

Traffic Impact Analysis (TIA) for G-Force Gymnastics

Draft Report

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Prepared for:
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EXECUTIVE SUMMARY

The following contains a Traffic Impact Analysis (TIA) for a multi-purpose recreational facility in Albuquerque, NM. Lee Engineering has completed this report for G2 Enterprises, LLC. All analyses and items contained herein conform to scoping requirements set forth in a scoping meeting held on July 26th, 2022.

BACKGROUND

The proposed development is to construct a multi-purpose recreational facility on Sage Rd, on the southeast corner of the intersection of Sage Rd and 86th St.

The site is anticipated to generate 107 ingress and 87 egress trips during the PM peak hour. Only PM peak hour was analyzed because the development would generate a negligible number of trips during the AM peak hour, as discussed at the scoping meeting. The number of vehicle trips generated by the proposed development was based on the trip generation rates and equations provided in the Trip Generation Manual, 11th Edition, by the Institute of Transportation Engineers (ITE) 435 – Multipurpose Recreational Facility.

Site access is available from Sage Rd via one access point, termed "Sage Access Driveway" for the purpose of this report. Site access is also available from 86th St via two access points, termed "86th Access Driveway 1" and "86th Access Driveway 2". Sage Access Driveway is currently positioned near the northeast corner of the development, and the 86th Access Driveways are both positioned along the west side of the development.

Study intersections include:

1. Sage Rd and 86th St
 - A. Sage Rd and Sage Access Driveway
 - B. 86th St and 86th Access Driveway 1
 - C. 86th St and 86th Access Driveway 2

Construction is anticipated to begin in 2022, with full completion of the development in 2023. The development is to be constructed in a single phase.

Analysis scenarios for this study include:

- Existing (2022) – Field counted Existing traffic volumes
- Build-Out Year (2023) Background –Existing traffic volumes with an applied annual growth rate
- Build-Out Year (2023) Total – Build-Out Year Background volumes plus site-generated trips

Existing turning movement counts were collected on August 17th, 2022, for all study intersections. These volumes were analyzed unaltered in the Existing portion of the Capacity Analysis section.

Site trips for the development site were generated based on ITE 435 – Multipurpose Recreational Facility, Peak Hour Generator. Proposed development-generated trips were used to analyze Build-Out Total volumes.

SUMMARY OF RECOMMENDATIONS

The following presents a summary of recommendations included in this report.

CONCLUSIONS

- All study intersections operate at an acceptable LOS throughout all study scenarios.
- 95th % Queue Lengths do not exceed queue storage at any intersection for any scenario.
- HCS results do not suggest the need for capacity mitigation measures or street improvements related to the proposed development.
- Driveway spacing meets DPM requirements, as outlined in the report.

DEVELOPMENT SPECIFIC RECOMMENDATIONS

- Adding painted arrows to convert the painted median on 86th St to a two-way left-turn lane at 86th Access Driveway 1 is recommended.
- Restricting Sage Access Driveway to right-in/right-out (RIRO) access is recommended.

DRAFT

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INTRODUCTION

This report details the procedures and findings of a Traffic Impact Analysis (TIA) performed by Lee Engineering for G2 Enterprises, LLC. This report and the analyses herein were performed for a multipurpose recreational facility to be constructed on Sage Rd in Albuquerque, NM. This study examines the impacts of the proposed development on surrounding traffic conditions and discusses the potential impacts of trips generated by the development on the study intersections.

The scope of this report and the analyses performed were completed in agreement with the scoping requirements set forth by the NMDOT. Scoping meeting notes from the scoping meeting held on July 26th, 2022, are included in Appendix A. Analysis procedures, conclusions, and recommendations for this study were developed according to the *Highway Capacity Manual 6th Edition* and the *Manual on Uniform Traffic Control Devices 2009 Edition*.

Single-phase construction is anticipated to begin in 2022, with full completion of the Development in 2023. The site plan displayed in Figure 1 shows that the proposed development is a multipurpose recreational facility. Traffic generated by the site is anticipated to be 107 ingress and 87 egress trips during PM peak hour. Lee Engineering conducted an HCS Capacity Analysis for the following PM peak hour scenarios:

Traffic Analysis

- Existing (2022) – Field counted Existing traffic volumes
- Build-Out Year (2023) Background –Existing traffic volumes with an applied annual growth rate
- Build-Out Year (2023) Total – Build-Out Year Background volumes plus site-generated trips

The HCS Capacity Analysis Reports are presented in full in the Appendix.

EXISTING CONDITIONS

PROJECT LOCATION & SITE PLAN

The multiuse recreational facility will be located on Sage Rd, in the southwest quadrant of Albuquerque. Figure 1 shows the proposed site plan, and Figure 2 shows the site location, study intersections, and the surrounding area. Nearby intersections include 86th St and Sage Rd.

The proposed development would convert 216,072 square feet of land into a multipurpose recreational facility. The development would include 203 parking spaces and a two-story, 53,973 square foot building. Proposed access points include one near the northeast corner of the development site, and two along the west side of the development.

The development Site Plan is presented in Figure 1, and Figure 2 shows the Vicinity Map, which includes the study area and intersections.

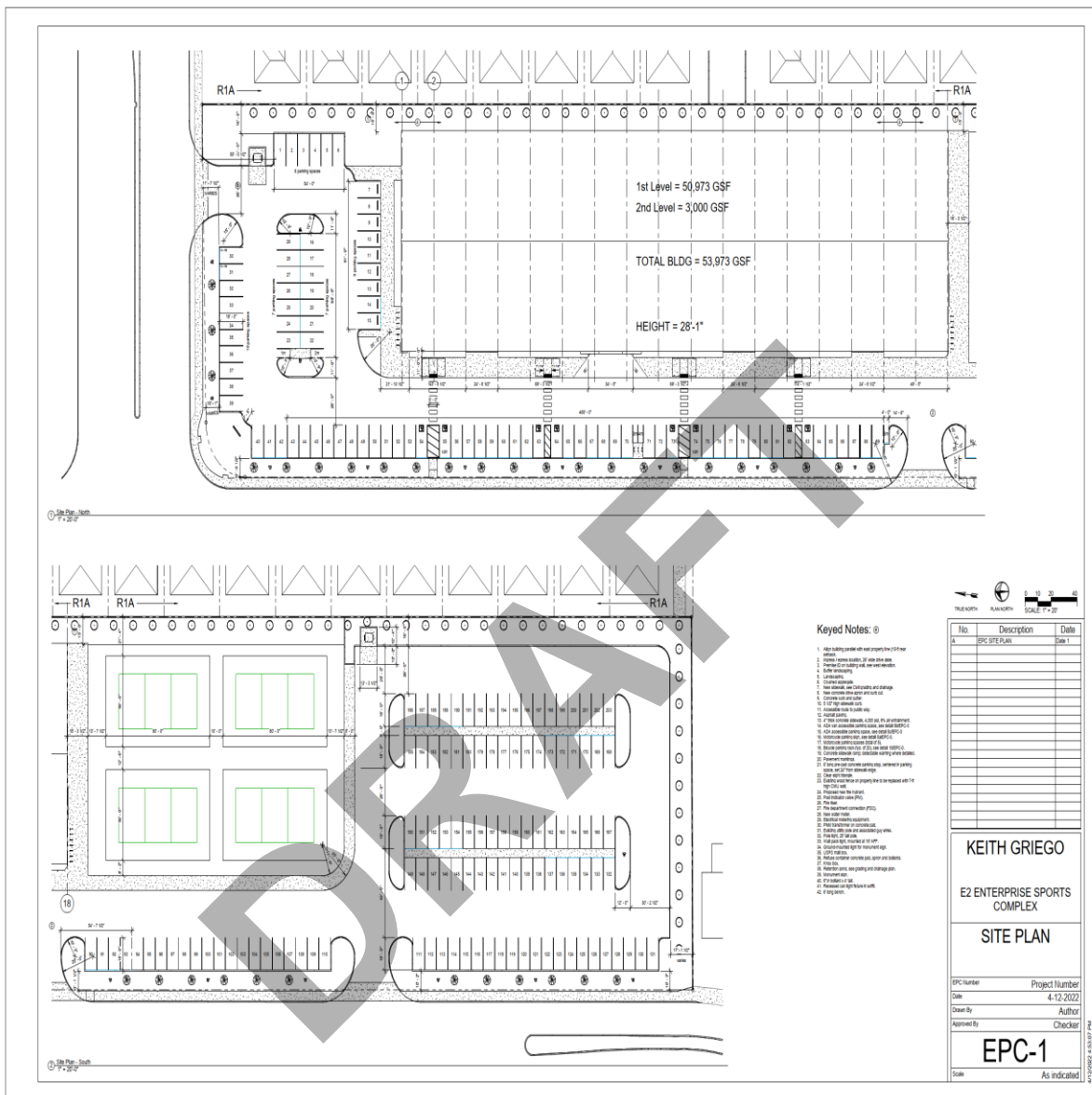




Figure 2: Vicinity Map

STUDY AREA, AREA LAND USE, AND STREETS NARRATIVE SUMMARY

STUDY AREA

The study area is defined as 86th St, from Sage Rd to the south edge of the development. The study area also includes Sage Rd along the north edge of the development. The following intersections were identified for analysis during the scoping meeting:

1. 86th St & Sage Rd
 - A. Sage Access Driveway
 - B. 86th Access Driveway 1
 - C. 86th Access Driveway 2

AREA LAND USE

The Development will be located on southeast corner of Sage Rd and 86th St. Land uses adjacent to and surrounding consist of the following:

- Residential: Immediately surrounding the study area are single-family residential developments. Additional nearby residential developments include townhouses and a multi-family, high-density development to the north.
- Commercial: There are no existing commercial developments immediately adjacent to the study area. To the west on 98th St are commercial and mixed-use developments. Additional mixed-use developments are located to the east of the study area, near Unser Blvd.
- Undeveloped: Undeveloped plots are located north of the study area, on 86th St. There are additional undeveloped plots to the east and a park and open space zone to the southwest.

STREETS

The following details the characteristics and features of streets included in the study area:

Sage Rd is a four-lane CABQ maintained roadway classified as a major collector, running east in Albuquerque, NM. The posted speed limit is 35 MPH. Travel lanes are 11 feet wide. The roadway is divided by a 16-foot median, which includes both painted and raised segments. The median narrows at intersection approaches to accommodate left turn lanes. There is continuous sidewalk in the eastbound and westbound directions. No bicycle facilities are present.

86th St is a two-lane CABQ maintained roadway classified as a major collector, running north in Albuquerque, NM. The posted speed limit is 30 MPH. Travel lanes are 12 feet wide, divided by a 12-foot painted median. Approximately 700 feet to the south of the intersection with Sage Rd, the median is raised and narrowed as a 14-foot-wide chicane on the west side of the roadway shifts the southbound travel lane closer to the northbound lane. Along the chicane, the travel lanes narrow to 9 feet wide. There is continuous sidewalk in the northbound and southbound directions. 5-foot-wide bicycle lanes are present in both directions.

INTERSECTIONS

The following details the traffic control and characteristics of the existing intersection in the study area:

86th St & Sage Rd is a 4-legged, signalized intersection of two major collectors. The eastbound and westbound legs each consist of a left turn lane and two through lanes, with right turns permitted. The northbound and southbound legs each consist of a left turn lane and a through lane, with right turns permitted. Painted crosswalks and pedestrian pushbuttons are present at each leg of the intersection. For the eastbound and westbound legs of the intersection, the left turn movements are protected-permissive. For the northbound and southbound legs, the left turn movements are permissive.

BICYCLE FACILITIES

An existing 5-foot-wide bike lane runs adjacent to the proposed development site on the east and west sides of 86th St.

DATA COLLECTION

The following section details the data collection method used in subsequent analyses of this report. The data discussed below was collected via a combination of field observations and machine/video recordings.

FIELD DATA COLLECTION

On-Street Parking

On-street parking facilities were assessed via satellite imagery. No dedicated on-street space is provided in the study area.

Pedestrians and Bicycles

Pedestrian and bicycle volumes were collected at all study intersections with turning movement counts (see Turning Movement Counts section below). Pedestrian and bicycle hourly volumes were used in the HCS capacity analyses and are provided in Appendix B.

Transit

Based on the ABQRIDE System Map (February 2022), no transit routes serve Sage Rd or 86th St. Accordingly, there are no bus stops inside the study area.

Signal Timings

Signal timing for the signalized intersection of 86th St and Sage Rd was provided by the City of Albuquerque Traffic Department. Signal timing sheets used in the capacity analyses are provided in Appendix C

TURNING MOVEMENT COUNTS

Turning movement counts for the study intersections were collected for the time period from 3:00 PM to 6:00 PM, on August 17th, 2022. Turning movement volumes collected at the study intersections show a typical commuter directionally biased distribution with an observable PM peak hour period. Only PM peak hour was analyzed because the Development would generate a negligible number of trips during AM peak hour, as discussed at the scoping meeting. PM peak hour counts are shown in Figure 3 and complete turning movement counts can be found in Appendix B.

