Source: Google 2022

CN A302250 Uptown Intersection Improvements Scoping and Alternatives Analysis Report

Prepared for

City of Albuquerque

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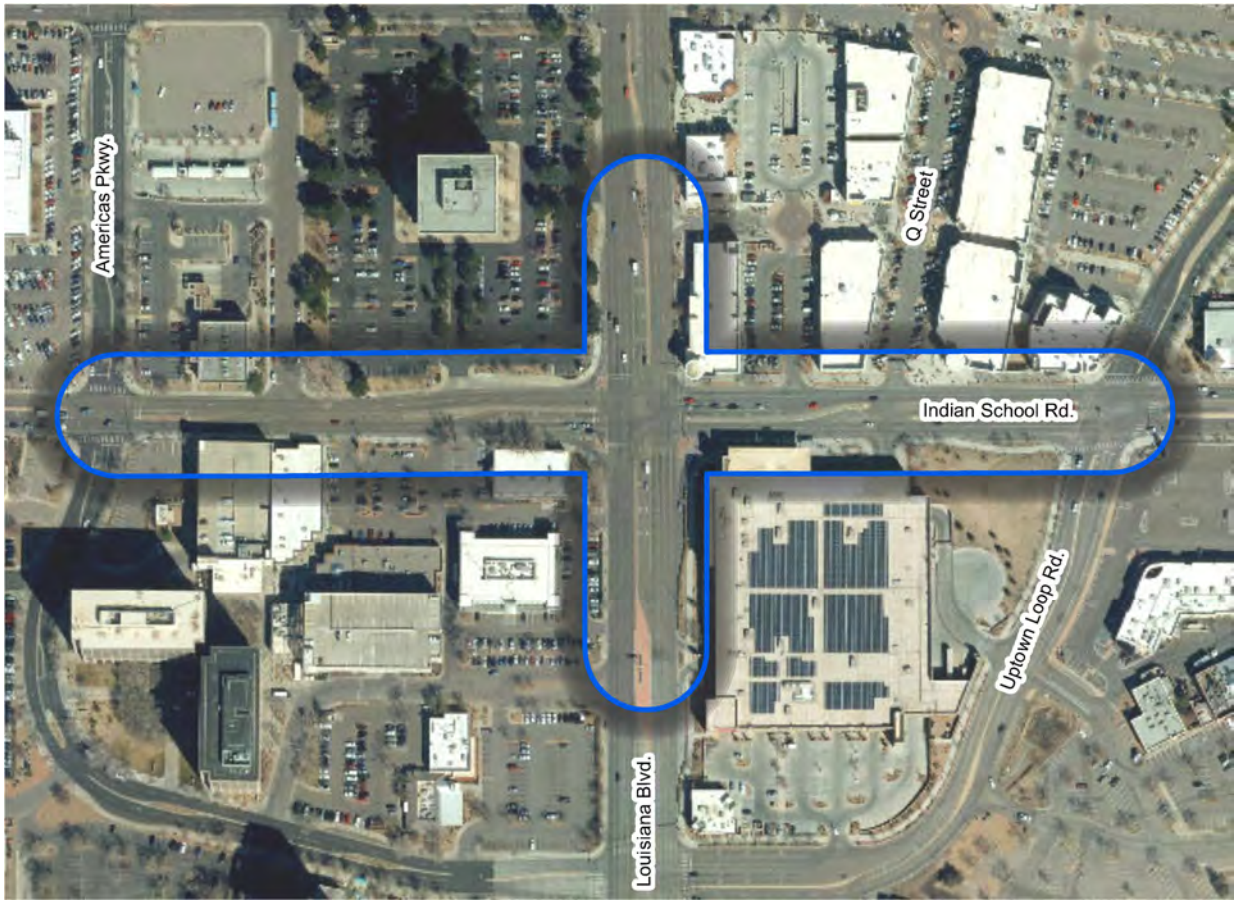
ACRONYMS AND ABBREVIATIONS

ADA	Americans with Disabilities Act
ART	Albuquerque Rapid Transit
CO	carbon monoxide
COA	City of Albuquerque
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
HCM6	Highway Capacity Manual, 6th Edition
HFIN	High Fatal and Injury Network
ITS	Intelligent Transportation Systems
LOS	level of service
mph	miles per hour
MRCOG	Mid-Region Council of Governments
MUTCD	Manual on Uniform Traffic Control Devices
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
ROW	right-of-way
SUE	subsurface utility engineering

1. PROJECT INTRODUCTION AND SETTING

This report focuses on the Uptown area on Indian School Road between Americas Parkway and Uptown Loop Road as shown in Figure 1-1. The area is identified as one of two Urban Center's in the *City of Albuquerque and Bernalillo County Comprehensive Plan* (City of Albuquerque and Bernalillo County 2017) and land use in the area is identified as mixed use and high intensity. The study area is home to the ABQ Uptown shopping area, Target, Park Square, City Place, and several restaurants and large commercial buildings.

Figure 1-1. Project Location



Source: Google 2022

The purpose of this Scoping and Alternatives Analysis Report is to evaluate alternatives to improve pedestrian access and safety along Indian School. This report builds upon the *Uptown Pedestrian Study* that was conducted in 2014 (Parametrix 2014). That study evaluated pedestrian and roadway conditions in the Uptown area and provided recommended improvements where previous City of Albuquerque Councilor Diana Gibson, District 7 had received citizen concerns about pedestrian safety including 1) pedestrian connections across Louisiana at Indian School; 2) the mid-block area on Indian School between Target and ABQ Uptown.

2. EXISTING CONDITIONS

2.1 Existing Roadway Conditions

2.1.1 Existing Roadway at Louisiana

Louisiana Boulevard is designated as a Community Principal Arterial by in the *Metropolitan Transportation Plan's Long Range System Guide* (Mid-Region Council of Governments [MRCOG] 2020b). It is also identified as a Major Transit Corridor in the *Albuquerque and Bernalillo County Comprehensive Plan* (City of Albuquerque and Bernalillo County 2017). Louisiana is a major arterial in the Albuquerque Uptown Urban Center that connects to I-40 about 0.25 miles from the study area. It carries an average of about 37,000 vehicles per day. The posted speed limit on Louisiana is 35 miles per hour (mph).

In the study area, Louisiana has four-through lanes in each direction with additional left and right turn lanes as shown in Figure 2-1. The intersection of Louisiana and Indian School has a four-way traffic signal with crosswalks on all four legs. The area includes sidewalks and landscaping. Driving lane widths vary from 10.5 to 11.5 feet and sidewalk widths at the intersection with Indian School are approximately 10 feet. There are no dedicated bike lanes on Louisiana, though a buffered bike lane is identified as a proposed future addition in the *Metropolitan Transportation Plan's Long Range System Guide* (MRCOG 2020b).

Figure 2-1. Existing Roadway at Louisiana

Source: Google 2022

2.1.2 Existing Roadway at Indian School

Indian School is designated as a Minor Arterial (MRCOG 2020b) that provides east-west access through the Uptown area, which includes shopping and commercial areas including ABQ Uptown and Target located east of Louisiana. It carries an average of about 9,900 vehicles per day west of Louisiana and 16,000 vehicles per day east of Louisiana. The posted speed limit is 35 mph. In the study area, Indian School has two through lanes in each direction and occasional right and left turn lanes as shown in Figure 2-2. Driving lanes range from 10.5 to 11.5 feet wide.

Figure 2-2. Existing Roadway at Indian School and Q Street

Source: Google 2022

Multimodal amenities on Indian School in the study area include a bicycle lane and, sidewalks on both sides of the roadway, crosswalks at major intersections (Americas Parkway, Louisiana, and Uptown Loop), landscaping, and lighting. Indian School east of Louisiana has two bus stops for Albuquerque Rapid Transit (ART) route 766. One bus stop is located on the south side of Indian School in front of Target and the other bus stop is located on the north side of Indian School, east of Q Street in front of The North Face store at ABQ Uptown.

2.2 Traffic Conditions

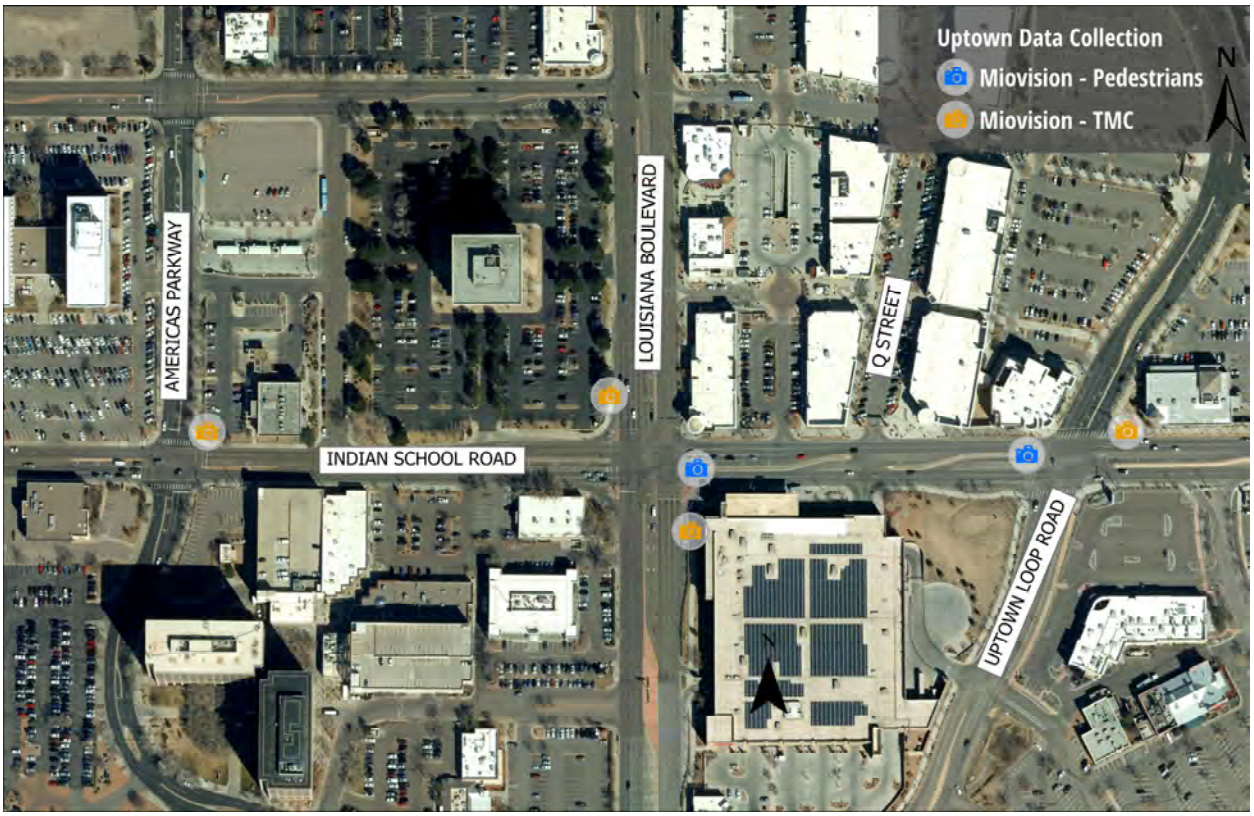
This section provides an existing conditions analysis of traffic capacity and operations of Indian School, bounded by the intersections of Louisiana and Uptown Loop for 2021 conditions.

2.2.1 Turning Movement Counts

Figure 2-1 shows the data collection locations at the intersections of Americas Parkway, Louisiana Boulevard, and Uptown Loop. Traffic data in the study area were collected via video cameras to determine vehicle turning movement counts and to analyze pedestrian activity as summarized below:

- Data were collected on Indian School at Louisiana and Uptown Loop on September 23, 24, and 25, 2021.
- Data were collected at Indian School and Americas Parkway on December 9. 2021.

Figure 2-3. Traffic Data Collection Locations



Louisiana Boulevard was used for the base peak hours for the study. The AM peak hour occurred at 7:30 AM and the PM peak hour occurred at 4:00 PM.

2.2.2 Growth Rates and Future Traffic Volumes

MRCOG provides a travel demand model with 2016 and 2040 peak hour traffic loads. Growth rates for the study area were calculated using the MRCOG model and can be found in Figure 2-4. The calculated growth rates were rounded to the nearest 0.25 percent. Note, the minimum growth rate per the City of Albuquerque's *Development Process Manual* is 0.50 percent (COA 2020).

Figure 2-4. Traffic Growth Rates

				MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Yearly Growth Rate	Growth Rate for Analysis
Indian School west of Americas Parkway	Eastbound	AM	PH	320	358	0.47%	0.50%
		PM	PH	620	785	0.99%	1.00%
	Westbound	AM	PH	494	575	0.63%	0.75%
		PM	PH	329	429	1.11%	1.25%
Indian School east of Americas Parkway	Eastbound	AM	PH	202	247	0.84%	1.00%
		PM	PH	368	471	1.03%	1.00%
	Westbound	AM	PH	250	291	0.63%	0.75%
		PM	PH	229	304	1.19%	1.25%

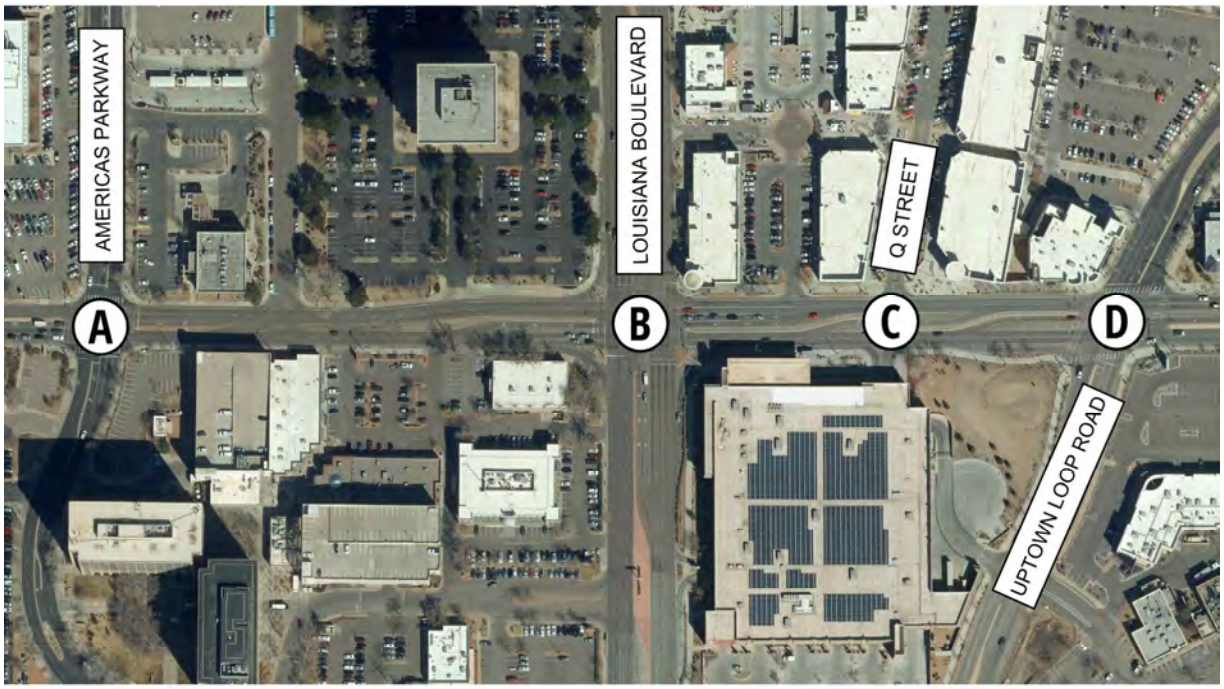
				MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Yearly Growth Rate	Growth Rate for Analysis
Indian School west of Indiana Street	Eastbound	AM	PH	202	247	0.84%	0.75%
		PM	PH	368	471	1.03%	1.00%
	Westbound	AM	PH	250	291	0.63%	0.75%
		PM	PH	229	304	1.19%	1.25%
Indian School east of Indiana Street	Eastbound	AM	PH	242	291	0.77%	0.75%
		PM	PH	516	646	0.94%	1.00%
	Westbound	AM	PH	395	459	0.63%	0.75%
		PM	PH	296	385	1.10%	1.00%
Indian School west of Louisiana	Eastbound	AM	PH	242	291	0.77%	0.75%
		PM	PH	516	646	0.94%	1.00%
	Westbound	AM	PH	395	459	0.63%	0.75%
		PM	PH	296	385	1.10%	1.00%
Indian School east of Louisiana	Eastbound	AM	PH	463	518	0.47%	0.50%
		PM	PH	661	759	0.58%	0.50%
	Westbound	AM	PH	627	751	0.75%	0.75%
		PM	PH	502	681	1.28%	1.25%
Indian School west of Q Street	Eastbound	AM	PH	463	518	0.47%	0.50%
		PM	PH	661	759	0.58%	0.50%
	Westbound	AM	PH	627	751	0.75%	0.75%
		PM	PH	502	681	1.28%	1.25%
Indian School east of Q Street	Eastbound	AM	PH	307	342	0.45%	0.50%
		PM	PH	609	708	0.63%	0.75%
	Westbound	AM	PH	581	696	0.76%	0.75%
		PM	PH	407	559	1.33%	1.25%
Indian School west of Uptown Loop	Eastbound	AM	PH	307	342	0.45%	0.50%
		PM	PH	609	708	0.63%	0.75%
	Westbound	AM	PH	581	696	0.76%	0.75%
		PM	PH	407	559	1.33%	1.25%
Indian School east Uptown Loop	Eastbound	AM	PH	787	836	0.25%	0.50%
		PM	PH	1362	1432	0.21%	0.50%
	Westbound	AM	PH	1345	1440	0.28%	0.50%
		PM	PH	1075	1133	0.22%	0.50%
Americas Parkway south of Indian School	Northbound	AM	PH	244	284	0.63%	0.75%
		PM	PH	101	126	0.93%	1.00%
	Southbound	AM	PH	118	111	-0.25%	0.50%
		PM	PH	253	315	0.92%	1.00%
	Northbound	AM	PH	2	2	0.00%	0.50%
		PM	PH	4	5	0.93%	1.00%

				MRCOG 2016 Model "Peak Hour Load"	MRCOG 2040 Model "Peak Hour Load"	Yearly Growth Rate	Growth Rate for Analysis
Americas Parkway north of Indian School	Southbound	AM	PH	2	3	1.70%	1.75%
		PM	PH	4	4	0.00%	0.50%
Louisiana south of Indian School	Northbound	AM	PH	1061	1198	0.51%	0.50%
		PM	PH	1338	1556	0.63%	0.75%
	Southbound	AM	PH	1395	1564	0.48%	0.50%
		PM	PH	1316	1354	0.12%	0.50%
Louisiana north of Indian School	Northbound	AM	PH	785	873	0.44%	0.50%
		PM	PH	1130	1343	0.72%	0.75%
	Southbound	AM	PH	1107	1173	0.24%	0.50%
		PM	PH	1046	958	-0.37%	0.50%
Q Street south of Indian School	Northbound	AM	PH	-	-	0.50%	0.50% *
		PM	PH	-	-	0.50%	0.50% *
	Southbound	AM	PH	-	-	0.50%	0.50% *
		PM	PH	-	-	0.50%	0.50% *
Q Street north of Indian School	Northbound	AM	PH	-	-	0.50%	0.50% *
		PM	PH	-	-	0.50%	0.50% *
	Southbound	AM	PH	-	-	0.50%	0.50% *
		PM	PH	-	-	0.50%	0.50% *
Uptown Loop south of Indian School	Northbound	AM	PH	660	745	0.51%	0.50%
		PM	PH	854	871	0.08%	0.50%
	Southbound	AM	PH	859	900	0.19%	0.50%
		PM	PH	860	842	-0.09%	0.50%
Uptown Loop north of Indian School	Northbound	AM	PH	281	349	0.91%	1.00%
		PM	PH	253	316	0.93%	1.00%
	Southbound	AM	PH	196	254	1.09%	1.00%
		PM	PH	342	438	1.04%	1.00%
*Indicates assumed growth rate							

2.2.3 Existing and Future Turning Movements

Based on turning movement counts and the anticipated growth rates, weekday peak hourly turning movement volumes for 2021 and 2040 are provided in Figure 2-5 and Figure 2-6. Raw data collection sheets for these turning movement volumes are included in Appendix A.

