodology)
X	Intersection
	Lane Configuration









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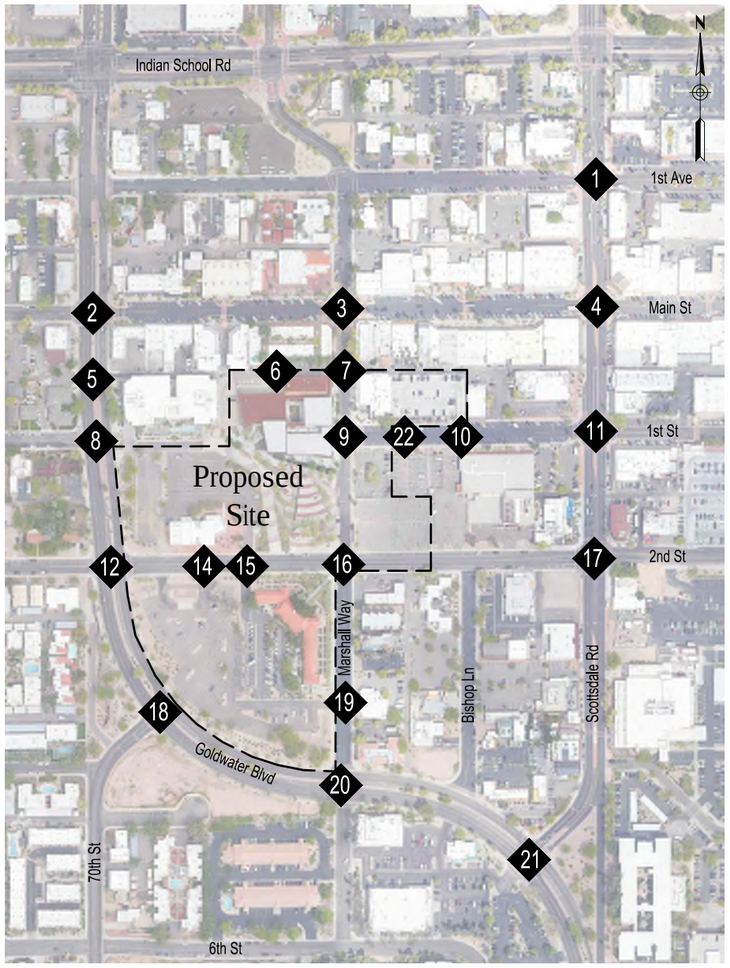
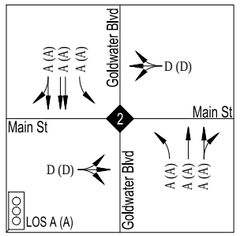
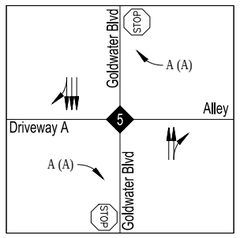
DATE	AUG 2018	CHECKED BY	JB