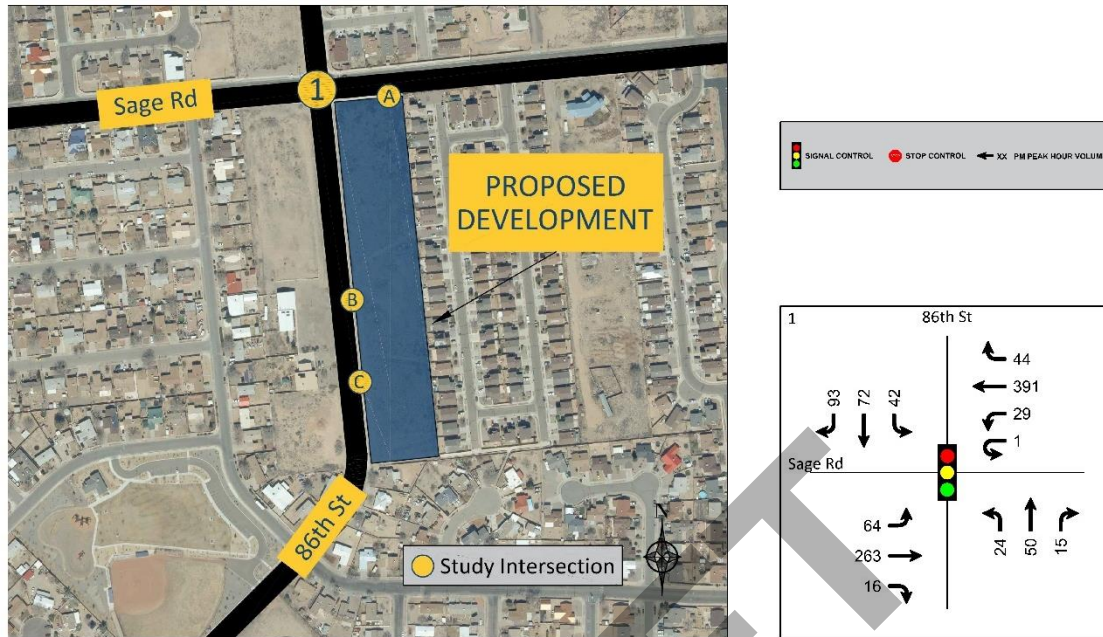


Figure 3: Existing PM Peak Hour Turning Movement Counts

CAPACITY ANALYSIS: LEVEL OF SERVICE AND QUEUING

ANALYSIS VOLUMES

EXISTING YEAR

For the Existing Year traffic volumes, video collected turning movement counts (TMCs) were used. The PM peak hour was analyzed for level of service, capacity, and queueing.

BUILD-OUT YEAR (2023) BACKGROUND

Existing TMCs were used with an applied annual growth rate developed from the MRCOG Metropolitan Transportation Plan (MTP) CUBE/2 Regional Model for the Build-Out Year Background volumes. Volumes and growth rates used to find the annual growth rate can be found in Table 4.

BUILD-OUT YEAR (2023) TOTAL

Site trips generated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, were added to the Build-Out Year Background volumes for analysis.

CAPACITY ANALYSIS

Per the Highway Capacity Manual, LOS is presented as a letter grade (A through F) based on the calculated average delay for an intersection or movement. Delay is calculated as a function of several variables, including signal phasing operations, cycle length, traffic volumes, and opposing traffic volumes, but is a measurement of the average wait time a driver can expect when moving through an intersection. Factors such as total cycle time (for all movements), queueing restrictions, and vehicle volumes can affect measurements of delay, especially for lower volume movements and side streets. Generally, these factors are only realized when delays reach or exceed LOS E thresholds. In such cases, a narrative is offered in subsequent sections specific to the individual movement in question.

Table 1 and Table 2 below, reproduced from the Highway Capacity Manual, shows delay thresholds and the associated Level of Service assigned to delay ranges for signalized intersections and stop controlled intersections, respectively. Generally, a LOS of D or better is considered an acceptable level of service.

Table 1: LOS Criteria and Descriptions for Signalized Intersections

Level of Service	Average Control Delay (sec/vehicle)	General Description (Signalized Intersections)
A	≤10	Free flow
B	>10 – 20	Stable flow (slight delays)
C	>20 – 35	Stable flow (acceptable delays)
D	>35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

Table 2: LOS Criteria and Descriptions for Unsignalized Intersections

Level of Service	Average Control Delay (sec/vehicle)
A	≤10
B	>10 – 15
C	>15 – 25
D	>25 – 35
E	>35 – 50
F	>50

Queueing is reported in vehicles, with a base assumption of 20 feet queue length per vehicle, for Two-Way Stop Controlled intersections, including the proposed site access points. Queues are reported for queue measurements falling within the 95th percentile. It should be noted that 95th percentile queues are statistically expected to occur during only 5% of the peak hour's sign cycles. It is also noted that un-reported average queueing at an intersection would statistically be much shorter than 95th percentile queueing.

For the purposes of this analysis, acceptable levels of service (LOS) are defined to be a LOS D or better. Based on procedures outlined in the Highway Capacity Manual, intersection delay and level of service for stop-controlled intersections are reported as the delay and level of service for the worst-case movement at each intersection. Detailed output sheets can be found in Appendix D.

HCS ANALYSIS

Highway Capacity Software was used to analyze the study intersections for Level of Service (LOS) and queueing conditions. All intersection approaches operate at a LOS of D or better during PM peak hour under the Existing scenario. The results of the HCS analysis for the Existing conditions are shown in Table 3.

Table 3: HCS Result Summary for Existing (2022) Conditions

	Existing 2022				
	Sage Rd & 86th St				
	Approach	Delay (s/veh)	95th Percentile Queue Length (veh/ln)	Storage Length (veh)	LOS
PM Peak Hour	EBL	4.7	0.4	9.0	A
	EBT	5.5	1.1	---	A
	EBR	5.5	1.1	---	A
	WBL	4.9	0.2	9.0	A
	WBT	6.3	2.0	---	A
	WBR	6.3	1.9	---	A
	NBL	27.7	0.6	8.0	C
	NBT	23.1	1.4	---	C
	NBR	---	---	---	---
	SBL	24.8	1.0	9.8	C
	SBT	25.4	3.9	---	C
	SBR	---	---	---	---

From the above table, the following conclusions are made from the Existing Year analysis:

- For the signalized intersection of Sage Rd and 86th St
 - Capacity Analysis
 - The worst-case movements are EBL and WBL, which operate at LOS D. All other movements operate at LOS C or better.
 - Queueing Analysis
 - Where HCS results for queue lengths are present, all existing storage lengths are sufficient to accommodate 95th percentile queue lengths

BUILD-OUT YEAR (2023) ANALYSES

The following sections detail the methods and calculations used to obtain traffic volumes for Build-Out Year analysis scenarios. This process used the following tools as described below: Traffic Projections, Site Trip Generation, and Trip Distribution and Assignment. Figures at the end of this section show the resulting traffic volumes determined for the Build-Out Year (2023) analysis scenario.

TRAFFIC PROJECTIONS

Development construction is anticipated to begin in the current year (2022), with full completion expected in 2023. Build-Out Year (2023) volumes were forecast from existing traffic volumes using counted values from 2016 and the 2040 (updated) travel demand models provided by MRCOG. These models were then compared using AM and PM peak hour direction volumes (AMPH LOAD and PMPH LOAD) to calculate anticipated growth rates for individual roadways near the study area. Roadways calculated to have a yearly growth rate of less than 1% were analyzed with a 1% per year growth rate to facilitate a conservative analysis. Growth rates were then converted to growth factors for specific analysis scenarios. Values provided by MRCOG are reproduced verbatim in Table 4: Growth Rates, in addition to the calculated growth rates used in the analysis. Growth rates were then applied to the 2022 existing volumes to forecast future volumes.

Table 4: Growth Rates

Roadway			MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Yearly Growth Rate	Average Yearly Growth	Growth Rate for Analysis
86th St North of Sage Rd	AM	PH	318	278	-0.56%	-0.13%	1.00%
	PM	PH	253	322	1.01%		
86th St South of Sage Rd	AM	PH	141	248	2.38%		
	PM	PH	263	274	0.17%		
Sage Rd West of 86th St	AM	PH	222	229	0.13%		
	PM	PH	407	421	0.14%		
Sage Rd East of 86th St	AM	PH	100	38	-3.95%		
	PM	PH	189	173	-0.37%		

Projected turning movement volumes were used for the Build-Out Year Background scenario. Projected turning movement volumes plus the site-generated trips were used for the Build-Out Year Total scenario.

SITE TRIP GENERATION

Trip generation for the Development was performed using the procedures and methodologies provided in the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition. The land use category Multipurpose Recreational Facility (ITE 435) was used to generate trips for the Development. Trips were calculated using the rate for Weekday Peak Hour of Adjacent Street Traffic, One Hour between 4 and 6 PM. Trips generated by the proposed development are shown below in the tables. Only the weekday peak hour was analyzed because the facility will generate a negligible number of trips during the AM peak hour. Site-generated trips were added to the Background traffic volumes to create the Total Build-Out traffic volumes. Table 5 below shows the trip generation and associated calculations. Since the size of this facility exceeds the maximum 23,050 sq. ft. in the ITE manual for this land use category, the trips generated by a 10,000 sq. ft. facility were used to calculate the trips for the proposed facility.

Table 5: Trip Generation

Use	Units		Weekday PM Peak Hour				
			Weekday PM Peak Hour				
			Total	Enter	Exit	In	Out
ITE 435 - Multipurpose Recreational Facility	53,973	Sq. Ft.	194	55%	45%	107	87

TRIP DISTRIBUTION AND ASSIGNMENT

The proposed site-generated trip distribution was determined based on the analysis of existing intersection demand characteristics within the study area. These direct trips were routed within the roadway network to

and from the Development based on the proportions of existing turning movement counts/demands.

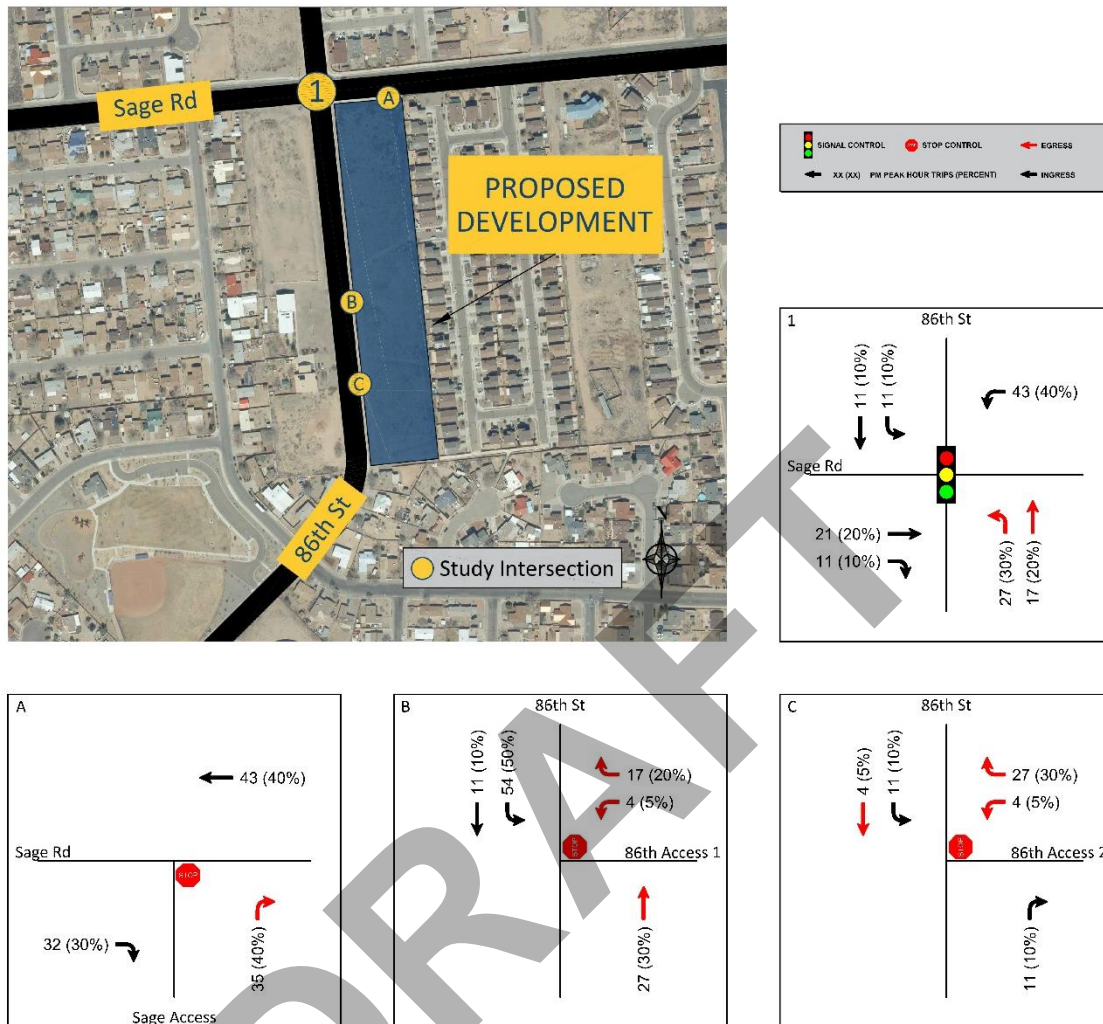


Figure 4: Site Generated Trips & Routing Percentages shows the direct trip distribution and routing percentages generated by the Development.