Figure 2-5. 2021 Weekday AM and PM Peak Hour Turning Movements



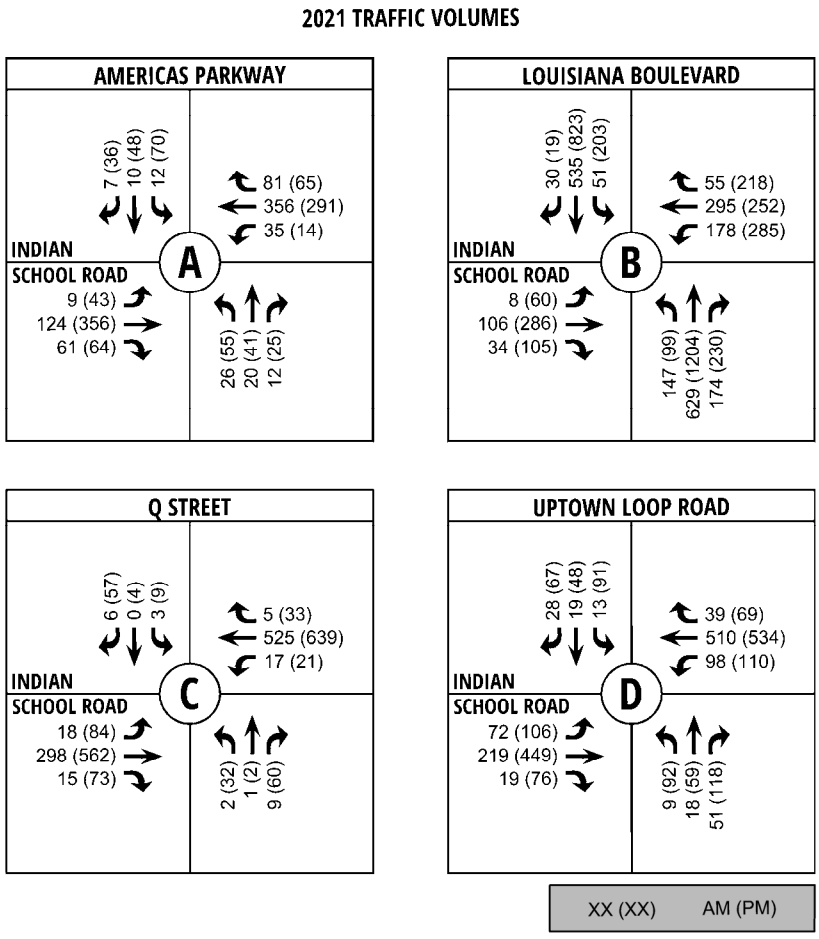
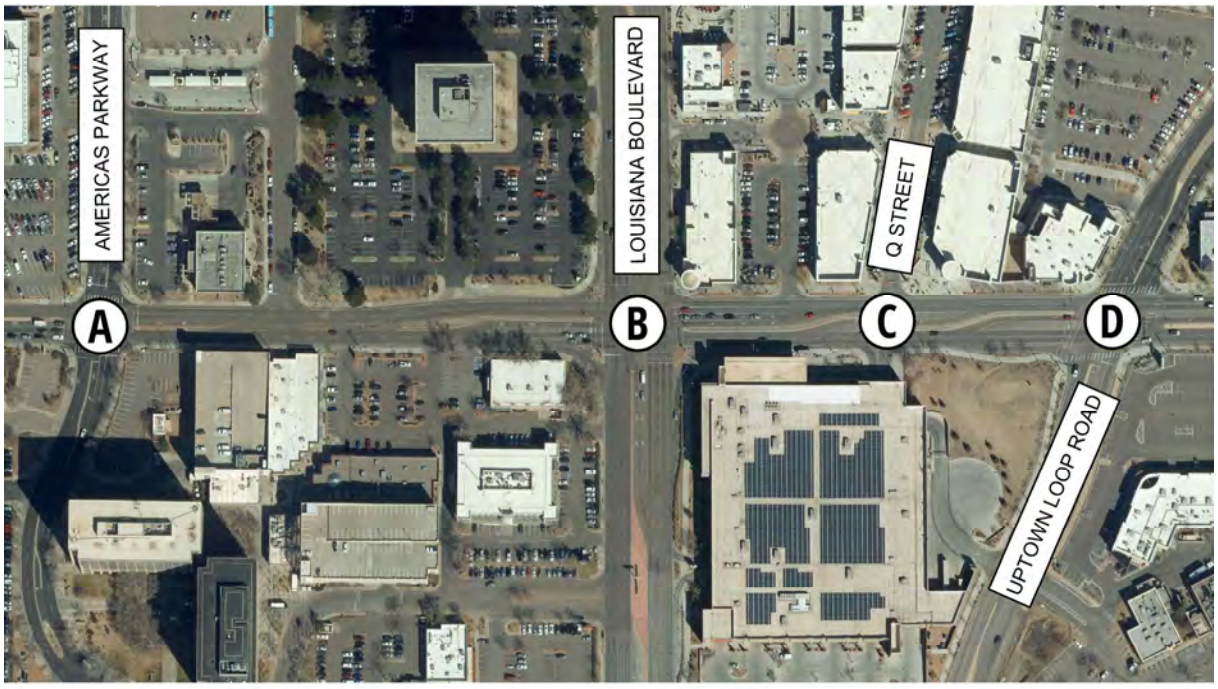
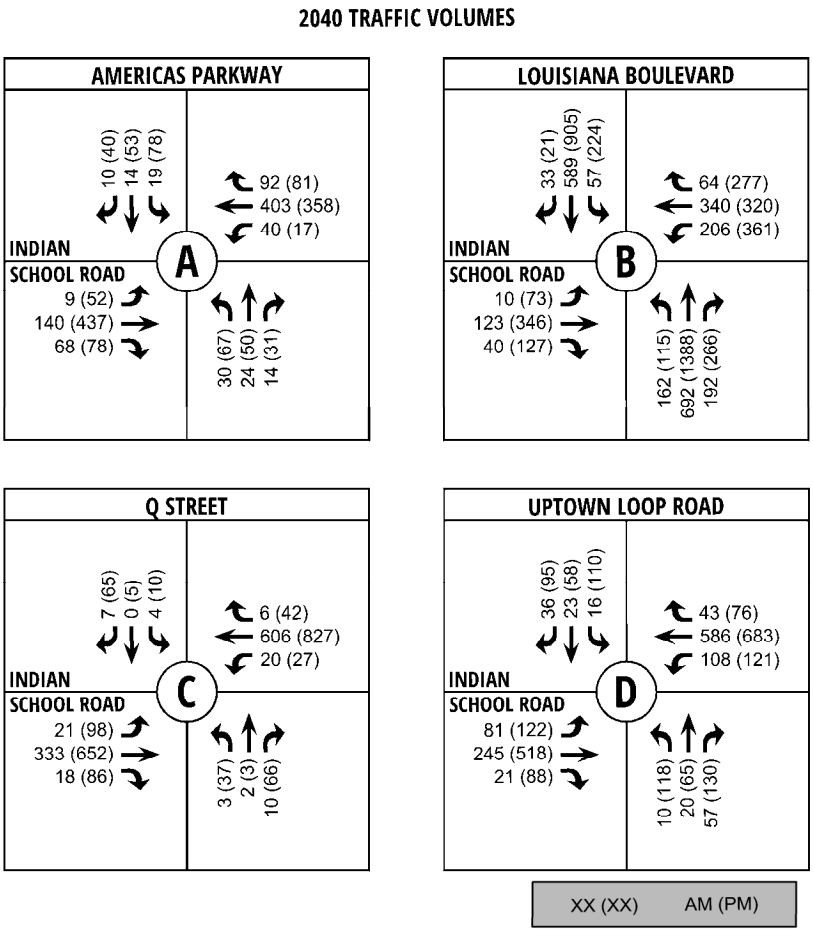


Figure 2-6. 2040 Weekday AM and PM Peak-Hour Turning Movements





2.2.4 Intersection Capacity, Level of Service, and Queuing

Intersection capacity and level of service (LOS) analyses were performed according to the methods and procedures provided in the Highway Capacity Manual, 6th Edition (HCM6). VISSIM software was used for the analysis of the existing conditions. Per the Highway Capacity Manual (HCM), 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. Figure 2-7, reproduced from the HCM, shows delay thresholds and the associated LOS assigned to delay ranges for signalized intersections. Generally, a LOS of an A to E is considered an acceptable level. For this study, failing movements are defined as those exhibiting a LOS F for an analysis period, which is consistent with the City of Albuquerque's *Development Process Manual* Table 7.2.28, which lists acceptable LOS for Major Transit Corridors at LOS E (applies to Louisiana) and Minor Arterials at LOS D to E in areas designated as Urban Centers (COA 2020)

Figure 2-7. LOS Criteria for Signalized Intersections

Level of Service	Average Control Delay (seconds/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, occasional cycle failures)
E	>55 – 80	Unstable flow (intolerable delay)
F	>80	Forced flow (jammed)

The two-way stop-controlled intersection is defined in terms of the average vehicle delay of an individual movement. Figure 2-8 shows the LOS criteria for unsignalized intersections.

Figure 2-8. LOS Criteria for Unsignalized Intersections

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

Traffic volumes for 2021 and 2040 were analyzed using VISSIM, a microsimulation software that models traffic operations and analyzes existing and alternative scenarios. The simulation provides a queue length, vehicle delay, and LOS for each intersection and turning movement.

Existing traffic operations have a stable flow. The intersections operate at an acceptable LOS in the AM and PM peak hours. However, the eastbound left-turn movement from Louisiana to Indian School in the AM and the northbound, southbound, and eastbound left-turn movements from Louisiana to Indian School in the PM exhibit a LOS E. Figure 2-9 provides the results gathered from the VISSIM analysis for 2021 existing traffic conditions.

Figure 2-9. 2021 Existing Traffic Conditions

	Existing AM			
	Movement	**Queue Length**	**Vehicle Delay**	**LOS**
Louisiana Boulevard	NBL	26.6	51.5	D
	NBT	34.4	27.8	C
	NBR	1.5	7.9	A
	SBL	12.1	53.1	D
	SBT	28.2	27.3	C
	SBR	0.0	7.5	A
	EBL	2.5	60.1	E
	EBT	8.1	20.3	C
	EBR	0.1	11.3	B
	WBL	29.1	47.2	D
	WBT	27.9	25.7	C
	WBR	27.9	25.2	C
			Intersection	**C**

Existing PM			
Movement	**Queue Length**	**Vehicle Delay**	**LOS**
NBL	20.9	61.9	E
NBT	52.5	25.6	C
NBR	4.4	10.8	B
SBL	53.7	59.8	E
SBT	26.5	18.3	B
SBR	0.0	5.5	A
EBL	18.6	57.6	E
EBT	40.0	41.1	D
EBR	4.6	23.7	C
WBL	46.3	49.0	D
WBT	66.0	33.8	C
WBR	66.0	35.8	D
		Intersection	C

Figure 2-9 Continued

Q Street

Existing AM			
Movement	**Queue Length**	**Vehicle Delay**	**Level of Service**
NBL	0.1	11.4	B
NBT	0.1	3.4	A
NBR	0.4	10.3	B
SBL	0.4	10.6	B
SBT	0.4	0.0	A
SBR	0.4	10.2	B
EBL	0.1	2.2	A
EBT	9.6	0.4	A
EBR	9.6	0.3	A
WBL	0.0	1.1	A
WBT	0.0	0.2	A
WBR	0.0	0.1	A
		Intersection	**A**

Existing PM			
Movement	**Queue Length**	**Vehicle Delay**	**Level of Service**
NBL	1.9	13.5	B
NBT	0.7	5.8	A
NBR	2.9	11.5	B
SBL	3.4	14.8	B
SBT	3.7	15.4	C
SBR	4.4	12.0	B
EBL	0.7	2.8	A
EBT	12.9	0.3	A
EBR	12.9	0.3	A
WBL	0.2	3.2	A
WBT	0.0	0.6	A
WBR	0.0	0.5	A
		Intersection	A

Uptown Loop Road

Existing AM			
Movement	**Queue Length**	**Vehicle Delay**	**Level of Service**
NBL	1.8	43.4	D
NBT	6.0	47.9	D
NBR	7.7	14.0	B
SBL	3.3	52.6	D
SBT	1.6	47.5	D
SBR	0.7	7.7	A
EBL	0.6	4.9	A
EBT	3.2	5.5	A
EBR	0.2	2.8	A
WBL	0.7	3.2	A
WBT	7.2	5.0	A
WBR	6.2	3.4	A
		Intersection	**A**

Existing PM			
Movement	**Queue Length**	**Vehicle Delay**	**Level of Service**
NBL	19.0	39.9	D
NBT	33.2	35.8	D
NBR	35.5	51.8	D
SBL	20.2	44.3	D
SBT	5.5	49.7	D
SBR	1.3	8.2	A
EBL	3.3	9.5	A
EBT	12.8	9.9	A
EBR	0.7	2.7	A
WBL	2.6	8.0	A
WBT	21.0	12.2	B
WBR	20.3	7.3	A
		Intersection	B

The following existing conditions observations are made from Figure 2-9:

2.2.4.1 Indian School at Louisiana

- The overall intersection is observed to operate at an acceptable LOS C in the 2021 AM and PM peak hours.
  - The eastbound left turn is observed to operate at a LOS E in the AM peak hour.
  - The northbound, southbound, and eastbound left turns are observed to operate at a LOS E in the PM peak hour.

2.2.4.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A in the 2021 AM and PM peak hours.

2.2.4.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A in the 2021 AM peak hour and a LOS B in the PM peak hour.

2.3 Traffic Safety and Crashes

A key component of the traffic analysis was safety for pedestrians crossing both Indian School and Louisiana. Pedestrian safety challenges at the intersection of Louisiana and Indian School include channelized right-turn pockets on the northwest, southwest, and southeast corners that can create sight distance issues for drivers and these turn pockets allow drivers to turn at higher speeds than a turn lane that requires drivers to make a 90 degree turn.

Traffic safety and crashes were evaluated on the most recent five years of data, from 2015 to 2019. Crashes were classified by several parameters including crashes by type, crashes by lighting conditions, crashes by severity, and crashes by top contributing factors. This section discusses the observations made from the analyses. Figure 2-10 shows the crash rates for the two intersections. Figure 2-11 and Figure 2-12 provide a summary of the crashes.

In addition to the information provided in this section, The City of Albuquerque's Vision Zero effort is working toward zero traffic fatalities and serious injuries by 2040 by prioritizing safety improvements at recurring crash locations. This is a data-driven effort informed by the High Fatal and Injury Network (HFIN), which analyzed five years of crash data (2014-2018) to identify the most dangerous corridors and intersections in Albuquerque. All four legs of the intersection at Louisiana and Indian School, and the intersection at Indian School and Uptown Loop are on the HFIN.

Figure 2-10. Crash Rates

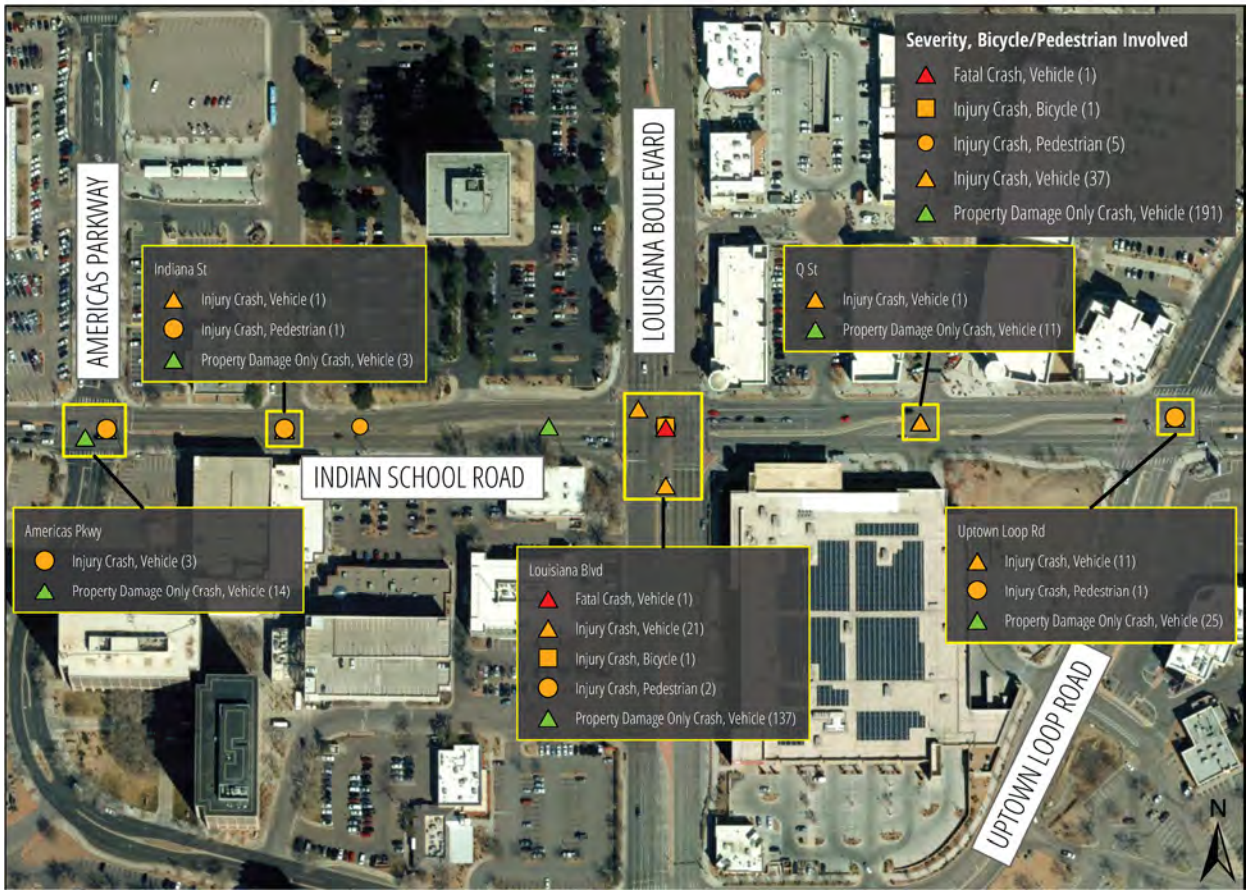
Intersection	Total Crashes	Crash Rate
Indian School and Louisiana	162	2.07
Indian School and Uptown Loop	37	1.08

Figure 2-11. Crash Summary

	Crash Summary	Indian School & Americas Parkway	Indian School & Louisiana	Indian School & between Americas Parkway & Louisiana	Indian School & Q St	Indian School & Uptown Loop
	Total Crashes:	**17**	**162**	**7**	**12**	**37**
By Year	2015	4	42	3	4	7
	2016	1	34	0	2	3
	2017	4	37	1	2	10
	2018	5	19	3	4	9
	2019	3	30	0	0	8
By Type	Fixed Object	0	5	0	0	3
	Invalid Code/Left Blank	2	45	1	2	6
	Other (Non-Collision)	1	0	0	0	0
	Other (Object)	0	2	0	0	0
	Other Vehicle - All Other	4	12	1	6	4
	Other Vehicle - All Others/Entering At Angle	0	1	0	0	2
	Other Vehicle - Both Going Straight/Entering At Angle	2	21	1	0	5
	Other Vehicle - Both Turning/Entering At Angle	0	3	0	0	1
	Other Vehicle - From Opposite Direction	4	29	2	1	6
	Other Vehicle - From Same Direction/All Others	4	37	0	1	9
	Overturn/Rollover	0	2	0	0	0
	Parked Vehicle	0	1	0	2	0
	Pedalcyclist	0	1	0	0	0
	Pedestrian	0	2	2	0	1
	Vehicle On Other Roadway	0	1	0	0	0
	% Other Vehicle - From Same Direction/All Others	24%	23%	0%	8%	24%
	% Other Vehicle - From Opposite Direction	24%	18%	29%	8%	16%
	% Other Vehicle - Both Going Straight/Entering At Angle	12%	13%	14%	0%	14%
By Lighting Conditions	Day	17	113	5	9	26
	Dawn/Dusk	0	3	0	0	1
	Dark	0	34	2	2	9
	Invalid Code/Not Specified	0	12	0	1	1
	% Day	100%	70%	71%	75%	70%
	% Dark	0%	21%	29%	17%	24%

	Crash Summary	Indian School & Americas Parkway	Indian School & Louisiana	Indian School & between Americas Parkway & Louisiana	Indian School & Q St	Indian School & Uptown Loop
By Severity	PDO	14	137	4	11	25
	Injury	3	24	3	1	12
	Fatality	0	1	0	0	0
	% PDO	82%	85%	57%	92%	68%
	% Injury	18%	15%	43%	8%	32%
	% Fatality	0%	1%	0%	0%	0%
By Contributing Factors	Alcohol/Drug Involved	0	6	2	0	2
	Avoid No Contact	0	2	0	0	2
	Disregarded Traffic Signal	3	6	0	0	2
	Driver Inattention	6	42	2	2	11
	Excessive Speed	1	10	0	0	0
	Failed to Yield Right of Way	2	22	1	6	6
	Following Too Closely	0	20	0	0	4
	Improper Backing	1	6	0	0	2
	Improper Lane Change	1	6	1	1	0
	Improper Overtaking	0	2	0	0	0
	Made Improper Turn	1	6	0	0	3
	Mechanical Defect	0	2	0	0	2
	None/Missing Data	2	22	1	3	3
	Other - No Driver Error	0	4	0	0	0
	Other Improper Driving	0	3	0	0	0
	Pedestrian Error	0	1	0	0	0
	Speed Too Fast for Conditions	0	2	0	0	0
	% Driver Inattention	35%	26%	29%	17%	30%
	% Failed to Yield Right of Way	12%	14%	14%	50%	16%
	% Following Too Closely	0%	12%	0%	0%	11%
	% Disregarded Traffic Signal	0%	12%	0%	0%	11%

Figure 2-12. Crash Map



2.3.1 Louisiana and Indian School

The following observations are made from Figure 2-10 through Figure 2-12:

- At the intersection of Indian School and Louisiana, 162 crashes were reported over the five years of crash data (2015 to 2019). This coincides with the greater number of vehicles that travel through the intersection.
- Of the 162 reported crashes, one resulted in a fatality (1 percent) while 24 crashes (15 percent) involved injuries. Of the 24 crashes with injuries, 2 were injury crashes involving pedestrians and 1 involved a bicyclist.
- The top 3 types of crashes were observed to be:
  - Other vehicle - from same direction/all others
  - Other vehicle - from opposite direction
  - Other vehicle - both going straight/entering at angle
- Crashes during daylight hours resulted in 70 percent of the crashes.
- Crashes during dark-lighted conditions resulted in 21 percent of crashes.

- The top 3 contributing factors were observed to be:
  - Driver inattention
  - Failed to yield right of way
  - Following too closely
- The total intersection crash rate at the intersection of Louisiana and Indian School is reported as 2.07 crashes per million entering vehicles. This is higher than the Albuquerque average intersection crash rate of 1.18 crashes per million entering vehicles. Comparable intersections in Albuquerque including Menaul Boulevard at San Pedro Drive; Candeleria Road at Juan Tabo Boulevard; and Comanche Road at Wyoming Boulevard report crash rates of 1.52, 1.62, and 1.60, respectively. These intersections exhibit similar traffic volumes to Louisiana at Indian School and have a lower crash rate.
- The MRCOG Roadway Safety and Crash Report (2015 through 2019) reports a severe crash rate of 0.31 crashes per million entering vehicles at Indian School Road and Louisiana Boulevard. This is below the Albuquerque area mean of 0.369.

2.3.2 Indian School at Q Street

The following observations are made from Figure 2-10 through Figure 2-12:

- At the intersection of Indian School and Q Street, 12 crashes were reported over the five years of crash data (2015 to 2019).
- Of the 12 reported crashes, no fatalities occurred although one crash (8 percent) involved injuries. None of the crashes involved pedestrians.
- The top 2 types of crashes were observed to be:
  - Other vehicle - all other
  - Parked vehicle
- Crashes during daylight hours resulted in 75 percent of the crashes.
- Crashes during dark-lighted conditions resulted in 17 percent of crashes.
- The top 2 contributing factors were observed to be:
  - Failed to yield right of way
  - Driver inattention
- The MRCOG Roadway Safety and Crash Report (2015 through 2019) does not report a severe crash rate for Indian School Road at Q Street. However, the HFIN reports a score that symbolizes the levels of fatal and injury crashers per mile. According to the MRCOG Roadway Safety and Crash Report, “The HFIN score is derived from summing the number of fatal and injury crashes on every link and then dividing that number by the length of the link in miles. The number of fatal crashes on each link is multiplied by 2 to give them greater significance than injury crashes.” The roadway segment between Louisiana Boulevard and Uptown Loop Road is given a score of 395.97. This rate is above twice the regional mean and its high value points to a

challenging area; however, caution should be used when rates are extrapolated from short segments.

