SOUTHWEST TRAFFIC ENGINEERING, LLC

TRAFFIC IMPACT ANALYSIS

THE RESIDENCES AT APACHE TRAIL

BROADWAY AVENUE/TOMAHAWK ROAD

14 JULY 2021

PREPARED FOR

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TRAFFIC IMPACT ANALYSIS
THE RESIDENCES AT APACHE TRAIL
BROADWAY AVENUE/TOMAHAWK ROAD

Executive Summary

The purpose of this traffic study is to evaluate the current and future transportation system within the project study area surrounding the site without and with the proposed Residences at Apache Trail project.

Existing and Future Traffic Data Without Project
All of the study intersections currently operate at an adequate level of service (LOS) and are expected to continue doing so in 2022 without traffic from the project.

Future Traffic Data With Project
All of the study intersections are anticipated to operate at an adequate LOS in 2022 without and with traffic from The Residences at Apache Trail site.

Turn Lane Analysis
Auxiliary turn lanes are not warranted at the access points directly serving the project site.

Crash Analysis
Of the fourteen (14) recorded crashes in the five-year study period at the intersection of Royal Palms Road/Old West Highway, eleven (11) were angle or left turn type collisions. These are likely due to the divided highway configuration of the intersections, where vehicles cross one direction of travel, make a complete STOP in the 'median intersection' before crossing over the second set of travel lanes. During periods of high traffic volumes, these movements can be difficult to complete, resulting in drivers rushing in their attempt to make a turn during an unsuitable gap in traffic.

Due to the limited number of crashes recorded at the other study intersections, no specific crash trends can be determined.

Traffic Signal Warrant Analysis
Traffic signal warrants do not currently meet and are not expected to be met in 2022 without and with traffic from the project site at the intersection of Broadway Avenue/Tomahawk Road.

TRAFFIC IMPACT ANALYSIS
THE RESIDENCES AT APACHE TRAIL
BROADWAY AVENUE/TOMAHAWK ROAD

Project Description

Sonoma Communities has proposed to develop the southwest corner of Broadway Avenue/Tomahawk Road in Apache Junction, Arizona. The project will consist of a 201 units of multi-family housing. The vicinity of the project is shown in **Figure 1**. The site is located as shown in **Figure 2**. This study will include the opening year (2022). Two (2) proposed access points will serve The Residences at Apache Trail project site.

The purpose of this traffic impact analysis is to:

- Evaluate the current and future operational characteristics of the adjacent roadway network surrounding the project site.
- Estimate the traffic generation associated with the project and assign that traffic to the existing roadway system.
- Analyze future traffic operations at five existing intersection and the two proposed access points.
- Determine the need for auxiliary lanes at the two access points directly serving the site.
- Determine if any specific crash trends are present in the study area.
- Evaluate the need for the installation of a traffic signal at the intersection of Broadway Avenue/Tomahawk Road.

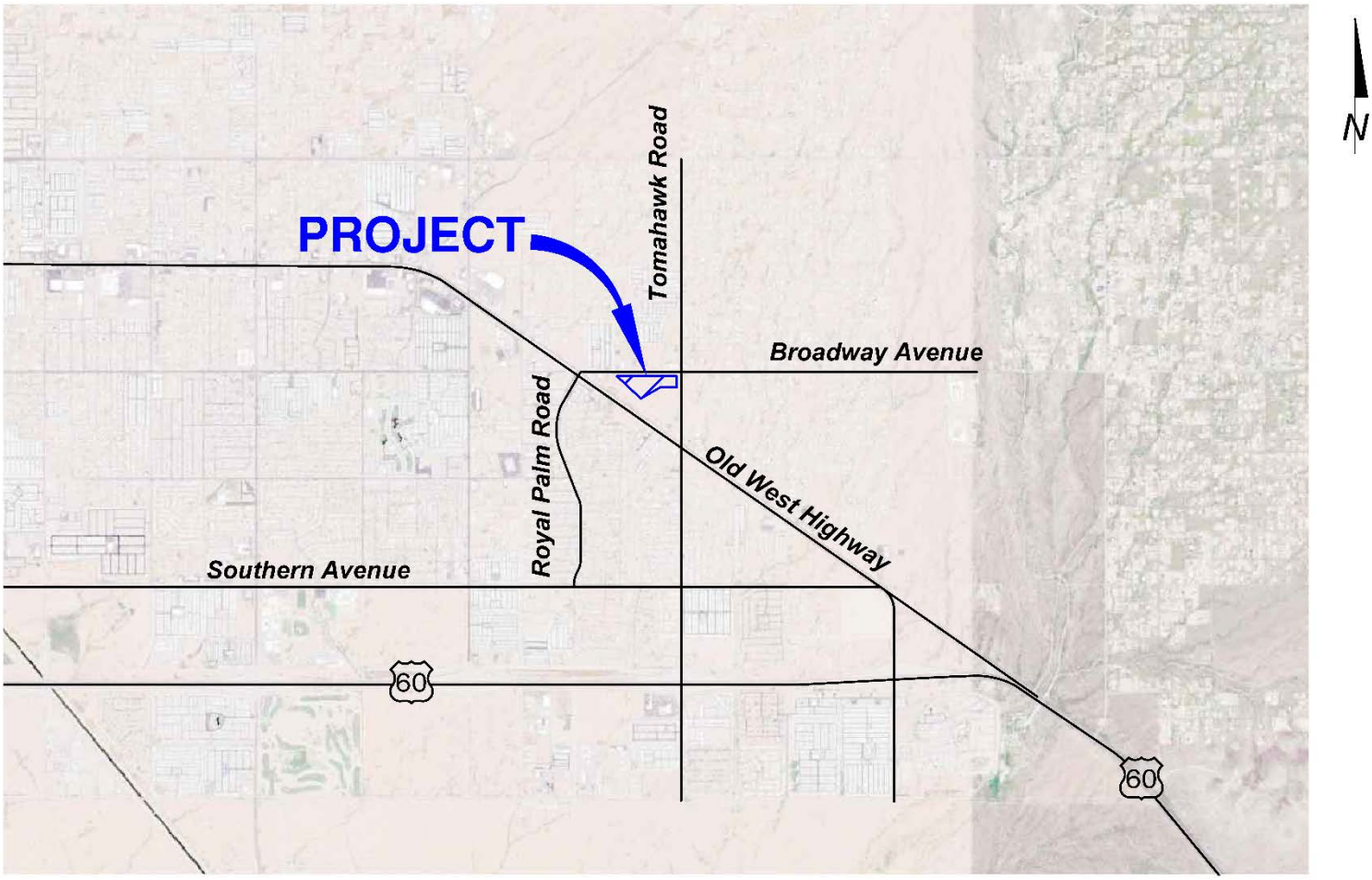
The author of this report is a registered Professional Engineer (Civil) in the State of Arizona having specific expertise and experience in the preparation of traffic impact analyses.

Study Methodology

In order to analyze and evaluate the potential traffic impacts of the proposed development, the following tasks were undertaken:

- Field observation of the proposed site and surrounding area was conducted to evaluate the existing physical and operational characteristics of the adjacent roadway network.
- Site traffic volumes generated by the proposed and existing sites were calculated using the *Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition,* 2017.
- Calculated site traffic was distributed based on existing traffic volumes and assigned to the primary roadways within the project study limits.
- Capacity analyses were performed for the existing conditions and future conditions without and with the project based on an opening year of 2022.

Figure 1 – Vicinity Map



LEGEND:

EXISTING ROAD

PROJECT SITE

LAND PLAN SUMMARY

SITE AREA: ≈ 22.77 ACRES (GROSS)
≈ 20.00 ACRES (NET)
≈ 16.60 ACRES (DEVELOPABLE, MINUS DRAINAGE AREAS)

UNITS: 201 (10.05 DU/ACRE - NET)
(12.11 DU/ACRE - DEVELOPABLE)
- 1 BEDROOM (SMALL): 12 (6%)
- 1 BEDROOM (LARGE): 62 (31%)
- 2 BEDROOM UNITS: 108 (53.5%)
- 2 BEDROOM (CARRIAGE): 8 (4%)
- 3 BEDROOM UNITS: 11 (5.5%)

* SINGLE STORY UNITS ONLY. MAX. BLD. HEIGHT = 24'
** CARRIAGE HOUSE GARAGES = 30'

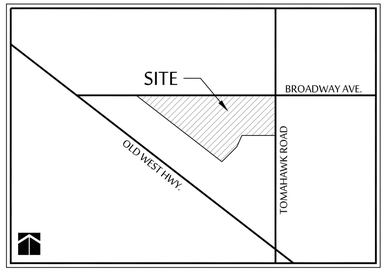
PARKING SPACES REQUIRED:
(9' X 18' MIN.)
PARKING SPACES PROVIDED: 431 (2.14 / UNIT)
- 399 SURFACE SPACES
- 32 GARAGES (W/ 24 STORAGE UNITS)

* RESIDENT AMENITIES MAY INCLUDE A POOL AREA, DOG PARK, TURF AREAS, BBQ/DINING AREAS, FIRE PITS, SHADED SEATING AREAS AND A RESIDENCE CLUBHOUSE.

LEGEND

- 1-BEDROOM (SMALL)
- 1-BEDROOM (LARGE)
- 2 BEDROOM UNIT
- 3 BEDROOM UNIT
- STORAGE UNIT (TYP.)
- GARAGES W/ 2BR CARRIAGE HOUSE

VICINITY MAP



MCGOUGH ADAMSON
Landscape Architects
Land Planning
Irrigation

SONOMA COMMUNITIES

THE RESIDENCES AT APACHE TRAIL

CONCEPT PLAN - 2.0

SWC OF BROADWAY AVE. & TOMAHAWK RD. - APACHE JUNCTION, AZ

JUNE 11, 2021

SCALE: 1"=60'-0"
0' 30' 60' 120' 180'

NORTH

- The intersections were analyzed using the methodology presented in the *2016 Highway Capacity Manual 6th Edition (HCM 6th)*.
- The need for auxiliary turn lanes at the study intersections directly serving the site were evaluated based on City of Apache Junction guidelines.
- Crash data was obtained from the Arizona Department of Transportation (ADOT) database for the study area.
- Traffic Signal Warrants were evaluated at the intersection of Broadway Avenue/Tomahawk Road based on existing and 2022 traffic volumes, without and with traffic from the proposed site.

Existing Conditions

Old West Highway is a 45 mile per hour (mph) urban principal arterial divided roadway that serves existing residential areas in the immediate vicinity of the project site. The alignment of Old West Highway runs northwest-southeast. For the purposes of this report, traffic volumes along Old West Highway will be consider as eastbound and westbound. Two lanes are provided in each direction separated by a wide dirt median. To the west, Old West Highway transitions into Apache Trail and provides access to Arizona State Route 88 (Idaho Road).

The City of Apache Junction has classified Tomahawk Road as a north-south, minor arterial roadway with a posted speed limit of 35 mph that provides one-lane in each direction. Tomahawk Road provides access to surrounding residential developments and to the United States Highway 60, approximately one and one-half miles south of the project site.

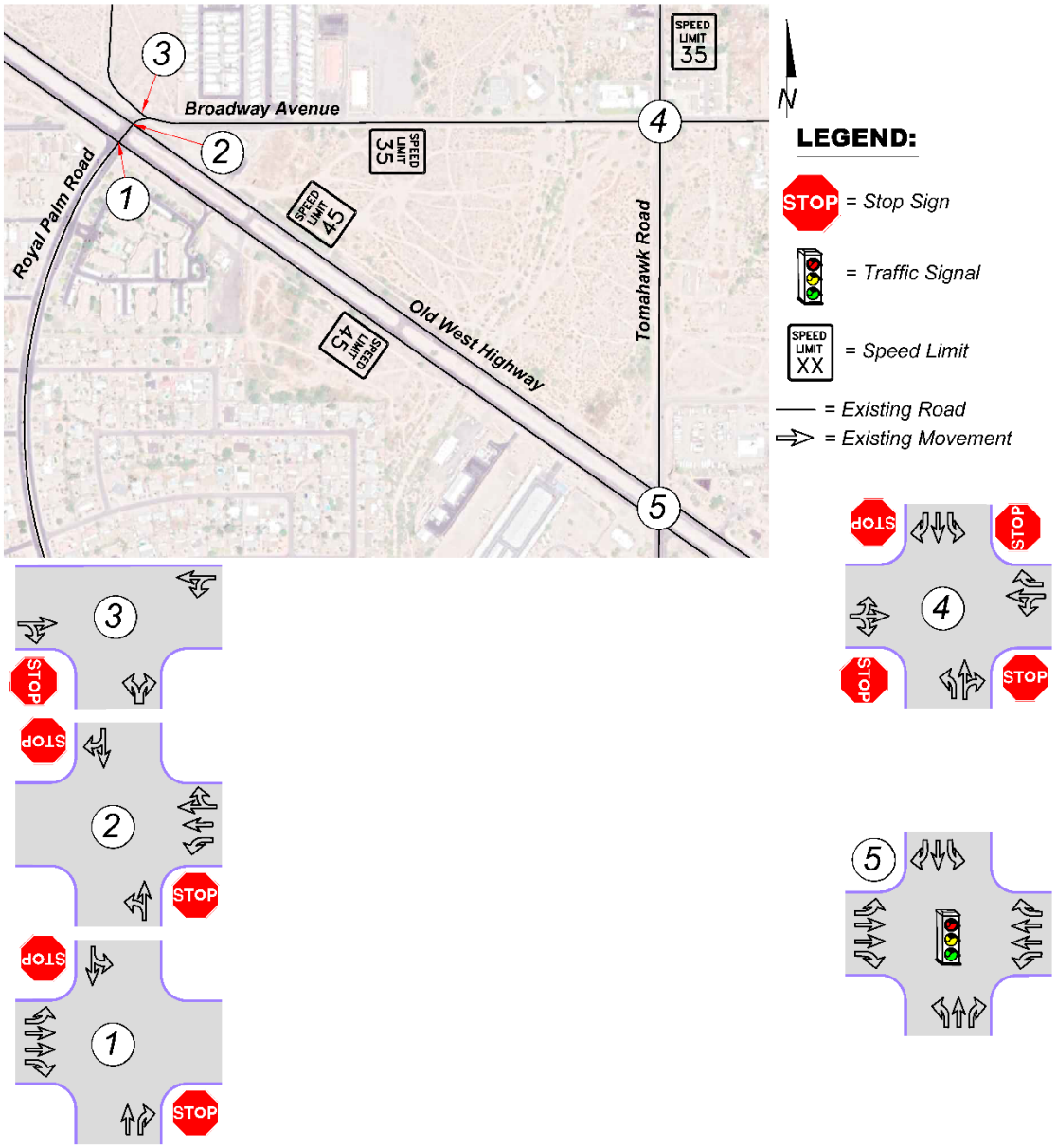
East-west Broadway Avenue is a minor arterial roadway with a posted speed limit of 35 mph in the vicinity of the project site. Along the project frontage, Broadway Avenue is a two-lane roadway, providing one lane in each direction of travel.

Royal Palm Road is a residential collector roadway with a posted speed limit of 30 mph which extends south from Old West Highway towards Southern Avenue. One lane is offered in each direction of travel, separated by a raised, concrete median.

The intersection of Tomahawk Road/Old West Highway is a four-leg, signalized intersection. Northbound and southbound movements operate under split traffic signal phasing and are offered a dedicated left turn lane, a through lane, and an exclusive right turn lane. Eastbound and westbound traffic are offered protected only left turn movements and utilize a left turn lane, two through lanes, and an exclusive right turn lane.

Existing lane configurations and traffic control are shown in **Figure 3**.

Figure 3 – Existing Lane Configurations and Traffic Control



Due to the configuration of the intersection of Royal Palms Road/Old West Highway, and the nature of completing turning movement across a divided highway, this intersection was analyzed as two separate intersections, as shown in **Figure 3**. The intermediate 'median intersection' between the eastbound and westbound travel lanes of Old West Highway provides approximately 30 feet of storage for vehicles to complete their two-staged movements to and from Old West Highway at these intersections.

Existing Traffic Data

In order to form a basis for analysis of the project impacts, weekday AM and PM peak hour turning movement counts were conducted at the following intersections:

- Tomahawk Road/Old West Highway
- Broadway Avenue/Tomahawk Road
- Royal Palm Road/Broadway Road
- Royal Palm Road/Old West Highway

The weekday turning movement counts were conducted from 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM in February 2020 while school was in session.

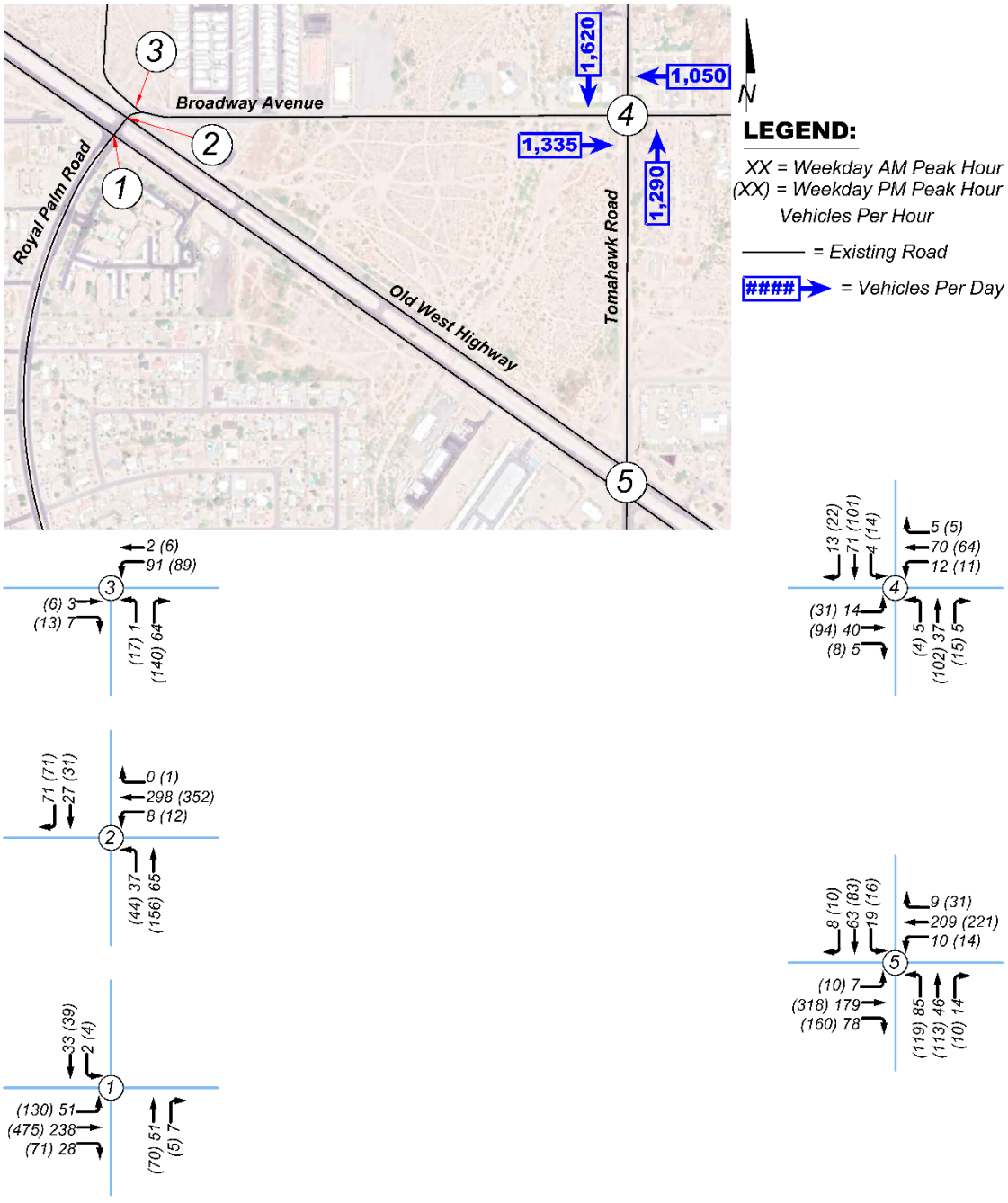
Weekday 24-hour intersection approach counts were also completed at the intersection of Broadway Avenue/Tomahawk Road.

The existing weekday daily, weekday AM peak hour, and weekday PM peak hour traffic volumes are shown in **Figure 4**. The complete traffic count summaries can be found in the Appendix.

Due to the recent impacts from the COVID-19 pandemic, many non-essential businesses have been forced to close or employees have been asked to work from home. People are also being asked to adhere to social distancing guidelines from the federal government. These implications have led to a reduction in vehicle trips on the roadway system.

Since these restrictions have been put in place, the Maricopa Association of Governments (MAG) has been collecting and analyzing traffic volume data within Maricopa County as it relates to the impacts of COVID-19. The basis of their analysis assumes that the average weekday traffic volumes in the first week of March 2020 were 'normal' traffic conditions, defined as 100%. Based on this assumption, MAG has reported that, beginning in February 2021, traffic volumes have approached 99% of this 'normal' value. Due to this, no corrective growth rate was applied to traffic volumes in the study area.

Figure 4 – Weekday Peak Hour Traffic Volumes



Access

Two (2) proposed access points will serve the proposed Residences at Apache Trail development.

West Access will be located approximately 900 feet west of Tomahawk Road, on the south side of Broadway Avenue. This access point will provide access to the leasing office, future resident parking areas and 173 of the proposed multi-family units. Northbound traffic exiting the site will be offered a shared left turn/right turn lane. Entering the site from Broadway Avenue, eastbound traffic will make use of a shared through/right turn lane while westbound vehicles will utilize a shared left turn/through lane.

East Access will serve as an access point for 28 multi-family units and will be located approximately 250 feet west of Tomahawk Road, on the south side of Broadway Avenue. Northbound traffic exiting the site will be offered a shared left turn/right turn lane. Entering the site from Broadway Avenue, eastbound traffic will make use of a shared through/right turn lane while westbound vehicles will utilize a shared left turn/through lane.

Figure 5 shows the locations, geometry and spacing for the proposed access points serving The Residences at Apache Trail that will serve as a baseline of analysis in the report.

Sight distances at the proposed access points should be verified during the design process.

Trip Generation

Trip generation for the project was developed utilizing nationally agreed upon data contained in the Institute of Transportation Engineers (ITE) publication *Trip Generation, 10th Edition*, 2017.

The Residences at Apache Trail project proposes 201 units of multifamily housing utilizing ITE Land Use Code (LUC) 220, Multifamily Housing (Low-Rise). **Table 1** presents the results of the ITE trip generation for the proposed Residences at Apache Trail project. The complete trip generation calculations can be found in the Appendix of the report.