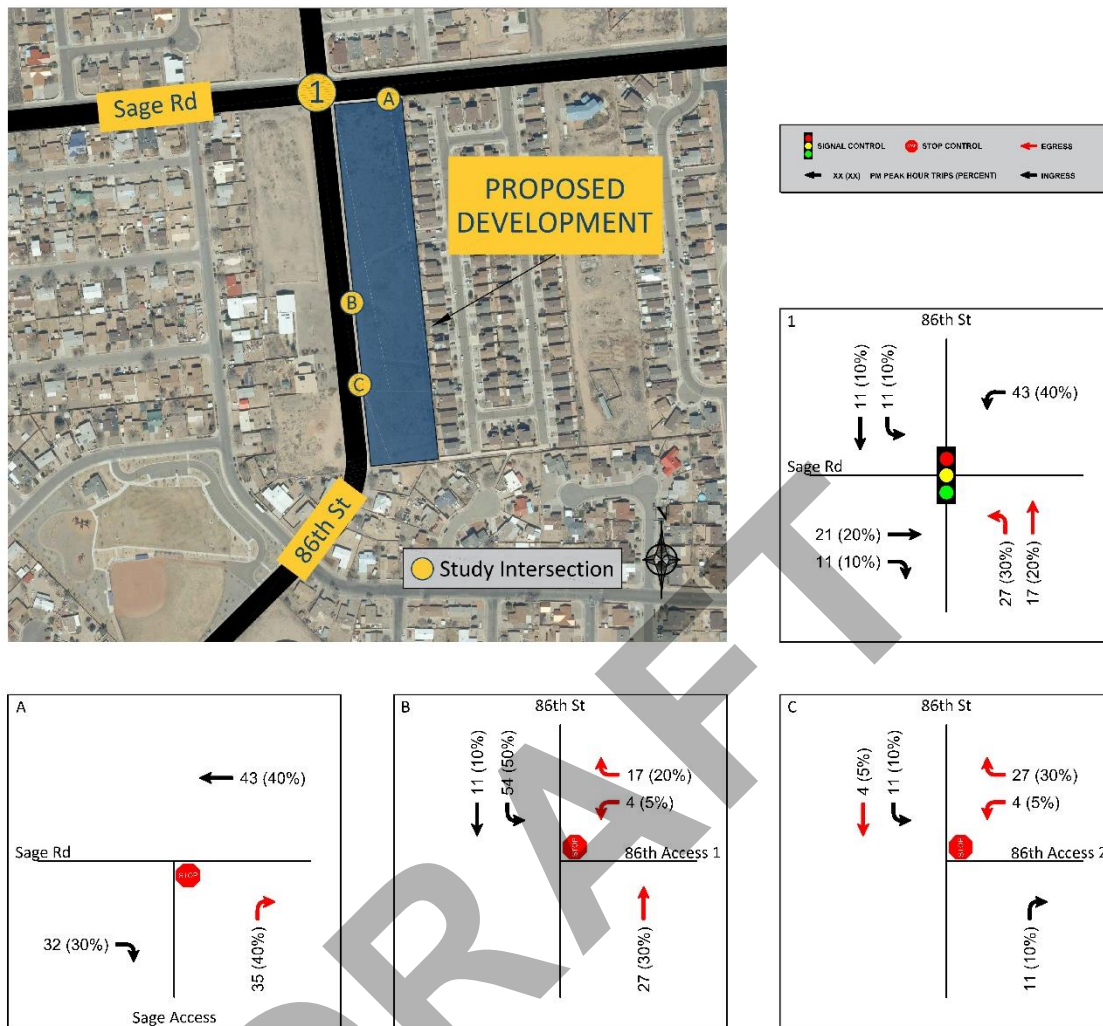


Figure 4: Site Generated Trips & Routing Percentages

TRAFFIC VOLUME CALCULATIONS

Traffic volumes used in the Build-Out Years analyses were calculated as follows:

- Build-Out Year (2023) Background –Existing traffic volumes with an applied annual growth rate
- Build-Out Year (2023) Total – Build-Out Year Background volumes plus site-generated trips

Figure 5 shows the Build-Out Year Background (2023) and **Error! Reference source not found.** shows Build-Out Year (2023) Total volumes.

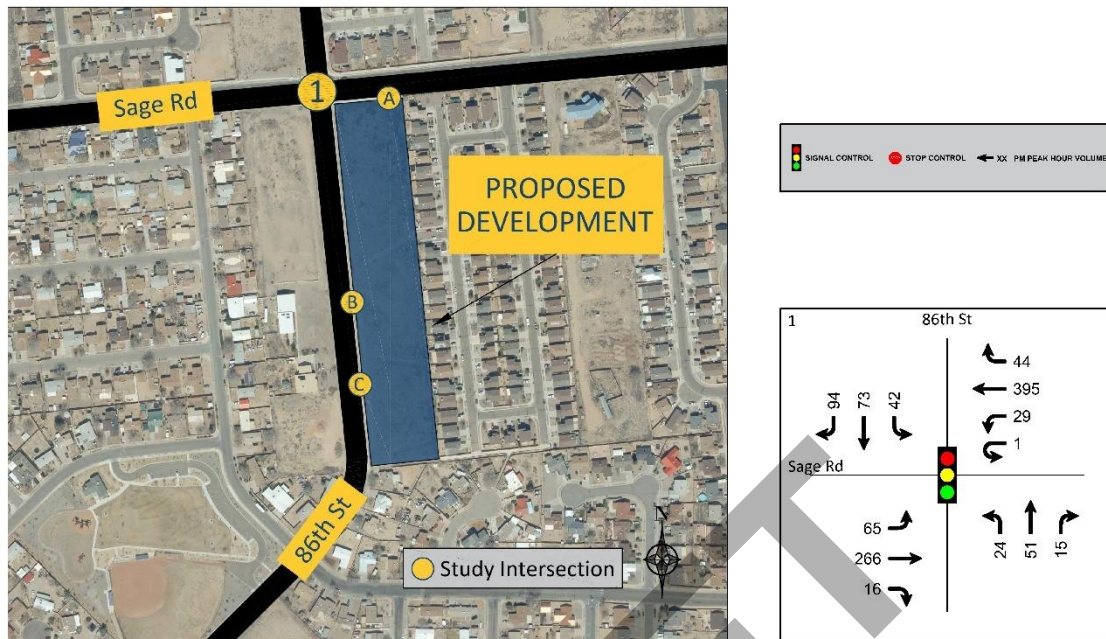


Figure 5: Build-Out Year (2023) Background

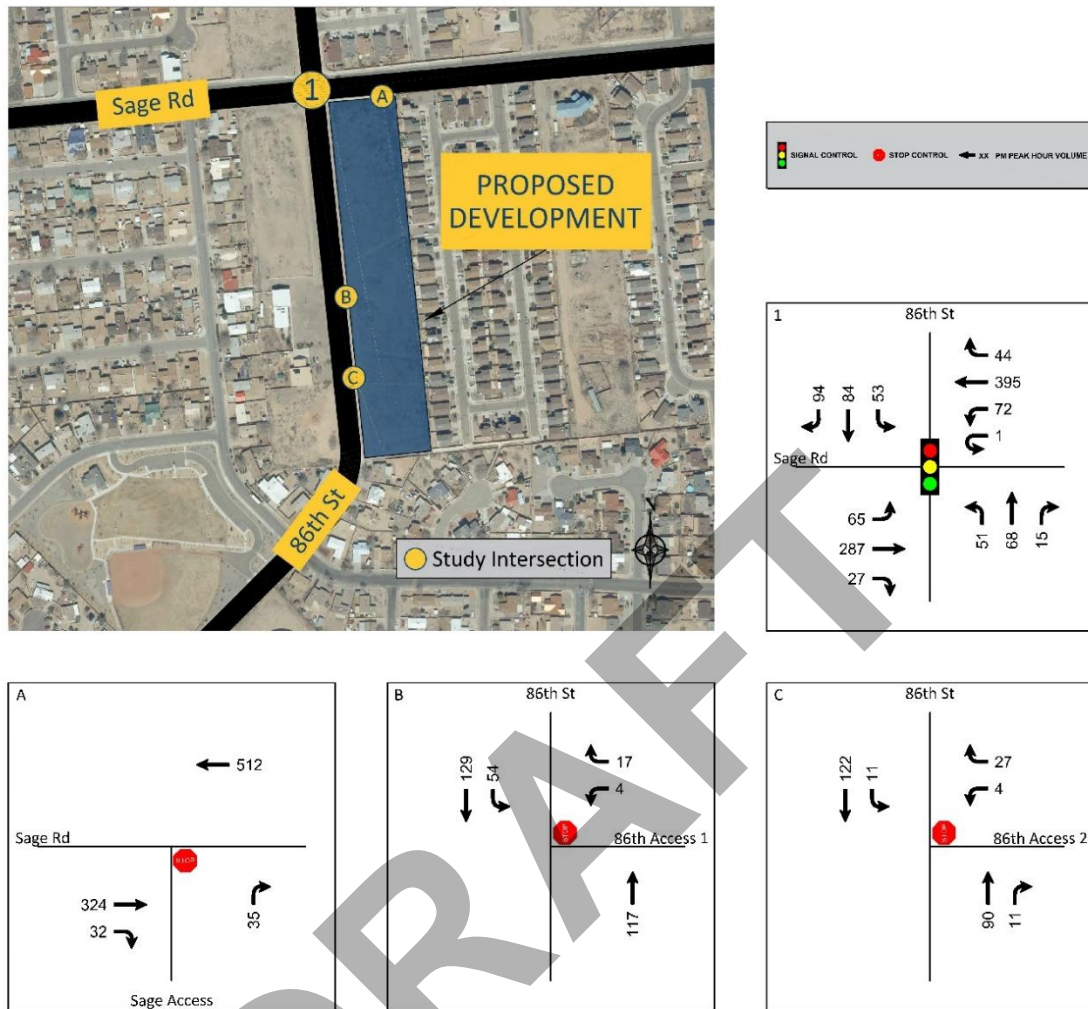


Figure 6: Build-Out Year (2023) Total

TRAFFIC ANALYSIS OF BUILD-OUT BACKGROUND AND TOTAL

As performed for Existing Background conditions, a Level of Service (LOS) and queueing analysis was performed for all Build-Out analysis scenarios using the same procedures, field data, and assumptions.

2023 BACKGROUND CONDITIONS

Table 6 below summarizes the intersection delay, level of service, and queueing under 2023 background conditions. Detailed capacity output sheets showing all individual movements can be found in Appendix D.

Table 6: HCS Result Summary for Build-Out Year (2023) Background Conditions

Background 2023					
PM Peak Hour	Sage Rd & 86th St				
	Approach	Delay (s/veh)	95th Percentile Queue Length (veh/ln)	Storage Length (veh)	LOS
	EBL	4.7	0.4	9.0	A
	EBT	5.5	1.2	---	A
	EBR	5.5	1.1	---	A
	WBL	4.9	0.2	9.0	A
	WBT	6.3	2.0	---	A
	WBR	6.4	2.0	---	A
	NBL	27.7	0.6	8.0	C
	NBT	23.1	1.5	---	C
	NBR	---	---	---	---
	SBL	24.8	1.0	9.8	C
	SBT	25.4	4.0	---	C
	SBR	---	---	---	---

From the above tables, the following conclusions are made for the Build-Out Year Background analysis:

- For the signalized intersection of Sage Rd and 86th St
 - Capacity Analysis
 - The worst-case movements are EBL and WBL, which operate at LOS D. All other movements operate at LOS C or better.
 - Queueing Analysis
 - Where HCS results for queue lengths are present, all existing storage lengths are sufficient to accommodate 95th percentile queue lengths

2023 Full Build Conditions

Table 7 below summarizes the intersection delay, level of service, and queueing under 2023 full build conditions. Detailed capacity output sheets showing all individual movements can be found in Appendix D.