2.3.3 Indian School at Uptown Loop

The following observations are made from Figure 2-10 through Figure 2-12:

- At the intersection of Indian School and Uptown Loop, 37 crashes were reported over the five years of crash data (2015 to 2019).
- Of the 37 reported crashes, no fatalities occurred although 12 crashes (32 percent) involved injuries. One of the crashes resulting in injury was a pedestrian crash.
- The top 3 types of crashes were observed to be:
  - Other vehicle - from same direction/all others
  - Other vehicle - from opposite direction
  - Other vehicle - both going straight/entering at angle
- Crashes during daylight hours resulted in 70 percent of the crashes.
- Crashes during dark-lighted conditions resulted in 24 percent of crashes.
- The top 3 contributing factors were observed to be:
  - Driver inattention
  - Failed to yield right of way
  - Following too closely or disregarded the traffic signal
- The MRCOG Roadway Safety and Crash Report (2015 through 2019) reports a severe crash rate of 0.35 crashes per million entering vehicles at Indian School Road and Uptown Loop. This is below the Albuquerque area mean of 0.369.
  - The total intersection crash rate is reported as 1.08 crashes per million entering vehicles. This is below the Albuquerque average intersection crash rate of 1.18 crashes per million entering vehicles. Comparing Lomas Boulevard and San Pedro Boulevard with our study intersection, the crash rate is below the crash rate of 1.96 crashes per million entering vehicle. Comanche Road at San Pedro Drive; Kathryn Avenue at San Mateo Boulevard; and Indian School Road at San Pedro Drive report crash rates of 1.21, 0.87, and 0.59, respectively. These intersections exhibit similar traffic volumes to the intersection of Indian School and Uptown Loop. The crash rate at Indian School and Uptown Loop is comparable to other similar intersections in Albuquerque.

2.4 Pedestrian Use and Observations

This section provides an overview of the observed pedestrian activity on Indian School, bounded by the intersections of Louisiana and Uptown Loop for 2021 traffic conditions. Observations were collected at the two signalized intersections at Indian School and Louisiana and Indian School and Uptown Loop using the turning movement counts. In between the two intersections, pedestrian observations were collected by viewing recorded video camera footage.

2.4.1 Pedestrians on Indian School and Louisiana and Indian School and Uptown Loop

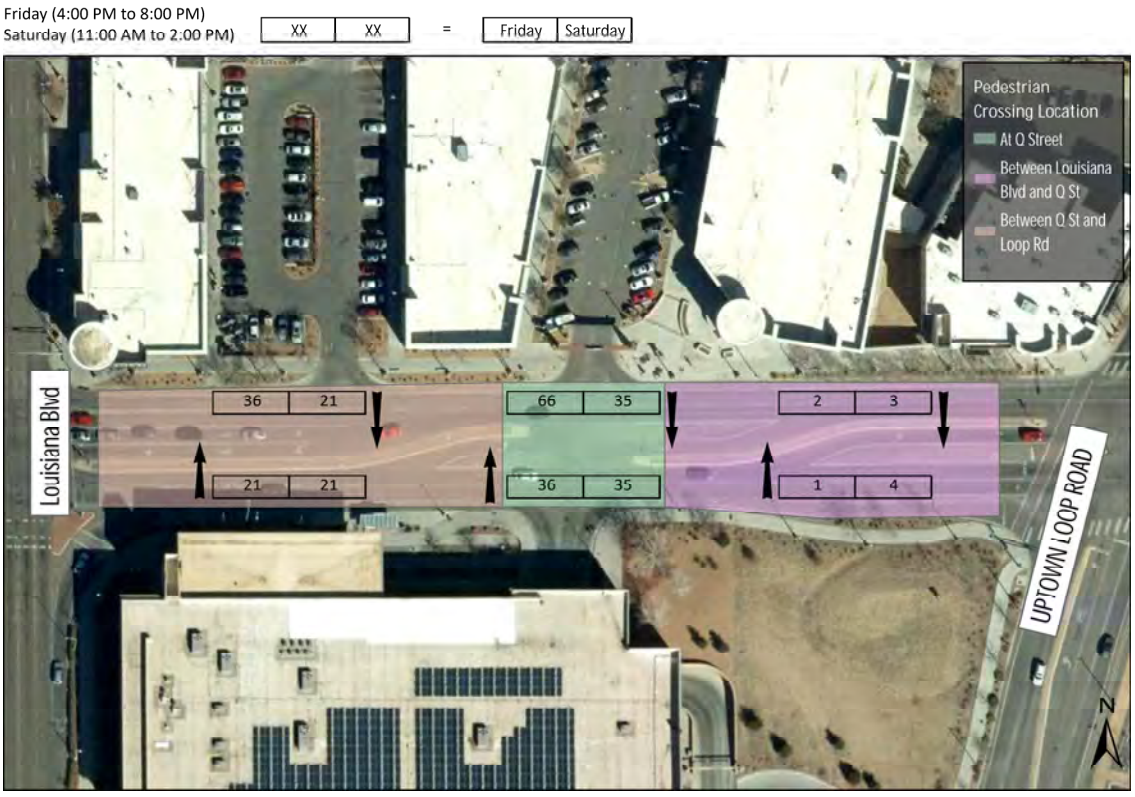
Pedestrian activity at the two existing signalized intersections was collected along with the turning movement count data. The following observations are made for the two intersections:

- At the intersection of Indian School and Louisiana, a total of 16 and 47 pedestrians were observed during the AM and PM peak hours, respectively.
- At the intersection of Indian School and Uptown Loop, a total of 3 and 18 pedestrians were observed during the AM and PM peak hours, respectively.
- Over the five-year time period that crashes were studied (2015 to 2019), there were 2 pedestrian/vehicle crashes and 1 bicycle/vehicle crash at Louisiana and Indian School that resulted in injury. At Indian school and Uptown Loop there was 1 crash with a pedestrian/vehicle that resulted in an injury.

2.4.2 Pedestrians on Indian School and Q Street

Video camera observations captured pedestrian traffic on Indian School between Louisiana and Uptown Loop. Video data were observed on Friday, September 24, 2021, from 4:00 PM to 8:00 PM, and Saturday, September 25, 2021, from 11:00 AM to 2:00 PM. Figure 2-13 summarizes the observed pedestrian activity.

Figure 2-13. Observed Pedestrians on Indian School between Louisiana and Uptown Loop



The following observations are made from Figure 2-13.

- Between Louisiana and Q Street, 57 and 42 pedestrians are crossing mid-block on Friday evening and Saturday, respectively.
- At Q Street, 102 and 70 pedestrians are crossing at the unmarked intersection on Friday and Saturday, respectively.
- Between Q Street and Uptown Loop, 3 and 7 pedestrians are crossing mid-block.

2.5 Intelligent Transportation Systems

Intelligent Transportation Systems (ITS) have the potential to improve safety and mobility efficiently. The existing ITS facilities include copper networks serving the greater Uptown area. Copper networks do not meet the current City standards and offer limited monitoring and operational capabilities.

The City of Albuquerque is currently constructing project A300759: ITS – Albuquerque Traffic Management Louisiana Improvements. This project will include replacing copper networks on Louisiana from Central Avenue to Menaul Avenue that do not meet current City standards with a fiber network. Other improvements include connecting ITS infrastructure and installing closed-circuit television cameras. These improvements are expected to be constructed in 2022.

2.6 Drainage

2.6.1 Drainage at Louisiana and Indian School

Louisiana north and south of Indian School slopes towards the Indian School/Louisiana intersection. Both Louisiana and Indian School are crowned at the median so runoff drains to the sides of these streets. At the intersection, drop inlets are located at all four intersection corners to intercept roadway runoff. The drop inlets drain to a large storm drain located under Indian School that conveys the runoff to the west.

2.6.2 Drainage on Indian School between Louisiana and Uptown Loop

Runoff on Indian School between Uptown Loop and Louisiana flows from east to west toward the curb drop inlets near the intersection at Louisiana and Indian School where they are conveyed to a large storm drain under Indian School. Runoff east of Uptown Loop drains to curb inlets located just east of Uptown Loop.

2.7 Utilities

Quality level B, C, and D subsurface utility engineering (SUE) was performed as part of this project. Quality Level D SUE entails records research, quality level C involves surveying above ground utility features, and quality level B involves field designation activities to determine the horizontal position of utilities. This study area is located in a highly developed urban setting, so there are many existing utilities, most of which reside within the roadway. Utilities in the study area include sanitary sewer, drinking water lines, gas lines, electric lines, fiber optic, and storm drains. Most of the utilities are located underground but have above ground features that could be impacted by proposed improvements.

Above ground utilities and utility features that may be impacted include:

- Strom drain manholes and drop inlets
- Sewer manholes
- Water valves
- Above ground light poles
- Overhead electric lines and poles
- Traffic equipment

2.8 Geotechnical Conditions

Appendix B contains the A Draft Preliminary Geotechnical Report that provides preliminary geotechnical information for the conceptual and preliminary design. This section summarizes key findings from that report.

Geotechnical conditions in the project study area appear suitable for the type of improvements that are being evaluated. Subsurface soils consist mostly of sand with varying amounts of clay, silt, and gravel with interbedded clay and silt layers to the full depth of exploration, which was about 26.5 feet below grade. Loose soils, shallow low bearing capability soils, and caving soil conditions will require attention as part of design and construction. Existing pavement in the study area consists of approximately 6 to 9 inches of asphalt concrete overlying 0 to 8 inches of base course.

2.9 Environmental Considerations

2.9.1 Land Use and Demographics

The area is identified as one of two Urban Centers in the *City of Albuquerque and Bernalillo County Comprehensive Plan* (City of Albuquerque and Bernalillo County 2017) and the area is home to the ABQ Uptown shopping area, Target, Park Square, City Place, and restaurants and large commercial buildings. Land use in the entire study area is identified as a mixed use, high-intensity zone, which allows large-scale destination retail and high-intensity commercial, residential, light industrial, and institutional uses as well as high-density residential uses (COA 2021a).

The study area is a retail and commercial area. There are no residences in the immediate study area, but residences are located just outside of the study area adjacent Americas Parkway and Uptown Loop. Demographic information within a one-mile radius of the study area is provided in Figure 2-14.

Figure 2-14. Study Area Demographics

Demographic Indicator	Study Area	New Mexico
Minority Population	55%	63%
Low-Income Population	35%	41%
Linguistically Isolated Population	6%	5%
Population with Less than a High School Education	4%	14%
Population under 5 years of age	2%	6%
Population over 64 years of age	21%	17%

Source: EPA 2022

2.9.2 Cultural Resources

Data were reviewed from the New Mexico Cultural Resources Information System on February 21, 2022. No archaeological sites or historic buildings were identified in the study area. Cultural resource surveys were conducted at the Target location in 2000 and near the intersection of Louisiana and Indian School in 2004. Archeological or historic resources are not anticipated within the study area.

2.9.3 Natural Resources

The study area is highly urbanized and is limited to areas that have been disturbed by the surrounding development. There are no waterbodies, streams, or critical or sensitive habitats for threatened and endangered species in the area. Vegetation is limited to landscaped areas and there is no native vegetation.

2.9.4 Hazardous Materials

On February 21, 2022, Parametrix conducted a review of the New Mexico Environment Department's OpenEnviroMap (https://gis.web.env.nm.gov/oem/?map=egis) to determine if hazardous materials were present within the study area. No properties containing hazardous materials were identified.

2.9.5 Air Quality

While the City has previously exceeded the National Ambient Air Quality Standard (NAAQS) for carbon monoxide (CO) and was a limited maintenance area for CO, it has not exceeded state or federal air quality standards since 1991. Additionally, since June 13, 2015, the Albuquerque metropolitan planning area has been in full attainment of the NAAQS. Pedestrian improvements in the study area are programmed in the 2023 Transportation Improvement Program, which has been approved by the MRCOG as conforming to all applicable NAAQS and state air quality requirements. As such, air quality is not anticipated to be a factor for any of the proposed alternatives or once the project is constructed.

3. ALTERNATIVES DEVELOPMENT AND EVALUATION

3.1 Purpose and Need

The purpose of the project is to improve pedestrian access and safety in the Uptown area at the intersection of Louisiana and Indian School and along Indian School between Louisiana and Uptown Loop. The project is needed to:

- Improve pedestrian safety and access – Two pedestrian crashes and a bicycle crash have occurred at the intersection of Louisiana and Indian School over a 5-year period from 2015 to 2019. The total intersection crash rate at the intersection of Louisiana and Indian School is reported as 2.05 crashes per million entering vehicles. This is higher than the Albuquerque average intersection crash rate of 1.18 crashes per million entering vehicles. The roadway segment between Louisiana and Uptown Loop exhibits two times the mean for the number of fatal and injury vehicle crashes over the roadways' segment length, which points to a challenging area for crashes. As a result, all four legs of the intersection at Louisiana and Indian School and the intersection of Indian School and Uptown Loop are on the HFIN. The area between Louisiana and Indian School has a high volume of pedestrian traffic that chooses to cross Indian School mid-block between Target and the restaurants and shops at ABQ Uptown, rather than walk several hundred feet out of their way to use pedestrian crossing signals located at Louisiana or Uptown Loop. In addition, there is a mid-block ART bus stop and bus shelter for route 766 located on the south side of Indian School in front of the Target and another bus stop located on the north side of Indian School at ABQ Uptown.
- Upgrade existing pedestrian facilities to meet current Americans with Disabilities Act (ADA) design requirements for curb ramps and other features.
- Updating the ITS system on Indian School to replace outdated copper networks that do not meet current City standards with a fiber network, installing closed-circuit television cameras to monitor signal operations, and connect ITS infrastructure on Louisiana and Indian School.

3.2 Project Area Planning and Land Use

Pedestrian safety, pedestrian-oriented development, and encouraging multimodal access have been well established goals for the Uptown area in multiple regional and local planning documents for over a decade. The area is identified as one of two mixed use, high-intensity Urban Center's in the City of Albuquerque as part of the *Comprehensive Plan* (City of Albuquerque and Bernalillo County 2017). The land use designation allows large-scale destination retail and high-intensity commercial, residential, light industrial, and institutional uses as well as high-density residential uses (COA 2021a). As described in the *Comprehensive Plan*, Urban Centers are distinct, walkable districts that have a mix of employment, service, and residential uses at a density and intensity lower than Downtown, but higher than other areas.

Pedestrian and transit-oriented development and amenities are high priorities in Uptown with a focus on encouraging walking, biking, and transit use through the development of streets using Complete Streets techniques. The intent of Complete Streets is to make medium and high traffic areas more

inclusive of all forms of urban transportation, reduce congestion, and make streets safer. Complete Streets put safety over speed; balance the needs of different modes; and support local land uses, economies, cultures, and natural environments. This approach incorporates best practice design standards that have been successfully employed in other cities around the country, including but not limited to traffic calming techniques, wider sidewalks, protected mid-block crossings, bulb-outs or sidewalk extensions, street trees, on-street parking, lighting improvements. The City's Complete Streets Ordinance, updated in 2019, requires that the City consider Complete Streets techniques for most road projects and implementation is a key element of the *Albuquerque's Vision Zero Action Plan* (COA 2021b and 2022a). Vision Zero is the City's commitment to work toward the goal of zero traffic deaths by 2040 and to create safer streets for all, regardless of our age or ability, whether we are walking, riding a bicycle, using a mobility device, driving, or taking transit.

Improving walkability and pedestrian safety in the Uptown area is consistent with the following local and regional planning documents:

- *Albuquerque's Vision Zero Action Plan* (COA 2021b)
- *City of Albuquerque Bicycle and Trail Crossings Guide* (COA 2022b)
- City of Albuquerque's *Development Process Manual* (COA 2020)
- City of Albuquerque's *Integrated Development Ordinance* (COA 2021a).
- *City of Albuquerque and Bernalillo County Comprehensive Plan* (March 2017).
- *Connections 2040*, Metropolitan Transportation Plan (MRCOG 2020a).
- *Long Range Transportation System Guide* (MRCOG 2020).

Goals specific to pedestrian and vehicle mobility in the Uptown area were identified in the City of Albuquerque's *Uptown Sector Development Plan* that was adopted on January 15, 2009, amended through December 2013, and repealed in 2017 (COA 2013). This plan was repealed in 2017, but the concepts and goals were incorporated in the 2017 *City of Albuquerque and Bernalillo County Comprehensive Plan* and the City of Albuquerque's *Integrated Development Ordinance.*

Specific goals from the Sector Plan that still apply include:

- Facilitating pedestrian safety by allowing more mid-block signalized crossings of major streets and providing, wherever possible, areas of "safe haven" for pedestrians to use while crossing the streets in the Uptown area.
- Encouraging pedestrians to walk between sites in the Uptown area by requiring new construction and/or redevelopment to provide 10-foot-wide walkways with enhanced landscaping and trees and providing signalized street crossings with raised or colored walkways and alternative ways for pedestrians to cross the wide boulevards in the Uptown area.

These planning documents and goals were considered when developing and evaluating alternatives in this report. In addition, *City of Albuquerque Bicycle and Trail Crossings Guide* (COA 2022b) was used as a guide to help identify and evaluate possible alternatives in the study area. The City's commitment to this guidance is provided in Appendix D, Bicycle and Trail Crossings Guide Memo. The *City of Albuquerque Bicycle and Trail Crossings Guide* provides a three-step decision-making tool to help 1) determine if a site is a desired location for a crossing; 2) determine if a crossing is technical feasible at a selected location;

and 3) determine appropriate treatments and designs. Based on the site selection process in the *City of Albuquerque Bicycle and Trail Crossings Guide,* the intersection of Indian School and Q Street qualifies as a high-priority location for a crossing based on land use, crash and safety factors, proximity to other crossing locations and transit, and the presence of pedestrian generators. Furthermore, a pedestrian crossing was determined to be feasible based on proximity to cross-streets and sight distance.

3.3 Alternatives Development

Alternatives were developed by considering options from the 2014 *Uptown Pedestrian Study* (Parametrix 2014), roadway treatments identified for pedestrian crossings from the City's *Development Process Manual*, guidance provided in the *City of Albuquerque Bicycle and Trail Crossings Guide* (COA 2022b) and suggestions from the public to consider a roundabout at the intersection of Indian School and Q Street. Proposed pedestrian improvements focus on the following two areas:

- Modifications at the Louisiana/Indian School intersection
- Providing a mid-block crossing at Indian School and Q Street

In addition to proposed pedestrian improvements, this project proposes to update the ITS system on Indian School to replace outdated copper networks that do not meet current City standards with a fiber network, install closed-circuit television cameras to monitor signal operations, and connect ITS infrastructure on Louisiana and Indian School.

3.3.1 Modifications at Louisiana and Indian School

The intersection of Louisiana and Indian School has "pork chop" islands - channelized right turn lanes that allow traffic to make higher-speed right turns - at all but the northeast corner. Right turns at pork chop islands are considered to be not as "friendly" to pedestrians as right turns made from lanes where traffic must first approach the cross street and stop perpendicularly. Also, corners with pork chop islands do not provide as much area for pedestrians at corners without them. Recommended improvements from the *Uptown Pedestrian Study* included removing the pork chop islands and exclusive right-turn lanes from the northwest, southwest, and southeast corners of the intersection and replacing them with a larger sidewalk and curb ramps that meet ADA requirements. These proposed recommendations were used to the develop the Louisiana Islands Removals Alternative that is described evaluated in this report.

3.3.2 Providing a Mid-Block Crossing at Indian School and Q Street

Suggestions have been made to consider a roundabout at this location, other possible solutions that would improve pedestrian safety and access include:

- Signalizing the intersection at Indian School and Q street
- Providing a mid-block pedestrian crossing using a pedestrian hybrid beacon (also known as a HAWK signal)
- Providing a mid-block crossing using a pedestrian flashing beacon

The recommendation from the *Uptown Pedestrian Study* was to provide pedestrian refuge by constructing raised medians at the intersection of Indian School and Q Street. Raised medians at this

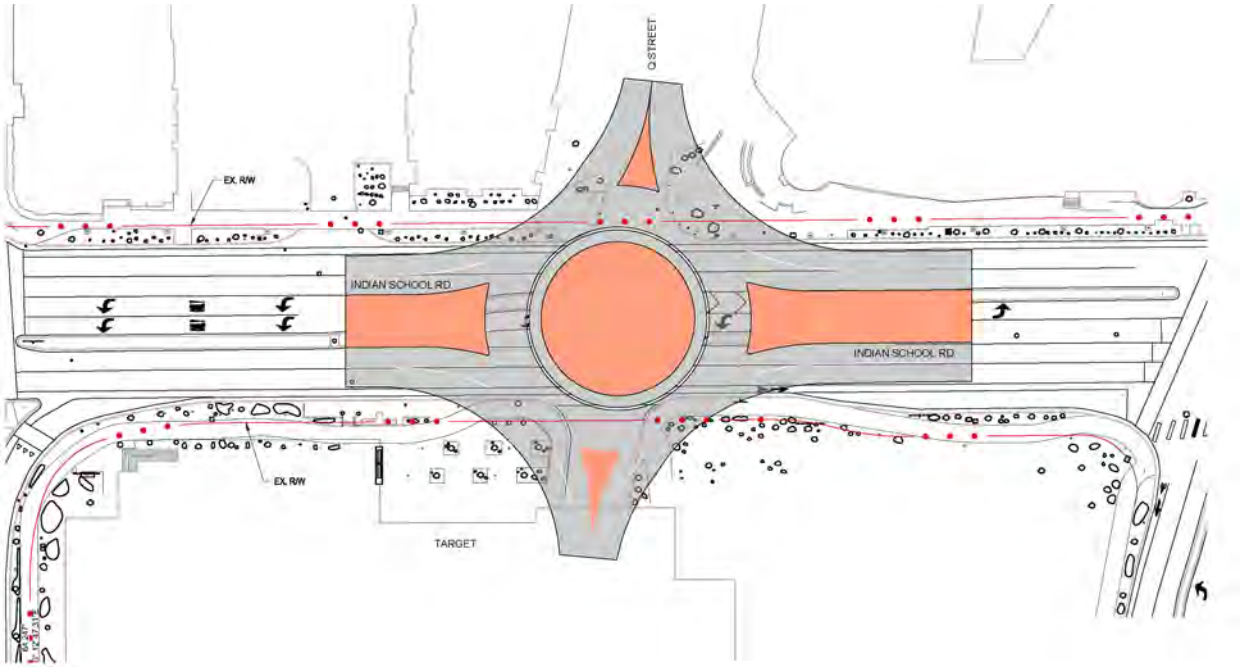
location would eliminate left-turns and through movements across Indian School for drivers coming out of the Target parking garage and ABQ Uptown. These proposed improvements were not supported by community stakeholders, so this concept was not considered. All concepts evaluated in this report would maintain current vehicle access into and out of the Target parking garage and ABQ Uptown, including left, right, and through movements.