Figure 5 –Baseline Access Point & Intersection Configuration Assumptions

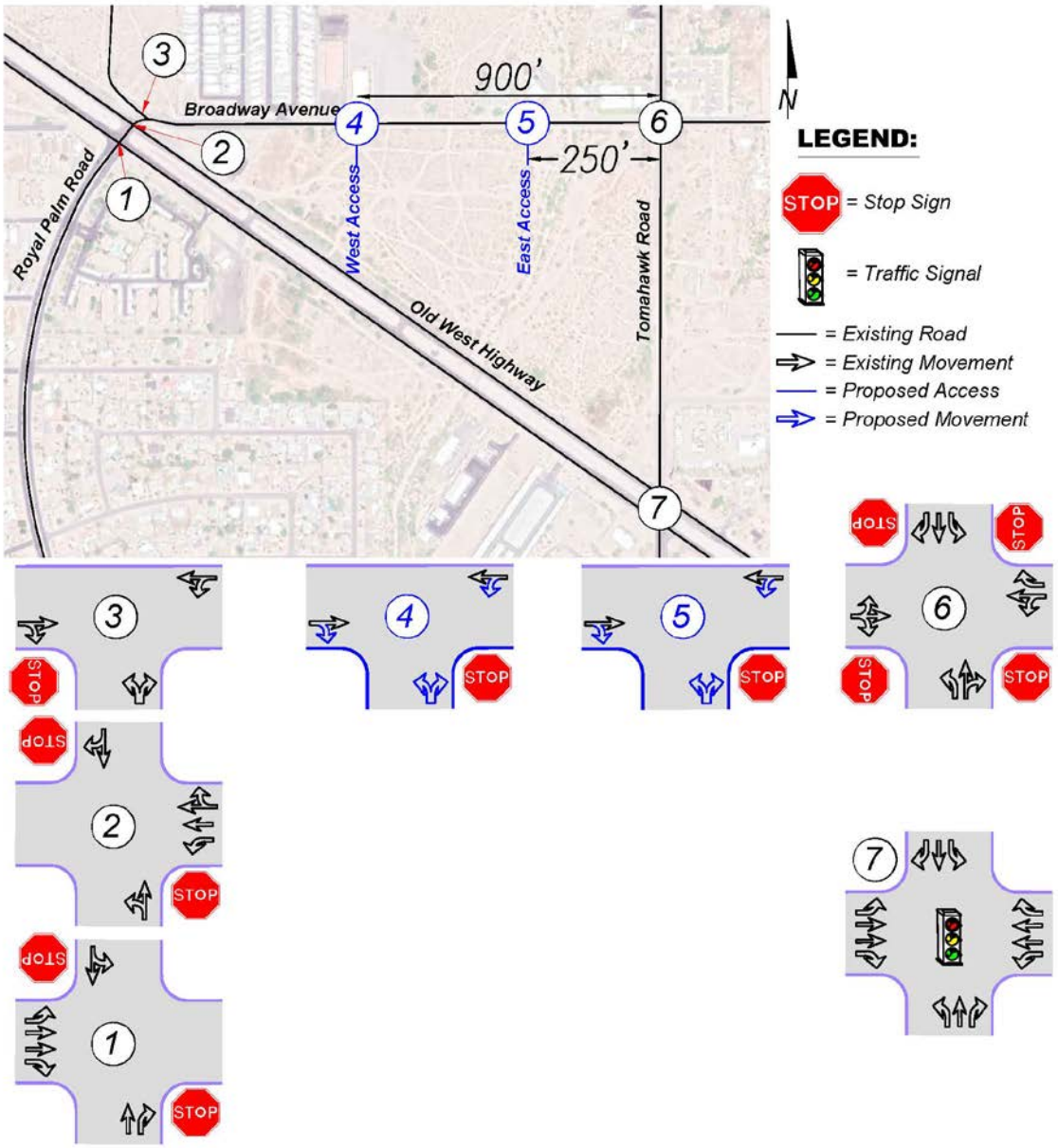


Table 1 – Weekday Project Site Generated Trips

Time Period	201 Unit Multi-Family Housing (LUC 220)
Average Daily, Inbound (vtpd)	720
Average Daily, Outbound (vtpd)	720
Total Daily	**1,440**
AM Peak Hour, Inbound (vtph)	21
AM Peak Hour, Outbound (vtph)	73
Total AM Peak	**94**
PM Peak Hour, Inbound (vtph)	72
PM Peak Hour, Outbound (vtph)	43
Total PM Peak	**115**

vtpd - vehicle trips per day, vtph - vehicle trips per hour

Trip Distribution & Assignment

Trip distribution for the proposed project was based on the existing traffic patterns observed at the study intersection. **Figure 6** shows the weekday peak hour trip distribution for the project as a percentage of net new primary trips.

Figure 7 shows the assignment of generated vehicle trips to the project intersections within the study area for The Residences at Apache Trail site.

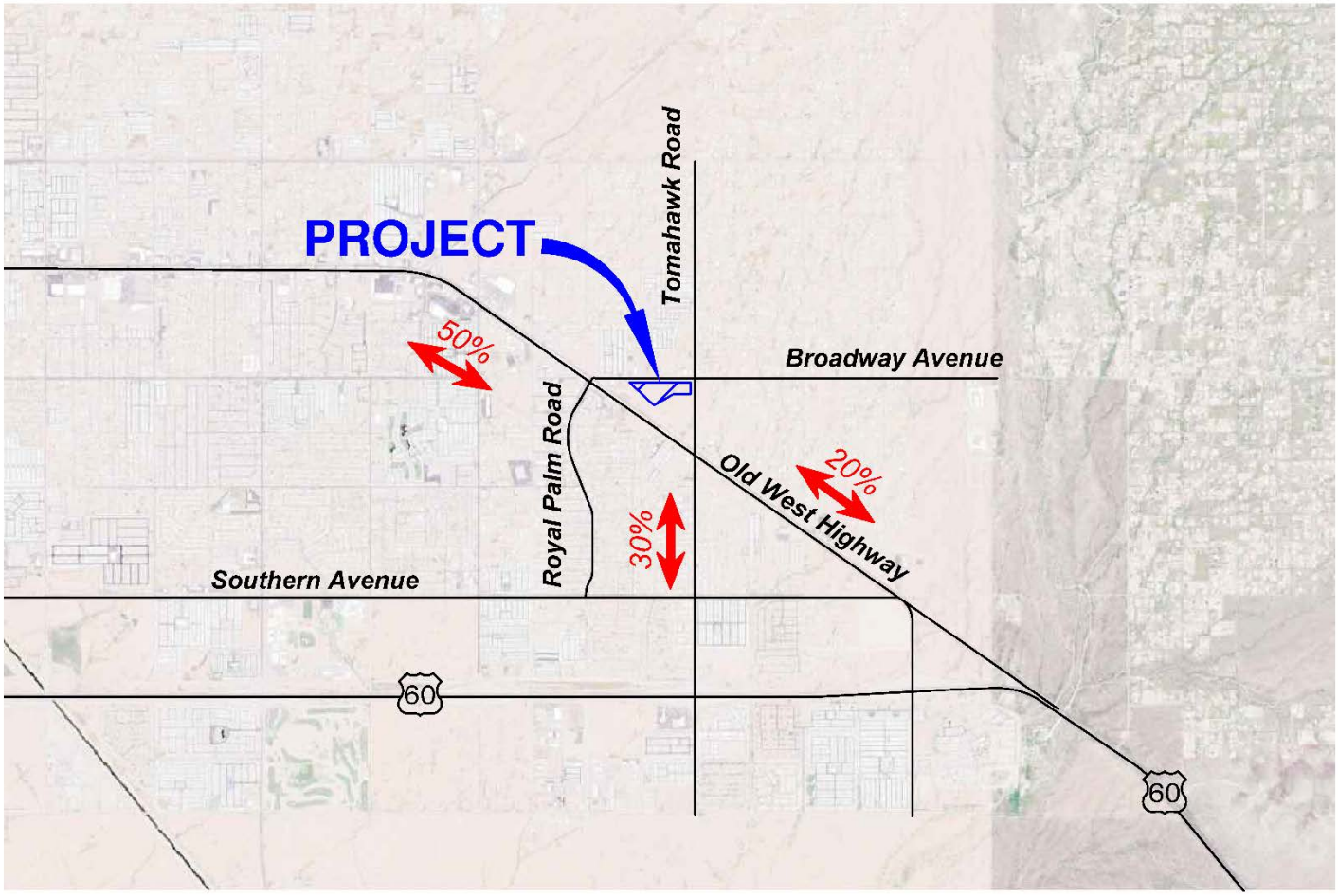
Existing Traffic Operations

Analysis of current intersection operations was conducted for the weekday AM and PM peak hours using the nationally accepted methodology set forth in the *Highway Capacity Manual 6th Edition* Transportation Research Board, 2016 (HCM 6th). The computer software Synchro 10 was utilized to calculate the levels of service for individual movements, approaches, and for the intersections as a whole.

Level of service (LOS) is a qualitative measure of the traffic operations at an intersection or on a roadway segment. Level of service is ranked from LOS A, which signifies little or no congestion and is the highest rank, to LOS F, which signifies congestion and jam conditions. LOS D is typically considered adequate operation at signalized and un-signalized intersections in developed areas.

At signalized intersections, level of service is calculated for each movement and then summed in a weighted fashion to yield the LOS for the approach and for the intersections as a whole. Criteria for level of service at signalized intersections are shown in **Table 2**.

Figure 6 – Weekday Peak Hour Trip Distribution



LEGEND:

EXISTING ROAD

PROJECT SITE

XX% DISTRIBUTION OF VEHICLE TRIPS

Figure 7 – Weekday Peak Hour Trip Assignment

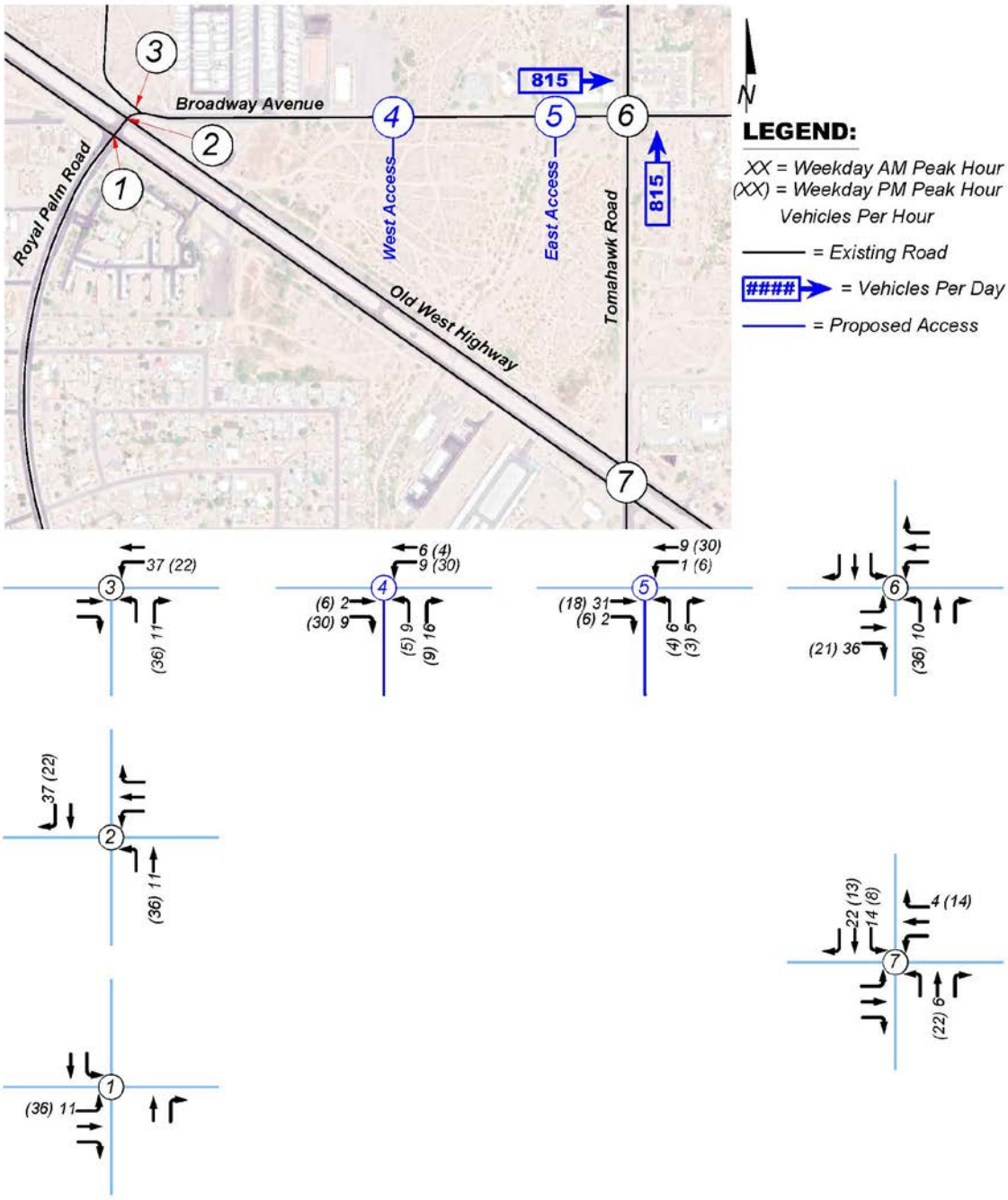


Table 2 – Level of Service Criteria – Signalized Intersections

Level-of-Service	Average Total Delay
A	≤ 10.0 seconds/vehicle
B	> 10.0 and ≤ 20.0 seconds/vehicle
C	> 20.0 and ≤ 35.0 seconds/vehicle
D	> 35.0 and ≤ 55.0 seconds/vehicle
E	> 55.0 and ≤ 80.0 seconds/vehicle
F	> 80.0 seconds/vehicle

In calculating the levels of service, assumed signal phasing and timing data was used. Other assumptions included:

- Cycle Length – 90 seconds
- Lane widths – 12 feet
- Approach grade – 0%
- Right turn on red allowed

At un-signalized intersections, level of service is predicted/calculated for those movements which must either stop for or yield to oncoming traffic and is based on average control delay for the particular movement. Control delay is the portion of total delay attributed to traffic control measures such as stop signs and traffic signals. The criteria for level of service at un-signalized intersections are shown in **Table 3**.

Table 3 – Level of Service Criteria – Un-signalized Intersections

Level-of-Service	Delay
A	≤ 10 seconds per vehicle
B	> 10 and ≤ 15 seconds/vehicle
C	> 15 and ≤ 25 seconds/vehicle
D	> 25 and ≤ 35 seconds/vehicle
E	> 35 and ≤ 50 seconds/vehicle
F	> 50 seconds per vehicle

Existing levels of service were calculated for the study intersections as shown in **Table 4**. Complete capacity calculations are included in the Appendix.

As shown in **Table 4**, all of the study intersections currently operate at an adequate LOS.

Table 4 – Existing Weekday Peak Hour Levels of Service

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Signalized Intersections				
Tomahawk Road/Old West Highway				
Overall Intersection	C	28.4	C	29.4
Eastbound Left	D	39.8	D	37.9
Eastbound Through	C	28.3	C	28.5
Eastbound Right	C	29.0	C	30.9
Westbound Left	D	40.3	D	42.9
Westbound Through	C	2.7	C	29.8
Westbound Right	C	26.4	C	27.9
Northbound Left	C	27.8	C	29.0
Northbound Through	C	26.5	C	28.6
Northbound Right	C	25.8	C	25.6
Southbound Left	C	26.6	C	27.3
Southbound Through	C	27.8	C	29.4
Southbound Right	C	26.3	C	27.2
Un-Signalized Intersections				
Royal Palm Road/Eastbound Old West Hwy				
Northbound Through	B	12.3	C	20.5
Northbound Right	A	9.1	A	9.9
Southbound Left/Through	B	12.3	C	20.4
Royal Palm Road/Westbound Old West Hwy				
Northbound Left/Through	B	12.4	C	16.3
Southbound Through/Right	B	10.6	B	11.2
Royal Palm Road/Broadway Avenue				
Eastbound Through/Right	A	8.4	A	8.4
Broadway Avenue/Tomahawk Road				
Eastbound Left/Through/Right	A	8.5	B	10.1
Westbound Left/Through	A	8.7	A	9.4
Westbound Right	A	7.1	A	7.8
Northbound Left	A	8.5	A	8.9
Northbound Through/Right	A	8.2	A	9.7
Southbound Left	A	8.4	A	9.0
Southbound Through	A	8.5	A	9.5
Southbound Right	A	7.2	A	7.8

Delay - seconds per vehicle

Future Traffic Operations Without Project

In order to assess the impacts of the project on future traffic operations, traffic projections were made for the opening year of 2022. A review of historical traffic data in the vicinity of the project showed increasing and decreasing traffic volumes. Due to this, a 2% annual traffic growth rate was used. Weekday traffic volumes in 2022 without the project were estimated with a 2% annual growth rate in **Figure 8**.

As with the current volumes, levels of service were calculated for each of the intersections in the study area for the study year 2022 without the project. Intersection levels of service for 2022 without the project are shown in **Table 5**. Complete capacity calculations are included in the Appendix.

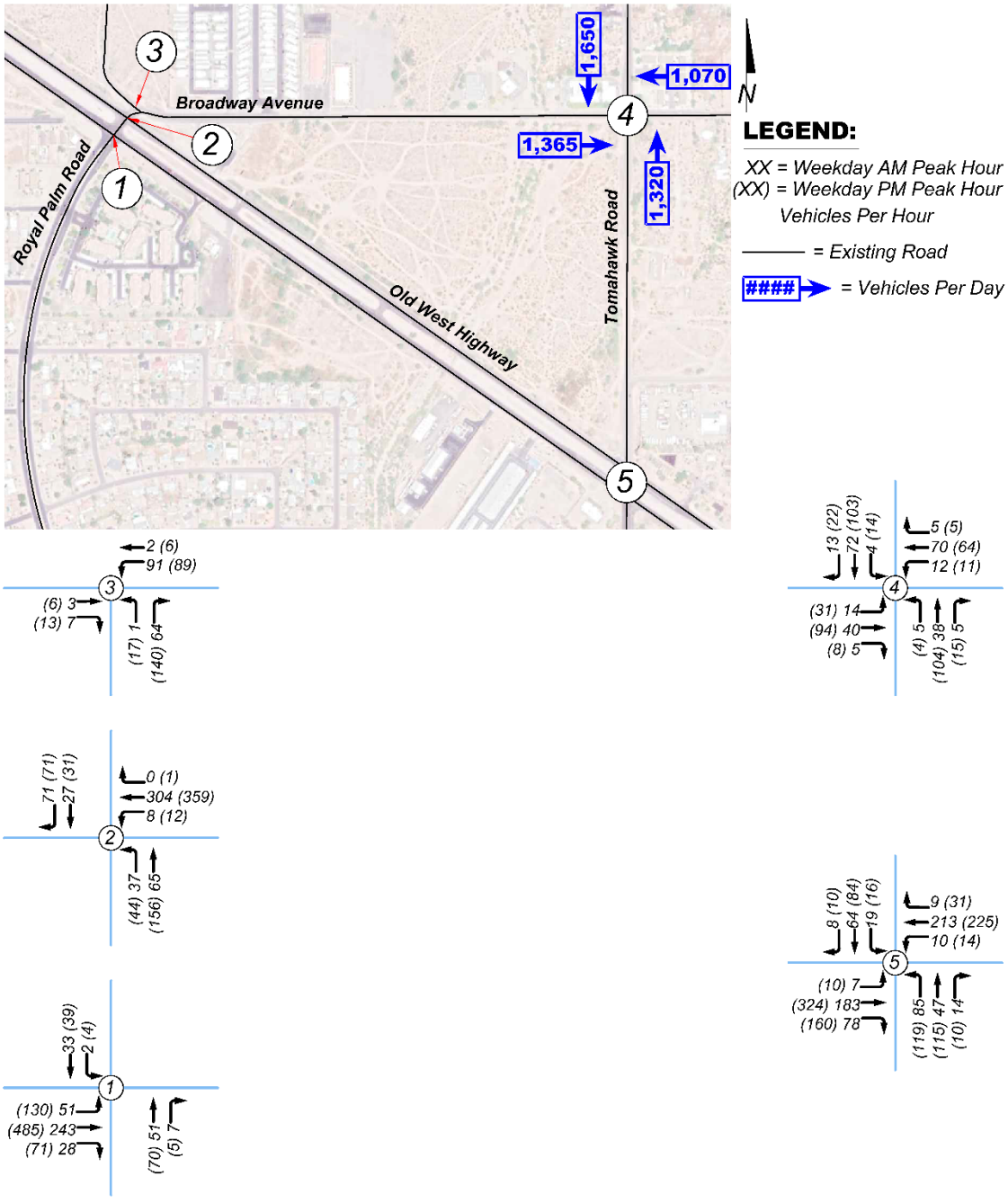
Table 5 – 2022 Weekday Peak Hour Levels of Service Without Project

Intersection	AM Peak		PM Peak	
	LOS	Delay	LOS	Delay
Signalized Intersections				
Tomahawk Road/Old West Highway				
Overall Intersection	C	28.4	C	29.5
Eastbound Left	D	39.8	D	37.9
Eastbound Through	C	28.3	C	28.6
Eastbound Right	C	29.0	C	30.9
Westbound Left	D	40.3	D	42.9
Westbound Through	C	28.7	C	29.9
Westbound Right	C	26.4	C	27.9
Northbound Left	C	27.8	C	29.0
Northbound Through	C	26.5	C	28.6
Northbound Right	C	25.8	C	25.6
Southbound Left	C	26.6	C	27.3
Southbound Through	C	27.9	C	29.4
Southbound Right	C	26.3	C	27.2
Un-Signalized Intersections				
Royal Palm Road/Eastbound Old West Hwy				
Northbound Through	B	12.3	C	20.8
Northbound Right	A	9.1	B	10.0
Southbound Left/Through	B	12.3	C	20.6
Royal Palm Road/Westbound Old West Hwy				
Northbound Left/Through	B	12.5	C	16.5
Southbound Through/Right	B	10.7	B	11.2
Royal Palm Road/Broadway Avenue				
Eastbound Through/Right	A	8.4	A	8.4
Broadway Avenue/Tomahawk Road				
Eastbound Left/Through/Right	A	8.5	B	10.1
Westbound Left/Through	A	8.7	A	9.4
Westbound Right	A	7.1	A	7.8
Northbound Left	A	8.5	A	8.9
Northbound Through/Right	A	8.2	A	9.7
Southbound Left	A	8.4	A	9.0
Southbound Through	A	8.5	A	9.6
Southbound Right	A	7.2	A	7.8

Delay - seconds per vehicle

As shown in **Table 5**, all of the study intersections are anticipated to continue to operate at an adequate LOS in 2022 without traffic from The Residences at Apache Trail site.

Figure 8 – 2022 Weekday Peak Hour Traffic Volumes Without Project



Future Traffic Operations With Project

In order to assess the impacts of the project on future traffic operations, levels of service were calculated for each project intersection in 2022, with the project. Weekday peak hour traffic volumes for 2022 without the project were combined with the estimated trips generated by the project to yield weekday peak hour traffic volumes with the project. The weekday peak hour traffic volumes with the project for 2022 are shown in **Figure 9**.

Weekday intersection levels of service for 2022, with the project, were then calculated as shown in **Table 6**. Complete capacity calculations are included in the Appendix.