Table 7: HCS Result Summary for Build-Out Year (2023) Full Build Conditions

Full Build 2023											
PM Peak Hour	Sage Rd & 86th St					PM Peak Hour	Sage Rd & Sage Access Driveway				
	Approach	Delay (s/veh)	95th Percentile Queue Length (veh/ln)	Storage Length (veh)	LOS		Approach	Delay (s/veh)	95th Percentile Queue Length (veh)	Storage Length (veh)	LOS
	EBL	5.6	0.5	9.0	A						
	EBT	6.8	1.6	---	A		EBT	---	---	---	---
	EBR	6.8	1.5	---	A		EBR	---	---	---	---
	WBL	5.3	0.5	9.0	A						
	WBT	7.1	2.3	---	A		WBT	---	---	---	---
	WBR	7.1	2.2	---	A						
	NBL	28.1	1.3	8.0	C						
	NBT	22.8	1.9	---	C						
	NBR	---	---	---	---		NBR	9.6	0.1	---	A
	SBL	24.8	1.2	9.8	C						
	SBT	24.7	4.3	---	C						
	SBR	---	---	---	---						
PM Peak Hour	86th & 86th Access Driveway 1					PM Peak Hour	86th & 86th Access Driveway 2				
	Approach	Delay (s/veh)	95th Percentile Queue Length (veh)	Storage Length (veh)	LOS		Approach	Delay (s/veh)	95th Percentile Queue Length (veh)	Storage Length (veh)	LOS
	WBL	---	---	---	---		WBL	---	---	---	---
	WBT	9.4	0.1	---	A		WBT	9.2	0.1	---	A
	WBR	---	---	---	---		WBR	---	---	---	---
	NBT	---	---	---	---		NBT	---	---	---	---
	NBR	---	---	---	---		NBR	---	---	---	---
	SBL	7.6	0.1	---	A		SBL	7.6	0.1	---	A
	SBT	---	---	---	---		SBT	---	---	---	---

From the above tables, the following conclusions are made for the Build-Out Year Full Build analyses:

- For the signalized intersection of Sage Rd and 86th St
 - Capacity Analysis
 - The worst-case movements are EBL, WBL, and SBT, which operate at LOS D. All other movements operate at LOS C or better.
 - Queueing Analysis
 - Where HCS results for queue lengths are present, all existing storage lengths are sufficient to accommodate 95th percentile queue lengths.
- For the stop-controlled intersection of Sage Rd and Sage Access Driveway
 - Capacity Analysis
 - Where HCS results are present, all movements operate at LOS A.
 - Queueing Analysis
 - Where HCS results are present, all 95th percentile queue lengths are < 1 vehicle (20 feet).
- For the stop-controlled intersection of 86th St and 86th Access Driveway 1
 - Capacity Analysis
 - Where HCS results are present, all movements operate at LOS A.
 - Queueing Analysis
 - Where HCS results are present, all 95th percentile queue lengths are < 1 vehicle (20 feet).
- For the stop-controlled intersection of 86th St and 86th Access Driveway 2
 - Capacity Analysis
 - Where HCS results are present, all movements operate at LOS A.
 - Queueing Analysis
 - Where HCS results are present, all 95th percentile queue lengths are < 1 vehicle (20 feet).

SITE RELATED CAPACITY MITIGATIONS AND STREET IMPROVEMENTS

The above section shows that capacity and queueing issues are not observed during the study peak hours. No capacity mitigations or street improvements are required based on the HCS Analysis results pertaining to the proposed site development.

SITE ACCESS SIGHT DISTANCE

The following presents recommended intersection sight distance requirements for the access driveway serving the Development. Intersection sight distance requirements were calculated based on the 2018 AASHTO "Green Book" chapter 9.5. The design vehicle used was a passenger vehicle.

- Case B1 – A stopped vehicle turning left from a minor street approach onto a major road.
- Case B2 – A stopped vehicle turning right from a minor street approach onto a major road.

Intersection sight distances were calculated based on the following assumptions:

- Required intersection sight distance for Case B2 was calculated based on the design vehicle crossing into the first lane of the roadway.

Values shown below in Table 8 were rounded up to the nearest 5-foot increment. Formulas, values, and calculations used in the sight distance analysis can be found in the Appendix.

Table 8: Site Distance Requirements

Case	Roadway	Speed	Intersection Sight Distance
Case B2 – Turning Right from Sage Access Driveway	Sage Rd	35 MPH	335 FT
Case B2 – Turning Right from 86 th Access Driveway 1 or 2	86 th St	30 MPH	290 FT
Case B1 – Turning Left from 86 th Access Driveway 1 or 2	86 th St	30 MPH	355 FT

It is recommended that all development driveways adhere to the sight distance provisions detailed in the AASHTO "Green Book". An area bounded by the above sight distances with the decision point placed 14.5 feet back from the edge of the shoulder midway between the outbound driving lane should be maintained clear of any obstructions. Current roadway geometry restricts Sage Access Driveway to right-in-right-out (RIRO) access only, as a raised median prevents left turns.

SITE ACCESS SPACING

CABQ DPM site access spacing requirements were reviewed for the site access driveways. DPM Table 7.4.45 provides a minimum distance between commercial site access points and intersections. DPM Table 7.4.46 provides the maximum number of commercial site access points per site. The results of this analysis are shown in Table 9.

Table 9: Site Access Spacing Analysis

Site Access	Functional Classification of Street	Design Speed (MPH)	DPM Table 7.4.45 Minimum Distance Between Commercial Site Access and Intersection	DPM Table 7.4.46 Maximum Number of Commercial Site Access Points per Site	Distance Between Site Access and Intersection	Distance Between Site Access Points
Sage Access Driveway	Major Collector	35	100 ft.	1 access point per 100 ft. frontage	155 ft.	---
86 th Access Driveway 1	Major Collector	30	100 ft.	1 access point per 100 ft. frontage	---	140 ft.
86 th Access Driveway 2	Major Collector	30	100 ft.	1 access point per 100 ft. frontage	---	140 ft.

Based on this analysis, the proposed location of each site access driveway meets spacing requirements. The approximate distance between Sage Access Driveway and the intersection of Sage Rd and 86th St was measured from the edge of the driveway to the center of the nearest lane of traffic on 86th St, using dimensions provided in the site plans. The two site access driveways on 86th St are spaced over 100 feet apart, meeting the requirements for the maximum number of commercial site access points per site.

AUXILIARY LANE ANALYSIS

CABQ DPM auxiliary lane warrants were reviewed for the site access driveways. DPM Table 7.4.67 was used to determine if right or left turn auxiliary lanes would be warranted for the site access points. DPM Tables 7.4.68 and 7.4.70 were used to determine deceleration length and taper length, if applicable. It is important to note that 2023 Build-Out traffic volumes were used in the analysis. The results of this analysis are shown in Table 10.

Table 10: Auxiliary Turn Lane Warrant

Location	Access/Turn Type	Design Speed (MPH)	DPM Table 7.4.67 Turning Volume per Hour	Build-Out Turning Volume per Hour	Warrant Result	DPM Tables 7.4.68/70 Minimum Storage Length (ft)	DPM Tables 7.4.68/70 Lane Transition Length (ft)
Sage Access Driveway	RIRO Only (Right Turn)	35	50	32	Not Required	240	150-150 Reverse Curve
86th Access Driveway 1	Full Access (Left Turn)	30	40	54	Required	---	150-150 Reverse Curve
86th Access Driveway 1	Full Access (Right Turn)	30	50	0	Not Required	240	150-150 Reverse Curve
86th Access Driveway 2	Full Access (Left Turn)	30	40	11	Not Required	---	150-150 Reverse Curve
86th Access Driveway 2	Full Access (Right Turn)	30	50	11	Not Required	240	150-150 Reverse Curve

Based on the above criteria, an auxiliary left turn lane would be required at 86th Access Driveway 1 since the turning volume per hour exceeds the threshold provided by Table 7.4.67 in the DPM.

An auxiliary left turn lane is recommended at 86th Access Driveway 1. It is noted that the existing painted median on 86th St at 86th St Access Driveway 1 could be used to accommodate this turn lane. The HCS results indicate a 95th % Queue Length of 0.1 vehicles for the left turning movement into the site at 86th Access Driveway 1, which translates into a Queue Storage Length of 2 feet. Adding painted arrows to create a two-way left-turn lane (TWLTL) from the existing painted median would provide adequate storage for the left turning movements.

CRASH DATA SUMMARY

At the request of the CABQ, a crash summary for the intersections within the study area has been completed. The purpose of this analysis is to highlight trends and observations from summarized crash data. Crash data was provided by CABQ for the years 2016 to 2020 in aggregate form and is summarized in the table below.

Table 11: Crash Summary

Crash Summary		Sage Rd & 86th St
Total Crashes		27
By Year	2016	10
	2017	4
	2018	2
	2019	7
	2020	4
By Type	Invalid Code/Left Blank	3
	Other Vehicle - All Other	5
	Other Vehicle - Both Going Straight/Entering At Angle	7
	Other Vehicle - From Opposite Direction	9
	Other Vehicle - From Same Direction/All Others	2
	Pedestrian	1
	%Other Vehicle - From Opposite Direction	33%
By Lighting Conditions	%Other Vehicle - Both Going Straight/Entering At Angle	26%
	%Other Vehicle - All Other	19%
	Day	14
	Dawn/Dusk	2
	Dark	6
	Invalid Code/Not Specified	5
	%Day	52%
By Severity	%Dark	22%
	PDO	17
	Injury	9
	Fatality	1
	%PDO	63%
	%Injury	33%
	%Fatality	4%
By Contributing Factors	Alcohol/Drug Involved	1
	Collision with Motor Vehicle	3
	Disregarded Traffic Signal	5
	Driver Inattention	6
	Failed to Yield Right of Way	4
	Missing Data	4
	Other - No Driver Error	1
	Inadequate Brakes	1
	Left Blank	1
	Inadequate Brakes	1
	%Driver Inattention	22%
	%Disregarded Traffic Signal	19%
	%Failed to Yield Right of Way	15%

Table 12: Crash Direction

Crash Direction	Number of Crashes
North	3
South	6
East	12
West	2
Southwest	1
Left Blank	3
Total Crashes	27

From the above tables, the following observations are made:

- For the intersection of Sage Rd and 86th St:
 - Within the years 2016 to 2020, 27 crashes were reported.
 - The most common crash classification was Other Vehicle – From Opposite Direction
 - The majority of crashes at this intersection occurred during daylight hours.
 - One fatal crash was reported from 2016 to 2020.
 - The fatal crash was reported on December 8th, 2019 and occurred at approximately 2:00 AM. The listed classification was Other Vehicle, and the highest contributing factor was listed as Alcohol/Drug Involved. The weather was clear, with dark lighting conditions.
 - Injuries were reported in 33% of crashes.
 - The most common cause of the crash was Driver Inattention.
 - One pedestrian-involved crash was reported from 2016 to 2020.
 - The pedestrian-involved crash was reported on March 30th, 2018 and occurred at approximately 2:00 PM. Visible injuries were reported. The highest contributing factor was listed as Failed to Yield Right of Way. The weather was clear, with daylight conditions.
 - No cyclist-involved crashes were reported from 2016 to 2020.
 - The majority of crashes occurred in the East direction.

SUMMARY OF RECOMMENDATIONS

The following presents a summary of recommendations included in this report.

CONCLUSIONS

- All study intersections operate at an acceptable LOS throughout all study scenarios.
- 95th % Queue Lengths do not exceed queue storage at any intersection for any scenario.
- HCS results do not suggest the need for capacity mitigation measures or street improvements related to the proposed development.
- Driveway spacing meets DPM requirements, as outlined in the report.

DEVELOPMENT SPECIFIC RECOMMENDATIONS

- Adding painted arrows to convert the painted median on 86th St to a two-way left-turn lane at 86th Access Driveway 1 is recommended.
- Restricting Sage Access Driveway to right-in/right-out (RIRO) access is recommended.

DRAFT

Appendix A
Scoping Meeting Notes

DRAFT

Agenda for G-Force Gymnastics TIA

July 26, 2022

-Meeting Notes in Red-

Attendees:

Matt Grush – City of Albuquerque

Jonathon Kruse – Lee Engineering

Abigail Yoerger – Lee Engineering

Lisa Gravelle – G-Force Gymnastics

1. Introductions
2. Review of Site Plan
 - a. Site Plan & land Uses
3. Discussion of Scope for TIS
 - a. Study Intersections
 - i. 86th and Sage
 - ii. Sage Access Driveway
 - iii. 86th Access Driveway 1
 - iv. 86th Access Driveway 2
 - v. **Good**
 - b. Data Collection
 - c. Trip Generation, Pass By, & Internal Capture
 - i. Trip Generation Manual (11th Edition) Land Use – See attachments for details.
 1. Weekday Peak Hour: 107 Entering / 87 Exiting
 2. **Omit AM Peak analysis but include note on why.**
 - ii. Pass-by trips
 1. **No**
 - iii. No Internal Capture
 1. **No**
 - iv. Trips distributed based on existing traffic patterns
 - d. Known Developments or Pending Improvements in Area:

Matt to check

- e. Build-out Year and Growth Rate
 - i. Build-Out Year (2023)
 1. Will look at MRCOG Model Projections and calculate growth rate (if any), otherwise will assume 1% growth per year.
- f. Analysis scenarios

- i. Existing Conditions
 - ii. Opening Year Background (No Build)
 - iii. Opening Year Buildout (Full Build)
 - iv. Opening Year Buildout Optimized (if required)
 - 1. All scenarios with existing signal timings except opening year buildout optimized.
 - v. **No horizon year**
- g. Required Analysis & Methodology
 - i. LOS Capacity analysis based on HCM 6th Edition (HCS)
 - ii. 95th Percentile Queue demands (HCS)
 - 1. Capacity & Queueing for network peak rather than individual intersection peaks
 - iii. Auxiliary Lane Analysis
 - iv. Sight Distance Analysis at Proposed Driveways
 - v. Crash Summary
 - 1. **Sage & 86th for 5 years**
- 4. Agency Input (Comments & Issues)
- 5. Meeting Notes (distributed by Lee Engineering)

Appendix B
Turning Movement Counts

DRAFT

NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

Full Length (6 AM-9 AM, 11 AM-2 PM, 3 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US

