North Ridge Estates

Traffic Impact Analysis

Prepared for submittal to:

Town of Oro Valley, AZ

M Esparza Engineering, LLC

2934 W. Salvia Drive

Tucson, AZ 85745

November 17, 2023

REVIEWED - SEE COMMENTS

Engineering: chuelle 12/28/2023

The issuance of a permit shall not be construed to be a permit or approval of any violation of the codes or ordinances of the Town of Oro Valley

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Project No. 2023.43
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November 17, 2023

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1. Introduction and Executive Summary

Purpose of Report and Study Objectives

This report is provided to support a rezoning application and addresses the potential traffic impacts associated with the proposed single-family residential project located on the southwest corner of the La Canada Drive/Moore Road intersection in Oro Valley, Arizona. The project location is shown in Exhibit 1. A site plan showing the layout of the thirty-four residential lots is shown on the cover and in Exhibit 2. As shown on the site plan, access to the project will be gated and will be on La Canada Drive, opposite White Diamond Place.

The current zoning is R1-144. The proposed zoning is R1-36.

Exhibit 1 Project Location

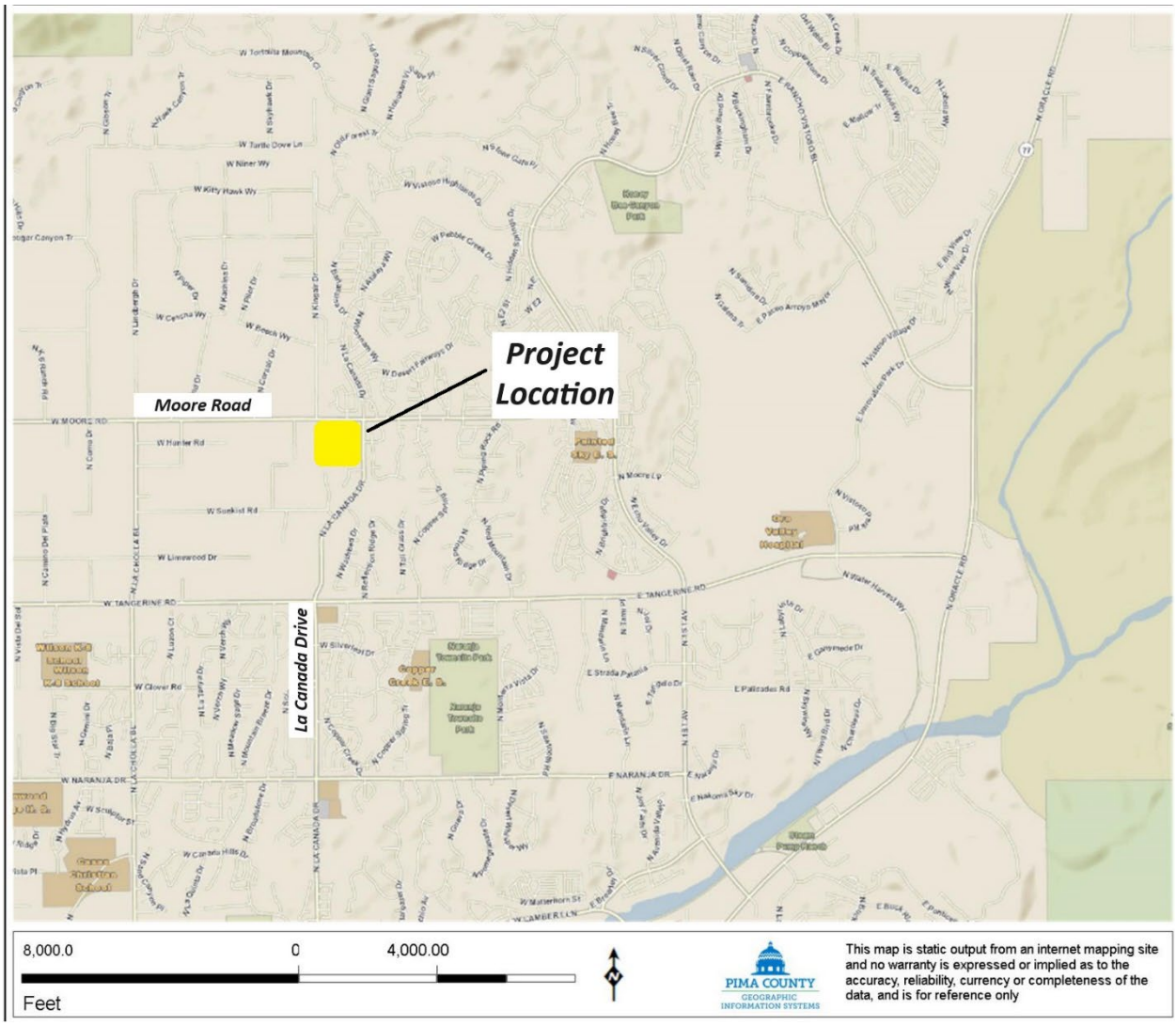


Exhibit 2 Site Plan

The objectives of this traffic study are to determine the traffic impacts of the project on the local transportation system and to recommend improvements to maintain efficient and safe traffic operations for motor vehicle uses, pedestrians, and bicyclists. This report focuses on access management, trip generation, operational analysis of the study area intersections and roadways, and the potential for a southbound right turn lane on La Canada Drive.

Summary of Findings

Study Area

The project is located south of Moore Road and west of La Canada Drive. The parcel is currently vacant. The Vistoso Highlands residential subdivision is east of the project. Other residential subdivisions are north, south, and west of the project site. The La Cholla Airpark is northwest of the site.

The study area includes the adjacent and nearby streets (La Canada Drive, Moore Road, White Diamond Place), and the intersections of La Canada Drive/White Diamond Place and La Canada Drive/Moore Road.

Development Description

The project includes thirty-four single family residential units. Access will be gated and will be on La Canada Drive opposite White Diamond Place

Principal Findings

1. The project will generate 321 daily trips, 24 AM peak hour trips and 32 PM peak hour trips.
2. All study area roadways and intersections will operate at LOS D or better based on projected 2025 daily and peak hour traffic volumes.
3. Based on a 2% background growth rate, the projected daily traffic volumes for 2025 without the project will not exceed the LOS D capacities of the project roadways and intersections.
4. A right turn lane is not numerically warranted for the southbound right turns from La Canada Drive into the project driveway.
5. The driveway spacing and corner clearances for the project driveway meet Pima County and Oro Valley standards.
6. The provision of gated entrances should conform to Oro Valley Subdivision Street Standards.
7. Roadway and subdivision design should conform to current jurisdictional standards. This includes ensuring that sight distance requirements are met.
8. All new traffic signs and markings, on-site and off-site, must comply fully with the *Manual on Uniform Traffic Control Devices* and Town requirements.

2. Proposed Development

Site Location

The project location is shown in Exhibit 1. The project is located on the southwest corner of the La Canada Drive/Moore Road intersection in Oro Valley, Arizona.

Land Use and Intensity

As shown in Exhibit 2, the project is a gated residential subdivision that will include thirty-four single family residential lots. It will be on a parcel currently zoned R1-144 which will be rezoned to R1-36.

Proposed Access

There is one proposed access locations off of La Canada Drive and opposite White Diamond Place. The access will be gated with keypad entry.

Development Phasing and Timing

For the purposes of this report, the buildout year is assumed to be 2025.

3. Study Area Conditions

Area Characteristics

Land Uses

The project area is adjacent to existing residential subdivisions on all sides. The site is currently vacant.

Anticipated Future Development

There are no major proposed development projects in the project study area, or in the vicinity of the project.

Program for Completion of Roadway and Intersection Improvements

There are no projects in the vicinity of the project listed in the 2022-2026 Pima Association of Governments Transportation Improvement Program.

Existing Roads

La Canada Drive and Moore Road will provide regional access to the site. Both are designated as major collectors in the Oro Valley General Plan. La Canada Drive is a north/south four-lane collector road east of the site. It has a posted speed limit of 35 mph north of Moore Road and a speed limit of 45 mph south of Moore Road.

Moore Road is a four-lane collector east of La Canada Drive. It narrows to a two-lane road west of La Canada Drive. It has a posted speed limit of 35 mph in the vicinity of the project.

Both roads have pedestrian and bicycle infrastructure in the vicinity of the project. . Exhibit 3 provides a physical inventory of the roadways within or near the study area.