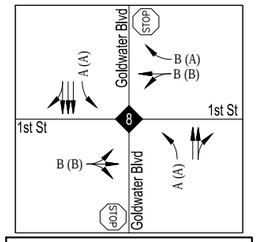
2025 No Build Capacity Analysis

Figure 11

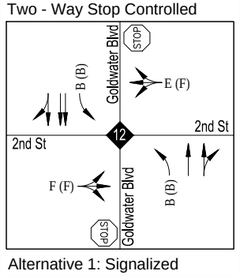




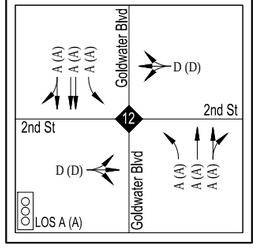


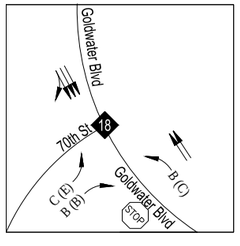


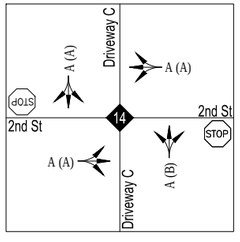
Two - Way Stop Controlled

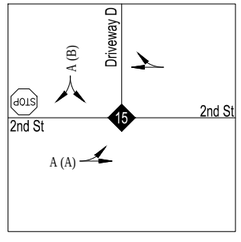


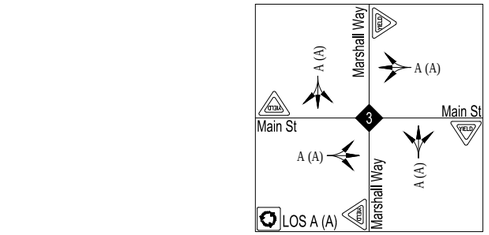
Alternative 1: Signalized

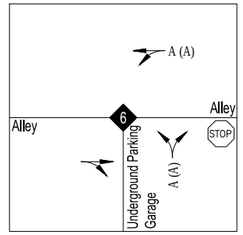


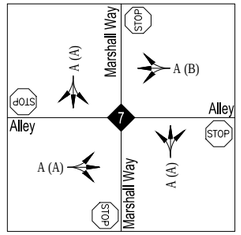


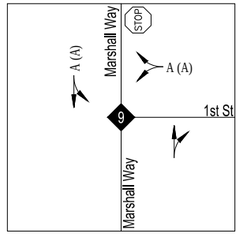


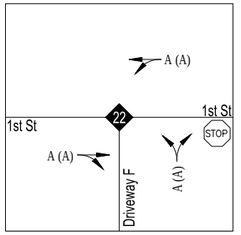


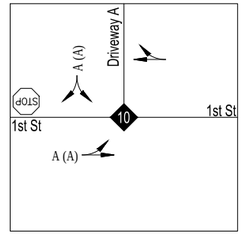


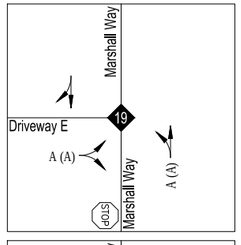


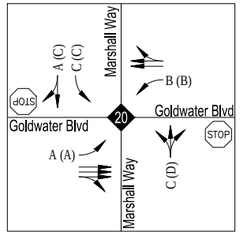


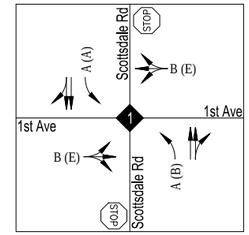


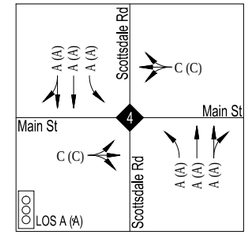


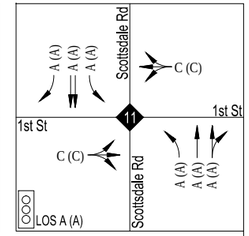


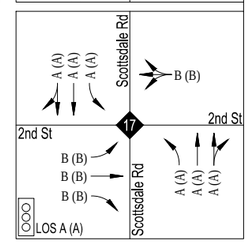


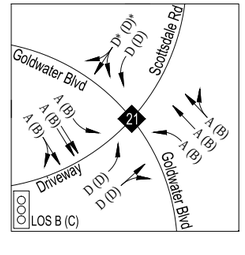












Legend

AM (PM)	2025 Build Peak Hour Capacity Analysis (HCM Methodology)
AM* (PM)*	2025 Build Peak Hour Capacity Analysis (Synchro Methodology)
	Intersection
	Lane Configuration

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2025 Build Capacity Analysis