The following concepts were considered at Indian School and Q Street:

- Roundabout at Indian School and Q Street
  - Includes a one-lane and two-lane concept
- Traffic Signal at Indian School and Q Street
- Pedestrian Hybrid Beacon (HAWK signal) at Indian School and Q Street
- Pedestrian Flashing Beacon at Indian School and Q Street

Conceptual designs were developed for the proposed concepts. The concept of a two-lane roundabout was initially considered since a two-lane roundabout would better accommodate the existing four-lane roadway configuration on Indian School. However, as shown in Figure 3-1, a two-lane roundabout in this area would have substantial effects to existing properties at ABQ Uptown and Target.

Figure 3-1. Two-Lane Roundabout at Indian School and Q Street



Red lines indicate the existing roadway right-of-way.

A total of about 0.25 acres of property would be needed from the ABQ Uptown development and Target property to build a two-lane roundabout. Impacts would include removing several parking spaces at ABQ Uptown; the ABQ Uptown sign bridge would need to be removed, rebuilt, or relocated; and the roundabout would extend well into the Target parking garage. Because there are other options available that could meet the project need with fewer impacts, this concept was dropped and not evaluated further.

ABQ Uptown entry, parking, and sidewalks would be impacted by a two-lane roundabout (photo Google 2022)

3.4 Alternatives Evaluated

The following text provides a description of the alternatives analyzed and evaluated. The build alternatives evaluated include:

- Louisiana Island Removals
- One-Lane Roundabout at Indian School and Q Street
- Traffic Signal at Indian School and Q Street
- Pedestrian Hybrid Beacon (HAWK) at Indian School and Q Street
- Pedestrian Flashing Beacon at Indian School and Q Street

In addition to the build alternatives listed above a No Build Alternative was considered for purposes of comparing traffic effects of the build alternatives to the existing condition.

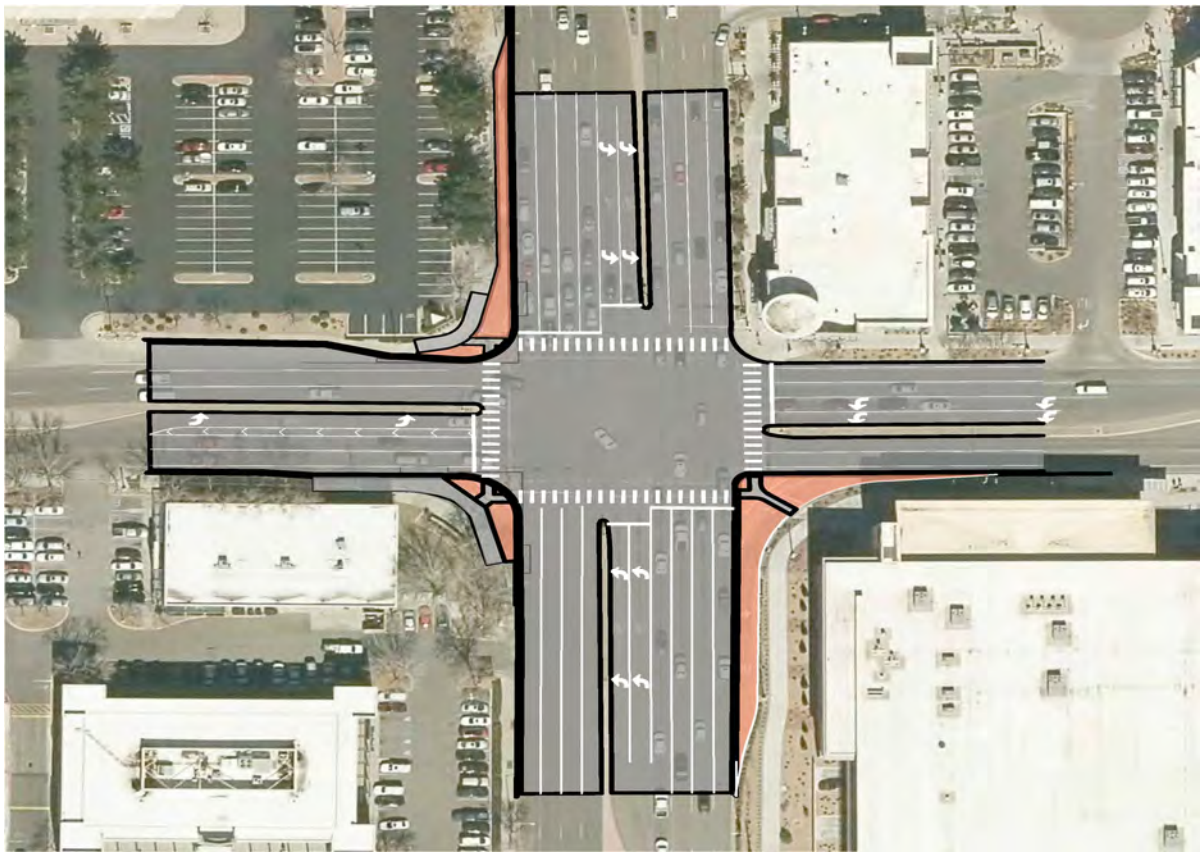
3.4.1 No Build

The No Build Alternative would maintain existing conditions as they are today and no improvements would be made. This alternative would not meet the project need to improving pedestrian access and safety in the Uptown area.

3.4.2 Louisiana Island Removals

This alternative would remove the “pork chop” islands, or the exclusive right turn lanes that allow vehicles to make higher-speed right turns at the northwest, southwest, and southeast corners of the intersection of Louisiana and Indian School as shown in Figure 3-2. Right-turning traffic would share the outside lane with through traffic. With this alternative, exclusive right-turn lanes would be removed and replaced with expanded sidewalks to provide additional space for pedestrians. Curb ramps would be constructed to meet current ADA requirements and would be built directional to the crossing.

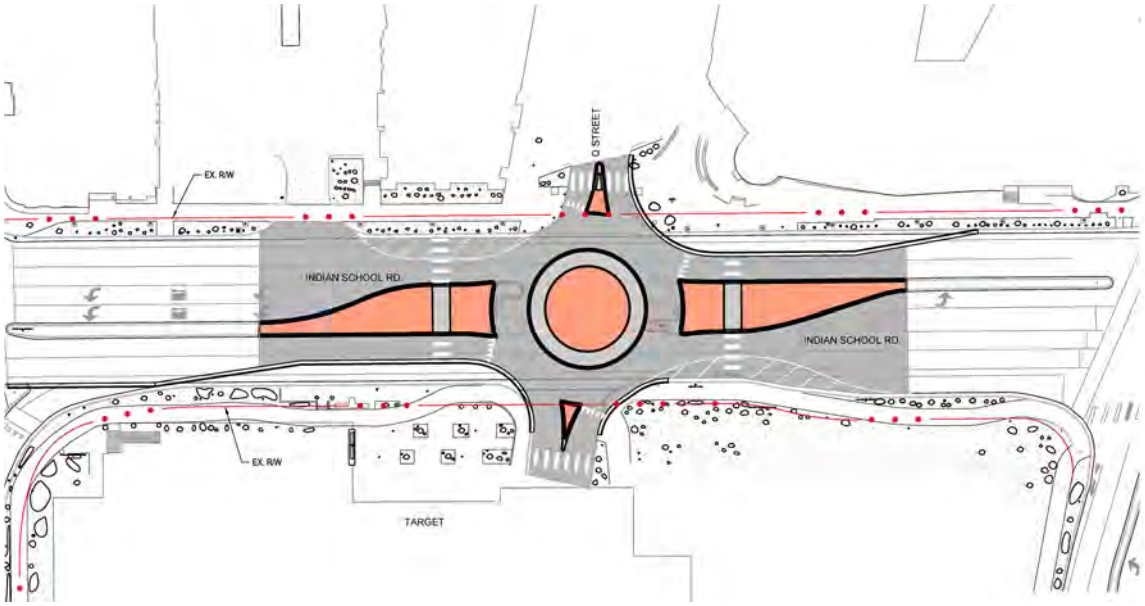
Figure 3-2. Louisiana Island Removals



3.4.3 One-Lane Roundabout at Indian School and Q Street

This alternative would construct a one-lane roundabout at Indian School and Q Street as shown in Figure 3-3. The roundabout would include crosswalks at all four intersections of Indian School and Q Street and would also include the island removals and sidewalk improvements at Louisiana. Indian School currently has two lanes in each direction with turning lanes. This alternative would require narrowing Indian School to one lane in each direction near the intersection with Q Street so traffic could proceed through the one-lane roundabout.

Figure 3-3. One-Lane Roundabout at Indian School and Q Street

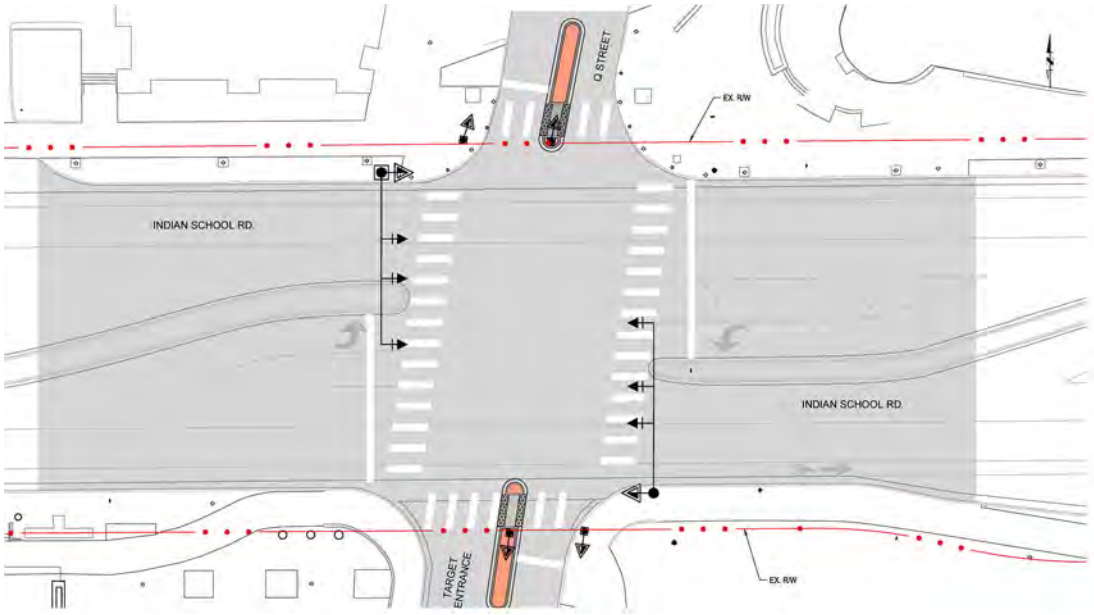


Red lines indicate the existing roadway right-of-way.

3.4.4 Traffic Signal at Indian School and Q Street

This alternative would add a traffic signal with pedestrian crossings at all four intersections of Indian School and Q Street as shown in Figure 3-4. This alternative would also include the island removals and sidewalk improvements at Louisiana.

Figure 3-4. Traffic Signal at Indian School and Q Street



Red lines indicate the existing roadway right-of-way.

3.4.5 Pedestrian Hybrid Beacon (HAWK signal) at Indian School and Q Street

This alternative would add a pedestrian hybrid beacon (also called a HAWK signal) providing a mid-block crossing of Indian School near Q Street. This alternative would also include the island removals and sidewalk improvements at Louisiana.

Pedestrian Hybrid Beacon (HAWK signal)

A pedestrian hybrid beacon is a traffic control device that activates when a pedestrian pushes the pedestrian push button. The call activates the beacon which then initiates a yellow to red lighting sequence. The flashing beacon acts as a signal with red lights, requiring vehicles to come to a complete stop. This provides the right-of-way to pedestrians, providing them with a protected mid-block roadway crossing. A major advantage of the pedestrian hybrid beacons is they can be coordinated with other traffic signals, such as the existing signals located at Indian School and Louisiana and Uptown Loop. This can decrease vehicle delay and queueing. Figure 3-5 was created by the Massachusetts Department of Transportation and provides an overview of the operations of a pedestrian hybrid beacon.

Figure 3-5. Pedestrian Hybrid Beacon Guide

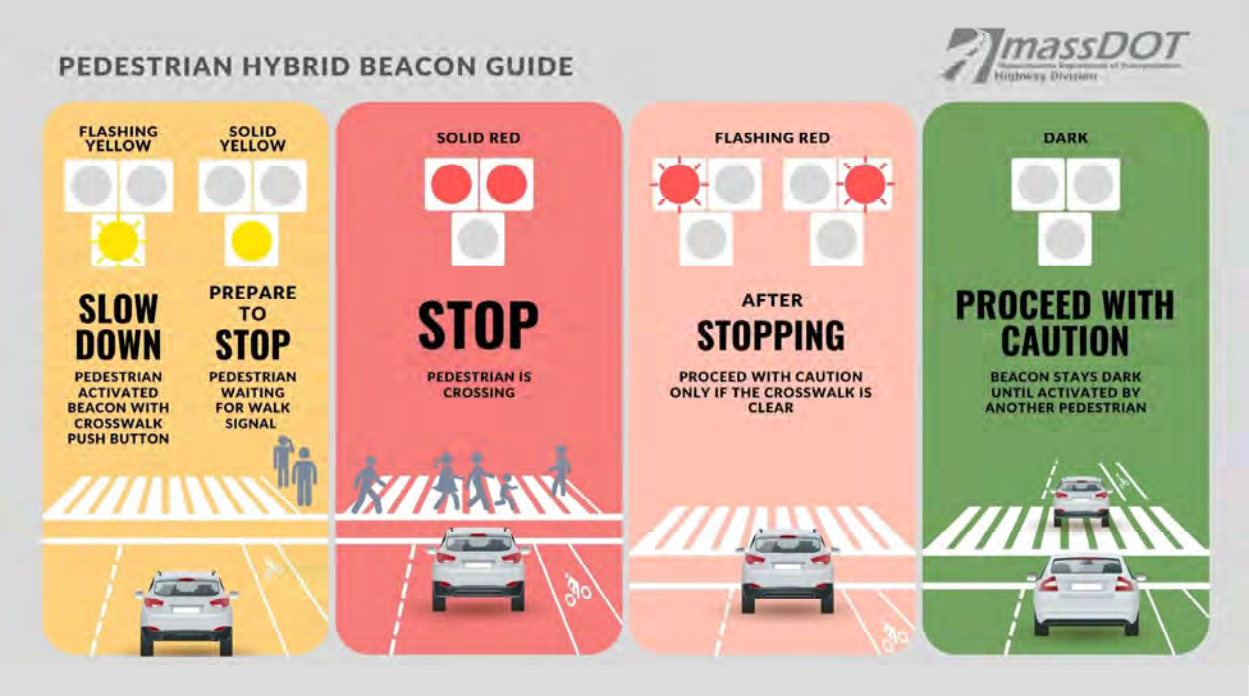
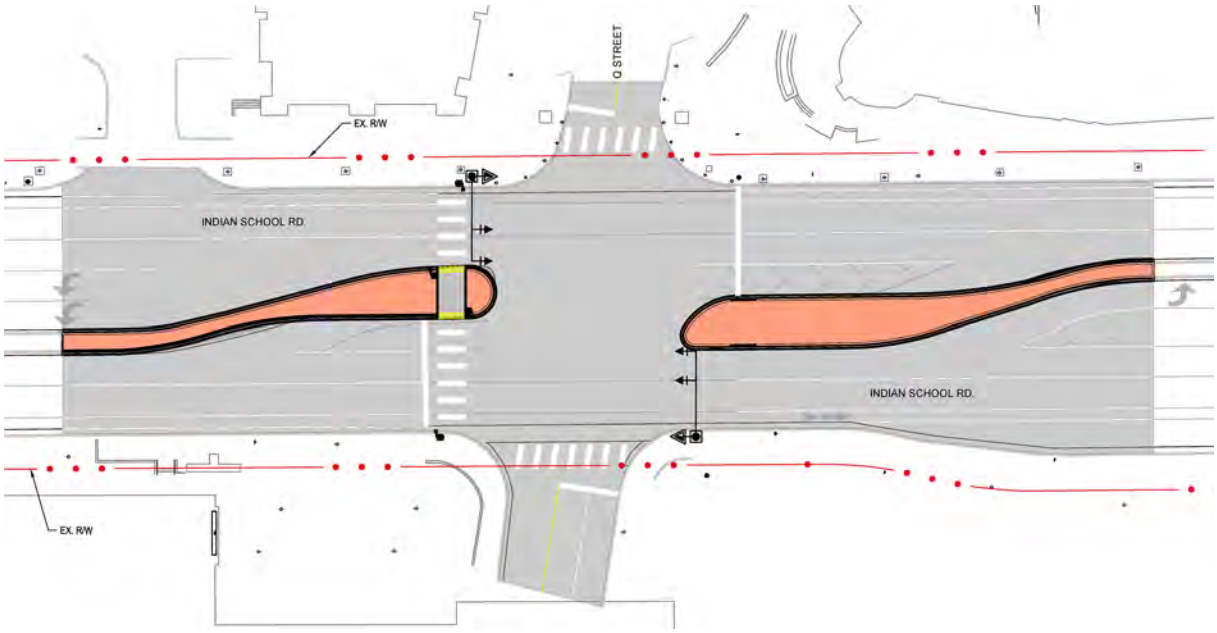


Figure created by the Massachusetts Department of Transportation

Figure 3-6 shows the conceptual layout for the pedestrian hybrid beacon, which would be located across Indian School just west of the intersection with Q Street. With this alternative, median treatments such as the sloping concrete shown in the adjacent photo could be constructed to encourage pedestrians to cross at the pedestrian hybrid beacon and discourage pedestrians from crossing Indian School mid-block just east of Q Street and the Target entrance or further west toward Louisiana.

Median Treatment to Discourage Pedestrian Use

Figure 3-6. Pedestrian Hybrid Beacon at Indian School and Q Street



Red lines indicate the existing roadway right-of-way.

3.4.6 Pedestrian Flashing Beacon at Indian School and Q Street

This layout of this alternative would be similar to the pedestrian hybrid beacon shown in Figure 3-6, only it would construct a pedestrian flashing beacon at Indian School, just west of the intersection with Q Street. A pedestrian flashing beacon is a smaller, yellow flashing signal that indicates that drivers should yield to pedestrians in the crosswalk. This alternative would also include the island removals and sidewalk improvements at Louisiana.

Similar to the pedestrian hybrid beacon, median treatments could be constructed to encourage pedestrians to cross at the pedestrian hybrid beacon and discourage pedestrians from crossing Indian School mid-block just east of Q Street and the Target entrance or further west toward Louisiana.

Pedestrian Flashing Beacon

3.5 Traffic Operations Analysis

A detailed traffic operations analysis using VISSIM was conducted to understand and compare potential traffic impacts of the proposed alternatives in the 2040 design year. Note that for the traffic analysis for all alternatives other than the No Build, it was assumed that the right-turn lanes on the northwest, southwest, and southeast corners of Louisiana and Indian School would be removed for any of the alternatives evaluated at the intersection of Indian School and Q street. Figure 3-7 and Figure 3-8 provide a detailed summary of the VISSIM analysis for the 2040 AM and PM peak hours.