Exhibit 3 Roadway Inventory

Road	*Segment*	*Travel Lanes*	*Speed Limit*	*Sidewalk/ Share Use Path*	*Oro Valley Bike Map Designation*	*Bus Service*	*ADT*	*ADT Year*	*Source*	*LOS D Capacity (vpd)*
Moore Road	West of La Canada Drive	2	35 MPH	SW: North Side	Signed Bike Route w/ On-Street Multipurpose Lane to Kingair Drive	Oro Valley-Catalina Dial-A-Ride ADA Transit Service	3,726	2022	PAG	13,320
Moore Road	East of La Canada Drive	4	35 MPH	SW: Both Sides	Signed Bike Route w/ On-Street Multipurpose Lane	Oro Valley-Catalina Dial-A-Ride ADA Transit Service	6,290	2023	Estimated from FDS/PAG Counts	29,160
La Canada Drive	North of Moore Road	2/4	35 MPH	SW: Both Sides	Paved Shared Use Path	Oro Valley-Catalina Dial-A-Ride ADA Transit Service	6,295	2022	PAG	13,986 (2-lanes); 29,160 (4-lanes)
La Canada Drive	South of Moore Road	4	45 MPH	SW: West Side; SUP: East Side	Signed Bike Route w/ On-Street Multipurpose Lane	Oro Valley-Catalina Dial-A-Ride ADA Transit Service	10,150	2023	FDS	35,820

FDS - Field Data Services of Arizona
PAG - Pima Association of Governments

Access

There is one proposed access location for this project, on La Canada Drive.

Study Area

The study area includes the adjacent roadways and intersections.

Physical Characteristics

Roadway Characteristics

La Canada Drive and Moore Road are major collectors. White Diamond Place is a local road opposite the project site.

La Canada Drive is a major regional four-lane north-south collector that continues north as a four-lane divided residential collector through Moore Road, transitions to a two-lane divided road and terminates at Pebble Creek Drive. South of the project site, La Canada Drive continues south into unincorporated Pima County, and becomes Flowing Wells Road at River Road.

Moore Road is an east-west collector that continues east from La Canada Drive into Rancho Vistoso. West of La Canada Drive, it continues east as a two-lane roadway through unincorporated Pima County and into the Town of Marana.

The speed limit on Moore Road and on La Canada Drive north of Moore Road, the speed limit is 35 mph. The posted speed limit on La Canada Drive south of Moore Road is 45 mph. There are bicycle lanes and sidewalks or multi-use paths on each road, as indicated in Exhibit 3.

Existing Intersections

The study area intersections are La Canada Drive/Moore Road and La Canada Drive/White Diamond Place. La Canada/Moore is a four-leg roundabout intersection with yield control on each approach. La Canada Drive/White Diamond Place is a three-leg unsignalized intersection with stop sign control on the White Diamond Place approach.

Ground Photos

Ground photos of the project area are provided in Exhibit 4.

Exhibit 4 Ground Photographs

Looking West toward La Canada Drive from White Diamond Place. The project access will be opposite White Diamond Place.

Looking South on La Canada Drive from the Project Access.

Looking North on La Canada Drive toward Moore Road from the Project Access.

Transit Service

The area is served by Oro Valley Sun Shuttle Dial-A-Ride transit program.

Pedestrian/Bicycle Facilities

Oro Valley Bike Map designations for the project roadways are provided in Exhibit 3. There is good bicycle route connectivity adjacent to and in the vicinity of the project.

Traffic Volumes

Peak Periods

The study area includes the adjacent and nearby streets (La Canada Drive, Moore Road, White Diamond Place), and the intersections of La Canada Drive/White Diamond Place and La Canada Drive/Moore Road.

Field Data Services of Arizona collected peak period turning movement counts at these intersections in November 2023. Exhibit 5 shows the 2023 (Existing) peak hour turning movement volumes. Traffic data documentation is provided in the appendix.

Daily Traffic Volumes

Daily traffic volumes for most study area roadways are available on PAG's website. Field Data Services collected daily traffic volumes on La Canada Drive south of Moore in November 2023.

Level of Service

Level of service (LOS) is a qualitative description of how well a roadway or intersection operates under prevailing traffic conditions. A grading system of A through F, similar to academic grades, is utilized. LOS A is free-flowing traffic, whereas LOS F is forced flow and extreme congestion.

Intersection Performance

Under existing conditions, the operational analysis for the La Canada Drive/Moore Road and La Canada Drive/White Diamond Lane intersections found that all movements at the intersections operate at LOS D or better during the weekday peak hours The results are shown in Exhibit 6.

Roadway Performance

Exhibit 3 (Roadway Inventory) shows the estimated current traffic volumes, capacity, and LOS for the average weekday on the nearby roadway segments.

Exhibit 5 Existing Peak Hour Intersection Volumes

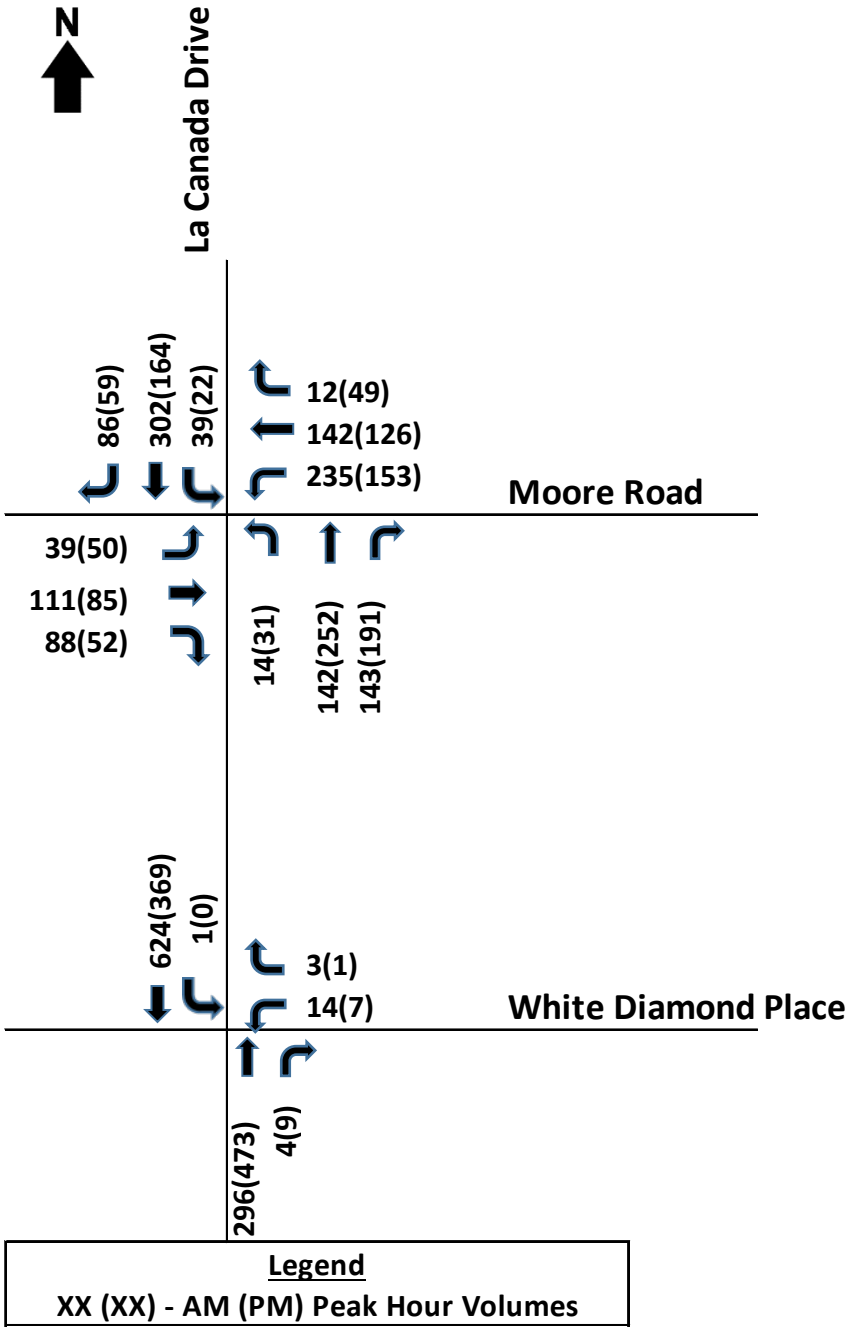


Exhibit 6 Existing Intersection Synchro Summary

La Canada/Moore	Existing 2023 AM Delay (sec/veh)	AM LOS	Existing 2023 PM Delay (sec/veh)	PM LOS
Eastbound				
Left/Through	7.8	A	5.1	A
Right	6.6	A	4.2	A
Approach	*7.4*	*A*	*4.9*	*A*
Westbound				
Left/Through	7.8	A	7.5	A
Right	3.3	A	4.2	A
Approach	*7.6*	*A*	*7.0*	*A*
Northbound				
Left/Through	4.7	A	5.5	A
Right	4.6	A	4.6	A
Approach	*4.7*	*A*	*5.1*	*A*
Southbound				
Left/Through	10.3	B	5.7	A
Right	5.2	A	4.3	A
Approach	*9.2*	*A*	*5.3*	*A*
Intersection	***7.4***	***A***	***5.7***	***A***

La Canada/White Diamond	Existing 2023 AM Delay (sec/veh)	AM LOS	Existing 2023 PM Delay (sec/veh)	PM LOS
Eastbound				
Left/Through/Right	N/A	N/A	N/A	N/A
Westbound				
Left/Through/Right	15.4	C	15.0	C
Northbound				
Left/U-Turn	0.0	A	0.0	A
Southbound				
Left	8.1	A	0.0	A

Safety Related Deficiencies

ADOT collects crash data for all roadways within the state. We reviewed the data for the intersections and roadways near the project site for the most recently available five-year period (2018-2022).