Figure 12

Table 13 – 2025 Level of Service and Delay for Unsignalized Intersections

Intersection	2025 No Build				2025 Build			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
Unsignalized Intersections	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
Scottsdale Road and 1st Avenue (1)								
Eastbound Shared Left-Through-Right	B	12.1	E	40.0	B	12.5	E	39.0
Westbound Shared Left-Through-Right	B	11.5	E	42.0	B	11.8	E	40.6
Northbound Left	A	8.1	B	10.2	A	8.2	B	10.4
Southbound Left	A	7.7	A	9.2	A	7.8	A	9.0
Main Street and Marshall Way (3)								
Eastbound Shared Left-Through-Right	A	6.8	A	7.1	A	6.8	A	7.2
Westbound Shared Left-Through-Right	A	7.1	A	7.2	A	7.1	A	7.3
Northbound Shared Left-Through-Right	A	7.2	A	7.4	A	7.4	A	7.4
Southbound Shared Left-Through-Right	A	7.0	A	7.2	A	7.0	A	7.3
Goldwater Boulevard and Alley (5)								
Eastbound Right	A	0.0	A	0.0	A	0.0	A	0.0
Westbound Right	A	0.0	A	9.8	A	0.0	A	9.9
Underground Parking Garage and Alley (6)								
Westbound Shared Left-Through	A	7.2	A	7.2	A	7.2	A	7.2
Northbound Shared Left-Right	A	8.5	A	8.5	A	8.4	A	8.5
Marshall Way and Alley (7)								
Eastbound Shared Left-Through-Right	A	8.7	A	9.4	A	8.7	A	9.5
Westbound Shared Left-Through-Right	A	0.0	B	10.0	A	0.0	B	10.2
Northbound Shared Left-Through-Right	A	7.3	A	7.4	A	7.3	A	7.5
Southbound Shared Left-Through-Right	A	7.3	A	7.4	A	7.3	A	7.4
Goldwater Boulevard and 1st Street (8)								
Eastbound Shared Left-Through-Right	B	10.0	B	15.5	B	10.0	B	12.6
Westbound Shared Left-Through	B	11.9	B	16.7	B	11.3	B	10.9
Westbound Right	B	10.0	A	9.8	B	10.1	A	9.8
Northbound Left	A	8.8	A	9.2	A	8.6	A	9.5
Southbound Left	A	8.5	A	8.3	A	8.6	A	8.4
Marshall Way and 1st Street (9)								
Westbound Shared Left-Right	A	8.7	A	9.1	A	8.7	A	9.3
Southbound Shared Left-Through	A	7.3	A	7.3	A	7.3	A	7.4
1st Street and Driveway A (10)								
Eastbound Shared Left-Through	A	7.3	A	7.4	A	7.3	A	7.4
Southbound Shared Left-Right	A	8.9	A	9.1	A	9.1	A	9.3
Goldwater Boulevard and 2nd Street (12)								
Eastbound Shared Left-Through-Right	C	16.1	C	17.8	F	67.9	F	169.6
Westbound Shared Left-Through-Right	B	12.1	C	16.1	E	35.6	F	175.9
Northbound Left	A	8.6	A	9.3	B	10.6	B	12.0
Southbound Left	A	8.6	A	8.3	B	10.4	B	10.1
2nd Street and Driveway B (13)								
Westbound Shared Left-Through	A	0.0	A	0.0	A	0.0	A	0.0
Northbound Shared Left-Right	A	8.9	A	9.2	A	0.0	A	0.0
2nd Street and Driveway C (14)								
Eastbound Shared Left-Through-Right	-	-	-	-	A	7.3	A	7.6
Westbound Shared Left-Through	A	7.3	A	7.4	-	-	-	-
Westbound Shared Left-Through-Right	-	-	-	-	A	7.3	A	7.4
Northbound Shared Left-Right	A	7.9	A	8.7	-	-	-	-
Northbound Shared Left-Through	-	-	-	-	A	9.2	B	10.4
Southbound Shared Left-Through-Right	-	-	-	-	A	8.5	A	9.0

Table 13 – 2025 Level of Service and Delay for Unsignalized Intersections – Continued

Intersection	2025 No Build				2025 Build			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
Unsignalized Intersections	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
2nd Street and Driveway D (15)								
Eastbound Shared Left-Through-Right	A	0.0	A	7.5	A	7.3	A	7.6
Westbound Shared Left-Through-Right	A	7.3	A	7.4	-	-	-	-
Northbound Shared Left-Through-Right	A	8.6	B	10.2	-	-	-	-
Southbound Shared Left-Through-Right	A	0.0	A	9.3	A	9.1	B	10.4
Marshall Way and 2nd Street (16)								
Eastbound Shared Left-Through-Right	A	7.4	A	7.5	A	7.6	A	7.8
Westbound Shared Left-Through-Right	A	7.2	A	7.7	A	7.4	A	8.0
Northbound Shared Left-Through-Right	A	7.1	A	7.4	A	7.5	A	7.9
Southbound Shared Left-Through-Right	A	7.1	A	7.4	A	7.2	A	7.7
Goldwater Boulevard and 70th Street (18)								
Northwestbound Left	B	10.5	C	15.4	B	10.6	C	15.5
Northeastbound Left	C	17.1	E	37.8	C	17.5	E	41.4
Northeastbound Right	B	11.0	B	13.9	B	11.1	B	14.0
Marshall Way and Driveway E (19)								
Eastbound Shared Left-Right	A	8.4	A	8.8	A	8.5	A	9.0
Northbound Shared Left-Through	A	7.3	A	7.3	A	7.3	A	7.4
Goldwater Boulevard and Marshall Way (20)								
Eastbound Left	A	8.2	A	8.1	A	8.3	A	8.2
Westbound Left	B	10.1	B	12.9	B	10.2	B	12.9
Northbound Shared Left-Through-Right	C	16.3	D	27.8	C	16.6	D	29.0
Southbound Left	B	14.7	C	17.9	C	15.6	C	20.7
Southbound Shared Through-Right	A	9.6	C	17.7	A	9.7	C	17.8
1st Street and Driveway F (22)								
Westbound Left	-	-	-	-	A	7.3	A	7.4
Northbound Shared Left-Right	-	-	-	-	A	8.9	A	8.9