Figure 3-7. 2040 AM Traffic Results

Louisiana Boulevard

No Build			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.2	52.1	D
NBT	35.7	27.9	C
NBR	1.5	7.8	A
SBL	13.8	52.8	D
SBT	30.3	27.5	C
SBR	0.1	8.6	A
EBL	2.8	64.7	E
EBT	9.9	23.0	C
EBR	0.2	11.7	B
WBL	32.6	46.7	D
WBT	35.0	27.6	C
WBR	35.0	28.5	C
		Intersection	**C**

Louisiana Island Removals			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.4	53.8	D
NBT	66.7	28.7	C
NBR	66.7	33.3	C
SBL	13.8	52.6	D
SBT	32.9	27.7	C
SBR	32.9	32.7	C
EBL	2.9	65.8	E
EBT	12.2	21.9	C
EBR	12.2	20.6	C
WBL	31.9	45.9	D
WBT	35.3	27.8	C
WBR	35.3	29.0	C
		Intersection	**C**

One-Lane Roundabout			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.4	52.4	D
NBT	59.3	28.6	C
NBR	59.3	32.5	C
SBL	11.9	51.5	D
SBT	33.3	28.1	C
SBR	33.3	33.0	C
EBL	2.7	62.3	E
EBT	14.5	22.9	C
EBR	14.5	22.0	C
WBL	0.0	52.3	D
WBT	0.0	17.5	B
WBR	0.0	17.9	B
		Intersection	**C**

Traffic Signal			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.3	52.1	D
NBT	59.5	28.7	C
NBR	59.5	32.7	C
SBL	13.7	52.4	D
SBT	32.5	27.7	C
SBR	32.5	32.9	C
EBL	3.1	69.0	E
EBT	12.5	22.1	C
EBR	12.5	22.0	C
WBL	32.8	47.2	D
WBT	29.8	23.3	C
WBR	29.8	24.9	C
		Intersection	**C**

Pedestrian Hybrid Beacon			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.4	53.8	D
NBT	67.6	28.8	C
NBR	67.6	35.2	D
SBL	13.6	52.2	D
SBT	32.5	27.6	C
SBR	32.5	33.4	C
EBL	2.9	65.8	E
EBT	13.2	23.5	C
EBR	13.2	25.0	C
WBL	31.9	46.4	D
WBT	34.3	26.9	C
WBR	34.3	27.5	C
		Intersection	**C**

Pedestrian Flashing Beacon			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	28.4	53.7	D
NBT	67.6	28.8	C
NBR	67.6	35.2	D
SBL	13.6	52.2	D
SBT	32.5	27.6	C
SBR	32.5	33.4	C
EBL	3.0	68.4	E
EBT	13.0	23.8	C
EBR	13.0	24.8	C
WBL	32.0	46.0	D
WBT	35.3	27.4	C
WBR	35.3	28.6	C
		Intersection	**C**

Q Street

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.2	11.9	B
NBT	0.1	4.3	A
NBR	0.4	10.5	B
SBL	0.5	11.2	B
SBT	0.5	0.0	A
SBR	0.6	10.7	B
EBL	0.1	1.9	A
EBT	10.0	0.4	A
EBR	10.0	0.3	A
WBL	0.0	1.1	A
WBT	0.0	0.3	A
WBR	0.0	0.2	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.0	9.4	A
NBT	0.0	1.7	A
NBR	0.5	10.6	B
SBL	0.4	9.3	A
SBT	0.0	0.0	A
SBR	0.4	10.0	A
EBL	0.0	1.8	A
EBT	0.6	0.3	A
EBR	0.6	0.2	A
WBL	0.0	0.9	A
WBT	0.0	0.3	A
WBR	0.0	0.2	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.0	1.6	A
NBT	0.0	1.9	A
NBR	0.0	2.6	A
SBL	0.0	1.5	A
SBT	0.0	0.0	A
SBR	0.0	1.5	A
EBL	6.2	6.8	A
EBT	6.2	6.3	A
EBR	6.2	7.1	A
WBL	96.8	22.8	C
WBT	96.8	21.3	C
WBR	96.8	17.0	C
		Intersection	**C**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.4	25.3	C
NBT	1.4	11.1	B
NBR	1.4	21.9	C
SBL	1.1	22.8	C
SBT	1.1	0.0	A
SBR	1.1	23.8	C
EBL	0.5	9.0	A
EBT	5.1	5.3	A
EBR	5.1	6.5	A
WBL	0.4	7.6	A
WBT	12.5	7.0	A
WBR	12.5	5.3	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.3	9.8	A
NBT	0.3	5.7	A
NBR	0.4	9.7	A
SBL	0.5	11.2	B
SBT	0.0	0.0	A
SBR	0.4	11.3	B
EBL	0.0	2.6	A
EBT	1.0	1.3	A
EBR	1.7	0.8	A
WBL	0.1	2.7	A
WBT	3.1	2.0	A
WBR	3.1	2.0	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.4	12.2	B
NBT	0.4	6.8	A
NBR	0.4	9.6	A
SBL	0.5	10.8	B
SBT	0.5	0.0	A
SBR	0.4	10.9	B
EBL	0.1	1.9	A
EBT	0.0	0.3	A
EBR	0.0	0.3	A
WBL	0.0	1.4	A
WBT	0.0	0.3	A
WBR	0.0	0.2	A
		Intersection	**A**

Uptown Loop Road

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.8	41.8	D
NBT	6.5	49.4	D
NBR	8.4	13.2	B
SBL	3.6	46.8	D
SBT	1.6	47.2	D
SBR	0.8	7.8	A
EBL	0.7	5.6	A
EBT	4.3	6.3	A
EBR	0.2	3.3	A
WBL	0.9	3.5	A
WBT	10.6	6.1	A
WBR	9.9	4.2	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.9	42.1	D
NBT	6.5	49.4	D
NBR	8.6	13.0	B
SBL	3.6	46.5	D
SBT	1.5	45.6	D
SBR	0.8	8.2	A
EBL	0.5	4.4	A
EBT	2.4	4.0	A
EBR	0.2	2.3	A
WBL	1.0	3.9	A
WBT	11.6	6.8	A
WBR	10.6	4.2	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.8	45.0	D
NBT	6.5	49.5	D
NBR	8.1	13.1	B
SBL	3.8	46.9	D
SBT	1.7	45.9	D
SBR	0.8	8.6	A
EBL	1.1	8.3	A
EBT	3.5	5.4	A
EBR	0.1	2.3	A
WBL	1.0	4.0	A
WBT	54.3	21.4	C
WBR	54.3	6.8	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.9	42.1	D
NBT	6.4	49.4	D
NBR	8.7	13.0	B
SBL	3.6	46.5	D
SBT	1.5	45.6	D
SBR	0.9	8.2	A
EBL	0.6	4.8	A
EBT	2.7	4.4	A
EBR	0.1	2.2	A
WBL	1.0	3.8	A
WBT	11.4	6.6	A
WBR	10.7	4.4	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.9	42.1	D
NBT	6.5	49.4	D
NBR	8.4	13.2	B
SBL	3.6	46.5	D
SBT	1.5	45.6	D
SBR	0.9	8.3	A
EBL	0.5	4.0	A
EBT	2.6	4.4	A
EBR	0.2	2.3	A
WBL	1.0	3.7	A
WBT	11.3	6.5	A
WBR	10.4	4.3	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.9	42.1	D
NBT	6.4	49.4	D
NBR	7.6	13.2	B
SBL	3.6	46.5	D
SBT	1.5	45.6	D
SBR	0.9	8.3	A
EBL	0.5	4.0	A
EBT	2.5	4.3	A
EBR	0.2	2.3	A
WBL	1.0	3.7	A
WBT	11.4	6.6	A
WBR	10.5	4.3	A
		Intersection	**A**

Figure 3-8. 2040 PM Traffic Results

Louisiana Boulevard

No Build			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.6	60.4	E
NBT	69.6	28.9	C
NBR	7.3	13.8	B
SBL	66.2	63.4	E
SBT	33.0	20.8	C
SBR	0.0	6.1	A
EBL	21.3	56.1	E
EBT	50.4	40.2	D
EBR	9.5	29.6	C
WBL	69.2	55.6	E
WBT	88.2	31.4	C
WBR	88.2	35.3	D
		Intersection	**C**

Louisiana Island Removals			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.7	60.8	E
NBT	100.8	30.5	C
NBR	100.8	35.8	D
SBL	66.3	63.5	E
SBT	34.6	21.3	C
SBR	34.6	22.1	C
EBL	21.1	55.7	E
EBT	63.6	40.5	D
EBR	63.6	40.8	D
WBL	65.8	53.9	D
WBT	84.0	31.0	C
WBR	84.0	34.4	C
		Intersection	**C**

One-Lane Roundabout			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.5	62.4	E
NBT	244.6	37.1	D
NBR	244.6	148.2	F
SBL	68.2	83.4	F
SBT	35.6	22.2	C
SBR	35.6	24.7	C
EBL	24.8	105.8	F
EBT	199.7	118.8	F
EBR	199.7	58.4	E
WBL	3.7	55.7	E
WBT	3.7	34.1	C
WBR	3.7	35.8	D
		Intersection	**D**

Traffic Signal			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.7	60.8	E
NBT	101.6	30.9	C
NBR	101.6	35.5	D
SBL	75.6	70.4	E
SBT	35.0	21.7	C
SBR	35.0	20.4	C
EBL	21.6	56.0	E
EBT	62.0	40.1	D
EBR	62.0	40.4	D
WBL	79.1	63.4	E
WBT	92.3	33.6	C
WBR	92.3	38.0	D
		Intersection	**D**

Pedestrian Hybrid Beacon			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.8	61.1	E
NBT	100.3	30.7	C
NBR	100.3	35.0	C
SBL	82.0	76.0	E
SBT	34.8	21.4	C
SBR	34.8	22.0	C
EBL	22.1	57.7	E
EBT	63.2	40.6	D
EBR	63.2	40.7	D
WBL	83.7	65.7	E
WBT	95.2	33.4	C
WBR	95.2	37.8	D
		Intersection	**D**

Pedestrian Flashing Beacon			
Movement	Queue Length	Vehicle Delay	Level of Service
NBL	23.4	60.5	E
NBT	100.6	30.8	C
NBR	100.6	35.0	C
SBL	72.2	67.8	E
SBT	35.0	21.6	C
SBR	35.0	22.4	C
EBL	22.3	57.9	E
EBT	62.6	40.2	D
EBR	62.6	40.1	D
WBL	66.7	55.0	E*
WBT	81.6	29.8	C
WBR	81.6	34.0	C
			D

Q Street

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	2.6	15.9	C
NBT	1.1	8.3	A
NBR	3.6	11.9	B
SBL	4.1	16.3	C
SBT	4.6	17.4	C
SBR	5.5	13.7	B
EBL	2.5	5.4	A
EBT	16.2	0.4	A
EBR	16.2	0.3	A
WBL	0.4	4.0	A
WBT	0.1	1.3	A
WBR	0.1	0.8	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	0.3	9.6	A
NBT	0.3	3.2	A
NBR	3.3	12.0	B
SBL	4.4	14.0	B
SBT	0.4	9.5	A
SBR	5.4	13.2	B
EBL	1.1	4.1	A
EBT	1.1	0.4	A
EBR	1.1	0.3	A
WBL	0.1	2.8	A
WBT	0.1	1.0	A
WBR	0.1	0.6	A
		Intersection	**A**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	1.6	12.5	B
NBT	1.6	7.5	A
NBR	1.6	12.1	B
SBL	0.3	3.2	A
SBT	0.3	1.6	A
SBR	0.3	2.7	A
EBL	232.9	38.4	E
EBT	232.9	37.5	E
EBR	232.9	37.8	E
WBL	360.1	52.7	F
WBT	360.1	53.0	F
WBR	360.1	51.4	F
		Intersection	**E**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	11.1	23.9	C
NBT	11.1	23.7	C
NBR	11.1	23.3	C
SBL	8.2	22.0	C
SBT	8.2	27.9	C
SBR	8.2	23.2	C
EBL	9.5	22.3	C
EBT	32.0	13.8	B
EBR	32.0	14.6	B
WBL	1.6	24.8	C
WBT	58.2	19.5	B
WBR	58.2	20.3	C
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	3.7	15.9	B
NBT	3.2	11.5	B
NBR	3.5	11.2	B
SBL	4.2	15.4	B
SBT	4.1	20.1	C
SBR	3.1	13.7	B
EBL	9.7	31.0	C
EBT	29.5	13.5	B
EBR	39.7	10.2	B
WBL	1.9	21.9	C
WBT	47.6	16.5	B
WBR	47.6	15.8	B
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	3.2	12.4	B
NBT	3.0	13.5	B
NBR	3.3	11.2	B
SBL	4.3	17.3	C
SBT	4.2	20.8	C
SBR	3.1	13.5	B
EBL	2.3	4.6	A
EBT	0.1	0.5	A
EBR	0.0	0.3	A
WBL	0.0	3.9	A
WBT	0.9	1.4	A
WBR	0.9	1.1	A
			A

Uptown Loop Road

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	25.7	41.1	D
NBT	37.2	37.1	D
NBR	39.3	52.6	D
SBL	21.6	39.2	D
SBT	6.8	47.7	D
SBR	2.1	8.7	A
EBL	5.1	12.5	B
EBT	18.1	12.2	B
EBR	1.0	3.3	A
WBL	3.5	9.3	A
WBT	29.7	13.5	B
WBR	29.3	10.0	B
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	25.6	41.0	D
NBT	36.6	37.2	D
NBR	38.8	52.3	D
SBL	21.6	39.3	D
SBT	6.7	47.5	D
SBR	2.4	8.7	A
EBL	5.0	13.1	B
EBT	18.8	12.7	B
EBR	1.2	4.0	A
WBL	3.4	9.2	A
WBT	30.8	13.9	B
WBR	30.3	9.8	A
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	158.9	245.4	F
NBT	69.8	57.0	E
NBR	72.1	70.5	E
SBL	21.4	39.0	D
SBT	6.9	50.4	D
SBR	11.2	30.3	C
EBL	16.8	42.0	D
EBT	13.5	9.6	A
EBR	0.8	3.2	A
WBL	582.7	165.2	F
WBT	582.7	335.0	F
WBR	2.0	185.5	F
		Intersection	**F**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	26.1	42.5	D
NBT	37.6	37.0	D
NBR	39.3	52.3	D
SBL	21.5	39.1	D
SBT	6.7	47.1	D
SBR	2.8	9.7	A
EBL	4.8	12.8	B
EBT	19.9	13.4	B
EBR	1.2	4.1	A
WBL	3.4	9.2	A
WBT	31.6	14.7	B
WBR	31.1	9.9	A
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	26.1	42.5	D
NBT	37.6	37.0	D
NBR	39.3	52.3	D
SBL	21.5	39.1	D
SBT	6.7	47.1	D
SBR	2.8	9.7	A
EBL	4.8	12.8	B
EBT	19.9	13.4	B
EBR	1.2	4.1	A
WBL	3.4	9.2	A
WBT	31.6	14.7	B
WBR	31.1	9.9	A
		Intersection	**B**

Movement	Queue Length	Vehicle Delay	Level of Service
NBL	25.6	41.1	D
NBT	36.6	37.3	D
NBR	38.8	52.6	D
SBL	21.7	39.5	D
SBT	6.7	47.5	D
SBR	2.4	8.8	A
EBL	5.0	13.2	B
EBT	19.1	13.1	B
EBR	1.2	4.1	A
WBL	3.4	9.1	A
WBT	30.1	13.5	B
WBR	29.7	9.9	A
			B

*LOS E assumed at 55.0 seconds of delay

3.5.1 No Build

The following observations are made for the 2040 No Build from Figure 3-7 and Figure 3-8:

3.5.1.1 Indian School at Louisiana

- Similar to 2021 existing conditions, the intersection is observed to operate at an acceptable LOS C with minimal increases to the queue lengths and vehicle delays in the AM and PM peak hours.
  - Similar to 2021 existing conditions, the eastbound left turn is observed to operate at a LOS E in the AM peak hour.
  - Similar to 2021 existing conditions, the northbound, southbound, and eastbound left turns are observed to operate at a LOS E in the PM peak hour. LOS for westbound lefts change from LOS D to LOS E in 2040 with minimal additional delay expected in the PM peak hour and are still expected to operate with acceptable LOS.

3.5.1.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A with minimal increases to the queue lengths and vehicle delays compared to 2021 existing conditions in the AM and PM peak hours.

3.5.1.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A and LOS B with minimal increases to the queue lengths and vehicle delays compared to 2021 existing conditions in the AM and PM peak hours, respectively.

3.5.2 Louisiana Island Removals

The following observations are made for the 2040 Louisiana Island Removals from Figure 3-7 and Figure 3-8:

3.5.2.1 Indian School at Louisiana

- The intersection is observed to operate at an acceptable LOS C during the AM and PM peak hours.
  - Similar to the 2040 No Build, the eastbound left turn is observed to operate at a LOS E in the AM peak hour with similar queue lengths and vehicle delays.
  - Similar to the 2040 No Build, the northbound, southbound, and eastbound left turns are observed to operate at a LOS E in the PM peak hour with similar queue lengths and vehicle delays.

Removing the dedicated right turn pockets at the northwest, southwest, and southeast corners of Indian School and Louisiana would increase vehicle delay and queue lengths and decrease LOS for vehicles making a right turn in both the AM and PM peak hours at all three corners. Even though the vehicle delay and queuing would increase, changes to delay and queuing for other movements would

experience minimal changes and LOS for right turning vehicles would remain acceptable at LOS C or D. LOS for the intersection would remain unchanged at LOS C. Delay would increase because drivers wanting to turn right would no longer have a free movement and would need to stop, make sure the intersection is clear, and turn. If the car in front of them is travelling straight through the intersection, the vehicle would need to wait until the signal turned green to make their turn. For most of these turns the increase in vehicle delay during the peak hours would range from about 9 to 25 seconds depending on the time of day and the location.

3.5.2.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A with minimal changes to the queue length and vehicle delays in the AM and PM peak hours.

3.5.2.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A and LOS B with minimal changes to the queue length and vehicle delays in the AM and PM peak hours, respectively.

3.5.3 One-Lane Roundabout at Indian School and Q Street

The following observations are made for the one-lane roundabout in 2040 from Figure 3-7 and Figure 3-8:

3.5.3.1 Indian School at Louisiana

- The intersection is observed to operate at an acceptable LOS C in the AM peak hour and LOS D in the PM peak hour. The full intersection LOS in the AM peak hour is similar to operations with No Build, but the LOS during the PM peak hour degrades to LOS D when compared to the 2040 No Build or Louisiana Island Removals. LOS D is considered acceptable; however, there are several specific turning movements during the PM peak that are expected to degrade to unacceptable (LOS F) levels as discussed below:
  - The eastbound right turn is observed to operate at a LOS E in the PM peak hour, with additional delay and queuing when compared to the 2040 No Build at LOS C and the Louisiana Island Removals at LOS D. Four movements, northbound right, southbound and eastbound lefts, and eastbound through movements are observed to be operating at an unacceptable LOS F during the PM peak with considerable vehicle delay.
    - These movements experience queuing from the Q Street intersection that affects operations at Louisiana.
  - Similar to the 2040 No Build and Louisiana Island Removals, the eastbound left turn is observed to operate at a LOS E in the AM peak hour with similar queue lengths and vehicle delays.
  - Similar to the 2040 No Build and Louisiana Island Removals, the northbound and westbound left turns are observed to operate at a LOS E in the PM peak hour, with similar vehicle delays.

3.5.3.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS C and LOS E in the AM and PM peak hours, respectively. However, delay and queuing would substantially increase, particularly for all eastbound and westbound movements during the PM peak hour. The delay and the resulting LOS are expected to occur along Indian School's approaches up until the queues reach the adjacent intersections at Louisiana and Uptown Loop. Hence, the delay at Q Street is projected to be under-reported and the model reported LOS is better than would be expected.
  - All westbound movements are observed to operate at an unacceptable LOS F in the PM peak hour, delay and vehicle queues for these movements are expected to increase substantially when compared to the alternatives for 2040 No Build and Louisiana Island Removals The westbound movement at Q street would be heavily impacted by a roundabout at this location.
  - All eastbound movements are observed to degrade to LOS E in the PM peak hour compared to LOS A for the 2040 No Build and Louisiana Island Removals.

3.5.3.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A in the AM peak hour and an unacceptable LOS F in the PM peak hour.
  - The northbound left and all westbound movements are observed to operate at an unacceptable LOS F in the PM peak hour. These turning movements would experience considerable delay in the PM peak hour that could last for a few minutes.
    - These movements experience queueing from the Q Street intersection that would affect operations at Uptown Loop.
  - The northbound through and right movements are observed to degrade to LOS E in the PM peak hour compared to LOSD for the 2040 No Build and Louisiana Island Removals.

3.5.4 Traffic Signal at Indian School and Q Street

The following observations are made for the traffic signal based on 2040 traffic information from Figure 3-7 and Figure 3-8:

3.5.4.1 Indian School at Louisiana

- The intersection is observed to operate at an acceptable LOS C and LOS D in the AM and PM peak hours, respectively.
  - Similar to the 2040 No Build and Louisiana Island Removals, the eastbound left turn is observed to operate at a LOS E in the AM peak hour with similar queue lengths and vehicle delays.
  - Similar to the 2040 No Build, the northbound, southbound, eastbound, and westbound left turns are observed to operate at a LOS E in the PM peak hour with similar queue lengths and vehicle delays.

3.5.4.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A and LOS B in the AM and PM peak hours, respectively.
  - All movements would operate within acceptable limits, but drivers would experience increased delays compared to the No Build or Louisiana Island Removals since vehicles at Q Street would need to wait for the traffic signal to change in order to proceed, particularly in the PM peak.

3.5.4.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A and LOS B with minimal changes to the queue length and vehicle delays in the AM and PM peak hours, respectively.

3.5.5 Pedestrian Hybrid Beacon (HAWK Signal) at Indian School and Q Street

The following observations are made for the Pedestrian Hybrid Beacon from Figure 3-7 and Figure 3-8:

3.5.5.1 Indian School at Louisiana

- The intersection is observed to operate at an acceptable LOS C and LOS D in the AM and PM peak hours, respectively.
  - Similar to the 2040 No Build and Louisiana Island Removals, the eastbound left turn is observed to operate at a LOS E in the AM peak hour with similar queue lengths and vehicle delays.
  - Similar to the 2040 No Build, the northbound, southbound, eastbound, and westbound left turns are observed to operate at a LOS E in the PM peak hour with similar queue lengths and vehicle delays.

3.5.5.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A in the AM peak hour and LOS B in the PM peak hour.
  - All movements would operate within acceptable limits, but drivers would experience minor increased delays compared to the No Build or Louisiana Island Removals in the PM peak for some eastbound and westbound turns since drivers at Q Street would occasionally need to wait for pedestrians to cross at the pedestrian hybrid beacon.

3.5.5.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A and LOS B in the AM and PM peak hours, respectively.

3.5.6 Pedestrian Flashing Beacon at Indian School and Q Street

A pedestrian flashing beacon operates similarly to a pedestrian hybrid beacon except it requires vehicles to come to a complete stop (rather than yield) and does not have the capability to be coordinated with other signals. When a pedestrian activates the beacon, warning signs and amber LED lights signal to drivers that a pedestrian is attempting to cross. The pedestrian flashing beacon is a non-regulatory traffic-controlled device, hence there may be a challenge for driver compliance. It should be noted that the VISSIM model assumes that traffic will always yield to pedestrians when they activate the pedestrian flashing beacon. The following observations are made for the Pedestrian Flashing Beacon from Figure 3-7 and Figure 3-8:

3.5.6.1 Indian School at Louisiana

- The intersection is observed to operate at an acceptable LOS C and LOS D in the AM and PM peak hours, respectively.
  - Similar to the 2040 No Build and Louisiana Island Removals, the eastbound left turn is observed to operate at a LOS E in the AM peak hour with similar queue lengths and vehicle delays.
  - Similar to the 2040 No Build, the northbound, southbound, westbound, and eastbound left turns are observed to operate at a LOS E in the PM peak hour with similar queue lengths and vehicle delays.

3.5.6.2 Indian School at Q Street

- The intersection is observed to operate at an acceptable LOS A in the AM and PM peak hours.

3.5.6.3 Indian School at Uptown Loop

- The intersection is observed to operate at an acceptable LOS A and LOS B in the AM and PM peak hours, respectively.

3.6 Alternatives Evaluation and Comparison

In addition to the traffic analysis discussed above, the alternatives at Q Street were evaluated by comparing potential impacts and considerations as listed below and described in Figure 3-9.

- Traffic operations – Describes traffic performance and LOS
- Pedestrian Safety – Describes pedestrian safety
- Right-of-way impacts – Identifies right-of-way impacts
- Drainage considerations – Identifies drainage considerations
- Utility considerations – Identifies utilities considerations
- Geotechnical considerations – Identifies geotechnical considerations
- Construction impacts – Identifies construction impacts

- Environmental considerations – Evaluates environmental constraints
- Cost – Compares relative costs

Figure 3-9 does not compare impacts of the No Build, since this there would be no change with this alternative or the Louisiana Island Alternatives, since these were discussed previously in Section 3.5.2.