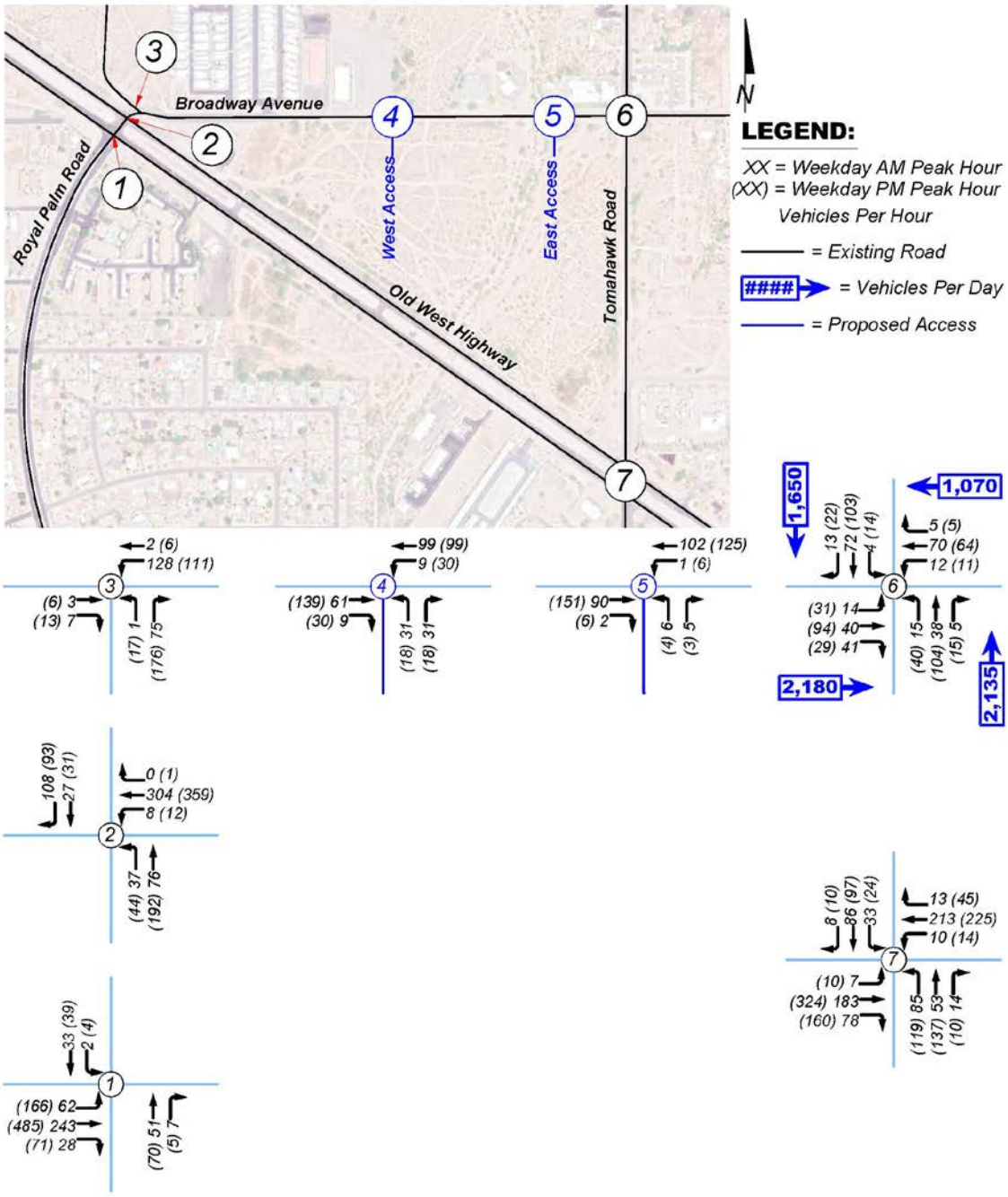
Table 6 – 2022 Weekday Peak Hour Levels of Service With Project

Intersection	2022 Without Project				2022 With Project			
	AM Peak		PM Peak		AM Peak		PM Peak	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
Signalized Intersections								
Tomahawk Road/Old West Highway								
Overall Intersection	C	28.4	C	29.5	C	28.5	C	29.6
Eastbound Left	D	39.8	D	37.9	D	39.8	D	37.9
Eastbound Through	C	28.3	C	28.6	C	28.3	C	28.6
Eastbound Right	C	29.0	C	30.9	C	29.0	C	30.9
Westbound Left	D	40.3	D	42.9	D	40.3	D	42.9
Westbound Through	C	28.7	C	29.9	C	28.7	C	29.9
Westbound Right	C	26.4	C	27.9	C	26.5	C	28.5
Northbound Left	C	27.8	C	29.0	C	27.8	C	29.0
Northbound Through	C	26.5	C	28.6	C	26.7	C	29.4
Northbound Right	C	25.8	C	25.6	C	25.8	C	25.6
Southbound Left	C	26.6	C	27.3	C	27.0	C	27.6
Southbound Through	C	27.9	C	29.4	C	28.6	C	29.9
Southbound Right	C	26.3	C	27.2	C	26.3	C	27.2
Un-Signalized Intersections								
Royal Palm Road/Eastbound Old West Hwy								
Northbound Through	B	12.3	C	20.8	B	12.6	C	23.3
Northbound Right	A	9.1	B	10.0	A	9.1	B	10.0
Southbound Left/Through	B	12.3	C	20.6	B	12.6	C	23.0
Royal Palm Road/Westbound Old West Hwy								
Northbound Left/Through	B	12.5	C	16.5	B	12.9	C	18.4
Southbound Through/Right	B	10.7	B	11.2	B	10.8	B	11.3
Royal Palm Road/Broadway Avenue								
Eastbound Through/Right	A	8.4	A	8.4	A	8.4	A	8.4
West Access/Broadway Avenue								
Westbound Through/Left	N/A		N/A		A	7.4	A	7.7
Northbound Left/Right					A	9.5	B	10.2
East Access/Broadway Avenue								
Westbound Through/Left	N/A		N/A		A	7.4	A	7.6
Northbound Left/Right					A	9.3	A	9.9
Broadway Avenue/Tomahawk Road								
Eastbound Left/Through/Right	A	8.5	B	10.1	A	8.6	B	10.6
Westbound Left/Through	A	8.7	A	9.4	A	8.8	A	9.8
Westbound Right	A	7.1	A	7.8	A	7.3	A	8.0
Northbound Left	A	8.5	A	8.9	A	8.7	A	9.5
Northbound Through/Right	A	8.2	A	9.7	A	8.4	A	9.9
Southbound Left	A	8.4	A	9.0	A	8.5	A	9.2
Southbound Through	A	8.5	A	9.6	A	8.7	A	9.9
Southbound Right	A	7.2	A	7.8	A	7.4	A	8.0

Delay - seconds per vehicle

As shown in **Table 6**, all of the study intersections are expected to operate at an adequate LOS of D or better in the weekday AM and PM peak hours in 2022 without and with traffic from the proposed project.

Figure 9 – 2022 Weekday Peak Hour Traffic Volumes With Project



Turn Lane Analysis

A key element of this traffic analysis is to determine if right or left turn lanes are required at the intersections providing access to the project. The City of Apache Junction does not provide specific warrants for the inclusion of left and right turn lanes at new driveways. For the purposes of this report, the National Cooperative Highway Research Program's (NCHRP) *Report 457 – Evaluating Intersection Improvements: An Engineering Study Guide* was used to determine the need for auxiliary turn lanes. NCHRP Report 457 provides criteria for determining if turn lanes are needed based on speed, through traffic volume and turning traffic volume during the peak hour.

When needed, turn lanes remove the slowing turning traffic from the through traffic stream, improving capacity and reducing rear-end crashes. **Tables 7** and **8** shows the locations that were evaluated for left and right turn lanes, respectively, based on the proposed access configuration for The Residences at Apache Trail site based on 2027 traffic volumes with the project.

Table 7 – Left Turn Lane Warrants

Intersection	Direction	# of Through Lanes per Direction	Major-Road Posted Speed (mph)	Turn Treatment Analyzed	Guidelines Applied	Peak Hour	Advancing Volume (V_A, vph)	Opposing Volume (V_O, vph)	Turning Volume (vph)	% of Left Turns in V_A	Turn Treatments Warranted?
East Access/Broadway Avenue	Westbound	1	35	Left Turn Lane	NCHRP	AM	102	90	1	1%	No
						PM	125	151	6	5%	No
West Access/Broadway Avenue	Westbound	1	35	Left Turn Lane	NCHRP	AM	99	61	9	9%	No
						PM	99	139	30	30%	No

vph - vehicles per hour, mph - miles per hour

Table 8 – Right Turn Lane Warrants

Intersection	Direction	# of Through Lanes per Direction	Major-Road Posted Speed (mph)	Turn Treatment Analyzed	Guidelines Applied	Peak Hour	Advancing Volume (V_A, vph)	Turning Volume (vph)	Turn Treatments Warranted?
East Access/Broadway Avenue	Westbound	1	35	Right Turn Lane	NCHRP	AM	90	2	No
						PM	151	6	No
West Access/Broadway Avenue	Westbound	1	35	Right Turn Lane	NCHRP	AM	61	9	No
						PM	139	30	No

vph - vehicles per hour, mph - miles per hour

Tables 7 and **8** show that auxiliary turn lanes are not warranted at the access points directly serving the project site.

Crash Analysis

Crash histories for the study intersections were obtained from the ADOT crash database between January 2015 to December 2019. The results of the crash data review are shown in **Tables 9** through **11**.

Table 9 – Crash Analysis at Royal Palms Road/Old West Highway

Year	Crash Type							Fatal	Injury	Crash Totals
	Angle	Left Turn	Rear-End	Sideswipe	Single Vehicle	Head On	Other			
2015							1		1	1
2016	3	3							2	6
2017	1						1			2
2018			1							1
2019	4								1	4
5-Year Total	**8**	**3**	**1**	**0**	**0**	**0**	**2**	**0**	**4**	**14**

As shown in **Table 9**, of the fourteen (14) recorded crashes in the five-year study period at the intersection of Royal Palms Road/Old West Highway, eleven (11) were angle or left turn type collisions. These are likely due to the divided highway configuration of the intersections, where vehicles cross one direction of travel, make a complete STOP in the 'median intersection' before crossing over the second set of travel lanes. During periods of high traffic volumes, these movements can be difficult to complete, resulting in drivers rushing in their attempt to make a turn during an unsuitable gap in traffic.

Table 10 – Crash Analysis at Tomahawk Road/Old West Highway

Year	Crash Type							Fatal	Injury	Crash Totals
	Angle	Left Turn	Rear-End	Sideswipe	Single Vehicle	Head On	Other			
2015										0
2016										0
2017	1	1	1						2	3
2018		1	1	2					2	4
2019	1									1
5-Year Total	**2**	**2**	**2**	**2**	**0**	**0**	**0**	**0**	**4**	**8**

As shown in **Table 10**, eight (8) crashes occurred during the five-year study period. Due to the limited number of crashes recorded, no specific crash trends can be determined at the intersection of Tomahawk Road/Old West Highway.

Table 11 – Crash Analysis at Broadway Avenue/Tomahawk Road

Year	Crash Type							Fatal	Injury	Crash Totals
	Angle	Left Turn	Rear-End	Sideswipe	Single Vehicle	Head On	Other			
2015										0
2016										0
2017										0
2018				1	1					2
2019							1			1
5-Year Total	0	0	0	1	1	0	1	0	0	3

As shown in **Table 11**, three (3) crashes occurred during the five-year study period. Due to the limited number of crashes recorded, no specific crash trends can be determined at the intersection of Broadway Avenue/Tomahawk Road.

It is possible that other crashes occurred in the area where the Police Department was not contacted and no official record of these crashes exists.

Traffic Signal Warrant Analysis

Traffic signal warrant analyses were performed at the intersection of Broadway Avenue/Tomahawk Road to determine if and/or when a traffic signal is needed based on existing and future (2022) traffic volumes, without and with the proposed site.

The *Manual on Uniform Traffic Control Devices (MUTCD),* Federal Highway Administration, 2009, lists nine warrants that are used to determine if a traffic signal should be considered for installation at an intersection. A traffic signal may be warranted if one or more of the warrants are satisfied. Warrants #1 (Eight Hour Volume) and #2 (Four Hour Vehicular Volume) were used to evaluate the need to signalize the intersection. Based on existing conditions, availability of information, and applicability, the remaining warrants (#3, #4, #5, #6, #7, #8, and #9) do not apply to the given conditions.

Warrant #1 (Eight Hour Volume) is satisfied when for at least eight (8) hours of an average day, specific traffic volume levels are met for both the major and minor streets (Condition A – Minimum Vehicular Volume). The MUTCD states these volumes depend on the vehicles per hour (vph) combined for both approaches of the major street, and for the highest volume approach on the minor street. The values vary depending on the number of approach lanes and the 85th percentile speed of the roadways.

Warrant #1 also applies to operating conditions where the major street traffic levels are sufficiently high that traffic entering or crossing from a minor street suffers excessive delay (Condition B – Interruption of Continuous Traffic). Once again, the warrant is satisfied when for each of any of the same eight (8) hours of an average day, specific traffic volume levels are met for both the major and minor streets.

Warrant #2 (Four Hour Volume) is met when, for any four hours of the average day on both the major and minor streets, the hourly approach volumes are above the plotted curve contained in the MUTCD (see Appendix F).

Daily traffic generated by The Residences at Apache Trail project was distributed throughout the 24 hours of a day based on existing daily traffic distributions.

Table 12 shows the results of the warrant analyses at the study intersection. A complete set of the warrant analysis is available in the Appendix.

Table 12 – Traffic Signal Warrant Analysis at Broadway Avenue/Tomahawk Road

Broadway Avenue/Tomahawk Road	Warrant Number									
	1		2	3	4	5	6	7	8	9
	Condition A	Condition B								
Existing	No	No	No	*	*	*	*	*	*	*
Hours Met	0	0	0	*	*	*	*	*	*	*
2022 Without Project	No	No	No	*	*	*	*	*	*	*
Hours Met	0	0	0	*	*	*	*	*	*	*
2022 With Project	No	No	No	*	*	*	*	*	*	*
Hours Met	0	0	0	*	*	*	*	*	*	*

* Warrant Does Not Apply

Table 12 shows that traffic signal warrants do not currently meet and are not expected to be met in 2022 without and with traffic from the project site at the intersection of Broadway Avenue/Tomahawk Road.

It is important to mention that traffic signals should not be installed because one or more of the warrants are satisfied. The MUTCD warrants reflect only the lowest minimum levels on which traffic engineers agree. It also states that, "The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."

Conclusion

When fully completed, the proposed Residences at Apache Trail project is predicted to generate an additional 1,440 vehicle trips per day (vtpd) on weekdays to the adjacent street system from the new project site. Fifty percent of these new trips (720 vehicle trips) will be into the project and fifty percent will be out of the project.

All of the study intersections currently operate at an adequate LOS and are expected to continue doing so in 2022 without traffic from the project.

All of the study intersections are anticipated to operate at an adequate LOS in 2022 without and with traffic from The Residences at Apache Trail site.

Auxiliary turn lanes are not warranted at the access points directly serving the project site.

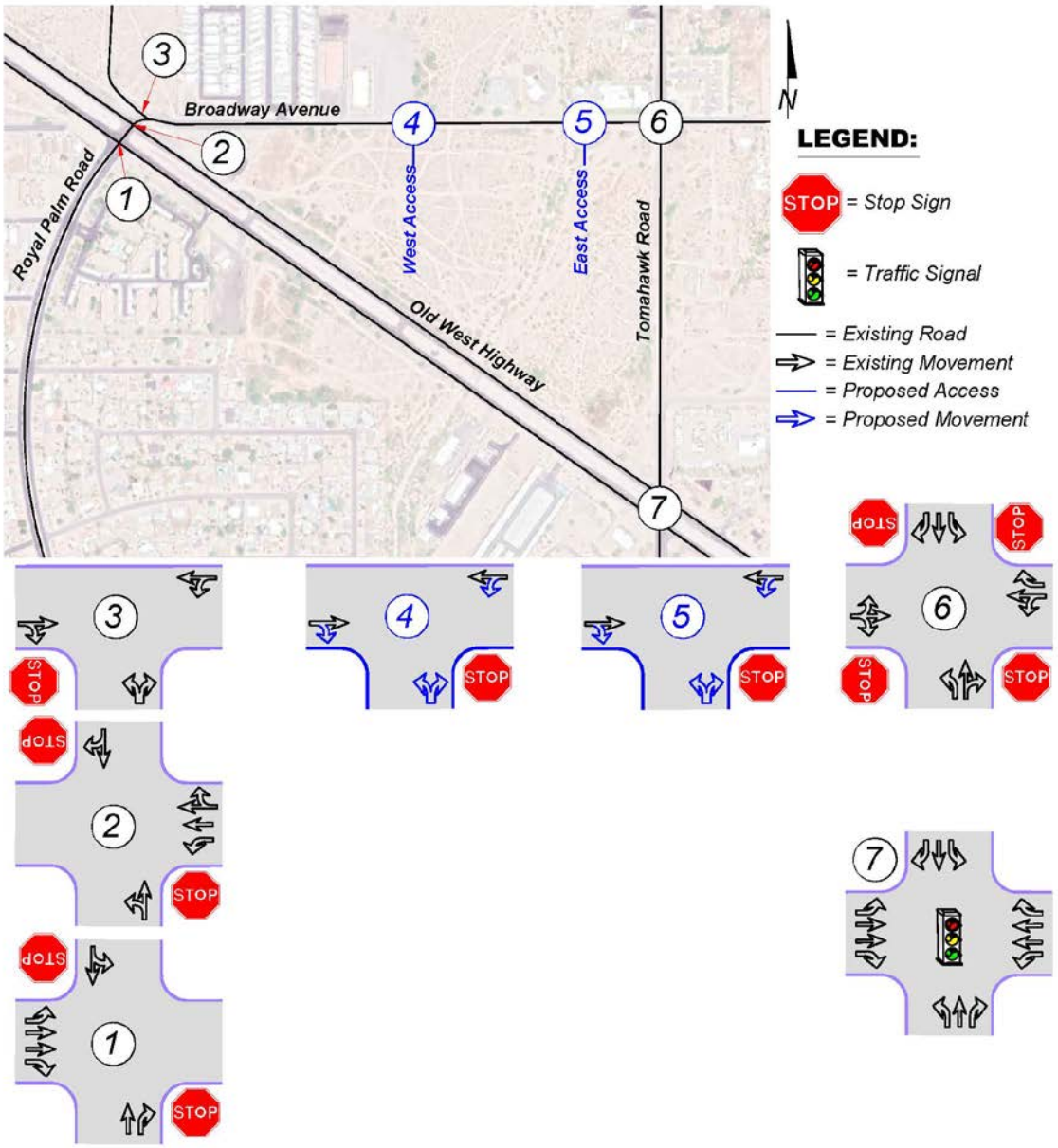
Of the fourteen (14) recorded crashes in the five-year study period at the intersection of Royal Palms Road/Old West Highway, eleven (11) were angle or left turn type collisions. These are likely due to the divided highway configuration of the intersections, where vehicles cross one direction of travel, make a complete STOP in the 'median intersection' before crossing over the second set of travel lanes. During periods of high traffic volumes, these movements can be difficult to complete, resulting in drivers rushing in their attempt to make a turn during an unsuitable gap in traffic.

Due to the limited number of crashes recorded at the other study intersections, no specific crash trends can be determined.

Traffic signal warrants do not currently meet and are not expected to be met in 2022 without and with traffic from the project site at the intersection of Broadway Avenue/Tomahawk Road.

Proposed lane configurations and traffic control with The Residences at Apache Trail site are shown in **Figure 10**.

Figure 10 – Proposed Lane Configurations and Traffic Control



TRAFFIC IMPACT ANALYSIS
THE RESIDENCES AT APACHE TRAIL
BROADWAY AVENUE/TOMAHAWK ROAD

APPENDIX

Traffic Counts

Trip Generation Calculations

Capacity Calculations

Traffic Signal Warrant Calculations

TRAFFIC IMPACT ANALYSIS
RESIDENCES AT APACHE JUNCTION
BROADWAY AVENUE/TOMAHAWK ROAD

APPENDIX

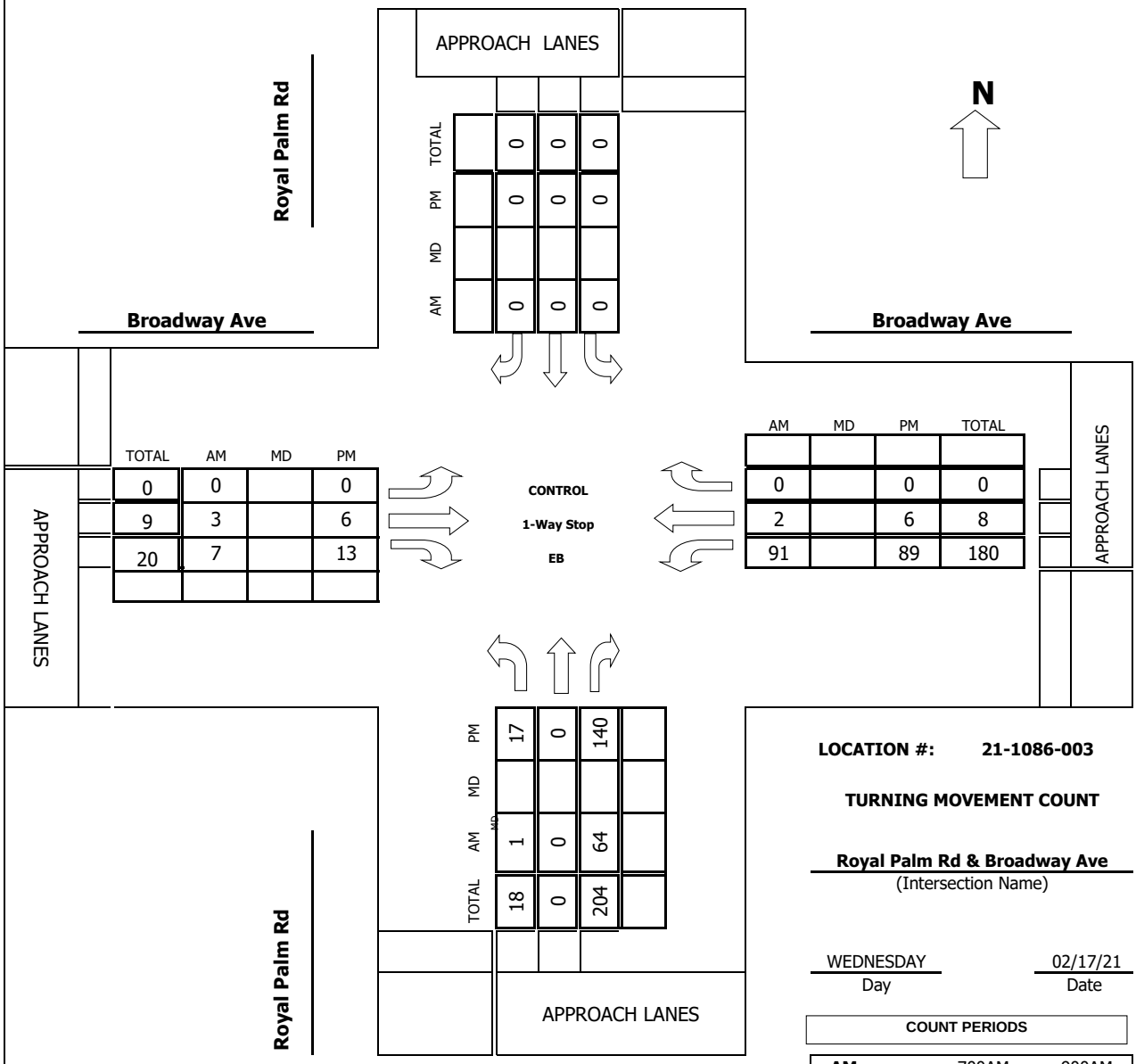
Traffic Counts

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1086-003

TMC SUMMARY OF Royal Palm Rd & Broadway Ave



LOCATION #: 21-1086-003

TURNING MOVEMENT COUNT

Royal Palm Rd & Broadway Ave
(Intersection Name)

WEDNESDAY (Day) 02/17/21 (Date)

COUNT PERIODS

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

AM PEAK HOUR 800 AM

NOON PEAK HOUR

PM PEAK HOUR 400 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Royal Palm Rd	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Broadway Ave	DAY:	WEDNESDAY	PROJECT#	21-1086-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	0	0	1	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	0	10	0	0	0	0	1	2	13	0	0	26
7:15 AM	1	0	13	0	0	0	0	2	1	15	1	0	33
7:30 AM	1	0	13	0	0	0	0	1	4	15	1	0	35
7:45 AM	4	0	7	0	0	0	0	0	2	20	2	0	35
8:00 AM	0	0	15	0	0	0	0	0	1	16	0	0	32
8:15 AM	1	0	10	0	0	0	0	1	2	26	0	0	40
8:30 AM	0	0	13	0	0	0	0	0	1	25	0	0	39
8:45 AM	0	0	26	0	0	0	0	2	3	24	2	0	57
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	7	0	107	0	0	0	0	7	16	154	6	0	297
Approach %	6.14	0.00	93.86	####	####	####	0.00	30.43	69.57	96.25	3.75	0.00	
App/Depart	114	/	0	0	/	170	23	/	114	160	/	13	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	1	0	64	0	0	0	0	3	7	91	2	0	168
Approach %	1.54	0.00	98.46	####	####	####	0.00	30.00	70.00	97.85	2.15	0.00	
PEAK HR. FACTOR:		0.625			0.000			0.500			0.894		0.737

CONTROL: 1-Way Stop (EB)
COMMENT 1:
GPS: 33.408011, -111.536907

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Royal Palm Rd 0	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Broadway Ave	DAY:	WEDNESDAY	PROJECT#	21-1086-003

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	0	0	0	0	0	1	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	5	0	38	0	0	0	0	3	4	21	3	0	74
4:15 PM	5	0	45	0	0	0	0	2	4	17	1	0	74
4:30 PM	3	0	18	0	0	0	0	0	3	27	0	0	51
4:45 PM	4	0	39	0	0	0	0	1	2	24	2	0	72
5:00 PM	4	0	41	0	0	0	0	2	3	21	1	0	72
5:15 PM	2	0	33	0	0	0	0	1	1	24	1	0	62
5:30 PM	4	0	31	0	0	0	0	1	0	23	1	0	60
5:45 PM	3	0	31	0	0	0	0	0	3	19	3	0	59
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	30	0	276	0	0	0	0	10	20	176	12	0	524
Approach %	9.80	0.00	90.20	####	####	####	0.00	33.33	66.67	93.62	6.38	0.00	
App/Depart	306	/	0	0	/	196	30	/	286	188	/	42	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	17	0	140	0	0	0	0	6	13	89	6	0	271
Approach %	10.83	0.00	89.17	####	####	####	0.00	31.58	68.42	93.68	6.32	0.00	
PEAK HR. FACTOR:		0.785			0.000			0.679			0.880		0.916