Table 14 – 2025 Level of Service and Delay for Signalized Intersections

Intersection	2025 No Build				2025 Build			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
Signalized Intersections	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
Goldwater Boulevard and Main Street (2)								
Overall	A	4.0	A	4.4	A	4.8	A	4.8
Eastbound Shared Left-Through-Right	D	52.1	D	52.2	D	51.4	D	51.5
Westbound Shared Left-Through-Right	D	52.3	D	52.9	D	52.6	D	52.8
Northbound Left	A	2.0	A	2.7	A	2.2	A	3.0
Northbound Through	A	2.0	A	2.0	A	2.2	A	2.2
Northbound Shared Through-Right	A	2.0	A	2.0	A	2.2	A	2.2
Southbound Left	A	2.2	A	2.3	A	2.5	A	2.7
Southbound Through	A	1.8	A	2.1	A	2.0	A	2.3
Southbound Shared Through-Right	A	1.9	A	2.3	A	2.1	A	2.5
Scottsdale Road and Main Street (4)								
Overall	A	1.8	A	4.1	A	1.8	A	4.1
Eastbound Shared Left-Through-Right	C	26.6	C	21.5	C	26.6	C	21.5
Westbound Shared Left-Through-Right	C	26.3	C	21.1	C	26.3	C	21.1
Northbound Left	A	0.0	A	0.3	A	0.0	A	0.3
Northbound Through	A	0.2	A	0.5	A	0.3	A	0.5
Northbound Shared Through-Right	A	0.2	A	0.5	A	0.3	A	0.6
Southbound Left	A	1.6	A	3.6	A	1.6	A	3.6
Southbound Through	A	2.0	A	4.8	A	2.0	A	4.9
Southbound Shared Through-Right	A	2.0	A	4.8	A	2.1	A	4.9
Scottsdale Road and 1st Street (11)								
Overall	A	1.3	A	2.3	A	2.4	A	2.7
Eastbound Shared Left-Through-Right	C	28.6	C	26.6	C	27.7	C	26.9
Westbound Shared Left-Through-Right	C	27.9	C	25.9	C	26.2	C	25.5
Northbound Left	A	0.1	A	0.1	A	0.1	A	0.1
Northbound Through	A	0.2	A	0.4	A	0.2	A	0.4
Northbound Shared Through-Right	A	0.2	A	0.4	A	0.3	A	0.4
Southbound Left	A	0.0	A	0.1	A	0.0	A	0.1
Southbound Through	A	0.1	A	0.2	A	0.1	A	0.2
Southbound Right	A	0.0	A	0.0	A	0.0	A	0.0
Goldwater Boulevard and 2nd Street (12)								
Overall	A	5.4	B	11.5	A	7.0	A	7.1
Eastbound Shared Left-Through-Right	D	54.2	D	51.4	D	36.2	D	36.2
Westbound Shared Left-Through-Right	D	52.8	D	54.8	D	36.2	D	39.3
Northbound Left	A	1.6	A	5.3	A	6.5	A	7.2
Northbound Through	A	2.0	A	2.4	A	7.8	A	7.6
Northbound Shared Through-Right	A	2.0	A	2.4	A	7.8	A	7.6
Southbound Left	A	0.2	A	6.8	A	0.7	A	0.6
Southbound Through	A	0.1	A	7.7	A	0.2	A	0.3
Southbound Shared Through-Right	A	0.2	A	7.9	A	0.3	A	0.6

Table 12 – 2025 Level of Service and Delay for Signalized Intersections – Continued