3.7 Alternatives Discussion and Recommendations

Based on the information provided in Figure 3-9, the following discussion and recommendations are provided for pedestrian improvements at Indian School and Q Street.

3.7.1 One-Lane Roundabout

The one-lane roundabout was found to impact traffic to unacceptable levels (LOS F) at multiple locations during the PM peak hour. The one-lane roundabout would be problematic for vehicles at Q Street and the Target parking garage and all along Indian School between Louisiana and Uptown Loop. In addition, this alternative has the biggest footprint of the four alternatives evaluated and would require about 0.07 acres of property at the driveway entering Target and property at ABQ Uptown. Because there are other options available that could meet the project need with fewer impacts, this concept was dropped from further consideration.

3.7.2 Traffic Signal

All three of the signal alternatives including the traffic signal, pedestrian hybrid beacon, and the pedestrian flashing beacon were found to meet the project purpose of improving pedestrian access and safety and operate with acceptable LOS and traffic operations. Spacing between traffic signals at Louisiana and Uptown Loop would be about 300 feet, which can be allowed per the City of Albuquerque's *Development Process Manual* but is rarely selected as a pedestrian crossing treatment unless there is also a traffic-related need as described in the *City of Albuquerque Bicycle and Trail Crossings Guide* (2022b). Currently, traffic operations are acceptable at this location and are expected to be acceptable for the 2040 No Build. Therefore, aside from the need to provide a safe pedestrian crossing, there is not an identified traffic need for a signal at this location. Furthermore, for most times of the day, drivers would have less delay with the pedestrian beacon alternatives, since during off-peak times, drivers coming out of ABQ Uptown or the Target garage would need to wait at for the stop light before proceeding into the intersection. For these reasons, a full traffic signal is not recommended at this location and has been dropped from further consideration.

Figure 3-9. Alternatives Comparison

Alternative/Metric	One-Lane Roundabout	Traffic Signal	Pedestrian Hybrid Beacon (HAWK Signal)	Pedestrian Flashing Beacon
Traffic Operations • Describes traffic performance	The 1-lane roundabout was found to impact traffic to unacceptable levels (LOS F) at multiple locations during the PM peak hour: • Traffic and congestion at the roundabout on Indian School and Q Street would degrade traffic operations at intersections with Louisiana and Uptown Loop. • Four turning movements at Louisiana, three movements at Q Street, and four movements at Uptown Loop would be expected to operate at LOS F with unacceptable levels of congestion and delay. • Overall intersection operations at Indian School and Uptown Loop would degrade to LOS F at four legs of the intersection (northbound lefts and all westbound movements) and drivers would experience a few minutes of delay.	Traffic operations are expected to operate with acceptable LOS and would operate better with any of the signals/beacons than with the roundabout. • Performance of the signal/beacon options would be similar; however, with the traffic signal, drivers leaving ABQ Uptown or the Target parking garage would experience additional delay when compared to existing conditions or the beacons in cases where they would need to wait at a stoplight when there is no traffic. For most times of the day, drivers would have less delay with the pedestrian beacon alternatives. • If a traffic signal were selected, a signal warrant analysis would be needed. • Spacing between traffic signals at Louisiana and Uptown Loop would be about 300 feet, which can be allowed per the City's *Development Process Manual* but are rarely selected as a pedestrian crossing treatment unless there is also a traffic-related need (COA 2022b).	Traffic operations are expected to operate with acceptable LOS and would operate better with any of the signal/beacon options than with the roundabout. • The pedestrian hybrid beacon provides a more protected crossing for pedestrians than a pedestrian flashing beacon since drivers must stop for the solid red and may stop and proceed when clear, with a flashing red. As a result, during the PM peak period drivers taking a westbound turn from Q Street or the Target parking garage could experience slightly more delay than they would with the pedestrian flashing beacon. • A pedestrian hybrid can be timed with signals at Louisiana and Uptown Loop to control queuing. • Application is consistent with City guidance suggesting use of pedestrian hybrid beacons in areas where speed limits are 35 mph or higher, average daily traffic is over 15,000 vehicles per day, and pedestrians must cross more than three traffic lanes.	Traffic operations are expected to operate with acceptable LOS and would operate better with any of the signals/beacons than with the roundabout. • This type of signal is more "permissive" for drivers than the pedestrian hybrid beacon signal since it is yellow (and not red) light that allows drivers to stop, look for pedestrians, and proceed into the intersection as soon as the pedestrian has crossed. Because of this, vehicle delays may be slightly reduced with the pedestrian flashing beacon when compared to the traffic signal or pedestrian hybrid beacon. However, during times with high pedestrian traffic, vehicles could experience more delay than with the pedestrian flashing beacon if the beacon is activated multiple times in a row by a pedestrian, which could cause traffic to queue on Indian School. • A pedestrian flashing beacon could not be coordinated with other traffic signals at Louisiana or Uptown Loop to minimize vehicle queuing.
Pedestrian Safety • Compares pedestrian safety	All the proposed alternatives would improve pedestrian safety for mid-block crossings on Indian School Road near Q street. • The roundabout would provide a marked mid-block crossing for pedestrians at two locations east and west of the intersection with Q Street and it would provide a pedestrian refuge area in the median. This alternative would provide two new mid-block crossings rather than one mid-block crossing with the pedestrian beacon alternatives. • This option would not provide a protected pedestrian movement, meaning that there would be no signal that stops traffic for pedestrians to cross.	• The traffic signal alternative would provide a pedestrian phase offering four protected movements. Similar to the roundabout alternative, this alternative would include two protected mid-block crossings across Indian School rather than one mid-block crossing with the pedestrian beacon alternatives.	• The pedestrian hybrid beacon alternative would provide one protected pedestrian crossing of Indian School just west of Q Street and the Target entrance. The pedestrian hybrid beacon provides a higher level of protection for pedestrians because when activated, it requires vehicles on Indian School to stop. • Marked pedestrian crossings would be provided across the Target entrance and Q Street, and these movements would continue to be unprotected.	• The pedestrian flashing beacon would have a similar configuration as the pedestrian hybrid beacon. The primary difference is that the flashing beacon is "permissive" meaning that it flashes yellow signaling drivers to yield rather than come to a complete stop. • The pedestrian flashing beacon is not a completely protected movement like it is for a traffic signal or a pedestrian hybrid beacon, but it would provide a dedicated mid-block crossing in this area, which would be an improvement over existing conditions.
Right-of-Way (ROW) Impacts • Compares ROW impacts	• The 1-lane roundabout would have the biggest footprint of the four alternatives. • Most of the roundabout could fit within the existing ROW but approximately 0.07 acres would be needed at the driveway entering Target and the area adjacent to Q Street in ABQ Uptown and additional easements or temporary construction permits may be required.	• Most of needed components for the traffic signal could fit inside of the existing ROW. • Items that could potentially be located outside of the existing ROW are pedestal poles or portions of curb access ramps. Depending on design, ROW needs could include a small permanent take, a permanent easement, or a temporary construction permit.	• Most of the needed components for the pedestrian hybrid beacon could fit inside of the existing ROW. • Items that could potentially be located outside of the existing ROW are modifications to the curb access ramps. Depending on design, ROW needs could include a small permanent take, a permanent easement, or a temporary construction permit.	• Most of the needed components for the pedestrian flashing beacon could fit inside of the existing ROW. • Items that could potentially be located outside of the existing ROW are modifications to the curb access ramps. Depending on design, ROW needs could include a small permanent take, a permanent easement, or a temporary construction permit.
Drainage Considerations • Identifies drainage considerations	• No drop inlets or storm drain would need to be relocated. Care should be taken to ensure the new medians do not create ponds between the crown location and proposed median. Curb cuts through the medians could be installed to convey flows across the median and prevent ponding.	• A traffic signal would not affect current drainage conditions on Indian School. Care should be taken to ensure the new medians at the Target entrance and Q Street do not create ponds between the crown location and proposed median. Curb cuts through the medians could be installed to convey flows to prevent ponding.	• A pedestrian hybrid beacon would not affect current drainage conditions on Indian School. Care should be taken to ensure the new medians at the Target entrance and Q Street do not create ponds between the crown location and proposed median. Curb cuts through the medians could be installed to convey flows to prevent ponding.	• A pedestrian flashing beacon would not affect current drainage conditions on Indian School. Care should be taken to ensure the new medians at the Target entrance and Q Street do not create ponds between the crown location and proposed median. Curb cuts through the medians could be installed to convey flows to prevent ponding.

Alternative/Metric	One-Lane Roundabout	Traffic Signal	Pedestrian Hybrid Beacon (HAWK Signal)	Pedestrian Flashing Beacon
Utility Considerations • Identifies utility considerations	• The 1-lane roundabout would impact utilities to a greater degree than the other alternatives due to its larger footprint. Impacts to existing utilities would include: - Manhole adjustments for sewer and electric - Underground electric associated with moving light poles and bollards - Relocation of light poles and foundations	• The traffic signal would potentially impact the following utilities: - Underground electric associated with moving light poles and bollards - Potential relocation of light poles and foundations	• A pedestrian hybrid beacon would potentially impact the following utilities: - Underground electric associated with moving light poles and bollards - Relocation of light poles and foundations	• A pedestrian hybrid beacon would potentially impact the following utilities: - Underground electric associated with moving light poles and bollards - Relocation of light poles and foundations
Geotechnical Considerations • Identifies geotechnical considerations	• Based on current information, geotechnical conditions suitable for the proposed roadway improvements.	• Based on current information, geotechnical conditions suitable for the proposed roadway improvements.	• Based on current information, geotechnical conditions suitable for the proposed roadway improvements.	• Based on current information, geotechnical conditions suitable for the proposed roadway improvements.
Construction Impacts • Identifies construction impacts	• The roundabout would affect traffic operations in the area during construction. In the short-term, congestion would increase on Indian School, particularly at the intersection with Q street. Lane closures would be required for an extended period, likely a few months.	• Signal construction impacts would be minimal and would mostly occur outside of the roadway. A brief lane closure of a few days would be needed to provide updated striping at the new crosswalks and install signals at the intersection of Indian School and Q Street.	• Signal construction impacts would be minimal and would mostly occur outside of the roadway. A brief lane closure of a few days would be needed to provide updated striping at the new crosswalks and install the pedestrian hybrid beacon at the intersection of Indian School and Q Street.	• Signal construction impacts would be minimal and would mostly occur outside of the roadway. A brief lane closure of a few days would be needed to provide updated striping at the new crosswalks and install the pedestrian flashing beacon at the intersection of Indian School and Q Street.
Environmental Considerations • Evaluates environmental constraints	• All the proposed improvements are located in an urbanized area where there is no habitat for listed species or cultural or natural resource concerns. Impacts to the built and human environment would be limited to those discussed above.	• All the proposed improvements are located in an urbanized area where there is no habitat for listed species or cultural or natural resource concerns. Impacts to the built and human environment would be limited to those discussed above.	• All the proposed improvements are located in an urbanized area where there is no habitat for listed species or cultural or natural resource concerns. Impacts to the built and human environment would be limited to those discussed above.	• All the proposed improvements are located in an urbanized area where there is no habitat for listed species or cultural or natural resource concerns. Impacts to the built and human environment would be limited to those discussed above.
Cost • Compares relative costs	• The roundabout would be the most expensive option.	• The traffic signal would cost less than the roundabout and more than the pedestrian beacons.	• The pedestrian hybrid beacon would cost more than a pedestrian flashing beacon and less than the roundabout or traffic signal.	• The pedestrian flashing beacon would have the least cost of the options considered.

3.7.3 Pedestrian Hybrid Beacon (HAWK signal)

The pedestrian hybrid beacon was found to meet the project purpose of improving pedestrian access and safety and operate with acceptable LOS and traffic operations. Studies have documented that pedestrian hybrid beacons can reduce pedestrian crashes by 29% and serious injury and fatal crashes by 15% (FHWA 2021).

The City of Albuquerque's *Development Process Manual* strongly encourages the use of mid-block crossings in Urban Centers where block lengths are longer than 400 feet, particularly in areas where there are two major pedestrian generators. In this area, pedestrian activity is high and there are more than two major pedestrian generators due to the presence of ABQ Uptown, Target, retail parking, and the two bus stops located on both sides of Indian School. In this case, the distance between protected/signalized crossings at Louisiana and Uptown Loop is just over 600 feet. Guidance provided in the *City of Albuquerque's Bicycle and Trail Crossings Guide* (2022b) suggests the use of pedestrian hybrid beacons in areas where speed limits are 35 mph or higher, average daily traffic is over 15,000 vehicles per day, and pedestrians need to cross more than three lanes of traffic. At this location, speeds are 35 mph, average daily traffic is about 16,000 vehicles per day, and there are four lanes of traffic. For these reasons, a pedestrian hybrid beacon is recommended over the pedestrian flashing beacon at this location. In addition, when compared to the pedestrian flashing beacon, the pedestrian hybrid beacon:

- Provides a more protected crossing for pedestrians since drivers must stop for the solid red signal.
- Can be timed with the adjacent traffic signals to control queuing on Indian School.

3.7.4 Pedestrian Flashing Beacon

The pedestrian flashing beacon was found to meet the project purpose of improving pedestrian access and safety and operate with acceptable LOS and traffic operations; however, as previously discussed, a pedestrian flashing beacon is more "permissive" than a pedestrian hybrid beacon and is generally recommended in areas with lower speed limits, lower average daily traffic, and fewer traffic lanes. In addition, the pedestrian flashing beacon cannot be timed with adjacent traffic signals to optimize traffic performance. Finally, per guidance in the *City of Albuquerque's Bicycle and Trail Crossings Guide* (2022b), pedestrian flashing beacons are typically more appropriate in areas where traffic volumes are lower and pedestrians need to cross one or two lanes of traffic, rather than the four lanes located on Indian School. For these reasons, the pedestrian flashing beacon is not recommended at this location.

4. RECOMMENDATIONS AND NEXT STEPS

4.1 Recommendations

4.1.1 Louisiana Island Removals

Based on the results of the traffic analysis conducted and benefits to pedestrians, it is recommended to move forward with the design and construction of removing the right turn lanes at the northwest, southwest, and southeast corners of Louisiana and Indian School. Removing the free-right turns at these locations will add modest delay to drivers taking right turns, but even during the AM and PM peak hours traffic is expected to operate with an acceptable LOS. Benefits to pedestrians include:

- Creating fewer lanes for pedestrians crossing the street and creating shorter crosswalk lengths across all four intersection legs.
- Reducing the speed of right-turning vehicles where pork chop islands are removed.
- Widening the sidewalk areas at the three corners of the intersection to provide additional pedestrian refuge and additional space.

4.1.2 Improvements at Indian School and Q Street

Based on the results of the traffic analysis conducted and benefits to pedestrians as a proven FHWA safety countermeasure, it is recommended to move forward with the design and construction of a pedestrian hybrid beacon at Indian School and Q Street. The pedestrian hybrid beacon was found to meet the project purpose of improving pedestrian access and safety and operate with acceptable LOS and traffic operations. Key benefits of the pedestrian hybrid beacon include:

- Providing a protected mid-block crossing for pedestrians in the Uptown Urban Center to improve pedestrian and safety and access across two major retail/commercial areas and the bus stops located on both sides of Indian School.
- The ability to time the pedestrian hybrid beacon with adjacent traffic signals to control queuing on Indian School.

The recommended location for the pedestrian hybrid beacon is on the west side of the Target parking garage and Q Street. The west side of Q Street was selected based on pedestrian generators at ABQ Uptown, Target, and the transit stations and data provided in Figure 2-13 that showed that pedestrians not using existing crosswalks at Louisiana and Uptown Loop tend to cross near Q Street or just west of it. The proposed placement of the pedestrian hybrid beacon is consistent with guidance in the *Manual on Uniform Traffic Control Devices* (MUTCD) that beacons should be placed no less than 300 feet from adjacent traffic signals (FHWA 2012). In this case, a beacon located west of Q Street is about 300 feet from the intersection of Louisiana and just over 300 feet from the intersection at Uptown Loop.

4.2 Design Considerations

This section contains information on design considerations.

4.2.1 ITS

As discussed in Section 2.5, there are plans to install fiber communications along Louisiana between Central Avenue and Menaul Avenue in 2022. This project proposes to update the ITS system on Indian School to replace outdated copper networks that do not meet current City standards with a fiber network, install closed-circuit television cameras to monitor signal operations, and connect ITS infrastructure on Louisiana and Indian School. The ITS improvements will help to improve traffic monitoring and operations to improve safety and traffic performance. The ITS improvements would also help to time the proposed pedestrian hybrid beacon with existing signals at Louisiana and Indian School. Specific ITS improvements will be identified as part of preliminary design.

4.2.2 Right-of-Way

Most of the needed components for the pedestrian hybrid beacon could fit inside of the existing right-of-way; however, improvements to curbs access ramps could require a small permanent take, a permanent easement, or a temporary construction permit to meet ADA requirements. Right-of-way impacts will be determined as part of preliminary design and will be minimized.

4.2.3 Drainage

4.2.3.1 Drainage Considerations at Louisiana and Indian School

Removing the pork chop islands at the northwest, southwest, and southeast corners of the Louisiana and Indian School intersection will require drainage relocations. All three of the corners have two curb drop inlets that will need to be relocated. There are 18-inch pipes that connect the inlets to the main storm drain in Indian School. Depending on the location of the new inlets, they may be able to tie into the existing 18-inch pipes. In the event the new drop inlet locations are not compatible with the existing pipes, new pipes will need to be designed that connect the new drop inlets to the existing manholes in Indian School.

4.2.3.2 Drainage Considerations at Indian School and Q Street

A pedestrian hybrid beacon would not affect current drainage conditions on Indian School. Care should be taken to ensure the new medians at the Target entrance and Q Street do not create ponds between the crown location and proposed median. Curb cuts through the medians could be installed to convey flows to prevent ponding.

4.2.4 Utilities

4.2.4.1 Utility Considerations at Louisiana and Indian School

The following utilities will be impacted with the improvements proposed at Louisiana and Indian School

- Underground Electric - The affected electric lines are all associated with traffic signal infrastructure at the intersection. All the impacted lines would be removed and relocated/replaced as part of the project.

- Storm Drain – Five storm drain inlets would likely need to be removed and replaced at the northwest, southwest, and southeast corners of the intersection. The associated storm drains would also need to be modified.
- Water Meter and Valve - A water meter and valve located at the northwest corner of the intersection would need to be adjusted to grade or modified.

4.2.4.2 Utility Considerations at Indian School and Q Street

For the intersection at Indian School and Q Street, the following utilities could potentially be impacted depending on the intersection design:

- Underground electric associated with moving light poles and bollards
- Potential relocation of aboveground light poles and foundations

4.2.5 Geotechnical Considerations

Geotechnical conditions in the project study area appear suitable for the type of improvements that are being evaluated. Subgrade soils consist predominately of relatively high-quality sand subgrade. On-site sands are expected to be suitable for use as structural backfill for pavements. Pavement thickness will be based on existing subgrade materials and traffic types and volumes in the study area. Thicker pavement sections will be associated with poorer quality subgrades with clayey sands. Subgrade stabilization may be required in lower quality subgrade soils and/or areas of loose or elevated moisture contents.

Excavations are expected to be accomplished using conventional earthwork equipment. Caving soils should be anticipated during construction. Light and traffic structures are anticipated to be supported on a deep foundation of drilled shafts bearing on undisturbed soil. Casing and/or drilling slurry may be required for drilled shaft construction.

Soils in the study area have moderate to mild corrosion potential to petal piping or conduits. Therefore, site specific corrosion test results will need to be considered in the selection of driven piles, metal conduits and drainage structures, and other metal elements of the project. Additional details regarding geotechnical considerations are provided in Appendix B, Preliminary Geotechnical Report.

4.2.6 Environmental Considerations

All the proposed improvements are located in an urbanized area where there is no habitat for listed species or cultural or natural resource concerns. Impacts to the built and human environment would be limited to those related to right-of-way acquisitions and short-term construction impacts. The project would benefit the built environment by improving pedestrian safety. Proposed improvements would be partially funded using federal funds programmed in the 2023 Transportation Improvement Program. As such, the project must obtain approval under the National Environmental Policy Act (NEPA). Based on the project scope and expected level of environmental impact, a Programmatic Categorical Exclusion with no supporting cultural or natural resources surveys is recommended.

4.2.7 Required Certifications

Since this project is federally funded, certifications will be required from the NMDOT. Based on the project description and expected impacts, this project will require the following certifications:

- ITS certification
- Right-of-way certification
- Utility certification
- Environmental certification
- Railroad certification

4.3 Preliminary Cost Estimate

Preliminary costs for the recommended improvements are estimated about $1,100,000 as shown in Appendix C, Preliminary Cost Estimates. Improvements at Louisiana and Indian School are estimated at about $464,000; the proposed pedestrian hybrid beacon and associated improvements are estimated at about $492,000; and ITS improvements are estimated at $144,000. Preliminary costs assume that right-of-way would not be required, but this will be analyzed in detail as part of preliminary engineering. Costs will be updated and refined as part of preliminary design.

4.4 Next Steps

Next steps for the project include:

- Completing preliminary engineering plans and identifying needed right-of-way, including permanent takes, permanent easements, or temporary construction easements.
- Coordination with adjacent property owners and the public as part of preliminary engineering.
- Completing environmental documentation.