Roadway Segment Crashes

As shown in Exhibit 7a, there were seven roadway segment crashes on La Canada Drive and on Moore Road during the five-year period. Five were single vehicle crashes, one was a rear end crash, and one was a head on crash. Four of the seven were property-damage only crashes, two were injury crashes and there was one fatality. There were no recorded crashes on La Canada Drive south of Moore Road during the five-year period.

Intersection Crashes

As shown in Exhibit 7b, there were twelve intersection crashes at La Canada Drive/Moore Road during the five-year period. Most of the crashes were angle type crashes (5), although most of these occurred prior to the reconstruction of the intersection to a roundabout. Seven of the twelve were non-injury crashes. The five-year crash rate at this intersection was 0.50 crashes per million-entering-vehicles.

There was one intersection crash at the La Canada Drive/White Mountain Place intersection during the five-year period.

Exhibit 7a Crash Data – Roadway Segments

La Canada Drive: Moore Road to 1/2 Mile north of Moore Road

Crash Type	2018	2019	2020	2021	2022	2018-2022	%
Single Vehicle	1	1	2			4	100%
Crash Rate (per MVM)	0.87	1.74	0.00	0.00	3.48	0.70	

Severity						Total	%
Bodily Injury			1			1	25%
Property Damage	1	1	1			3	75%

Moore Road: La Canada Drive to 1/2 Mile west of La Canada Drive

Crash Type	2018	2019	2020	2021	2022	2018-2022	%
Single Vehicle	1					1	50%
Head On		1				1	50%
Crash Rate (per MVM)	1.47	1.47	0.00	0.00	0.00	0.59	

Severity						Total	%
Fatality		1				1	50%
Property Damage	1					1	50%

Moore Road: La Canada Drive to 1/2 Mile east of La Canada Drive

Crash Type	2018	2019	2020	2021	2022	2018-2022	%
Rear End					1	1	100%
Crash Rate (per MVM)	0.00	0.00	0.00	0.00	0.87	0.17	

Severity						Total	%
Bodily Injury						0	0%
Property Damage					1	1	100%

Note: MVM = Million Vehicle Miles

Exhibit 7b Crash Data – Intersections

La Canada/Moore

Crash Type	2018	2019	2020	2021	2022	Total	%
Single Vehicle				2	1	3	25%
Angle	2	1	1		1	5	42%
Rear End	1	1		1		3	25%
Other			1			1	8%
Total	3	2	2	3	2	12	
Crash Rate (per MVE)	0.62	0.41	0.41	0.62	0.41	0.50	

Severity						Total	%
Bodily Injury	3	1	1			5	42%
Property Damage		1	1	3	2	7	58%

La Canada/White Diamond

Crash Type	2018	2019	2020	2021	2022	Total	%
Single Vehicle			1			1	100%
Total	0	0	1	0	0	1	
Crash Rate (per MVE)	0.00	0.00	0.26	0.00	0.00	0.05	

Severity						Total	%
Bodily Injury						0	0%
Property Damage			1			1	100%

Note: MVE = Million Vehicles Entering the Intersection

4. Projected Traffic

Site Traffic Forecasting

Trip Generation

The future traffic from the project is estimated using the trip rates contained in the Institute of Traffic Engineers' *Trip Generation Manual,* 11th Edition. The number of trips generated is the mathematical product of land use intensity (building square footage, number of dwelling units, etc.) and the trip generation rate, based on an average rate or from a fitted curve equation. The result is the total number of one-way trips (not round trips) expected to be generated by the project. These trips represent the number of vehicles estimated to enter and leave the project.

Trip Generation

We applied the average trip rates for weekday, AM and PM peak hour trip generation from *Trip Generation Manual* to estimate trip generation for the land use, Single Family Detached Unit (ITE Land Use 210).

Exhibit 8 shows the trip rates and estimated trip generation. Based on the trip rates for the project land use, the project generates about 321 daily one-way trips with 24 during the AM peak hour and 32 during the PM peak hours.

Exhibit 8 Trip Generation

				Trip Generation Average Rates					
				Weekday AM		Weekday PM		Avg Weekday	
Land Use	*Unit*	*No. Units*	*ITE Categ.*	*In*	*Out*	*In*	*Out*	*In*	*Out*
Single Family Detached Unit	Units	34	210	0.7		0.94		9.43	
				26%	74%	63%	37%	50%	50%

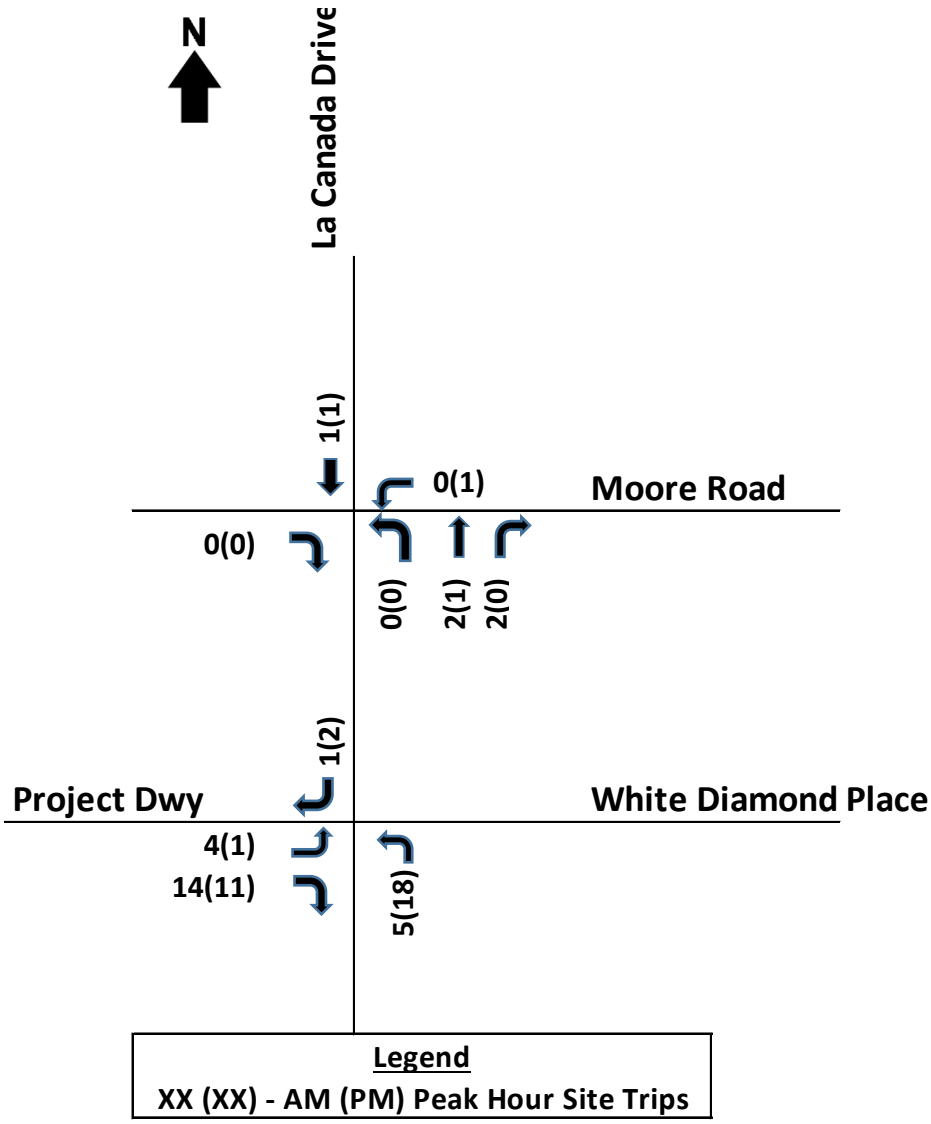
				Trip Generation					
				Weekday AM		Weekday PM		Avg Weekday	
Phase 1	*Unit*	*No. Units*	*ITE Categ.*	*In*	*Out*	*In*	*Out*	*In*	*Out*
Single Family Detached Unit	1000 SF	34	210	24		32		321	
				6	18	20	12	160	160

Note: AM, PM Rates based on Peak Hour of Adjacent Street Traffic (7-9 AM; 4-6 PM)

Trip Distribution and Assignment

We collected traffic data at the study area intersections to determine what the distribution of trips is on La Canada Drive and on Moore Road. Based on the existing volumes at this intersection, we applied a 90%/10% Southbound/Northbound distribution at the project access driveway to the project trips. The majority of the site traffic will be via La Canada Drive to the south. The site trip distribution and assignment are shown in Exhibit 9.