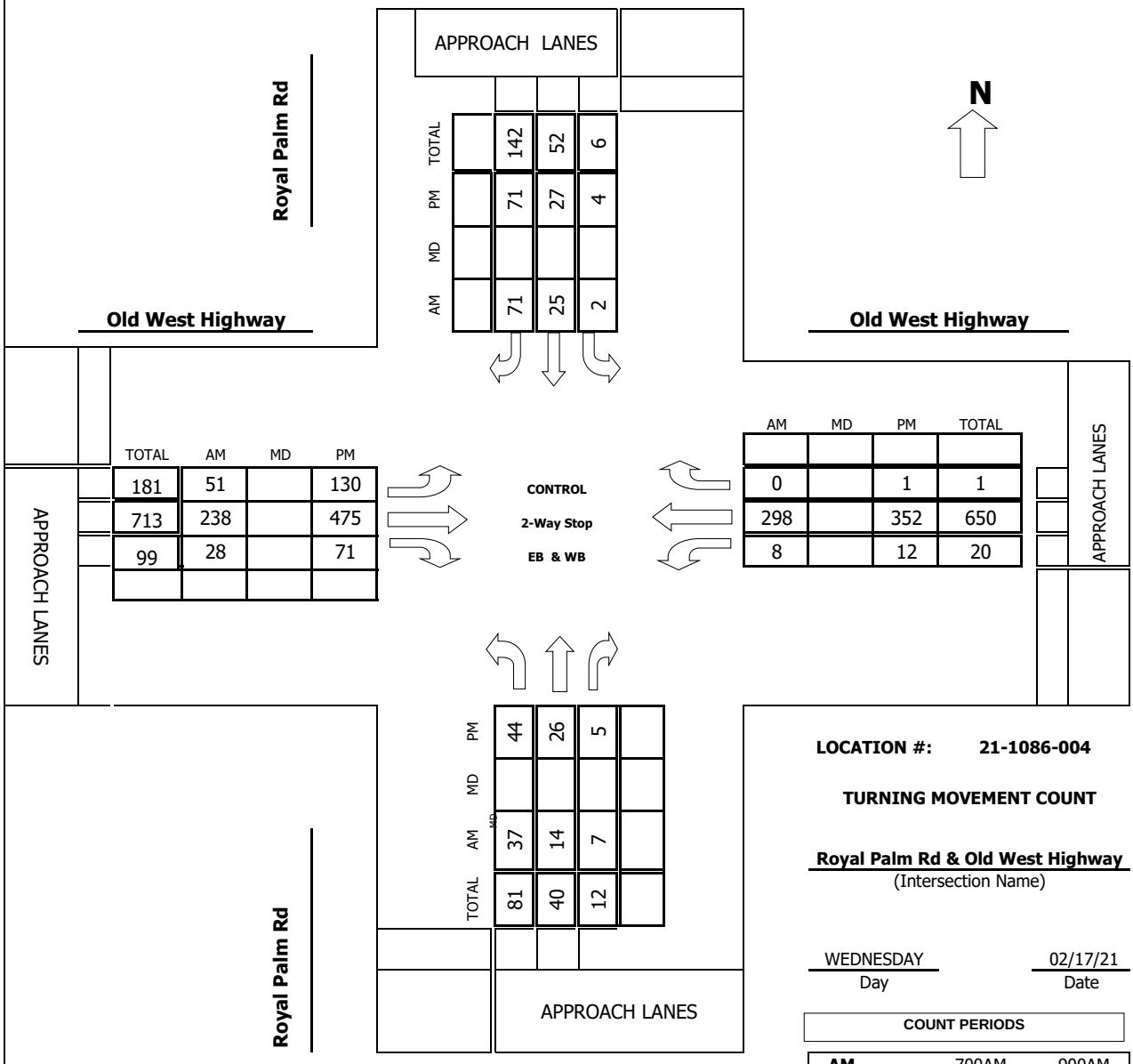
CONTROL: 1-Way Stop (EB)
COMMENT 1: 0
GPS: 33.408011, -111.536907

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1086-004

TMC SUMMARY OF Royal Palm Rd & Old West Highway



LOCATION #: 21-1086-004

TURNING MOVEMENT COUNT

Royal Palm Rd & Old West Highway
(Intersection Name)

WEDNESDAY (Day) 02/17/21 (Date)

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

AM PEAK HOUR 800 AM

NOON PEAK HOUR

PM PEAK HOUR 400 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Royal Palm Rd	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Old West Highway	DAY:	WEDNESDAY	PROJECT#	21-1086-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	0	1	2	1	1	2	0	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	6	4	1	1	1	13	5	26	3	1	40	1	102
7:15 AM	12	3	0	0	6	10	11	34	6	0	46	0	128
7:30 AM	9	4	1	0	7	12	10	43	7	2	61	0	156
7:45 AM	12	5	2	0	8	14	6	39	6	2	61	0	155
8:00 AM	4	2	2	0	4	13	13	56	4	3	66	0	167
8:15 AM	9	3	3	1	10	17	8	63	8	2	56	0	180
8:30 AM	12	2	1	0	7	19	11	50	13	2	80	0	197
8:45 AM	12	7	1	1	4	22	19	69	3	1	96	0	235
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	76	30	11	3	47	120	83	380	50	13	506	1	1320
Approach %	64.96	25.64	9.40	1.76	27.65	70.59	16.18	74.07	9.75	2.50	97.31	0.19	
App/Depart	117	/	114	170	/	110	513	/	394	520	/	702	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	37	14	7	2	25	71	51	238	28	8	298	0	779
Approach %	63.79	24.14	12.07	2.04	25.51	72.45	16.09	75.08	8.83	2.61	97.39	0.00	
PEAK HR. FACTOR:		0.725			0.875			0.871			0.789		0.829

CONTROL:	2-Way Stop (EB & WB)
COMMENT 1:	
GPS:	33.407769, -111.537211

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Royal Palm Rd 0	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Old West Highway	DAY:	WEDNESDAY	PROJECT#	21-1086-004

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	0	1	1	0	1	0	1	2	1	1	2	0	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	10	8	2	1	7	17	35	108	18	3	106	0	315
4:15 PM	14	7	2	0	6	15	43	127	15	5	88	0	322
4:30 PM	11	4	0	1	8	21	17	142	22	2	86	0	314
4:45 PM	9	7	1	2	6	18	35	98	16	2	72	1	267
5:00 PM	7	10	1	0	5	19	34	113	24	2	88	1	304
5:15 PM	11	8	0	0	6	19	26	105	17	2	68	1	263
5:30 PM	13	6	1	3	2	18	28	96	19	3	67	1	257
5:45 PM	11	6	1	1	6	15	27	93	16	7	68	1	252
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	86	56	8	8	46	142	245	882	147	26	643	5	2294
Approach %	57.33	37.33	5.33	4.08	23.47	72.45	19.23	69.23	11.54	3.86	95.40	0.74	
App/Depart	150	/	306	196	/	219	1274	/	898	674	/	871	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	44	26	5	4	27	71	130	475	71	12	352	1	1218
Approach %	58.67	34.67	6.67	3.92	26.47	69.61	19.23	70.27	10.50	3.29	96.44	0.27	
PEAK HR. FACTOR:		0.815			0.850			0.914			0.837		0.946

CONTROL: 2-Way Stop (EB & WB)
COMMENT 1: 0
GPS: 33.407769, -111.537211

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

Volumes for: Wednesday, February 17, 2021 City: Apache Junction Project #: 21-1086-005

Location: Broadway Ave & Tomahawk Rd

AM Period	NB		SB		EB		WB			PM Period	NB		SB		EB		WB		
00:00	0		1		6		0			12:00	25		37		21		19		
00:15	1		2		0		1			12:15	24		21		21		18		
00:30	3		5		1		2			12:30	23		34		29		20		
00:45	0	4	1	9	1	8	1	4	25	12:45	23	95	17	109	25	96	23	80	380
01:00	1		1		2		0			13:00	24		25		22		17		
01:15	2		0		1		0			13:15	23		26		24		28		
01:30	0		0		0		0			13:30	32		39		24		15		
01:45	2	5	1	2	1	4	2	2	13	13:45	31	110	20	110	25	95	17	77	392
02:00	0		2		2		0			14:00	27		36		34		18		
02:15	0		2		1		0			14:15	29		27		29		16		
02:30	0		1		1		0			14:30	21		44		27		24		
02:45	0	0	0	5	0	4	0	0	9	14:45	31	108	29	136	14	104	22	80	428
03:00	1		3		1		0			15:00	35		32		25		16		
03:15	0		2		0		1			15:15	32		24		25		24		
03:30	0		2		0		0			15:30	32		27		28		18		
03:45	0	1	3	10	1	2	3	4	17	15:45	27	126	25	108	33	111	25	83	428
04:00	2		5		0		2			16:00	41		31		37		19		
04:15	1		6		0		5			16:15	38		26		34		20		
04:30	1		6		1		2			16:30	33		25		26		15		
04:45	0	4	15	32	0	1	8	17	54	16:45	29	141	30	112	37	134	21	75	462
05:00	2		8		0		1			17:00	28		37		35		20		
05:15	5		17		0		1			17:15	36		43		28		23		
05:30	3		19		3		2			17:30	28		27		33		16		
05:45	1	11	10	54	2	5	3	7	77	17:45	27	119	26	133	29	125	14	73	450
06:00	4		7		2		11			18:00	22		17		16		13		
06:15	5		18		3		7			18:15	20		25		16		7		
06:30	7		10		11		2			18:30	14		20		22		18		
06:45	7	23	15	50	5	21	12	32	126	18:45	13	69	14	76	18	72	12	50	267
07:00	10		19		10		12			19:00	11		20		35		6		
07:15	6		28		14		15			19:15	16		16		23		11		
07:30	8		21		6		18			19:30	11		15		18		7		
07:45	20	44	22	90	11	41	15	60	235	19:45	14	52	11	62	17	93	12	36	243
08:00	10		21		10		22			20:00	3		18		13		2		
08:15	9		21		14		22			20:15	8		10		11		8		
08:30	17		28		13		23			20:30	1		10		12		6		
08:45	11	47	18	88	22	59	20	87	281	20:45	6	18	20	58	9	45	2	18	139
09:00	18		24		15		21			21:00	9		13		6		4		
09:15	15		31		17		19			21:15	9		3		7		4		
09:30	14		28		18		20			21:30	8		5		6		3		
09:45	15	62	35	118	19	69	14	74	323	21:45	5	31	5	26	8	27	1	12	96
10:00	18		16		27		22			22:00	2		2		7		1		
10:15	34		23		18		14			22:15	6		4		0		1		
10:30	21		24		24		27			22:30	2		4		3		4		
10:45	28	101	35	98	33	102	26	89	390	22:45	2	12	0	10	4	14	2	8	44
11:00	28		19		19		11			23:00	0		2		1		1		
11:15	31		40		31		20			23:15	2		4		3		0		
11:30	19		34		24		23			23:30	3		2		1		2		
11:45	21	99	20	113	23	97	23	77	386	23:45	3	8	0	8	0	5	1	4	25
Total Vol.	401		669		413		453		**1936**		889		948		921		596		**3354**

GPS Coordinates: 33.407884, -111.528766

Daily Totals

NB	SB	EB	WB	Combined
1290	1617	1334	1049	**5290**

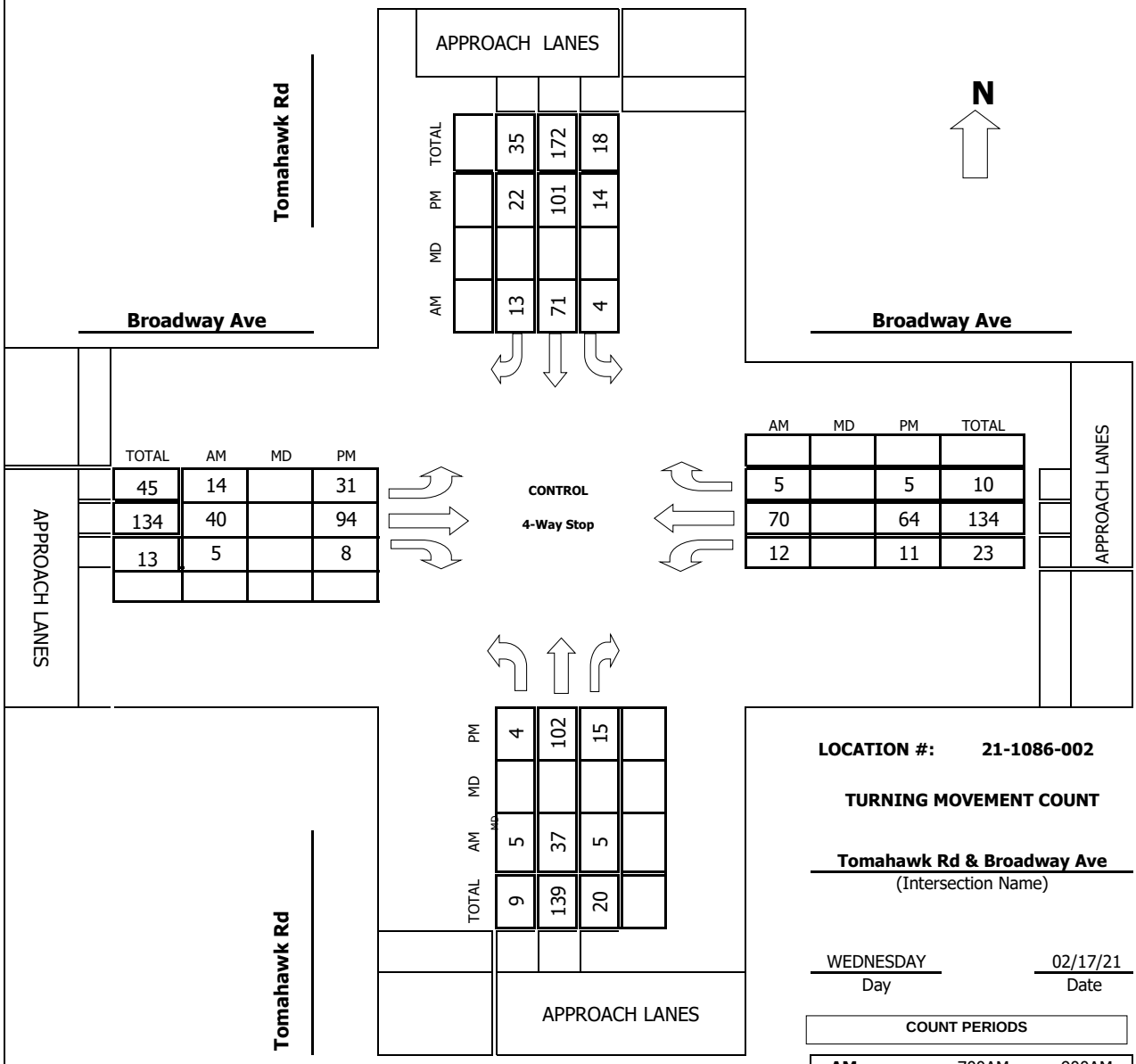
	AM					PM				
Split %	20.7%	34.6%	21.3%	23.4%	**36.6%**	26.5%	28.3%	27.5%	17.8%	**63.4%**
Peak Hour	10:15	11:15	10:30	10:00	**10:45**	16:00	16:45	16:00	12:30	**16:45**
Volume	111	131	107	89	**421**	141	137	134	88	**471**
P.H.F.	0.82	0.82	0.81	0.82	**0.86**	0.86	0.80	0.91	0.79	**0.91**

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1086-002

TMC SUMMARY OF Tomahawk Rd & Broadway Ave



LOCATION #: 21-1086-002

TURNING MOVEMENT COUNT

Tomahawk Rd & Broadway Ave
(Intersection Name)

WEDNESDAY (Day) 02/17/21 (Date)

COUNT PERIODS

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

AM PEAK HOUR 800 AM

NOON PEAK HOUR

PM PEAK HOUR 445 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Tomahawk Rd	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Broadway Ave	DAY:	WEDNESDAY	PROJECT#	21-1086-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	1	0	1	0	0	1	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	0	7	3	0	17	2	1	8	1	6	6	0	51
7:15 AM	1	4	1	1	22	5	4	8	2	1	14	0	63
7:30 AM	0	6	2	1	18	2	2	3	1	2	14	2	53
7:45 AM	1	17	2	2	14	6	2	9	0	3	11	1	68
8:00 AM	2	7	1	1	18	2	1	7	2	2	17	3	63
8:15 AM	0	8	1	0	20	1	4	10	0	2	20	0	66
8:30 AM	2	13	2	1	19	8	2	11	0	4	17	2	81
8:45 AM	1	9	1	2	14	2	7	12	3	4	16	0	71
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	7	71	13	8	142	28	23	68	9	24	115	8	516
Approach %	7.69	78.02	14.29	4.49	79.78	15.73	23.00	68.00	9.00	16.33	78.23	5.44	
App/Depart	91	/	102	178	/	175	100	/	89	147	/	150	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	5	37	5	4	71	13	14	40	5	12	70	5	281
Approach %	10.64	78.72	10.64	4.55	80.68	14.77	23.73	67.80	8.47	13.79	80.46	5.75	
PEAK HR. FACTOR:		0.691			0.786			0.670			0.946		0.867

CONTROL: 4-Way Stop
COMMENT 1:
GPS: 33.407884, -111.528766

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Tomahawk Rd 0	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Broadway Ave	DAY:	WEDNESDAY	PROJECT#	21-1086-002

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	0	1	1	1	0	1	0	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	0	37	4	2	23	6	11	20	6	5	12	2	128
4:15 PM	0	31	7	2	20	4	11	22	1	3	16	1	118
4:30 PM	1	27	5	2	16	7	8	18	0	2	12	1	99
4:45 PM	2	23	4	1	24	5	8	27	2	3	17	1	117
5:00 PM	1	20	7	6	30	1	7	26	2	3	15	2	120
5:15 PM	0	34	2	4	31	8	7	20	1	4	19	0	130
5:30 PM	1	25	2	3	16	8	9	21	3	1	13	2	104
5:45 PM	1	21	5	1	20	5	10	16	3	3	10	1	96
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	6	218	36	21	180	44	71	170	18	24	114	10	912
Approach %	2.31	83.85	13.85	8.57	73.47	17.96	27.41	65.64	6.95	16.22	77.03	6.76	
App/Depart	260	/	299	245	/	222	259	/	227	148	/	164	

PM Peak Hr Begins at: 445 PM

PEAK													
Volumes	4	102	15	14	101	22	31	94	8	11	64	5	471
Approach %	3.31	84.30	12.40	10.22	73.72	16.06	23.31	70.68	6.02	13.75	80.00	6.25	
PEAK HR. FACTOR:		0.840			0.797			0.899			0.870		0.906

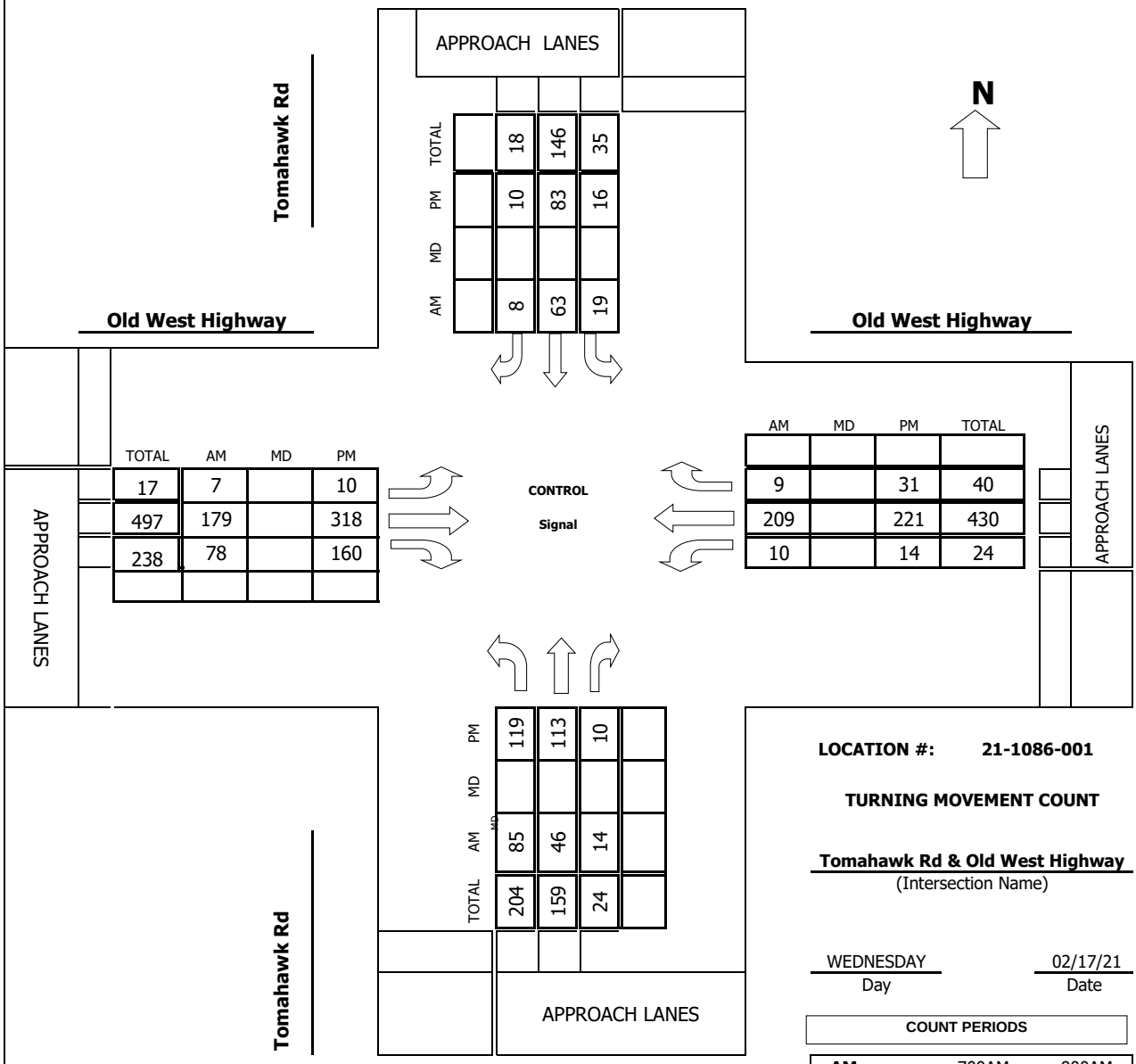
CONTROL: 4-Way Stop
COMMENT 1: 0
GPS: 33.407884, -111.528766

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

Project #: 21-1086-001

TMC SUMMARY OF Tomahawk Rd & Old West Highway



LOCATION #: 21-1086-001

TURNING MOVEMENT COUNT

Tomahawk Rd & Old West Highway
(Intersection Name)

WEDNESDAY (Day) 02/17/21 (Date)

COUNT PERIODS

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

AM PEAK HOUR 800 AM

NOON PEAK HOUR

PM PEAK HOUR 400 PM

Intersection Turning Movement
Prepared by:

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Tomahawk Rd	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Old West Highway	DAY:	WEDNESDAY	PROJECT#	21-1086-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	1	2	1	1	2	1	
6:00 AM													
6:15 AM													
6:30 AM													
6:45 AM													
7:00 AM	19	10	2	1	21	2	1	16	14	2	23	0	111
7:15 AM	17	7	2	4	24	1	2	27	6	0	31	0	121
7:30 AM	12	8	0	4	19	2	1	32	15	1	51	2	147
7:45 AM	22	9	0	2	20	1	2	21	15	1	37	2	132
8:00 AM	20	13	1	8	8	2	1	46	23	0	33	1	156
8:15 AM	23	9	3	6	12	2	4	35	24	0	51	1	170
8:30 AM	17	13	4	3	26	2	2	49	12	5	66	3	202
8:45 AM	25	11	6	2	17	2	0	49	19	5	59	4	199
9:00 AM													
9:15 AM													
9:30 AM													
9:45 AM													
10:00 AM													
10:15 AM													
10:30 AM													
10:45 AM													
11:00 AM													
11:15 AM													
11:30 AM													
11:45 AM													

TOTAL	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
Volumes	155	80	18	30	147	14	13	275	128	14	351	13	1238
Approach %	61.26	31.62	7.11	15.71	76.96	7.33	3.13	66.11	30.77	3.70	92.86	3.44	
App/Depart	253	/	106	191	/	289	416	/	323	378	/	520	

AM Peak Hr Begins at: 800 AM

PEAK													
Volumes	85	46	14	19	63	8	7	179	78	10	209	9	727
Approach %	58.62	31.72	9.66	21.11	70.00	8.89	2.65	67.80	29.55	4.39	91.67	3.95	
PEAK HR. FACTOR:		0.863			0.726			0.943			0.770		0.900