Intersection	2025 No Build				2025 Build			
	AM PEAK		PM PEAK		AM PEAK		PM PEAK	
Signalized Intersections	LOS	DELAY	LOS	DELAY	LOS	DELAY	LOS	DELAY
Scottsdale Road and 2nd Street (17)								
Overall	A	4.1	A	5.1	A	5.6	A	6
Eastbound Left	C	25.9	C	24.5	B	15.6	B	15.7
Eastbound Through	C	26.5	C	24.6	B	15.6	B	15.5
Eastbound Right	C	26.0	C	24.4	B	15.5	B	15.4
Westbound Shared Left-Through-Right	C	26.4	C	26.5	B	15.7	B	16.5
Northbound Left	A	1.9	A	2.4	A	6.4	A	6.5
Northbound Through	A	2.3	A	3.1	A	7.6	A	8.2
Northbound Shared Through-Right	A	2.3	A	3.1	A	7.7	A	8.3
Southbound Left	A	0.1	A	0.2	A	0.4	A	0.7
Southbound Through	A	0.2	A	0.4	A	0.4	A	0.9
Southbound Shared Through-Right	A	0.2	A	0.4	A	0.5	A	1.0
Goldwater Boulevard and Scottsdale Road (21)								
Overall	B	17.1	C	24.9	B	17.5	C	24.6
Eastbound Left	D	54.4	D	53.6	D	54.4	D	54.0
Eastbound Shared Through-Right	D	54.7	D	54.1	D	54.7	D	54.5
Westbound Left	D	50.4	D	44.4	D	50.2	D	44.4
Westbound Shared Left-Through-Right*	D	54.5	D	45.5	D	53.3	D	47.2
Northbound Left	A	7.2	B	16.0	A	7.6	B	16.2
Northbound Through	A	6.6	B	12.3	A	6.9	B	12.4
Northbound Shared Through-Right	A	6.6	B	12.3	A	6.9	B	12.4
Southbound Left	A	7.6	B	13.7	A	8.0	B	14.0
Southbound Through	A	6.2	B	13.1	A	6.4	B	13.1
Southbound Shared Through-Right	A	6.3	B	13.4	A	6.6	B	13.5

*Results from Synchro LOS and Delay Methodology

7. Recommendations & Conclusions

The proposed mixed-use development will be generally located east and north of Goldwater Boulevard, west of Marshall Way, and south of 1st Street, also including the northeast corner of 2nd Street and Marshall Way, the northeast corner of Marshall Way and 1st Street (the proposed Canopy by Hilton development) and the Scottsdale Museum of the West in Scottsdale, Arizona.

The proposed development will be comprised of the following land uses:

- 61 units (11 stories) Residential Building #1
- 79 units (13 stories) Residential Building #2
- 77 units (12 stories) Residential Building #3
- 80 units (4 to 6 stories) Residential Building #4
- 190 rooms Hotel
- 22, 500 square feet Museum (Expansion)

The above does not include the proposed Canopy by Hilton or the existing developments to remain (Stagebrush Theatre, Scottsdale Artists' School, and Scottsdale Museum of the West). A separate TI&MA was prepared for the Canopy by Hilton, which included trip generation calculations and comparisons. The trip generation from the May 29, 2018 TI&MA for the proposed Canopy by Hilton are included in the year 2025 analyses.

Existing Capacity Analysis

The AM and PM peak hour existing conditions capacity analysis were completed for the twenty-one (21) existing study intersections. The following intersections currently operate with movements at a LOS E or F:

Scottsdale Road and 1st Avenue (1) – Stop Controlled

- EB Shared Left-Through-Right PM peak hour operates at LOS E
- WB Shared Left-Through-Right PM peak hour operates at LOS E

Goldwater Boulevard and Scottsdale Road (21) – Signalized

- EB Left AM peak hour operates at LOS E
- EB Shared Through-Right AM peak hour operates at LOS E

Trip Generation

The trip generation for the previously approved Loloma Mixed-Use Development is shown below per the report dated February 11, 2002.

Trip Generation – Loloma Mixed-Use Development

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1,115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
			Total	4,348	228	69	159	447	186	261

The trip generation under the existing zoning and the proposed Museum Square development were calculated. With approximately 7.4 acres and a 1.3 base gross floor area, approximately 418,200 square feet can be developed on this site along with 369 residential dwelling units.

Trip Generation – Existing Zoning

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
			Total	14,109	605	386	219	1,324	584	740

The potential development under the existing zoning generates 14,109 weekday daily trips, with 605 trips during the AM peak hour, and 1,324 trips during the PM peak hour.