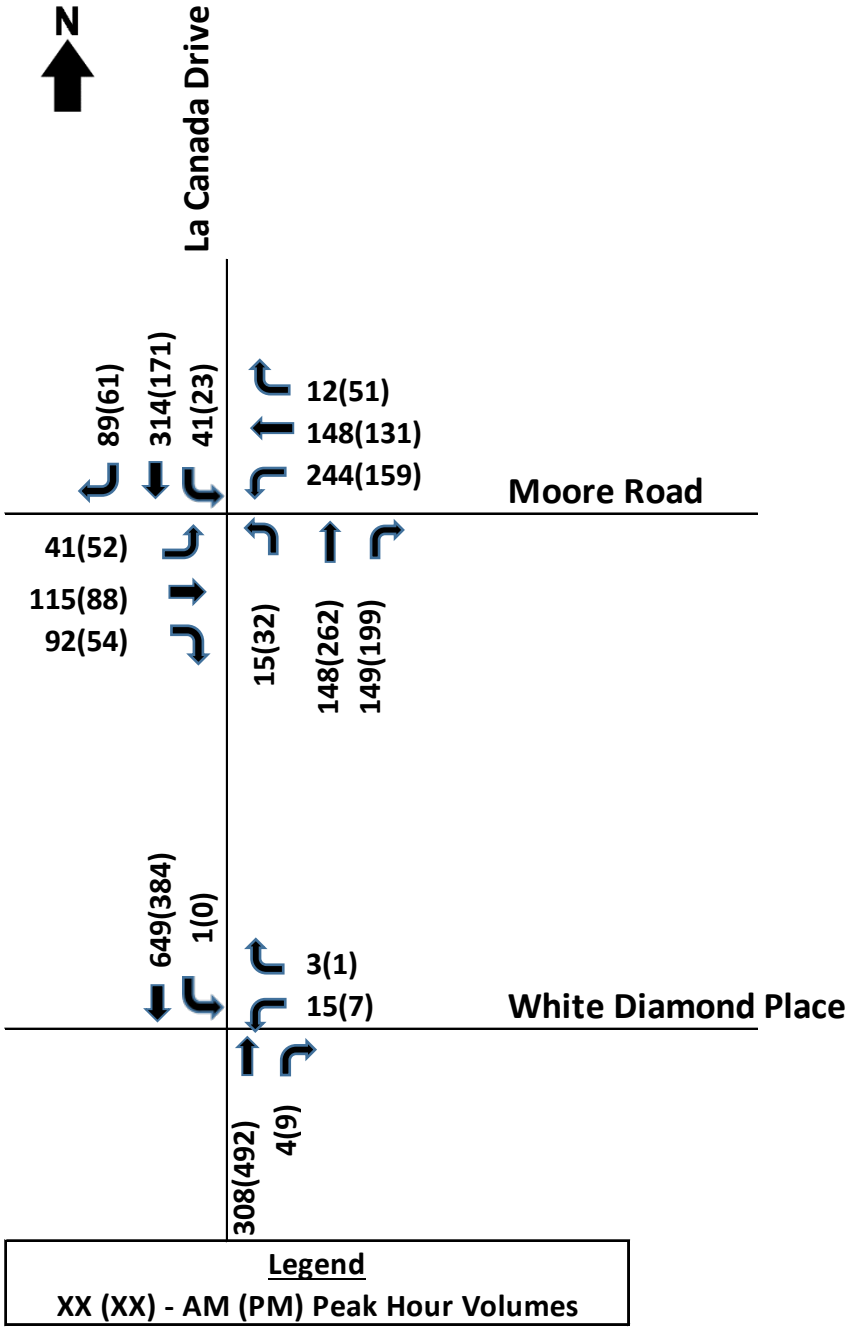
Exhibit 9 Site Traffic Assignment



Background Traffic

We applied a 2% per year growth factor to the recorded peak hour volumes at the project intersections and at the project roadways to estimate 2025 "no project" volumes. Year 2025 intersection peak hour intersection volumes for the no project condition are shown in Exhibit 10. Year 2025 daily roadway volumes for the no project condition are shown in Exhibit 11. As shown in Exhibit 11, the daily volumes under the no project condition are well below the LOS D daily volume threshold capacities.

Exhibit 10 Future Intersection Peak Hour Volumes – 2025 (No Project)



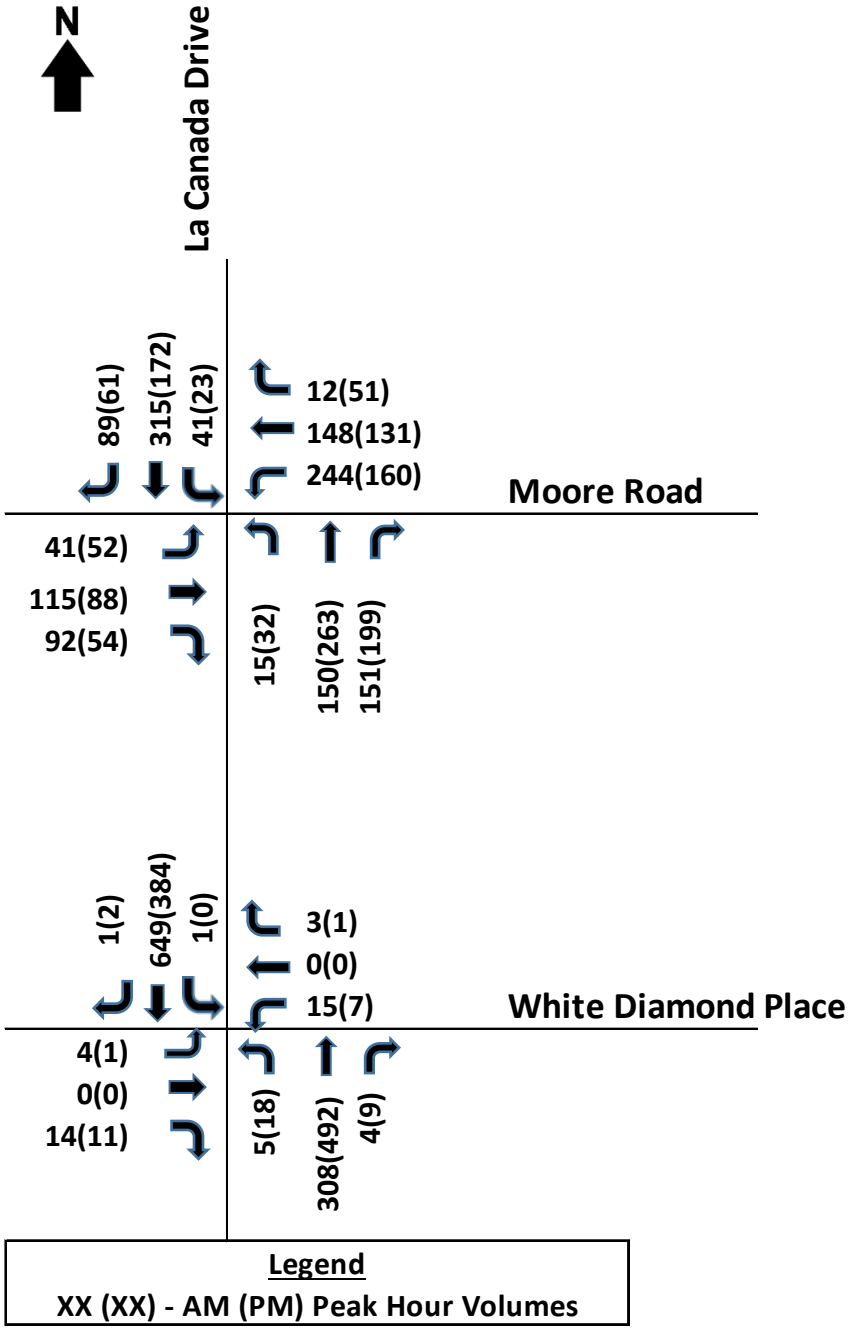
Total Traffic

We added the site trips to the 2025 no project volumes to estimate 2025 "with project" volumes. Year 2025 intersection with project peak hour intersection volumes are shown in Exhibit 12. Year 2025 daily roadway volumes are shown in Exhibit 11. As shown in Exhibit 11, the daily volumes are well below the LOS D daily volume threshold capacities.