CONTROL:	Signal
COMMENT 1:	
GPS:	33.402838, -111.528743

Intersection Turning Movement

FIELD DATA SERVICES OF ARIZONA, INC.
520.316.6745

veracitytrafficgroup

N-S STREET:	Tomahawk Rd 0	DATE:	02/17/21	LOCATION:	Apache Junction
E-W STREET:	Old West Highway	DAY:	WEDNESDAY	PROJECT#	21-1086-001

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
LANES:	1	1	1	1	1	1	1	2	1	1	2	1	
1:00 PM													
1:15 PM													
1:30 PM													
1:45 PM													
2:00 PM													
2:15 PM													
2:30 PM													
2:45 PM													
3:00 PM													
3:15 PM													
3:30 PM													
3:45 PM													
4:00 PM	37	29	3	4	25	1	4	82	35	3	61	13	297
4:15 PM	24	37	4	7	21	1	1	85	47	2	60	5	294
4:30 PM	28	25	1	3	13	6	3	78	46	6	52	9	270
4:45 PM	30	22	2	2	24	2	2	73	32	3	48	4	244
5:00 PM	27	26	3	3	30	6	1	75	43	2	53	2	271
5:15 PM	26	25	2	5	31	5	3	60	44	8	41	2	252
5:30 PM	25	25	1	1	15	2	1	68	32	2	42	2	216
5:45 PM	21	22	2	2	16	3	2	52	31	3	41	1	196
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	218	211	18	27	175	26	17	573	310	29	398	38	2040
Approach %	48.77	47.20	4.03	11.84	76.75	11.40	1.89	63.67	34.44	6.24	85.59	8.17	
App/Depart	447	/	266	228	/	514	900	/	618	465	/	642	

PM Peak Hr Begins at: 400 PM

PEAK													
Volumes	119	113	10	16	83	10	10	318	160	14	221	31	1105
Approach %	49.17	46.69	4.13	14.68	76.15	9.17	2.05	65.16	32.79	5.26	83.08	11.65	
PEAK HR. FACTOR:		0.877			0.908			0.917			0.864		0.930

CONTROL:	Signal
COMMENT 1:	0
GPS:	33.402838, -111.528743

TRAFFIC IMPACT ANALYSIS
RESIDENCES AT APACHE JUNCTION
BROADWAY AVENUE/TOMAHAWK ROAD

APPENDIX

Trip Generation Calculations

Multifamily Housing (Low Rise)

LAND USE: 173 Dwelling Units Multifamily Housing (Low Rise)

TRIP GENERATION CALCULATIONS ARE BASED ON THE INSTITUTE OF TRANSPORTATION ENGINEERS' TRIP GENERATION, 10TH EDITION. THE ITE LAND USE CODE IS Multifamily Housing (Low Rise) (220), General Urban/Suburban

Weekday

Fitted Curve	T=7.56(X) - 40.86		
	Where X = 173d.u.		
		T =	1,268 VTPD
ENTER:	(0.5)*(1268) =		634 VTPD
EXIT:	(0.5)*(1268) =		634 VTPD

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

Fitted Curve	Ln(T) = 0.95Ln(X) - 0.51		
	Where X = 173d.u.		
		T =	80 VPH
ENTER:	(0.23)*(80) =		18 VPH
EXIT:	(0.77)*(80) =		62 VPH

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

Fitted Curve	Ln(T) = 0.89Ln(X) - 0.02		
	Where X = 173d.u.		
		T =	96 VPH
ENTER:	(0.63)*(96) =		60 VPH
EXIT:	(0.37)*(96) =		36 VPH

*where, T = trip ends

TRIP GENERATION SUMMARY

WEEKDAY	1,268 VTPD
AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)	80 VPH
PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)	96 VPH

Multifamily Housing (Low Rise)

LAND USE: 28 Dwelling Units Multifamily Housing (Low Rise)

TRIP GENERATION CALCULATIONS ARE BASED ON THE INSTITUTE OF TRANSPORTATION ENGINEERS' TRIP GENERATION, 10TH EDITION. THE ITE LAND USE CODE IS Multifamily Housing (Low Rise) (220), General Urban/Suburban

Weekday

Fitted Curve	T=7.56(X) - 40.86		
	Where X = 28d.u.		
		T =	172 VTPD
ENTER:	(0.5)*(172) =		86 VTPD
EXIT:	(0.5)*(172) =		86 VTPD

AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)

Fitted Curve	Ln(T) = 0.95Ln(X) - 0.51		
	Where X = 28d.u.		
		T =	14 VPH
ENTER:	(0.23)*(14) =		3 VPH
EXIT:	(0.77)*(14) =		11 VPH

PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)

Fitted Curve	Ln(T) = 0.89Ln(X) - 0.02		
	Where X = 28d.u.		
		T =	19 VPH
ENTER:	(0.63)*(19) =		12 VPH
EXIT:	(0.37)*(19) =		7 VPH

*where, T = trip ends

TRIP GENERATION SUMMARY

WEEKDAY	172 VTPD
AM PEAK HOUR (ONE HOUR BETWEEN 7 AND 9 AM)	14 VPH
PM PEAK HOUR (ONE HOUR BETWEEN 4 AND 6 PM)	19 VPH

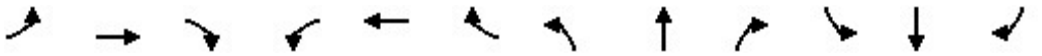
TRAFFIC IMPACT ANALYSIS
RESIDENCES AT APACHE JUNCTION
BROADWAY AVENUE/TOMAHAWK ROAD

APPENDIX

Capacity Calculations

HCM 6th Signalized Intersection Summary
1: Tomahawk Road & Old West Hwy

03/06/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	179	78	10	209	9	85	46	14	19	63	8
Future Volume (veh/h)	7	179	78	10	209	9	85	46	14	19	63	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	199	87	11	232	10	94	51	16	21	70	9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	849	379	129	849	379	445	468	396	426	447	379
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.25	0.25	0.25	0.24	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	8	199	87	11	232	10	94	51	16	21	70	9
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.4	4.1	4.0	0.5	4.8	0.4	3.8	1.9	0.7	0.8	2.7	0.4
Cycle Q Clear(g_c), s	0.4	4.1	4.0	0.5	4.8	0.4	3.8	1.9	0.7	0.8	2.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
V/C Ratio(X)	0.06	0.23	0.23	0.09	0.27	0.03	0.21	0.11	0.04	0.05	0.16	0.02
Avail Cap(c_a), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	27.6	27.6	39.0	27.9	26.2	26.7	26.0	25.6	26.4	27.1	26.2
Incr Delay (d2), s/veh	0.9	0.6	1.4	1.3	0.8	0.1	1.1	0.5	0.2	0.2	0.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	1.6	0.3	2.0	0.2	1.7	0.9	0.3	0.4	1.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	28.3	29.0	40.3	28.7	26.4	27.8	26.5	25.8	26.6	27.8	26.3
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		294			253			161			100	
Approach Delay, s/veh		28.8			29.1			27.2			27.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	11.0	26.0		26.0	11.0	26.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	6.5	21.5		21.5	6.5	21.5				
Max Q Clear Time (g_c+I1), s		5.8	2.5	6.1		4.7	2.4	6.8				
Green Ext Time (p_c), s		0.5	0.0	1.2		0.3	0.0	1.1				

Intersection Summary	
HCM 6th Ctrl Delay	28.4
HCM 6th LOS	C

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	238	28	0	0	0	0	51	7	2	33	0
Future Vol, veh/h	51	238	28	0	0	0	0	51	7	2	33	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	264	31	0	0	0	0	57	8	2	37	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	378	132	275	409	-	
Stage 1	-	-	-	-	378	-	0	0	-	
Stage 2	-	-	-	-	0	-	275	409	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	552	893	656	531	0	
Stage 1	-	-	-	0	614	-	-	-	0	
Stage 2	-	-	-	0	-	-	708	594	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	552	893	599	531	-	
Mov Cap-2 Maneuver	-	-	-	-	552	-	599	531	-	
Stage 1	-	-	-	-	614	-	-	-	-	
Stage 2	-	-	-	-	-	-	637	594	-	

Approach	EB	NB	SB
HCM Control Delay, s		11.9	12.3
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	552	893	-	-	-	534
HCM Lane V/C Ratio	0.103	0.009	-	-	-	0.073
HCM Control Delay (s)	12.3	9.1	-	-	-	12.3
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	298	0	37	65	0	0	27	71
Future Vol, veh/h	0	0	0	8	298	0	37	65	0	0	27	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	331	0	41	72	0	0	30	79

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	0	0	0	199	349	-	-	349	166	
Stage 1	-	-	-	0	0	-	-	349	-	
Stage 2	-	-	-	199	349	-	-	0	-	
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-	
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-	
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32	
Pot Cap-1 Maneuver	-	-	-	742	574	0	0	574	849	
Stage 1	-	-	-	-	-	0	0	632	-	
Stage 2	-	-	-	784	632	0	0	-	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	646	574	-	-	574	849	
Mov Cap-2 Maneuver	-	-	-	646	574	-	-	574	-	
Stage 1	-	-	-	-	-	-	-	632	-	
Stage 2	-	-	-	677	632	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s		12.4	10.6
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	598	-	-	-	750
HCM Lane V/C Ratio	0.19	-	-	-	0.145
HCM Control Delay (s)	12.4	-	-	-	10.6
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.7	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	7	91	2	1	64
Future Vol, veh/h	3	7	91	2	1	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	8	101	2	1	71

Major/Minor	Minor2		Major2	
Conflicting Flow All	204	2	0	0
Stage 1	204	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	692	1082	-	-
Stage 1	733	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1082	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

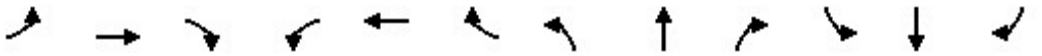
Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1082	-	-
HCM Lane V/C Ratio	0.01	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	40	5	12	70	5	5	37	5	4	71	13
Future Vol, veh/h	14	40	5	12	70	5	5	37	5	4	71	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	44	6	13	78	6	6	41	6	4	79	14
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	8.5	8.6	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	24%	15%	0%	100%	0%	0%
Vol Thru, %	0%	88%	68%	85%	0%	0%	100%	0%
Vol Right, %	0%	12%	8%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	42	59	82	5	4	71	13
LT Vol	5	0	14	12	0	4	0	0
Through Vol	0	37	40	70	0	0	71	0
RT Vol	0	5	5	0	5	0	0	13
Lane Flow Rate	6	47	66	91	6	4	79	14
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.009	0.066	0.095	0.131	0.007	0.007	0.112	0.018
Departure Headway (Hd)	5.715	5.129	5.206	5.157	4.383	5.619	5.117	4.414
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	627	699	689	696	817	638	701	811
Service Time	3.444	2.857	2.933	2.881	2.107	3.346	2.844	2.141
HCM Lane V/C Ratio	0.01	0.067	0.096	0.131	0.007	0.006	0.113	0.017
HCM Control Delay	8.5	8.2	8.5	8.7	7.1	8.4	8.5	7.2
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0.2	0.3	0.4	0	0	0.4	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	318	160	14	221	31	119	113	10	16	83	10
Future Volume (veh/h)	10	318	160	14	221	31	119	113	10	16	83	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	353	178	16	246	34	132	126	11	18	92	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	928	414	109	809	361	445	468	396	406	426	361
Arrive On Green	0.09	0.26	0.26	0.06	0.23	0.23	0.25	0.25	0.25	0.23	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	11	353	178	16	246	34	132	126	11	18	92	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.5	7.3	8.4	0.8	5.2	1.5	5.4	4.9	0.5	0.7	3.6	0.5
Cycle Q Clear(g_c), s	0.5	7.3	8.4	0.8	5.2	1.5	5.4	4.9	0.5	0.7	3.6	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
V/C Ratio(X)	0.07	0.38	0.43	0.15	0.30	0.09	0.30	0.27	0.03	0.04	0.22	0.03
Avail Cap(c_a), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	27.3	27.7	40.0	28.8	27.4	27.3	27.1	25.5	27.1	28.2	27.0
Incr Delay (d2), s/veh	0.7	1.2	3.2	2.8	1.0	0.5	1.7	1.4	0.1	0.2	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.1	3.4	0.4	2.2	0.6	2.4	2.3	0.2	0.3	1.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	28.5	30.9	42.9	29.8	27.9	29.0	28.6	25.6	27.3	29.4	27.2
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		542			296			269			121	
Approach Delay, s/veh		29.5			30.3			28.7			28.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	10.0	28.0		25.0	13.0	25.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	5.5	23.5		20.5	8.5	20.5				
Max Q Clear Time (g_c+I1), s		7.4	2.8	10.4		5.6	2.5	7.2				
Green Ext Time (p_c), s		0.9	0.0	2.2		0.4	0.0	1.2				

Intersection Summary												
HCM 6th Ctrl Delay			29.4									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	475	71	0	0	0	0	70	5	4	39	0
Future Vol, veh/h	130	475	71	0	0	0	0	70	5	4	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	528	79	0	0	0	0	78	6	4	43	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	816	264	591	895	-	
Stage 1	-	-	-	-	816	-	0	0	-	
Stage 2	-	-	-	-	0	-	591	895	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	310	734	391	279	0	
Stage 1	-	-	-	0	389	-	-	-	0	
Stage 2	-	-	-	0	-	-	460	357	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	310	734	313	279	-	
Mov Cap-2 Maneuver	-	-	-	-	310	-	313	279	-	
Stage 1	-	-	-	-	389	-	-	-	-	
Stage 2	-	-	-	-	-	-	365	357	-	

Approach	EB	NB	SB
HCM Control Delay, s		19.8	20.4
HCM LOS		C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	310	734	-	-	-	282
HCM Lane V/C Ratio	0.251	0.008	-	-	-	0.169
HCM Control Delay (s)	20.5	9.9	-	-	-	20.4
HCM Lane LOS	C	A	-	-	-	C
HCM 95th %tile Q(veh)	1	0	-	-	-	0.6

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	12	352	1	44	156	0	0	31	71
Future Vol, veh/h	0	0	0	12	352	1	44	156	0	0	31	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	391	1	49	173	0	0	34	79

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	0	0	0	239	418	-	-	418	196	
Stage 1	-	-	-	0	0	-	-	418	-	
Stage 2	-	-	-	239	418	-	-	0	-	
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-	
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-	
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32	
Pot Cap-1 Maneuver	-	-	-	695	524	0	0	524	812	
Stage 1	-	-	-	-	-	0	0	589	-	
Stage 2	-	-	-	743	589	0	0	-	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	596	524	-	-	524	812	
Mov Cap-2 Maneuver	-	-	-	596	524	-	-	524	-	
Stage 1	-	-	-	-	-	-	-	589	-	
Stage 2	-	-	-	632	589	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s		16.3	11.2
HCM LOS		C	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	538	-	-	-	696
HCM Lane V/C Ratio	0.413	-	-	-	0.163
HCM Control Delay (s)	16.3	-	-	-	11.2
HCM Lane LOS	C	-	-	-	B
HCM 95th %tile Q(veh)	2	-	-	-	0.6

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	13	89	6	17	140
Future Vol, veh/h	6	13	89	6	17	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	14	99	7	19	156

Major/Minor	Minor2		Major2	
Conflicting Flow All	205	7	0	0
Stage 1	205	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	691	1075	-	-
Stage 1	732	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1075	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1075	-	-
HCM Lane V/C Ratio	0.02	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

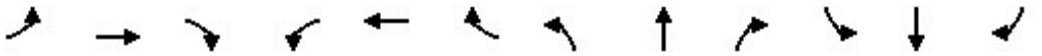
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	94	8	11	64	5	4	102	15	14	101	22
Future Vol, veh/h	31	94	8	11	64	5	4	102	15	14	101	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	104	9	12	71	6	4	113	17	16	112	24
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	10.1	9.3	9.7	9.2
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	23%	15%	0%	100%	0%	0%
Vol Thru, %	0%	87%	71%	85%	0%	0%	100%	0%
Vol Right, %	0%	13%	6%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	117	133	75	5	14	101	22
LT Vol	4	0	31	11	0	14	0	0
Through Vol	0	102	94	64	0	0	101	0
RT Vol	0	15	8	0	5	0	0	22
Lane Flow Rate	4	130	148	83	6	16	112	24
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.008	0.199	0.231	0.133	0.008	0.026	0.173	0.033
Departure Headway (Hd)	6.099	5.504	5.617	5.751	4.975	6.062	5.558	4.853
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	582	646	634	618	711	586	640	730
Service Time	3.881	3.286	3.397	3.54	2.763	3.843	3.339	2.633
HCM Lane V/C Ratio	0.007	0.201	0.233	0.134	0.008	0.027	0.175	0.033
HCM Control Delay	8.9	9.7	10.1	9.4	7.8	9	9.5	7.8
HCM Lane LOS	A	A	B	A	A	A	A	A
HCM 95th-tile Q	0	0.7	0.9	0.5	0	0.1	0.6	0.1

HCM 6th Signalized Intersection Summary
1: Tomahawk Road & Old West Hwy

03/06/2021



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	183	78	10	213	9	85	47	14	19	64	8
Future Volume (veh/h)	7	183	78	10	213	9	85	47	14	19	64	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	203	87	11	237	10	94	52	16	21	71	9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	849	379	129	849	379	445	468	396	426	447	379
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.25	0.25	0.25	0.24	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	8	203	87	11	237	10	94	52	16	21	71	9
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.4	4.2	4.0	0.5	4.9	0.4	3.8	1.9	0.7	0.8	2.7	0.4
Cycle Q Clear(g_c), s	0.4	4.2	4.0	0.5	4.9	0.4	3.8	1.9	0.7	0.8	2.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
V/C Ratio(X)	0.06	0.24	0.23	0.09	0.28	0.03	0.21	0.11	0.04	0.05	0.16	0.02
Avail Cap(c_a), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	27.6	27.6	39.0	27.9	26.2	26.7	26.0	25.6	26.4	27.1	26.2
Incr Delay (d2), s/veh	0.9	0.7	1.4	1.3	0.8	0.1	1.1	0.5	0.2	0.2	0.8	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	1.6	0.3	2.1	0.2	1.7	0.9	0.3	0.4	1.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	28.3	29.0	40.3	28.7	26.4	27.8	26.5	25.8	26.6	27.9	26.3
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		298			258			162			101	
Approach Delay, s/veh		28.8			29.1			27.2			27.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	11.0	26.0		26.0	11.0	26.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	6.5	21.5		21.5	6.5	21.5				
Max Q Clear Time (g_c+I1), s		5.8	2.5	6.2		4.7	2.4	6.9				
Green Ext Time (p_c), s		0.5	0.0	1.2		0.3	0.0	1.1				

Intersection Summary												
HCM 6th Ctrl Delay			28.4									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	243	28	0	0	0	0	51	7	2	33	0
Future Vol, veh/h	51	243	28	0	0	0	0	51	7	2	33	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	57	270	31	0	0	0	0	57	8	2	37	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	384	135	278	415	-	
Stage 1	-	-	-	-	384	-	0	0	-	
Stage 2	-	-	-	-	0	-	278	415	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	548	889	652	527	0	
Stage 1	-	-	-	0	610	-	-	-	0	
Stage 2	-	-	-	0	-	-	705	591	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	548	889	595	527	-	
Mov Cap-2 Maneuver	-	-	-	-	548	-	595	527	-	
Stage 1	-	-	-	-	610	-	-	-	-	
Stage 2	-	-	-	-	-	-	634	591	-	

Approach	EB	NB	SB
HCM Control Delay, s		11.9	12.3
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	548	889	-	-	-	530
HCM Lane V/C Ratio	0.103	0.009	-	-	-	0.073
HCM Control Delay (s)	12.3	9.1	-	-	-	12.3
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.3	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	4.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	304	0	37	65	0	0	27	71
Future Vol, veh/h	0	0	0	8	304	0	37	65	0	0	27	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	338	0	41	72	0	0	30	79

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	0	0	0	202	356	-	-	356	169	
Stage 1	-	-	-	0	0	-	-	356	-	
Stage 2	-	-	-	202	356	-	-	0	-	
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-	
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-	
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32	
Pot Cap-1 Maneuver	-	-	-	738	568	0	0	568	845	
Stage 1	-	-	-	-	-	0	0	628	-	
Stage 2	-	-	-	781	628	0	0	-	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	642	568	-	-	568	845	
Mov Cap-2 Maneuver	-	-	-	642	568	-	-	568	-	
Stage 1	-	-	-	-	-	-	-	628	-	
Stage 2	-	-	-	674	628	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s		12.5	10.7
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	593	-	-	-	745
HCM Lane V/C Ratio	0.191	-	-	-	0.146
HCM Control Delay (s)	12.5	-	-	-	10.7
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.7	-	-	-	0.5

Intersection	
Int Delay, s/veh	0.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	7	91	2	1	64
Future Vol, veh/h	3	7	91	2	1	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	8	101	2	1	71

Major/Minor	Minor2		Major2	
Conflicting Flow All	204	2	0	0
Stage 1	204	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	692	1082	-	-
Stage 1	733	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1082	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

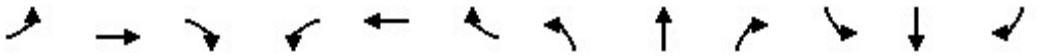
Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1082	-	-
HCM Lane V/C Ratio	0.01	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Intersection Delay, s/veh	8.4
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	40	5	12	70	5	5	38	5	4	72	13
Future Vol, veh/h	14	40	5	12	70	5	5	38	5	4	72	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	44	6	13	78	6	6	42	6	4	80	14
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	8.5	8.6	8.2	8.3
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	24%	15%	0%	100%	0%	0%
Vol Thru, %	0%	88%	68%	85%	0%	0%	100%	0%
Vol Right, %	0%	12%	8%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	5	43	59	82	5	4	72	13
LT Vol	5	0	14	12	0	4	0	0
Through Vol	0	38	40	70	0	0	72	0
RT Vol	0	5	5	0	5	0	0	13
Lane Flow Rate	6	48	66	91	6	4	80	14
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.009	0.068	0.095	0.131	0.007	0.007	0.114	0.018
Departure Headway (Hd)	5.717	5.132	5.212	5.163	4.389	5.622	5.12	4.417
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	626	698	688	695	815	637	701	810
Service Time	3.447	2.862	2.941	2.889	2.115	3.349	2.847	2.144
HCM Lane V/C Ratio	0.01	0.069	0.096	0.131	0.007	0.006	0.114	0.017
HCM Control Delay	8.5	8.2	8.5	8.7	7.1	8.4	8.5	7.2
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0	0.2	0.3	0.4	0	0	0.4	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	324	160	14	225	31	119	115	10	16	84	10
Future Volume (veh/h)	10	324	160	14	225	31	119	115	10	16	84	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	360	178	16	250	34	132	128	11	18	93	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	928	414	109	809	361	445	468	396	406	426	361
Arrive On Green	0.09	0.26	0.26	0.06	0.23	0.23	0.25	0.25	0.25	0.23	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	11	360	178	16	250	34	132	128	11	18	93	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.5	7.5	8.4	0.8	5.3	1.5	5.4	5.0	0.5	0.7	3.6	0.5
Cycle Q Clear(g_c), s	0.5	7.5	8.4	0.8	5.3	1.5	5.4	5.0	0.5	0.7	3.6	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
V/C Ratio(X)	0.07	0.39	0.43	0.15	0.31	0.09	0.30	0.27	0.03	0.04	0.22	0.03
Avail Cap(c_a), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	27.3	27.7	40.0	28.9	27.4	27.3	27.2	25.5	27.1	28.2	27.0
Incr Delay (d2), s/veh	0.7	1.2	3.2	2.8	1.0	0.5	1.7	1.4	0.1	0.2	1.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.1	3.4	0.4	2.2	0.6	2.4	2.3	0.2	0.3	1.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	28.6	30.9	42.9	29.9	27.9	29.0	28.6	25.6	27.3	29.4	27.2
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		549			300			271			122	
Approach Delay, s/veh		29.5			30.3			28.7			28.9	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	10.0	28.0		25.0	13.0	25.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	5.5	23.5		20.5	8.5	20.5				
Max Q Clear Time (g_c+I1), s		7.4	2.8	10.4		5.6	2.5	7.3				
Green Ext Time (p_c), s		0.9	0.0	2.2		0.4	0.0	1.2				