Leg Direction	Sage Rd Eastbound						Sage Rd Westbound						86th St Northbound						86th St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-08-17 6:00AM	5	30	1	0	36	0	0	18	3	0	21	0	0	4	4	0	8	0	3	1	7	0	11	0	76
6:15AM	5	42	2	0	49	1	2	17	4	0	23	0	0	12	4	0	16	0	8	4	6	0	18	0	106
6:30AM	8	57	0	0	65	1	1	33	3	0	37	0	4	10	3	0	17	0	6	6	7	0	19	1	138
6:45AM	9	81	1	0	91	0	6	35	5	0	46	0	5	17	7	0	29	0	8	6	7	0	21	0	187
Hourly Total	27	210	4	0	241	2	9	103	15	0	127	0	9	43	18	0	70	0	25	17	27	0	69	1	507
7:00AM	11	80	1	0	92	0	2	37	10	0	49	0	1	17	5	0	23	0	11	3	8	0	22	1	186
7:15AM	16	105	2	0	123	1	1	43	11	0	55	0	2	19	16	0	37	0	7	8	12	0	27	0	242
7:30AM	18	103	3	0	124	0	8	51	10	0	69	0	1	21	16	0	38	0	8	9	14	0	31	0	262
7:45AM	15	132	1	0	148	0	6	69	14	0	89	0	5	23	8	0	36	0	14	15	33	0	62	0	335
Hourly Total	60	420	7	0	487	1	17	200	45	0	262	0	9	80	45	0	134	0	40	35	67	0	142	1	1025
8:00AM	14	99	4	1	118	0	4	61	6	0	71	1	2	15	7	0	24	0	3	16	12	0	31	0	244
8:15AM	8	60	3	0	71	0	5	46	8	0	59	0	3	13	4	0	20	0	6	9	15	0	30	0	180
8:30AM	14	59	0	0	73	0	3	49	9	0	61	0	5	14	6	0	25	0	7	3	8	0	18	0	177
8:45AM	11	45	2	0	58	0	3	39	4	0	46	1	1	7	2	0	10	0	6	10	10	0	26	0	140
Hourly Total	47	263	9	1	320	0	15	195	27	0	237	2	11	49	19	0	79	0	22	38	45	0	105	0	741
11:00AM	6	32	5	0	43	0	4	38	3	0	45	0	0	6	5	0	11	0	7	5	13	0	25	0	124
11:15AM	5	46	5	0	56	0	3	34	8	0	45	0	1	7	4	0	12	0	5	8	6	0	19	0	132
11:30AM	3	43	2	0	48	0	1	33	4	0	38	0	4	7	3	0	14	0	4	8	7	0	19	0	119
11:45AM	10	38	2	0	50	0	1	41	5	0	47	0	4	8	2	0	14	0	2	9	4	0	15	0	126
Hourly Total	24	159	14	0	197	0	9	146	20	0	175	0	9	28	14	0	51	0	18	30	30	0	78	0	501
12:00PM	8	45	4	0	57	0	2	58	4	0	64	0	0	6	3	0	9	0	7	5	12	0	24	0	154
12:15PM	4	41	3	0	48	0	1	44	6	0	51	0	4	6	5	0	15	0	6	10	16	0	32	0	146
12:30PM	8	41	4	0	53	0	4	44	6	0	54	0	1	7	1	0	9	0	10	7	6	0	23	0	139
12:45PM	14	52	1	0	67	0	2	49	5	0	56	0	3	8	1	0	12	0	4	8	16	0	28	0	163
Hourly Total	34	179	12	0	225	0	9	195	21	0	225	0	8	27	10	0	45	0	27	30	50	0	107	0	602
1:00PM	9	50	2	0	61	0	4	55	2	1	62	0	2	11	1	0	14	0	4	5	8	0	17	0	154
1:15PM	5	40	7	0	52	0	2	49	10	0	61	0	1	9	1	0	11	0	5	10	11	0	26	0	150
1:30PM	13	38	2	0	53	0	3	54	8	0	65	0	4	9	1	0	14	0	7	8	12	0	27	1	159
1:45PM	9	50	4	0	63	0	4	48	3	0	55	0	2	7	3	0	12	0	7	11	9	0	27	0	157
Hourly Total	36	178	15	0	229	0	13	206	23	1	243	0	9	36	6	0	51	0	23	34	40	0	97	1	620
3:00PM	20	81	5	0	106	0	7	85	12	0	104	0	4	20	8	0	32	1	7	20	25	0	52	1	294
3:15PM	15	73	5	0	93	0	1	74	12	0	87	0	8	7	7	0	22	0	7	9	28	0	44	0	246
3:30PM	8	70	7	0	85	0	7	78	9	0	94	0	1	9	4	0	14	1	7	18	27	0	52	0	245
3:45PM	12	76	8	1	97	0	7	79	11	0	97	0	2	9	6	0	17	0	5	15	26	0	46	0	257
Hourly Total	55	300	25	1	381	0	22	316	44	0	382	0	15	45	25	0	85	2	26	62	106	0	194	1	1042
4:00PM	5	70	2	0	77	0	3	87	15	0	105	0	4	13	6	0	23	1	8	21	21	0	50	1	255
4:15PM	14	67	5	0	86	0	8	87	9	0	104	0	1	14	4	0	19	0	9	15	19	0	43	0	252

Leg Direction	Sage Rd Eastbound						Sage Rd Westbound						86th St Northbound						86th St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
4:30PM	16	62	4	0	82	0	9	118	14	0	141	0	11	6	4	0	21	0	8	17	21	0	46	0	290
4:45PM	11	70	4	0	85	0	6	85	14	0	105	0	2	13	2	0	17	1	13	19	23	0	55	0	262
Hourly Total	46	269	15	0	330	0	26	377	52	0	455	0	18	46	16	0	80	2	38	72	84	0	194	1	1059
5:00PM	12	73	4	0	89	0	8	88	8	1	105	0	0	15	4	0	19	0	7	17	28	0	52	0	265
5:15PM	25	58	4	0	87	0	6	100	8	0	114	0	11	16	5	0	32	0	14	19	21	0	54	0	287
5:30PM	16	53	4	0	73	0	9	102	12	0	123	0	1	17	6	0	24	0	10	16	19	0	45	0	265
5:45PM	14	76	5	0	95	0	7	97	17	0	121	0	2	10	8	0	20	0	6	17	21	0	44	0	280
Hourly Total	67	260	17	0	344	0	30	387	45	1	463	0	14	58	23	0	95	0	37	69	89	0	195	0	1097
Total	396	2238	118	2	2754	3	150	2125	292	2	2569	2	102	412	176	0	690	4	256	387	538	0	1181	5	7194
% Approach	14.4%	81.3%	4.3%	0.1%	-	-	5.8%	82.7%	11.4%	0.1%	-	-	14.8%	59.7%	25.5%	0%	-	-	21.7%	32.8%	45.6%	0%	-	-	-
% Total	5.5%	31.1%	1.6%	0%	38.3%	-	2.1%	29.5%	4.1%	0%	35.7%	-	1.4%	5.7%	2.4%	0%	9.6%	-	3.6%	5.4%	7.5%	0%	16.4%	-	-
Lights	391	2208	116	2	2717	-	149	2102	286	2	2539	-	101	409	173	0	683	-	252	385	533	0	1170	-	7109
% Lights	98.7%	98.7%	98.3%	100%	98.7%	-	99.3%	98.9%	97.9%	100%	98.8%	-	99.0%	99.3%	98.3%	0%	99.0%	-	98.4%	99.5%	99.1%	0%	99.1%	-	98.8%
Articulated Trucks	0	3	0	0	3	-	0	3	0	0	3	-	0	0	0	0	0	-	0	0	0	0	0	-	6
% Articulated Trucks	0%	0.1%	0%	0%	0.1%	-	0%	0.1%	0%	0%	0.1%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Buses and Single-Unit Trucks	5	26	2	0	33	-	1	20	6	0	27	-	1	3	1	0	5	-	4	2	5	0	11	-	76
% Buses and Single-Unit Trucks	1.3%	1.2%	1.7%	0%	1.2%	-	0.7%	0.9%	2.1%	0%	1.1%	-	1.0%	0.7%	0.6%	0%	0.7%	-	1.6%	0.5%	0.9%	0%	0.9%	-	1.1%
Bicycles on Road	0	1	0	0	1	-	0	0	0	0	0	-	0	0	2	0	2	-	0	0	0	0	0	-	3
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	1.1%	0%	0.3%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	3	-	-	-	-	-	1	-	-	-	-	-	3	-	-	-	-	-	4	
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	50.0%	-	-	-	-	-	75.0%	-	-	-	-	-	80.0%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	1	
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	50.0%	-	-	-	-	-	25.0%	-	-	-	-	-	20.0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

Full Length (6 AM-9 AM, 11 AM-2 PM, 3 PM-6 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

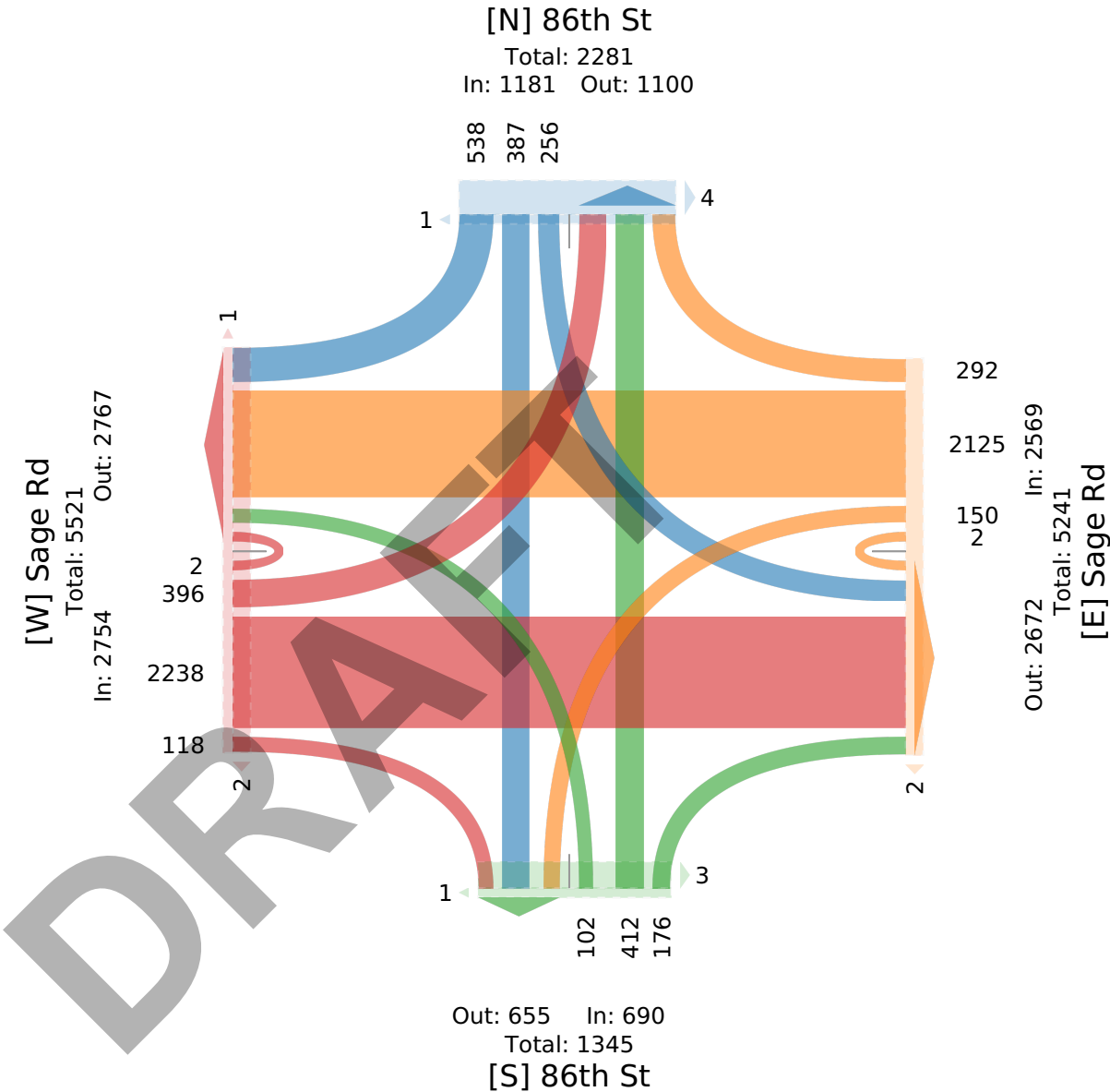
All Movements

ID: 979497, Location: 35.057472, -106.729656



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NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US