5. REFERENCES

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Appendix A

Supporting Traffic Information

Turning Movement Data
Louisiana and Indian School
9-23-2021

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021
Page No: 1

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
7:00 AM	1	2	81	9	0	0	93	1	0	36	25	0	0	62	6	16	109	21	0	0	152	7	2	12	6	0	1	27	334
7:15 AM	2	2	139	8	0	3	151	2	2	56	29	0	3	89	6	14	126	30	0	1	176	4	3	16	2	0	2	25	441
7:30 AM	4	3	155	7	0	3	169	6	7	64	35	1	1	113	15	12	155	28	1	0	211	3	6	18	3	0	0	30	523
7:45 AM	9	2	144	14	0	3	169	10	2	98	34	0	1	144	10	25	150	43	3	1	231	9	0	33	2	0	0	44	588
Hourly Total	16	9	519	38	0	9	582	19	11	254	123	1	5	408	37	67	540	122	4	2	770	23	11	79	13	0	3	126	1886
8:00 AM	4	3	121	25	0	3	153	9	4	67	58	0	1	138	10	49	165	38	0	0	262	10	2	31	2	0	0	45	598
8:15 AM	3	2	115	5	0	0	125	12	5	66	51	0	2	134	20	33	159	38	0	1	250	1	3	24	1	0	0	29	538
8:30 AM	2	1	114	15	0	0	132	15	4	55	43	1	1	118	10	21	129	31	0	2	191	7	2	30	7	0	0	46	487
8:45 AM	2	2	103	26	0	1	133	12	3	49	31	0	2	95	10	23	200	31	0	1	264	12	5	33	1	0	0	51	543
Hourly Total	11	8	453	71	0	4	543	48	16	237	183	1	6	485	50	126	653	138	0	4	967	30	12	118	11	0	0	171	2166
9:00 AM	2	2	92	21	0	1	117	4	8	43	24	0	1	79	15	32	133	26	0	3	206	10	6	26	1	0	1	43	445
9:15 AM	5	0	95	16	0	2	116	16	5	33	27	0	0	81	13	32	150	28	0	3	223	10	2	35	0	0	1	47	467
9:30 AM	3	0	97	28	0	1	128	22	10	47	38	0	1	117	16	22	149	19	0	2	206	10	6	27	3	0	0	46	497
9:45 AM	3	2	109	26	0	1	140	18	14	52	39	0	0	123	16	24	187	23	0	2	250	12	4	34	5	1	1	56	569
Hourly Total	13	4	393	91	0	5	501	60	37	175	128	0	2	400	60	110	619	96	0	10	885	42	18	122	9	1	3	192	1978
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	5	2	143	33	0	1	183	33	15	43	50	2	0	143	19	33	243	30	3	0	328	19	2	36	4	0	0	61	715
11:15 AM	8	1	113	43	0	2	165	35	16	53	42	1	0	147	28	20	264	27	6	0	345	16	3	50	15	0	1	84	741
11:30 AM	7	1	156	54	0	5	218	29	17	65	66	0	0	177	30	18	247	30	3	0	328	23	3	44	8	0	0	78	801
11:45 AM	3	2	150	29	1	4	185	33	20	66	86	0	0	205	30	31	276	39	0	3	376	27	4	49	9	0	1	89	855
Hourly Total	23	6	562	159	1	12	751	130	68	227	244	3	0	672	107	102	1030	126	12	3	1377	85	12	179	36	0	2	312	3112
12:00 PM	3	0	165	42	2	2	212	44	4	68	74	0	2	190	31	11	291	28	2	1	363	14	9	50	12	0	0	85	850
12:15 PM	9	1	182	56	2	6	250	32	8	62	77	3	3	182	39	15	261	30	1	0	346	12	5	61	7	0	0	85	863
12:30 PM	7	0	176	54	1	1	238	25	10	61	60	1	2	157	20	30	229	35	1	1	315	24	2	53	8	0	0	87	797
12:45 PM	6	4	186	44	1	5	241	39	10	83	79	0	6	211	32	7	248	31	2	2	320	24	0	64	9	0	0	97	869
Hourly Total	25	5	709	196	6	14	941	140	32	274	290	4	13	740	122	63	1029	124	6	4	1344	74	16	228	36	0	0	354	3379
1:00 PM	5	2	222	62	0	2	291	33	5	72	68	0	2	178	27	36	233	31	4	0	331	20	8	53	14	0	0	95	895
1:15 PM	0	2	218	28	1	4	249	37	12	63	79	0	3	191	42	29	260	33	4	4	368	17	2	58	11	0	4	88	896
1:30 PM	3	1	210	55	1	3	270	44	17	59	67	1	2	188	31	12	256	43	1	1	343	23	5	42	12	0	3	82	883
1:45 PM	7	2	194	57	2	7	262	28	19	57	68	1	3	173	26	23	236	33	2	1	320	11	5	51	7	0	0	74	829
Hourly Total	15	7	844	202	4	16	1072	142	53	251	282	2	10	730	126	100	985	140	11	6	1362	71	20	204	44	0	7	339	3503
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	5	0	208	58	0	5	271	46	4	45	70	1	6	166	34	24	266	25	1	1	350	18	2	48	11	0	0	79	866
3:45 PM	2	2	197	35	0	3	236	29	11	66	67	1	2	174	34	21	285	31	0	5	371	15	1	77	10	0	5	103	884
Hourly Total	7	2	405	93	0	8	507	75	15	111	137	2	8	340	68	45	551	56	1	6	721	33	3	125	21	0	5	182	1750

4:00 PM	2	2	220	50	0	4	274	35	17	74	77	0	6	203	22	15	333	31	4	2	405	26	4	64	18	0	3	112	994
4:15 PM	2	2	199	51	2	1	256	31	24	59	61	2	9	177	37	32	277	22	9	2	377	19	0	71	14	0	0	104	914
4:30 PM	5	4	206	53	1	1	269	40	19	43	69	0	1	171	42	28	296	24	3	2	393	23	2	73	15	0	1	113	946
4:45 PM	1	1	198	49	0	2	249	40	12	76	78	0	3	206	32	22	298	22	2	7	376	30	1	78	13	0	3	122	953
Hourly Total	10	9	823	203	3	8	1048	146	72	252	285	2	19	757	133	97	1204	99	18	13	1551	98	7	286	60	0	7	451	3807
5:00 PM	7	0	226	61	0	2	294	31	16	43	58	0	3	148	42	28	291	21	3	3	385	21	1	80	15	0	0	117	944
5:15 PM	3	1	185	62	1	1	252	36	16	62	74	2	5	190	26	24	302	24	0	3	376	23	4	86	8	0	2	121	939
5:30 PM	3	1	227	66	1	0	298	34	19	58	64	0	3	175	38	12	290	22	3	5	365	18	2	73	17	0	1	110	948
5:45 PM	5	2	183	48	2	3	240	40	9	62	90	0	3	201	42	25	274	19	2	1	362	25	0	41	8	1	0	75	878
Hourly Total	18	4	821	237	4	6	1084	141	60	225	286	2	14	714	148	89	1157	86	8	12	1488	87	7	280	48	1	3	423	3709
6:00 PM	6	0	230	54	0	1	290	46	10	46	68	1	4	171	33	24	254	12	3	3	326	19	5	37	2	0	1	63	850
6:15 PM	5	2	190	36	0	0	233	36	14	38	80	0	1	168	30	17	209	19	5	10	280	12	3	48	8	1	2	72	753
Grand Total	149	56	5949	1380	18	83	7552	983	388	2090	2106	18	82	5585	914	840	8231	1018	68	73	11071	574	114	1706	288	3	33	2685	26893
Approach %	2.0	0.7	78.8	18.3	0.2	-	-	17.6	6.9	37.4	37.7	0.3	-	-	8.3	7.6	74.3	9.2	0.6	-	-	21.4	4.2	63.5	10.7	0.1	-	-	-
Total %	0.6	0.2	22.1	5.1	0.1	-	28.1	3.7	1.4	7.8	7.8	0.1	-	20.8	3.4	3.1	30.6	3.8	0.3	-	41.2	2.1	0.4	6.3	1.1	0.0	-	10.0	-
Lights	146	56	5900	1374	18	-	7494	976	386	2050	2092	17	-	5521	908	833	8153	999	68	-	10961	557	109	1670	281	3	-	2620	26596
% Lights	98.0	100.0	99.2	99.6	100.0	-	99.2	99.3	99.5	98.1	99.3	94.4	-	98.9	99.3	99.2	99.1	98.1	100.0	-	99.0	97.0	95.6	97.9	97.6	100.0	-	97.6	98.9
Mediums	2	0	33	4	0	-	39	5	2	39	11	1	-	58	4	4	61	17	0	-	86	12	5	34	5	0	-	56	239
% Mediums	1.3	0.0	0.6	0.3	0.0	-	0.5	0.5	0.5	1.9	0.5	5.6	-	1.0	0.4	0.5	0.7	1.7	0.0	-	0.8	2.1	4.4	2.0	1.7	0.0	-	2.1	0.9
Articulated Trucks	1	0	16	2	0	-	19	2	0	0	3	0	-	5	2	3	17	2	0	-	24	5	0	1	2	0	-	8	56
% Articulated Trucks	0.7	0.0	0.3	0.1	0.0	-	0.3	0.2	0.0	0.0	0.1	0.0	-	0.1	0.2	0.4	0.2	0.2	0.0	-	0.2	0.9	0.0	0.1	0.7	0.0	-	0.3	0.2
Bicycles on Road	0	0	0	0	0	-	0	0	0	1	0	0	-	1	0	0	0	0	0	-	0	0	0	1	0	0	-	1	2
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	9	-	-	-	-	-	-	4	-	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-
% Bicycles on Crosswalk	-	-	-	-	-	10.8	-	-	-	-	-	-	4.9	-	-	-	-	-	-	2.7	-	-	-	-	-	-	6.1	-	-
Pedestrians	-	-	-	-	-	74	-	-	-	-	-	-	78	-	-	-	-	-	-	71	-	-	-	-	-	-	31	-	-
% Pedestrians	-	-	-	-	-	89.2	-	-	-	-	-	-	95.1	-	-	-	-	-	-	97.3	-	-	-	-	-	-	93.9	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
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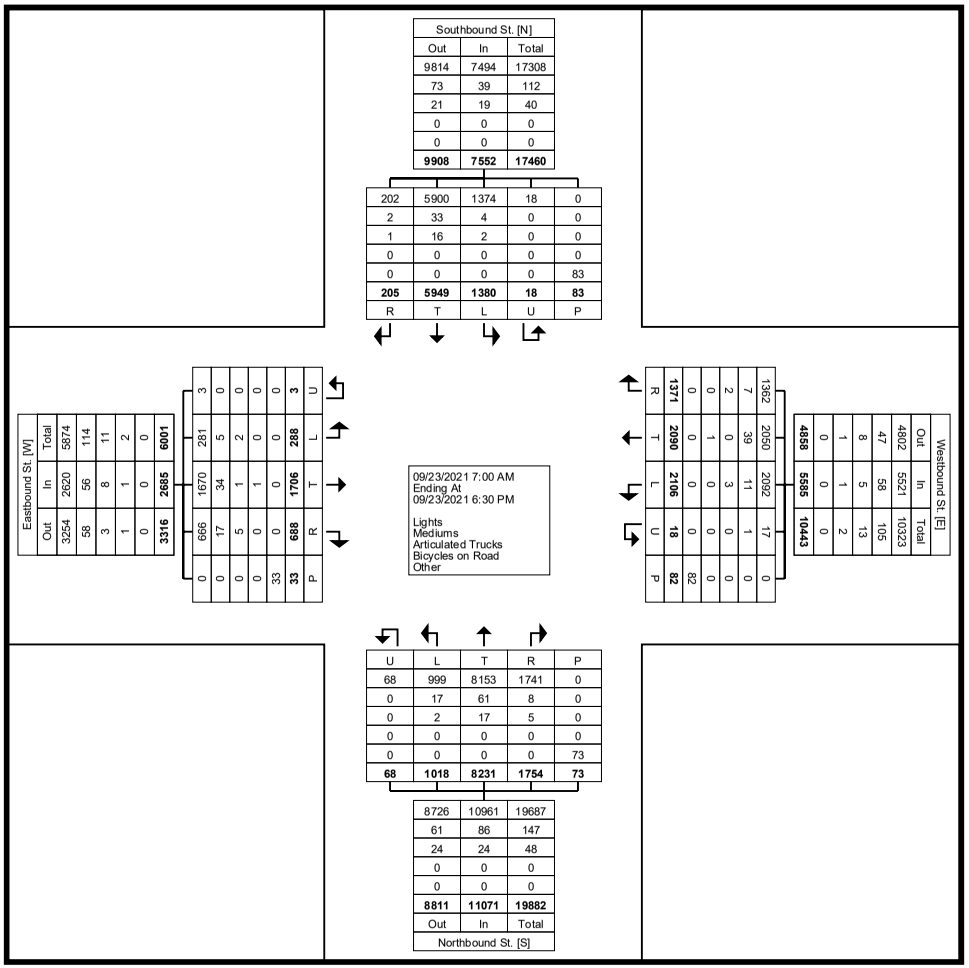
Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021



Turning Movement Data Plot

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (7:30 AM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
7:30 AM	4	3	155	7	0	3	169	6	7	64	35	1	1	113	15	12	155	28	1	0	211	3	6	18	3	0	0	30	523
7:45 AM	9	2	144	14	0	3	169	10	2	98	34	0	1	144	10	25	150	43	3	1	231	9	0	33	2	0	0	44	588
8:00 AM	4	3	121	25	0	3	153	9	4	67	58	0	1	138	10	49	165	38	0	0	262	10	2	31	2	0	0	45	598
8:15 AM	3	2	115	5	0	0	125	12	5	66	51	0	2	134	20	33	159	38	0	1	250	1	3	24	1	0	0	29	538
Total	20	10	535	51	0	9	616	37	18	295	178	1	5	529	55	119	629	147	4	2	954	23	11	106	8	0	0	148	2247
Approach %	3.2	1.6	86.9	8.3	0.0	-	-	7.0	3.4	55.8	33.6	0.2	-	-	5.8	12.5	65.9	15.4	0.4	-	-	15.5	7.4	71.6	5.4	0.0	-	-	-
Total %	0.9	0.4	23.8	2.3	0.0	-	27.4	1.6	0.8	13.1	7.9	0.0	-	23.5	2.4	5.3	28.0	6.5	0.2	-	42.5	1.0	0.5	4.7	0.4	0.0	-	6.6	-
PHF	0.556	0.833	0.863	0.510	0.000	-	0.911	0.771	0.643	0.753	0.767	0.250	-	0.918	0.688	0.607	0.953	0.855	0.333	-	0.910	0.575	0.458	0.803	0.667	0.000	-	0.822	0.939
Lights	20	10	531	50	0	-	611	37	17	292	177	1	-	524	54	119	620	144	4	-	941	23	11	101	6	0	-	141	2217
% Lights	100.0	100.0	99.3	98.0	-	-	99.2	100.0	94.4	99.0	99.4	100.0	-	99.1	98.2	100.0	98.6	98.0	100.0	-	98.6	100.0	100.0	95.3	75.0	-	-	95.3	98.7
Mediums	0	0	3	0	0	-	3	0	1	3	0	0	-	4	0	0	4	3	0	-	7	0	0	5	1	0	-	6	20
% Mediums	0.0	0.0	0.6	0.0	-	-	0.5	0.0	5.6	1.0	0.0	0.0	-	0.8	0.0	0.0	0.6	2.0	0.0	-	0.7	0.0	0.0	4.7	12.5	-	-	4.1	0.9
Articulated Trucks	0	0	1	1	0	-	2	0	0	0	1	0	-	1	1	0	5	0	0	-	6	0	0	0	1	0	-	1	10
% Articulated Trucks	0.0	0.0	0.2	2.0	-	-	0.3	0.0	0.0	0.0	0.6	0.0	-	0.2	1.8	0.0	0.8	0.0	0.0	-	0.6	0.0	0.0	0.0	12.5	-	-	0.7	0.4
Bicycles on Road	0	0	0	0	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	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	11.1	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	-	5	-	-	-	-	-	-	2	-	-	-	-	-	-	0	-	-
% Pedestrians	-	-	-	-	-	88.9	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-

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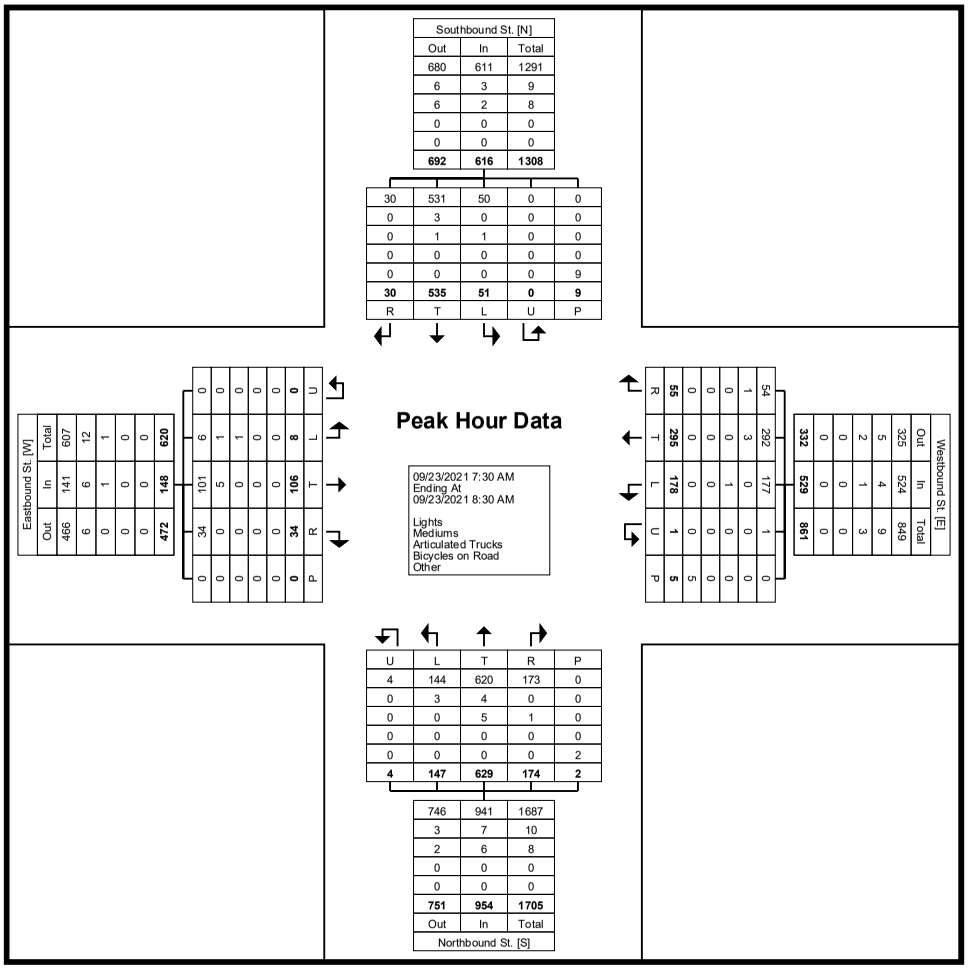

Turning Movement Peak Hour Data Plot (7:30 AM)

Lee Engineering, LLC
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Oklahoma City, Oklahoma - San Antonio, Texas
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jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
11:00 AM	5	2	143	33	0	1	183	33	15	43	50	2	0	143	19	33	243	30	3	0	328	19	2	36	4	0	0	61	715
11:15 AM	8	1	113	43	0	2	165	35	16	53	42	1	0	147	28	20	264	27	6	0	345	16	3	50	15	0	1	84	741
11:30 AM	7	1	156	54	0	5	218	29	17	65	66	0	0	177	30	18	247	30	3	0	328	23	3	44	8	0	0	78	801
11:45 AM	3	2	150	29	1	4	185	33	20	66	86	0	0	205	30	31	276	39	0	3	376	27	4	49	9	0	1	89	855
Total	23	6	562	159	1	12	751	130	68	227	244	3	0	672	107	102	1030	126	12	3	1377	85	12	179	36	0	2	312	3112
Approach %	3.1	0.8	74.8	21.2	0.1	-	-	19.3	10.1	33.8	36.3	0.4	-	-	7.8	7.4	74.8	9.2	0.9	-	-	27.2	3.8	57.4	11.5	0.0	-	-	-
Total %	0.7	0.2	18.1	5.1	0.0	-	24.1	4.2	2.2	7.3	7.8	0.1	-	21.6	3.4	3.3	33.1	4.0	0.4	-	44.2	2.7	0.4	5.8	1.2	0.0	-	10.0	-
PHF	0.719	0.750	0.901	0.736	0.250	-	0.861	0.929	0.850	0.860	0.709	0.375	-	0.820	0.892	0.773	0.933	0.808	0.500	-	0.916	0.787	0.750	0.895	0.600	0.000	-	0.876	0.910
Lights	23	6	555	158	1	-	743	130	67	220	244	3	-	664	105	102	1019	123	12	-	1361	80	12	174	36	0	-	302	3070
% Lights	100.0	100.0	98.8	99.4	100.0	-	98.9	100.0	98.5	96.9	100.0	100.0	-	98.8	98.1	100.0	98.9	97.6	100.0	-	98.8	94.1	100.0	97.2	100.0	-	-	96.8	98.7
Mediums	0	0	4	1	0	-	5	0	1	6	0	0	-	7	1	0	9	3	0	-	13	4	0	5	0	0	-	9	34
% Mediums	0.0	0.0	0.7	0.6	0.0	-	0.7	0.0	1.5	2.6	0.0	0.0	-	1.0	0.9	0.0	0.9	2.4	0.0	-	0.9	4.7	0.0	2.8	0.0	-	-	2.9	1.1
Articulated Trucks	0	0	3	0	0	-	3	0	0	0	0	0	-	0	1	0	2	0	0	-	3	1	0	0	0	0	-	1	7
% Articulated Trucks	0.0	0.0	0.5	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	0.0	-	0.0	0.9	0.0	0.2	0.0	0.0	-	0.2	1.2	0.0	0.0	0.0	-	-	0.3	0.2
Bicycles on Road	0	0	0	0	0	-	0	0	0	1	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.4	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	3	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	25.0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	50.0	-	-
Pedestrians	-	-	-	-	-	9	-	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	75.0	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	50.0	-	-