Exhibit 11 Year 2025 Daily Traffic Volumes and Capacities

Road	*Segment*	*LOS D Capacity (vpd)*	*2025 ADT (No Project)*	*Daily Site Trips*	*2025 ADT (with Project)*
Moore Road	West of La Canada Drive	13,320	3,877	6	3,883
Moore Road	East of La Canada Drive	29,160	6,544	10	6,554
La Canada Drive	North of Moore Road	13,986 (2-lanes); 29,160 (4-lanes)	6,680	48	6,728
La Canada Drive	South of Moore Road	35,820	10,771	257	11,028

Exhibit 12 Future Intersection Peak Hour Volumes – 2025 (With Project)



5. Traffic and Improvement Analysis

Level of Service Analysis

With Project

We conducted intersection capacity analyses for the study area intersections for the build out year 2025 under the with project condition only. The results of the intersection analysis are shown in Exhibit 13. All movements operate at LOS D or better.

Exhibit 13 Intersection Level of Service – Future Conditions

	2025 With Project			
	AM		PM	
La Canada/Moore	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**
Eastbound				
Left/Through	8.3	A	5.3	A
Right	6.9	A	4.3	A
Approach	*7.7*	*A*	*5.0*	*A*
Westbound				
Left/Through	8.2	A	7.9	A
Right	3.3	A	4.3	A
Approach	*8.0*	*A*	*7.3*	*A*
Northbound				
Left/Through	4.9	A	5.6	A
Right	4.7	A	4.7	A
Approach	*4.8*	*A*	*5.3*	*A*
Southbound				
Left/Through	11.0	B	5.9	A
Right	5.4	A	4.4	A
Approach	*9.9*	*A*	*5.6*	*A*
Intersection	***7.8***	***A***	***5.9***	***A***

	2025 With Project			
	AM		PM	
La Canada/White Diamond	**Delay (sec/veh)**	**LOS**	**Delay (sec/veh)**	**LOS**
Eastbound				
Left/Through/Right	14.5	B	10.3	B
Westbound				
Left/Through/Right	18.8	C	18.2	C
Northbound				
Left/U-Turn	9.5	A	8.3	A
Southbound				
Left	8.1	A	0.0	A

Off Site Improvements

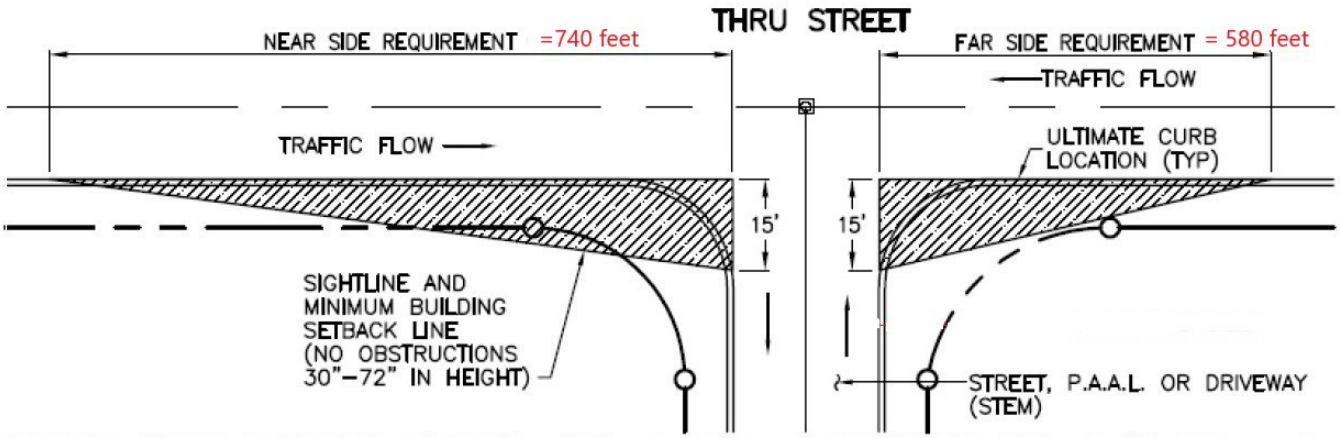
There is an existing curb cut on La Canada Drive at the proposed driveway location. The driveway will be designed to meet standards in the Oro Valley Subdivision Street Standards and Policies Manual.

Traffic Safety

Sight Distance

Sight distances at the project driveway should meet the criteria in Oro Valley's Subdivision Street Standards and Policies Manual. Based on the design speed of 50 mph (5 mph over the speed limit of 45 mph) on La Canada Drive (see Exhibit 14), the near side distance should be 740 feet. The far side distance should be 580 feet.

Exhibit 14 Sight Distance Requirements

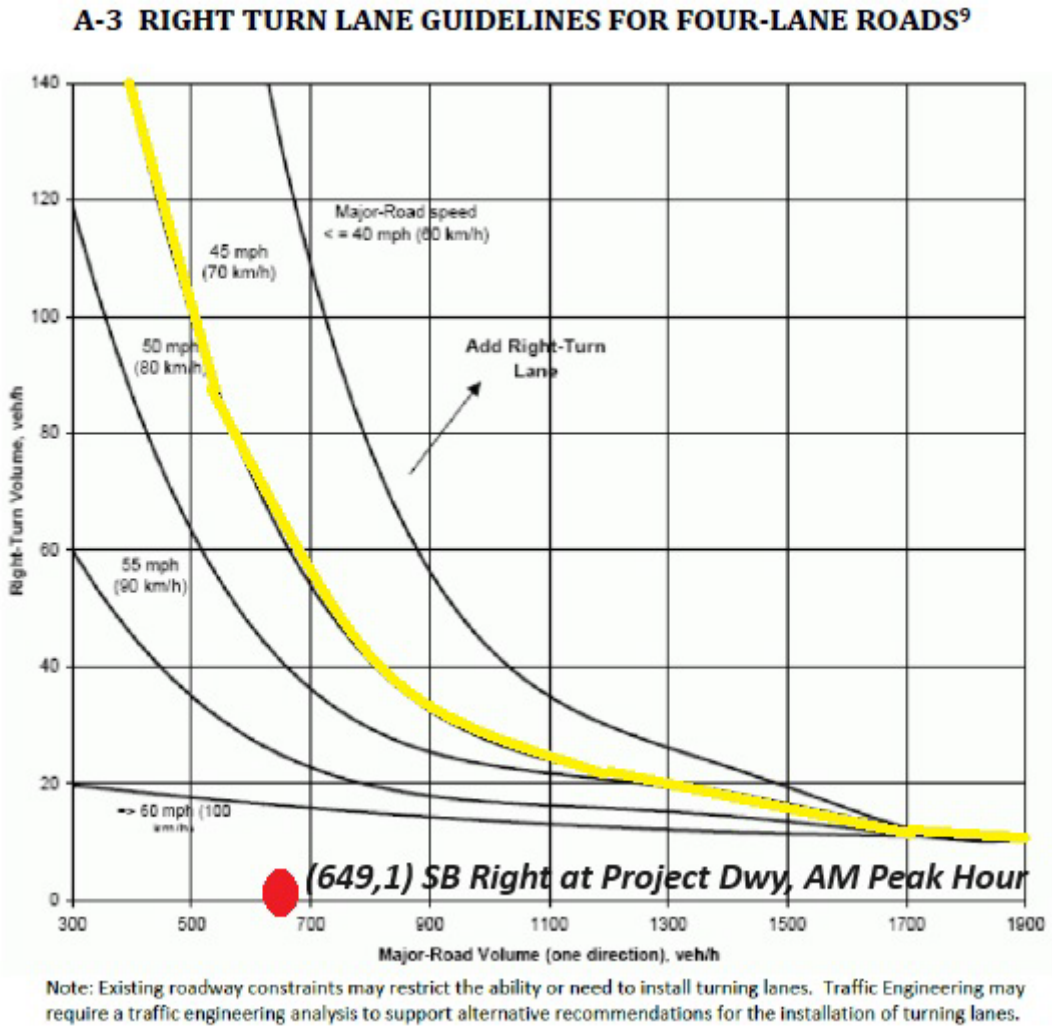


Per Oro Valley Subdivision Street Standards and Policies Manual, SVT must be 5 mph over speed limit (45 mph), so SVT based on 50 mph design speed.