Leg Direction	Sage Rd Eastbound						Sage Rd Westbound						86th St Northbound						86th St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-08-17 7:15AM	16	105	2	0	123	1	1	43	11	0	55	0	2	19	16	0	37	0	7	8	12	0	27	0	242
7:30AM	18	103	3	0	124	0	8	51	10	0	69	0	1	21	16	0	38	0	8	9	14	0	31	0	262
7:45AM	15	132	1	0	148	0	6	69	14	0	89	0	5	23	8	0	36	0	14	15	33	0	62	0	335
8:00AM	14	99	4	1	118	0	4	61	6	0	71	1	2	15	7	0	24	0	3	16	12	0	31	0	244
Total	63	439	10	1	513	1	19	224	41	0	284	1	10	78	47	0	135	0	32	48	71	0	151	0	1083
% Approach	12.3%	85.6%	1.9%	0.2%	-	-	6.7%	78.9%	14.4%	0%	-	-	7.4%	57.8%	34.8%	0%	-	-	21.2%	31.8%	47.0%	0%	-	-	-
% Total	5.8%	40.5%	0.9%	0.1%	47.4%	-	1.8%	20.7%	3.8%	0%	26.2%	-	0.9%	7.2%	4.3%	0%	12.5%	-	3.0%	4.4%	6.6%	0%	13.9%	-	-
PHF	0.875	0.830	0.625	0.250	0.865	-	0.594	0.812	0.732	-	0.798	-	0.500	0.848	0.734	-	0.888	-	0.571	0.750	0.538	-	0.609	-	0.807
Lights	62	433	9	1	505	-	19	219	40	0	278	-	10	78	47	0	135	-	31	47	70	0	148	-	1066
% Lights	98.4%	98.6%	90.0%	100%	98.4%	-	100%	97.8%	97.6%	0%	97.9%	-	100%	100%	100%	0%	100%	-	96.9%	97.9%	98.6%	0%	98.0%	-	98.4%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	1	5	1	0	7	-	0	5	1	0	6	-	0	0	0	0	0	-	1	1	1	0	3	-	16
% Buses and Single-Unit Trucks	1.6%	1.1%	10.0%	0%	1.4%	-	0%	2.2%	2.4%	0%	2.1%	-	0%	0%	0%	0%	0%	-	3.1%	2.1%	1.4%	0%	2.0%	-	1.5%
Bicycles on Road	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Bicycles on Road	0%	0.2%	0%	0%	0.2%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.1%
Pedestrians	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	100%	-	-	-	-	-	0%	-	-	-	-	-	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	0%	-	-	-	-	-	100%	-	-	-	-	-	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

AM Peak (7:15 AM - 8:15 AM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

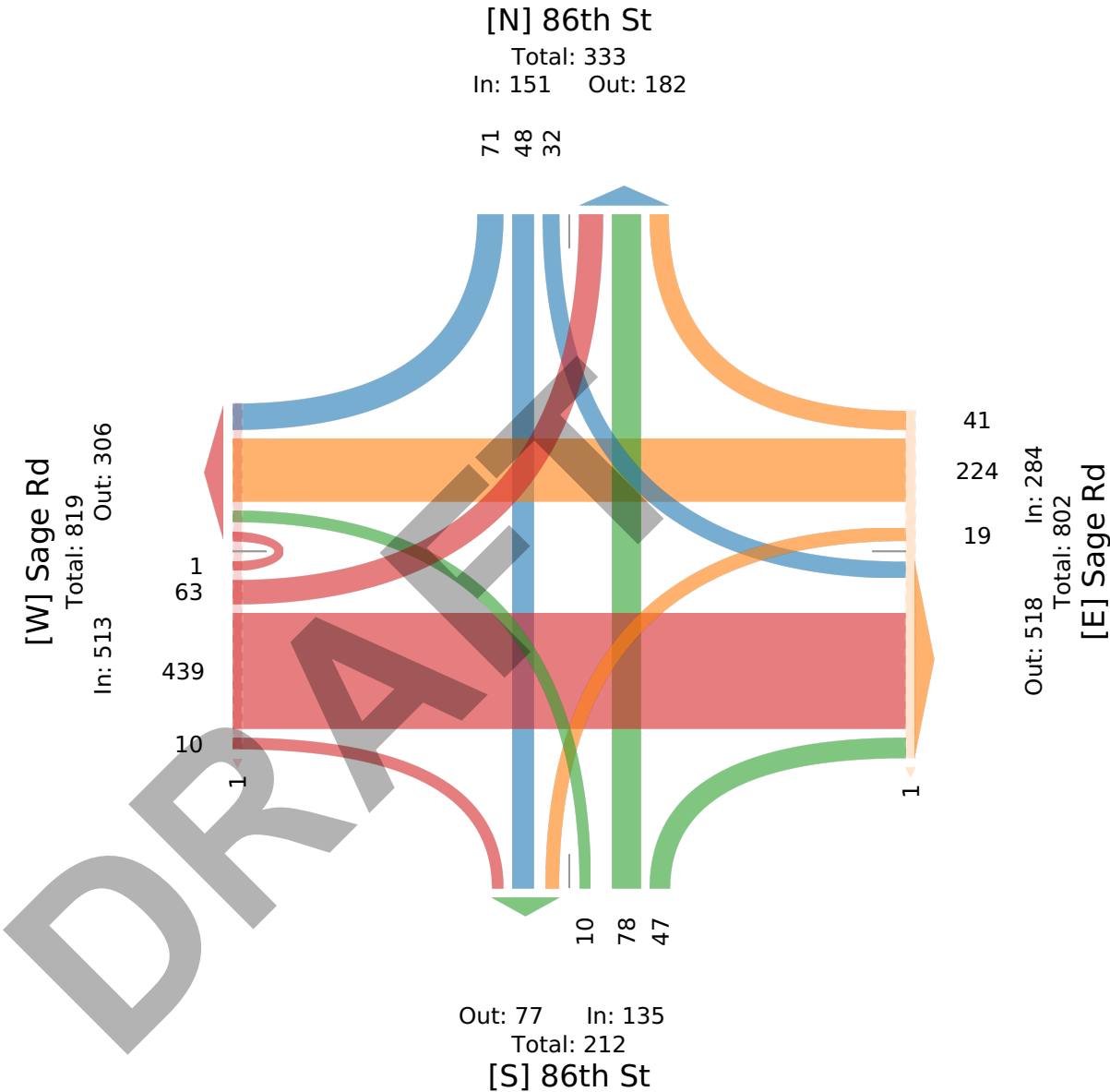
All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

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NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

Midday Peak (12:45 PM - 1:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US

Leg Direction	Sage Rd Eastbound						Sage Rd Westbound						86th St Northbound						86th St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-08-17 12:45PM	14	52	1	0	67	0	2	49	5	0	56	0	3	8	1	0	12	0	4	8	16	0	28	0	163
1:00PM	9	50	2	0	61	0	4	55	2	1	62	0	2	11	1	0	14	0	4	5	8	0	17	0	154
1:15PM	5	40	7	0	52	0	2	49	10	0	61	0	1	9	1	0	11	0	5	10	11	0	26	0	150
1:30PM	13	38	2	0	53	0	3	54	8	0	65	0	4	9	1	0	14	0	7	8	12	0	27	1	159
Total	41	180	12	0	233	0	11	207	25	1	244	0	10	37	4	0	51	0	20	31	47	0	98	1	626
% Approach	17.6%	77.3%	5.2%	0%	-	-	4.5%	84.8%	10.2%	0.4%	-	-	19.6%	72.5%	7.8%	0%	-	-	20.4%	31.6%	48.0%	0%	-	-	-
% Total	6.5%	28.8%	1.9%	0%	37.2%	-	1.8%	33.1%	4.0%	0.2%	39.0%	-	1.6%	5.9%	0.6%	0%	8.1%	-	3.2%	5.0%	7.5%	0%	15.7%	-	-
PHF	0.732	0.865	0.429	-	0.869	-	0.688	0.941	0.625	0.250	0.938	-	0.625	0.841	1.000	-	0.911	-	0.714	0.775	0.734	-	0.875	-	0.960
Lights	40	178	12	0	230	-	11	205	24	1	241	-	10	36	4	0	50	-	20	31	47	0	98	-	619
% Lights	97.6%	98.9%	100%	0%	98.7%	-	100%	99.0%	96.0%	100%	98.8%	-	100%	97.3%	100%	0%	98.0%	-	100%	100%	100%	0%	100%	-	98.9%
Articulated Trucks	0	0	0	0	0	-	0	1	0	0	1	-	0	0	0	0	0	-	0	0	0	0	0	-	1
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0.5%	0%	0%	0.4%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0.2%
Buses and Single-Unit Trucks	1	2	0	0	3	-	0	1	1	0	2	-	0	1	0	0	1	-	0	0	0	0	0	-	6
% Buses and Single-Unit Trucks	2.4%	1.1%	0%	0%	1.3%	-	0%	0.5%	4.0%	0%	0.8%	-	0%	2.7%	0%	0%	2.0%	-	0%	0%	0%	0%	0%	-	1.0%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

Midday Peak (12:45 PM - 1:45 PM)

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

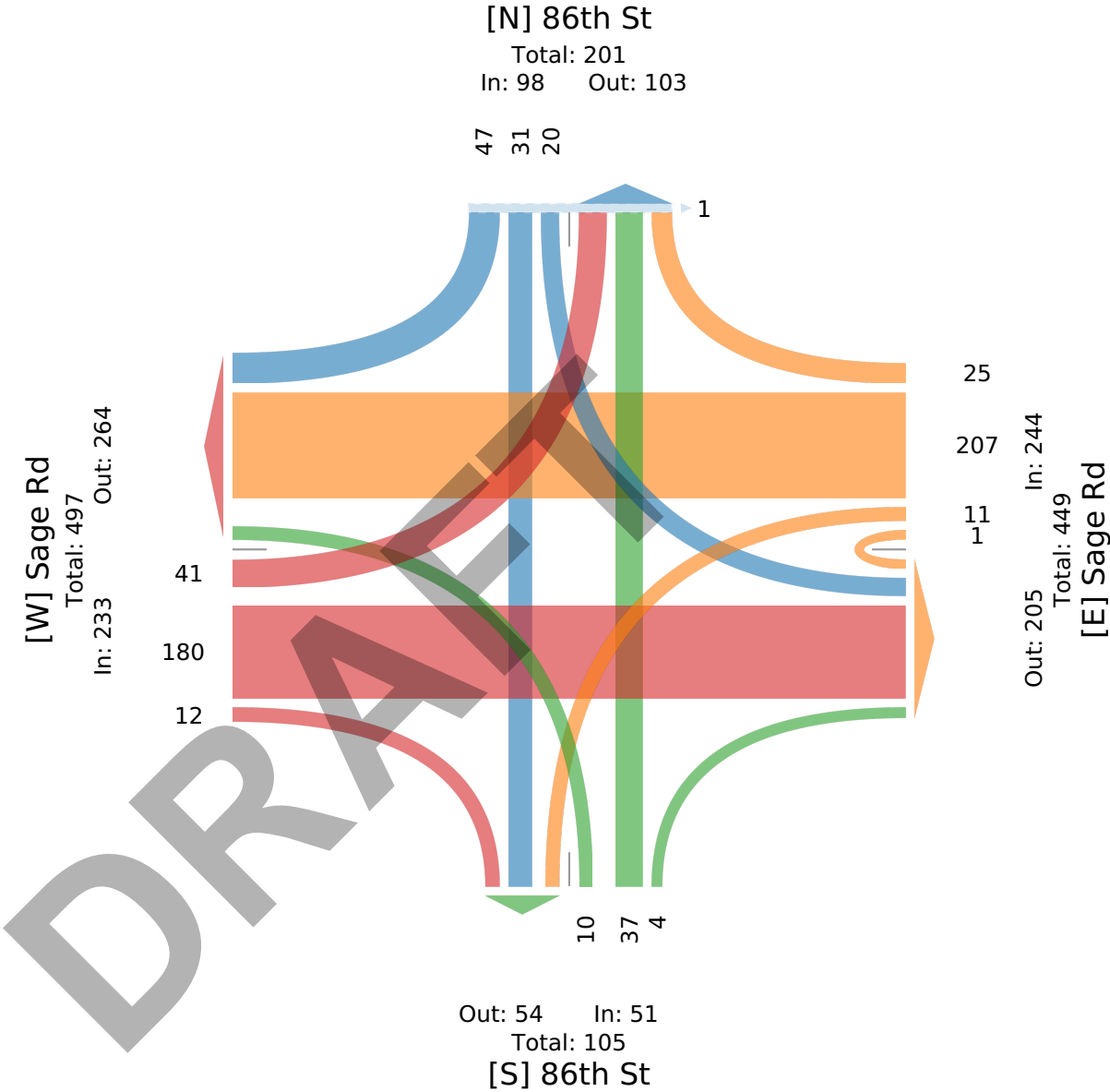
All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US



NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US

Leg Direction	Sage Rd Eastbound						Sage Rd Westbound						86th St Northbound						86th St Southbound						
Time	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	L	T	R	U	App	Ped*	Int
2022-08-17 4:30PM	16	62	4	0	82	0	9	118	14	0	141	0	11	6	4	0	21	0	8	17	21	0	46	0	290
4:45PM	11	70	4	0	85	0	6	85	14	0	105	0	2	13	2	0	17	1	13	19	23	0	55	0	262
5:00PM	12	73	4	0	89	0	8	88	8	1	105	0	0	15	4	0	19	0	7	17	28	0	52	0	265
5:15PM	25	58	4	0	87	0	6	100	8	0	114	0	11	16	5	0	32	0	14	19	21	0	54	0	287
Total	64	263	16	0	343	0	29	391	44	1	465	0	24	50	15	0	89	1	42	72	93	0	207	0	1104
% Approach	18.7%	76.7%	4.7%	0%	-	-	6.2%	84.1%	9.5%	0.2%	-	-	27.0%	56.2%	16.9%	0%	-	-	20.3%	34.8%	44.9%	0%	-	-	-
% Total	5.8%	23.8%	1.4%	0%	31.1%	-	2.6%	35.4%	4.0%	0.1%	42.1%	-	2.2%	4.5%	1.4%	0%	8.1%	-	3.8%	6.5%	8.4%	0%	18.8%	-	-
PHF	0.640	0.901	1.000	-	0.963	-	0.806	0.828	0.786	0.250	0.824	-	0.545	0.781	0.750	-	0.695	-	0.750	0.947	0.830	-	0.941	-	0.952
Lights	63	261	16	0	340	-	29	390	44	1	464	-	24	50	14	0	88	-	40	72	93	0	205	-	1097
% Lights	98.4%	99.2%	100%	0%	99.1%	-	100%	99.7%	100%	100%	99.8%	-	100%	100%	93.3%	0%	98.9%	-	95.2%	100%	100%	0%	99.0%	-	99.4%
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Articulated Trucks	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Buses and Single-Unit Trucks	1	2	0	0	3	-	0	1	0	0	1	-	0	0	1	0	1	-	2	0	0	0	2	-	7
% Buses and Single-Unit Trucks	1.6%	0.8%	0%	0%	0.9%	-	0%	0.3%	0%	0%	0.2%	-	0%	0%	6.7%	0%	1.1%	-	4.8%	0%	0%	0%	1.0%	-	0.6%
Bicycles on Road	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0	0	0	0	0	-	0
% Bicycles on Road	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%	0%	0%	0%	0%	-	0%
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	0	-
% Pedestrians	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	100%	-	-	-	-	-	-	-	-
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-
% Bicycles on Crosswalk	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0%	-	-	-	-	-	-	-	-