Trip Generation – Museum Square

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total				3,221	194	81	113	244	134	110

The proposed Museum Square development is anticipated to generate, 3,221 weekday trips, with 194 trips occurring during the AM peak hour and 244 trips occurring during the PM peak hour.

Trip Generation Comparison

A comparison between the trips generated by the build out under the previously approved Loloma Mixed-Use Development versus the proposed Museum Square development was calculated.

Trip Generation Comparison (Loloma Mixed-Use Development vs. Proposed)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Low-Rise-Apartments	221	142	Dwelling Units	1115	73	15	58	91	60	31
Lofts	221	53	Dwelling Units	659	32	6	26	38	25	13
Artist Studios (Residences)	221	5	Dwelling Units	413	5	1	4	5	3	2
Residential Condo/Townhouse	230	53	Dwelling Units	380	32	5	27	37	25	12
Specialty Retail	814	12,815	1000 SF	522	83	40	43	34	15	19
Quality Restaurant	831	2,981	1000 SF	269	3	2	1	23	15	8
Museum	-	20,000	1000 SF	440	0	0	0	97	19	78
Museum Expansion	-	25,000	1000 SF	550	0	0	0	122	24	98
Total - Loloma Mixed-Use Development				4,348	228	69	159	447	186	261
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-1,127	-34	12	-46	-203	-52	-151
% Difference				-26%	15%	17%	29%	-45%	-28%	-58%

Table 9 shows that the proposed mixed-use Museum Square development will produce 1,127 (26%) fewer weekday daily trips will occur, 34 (15%) fewer trips during the AM peak hour, and 203 (45%) fewer trips during the PM peak hour.

Additionally, a comparison between the trips generated by the build out under the existing zoning with a 209,100 sf of retail, 209,100 sf of office space, and 369 residential units versus the proposed Museum Square development was calculated.

Trip Generation Comparison (Existing Zoning vs. Proposed)

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
General Office Building	710	209.10	1000 SF GLA	2,171	224	193	31	230	37	193
Shopping Center	820	209.10	1000 SF GLA	9,928	257	160	97	938	451	487
Multifamily Housing (Mid-Rise)	221	369	1000 SF GLA	2,010	124	33	91	156	96	60
Total - Existing Zoning				14,109	605	386	219	1,324	584	740
Multifamily Housing (Mid-Rise)	221	80	Dwelling Units	435	28	8	20	36	22	14
Multifamily Housing (High-Rise)	222	217	Dwelling Units	1,067	74	18	56	83	51	32
Hotel	310	190	Rooms	1,719	90	54	36	117	60	57
Museum - Expansion	580	22.5	1000 SF GFA	0	2	1	1	8	1	7
Total - Proposed				3,221	194	81	113	244	134	110
Difference				-10,888	-411	-305	-106	-1,080	-450	-630
% Reduction				77%	68%	79%	48%	82%	77%	85%

The proposed Museum Square development is anticipated to generate 10,888 (77%) fewer weekday daily trips, 411 (68%) fewer trips during the AM peak hour, and 1,080 (82%) fewer trips during the PM peak hour.

Future Conditions

Year 2025 (opening year) analyses were completed without the build out, as well as with the build out of the proposed development. Based on the MAG model, an annual growth rate of 1.0% was applied along Goldwater Boulevard. Additionally, the traffic volumes of known future developments were added and distributed throughout the studied roadway network. These developments include, Canopy by Hilton, and The Goldwater.

Canopy by Hilton

Based on the May 29, 2018 TI&MA for Canopy by Hilton, this proposed development will be located on the northeast corner of Marshall Way and 1st Street. It will be comprised of a 176 room hotel with a fitness center, pool and spa, café, bar, and 4,130 sf of conference/meeting space.

Trip Generation – Canopy by Hilton

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Hotel (Proposed)	310	176	Rooms	1,472	83	49	34	106	54	52

The Goldwater

Based on the December 15, 2017 TI&MA for The Goldwater, this proposed development will be located on the southeast corner of Goldwater Boulevard and 70th Street. It will be comprised of 40 residential units, a 2,500 sf restaurant, and a 5,500 sf office space. Additionally, there will be three (3) owner owned guest casitas.