Acceleration/Deceleration Lanes, Auxiliary Lanes

Turn lane warrant criteria from the *Pima County Subdivision and Development Street Standards* were applied to determine whether a southbound right turn lane is warranted at the project intersection on La Canada Drive, a 45-mph roadway. There is an existing two-way left turn lane along La Canada Drive at the project driveway, so only the right turn lane warrant analysis was conducted. Exhibit 15 shows the right turn lane warrant criteria and where the southbound right turn lane volumes under the 2025 With Project condition fall on the chart. A right turn lane is not warranted at the project driveway.

Exhibit 15 Right Turn Lane Warrant Chart



Note: First number within parentheses is the major road peak hour volume; second number is the projected peak hour right turn volume.
Source: Pima County Subdivision and Development Street Standards, 2016

Driveway Spacing

As shown in the site plan, the driveway is directly opposite White Diamond Place, and there are no other driveways within 230 feet of the driveway. Therefore, the location of the driveway meets Pima County standards for driveway spacing on a 45-mph road. Oro Valley defers to Pima County standards for driveway spacing.

Gated Access

The development will have gated access. Pima County includes guidance on the placement of gates at the entrances to residential developments in their Subdivision and Development Street Standards:

"Gated entrances shall be allowed for commercial/industrial developments such as apartments where on-site parking areas are privately maintained and for residential subdivisions with private streets. Gated entries shall meet the following requirements:

Stopping locations (keypads, card-readers, guard shacks, etc.) shall be set back from the right-of-way of the cross street to avoid interfering with through traffic and to provide protection for entering vehicles.

The gate may not encroach into the travel lane when open.

Each side of a median-divided roadway/driveway shall be at least 16 feet wide to provide accessibility of emergency vehicles.

Any equipment or obstructions such as keypads or card-readers shall be installed in a median island.

The design of the entrance shall allow vehicles that do not go past the gate to turn around without interfering with other traffic.

The turnaround area shall be located within the development boundary outside of the collector or arterial right-of-way.

Gate Queuing Analysis

Using a basic Poisson distribution methodology, it is possible to estimate the average queue at a gate. The entering volume of 20 entering volumes per hour at the project driveway was applied to this analysis. We also assume that it takes an average of 30 seconds for a driver to activate the gate and to enter. The following queue equation is applied:

$E(n) = \rho/(1-\rho) = \lambda/(\mu - \lambda)$,

Where:

λ = arrival rate, in this case 20 vehicles/hour, or 0.33/minute,
μ = service rate, in this case 30 seconds per vehicle/hour, or 2 vehicles/minute,
$\rho = \lambda/\mu = 0.165$. This is the traffic intensity, or utilization factor.

This equation estimates the average number of queued vehicles plus the vehicle entering the gate.

The average number of vehicles in the queue is then:

$0.165/(1-0.165) = 0.20$ vehicle on average at the gate.

The probability that there will be three vehicles at the gate is:

$P(3) = \rho^3 \times P(0)$, where P(0) is the probability of no queue, and $P(0) = 1-\rho = 0.835$,

$= 0.165^3 \times 0.835 = 0.004$, or less than a 1% probability of a queue of 3 vehicles.

The probability of four or more vehicles queued decreases rapidly, so it can be estimated that there is a 99% probability that entering vehicles will not back up to the street if storage for at least three vehicles

is provided between the gate and the street. For this reason, it is recommended that there be enough space for three to four vehicles to queue before the gate keypad.

Alternative Modes Considerations

La Canada Drive has bike lanes, sidewalks and/or multi-use paths in the vicinity of the project. The area is well served for alternate modes.

6. Conclusions and Recommendations

1. The project will generate 321 daily trips, 24 AM peak hour trips and 32 PM peak hour trips.
2. All study area roadways and intersections will operate at LOS D or better based on projected 2025 daily and peak hour traffic volumes.
3. Based on a 2% background growth rate, the projected daily traffic volumes for 2025 without the project will not exceed the LOS D capacities of the project roadways and intersections.
4. A right turn lane is not numerically warranted for the southbound right turns from La Canada Drive into the project driveway.
5. The driveway spacing and corner clearances for the project driveway meet Pima County and Oro Valley standards.
6. The provision of gated entrances should conform to Oro Valley Subdivision Street Standards.
7. Roadway and subdivision design should conform to current jurisdictional standards. This includes ensuring that sight distance requirements are met.
8. All new traffic signs and markings, on-site and off-site, must comply fully with the *Manual on Uniform Traffic Control Devices* and Town requirements.

Appendix

- Site Plan
- Traffic Data
- Synchro Analysis

Property Data

1.	Property Area:	35.4± Ac.
2.	Assessor Parcel(s):	219-49-003A
3.	Existing Zoning:	R1-144
4.	Existing O.V. Gen. Plan:	LDR-1.2 West of Wash LDR-2.0 East of Wash
5.	FEMA Floodplain:	Zone 'X' (Minimal Flood Hazard)

Proposal Summary

1.	Gen. Plan:	No Change Proposed
2.	Rezoning:	R1-36
3.	Homes:	34
4.	Minimum Lot Size:	Half-Acre
5.	Average Lot Size:	0.9 Acre
6.	Gross Density:	0.96 Homes per Acre
7.	Open Space:	51% (ESOS + Non-ESOS Open Space) See ESOS Diagram Below Total ESOS Req'd. = 69% Total ESOS Provided = 46%
8.	Building Height:	18' Single-Story
9.	Max. Disturbance:	14,250 Sq. Ft. Avg. per Lot

ESOS Compliance

North Ridge Estates Conceptual Site Plan

"G:\Projects\21ab La Canada & Moore SWC\b01 Rezone\0230\Site Analysis\Exhibits\Site Plan.dwg"

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: La Canada Dr DATE: 11/02/23 LOCATION: Oro Valley

E-W STREET: White Diamond Pl DAY: THURSDAY PROJECT# 23-1537-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	0	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	49	0	0	157	0	0	0	0	4	0	2	212
7:15 AM	0	65	1	0	196	0	0	0	0	2	0	1	265
7:30 AM	0	85	1	1	164	0	0	0	0	5	0	0	256
7:45 AM	0	97	2	0	107	0	0	0	0	3	0	0	209
8:00 AM	0	80	2	0	96	0	0	0	0	1	0	1	180
8:15 AM	0	91	1	1	95	0	0	0	0	1	0	0	189
8:30 AM	0	89	1	0	131	0	0	0	0	3	0	0	224
8:45 AM	0	91	2	0	101	0	0	0	0	1	0	0	195
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	647	10	2	1047	0	0	0	0	20	0	4	1730
Approach %	0.00	98.48	1.52	0.19	99.81	0.00	####	####	####	83.33	0.00	16.67	
App/Depart	657	/	651	1049	/	1067	0	/	12	24	/	0	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	0	296	4	1	624	0	0	0	0	14	0	3	942
2025 NP	0	308	4	1	649	0	0	0	0	15	0	3	
Site Trips	5					1	4		14				
2025 WP	5	308	4	1	649	1	4	0	14	15	0	3	
Approach %	0.00	98.67	1.33	0.16	99.84	0.00	####	####	####	82.35	0.00	17.65	

PEAK HR. FACTOR:	0.758	0.797	0.000	0.708	0.889

CONTROL: 1-Way Stop (WB)
COMMENT 1:
GPS: 32.436510, -110.991071

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745
veracitytrafficgroup

N-S STREET: La Canada Dr
0
E-W STREET: White Diamond Pl

DATE: 11/02/23
DAY: THURSDAY

LOCATION: Oro Valley
PROJECT# 23-1537-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	2	0	1	2	0	0	0	0	0	1	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	0	113	3	0	105	0	0	0	0	1	0	1	223
4:15 PM	0	127	2	0	89	0	0	0	0	1	0	0	219
4:30 PM	0	134	1	0	85	0	0	0	0	2	0	0	222
4:45 PM	0	99	3	0	90	0	0	0	0	3	0	0	195
5:00 PM	0	127	2	1	76	0	0	0	0	2	0	0	208
5:15 PM	0	90	3	1	73	0	0	0	0	3	0	0	170
5:30 PM	0	126	5	0	81	0	0	0	0	3	0	1	216
5:45 PM	0	97	2	0	74	0	0	0	0	1	0	0	174
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	0	913	21	2	673	0	0	0	0	16	0	2	1627
Approach %	0.00	97.75	2.25	0.30	99.70	0.00	####	####	####	88.89	0.00	11.11	
App/Depart	934	/	915	675	/	689	0	/	23	18	/	0	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	0	473	9	0	369	0	0	0	0	7	0	1	859
2025 NP	0	492	9	0	384	0	0	0	0	7	0	1	
Site Trips	18					2	1		11				
2025 WP	18	492	9	0	384	2	1	0	11	7	0	1	
Approach %	0.00	98.13	1.87	0.00	100.00	0.00	####	####	####	87.50	0.00	12.50	