* Pedestrians and Bicycles on Crosswalk. L: Left, R: Right, T: Thru, U: U-Turn

NM332.01 G-Force Gymnastics TIA - TMC

Wed Aug 17, 2022

PM Peak (4:30 PM - 5:30 PM) - Overall Peak Hour

All Classes (Lights, Articulated Trucks, Buses and Single-Unit Trucks, Pedestrians, Bicycles on Road, Bicycles on Crosswalk)

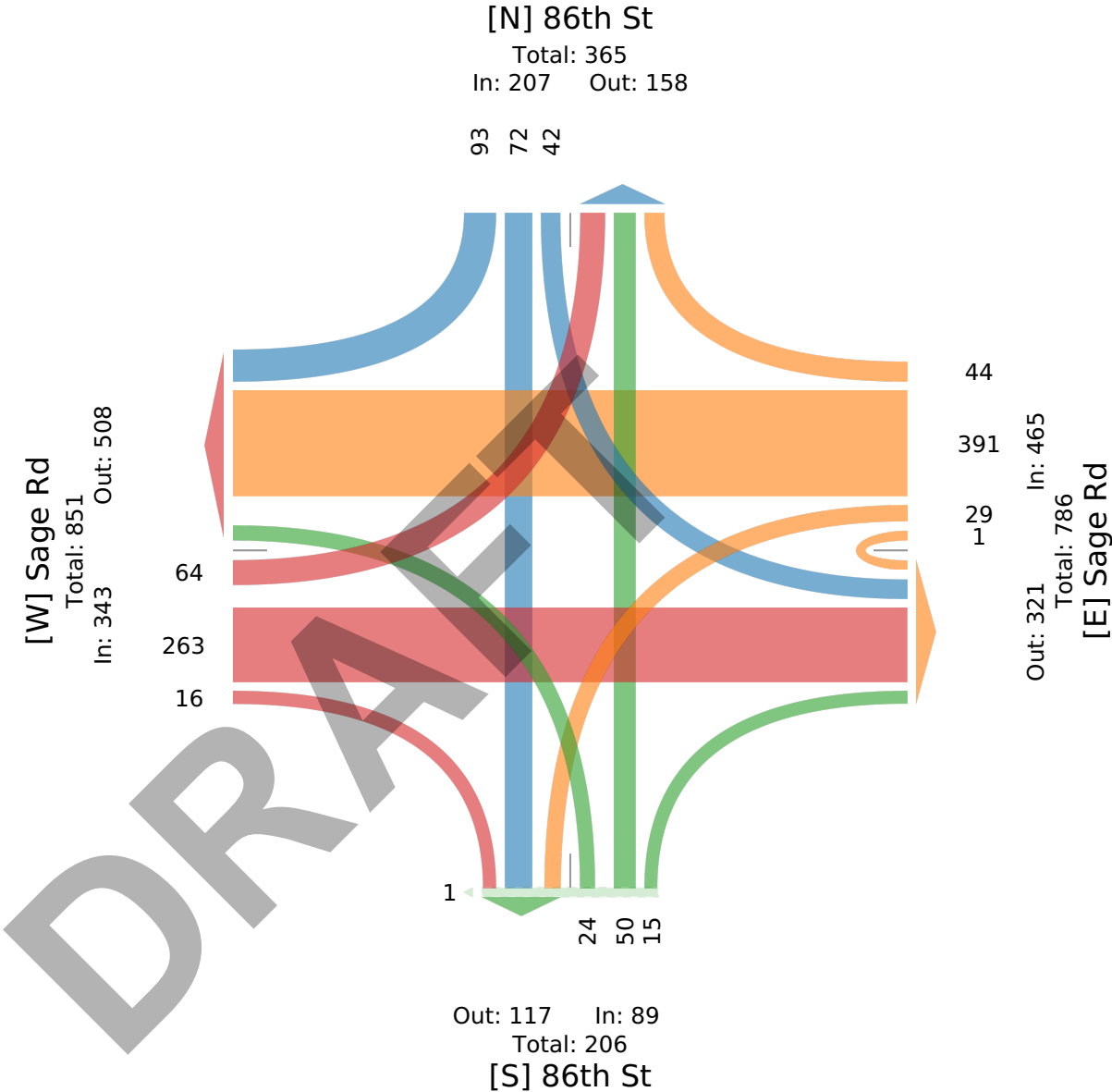
All Movements

ID: 979497, Location: 35.057472, -106.729656



Provided by: Lee Engineering, LLC

Phoenix, Arizona - Dallas, Texas, Oklahoma City, Oklahoma - San Antonio, Texas, Albuquerque, NM, US



Appendix C
Signal Timing Plan

DRAFT

Intersection No.: 401

NONE

Intersection Name: SAGE - 86TH

Revision Date 5/26/2017

Timing Data

Phase I.D.:	1	2	3	4	5	6	7	8
Phase Dir.:	W-S	EB		NB	E-N	WB		SB
Min Grn	3	16		8	3	16		8
Walk:	0	7		7	0	7		7
Ped Clr:	0	10		16	0	10		16
Veh Ext:	1.5	4.0		3.0	1.5	4.0		3.0
Veh Ext2:	1.5	4.0		3.0	1.5	4.0		3.0
Max 1:	16	36		24	16	36		24
Max 2:	16	36		24	16	36		24
Max 3:								
Yellow:	3.0	3.5		3.5	3.0	3.5		3.5
Red Clr	0.5	1.5		2.0	0.5	1.5		2.0

Recall Data

Locking Memory:							
Vehicle Recall:							
Ped Recall:							
Recall To Max:		X			X		

Flash Mode: ALL RED

Start Up Mode: ALL RED

Time: 8 SEC.

First Phases: 2 & 6

Start In: GREEN

Overlap Phases:

Overlap	Par Ph	Grn	Yel	Red
A				
B				
C				
D				

NOTES: 1. Intersection flash date, 8/21/00. Turn on date, 8/24/00.

2. Timing sheet updated, 4/17/03.

3. Intersection updated and turn arrows installed for N-W, S-E and E-N, 3-12-12.

4. Clearance intervals updated to NMDOT standard by BB, 10/3/13.

5. Timing sheet revised to current timing sheet, 8-31-16.

6. New Coordination Patterns implemented 05-24-2017, Lee Engineering.

Appendix D

HCS Results

DRAFT

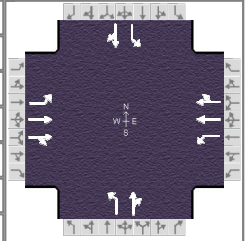
HCS7 Signalized Intersection Results Summary

General Information

Agency	Lee Engineering
Analyst	AY
Jurisdiction	CABQ
Urban Street	Sage Rd SW
Intersection	Sage & 86th
Project Description	G-Force Gymnastics TIA

Intersection Information

Duration, h	1.000
Area Type	Other
PHF	1.00
Analysis Period	1> 4:30
File Name	Sage and 86th Existing 2022.xus



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	64	263	16	30	391	44	24	50	15	42	72	93

Signal Information

Cycle, s	61.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		4		8
Case Number	1.1	4.0	1.1	4.0		6.0		6.0
Phase Duration, s	5.5	41.8	4.7	41.0		14.7		14.7
Change Period, ($Y+R_c$), s	3.5	5.0	3.5	5.0		5.5		5.5
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (g_s), s	2.9	4.0	2.4	5.4		8.7		7.5
Green Extension Time (g_e), s	0.1	1.3	0.0	1.3		0.5		0.5
Phase Call Probability	0.66	1.00	0.40	1.00		0.99		0.99
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	64	141	138	30	221	214	24	65		42	165	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1885	1824	1810	1900	1825	1240	1717		1303	1711	
Queue Service Time (g_s), s	0.9	2.0	2.0	0.4	3.3	3.4	1.1	2.0		1.8	5.5	
Cycle Queue Clearance Time (g_c), s	0.9	2.0	2.0	0.4	3.3	3.4	6.7	2.0		3.9	5.5	
Green Ratio (g/C)	0.62	0.60	0.60	0.61	0.59	0.59	0.15	0.15		0.15	0.15	
Capacity (c), veh/h	684	1133	1097	752	1117	1073	192	259		270	258	
Volume-to-Capacity Ratio (X)	0.094	0.124	0.126	0.040	0.197	0.200	0.125	0.251		0.156	0.640	
Back of Queue (Q), ft/ln (95 th percentile)	8.2	23	22.3	3.9	39.5	38.6	11.8	31.1		20.4	78.5	
Back of Queue (Q), veh/ln (95 th percentile)	0.4	1.1	1.1	0.2	2.0	1.9	0.6	1.4		1.0	3.9	
Queue Storage Ratio (RQ) (95 th percentile)	0.06	0.00	0.00	0.03	0.00	0.00	0.09	0.00		0.13	0.00	
Uniform Delay (d_1), s/veh	4.7	5.3	5.3	4.9	5.9	5.9	27.6	22.9		24.7	24.4	
Incremental Delay (d_2), s/veh	0.0	0.2	0.2	0.0	0.4	0.4	0.1	0.2		0.1	1.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	4.7	5.5	5.5	4.9	6.3	6.3	27.7	23.1		24.8	25.4	
Level of Service (LOS)	A	A	A	A	A	A	C	C		C	C	
Approach Delay, s/veh / LOS	5.3		A	6.2		A	24.4		C	25.3		C
Intersection Delay, s/veh / LOS	11.0						B					

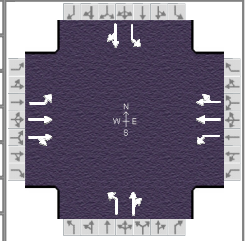
Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.86		B	1.86		B	2.28		B	2.28		B
Bicycle LOS Score / LOS	0.77		A	0.87		A	0.63		A	0.83		A

HCS7 Signalized Intersection Results Summary

General Information

Agency	Lee Engineering			Duration, h	1.000
Analyst	AY	Analysis Date	Aug 26, 2022	Area Type	Other
Jurisdiction	CABQ	Time Period	4:30-5:30 PM	PHF	1.00
Urban Street	Sage Rd SW	Analysis Year	2023	Analysis Period	1> 4:30
Intersection	Sage & 86th	File Name	Sage and 86th Background 2023.xus		
Project Description	G-Force Gymnastics TIA				



Demand Information

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	65	266	16	30	395	44	24	51	15	42	73	94

Signal Information

Cycle, s	61.3	Reference Phase	2									
Offset, s	0	Reference Point	End									
Uncoordinated	Yes	Simult. Gap E/W	On									
Force Mode	Fixed	Simult. Gap N/S	On									

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		4		8
Case Number	1.1	4.0	1.1	4.0		6.0		6.0
Phase Duration, s	5.5	41.8	4.7	41.0		14.8		14.8
Change Period, ($Y+R_c$), s	3.5	5.0	3.5	5.0		5.5		5.5
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (g_s), s	2.9	4.0	2.4	5.4		8.8		7.6
Green Extension Time (g_e), s	0.1	1.3	0.0	1.3		0.5		0.5
Phase Call Probability	0.67	1.00	0.40	1.00		0.99		0.99
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	65	143	139	30	223	216	24	66		42	167	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1885	1825	1810	1900	1826	1238	1718		1302	1711	
Queue Service Time (g_s), s	0.9	2.0	2.0	0.4	3.4	3.4	1.1	2.1		1.8	5.6	
Cycle Queue Clearance Time (g_c), s	0.9	2.0	2.0	0.4	3.4	3.4	6.8	2.1		3.9	5.6	
Green Ratio (g/C)	0.62	0.60	0.60	0.61	0.59	0.59	0.15	0.15		0.15	0.15	
Capacity (c), veh/h	681	1132	1095	749	1115	1072	191	261		271	260	
Volume-to-Capacity Ratio (X)	0.095	0.126	0.127	0.040	0.200	0.202	0.125	0.253		0.155	0.643	
Back of Queue (Q), ft/ln (95 th percentile)	8.4	23.4	22.8	4	40.1	39.4	11.8	31.6		20.5	79.7	
Back of Queue (Q), veh/ln (95 th percentile)	0.4	1.2	1.1	0.2	2.0	2.0	0.6	1.5		1.0	4.0	
Queue Storage Ratio (RQ) (95 th percentile)	0.06	0.00	0.00	0.03	0.00	0.00	0.09	0.00		0.13	0.00	
Uniform Delay (d_1), s/veh	4.7	5.3	5.3	4.9	5.9	5.9	27.6	22.9		24.7	24.4	
Incremental Delay (d_2), s/veh	0.0	0.2	0.2	0.0	0.4	0.4	0.1	0.2		0.1	1.0	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	4.7	5.5	5.5	4.9	6.3	6.4	27.7	23.1		24.8	25.4	
Level of Service (LOS)	A	A	A	A	A	A	C	C		C	C	
Approach Delay, s/veh / LOS	5.4		A	6.2		A	24.4		C	25.3		C
Intersection Delay, s/veh / LOS	11.0						B					