Intersection Summary												
HCM 6th Ctrl Delay			29.5									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	130	485	71	0	0	0	0	70	5	4	39	0
Future Vol, veh/h	130	485	71	0	0	0	0	70	5	4	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	144	539	79	0	0	0	0	78	6	4	43	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	827	270	597	906	-	
Stage 1	-	-	-	-	827	-	0	0	-	
Stage 2	-	-	-	-	0	-	597	906	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	305	728	387	275	0	
Stage 1	-	-	-	0	384	-	-	-	0	
Stage 2	-	-	-	0	-	-	456	353	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	305	728	308	275	-	
Mov Cap-2 Maneuver	-	-	-	-	305	-	308	275	-	
Stage 1	-	-	-	-	384	-	-	-	-	
Stage 2	-	-	-	-	-	-	361	353	-	

Approach	EB	NB	SB
HCM Control Delay, s		20.1	20.6
HCM LOS		C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	305	728	-	-	-	278
HCM Lane V/C Ratio	0.255	0.008	-	-	-	0.172
HCM Control Delay (s)	20.8	10	-	-	-	20.6
HCM Lane LOS	C	B	-	-	-	C
HCM 95th %tile Q(veh)	1	0	-	-	-	0.6

Intersection	
Int Delay, s/veh	6.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	12	359	1	44	156	0	0	31	71
Future Vol, veh/h	0	0	0	12	359	1	44	156	0	0	31	71
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	399	1	49	173	0	0	34	79

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	243	426	-	-	426	200
Stage 1	-	-	-	0	0	-	-	426	-
Stage 2	-	-	-	243	426	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	691	519	0	0	519	808
Stage 1	-	-	-	-	-	0	0	584	-
Stage 2	-	-	-	739	584	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	592	519	-	-	519	808
Mov Cap-2 Maneuver	-	-	-	592	519	-	-	519	-
Stage 1	-	-	-	-	-	-	-	584	-
Stage 2	-	-	-	628	584	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		16.5	11.2
HCM LOS		C	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	533	-	-	-	691
HCM Lane V/C Ratio	0.417	-	-	-	0.164
HCM Control Delay (s)	16.5	-	-	-	11.2
HCM Lane LOS	C	-	-	-	B
HCM 95th %tile Q(veh)	2	-	-	-	0.6

Intersection	
Int Delay, s/veh	1.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	13	89	6	17	140
Future Vol, veh/h	6	13	89	6	17	140
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	14	99	7	19	156

Major/Minor	Minor2		Major2	
Conflicting Flow All	205	7	0	0
Stage 1	205	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	691	1075	-	-
Stage 1	732	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1075	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

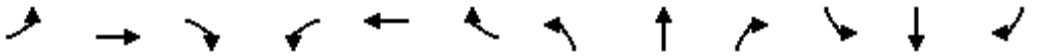
Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1075	-	-
HCM Lane V/C Ratio	0.02	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Intersection Delay, s/veh	9.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	94	8	11	64	5	4	104	15	14	103	22
Future Vol, veh/h	31	94	8	11	64	5	4	104	15	14	103	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	104	9	12	71	6	4	116	17	16	114	24
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	10.1	9.3	9.7	9.3
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	23%	15%	0%	100%	0%	0%
Vol Thru, %	0%	87%	71%	85%	0%	0%	100%	0%
Vol Right, %	0%	13%	6%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	119	133	75	5	14	103	22
LT Vol	4	0	31	11	0	14	0	0
Through Vol	0	104	94	64	0	0	103	0
RT Vol	0	15	8	0	5	0	0	22
Lane Flow Rate	4	132	148	83	6	16	114	24
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.008	0.202	0.231	0.133	0.008	0.026	0.177	0.033
Departure Headway (Hd)	6.107	5.513	5.63	5.766	4.99	6.069	5.565	4.86
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	582	645	632	616	709	586	640	729
Service Time	3.887	3.293	3.41	3.554	2.777	3.848	3.344	2.638
HCM Lane V/C Ratio	0.007	0.205	0.234	0.135	0.008	0.027	0.178	0.033
HCM Control Delay	8.9	9.7	10.1	9.4	7.8	9	9.6	7.8
HCM Lane LOS	A	A	B	A	A	A	A	A
HCM 95th-tile Q	0	0.8	0.9	0.5	0	0.1	0.6	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	183	78	10	213	13	85	53	14	33	86	8
Future Volume (veh/h)	7	183	78	10	213	13	85	53	14	33	86	8
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	8	203	87	11	237	14	94	59	16	37	96	9
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	129	849	379	129	849	379	445	468	396	426	447	379
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.25	0.25	0.25	0.24	0.24	0.24
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	8	203	87	11	237	14	94	59	16	37	96	9
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.4	4.2	4.0	0.5	4.9	0.6	3.8	2.2	0.7	1.5	3.7	0.4
Cycle Q Clear(g_c), s	0.4	4.2	4.0	0.5	4.9	0.6	3.8	2.2	0.7	1.5	3.7	0.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
V/C Ratio(X)	0.06	0.24	0.23	0.09	0.28	0.04	0.21	0.13	0.04	0.09	0.21	0.02
Avail Cap(c_a), veh/h	129	849	379	129	849	379	445	468	396	426	447	379
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.9	27.6	27.6	39.0	27.9	26.3	26.7	26.1	25.6	26.6	27.5	26.2
Incr Delay (d2), s/veh	0.9	0.7	1.4	1.3	0.8	0.2	1.1	0.6	0.2	0.4	1.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.7	1.6	0.3	2.1	0.2	1.7	1.0	0.3	0.6	1.7	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.8	28.3	29.0	40.3	28.7	26.5	27.8	26.7	25.8	27.0	28.6	26.3
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		298			262			169			142	
Approach Delay, s/veh		28.8			29.1			27.2			28.0	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	11.0	26.0		26.0	11.0	26.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	6.5	21.5		21.5	6.5	21.5				
Max Q Clear Time (g_c+I1), s		5.8	2.5	6.2		5.7	2.4	6.9				
Green Ext Time (p_c), s		0.5	0.0	1.2		0.5	0.0	1.1				

Intersection Summary												
HCM 6th Ctrl Delay			28.5									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	62	243	28	0	0	0	0	51	7	2	33	0
Future Vol, veh/h	62	243	28	0	0	0	0	51	7	2	33	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	69	270	31	0	0	0	0	57	8	2	37	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	408	135	302	439	-	
Stage 1	-	-	-	-	408	-	0	0	-	
Stage 2	-	-	-	-	0	-	302	439	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	531	889	627	510	0	
Stage 1	-	-	-	0	595	-	-	-	0	
Stage 2	-	-	-	0	-	-	682	576	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	531	889	571	510	-	
Mov Cap-2 Maneuver	-	-	-	-	531	-	571	510	-	
Stage 1	-	-	-	-	595	-	-	-	-	
Stage 2	-	-	-	-	-	-	612	576	-	

Approach	EB	NB	SB
HCM Control Delay, s		12.2	12.6
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	531	889	-	-	-	513
HCM Lane V/C Ratio	0.107	0.009	-	-	-	0.076
HCM Control Delay (s)	12.6	9.1	-	-	-	12.6
HCM Lane LOS	B	A	-	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	-	0.2

Intersection	
Int Delay, s/veh	5.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	8	304	0	37	76	0	0	27	108
Future Vol, veh/h	0	0	0	8	304	0	37	76	0	0	27	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	9	338	0	41	84	0	0	30	120

Major/Minor	Major2			Minor1			Minor2			
Conflicting Flow All	0	0	0	202	356	-	-	356	169	
Stage 1	-	-	-	0	0	-	-	356	-	
Stage 2	-	-	-	202	356	-	-	0	-	
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94	
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-	
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-	
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32	
Pot Cap-1 Maneuver	-	-	-	738	568	0	0	568	845	
Stage 1	-	-	-	-	-	0	0	628	-	
Stage 2	-	-	-	781	628	0	0	-	-	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	607	568	-	-	568	845	
Mov Cap-2 Maneuver	-	-	-	607	568	-	-	568	-	
Stage 1	-	-	-	-	-	-	-	628	-	
Stage 2	-	-	-	638	628	-	-	-	-	

Approach	WB	NB	SB
HCM Control Delay, s		12.9	10.8
HCM LOS		B	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	580	-	-	-	770
HCM Lane V/C Ratio	0.216	-	-	-	0.195
HCM Control Delay (s)	12.9	-	-	-	10.8
HCM Lane LOS	B	-	-	-	B
HCM 95th %tile Q(veh)	0.8	-	-	-	0.7

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	3	7	128	2	1	75
Future Vol, veh/h	3	7	128	2	1	75
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	8	142	2	1	83

Major/Minor	Minor2		Major2	
Conflicting Flow All	286	2	0	0
Stage 1	286	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	623	1082	-	-
Stage 1	675	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1082	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1082	-	-
HCM Lane V/C Ratio	0.01	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

Intersection	
Int Delay, s/veh	2.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	61	9	9	99	31	31
Future Vol, veh/h	61	9	9	99	31	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	68	10	10	110	34	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	78	0	203	73
Stage 1	-	-	-	-	73	-
Stage 2	-	-	-	-	130	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1520	-	786	989
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	896	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1520	-	780	989
Mov Cap-2 Maneuver	-	-	-	-	780	-
Stage 1	-	-	-	-	950	-
Stage 2	-	-	-	-	890	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	9.5
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	872	-	-	1520	-
HCM Lane V/C Ratio	0.079	-	-	0.007	-
HCM Control Delay (s)	9.5	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0.3	-	-	0	-

Intersection	
Int Delay, s/veh	0.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	90	2	1	102	6	5
Future Vol, veh/h	90	2	1	102	6	5
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	100	2	1	113	7	6

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	102	0	216	101
Stage 1	-	-	-	-	101	-
Stage 2	-	-	-	-	115	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1490	-	772	954
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	910	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1490	-	771	954
Mov Cap-2 Maneuver	-	-	-	-	771	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	909	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	9.3
HCM LOS			A

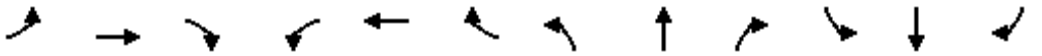
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	845	-	-	1490	-
HCM Lane V/C Ratio	0.014	-	-	0.001	-
HCM Control Delay (s)	9.3	-	-	7.4	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	8.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	14	40	41	12	70	5	15	38	5	4	72	13
Future Vol, veh/h	14	40	41	12	70	5	15	38	5	4	72	13
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	16	44	46	13	78	6	17	42	6	4	80	14
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	8.6	8.7	8.5	8.5
HCM LOS	A	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	15%	15%	0%	100%	0%	0%
Vol Thru, %	0%	88%	42%	85%	0%	0%	100%	0%
Vol Right, %	0%	12%	43%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	43	95	82	5	4	72	13
LT Vol	15	0	14	12	0	4	0	0
Through Vol	0	38	40	70	0	0	72	0
RT Vol	0	5	41	0	5	0	0	13
Lane Flow Rate	17	48	106	91	6	4	80	14
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.027	0.07	0.146	0.134	0.007	0.007	0.117	0.018
Departure Headway (Hd)	5.829	5.244	4.969	5.279	4.504	5.757	5.255	4.551
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	614	682	721	679	793	622	682	785
Service Time	3.567	2.982	2.702	3.013	2.239	3.492	2.99	2.286
HCM Lane V/C Ratio	0.028	0.07	0.147	0.134	0.008	0.006	0.117	0.018
HCM Control Delay	8.7	8.4	8.6	8.8	7.3	8.5	8.7	7.4
HCM Lane LOS	A	A	A	A	A	A	A	A
HCM 95th-tile Q	0.1	0.2	0.5	0.5	0	0	0.4	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	324	160	14	225	45	119	137	10	24	97	10
Future Volume (veh/h)	10	324	160	14	225	45	119	137	10	24	97	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	360	178	16	250	50	132	152	11	27	108	11
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	168	928	414	109	809	361	445	468	396	406	426	361
Arrive On Green	0.09	0.26	0.26	0.06	0.23	0.23	0.25	0.25	0.25	0.23	0.23	0.23
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	1781	1870	1585
Grp Volume(v), veh/h	11	360	178	16	250	50	132	152	11	27	108	11
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1781	1870	1585
Q Serve(g_s), s	0.5	7.5	8.4	0.8	5.3	2.3	5.4	6.0	0.5	1.1	4.3	0.5
Cycle Q Clear(g_c), s	0.5	7.5	8.4	0.8	5.3	2.3	5.4	6.0	0.5	1.1	4.3	0.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
V/C Ratio(X)	0.07	0.39	0.43	0.15	0.31	0.14	0.30	0.33	0.03	0.07	0.25	0.03
Avail Cap(c_a), veh/h	168	928	414	109	809	361	445	468	396	406	426	361
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.1	27.3	27.7	40.0	28.9	27.7	27.3	27.6	25.5	27.2	28.5	27.0
Incr Delay (d2), s/veh	0.7	1.2	3.2	2.8	1.0	0.8	1.7	1.8	0.1	0.3	1.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	3.1	3.4	0.4	2.2	0.9	2.4	2.8	0.2	0.5	2.0	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.9	28.6	30.9	42.9	29.9	28.5	29.0	29.4	25.6	27.6	29.9	27.2
LnGrp LOS	D	C	C	D	C	C	C	C	C	C	C	C
Approach Vol, veh/h		549			316			295			146	
Approach Delay, s/veh		29.5			30.3			29.1			29.3	
Approach LOS		C			C			C			C	

Timer - Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		27.0	10.0	28.0		25.0	13.0	25.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		22.5	5.5	23.5		20.5	8.5	20.5				
Max Q Clear Time (g_c+I1), s		8.0	2.8	10.4		6.3	2.5	7.3				
Green Ext Time (p_c), s		1.0	0.0	2.2		0.5	0.0	1.2				

Intersection Summary												
HCM 6th Ctrl Delay			29.6									
HCM 6th LOS			C									

Intersection	
Int Delay, s/veh	3.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	166	485	71	0	0	0	0	70	5	4	39	0
Future Vol, veh/h	166	485	71	0	0	0	0	70	5	4	39	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	50	-	150	-	-	-	-	-	150	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	184	539	79	0	0	0	0	78	6	4	43	0

Major/Minor	Major1			Minor1			Minor2			
Conflicting Flow All	0	0	0	-	907	270	677	986	-	
Stage 1	-	-	-	-	907	-	0	0	-	
Stage 2	-	-	-	-	0	-	677	986	-	
Critical Hdwy	4.14	-	-	-	6.54	6.94	7.54	6.54	-	
Critical Hdwy Stg 1	-	-	-	-	5.54	-	-	-	-	
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	
Follow-up Hdwy	2.22	-	-	-	4.02	3.32	3.52	4.02	-	
Pot Cap-1 Maneuver	-	-	-	0	274	728	339	246	0	
Stage 1	-	-	-	0	353	-	-	-	0	
Stage 2	-	-	-	0	-	-	409	324	0	
Platoon blocked, %		-	-							
Mov Cap-1 Maneuver	-	-	-	-	274	728	263	246	-	
Mov Cap-2 Maneuver	-	-	-	-	274	-	263	246	-	
Stage 1	-	-	-	-	353	-	-	-	-	
Stage 2	-	-	-	-	-	-	316	324	-	

Approach	EB	NB	SB
HCM Control Delay, s		22.4	23
HCM LOS		C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	SBLn1
Capacity (veh/h)	274	728	-	-	-	247
HCM Lane V/C Ratio	0.284	0.008	-	-	-	0.193
HCM Control Delay (s)	23.3	10	-	-	-	23
HCM Lane LOS	C	B	-	-	-	C
HCM 95th %tile Q(veh)	1.1	0	-	-	-	0.7

Intersection	
Int Delay, s/veh	7.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	0	12	359	1	44	192	0	0	31	93
Future Vol, veh/h	0	0	0	12	359	1	44	192	0	0	31	93
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	150	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	2	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	13	399	1	49	213	0	0	34	103

Major/Minor	Major2			Minor1			Minor2		
Conflicting Flow All	0	0	0	243	426	-	-	426	200
Stage 1	-	-	-	0	0	-	-	426	-
Stage 2	-	-	-	243	426	-	-	0	-
Critical Hdwy	4.14	-	-	7.54	6.54	-	-	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.54	-
Critical Hdwy Stg 2	-	-	-	6.54	5.54	-	-	-	-
Follow-up Hdwy	2.22	-	-	3.52	4.02	-	-	4.02	3.32
Pot Cap-1 Maneuver	-	-	-	691	519	0	0	519	808
Stage 1	-	-	-	-	-	0	0	584	-
Stage 2	-	-	-	739	584	0	0	-	-
Platoon blocked, %		-	-						
Mov Cap-1 Maneuver	-	-	-	572	519	-	-	519	808
Mov Cap-2 Maneuver	-	-	-	572	519	-	-	519	-
Stage 1	-	-	-	-	-	-	-	584	-
Stage 2	-	-	-	606	584	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s		18.4	11.3
HCM LOS		C	B

Minor Lane/Major Mvmt	NBLn1	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	528	-	-	-	709
HCM Lane V/C Ratio	0.497	-	-	-	0.194
HCM Control Delay (s)	18.4	-	-	-	11.3
HCM Lane LOS	C	-	-	-	B
HCM 95th %tile Q(veh)	2.7	-	-	-	0.7

Intersection	
Int Delay, s/veh	1.2

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	6	13	111	6	17	176
Future Vol, veh/h	6	13	111	6	17	176
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	16974	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	7	14	123	7	19	196

Major/Minor	Minor2		Major2	
Conflicting Flow All	253	7	0	0
Stage 1	253	-	-	-
Stage 2	0	-	-	-
Critical Hdwy	6.52	6.22	4.12	-
Critical Hdwy Stg 1	5.52	-	-	-
Critical Hdwy Stg 2	-	-	-	-
Follow-up Hdwy	4.018	3.318	2.218	-
Pot Cap-1 Maneuver	650	1075	-	-
Stage 1	698	-	-	-
Stage 2	-	-	-	-
Platoon blocked, %				-
Mov Cap-1 Maneuver	0	1075	-	-
Mov Cap-2 Maneuver	0	-	-	-
Stage 1	0	-	-	-
Stage 2	0	-	-	-

Approach	EB	WB
HCM Control Delay, s	8.4	
HCM LOS	A	

Minor Lane/Major Mvmt	EBLn1	WBL	WBT
Capacity (veh/h)	1075	-	-
HCM Lane V/C Ratio	0.02	-	-
HCM Control Delay (s)	8.4	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-

Intersection	
Int Delay, s/veh	1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	139	30	30	99	18	18
Future Vol, veh/h	139	30	30	99	18	18
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	154	33	33	110	20	20

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	187	0	347	171
Stage 1	-	-	-	-	171	-
Stage 2	-	-	-	-	176	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1387	-	650	873
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	855	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1387	-	634	873
Mov Cap-2 Maneuver	-	-	-	-	634	-
Stage 1	-	-	-	-	859	-
Stage 2	-	-	-	-	834	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.8	10.2
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	735	-	-	1387	-
HCM Lane V/C Ratio	0.054	-	-	0.024	-
HCM Control Delay (s)	10.2	-	-	7.7	0
HCM Lane LOS	B	-	-	A	A
HCM 95th %tile Q(veh)	0.2	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	151	6	6	125	4	3
Future Vol, veh/h	151	6	6	125	4	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	168	7	7	139	4	3

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	175	0	325	172
Stage 1	-	-	-	-	172	-
Stage 2	-	-	-	-	153	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	1401	-	669	872
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	875	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	1401	-	666	872
Mov Cap-2 Maneuver	-	-	-	-	666	-
Stage 1	-	-	-	-	858	-
Stage 2	-	-	-	-	871	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	9.9
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	741	-	-	1401	-
HCM Lane V/C Ratio	0.01	-	-	0.005	-
HCM Control Delay (s)	9.9	-	-	7.6	0
HCM Lane LOS	A	-	-	A	A
HCM 95th %tile Q(veh)	0	-	-	0	-

Intersection	
Intersection Delay, s/veh	9.9
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	31	94	29	11	64	5	40	104	15	14	103	22
Future Vol, veh/h	31	94	29	11	64	5	40	104	15	14	103	22
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	34	104	32	12	71	6	44	116	17	16	114	24
Number of Lanes	0	1	0	0	1	1	1	1	0	1	1	1

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	1	3	2
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	2	1	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	2	3	2	1
HCM Control Delay	10.6	9.7	9.8	9.5
HCM LOS	B	A	A	A

Lane	NBLn1	NBLn2	EBLn1	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	20%	15%	0%	100%	0%	0%
Vol Thru, %	0%	87%	61%	85%	0%	0%	100%	0%
Vol Right, %	0%	13%	19%	0%	100%	0%	0%	100%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	40	119	154	75	5	14	103	22
LT Vol	40	0	31	11	0	14	0	0
Through Vol	0	104	94	64	0	0	103	0
RT Vol	0	15	29	0	5	0	0	22
Lane Flow Rate	44	132	171	83	6	16	114	24
Geometry Grp	8	8	8	8	8	8	8	8
Degree of Util (X)	0.078	0.209	0.274	0.14	0.008	0.027	0.185	0.035
Departure Headway (Hd)	6.29	5.695	5.769	6.052	5.274	6.338	5.834	5.127
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	571	632	626	593	679	566	617	699
Service Time	4.01	3.416	3.469	3.779	3	4.062	3.557	2.85
HCM Lane V/C Ratio	0.077	0.209	0.273	0.14	0.009	0.028	0.185	0.034
HCM Control Delay	9.5	9.9	10.6	9.8	8	9.2	9.9	8
HCM Lane LOS	A	A	B	A	A	A	A	A
HCM 95th-tile Q	0.3	0.8	1.1	0.5	0	0.1	0.7	0.1

TRAFFIC IMPACT ANALYSIS
RESIDENCES AT APACHE JUNCTION
BROADWAY AVENUE/TOMAHAWK ROAD

APPENDIX

Traffic Signal Warrant Calculations

General Description of Intersection

Project Number: 21037

Existing

Name of Major Roadway: Tomahawk Road

Direction: N/S

# of NB Lanes: 1

# of SB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

Name of Minor Roadway: Broadway Avenue

Direction: E/W

# of EB Lanes: 1

# of WB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

City: Apache Junction

Population: 41,000

County: Maricopa

District:

Data Source: 24-hour approach

Date of Survey: 2/17/2021 *(press Ctrl + ;)*

Day of Week: Wednesday

Weather: Sunny

Surface Conditions: Dry

Smooth

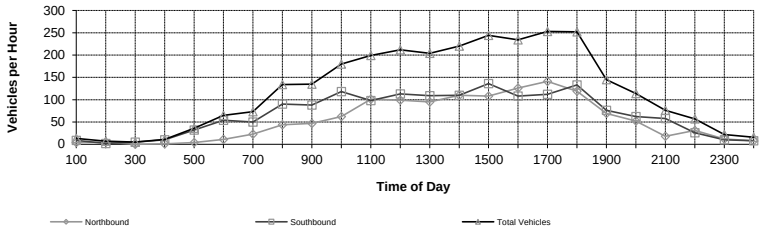
Enter Traffic Volumes:

Automated Traffic Counts

Street: **Tomahawk Road**
Location: **Broadway Avenue**

City/State: **Apache Junction, AZ**
Project #: **21037**
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**

24-Hour Volume: **2,907**



Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	4		9	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	5		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	0		5	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	1		10	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	4		32	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	11		54	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	23		50	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	44		90	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	47		88	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	62		118	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	101		98	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	99		113	

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM	95		109	
1:15 PM				
1:30 PM				
1:45 PM				
2:00 PM	110		110	
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM	108		136	
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM	126		108	
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM	141		112	
5:15 PM				
5:30 PM				
5:45 PM				
6:00 PM	119		133	
6:15 PM				
6:30 PM				
6:45 PM				
7:00 PM	69		76	
7:15 PM				
7:30 PM				
7:45 PM				
8:00 PM	52		62	
8:15 PM				
8:30 PM				
8:45 PM				
9:00 PM	18		58	
9:15 PM				
9:30 PM				
9:45 PM				
10:00 PM	31		26	
10:15 PM				
10:30 PM				
10:45 PM				
11:00 PM	12		10	
11:15 PM				
11:30 PM				
11:45 PM				
12:00 AM	8		8	
	1,290		1,617	
	24-Hour Volume		2,907	