Trip Generation – The Goldwater

Land Use	ITE Code	Qty	Unit	Weekday	AM Peak Hour			PM Peak Hour		
				Total	Total	In	Out	Total	In	Out
Multifamily Housing (Mid-Rise)	221	43	Dwelling Units	234	16	4	12	19	12	7
General Office Building	710	5.5	1000 SF GFA	54	6	5	1	6	1	5
High-Turnover (Sit-Down) Restaurant	932	2.5	1000 SF GLA	280	25	14	11	24	15	9
			Total	568	47	23	24	50	28	22

As stated in **Section 3.1.2** the City of Scottsdale has considered the installation of a traffic signal at this intersection as 2nd Street has been identified as the main east-west bicycle corridor through Old Town Scottsdale and efforts are in place to connect it to the Camelback path east of Miller Road. The traffic signal has also been requested by area merchants and residents to improve bicycle and pedestrian access across Goldwater Boulevard, and this is also consist with the Holly Street plan.

Therefore, the 2025 no build and build capacity analyses were completed with a traffic signal at the intersection of Goldwater Boulevard and 2nd Street (12).

Year 2025

Capacity analyses were completed for both the AM and PM peak hours for year 2025, without the build out of the proposed Museum Square development, as well as with the build out.

All movements operate at a LOS D or better, or are maintained at the no build level of service, with the exception of the following:

Goldwater Boulevard and 2nd Street (12) – Stop Controlled

- EB Shared Left-Through-Right AM and PM peak hour operates at LOS F
- WB Shared Left-Through-Right AM and PM peak hour operates at LOS E and F, respectively

With the build out of Museum Square, it is recommended that signal timing splits and offsets of all adjacent and nearby intersections be updated to efficiently service future traffic patterns.

Goldwater Boulevard and 2nd Street (12) – Stop Controlled
For the intersection of Goldwater Boulevard and 2nd Street (12), capacity analyses were completed as a two-way stop controlled intersection, as it exists today, as well as with the installation of a traffic signal. With the combination of the increased traffic volumes and pedestrian volumes with the build out of the proposed Museum Square, the stop-controlled movements operate at LOS E and F.

Additionally, there were a total of 28 angle collisions between April 2015 to April 2018. Of which 12 occurred between April 2015 and April 2016, 12 occurred between April 2016 and April 2017, and 4 occurred between April 2017 and April 2018. As stated in the Manual of Uniform Traffic Control Devices Section 4C.08.B under the traffic signal warrant section, based on crash experience, "the need for a traffic control signal shall be considered if…five or more reported crashes, of types susceptible to correction by a traffic control signal, have occurred within a 12-month period, each crash involving personal injury or property damage." Although a formal traffic signal warrant analysis has not been completed for this intersection as part of this study, based on the crash data it appears that this criteria is met for two of the three years analyzed.

Therefore, it is recommended with the build out of Museum Square that a traffic signal be installed at the intersection of Goldwater Boulevard and 2nd Street (12). As previously stated, the City of Scottsdale has considered the installation of a traffic signal at this intersection. If the traffic signal has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Goldwater Boulevard Pedestrian Hybrid Beacon
The City of Scottsdale has also considered the installation of a pedestrian hybrid beacon along Goldwater Boulevard approximately 300 feet west of Marshall Way to assist with pedestrian and bicycle crossings and in response to requests from area residents.

Similar to the traffic signal at Goldwater Boulevard and 2nd Street (12), if the pedestrian hybrid beacon has not yet been installed by the City of Scottsdale before the Museum Square development begins construction, Macdonald Development Corporation is committed to working with the City of Scottsdale to provide this infrastructure improvement.

Multi Modal Circulation
The Museum Square development encourages alternative modes of transportation including, movement by foot, bicycle, scooters, and/or trolley. Museum Square has been intentionally designed to embrace an active street frontage reinforcing the Old Town pedestrian environment and encouraging walkability and social interaction.

These alternative means of transportation are inherent to downtown mixed-use areas with nearby restaurants, retail, and cultural destinations. In addition to the Gallery District located to the north of the proposed development, guests will be within walking distance to significant destinations such as, Museum of the West, the Scottsdale Artists' School, Scottsdale Historical Museum, Scottsdale Stadium, Scottsdale Fashion Square Mall and Scottsdale Waterfront.

Shading of the pedestrian realm along the street frontages and internal connection points will be provided by a variety of structures and/or desert appropriate trees. Additionally, Museum Square intends to provide a multi-use public space located northeast of the proposed hotel. This multi-use space will provide its guests outdoor dining, shaded areas, patios, terraces, and a sculpture garden.