PEAK HR. FACTOR:	0.893	0.879	0.000	0.667	0.963

CONTROL: 1-Way Stop (WB)
COMMENT 1: 0
GPS: 32.436510, -110.991071

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: La Canada Dr DATE: 11/02/23 LOCATION: Oro Valley

E-W STREET: Moore Rd DAY: THURSDAY PROJECT# 23-1537-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	1	0	1	1	0	1	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	3	12	36	15	75	12	7	20	22	60	25	1	288
7:15 AM	3	30	33	14	89	30	7	31	30	77	43	2	389
7:30 AM	4	52	29	3	79	21	9	24	21	65	36	3	346
7:45 AM	4	48	45	7	59	23	16	36	15	33	38	6	330
8:00 AM	3	42	36	3	45	23	24	26	10	41	26	4	283
8:15 AM	6	43	42	5	44	14	15	15	16	36	22	9	267
8:30 AM	4	52	33	8	72	32	9	16	22	37	32	8	325
8:45 AM	3	56	32	3	65	10	11	20	8	28	16	4	256
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	30	335	286	58	528	165	98	188	144	377	238	37	2484
Approach %	4.61	51.46	43.93	7.72	70.31	21.97	22.79	43.72	33.49	57.82	36.50	5.67	
App/Depart	651	/	470	751	/	1049	430	/	532	652	/	433	

AM Peak Hr Begins at: 700 AM

PEAK													
Volumes	14	142	143	39	302	86	39	111	88	235	142	12	1353
2025 NP	15	148	149	41	314	89	41	115	92	244	148	12	
Site Trips	0	2	2		1				0	0			
2025 WP	15	150	151	41	315	89	41	115	92	244	148	12	
Approach %	4.68	47.49	47.83	9.13	70.73	20.14	16.39	46.64	36.97	60.41	36.50	3.08	

PEAK HR. FACTOR:	0.771	0.803	0.875	0.797	0.870

CONTROL: Round a bout
COMMENT 1:
GPS: 32.438370, -110.991084

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET: La Canada Dr
0
E-W STREET: Moore Rd

DATE: 11/02/23
DAY: THURSDAY

LOCATION: Oro Valley
PROJECT# 23-1537-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	1	0	1	1	0	1	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	8	59	47	5	44	17	12	17	13	48	45	11	326
4:15 PM	7	68	52	4	43	16	15	22	11	35	24	10	307
4:30 PM	9	75	50	7	36	17	11	25	13	36	21	16	316
4:45 PM	7	50	42	6	41	9	12	21	15	34	36	12	285
5:00 PM	14	53	60	1	31	8	13	18	13	33	28	15	287
5:15 PM	6	47	37	2	40	14	7	23	9	25	18	14	242
5:30 PM	11	69	47	2	48	13	8	26	13	20	26	11	294
5:45 PM	11	51	35	1	38	13	10	21	7	29	15	11	242
6:00 PM													
6:15 PM													
6:30 PM													
6:45 PM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	73	472	370	28	321	107	88	173	94	260	213	100	2299
Approach %	7.98	51.58	40.44	6.14	70.39	23.46	24.79	48.73	26.48	45.38	37.17	17.45	
App/Depart	915	/	660	456	/	675	355	/	571	573	/	393	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	31	252	191	22	164	59	50	85	52	153	126	49	1234
2025 NP	32	262	199	23	171	61	52	88	54	159	131	51	
Site Trips	0	1	0		1				0	1			
2025 WP	32	263	199	23	172	61	52	88	54	160	131	51	
Approach %	6.54	53.16	40.30	8.98	66.94	24.08	26.74	45.45	27.81	46.65	38.41	14.94	

PEAK HR. FACTOR:	0.884	0.928	0.954	0.788	0.946

CONTROL: Round a bout
COMMENT 1: 0
GPS: 32.438370, -110.991084

Prepared by: Field Data Services of Arizona/Veracity Traffic Group (520) 316-6745

Volumes for: Thursday, November 2, 2023 City: Oro Valley Project #: 23-1537-003

Location: La Canada Dr south of Moore Rd

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	5		1					12:00	71		68				
00:15	2		1					12:15	83		79				
00:30	3		4					12:30	69		74				
00:45	2	12	0	6			18	12:45	90	313	77	298			611
01:00	2		0					13:00	71		70				
01:15	1		1					13:15	73		72				
01:30	0		0					13:30	88		99				
01:45	2	5	0	1			6	13:45	85	317	72	313			630
02:00	1		0					14:00	91		97				
02:15	0		1					14:15	89		87				
02:30	0		2					14:30	84		107				
02:45	0	1	2	5			6	14:45	109	373	128	419			792
03:00	0		2					15:00	134		95				
03:15	1		2					15:15	131		65				
03:30	2		6					15:30	114		130				
03:45	2	5	6	16			21	15:45	116	495	98	388			883
04:00	2		9					16:00	114		105				
04:15	6		9					16:15	127		89				
04:30	4		13					16:30	134		85				
04:45	3	15	20	51			66	16:45	99	474	90	369			843
05:00	1		16					17:00	127		77				
05:15	7		22					17:15	90		74				
05:30	13		33					17:30	127		81				
05:45	13	34	31	102			136	17:45	97	441	74	306			747
06:00	18		45					18:00	97		65				
06:15	16		64					18:15	90		56				
06:30	33		69					18:30	75		51				
06:45	56	123	93	271			394	18:45	86	348	40	212			560
07:00	51		157					19:00	72		34				
07:15	66		196					19:15	77		21				
07:30	85		165					19:30	62		37				
07:45	97	299	107	625			924	19:45	56	267	23	115			382
08:00	81		96					20:00	60		21				
08:15	91		96					20:15	34		17				
08:30	89		131					20:30	54		28				
08:45	91	352	101	424			776	20:45	58	206	23	89			295
09:00	93		96					21:00	39		8				
09:15	64		74					21:15	39		9				
09:30	42		99					21:30	26		13				
09:45	64	263	74	343			606	21:45	21	125	6	36			161
10:00	74		79					22:00	17		7				
10:15	49		85					22:15	16		9				
10:30	67		78					22:30	15		7				
10:45	68	258	61	303			561	22:45	17	65	6	29			94
11:00	72		82					23:00	7		6				
11:15	68		88					23:15	13		2				
11:30	63		64					23:30	6		3				
11:45	84	287	72	306			593	23:45	7	33	1	12			45
Total Vol.		1654		2453			**4107**			3457		2586			**6043**

GPS Coordinates: 32.437413, -110.991086

Daily Totals

NB	SB	EB	WB	Combined
5111	5039			**10150**

	AM			PM		
Split %	40.3%	59.7%	**40.5%**	57.2%	42.8%	**59.5%**
Peak Hour	08:15	07:00	**07:00**	15:00	15:30	**14:45**
Volume	364	625	**924**	495	422	**906**
P.H.F.	0.98	0.80	**0.88**	0.92	0.81	**0.93**

Intersection	
Int Delay, s/veh	0.3

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	14	3	0	296	4	1	624
Future Vol, veh/h	14	3	0	296	4	1	624
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	215	-	-	160	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	71	71	76	76	76	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	20	4	0	389	5	1	780

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	784	197	780	0	0	394	0
Stage 1	392	-	-	-	-	-	-
Stage 2	392	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	330	811	459	-	-	1161	-
Stage 1	652	-	-	-	-	-	-
Stage 2	652	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	330	811	459	-	-	1161	-
Mov Cap-2 Maneuver	330	-	-	-	-	-	-
Stage 1	652	-	-	-	-	-	-
Stage 2	651	-	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	15.4	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	459	-	-	369	1161	-
HCM Lane V/C Ratio	-	-	-	0.065	0.001	-
HCM Control Delay (s)	0	-	-	15.4	8.1	-
HCM Lane LOS	A	-	-	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0	-

Intersection	
Intersection Delay, s/veh	7.4
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	270	487	388	535
Demand Flow Rate, veh/h	276	497	396	546
Vehicles Circulating, veh/h	736	251	224	500
Vehicles Exiting, veh/h	310	369	788	248
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.4	7.6	4.7	9.2
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized								
Lane Util	0.630	0.370	0.970	0.030	0.520	0.480	0.799	0.201
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.544	4.544	4.544	4.544	4.544	4.544
Entry Flow, veh/h	174	102	482	15	206	190	436	110
Cap Entry Lane, veh/h	727	727	1130	1130	1158	1158	901	901
Entry HV Adj Factor	0.980	0.980	0.980	1.000	0.982	0.979	0.980	0.982
Flow Entry, veh/h	170	100	472	15	202	186	427	108
Cap Entry, veh/h	712	713	1108	1130	1137	1134	883	885
V/C Ratio	0.239	0.140	0.427	0.013	0.178	0.164	0.484	0.122
Control Delay, s/veh	7.8	6.6	7.8	3.3	4.7	4.6	10.3	5.2
LOS	A	A	A	A	A	A	B	A
95th %tile Queue, veh	1	0	2	0	1	1	3	0

Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBU	NBT	NBR	SBL	SBT
Lane Configurations							
Traffic Vol, veh/h	7	1	0	473	9	0	369
Future Vol, veh/h	7	1	0	473	9	0	369
Conflicting Peds, #/hr	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	-	None	-	None
Storage Length	0	-	215	-	-	160	-
Veh in Median Storage, #	0	-	-	0	-	-	0
Grade, %	0	-	-	0	-	-	0
Peak Hour Factor	67	67	89	89	89	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	10	1	0	531	10	0	419

Major/Minor	Minor1		Major1			Major2	
Conflicting Flow All	746	271	419	0	0	541	0
Stage 1	536	-	-	-	-	-	-
Stage 2	210	-	-	-	-	-	-
Critical Hdwy	6.84	6.94	6.44	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	2.52	-	-	2.22	-
Pot Cap-1 Maneuver	349	727	779	-	-	1024	-
Stage 1	551	-	-	-	-	-	-
Stage 2	805	-	-	-	-	-	-
Platoon blocked, %				-	-		-
Mov Cap-1 Maneuver	349	727	779	-	-	1024	-
Mov Cap-2 Maneuver	349	-	-	-	-	-	-
Stage 1	551	-	-	-	-	-	-
Stage 2	805	-	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBU	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	779	-	-	373	1024	-
HCM Lane V/C Ratio	-	-	-	0.032	-	-
HCM Control Delay (s)	0	-	-	15	0	-
HCM Lane LOS	A	-	-	C	A	-
HCM 95th %tile Q(veh)	0	-	-	0.1	0	-

Intersection	
Intersection Delay, s/veh	5.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	197	415	538	263
Demand Flow Rate, veh/h	201	423	549	268
Vehicles Circulating, veh/h	402	382	169	396
Vehicles Exiting, veh/h	262	336	434	409
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.9	7.0	5.1	5.3
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized								
Lane Util	0.721	0.279	0.851	0.149	0.597	0.403	0.761	0.239
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.544	4.544	4.544	4.544	4.544	4.544
Entry Flow, veh/h	145	56	360	63	328	221	204	64
Cap Entry Lane, veh/h	985	985	1003	1003	1218	1218	990	990
Entry HV Adj Factor	0.981	0.982	0.980	0.984	0.979	0.982	0.983	0.984
Flow Entry, veh/h	142	55	353	62	321	217	200	63
Cap Entry, veh/h	966	967	983	987	1193	1196	973	975
V/C Ratio	0.147	0.057	0.359	0.063	0.269	0.181	0.206	0.065
Control Delay, s/veh	5.1	4.2	7.5	4.2	5.5	4.6	5.7	4.3
LOS	A	A	A	A	A	A	A	A
95th %tile Queue, veh	1	0	2	0	1	1	1	0

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↰	↑↕		↰	↑↕	
Traffic Vol, veh/h	4	0	14	15	0	3	5	308	4	1	649	1
Future Vol, veh/h	4	0	14	15	0	3	5	308	4	1	649	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	215	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	71	71	71	76	76	76	80	80	80
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	0	15	21	0	4	7	405	5	1	811	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1031	1238	406	830	1236	205	812	0	0	410	0	0
Stage 1	814	814	-	422	422	-	-	-	-	-	-	-
Stage 2	217	424	-	408	814	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	187	174	594	263	175	802	810	-	-	1145	-	-
Stage 1	338	390	-	580	587	-	-	-	-	-	-	-
Stage 2	765	585	-	591	390	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	185	172	594	254	173	802	810	-	-	1145	-	-
Mov Cap-2 Maneuver	185	172	-	254	173	-	-	-	-	-	-	-
Stage 1	335	390	-	575	582	-	-	-	-	-	-	-
Stage 2	754	580	-	575	390	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	14.5	18.8	0.1	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	810	-	-	398	287	1145	-	-
HCM Lane V/C Ratio	0.008	-	-	0.049	0.088	0.001	-	-
HCM Control Delay (s)	9.5	-	-	14.5	18.8	8.1	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.3	0	-	-

Intersection	
Intersection Delay, s/veh	7.8
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	283	505	410	556
Demand Flow Rate, veh/h	289	515	418	567
Vehicles Circulating, veh/h	765	266	234	519
Vehicles Exiting, veh/h	321	386	820	262
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.7	8.0	4.8	9.9
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized								
Lane Util	0.630	0.370	0.971	0.029	0.522	0.478	0.801	0.199
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.544	4.544	4.544	4.544	4.544	4.544
Entry Flow, veh/h	182	107	500	15	218	200	454	113
Cap Entry Lane, veh/h	708	708	1115	1115	1148	1148	885	885
Entry HV Adj Factor	0.980	0.981	0.981	1.000	0.982	0.980	0.980	0.982
Flow Entry, veh/h	178	105	490	15	214	196	445	111
Cap Entry, veh/h	694	695	1093	1115	1127	1125	868	870
V/C Ratio	0.257	0.151	0.449	0.013	0.190	0.174	0.513	0.128
Control Delay, s/veh	8.3	6.9	8.2	3.3	4.9	4.7	11.0	5.4
LOS	A	A	A	A	A	A	B	A
95th %tile Queue, veh	1	1	2	0	1	1	3	0

Intersection	
Int Delay, s/veh	0.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	0	11	7	0	1	18	492	9	0	384	2
Future Vol, veh/h	1	0	11	7	0	1	18	492	9	0	384	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	215	-	-	160	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	67	67	67	89	89	89	88	88	88
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	1	0	12	10	0	1	20	553	10	0	436	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	754	1040	219	816	1036	282	438	0	0	563	0	0
Stage 1	437	437	-	598	598	-	-	-	-	-	-	-
Stage 2	317	603	-	218	438	-	-	-	-	-	-	-
Critical Hdwy	7.54	6.54	6.94	7.54	6.54	6.94	4.14	-	-	4.14	-	-
Critical Hdwy Stg 1	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.54	5.54	-	6.54	5.54	-	-	-	-	-	-	-
Follow-up Hdwy	3.52	4.02	3.32	3.52	4.02	3.32	2.22	-	-	2.22	-	-
Pot Cap-1 Maneuver	298	229	785	269	230	715	1118	-	-	1005	-	-
Stage 1	568	578	-	456	489	-	-	-	-	-	-	-
Stage 2	669	487	-	764	577	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	293	225	785	261	226	715	1118	-	-	1005	-	-
Mov Cap-2 Maneuver	293	225	-	261	226	-	-	-	-	-	-	-
Stage 1	558	578	-	448	480	-	-	-	-	-	-	-
Stage 2	656	478	-	752	577	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.3	18.2	0.3	0
HCM LOS	B	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1118	-	-	689	284	1005	-	-
HCM Lane V/C Ratio	0.018	-	-	0.019	0.042	-	-	-
HCM Control Delay (s)	8.3	-	-	10.3	18.2	0	-	-
HCM Lane LOS	A	-	-	B	C	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.1	0.1	0	-	-

Intersection	
Intersection Delay, s/veh	5.9
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	2	2	2	2
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	205	434	561	276
Demand Flow Rate, veh/h	209	442	573	282
Vehicles Circulating, veh/h	421	398	176	413
Vehicles Exiting, veh/h	273	351	454	427
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.0	7.3	5.3	5.6
Approach LOS	A	A	A	A

Lane	Left	Right	Left	Right	Left	Right	Left	Right
Designated Moves	LT	R	LT	R	LT	R	LT	R
Assumed Moves	LT	R	LT	R	LT	R	LT	R
RT Channelized								
Lane Util	0.722	0.278	0.851	0.149	0.597	0.403	0.762	0.238
Follow-Up Headway, s	2.535	2.535	2.535	2.535	2.535	2.535	2.535	2.535
Critical Headway, s	4.544	4.544	4.544	4.544	4.544	4.544	4.544	4.544
Entry Flow, veh/h	151	58	376	66	342	231	215	67
Cap Entry Lane, veh/h	968	968	989	989	1210	1210	975	975
Entry HV Adj Factor	0.981	0.983	0.981	0.985	0.980	0.978	0.978	0.985
Flow Entry, veh/h	148	57	369	65	335	226	210	66
Cap Entry, veh/h	950	951	969	974	1185	1184	954	961
V/C Ratio	0.156	0.060	0.380	0.067	0.283	0.191	0.220	0.069
Control Delay, s/veh	5.3	4.3	7.9	4.3	5.6	4.7	5.9	4.4
LOS	A	A	A	A	A	A	A	A
95th %tile Queue, veh	1	0	2	0	1	1	1	0