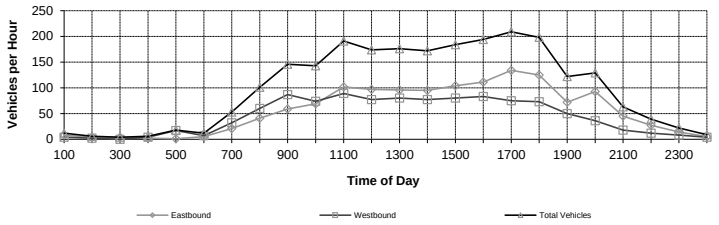
Equipment ID#:

Automated Traffic Counts

Street: **Broadway Avenue**
Location: **Tomahawk Road**

City/State: **Apache Junction, AZ**
Project #:
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**

24-Hour Volume: **2,383**



Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	8		4	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	4		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	4		0	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	2		4	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	1		17	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	5		7	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	21		32	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	41		60	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	59		87	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	69		74	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	102		89	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	97		77	

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:59 PM				
12:30 PM				
12:45 PM				
1:00 PM	96		80	
1:59 PM				
1:30 PM				
1:45 PM				
2:00 PM	95		77	
2:59 PM				
2:30 PM				
2:45 PM				
3:00 PM	104		80	
3:59 PM				
3:30 PM				
3:45 PM				
4:00 PM	111		83	
4:59 PM				
4:30 PM				
12:00 AM				
5:00 PM	134		75	
5:59 PM				
5:30 PM				
5:45 PM				
6:00 PM	125		73	
6:59 PM				
6:30 PM				
6:45 PM				
7:00 PM	72		50	
7:59 PM				
7:30 PM				
7:45 PM				
8:00 PM	93		36	
8:59 PM				
8:30 PM				
8:45 PM				
9:00 PM	45		18	
9:59 PM				
9:30 PM				
9:45 PM				
10:00 PM	27		12	
10:59 PM				
10:30 PM				
10:45 PM				
11:00 PM	14		8	
11:59 PM				
11:30 PM				
11:45 PM				
12:00 AM	5		4	
	1,334		1,049	
	24-Hour Volume		2,383	

Equipment ID#:

TRAFFIC SURVEY - COUNT ANALYSIS

2009 MUTCD WARRANTS

Existing

County: Maricopa **District No.:**

City: Apache Junction **Population:** 41,000 **Survey Date:** 2/17/2021

	Route #	Name	Control	Section	85% Speed
Major		Tomahawk Road		-	35
Minor		Broadway Avenue		-	35

Warrant 1: Eight- Hour Volumes

Condition A

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural
1		1	**500**	350	**150**	105
2 or more		1	600	420	150	105
2 or more		2 or more	600	420	200	140
1		2 or more	500	350	200	140

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 1

Time		Volume		Criteria		
Begin	End	Major	Minor	Major >= 500	Minor >= 150	Both Meet
12:00 AM	1:00 AM	13	8	N	N	N
1:00 AM	2:00 AM	7	4	N	N	N
2:00 AM	3:00 AM	5	4	N	N	N
3:00 AM	4:00 AM	11	4	N	N	N
4:00 AM	5:00 AM	36	17	N	N	N
5:00 AM	6:00 AM	65	7	N	N	N
6:00 AM	7:00 AM	73	32	N	N	N
7:00 AM	8:00 AM	134	60	N	N	N
8:00 AM	9:00 AM	135	87	N	N	N
9:00 AM	10:00 AM	180	74	N	N	N
10:00 AM	11:00 AM	199	102	N	N	N
11:00 AM	12:00 PM	212	97	N	N	N
12:00 PM	1:00 PM	204	96	N	N	N
1:00 PM	2:00 PM	220	95	N	N	N
2:00 PM	3:00 PM	244	104	N	N	N
3:00 PM	4:00 PM	234	111	N	N	N
4:00 PM	5:00 PM	253	134	N	N	N
5:00 PM	6:00 PM	252	125	N	N	N
6:00 PM	7:00 PM	145	72	N	N	N
7:00 PM	8:00 PM	114	93	N	N	N
8:00 PM	9:00 PM	76	45	N	N	N
9:00 PM	10:00 PM	57	27	N	N	N
10:00 PM	11:00 PM	22	14	N	N	N
11:00 PM	12:00 AM	16	5	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition A is not satisfied

Warrant 1 not satisfied.

Warrant 1: Eight- Hour Volumes

Condition B

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	**750**	525	**75**	53
2 or more		1	900	630	75	53
2 or more		2 or more	900	630	100	70
1		2 or more	750	525	100	70

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 2

Time		Volume		Criteria		
				Major	Minor	
Begin	End	Major	Minor	>= 750	>=75	Both Meet
12:00 AM	1:00 AM	13	8	N	N	N
1:00 AM	2:00 AM	7	4	N	N	N
2:00 AM	3:00 AM	5	4	N	N	N
3:00 AM	4:00 AM	11	4	N	N	N
4:00 AM	5:00 AM	36	17	N	N	N
5:00 AM	6:00 AM	65	7	N	N	N
6:00 AM	7:00 AM	73	32	N	N	N
7:00 AM	8:00 AM	134	60	N	N	N
8:00 AM	9:00 AM	135	87	N	Y	N
9:00 AM	10:00 AM	180	74	N	N	N
10:00 AM	11:00 AM	199	102	N	Y	N
11:00 AM	12:00 PM	212	97	N	Y	N
12:00 PM	1:00 PM	204	96	N	Y	N
1:00 PM	2:00 PM	220	95	N	Y	N
2:00 PM	3:00 PM	244	104	N	Y	N
3:00 PM	4:00 PM	234	111	N	Y	N
4:00 PM	5:00 PM	253	134	N	Y	N
5:00 PM	6:00 PM	252	125	N	Y	N
6:00 PM	7:00 PM	145	72	N	N	N
7:00 PM	8:00 PM	114	93	N	Y	N
8:00 PM	9:00 PM	76	45	N	N	N
9:00 PM	10:00 PM	57	27	N	N	N
10:00 PM	11:00 PM	22	14	N	N	N
11:00 PM	12:00 AM	16	5	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition B is not satisfied

Warrant 1 not satisfied.

Warrant 2: Four Hour Vehicular Volumes

This warrant is similar to Warrant 1A, except that the required traffic volumes must be present for at least four hours of an average day. The traffic volumes required are based on curves (Figure 4C-2) shown in the MUTCD.

*** The required traffic volumes for Warrant 2 do not meet for any one hour.**

Warrant 2 is not satisfied

Warrant 3, Condition A- Peak Hour Delay

This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the major street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average weekday:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, **and**

(2) the volume on the side street (one direction) equals or exceeds 100 vph for one moving lane of traffic and 150 vph for two moving lanes, **and**

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 vph for an intersection with four (or more) approaches or 650 vph for three approaches.

***Part 1 - N/A**
***Part 2 - N/A**
***Part 3 - N/A**

Warrant 3, Condition B - Peak Hour Volume

This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This w is satisfied when the main street and side street traffic volumes satisfy the curves shown in Figure 4C-4 of the TMUTCD.

Warrant 3 is N/A.

Warrant 4: Pedestrian Volume

Required*	Existing
100 or more for each of any four hours	_____
OR	
190 or more during any one hour	_____

* For predominant pedestrian crossing speeds less than 3.5 ft/sec, the pedestrian volume may be reduced as much as 50 percent.

Gap Requirements

YES	NO	Is the nearest signal located more than 300 feet away?
YES	NO	For traffic flow which is not platooned, are there less than 60 gaps per hour of adequate length for the pedestrians to cross the street?

Warrant 4 is N/A.

Warrant 5: School Crossing

YES NO Is the number of adequate gaps in traffic stream during the period when the children are using the crossing less than the number of minutes in the same period?

Warrant 5 is N/A.

Warrant 6: Coordinate Systems

YES NO Are the adjacent signals in a signal system?
YES NO Would the resultant spacing be 1000 feet or more?

Warrant 6 is N/A.

Warrant 7: Crash Experience

YES NO Is 80% or more of one of Warrants #1, #2, or #3 met?
YES NO Have there been more than five accidents susceptible to correction by a traffic signal in 12 months?

Warrant 7 is N/A.

Warrant 8: Roadway Network

YES NO Does the major street having an existing or immediately projected entering volume of > 1000 vehicles per hour of a typical weekday?

YES NO Do 5-year projected traffic volumes meet Warrants 1, 2, or 3?

YES NO Is there an entering traffic volume of at least 1000 vehicles per hour for each of any 5 hours on a Saturday or Sunday?

Warrant 8 is N/A.

Summary:

Warrants satisfied: none

Warrants not satisfied: 1, 2

Warrants not applicable: 3, 4, 5, 6, 7, 8

Warrants not included in study: none

Warrant 2 - Four Hour Vehicular Volumes

85th % speed: <= 40 mph
Population: >= 10,000

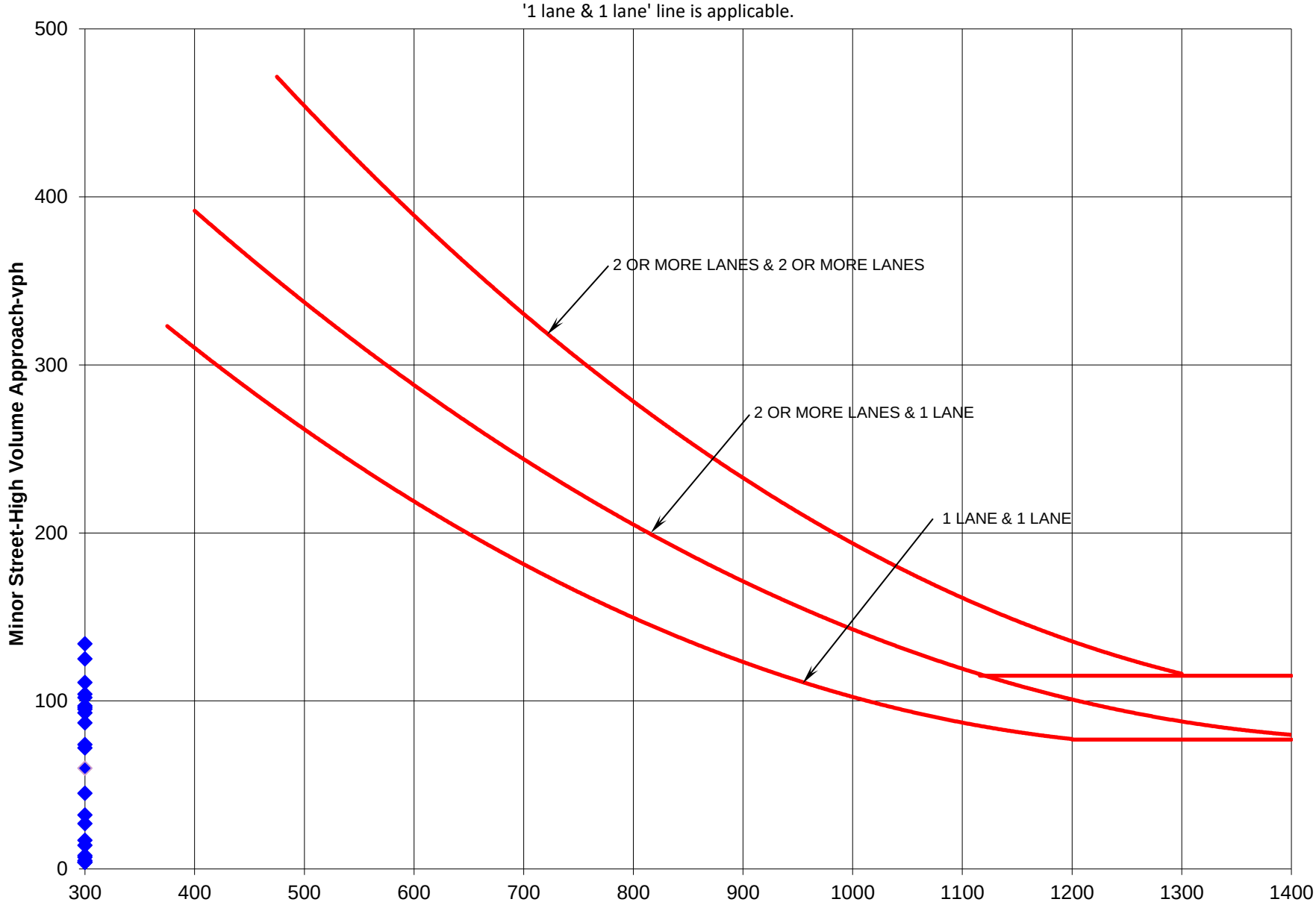
Major Street Lanes: 1
Minor Street Lanes: 1

Use Figure: 4C-1 1&1

Rank	Major Street Volume	Minor Street Volume	Figure 4C-1			Figure 4C-2		
			1&1	2&1	2&2	1&1	2&1	2&2
1	16	5	N	-	-	-	-	-
2	13	8	N	-	-	-	-	-
3	7	4	N	-	-	-	-	-
4	5	4	N	-	-	-	-	-
5	11	4	N	-	-	-	-	-
6	36	17	N	-	-	-	-	-
7	65	7	N	-	-	-	-	-
8	73	32	N	-	-	-	-	-
9	134	60	N	-	-	-	-	-
10	135	87	N	-	-	-	-	-
11	180	74	N	-	-	-	-	-
12	199	102	N	-	-	-	-	-
13	212	97	N	-	-	-	-	-
14	204	96	N	-	-	-	-	-
15	220	95	N	-	-	-	-	-
16	244	104	N	-	-	-	-	-
17	234	111	N	-	-	-	-	-
18	253	134	N	-	-	-	-	-
19	252	125	N	-	-	-	-	-
20	145	72	N	-	-	-	-	-
21	114	93	N	-	-	-	-	-
22	76	45	N	-	-	-	-	-
23	57	27	N	-	-	-	-	-
24	22	14	N	-	-	-	-	-
			0	0	0	0	0	0
Warrant 2 is not satisfied.			N	N	N	N	N	N

Warrant 2

Figure 4C-1 Four Hour Volume Warrant



* If data point is outside graph boundaries, it is plotted at the maximum shown value(s).

General Description of Intersection

Project Number: 21037

2022 Without

Name of Major Roadway: Tomahawk Road

Direction: N/S

# of NB Lanes: 1

# of SB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

Name of Minor Roadway: Broadway Avenue

Direction: E/W

# of EB Lanes: 1

# of WB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

City: Apache Junction

Population: 41,000

County: Maricopa

District:

Data Source: 24-hour approach

Date of Survey: 2/17/2021 *(press Ctrl + ;)*

Day of Week: Wednesday

Weather: Sunny

Surface Conditions: Dry, Smooth

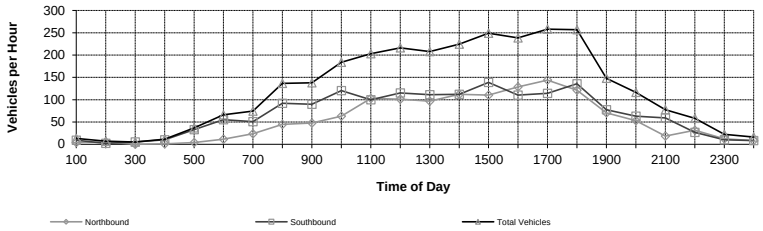
Enter Traffic Volumes:

Automated Traffic Counts

Street: **Tomahawk Road**
Location: **Broadway Avenue**

City/State: **Apache Junction, AZ**
Project #: **21037**
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**

24-Hour Volume: **2,965**



Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	4		9	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	5		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	0		5	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	1		10	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	4		33	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	11		55	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	23		51	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	45		92	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	48		90	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	63		120	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	103		100	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	101		115	

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM	97		111	
1:15 PM				
1:30 PM				
1:45 PM				
2:00 PM	112		112	
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM	110		139	
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM	129		110	
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM	144		114	
5:15 PM				
5:30 PM				
5:45 PM				
6:00 PM	121		136	
6:15 PM				
6:30 PM				
6:45 PM				
7:00 PM	70		78	
7:15 PM				
7:30 PM				
7:45 PM				
8:00 PM	53		63	
8:15 PM				
8:30 PM				
8:45 PM				
9:00 PM	18		59	
9:15 PM				
9:30 PM				
9:45 PM				
10:00 PM	32		27	
10:15 PM				
10:30 PM				
10:45 PM				
11:00 PM	12		10	
11:15 PM				
11:30 PM				
11:45 PM				
12:00 AM	8		8	
	1,316		1,649	
	24-Hour Volume		2,965	

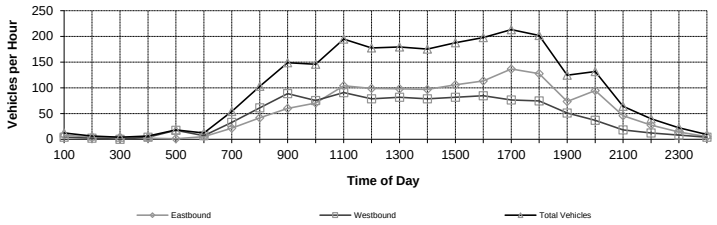
Equipment ID#:

Automated Traffic Counts

Street: **Broadway Avenue**
Location: **Tomahawk Road**

City/State: **Apache Junction, AZ**
Project #:
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**

24-Hour Volume: **2,431**



Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	8		4	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	4		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	4		0	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	2		4	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	1		17	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	5		7	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	21		33	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	42		61	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	60		89	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	70		75	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	104		91	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	99		79	

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:59 PM				
12:30 PM				
12:45 PM				
1:00 PM	98		82	
1:59 PM				
1:30 PM				
1:45 PM				
2:00 PM	97		79	
2:59 PM				
2:30 PM				
2:45 PM				
3:00 PM	106		82	
3:59 PM				
3:30 PM				
3:45 PM				
4:00 PM	113		85	
4:59 PM				
4:30 PM				
12:00 AM				
5:00 PM	137		77	
5:59 PM				
5:30 PM				
5:45 PM				
6:00 PM	128		74	
6:59 PM				
6:30 PM				
6:45 PM				
7:00 PM	73		51	
7:59 PM				
7:30 PM				
7:45 PM				
8:00 PM	95		37	
8:59 PM				
8:30 PM				
8:45 PM				
9:00 PM	46		18	
9:59 PM				
9:30 PM				
9:45 PM				
10:00 PM	28		12	
10:59 PM				
10:30 PM				
10:45 PM				
11:00 PM	14		8	
11:59 PM				
11:30 PM				
11:45 PM				
12:00 AM	5		4	
	1,361		1,070	
24-Hour Volume	2,431			

Equipment ID#:

TRAFFIC SURVEY - COUNT ANALYSIS

2009 MUTCD WARRANTS

2022 Without

County: Maricopa **District No.:**

City: Apache Junction **Population:** 41,000 **Survey Date:** 2/17/2021

	Route #	Name	Control	Section	85% Speed
Major		Tomahawk Road		-	35
Minor		Broadway Avenue		-	35

Warrant 1: Eight- Hour Volumes

Condition A

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural
1		1	**500**	350	**150**	105
2 or more		1	600	420	150	105
2 or more		2 or more	600	420	200	140
1		2 or more	500	350	200	140

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 1

Time		Volume		Criteria		
Begin	End	Major	Minor	Major >= 500	Minor >= 150	Both Meet
12:00 AM	1:00 AM	13	8	N	N	N
1:00 AM	2:00 AM	7	4	N	N	N
2:00 AM	3:00 AM	5	4	N	N	N
3:00 AM	4:00 AM	11	4	N	N	N
4:00 AM	5:00 AM	37	17	N	N	N
5:00 AM	6:00 AM	66	7	N	N	N
6:00 AM	7:00 AM	74	33	N	N	N
7:00 AM	8:00 AM	137	61	N	N	N
8:00 AM	9:00 AM	138	89	N	N	N
9:00 AM	10:00 AM	184	75	N	N	N
10:00 AM	11:00 AM	203	104	N	N	N
11:00 AM	12:00 PM	216	99	N	N	N
12:00 PM	1:00 PM	208	98	N	N	N
1:00 PM	2:00 PM	224	97	N	N	N
2:00 PM	3:00 PM	249	106	N	N	N
3:00 PM	4:00 PM	239	113	N	N	N
4:00 PM	5:00 PM	258	137	N	N	N
5:00 PM	6:00 PM	257	128	N	N	N
6:00 PM	7:00 PM	148	73	N	N	N
7:00 PM	8:00 PM	116	95	N	N	N
8:00 PM	9:00 PM	78	46	N	N	N
9:00 PM	10:00 PM	58	28	N	N	N
10:00 PM	11:00 PM	22	14	N	N	N
11:00 PM	12:00 AM	16	5	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition A is not satisfied

Warrant 1 not satisfied.

Warrant 1: Eight- Hour Volumes

Condition B

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	**750**	525	**75**	53
2 or more		1	900	630	75	53
2 or more		2 or more	900	630	100	70
1		2 or more	750	525	100	70

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 2

Time		Volume		Criteria		
				Major	Minor	
Begin	End	Major	Minor	>= 750	>=75	Both Meet
12:00 AM	1:00 AM	13	8	N	N	N
1:00 AM	2:00 AM	7	4	N	N	N
2:00 AM	3:00 AM	5	4	N	N	N
3:00 AM	4:00 AM	11	4	N	N	N
4:00 AM	5:00 AM	37	17	N	N	N
5:00 AM	6:00 AM	66	7	N	N	N
6:00 AM	7:00 AM	74	33	N	N	N
7:00 AM	8:00 AM	137	61	N	N	N
8:00 AM	9:00 AM	138	89	N	Y	N
9:00 AM	10:00 AM	184	75	N	Y	N
10:00 AM	11:00 AM	203	104	N	Y	N
11:00 AM	12:00 PM	216	99	N	Y	N
12:00 PM	1:00 PM	208	98	N	Y	N
1:00 PM	2:00 PM	224	97	N	Y	N
2:00 PM	3:00 PM	249	106	N	Y	N
3:00 PM	4:00 PM	239	113	N	Y	N
4:00 PM	5:00 PM	258	137	N	Y	N
5:00 PM	6:00 PM	257	128	N	Y	N
6:00 PM	7:00 PM	148	73	N	N	N
7:00 PM	8:00 PM	116	95	N	Y	N
8:00 PM	9:00 PM	78	46	N	N	N
9:00 PM	10:00 PM	58	28	N	N	N
10:00 PM	11:00 PM	22	14	N	N	N
11:00 PM	12:00 AM	16	5	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition B is not satisfied

Warrant 1 not satisfied.

Warrant 2: Four Hour Vehicular Volumes

This warrant is similar to Warrant 1A, except that the required traffic volumes must be present for at least four hours of an average day. The traffic volumes required are based on curves (Figure 4C-2) shown in the MUTCD.

*** The required traffic volumes for Warrant 2 do not meet for any one hour.**

Warrant 2 is not satisfied

Warrant 3, Condition A- Peak Hour Delay

This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the major street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average weekday:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, **and**

(2) the volume on the side street (one direction) equals or exceeds 100 vph for one moving lane of traffic and 150 vph for two moving lanes, **and**

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 vph for an intersection with four (or more) approaches or 650 vph for three approaches.

***Part 1 - N/A**
***Part 2 - N/A**
***Part 3 - N/A**

Warrant 3, Condition B - Peak Hour Volume

This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This w is satisfied when the main street and side street traffic volumes satisfy the curves shown in Figure 4C-4 of the TMUTCD.

Warrant 3 is N/A.

Warrant 4: Pedestrian Volume

Required*	Existing
100 or more for each of any four hours	_____
OR	
190 or more during any one hour	_____

* For predominant pedestrian crossing speeds less than 3.5 ft/sec, the pedestrian volume may be reduced as much as 50 percent.

Gap Requirements

YES	NO	Is the nearest signal located more than 300 feet away?
YES	NO	For traffic flow which is not platooned, are there less than 60 gaps per hour of adequate length for the pedestrians to cross the street?

Warrant 4 is N/A.

Warrant 5: School Crossing

YES NO Is the number of adequate gaps in traffic stream during the period when the children are using the crossing less than the number of minutes in the same period?

Warrant 5 is N/A.

Warrant 6: Coordinate Systems

YES NO Are the adjacent signals in a signal system?
YES NO Would the resultant spacing be 1000 feet or more?

Warrant 6 is N/A.

Warrant 7: Crash Experience

YES NO Is 80% or more of one of Warrants #1, #2, or #3 met?
YES NO Have there been more than five accidents susceptible to correction by a traffic signal in 12 months?

Warrant 7 is N/A.

Warrant 8: Roadway Network

YES NO Does the major street having an existing or immediately projected entering volume of > 1000 vehicles per hour of a typical weekday?

YES NO Do 5-year projected traffic volumes meet Warrants 1, 2, or 3?