Multimodal Results

	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	1.86	B	1.86	B	2.28	B	2.28	B
Bicycle LOS Score / LOS	0.77	A	0.87	A	0.64	A	0.83	A

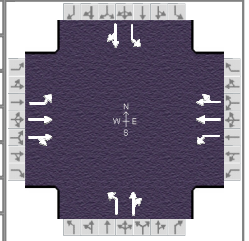
HCS7 Signalized Intersection Results Summary

General Information

Agency	Lee Engineering
Analyst	AY
Jurisdiction	CABQ
Urban Street	Sage Rd SW
Intersection	Sage & 86th
Project Description	G-Force Gymnastics TIA

Intersection Information

Duration, h	1.000
Area Type	Other
PHF	1.00
Analysis Period	1> 4:30
File Name	Sage and 86th Full Build 2023.xus



Demand Information

Approach Movement	EB			WB			NB			SB		
	L	T	R	L	T	R	L	T	R	L	T	R
Demand (v), veh/h	65	287	27	73	395	44	51	68	15	53	84	94

Signal Information

Cycle, s	63.5	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Timer Results

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	5	2	1	6		4		8
Case Number	1.1	4.0	1.1	4.0		6.0		6.0
Phase Duration, s	5.6	41.0	5.8	41.2		16.7		16.7
Change Period, ($Y+R_c$), s	3.5	5.0	3.5	5.0		5.5		5.5
Max Allow Headway (MAH), s	3.1	3.1	3.1	3.1		3.3		3.3
Queue Clearance Time (g_s), s	3.0	4.6	3.1	5.7		10.5		8.0
Green Extension Time (g_e), s	0.1	1.4	0.1	1.4		0.7		0.7
Phase Call Probability	0.68	1.00	0.72	1.00		1.00		1.00
Max Out Probability	0.00	0.00	0.00	0.00		0.00		0.00

Movement Group Results

	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	5	2	12	1	6	16	7	4	14	3	8	18
Adjusted Flow Rate (v), veh/h	65	159	155	73	223	216	51	83		53	178	
Adjusted Saturation Flow Rate (s), veh/h/ln	1781	1885	1806	1810	1900	1826	1225	1732		1282	1721	
Queue Service Time (g_s), s	1.0	2.5	2.6	1.1	3.6	3.7	2.5	2.6		2.4	6.0	
Cycle Queue Clearance Time (g_c), s	1.0	2.5	2.6	1.1	3.6	3.7	8.5	2.6		5.0	6.0	
Green Ratio (g/C)	0.60	0.57	0.57	0.60	0.57	0.57	0.18	0.18		0.18	0.18	
Capacity (c), veh/h	628	1068	1023	747	1083	1040	214	307		288	305	
Volume-to-Capacity Ratio (X)	0.104	0.149	0.151	0.098	0.206	0.208	0.238	0.270		0.184	0.584	
Back of Queue (Q), ft/ln (95 th percentile)	9.9	32.1	30.9	10.7	45.4	44.3	25.9	40.3		26.5	85.1	
Back of Queue (Q), veh/ln (95 th percentile)	0.5	1.6	1.5	0.5	2.3	2.2	1.3	1.9		1.2	4.3	
Queue Storage Ratio (RQ) (95 th percentile)	0.07	0.00	0.00	0.07	0.00	0.00	0.20	0.00		0.17	0.00	
Uniform Delay (d_1), s/veh	5.5	6.5	6.5	5.3	6.7	6.7	27.9	22.6		24.7	24.0	
Incremental Delay (d_2), s/veh	0.0	0.3	0.3	0.0	0.4	0.5	0.2	0.2		0.1	0.7	
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0	
Control Delay (d), s/veh	5.6	6.8	6.8	5.3	7.1	7.1	28.1	22.8		24.8	24.7	
Level of Service (LOS)	A	A	A	A	A	A	C	C		C	C	
Approach Delay, s/veh / LOS	6.6		A	6.8		A	24.8		C	24.7		C
Intersection Delay, s/veh / LOS	12.0						B					

Multimodal Results

	EB			WB			NB			SB		
Pedestrian LOS Score / LOS	1.87		B	1.87		B	2.28		B	2.28		B
Bicycle LOS Score / LOS	0.80		A	0.91		A	0.71		A	0.87		A

HCS7 Two-Way Stop-Control Report

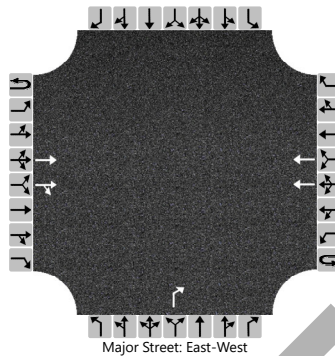
General Information

Analyst	AY
Agency/Co.	Lee Engineering
Date Performed	8/26/2022
Analysis Year	2023
Time Analyzed	4:30 PM - 5:30 PM
Intersection Orientation	East-West
Project Description	G-Force Gymnastics

Site Information

Intersection	Sage/Sage Access Driveway
Jurisdiction	City of Albuquerque
East/West Street	Sage Rd
North/South Street	Sage Access Driveway
Peak Hour Factor	0.92
Analysis Time Period (hrs)	1.00

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6	7	8	9		10	11	12	
Number of Lanes	0	0	2	0	0	0	2	0		0	0	1		0	0	0
Configuration			T	TR			T					R				
Volume (veh/h)			324	32			512					35				
Percent Heavy Vehicles (%)												3				
Proportion Time Blocked																
Percent Grade (%)										0						
Right Turn Channelized										No						
Median Type Storage							Undivided									

Critical and Follow-up Headways

Base Critical Headway (sec)												6.9				
Critical Headway (sec)												6.96				
Base Follow-Up Headway (sec)												3.3				
Follow-Up Headway (sec)												3.33				

Delay, Queue Length, and Level of Service

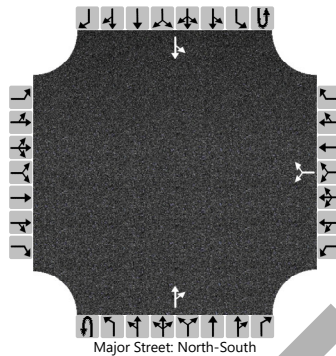
Flow Rate, v (veh/h)												38				
Capacity, c (veh/h)												812				
v/c Ratio												0.05				
95% Queue Length, Q ₉₅ (veh)												0.1				
Control Delay (s/veh)												9.6				
Level of Service (LOS)												A				
Approach Delay (s/veh)											9.6					
Approach LOS											A					

HCS7 Two-Way Stop-Control Report

General Information

Analyst	AY	Intersection	86th/86th Access Drive 1
Agency/Co.	Lee Engineering	Jurisdiction	City of Albuquerque
Date Performed	8/26/2022	East/West Street	86th Access Driveway 1
Analysis Year	2023	North/South Street	86th St
Time Analyzed	4:30 PM - 5:30 PM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	G-Force Gymnastics		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		17			117	0		54	129	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)						0										
Right Turn Channelized																
Median Type Storage					Left Only								1			

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

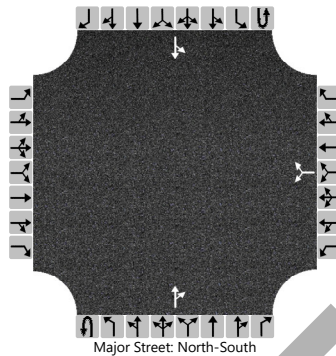
Flow Rate, v (veh/h)						23								59		
Capacity, c (veh/h)						847								1453		
v/c Ratio						0.03								0.04		
95% Queue Length, Q ₉₅ (veh)						0.1								0.1		
Control Delay (s/veh)						9.4								7.6		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.4								2.5		
Approach LOS						A										

HCS7 Two-Way Stop-Control Report

General Information

Analyst	AY	Intersection	86th/86th Access Drive 2
Agency/Co.	Lee Engineering	Jurisdiction	City of Albuquerque
Date Performed	8/26/2022	East/West Street	86th Access Driveway 2
Analysis Year	2023	North/South Street	86th St
Time Analyzed	4:30 PM - 5:30 PM	Peak Hour Factor	0.92
Intersection Orientation	North-South	Analysis Time Period (hrs)	1.00
Project Description	G-Force Gymnastics		

Lanes



Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority		10	11	12		7	8	9	1U	1	2	3	4U	4	5	6
Number of Lanes		0	0	0		0	1	0	0	0	1	0	0	0	1	0
Configuration							LR					TR		LT		
Volume (veh/h)						4		27			90	11		11	122	
Percent Heavy Vehicles (%)						3		3						3		
Proportion Time Blocked																
Percent Grade (%)							0									
Right Turn Channelized																
Median Type Storage							Left Only								1	

Critical and Follow-up Headways

Base Critical Headway (sec)						7.1		6.2						4.1		
Critical Headway (sec)						6.43		6.23						4.13		
Base Follow-Up Headway (sec)						3.5		3.3						2.2		
Follow-Up Headway (sec)						3.53		3.33						2.23		

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						34								12		
Capacity, c (veh/h)						914								1474		
v/c Ratio						0.04								0.01		
95% Queue Length, Q ₉₅ (veh)						0.1								0.0		
Control Delay (s/veh)						9.1								7.5		
Level of Service (LOS)						A								A		
Approach Delay (s/veh)						9.1								0.7		
Approach LOS						A										

Appendix E
Intersection Sight Distance Calculations

INTERSECTION SIGHT DISTANCE CALCULATIONS

Reference: 2018 AASHTO "Green Book" chapter 9.5

Design Vehicle: Passenger Vehicles

Major Road Lanes:

Sage Rd EB at Sage Access Driveway: 2 through lanes, 1 non-traversable median (RIRO access only)

86th St at 86th St Access Driveways: 1 SB through lane, 1 NB through lane, 1 12-foot painted median.

Major Road Speed:

Sage Rd: 35 MPH

86th St: 30 MPH

Case B1: A stopped vehicle turning left from a minor street approach onto a major road

Case B2: A stopped vehicle turning right from a minor street approach onto a major road

FORMULA:

$$ISD = 1.47 * V_{major} * t_g$$

Units: ISD (ft), V_{major} (MPH), and t_g (seconds)

Time Gaps (t_g):

7.5 (for passenger vehicles turning left, crossing one lane of traffic)

6.5 (for passenger vehicles turning right)

0.5 (added for each additional lane or median crossed)

SAGE ACCESS DRIVEWAY

CASE B2 (RIGHT TURN):

Assumption: Design vehicle is turning into the first lane of the major roadway.

Time Gap (t_g) = 6.5

$$ISD = 1.47 * 35 * 6.5 = 334.43 \sim \mathbf{335 \text{ ft}}$$

86TH ST ACCESS DRIVEWAY 1

CASE B1 (LEFT TURN):

Time Gap (t_g) = 7.5 + 0.5

$$ISD = 1.47 * 30 * 8.0 = 352.8 \sim \mathbf{355 \text{ ft}}$$

CASE B2 (RIGHT TURN):

Assumption: Design vehicle is turning into the first lane of the major roadway.

Time Gap (t_g) = 6.5

$$ISD = 1.47 * 30 * 6.5 = 286.65 \sim \mathbf{290 \text{ ft}}$$

86TH ST ACCESS DRIVEWAY 2

CASE B1 (LEFT TURN):

Time Gap (t_g) = 7.5 + 0.5

$$ISD = 1.47 * 30 * 8.0 = 352.8 \sim \mathbf{355 \text{ ft}}$$

CASE B2 (RIGHT TURN):

Assumption: Design vehicle is turning into the first lane of the major roadway.

Time Gap (t_g) = 6.5

$$ISD = 1.47 * 30 * 6.5 = 286.65 \sim \mathbf{290 \text{ ft}}$$

Appendix F
ITE Trip Generation

DRAFT

Trip Generation Tables

Use	Units		Weekday PM Peak Hour				
			Total	Enter	Exit	In	Out
ITE 435 - Multipurpose Recreational Facility	53, 973	Sq. Ft.	194	55%	45%	107	87

Notes: Since this facility is larger than the maximum sq. ft. allowed in this category, the rates for a 10,000 sq. ft. facility were used to calculate rates for this facility. The time period used is the only period allowed in ITE for this land use category.

ITE Trip Generation Manual Rates						
Daily Rate: Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4 and 6 pm						
Average Rate:						
Units		Total	Enter	Exit	In	Out
10,000	Sq. Ft.	36	55%	45%	19.8	16.2