YES NO Is there an entering traffic volume of at least 1000 vehicles per hour for each of any 5 hours on a Saturday or Sunday?

Warrant 8 is N/A.

Summary:

Warrants satisfied: none

Warrants not satisfied: 1, 2

Warrants not applicable: 3, 4, 5, 6, 7, 8

Warrants not included in study: none

Warrant 2 - Four Hour Vehicular Volumes

85th % speed: <= 40 mph
Population: >= 10,000

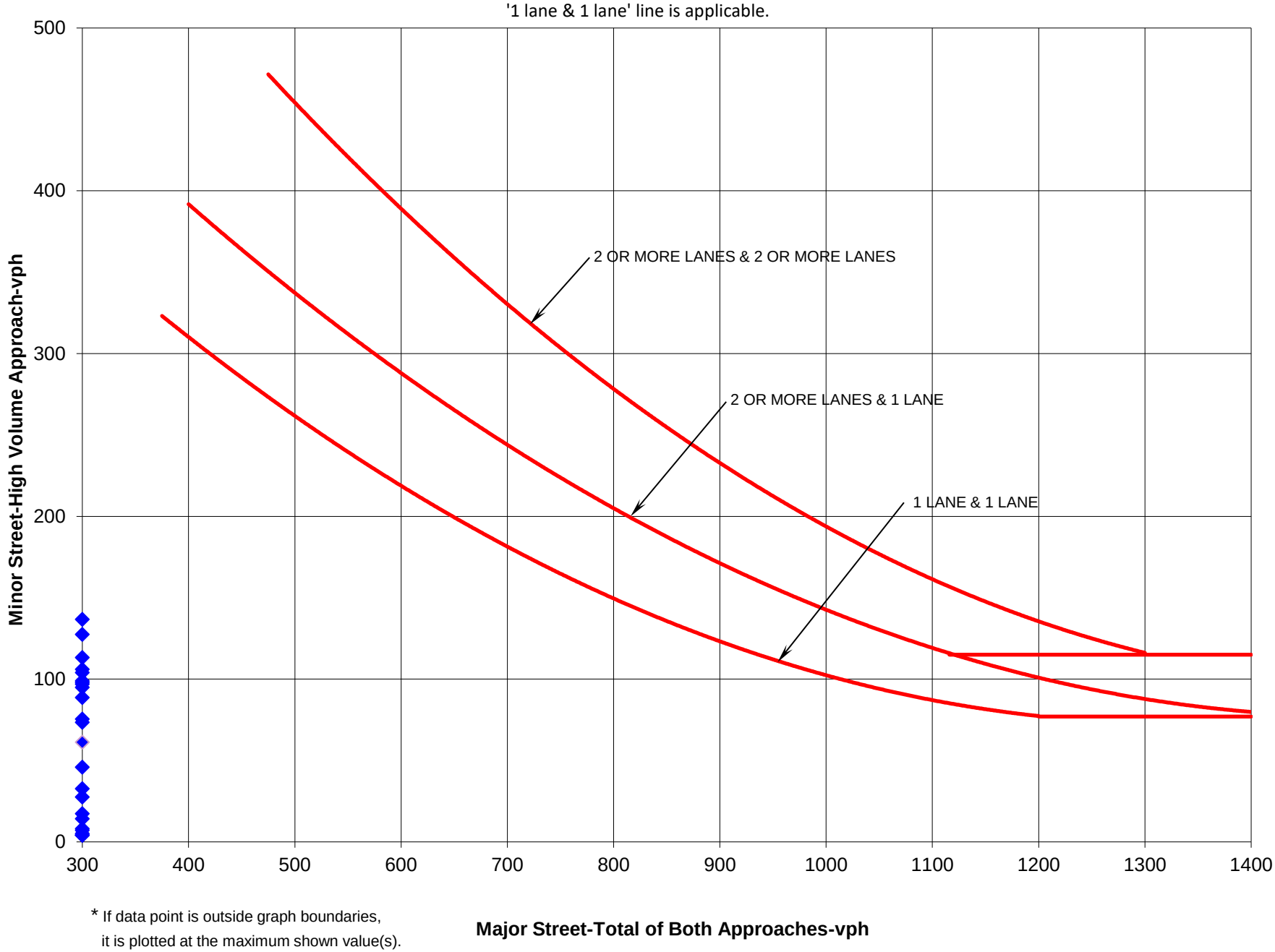
Major Street Lanes: 1
Minor Street Lanes: 1

Use Figure: 4C-1 1&1

Rank	Major Street Volume	Minor Street Volume	Figure 4C-1			Figure 4C-2		
			1&1	2&1	2&2	1&1	2&1	2&2
1	16	5	N	-	-	-	-	-
2	13	8	N	-	-	-	-	-
3	7	4	N	-	-	-	-	-
4	5	4	N	-	-	-	-	-
5	11	4	N	-	-	-	-	-
6	37	17	N	-	-	-	-	-
7	66	7	N	-	-	-	-	-
8	74	33	N	-	-	-	-	-
9	137	61	N	-	-	-	-	-
10	138	89	N	-	-	-	-	-
11	184	75	N	-	-	-	-	-
12	203	104	N	-	-	-	-	-
13	216	99	N	-	-	-	-	-
14	208	98	N	-	-	-	-	-
15	224	97	N	-	-	-	-	-
16	249	106	N	-	-	-	-	-
17	239	113	N	-	-	-	-	-
18	258	137	N	-	-	-	-	-
19	257	128	N	-	-	-	-	-
20	148	73	N	-	-	-	-	-
21	116	95	N	-	-	-	-	-
22	78	46	N	-	-	-	-	-
23	58	28	N	-	-	-	-	-
24	22	14	N	-	-	-	-	-
			0	0	0	0	0	0
Warrant 2 is not satisfied.			N	N	N	N	N	N

Warrant 2

Figure 4C-1 Four Hour Volume Warrant



* If data point is outside graph boundaries, it is plotted at the maximum shown value(s).

General Description of Intersection

Project Number: 21037

2022 With

Name of Major Roadway: Tomahawk Road

Direction: N/S

# of NB Lanes: 1

# of SB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

Name of Minor Roadway: Broadway Avenue

Direction: E/W

# of EB Lanes: 1

# of WB Lanes: 1

85th percentile speed: 35 *mph*

Control #:

Section #:

Route #:

City: Apache Junction

Population: 41,000

County: Maricopa

District:

Data Source: 24-hour approach

Date of Survey: 2/17/2021 *(press Ctrl + ;)*

Day of Week: Wednesday

Weather: Sunny

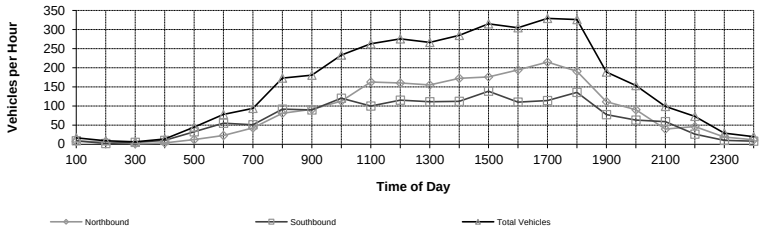
Surface Conditions: Dry, Smooth

Enter Traffic Volumes:

Automated Traffic Counts

Street: **Tomahawk Road**
Location: **Broadway Avenue**

City/State: **Apache Junction, AZ**
Project #: **21037**
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**



24-Hour Volume: **3,780**

Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	8		9	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	7		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	1		5	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	4		10	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	12		33	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	23		55	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	43		51	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	81		92	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	91		90	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	113		120	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	163		100	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	160		115	

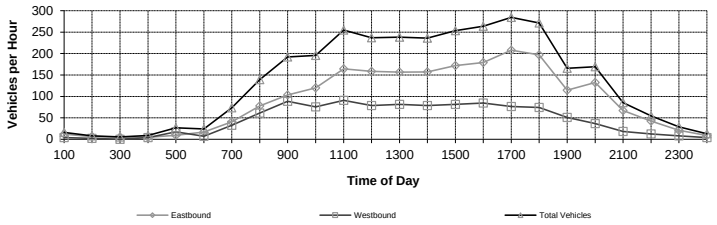
Time	Northbound		Southbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:15 PM				
12:30 PM				
12:45 PM				
1:00 PM	155		111	
1:15 PM				
1:30 PM				
1:45 PM				
2:00 PM	173		112	
2:15 PM				
2:30 PM				
2:45 PM				
3:00 PM	176		139	
3:15 PM				
3:30 PM				
3:45 PM				
4:00 PM	194		110	
4:15 PM				
4:30 PM				
4:45 PM				
5:00 PM	215		114	
5:15 PM				
5:30 PM				
5:45 PM				
6:00 PM	191		136	
6:15 PM				
6:30 PM				
6:45 PM				
7:00 PM	112		78	
7:15 PM				
7:30 PM				
7:45 PM				
8:00 PM	90		63	
8:15 PM				
8:30 PM				
8:45 PM				
9:00 PM	40		59	
9:15 PM				
9:30 PM				
9:45 PM				
10:00 PM	46		27	
10:15 PM				
10:30 PM				
10:45 PM				
11:00 PM	19		10	
11:15 PM				
11:30 PM				
11:45 PM				
12:00 AM	12		8	
	2,131		1,649	
	24-Hour Volume		3,780	

Equipment ID#:

Automated Traffic Counts

Street: **Broadway Avenue**
Location: **Tomahawk Road**

City/State: **Apache Junction, AZ**
Project #:
Date: **2/17/2021**
Day of Week: **Wednesday**
Data Source: **24-hour approach**



24-Hour Volume: **3,246**

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 AM				
12:15 AM				
12:30 AM				
12:45 AM				
1:00 AM	12		4	
1:15 AM				
1:30 AM				
1:45 AM				
2:00 AM	6		2	
2:15 AM				
2:30 AM				
2:45 AM				
3:00 AM	5		0	
3:15 AM				
3:30 AM				
3:45 AM				
4:00 AM	5		4	
4:15 AM				
4:30 AM				
4:45 AM				
5:00 AM	9		17	
5:15 AM				
5:30 AM				
5:45 AM				
6:00 AM	17		7	
6:15 AM				
6:30 AM				
6:45 AM				
7:00 AM	41		33	
7:15 AM				
7:30 AM				
7:45 AM				
8:00 AM	78		61	
8:15 AM				
8:30 AM				
8:45 AM				
9:00 AM	103		89	
9:15 AM				
9:30 AM				
9:45 AM				
10:00 AM	120		75	
10:15 AM				
10:30 AM				
10:45 AM				
11:00 AM	164		91	
11:15 AM				
11:30 AM				
11:45 AM				
12:00 PM	158		79	

Time	Eastbound		Westbound	
	Vehicles	Peds	Vehicles	Peds
12:00 PM				
12:59 PM				
12:30 PM				
12:45 PM				
1:00 PM	156		82	
1:59 PM				
1:30 PM				
1:45 PM				
2:00 PM	157		79	
2:59 PM				
2:30 PM				
2:45 PM				
3:00 PM	172		82	
3:59 PM				
3:30 PM				
3:45 PM				
4:00 PM	179		85	
4:59 PM				
4:30 PM				
12:00 AM				
5:00 PM	208		77	
5:59 PM				
5:30 PM				
5:45 PM				
6:00 PM	197		74	
6:59 PM				
6:30 PM				
6:45 PM				
7:00 PM	115		51	
7:59 PM				
7:30 PM				
7:45 PM				
8:00 PM	132		37	
8:59 PM				
8:30 PM				
8:45 PM				
9:00 PM	67		18	
9:59 PM				
9:30 PM				
9:45 PM				
10:00 PM	42		12	
10:59 PM				
10:30 PM				
10:45 PM				
11:00 PM	21		8	
11:59 PM				
11:30 PM				
11:45 PM				
12:00 AM	9		4	
	2,176		1,070	
	24-Hour Volume		3,246	

Equipment ID#:

TRAFFIC SURVEY - COUNT ANALYSIS

2009 MUTCD WARRANTS

2022 With

County: Maricopa **District No.:**

City: Apache Junction **Population:** 41,000 **Survey Date:** 2/17/2021

	Route #	Name	Control	Section	85% Speed
Major		Tomahawk Road		-	35
Minor		Broadway Avenue		-	35

Warrant 1: Eight- Hour Volumes

Condition A

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural
1		1	**500**	350	**150**	105
2 or more		1	600	420	150	105
2 or more		2 or more	600	420	200	140
1		2 or more	500	350	200	140

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 1

Time		Volume		Criteria		
Begin	End	Major	Minor	Major >= 500	Minor >= 150	Both Meet
12:00 AM	1:00 AM	17	12	N	N	N
1:00 AM	2:00 AM	9	6	N	N	N
2:00 AM	3:00 AM	6	5	N	N	N
3:00 AM	4:00 AM	14	5	N	N	N
4:00 AM	5:00 AM	45	17	N	N	N
5:00 AM	6:00 AM	78	17	N	N	N
6:00 AM	7:00 AM	94	41	N	N	N
7:00 AM	8:00 AM	173	78	N	N	N
8:00 AM	9:00 AM	181	103	N	N	N
9:00 AM	10:00 AM	233	120	N	N	N
10:00 AM	11:00 AM	263	164	N	Y	N
11:00 AM	12:00 PM	276	158	N	Y	N
12:00 PM	1:00 PM	267	156	N	Y	N
1:00 PM	2:00 PM	285	157	N	Y	N
2:00 PM	3:00 PM	315	172	N	Y	N
3:00 PM	4:00 PM	305	179	N	Y	N
4:00 PM	5:00 PM	329	208	N	Y	N
5:00 PM	6:00 PM	326	197	N	Y	N
6:00 PM	7:00 PM	189	115	N	N	N
7:00 PM	8:00 PM	154	132	N	N	N
8:00 PM	9:00 PM	99	67	N	N	N
9:00 PM	10:00 PM	73	42	N	N	N
10:00 PM	11:00 PM	29	21	N	N	N
11:00 PM	12:00 AM	20	9	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition A is not satisfied

Warrant 1 not satisfied.

Warrant 1: Eight- Hour Volumes

Condition B

Number of Lanes			Major Street Both Approaches Required		Minor Street High Volume Approach Required	
Major	Street	Minor Street	Urban	Rural*	Urban	Rural*
1		1	**750**	525	**75**	53
2 or more		1	900	630	75	53
2 or more		2 or more	900	630	100	70
1		2 or more	750	525	100	70

*Criteria when the 85th percentile speed is greater than 40 mph or when the population is less than 10,000

Warrant 2

Time		Volume		Criteria		
				Major	Minor	
Begin	End	Major	Minor	>= 750	>=75	Both Meet
12:00 AM	1:00 AM	17	12	N	N	N
1:00 AM	2:00 AM	9	6	N	N	N
2:00 AM	3:00 AM	6	5	N	N	N
3:00 AM	4:00 AM	14	5	N	N	N
4:00 AM	5:00 AM	45	17	N	N	N
5:00 AM	6:00 AM	78	17	N	N	N
6:00 AM	7:00 AM	94	41	N	N	N
7:00 AM	8:00 AM	173	78	N	Y	N
8:00 AM	9:00 AM	181	103	N	Y	N
9:00 AM	10:00 AM	233	120	N	Y	N
10:00 AM	11:00 AM	263	164	N	Y	N
11:00 AM	12:00 PM	276	158	N	Y	N
12:00 PM	1:00 PM	267	156	N	Y	N
1:00 PM	2:00 PM	285	157	N	Y	N
2:00 PM	3:00 PM	315	172	N	Y	N
3:00 PM	4:00 PM	305	179	N	Y	N
4:00 PM	5:00 PM	329	208	N	Y	N
5:00 PM	6:00 PM	326	197	N	Y	N
6:00 PM	7:00 PM	189	115	N	Y	N
7:00 PM	8:00 PM	154	132	N	Y	N
8:00 PM	9:00 PM	99	67	N	N	N
9:00 PM	10:00 PM	73	42	N	N	N
10:00 PM	11:00 PM	29	21	N	N	N
11:00 PM	12:00 AM	20	9	N	N	N

Total number of hours, both the major(both approaches) and minor(high volume approach) met: 0

Hours Required: 8

Condition B is not satisfied

Warrant 1 not satisfied.

Warrant 2: Four Hour Vehicular Volumes

This warrant is similar to Warrant 1A, except that the required traffic volumes must be present for at least four hours of an average day. The traffic volumes required are based on curves (Figure 4C-2) shown in the MUTCD.

*** The required traffic volumes for Warrant 2 do not meet for any one hour.**

Warrant 2 is not satisfied

Warrant 3, Condition A- Peak Hour Delay

This warrant is intended for application where traffic conditions will cause undue delay to traffic entering or crossing the major street. The peak hour delay warrant is satisfied when the following conditions exist for one hour (any four consecutive 15-minute periods) of an average weekday:

(1) The total delay by the traffic on a side street controlled by a stop sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach, **and**

(2) the volume on the side street (one direction) equals or exceeds 100 vph for one moving lane of traffic and 150 vph for two moving lanes, **and**

(3) the total traffic volume serviced during 1 hour equals or exceeds 800 vph for an intersection with four (or more) approaches or 650 vph for three approaches.

***Part 1 - N/A**
***Part 2 - N/A**
***Part 3 - N/A**

Warrant 3, Condition B - Peak Hour Volume

This warrant applies to traffic entering from the minor street which encounters undue delay crossing the main street. This w is satisfied when the main street and side street traffic volumes satisfy the curves shown in Figure 4C-4 of the TMUTCD.

Warrant 3 is N/A.

Warrant 4: Pedestrian Volume

Required*	Existing
100 or more for each of any four hours	_____
OR	
190 or more during any one hour	_____

* For predominant pedestrian crossing speeds less than 3.5 ft/sec, the pedestrian volume may be reduced as much as 50 percent.

Gap Requirements

YES	NO	Is the nearest signal located more than 300 feet away?
YES	NO	For traffic flow which is not platooned, are there less than 60 gaps per hour of adequate length for the pedestrians to cross the street?

Warrant 4 is N/A.

Warrant 5: School Crossing

YES NO Is the number of adequate gaps in traffic stream during the period when the children are using the crossing less than the number of minutes in the same period?

Warrant 5 is N/A.

Warrant 6: Coordinate Systems

YES NO Are the adjacent signals in a signal system?
YES NO Would the resultant spacing be 1000 feet or more?

Warrant 6 is N/A.

Warrant 7: Crash Experience

YES NO Is 80% or more of one of Warrants #1, #2, or #3 met?
YES NO Have there been more than five accidents susceptible to correction by a traffic signal in 12 months?

Warrant 7 is N/A.

Warrant 8: Roadway Network

YES NO Does the major street having an existing or immediately projected entering volume of > 1000 vehicles per hour of a typical weekday?

YES NO Do 5-year projected traffic volumes meet Warrants 1, 2, or 3?

YES NO Is there an entering traffic volume of at least 1000 vehicles per hour for each of any 5 hours on a Saturday or Sunday?

Warrant 8 is N/A.

Summary:

Warrants satisfied: none

Warrants not satisfied: 1, 2

Warrants not applicable: 3, 4, 5, 6, 7, 8

Warrants not included in study: none

Warrant 2 - Four Hour Vehicular Volumes

85th % speed: <= 40 mph
Population: >= 10,000

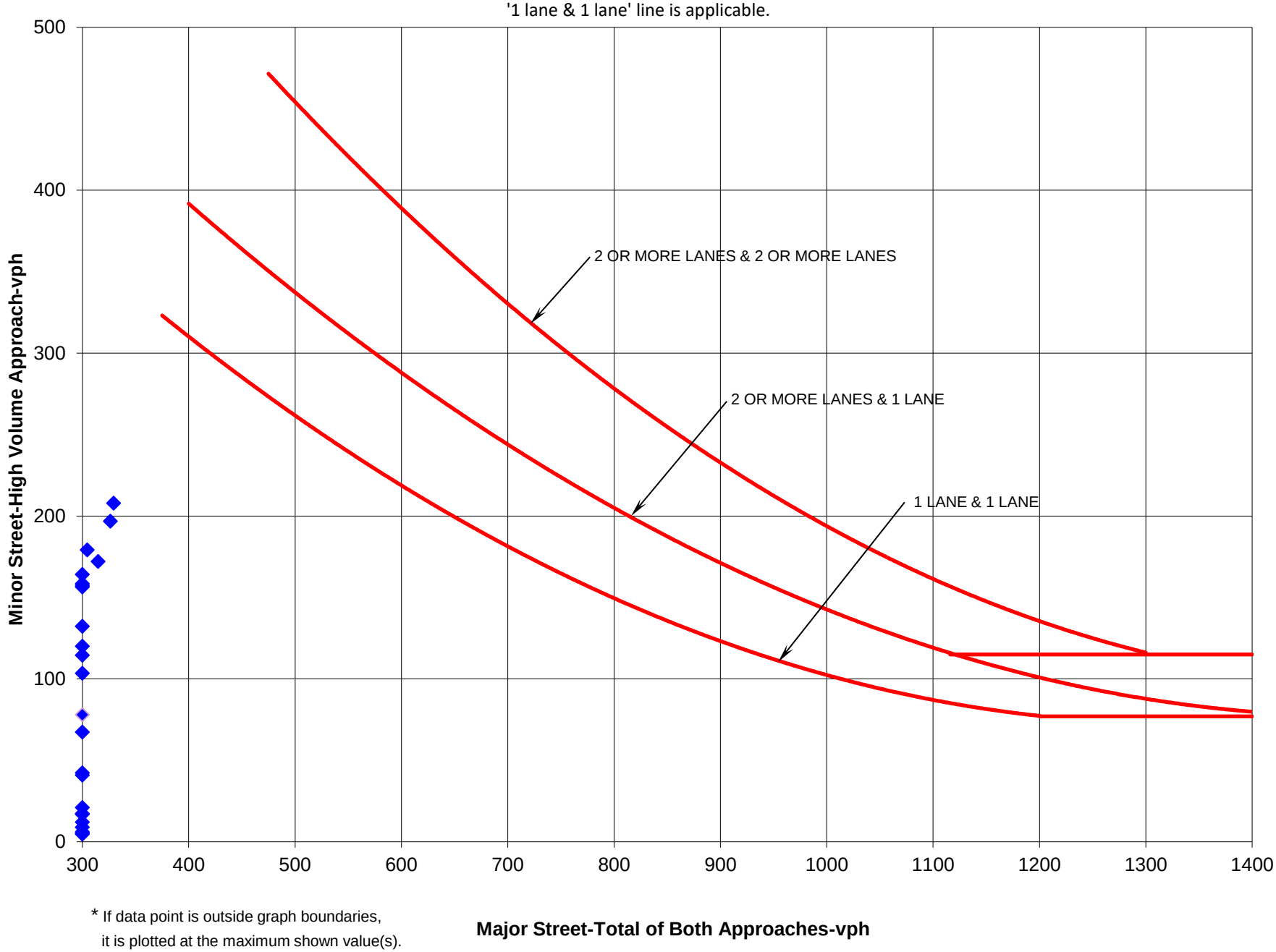
Major Street Lanes: 1
Minor Street Lanes: 1

Use Figure: 4C-1 1&1

Rank	Major Street Volume	Minor Street Volume	Figure 4C-1			Figure 4C-2		
			1&1	2&1	2&2	1&1	2&1	2&2
1	20	9	N	-	-	-	-	-
2	17	12	N	-	-	-	-	-
3	9	6	N	-	-	-	-	-
4	6	5	N	-	-	-	-	-
5	14	5	N	-	-	-	-	-
6	45	17	N	-	-	-	-	-
7	78	17	N	-	-	-	-	-
8	94	41	N	-	-	-	-	-
9	173	78	N	-	-	-	-	-
10	181	103	N	-	-	-	-	-
11	233	120	N	-	-	-	-	-
12	263	164	N	-	-	-	-	-
13	276	158	N	-	-	-	-	-
14	267	156	N	-	-	-	-	-
15	285	157	N	-	-	-	-	-
16	315	172	N	-	-	-	-	-
17	305	179	N	-	-	-	-	-
18	329	208	N	-	-	-	-	-
19	326	197	N	-	-	-	-	-
20	189	115	N	-	-	-	-	-
21	154	132	N	-	-	-	-	-
22	99	67	N	-	-	-	-	-
23	73	42	N	-	-	-	-	-
24	29	21	N	-	-	-	-	-
			0	0	0	0	0	0
Warrant 2 is not satisfied.			N	N	N	N	N	N

Warrant 2

Figure 4C-1 Four Hour Volume Warrant



* If data point is outside graph boundaries, it is plotted at the maximum shown value(s).