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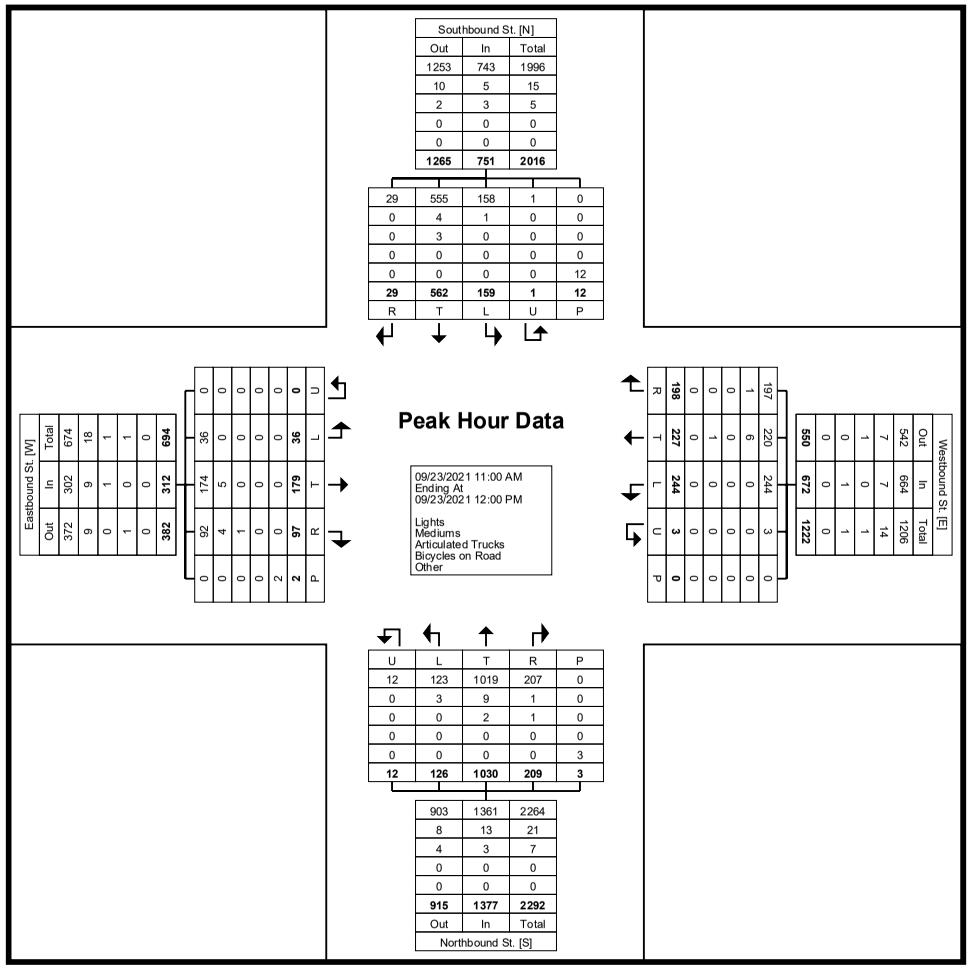
Site Code:
Start Date: 09/23/2021



Turning Movement Peak Hour Data Plot (11:00 AM)

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (12:45 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
12:45 PM	6	4	186	44	1	5	241	39	10	83	79	0	6	211	32	7	248	31	2	2	320	24	0	64	9	0	0	97	869
1:00 PM	5	2	222	62	0	2	291	33	5	72	68	0	2	178	27	36	233	31	4	0	331	20	8	53	14	0	0	95	895
1:15 PM	0	2	218	28	1	4	249	37	12	63	79	0	3	191	42	29	260	33	4	4	368	17	2	58	11	0	4	88	896
1:30 PM	3	1	210	55	1	3	270	44	17	59	67	1	2	188	31	12	256	43	1	1	343	23	5	42	12	0	3	82	883
Total	14	9	836	189	3	14	1051	153	44	277	293	1	13	768	132	84	997	138	11	7	1362	84	15	217	46	0	7	362	3543
Approach %	1.3	0.9	79.5	18.0	0.3	-	-	19.9	5.7	36.1	38.2	0.1	-	-	9.7	6.2	73.2	10.1	0.8	-	-	23.2	4.1	59.9	12.7	0.0	-	-	-
Total %	0.4	0.3	23.6	5.3	0.1	-	29.7	4.3	1.2	7.8	8.3	0.0	-	21.7	3.7	2.4	28.1	3.9	0.3	-	38.4	2.4	0.4	6.1	1.3	0.0	-	10.2	-
PHF	0.583	0.563	0.941	0.762	0.750	-	0.903	0.869	0.647	0.834	0.927	0.250	-	0.910	0.786	0.583	0.959	0.802	0.688	-	0.925	0.875	0.469	0.848	0.821	0.000	-	0.933	0.989
Lights	14	9	828	189	3	-	1043	152	44	273	290	1	-	760	132	82	984	138	11	-	1347	83	15	212	45	0	-	355	3505
% Lights	100.0	100.0	99.0	100.0	100.0	-	99.2	99.3	100.0	98.6	99.0	100.0	-	99.0	100.0	97.6	98.7	100.0	100.0	-	98.9	98.8	100.0	97.7	97.8	-	-	98.1	98.9
Mediums	0	0	7	0	0	-	7	1	0	4	3	0	-	8	0	1	9	0	0	-	10	0	0	5	1	0	-	6	31
% Mediums	0.0	0.0	0.8	0.0	0.0	-	0.7	0.7	0.0	1.4	1.0	0.0	-	1.0	0.0	1.2	0.9	0.0	0.0	-	0.7	0.0	0.0	2.3	2.2	-	-	1.7	0.9
Articulated Trucks	0	0	1	0	0	-	1	0	0	0	0	0	-	0	0	1	4	0	0	-	5	1	0	0	0	0	-	1	7
% Articulated Trucks	0.0	0.0	0.1	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	1.2	0.4	0.0	0.0	-	0.4	1.2	0.0	0.0	0.0	-	-	0.3	0.2
Bicycles on Road	0	0	0	0	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	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	7.7	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	14	-	-	-	-	-	-	12	-	-	-	-	-	-	7	-	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	92.3	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
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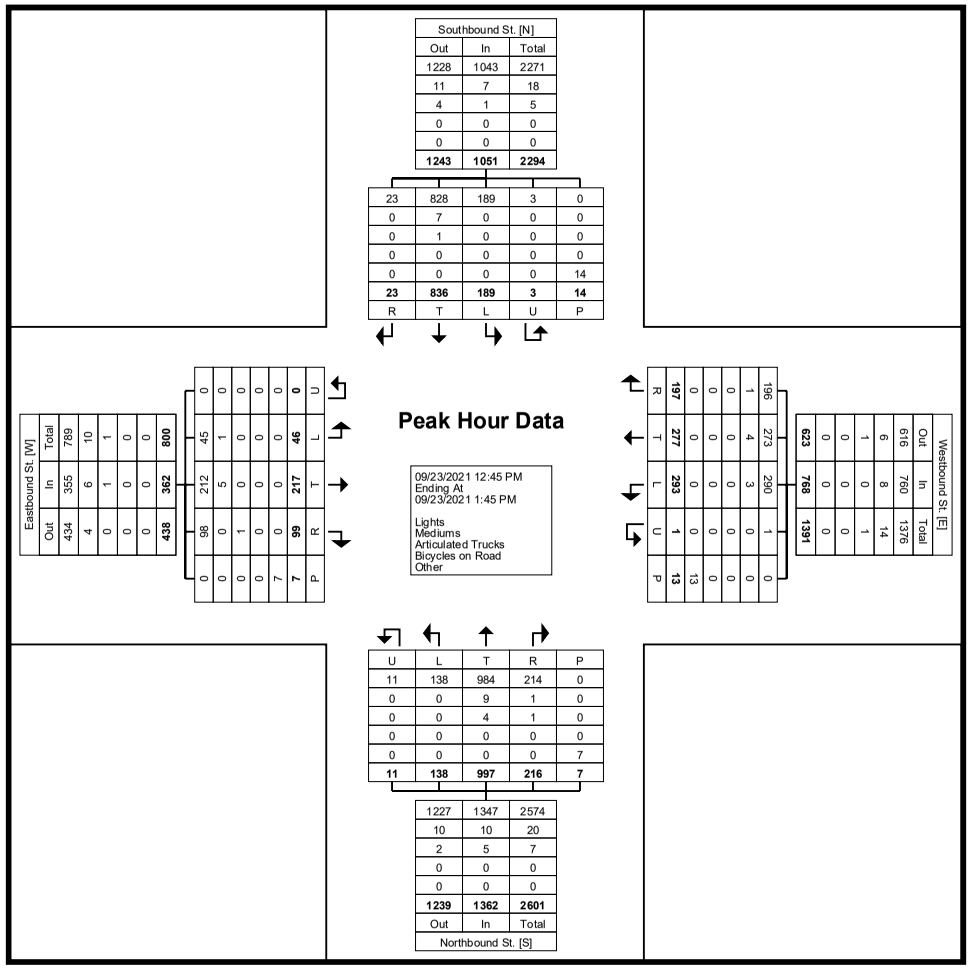
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021



Turning Movement Peak Hour Data Plot (12:45 PM)

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:00 PM	2	2	220	50	0	4	274	35	17	74	77	0	6	203	22	15	333	31	4	2	405	26	4	64	18	0	3	112	994
4:15 PM	2	2	199	51	2	1	256	31	24	59	61	2	9	177	37	32	277	22	9	2	377	19	0	71	14	0	0	104	914
4:30 PM	5	4	206	53	1	1	269	40	19	43	69	0	1	171	42	28	296	24	3	2	393	23	2	73	15	0	1	113	946
4:45 PM	1	1	198	49	0	2	249	40	12	76	78	0	3	206	32	22	298	22	2	7	376	30	1	78	13	0	3	122	953
Total	10	9	823	203	3	8	1048	146	72	252	285	2	19	757	133	97	1204	99	18	13	1551	98	7	286	60	0	7	451	3807
Approach %	1.0	0.9	78.5	19.4	0.3	-	-	19.3	9.5	33.3	37.6	0.3	-	-	8.6	6.3	77.6	6.4	1.2	-	-	21.7	1.6	63.4	13.3	0.0	-	-	-
Total %	0.3	0.2	21.6	5.3	0.1	-	27.5	3.8	1.9	6.6	7.5	0.1	-	19.9	3.5	2.5	31.6	2.6	0.5	-	40.7	2.6	0.2	7.5	1.6	0.0	-	11.8	-
PHF	0.500	0.563	0.935	0.958	0.375	-	0.956	0.913	0.750	0.829	0.913	0.250	-	0.919	0.792	0.758	0.904	0.798	0.500	-	0.957	0.817	0.438	0.917	0.833	0.000	-	0.924	0.957
Lights	10	9	822	202	3	-	1046	144	72	248	284	2	-	750	133	96	1201	98	18	-	1546	98	7	283	60	0	-	448	3790
% Lights	100.0	100.0	99.9	99.5	100.0	-	99.8	98.6	100.0	98.4	99.6	100.0	-	99.1	100.0	99.0	99.8	99.0	100.0	-	99.7	100.0	100.0	99.0	100.0	-	-	99.3	99.6
Mediums	0	0	1	0	0	-	1	1	0	4	1	0	-	6	0	1	3	1	0	-	5	0	0	3	0	0	-	3	15
% Mediums	0.0	0.0	0.1	0.0	0.0	-	0.1	0.7	0.0	1.6	0.4	0.0	-	0.8	0.0	1.0	0.2	1.0	0.0	-	0.3	0.0	0.0	1.0	0.0	-	-	0.7	0.4
Articulated Trucks	0	0	0	1	0	-	1	1	0	0	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.0	0.5	0.0	-	0.1	0.7	0.0	0.0	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.1
Bicycles on Road	0	0	0	0	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	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	5.3	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	8	-	-	-	-	-	-	18	-	-	-	-	-	-	13	-	-	-	-	-	-	7	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	94.7	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
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Albuquerque, New Mexico, United States
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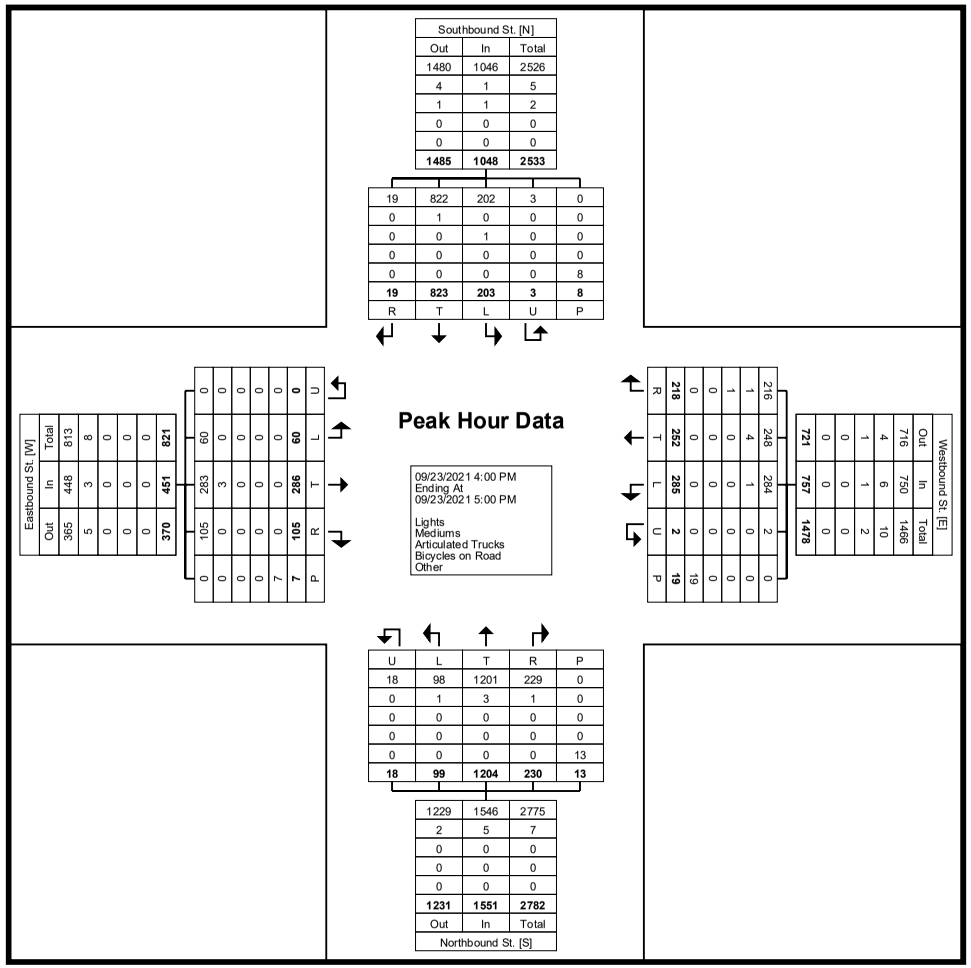
Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021



Turning Movement Peak Hour Data Plot (4:00 PM)

Turning Movement Data
Louisiana and Indian School
9-24-2021

Count Name: NM 313.01
Site Code:
Start Date: 09/24/2021
Page No: 1

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:00 PM	7	0	274	60	0	1	341	38	19	80	78	1	2	216	57	13	346	36	2	3	454	21	9	80	13	0	3	123	1134
4:15 PM	1	0	246	56	0	1	303	31	16	82	69	1	3	199	50	16	316	27	3	2	412	25	10	87	11	0	2	133	1047
4:30 PM	4	2	293	63	0	1	362	35	10	62	71	0	2	178	33	27	329	22	4	4	415	23	2	79	9	0	0	113	1068
4:45 PM	4	1	247	71	0	5	323	38	20	69	86	0	5	213	35	22	342	26	6	5	431	22	5	71	10	0	0	108	1075
Hourly Total	16	3	1060	250	0	8	1329	142	65	293	304	2	12	806	175	78	1333	111	15	14	1712	91	26	317	43	0	5	477	4324
5:00 PM	0	0	283	68	0	0	351	36	25	48	79	0	1	188	45	22	304	39	6	5	416	16	7	70	7	0	1	100	1055
5:15 PM	3	1	239	56	2	1	301	48	15	60	73	0	2	196	45	23	325	14	5	2	412	21	3	85	18	0	4	127	1036
5:30 PM	2	2	249	81	1	2	335	30	28	47	62	0	3	167	52	19	297	35	6	2	409	14	5	51	8	0	1	78	989
5:45 PM	4	2	256	39	0	0	301	39	12	58	85	3	7	197	56	31	295	24	3	7	409	21	11	78	11	0	2	121	1028
Hourly Total	9	5	1027	244	3	3	1288	153	80	213	299	3	13	748	198	95	1221	112	20	16	1646	72	26	284	44	0	8	426	4108
6:00 PM	6	0	277	71	0	2	354	36	15	49	62	0	3	162	39	33	292	25	0	4	389	20	9	42	12	0	2	83	988
6:15 PM	11	1	215	51	1	0	279	48	17	56	83	0	9	204	31	30	302	32	5	6	400	10	3	53	11	0	0	77	960
6:30 PM	10	6	240	65	0	2	321	33	22	40	79	4	3	178	34	16	269	26	5	4	350	24	1	43	9	0	0	77	926
6:45 PM	9	3	262	70	0	1	344	33	18	42	78	0	6	171	31	29	264	21	7	3	352	15	2	44	5	0	2	66	933
Hourly Total	36	10	994	257	1	5	1298	150	72	187	302	4	21	715	135	108	1127	104	17	17	1491	69	15	182	37	0	4	303	3807
7:00 PM	2	0	235	68	0	3	305	36	19	44	82	1	11	182	28	22	235	23	0	2	308	12	3	37	8	0	0	60	855
7:15 PM	3	6	230	62	1	3	302	41	27	39	83	3	21	193	27	22	206	30	5	2	290	16	9	45	10	0	0	80	865
7:30 PM	2	4	176	67	0	3	249	33	20	38	73	2	5	166	27	17	217	26	4	3	291	15	7	39	11	0	1	72	778
7:45 PM	3	4	197	61	0	1	265	27	23	30	70	1	6	151	25	23	197	29	2	5	276	16	8	36	7	1	3	68	760
Hourly Total	10	14	838	258	1	10	1121	137	89	151	308	7	43	692	107	84	855	108	11	12	1165	59	27	157	36	1	4	280	3258
Grand Total	71	32	3919	1009	5	26	5036	582	306	844	1213	16	89	2961	615	365	4536	435	63	59	6014	291	94	940	160	1	21	1486	15497
Approach %	1.4	0.6	77.8	20.0	0.1	-	-	19.7	10.3	28.5	41.0	0.5	-	-	10.2	6.1	75.4	7.2	1.0	-	-	19.6	6.3	63.3	10.8	0.1	-	-	-
Total %	0.5	0.2	25.3	6.5	0.0	-	32.5	3.8	2.0	5.4	7.8	0.1	-	19.1	4.0	2.4	29.3	2.8	0.4	-	38.8	1.9	0.6	6.1	1.0	0.0	-	9.6	-
Lights	71	32	3907	1008	5	-	5023	579	306	830	1212	16	-	2943	614	365	4515	433	63	-	5990	290	94	928	160	1	-	1473	15429
% Lights	100.0	100.0	99.7	99.9	100.0	-	99.7	99.5	100.0	98.3	99.9	100.0	-	99.4	99.8	100.0	99.5	99.5	100.0	-	99.6	99.7	100.0	98.7	100.0	100.0	-	99.1	99.6
Mediums	0	0	10	1	0	-	11	3	0	13	1	0	-	17	1	0	20	2	0	-	23	0	0	12	0	0	-	12	63
% Mediums	0.0	0.0	0.3	0.1	0.0	-	0.2	0.5	0.0	1.5	0.1	0.0	-	0.6	0.2	0.0	0.4	0.5	0.0	-	0.4	0.0	0.0	1.3	0.0	0.0	-	0.8	0.4
Articulated Trucks	0	0	2	0	0	-	2	0	0	0	0	0	-	0	0	0	1	0	0	-	1	1	0	0	0	0	-	1	4
% Articulated Trucks	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.3	0.0	0.0	0.0	0.0	-	0.1	0.0
Bicycles on Road	0	0	0	0	0	-	0	0	0	1	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	2	-	-	-	-	-	-	2	-	-	-	-	-	-	10	-	-	-	-	-	-	2	-	-

% Bicycles on Crosswalk	-	-	-	-	-	7.7	-	-	-	-	-	-	2.2	-	-	-	-	-	-	16.9	-	-	-	-	-	-	9.5	-	-
Pedestrians	-	-	-	-	-	24	-	-	-	-	-	-	87	-	-	-	-	-	-	49	-	-	-	-	-	-	19	-	-
% Pedestrians	-	-	-	-	-	92.3	-	-	-	-	-	-	97.8	-	-	-	-	-	-	83.1	-	-	-	-	-	-	90.5	-	-

Lee Engineering, LLC
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Count Name: NM 313.01
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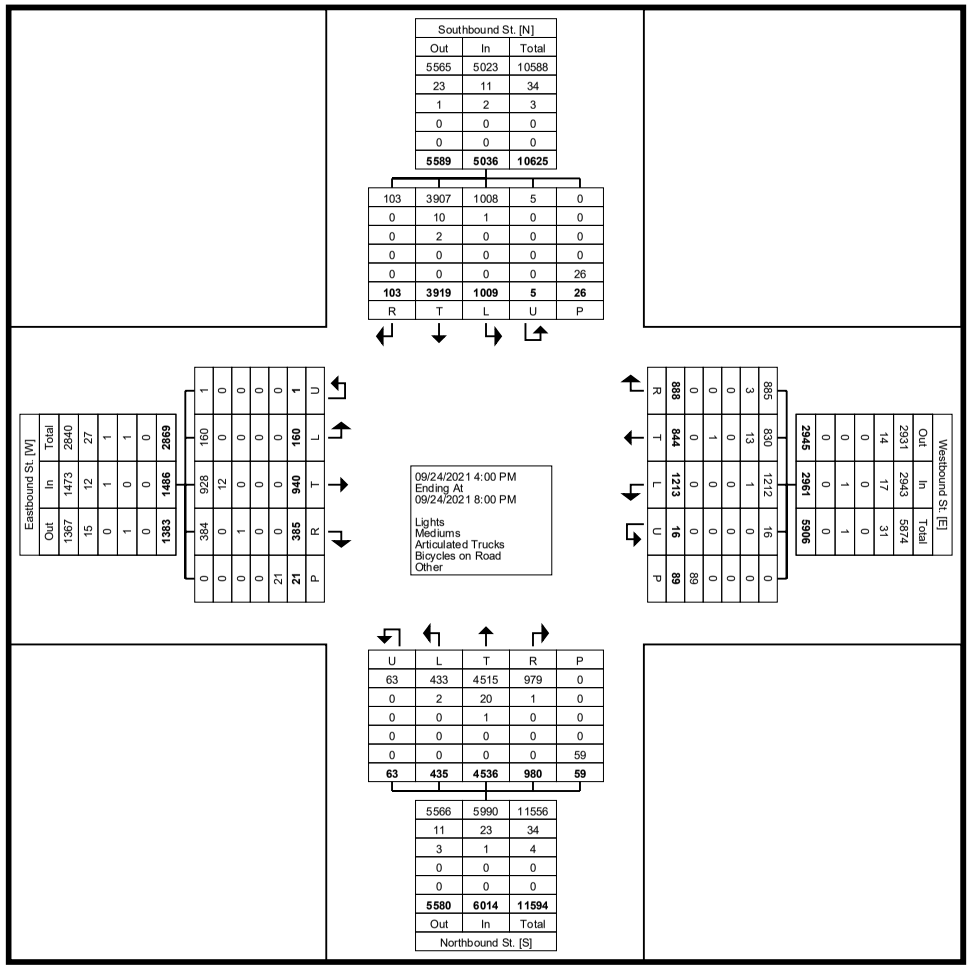


Turning Movement Data Plot

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

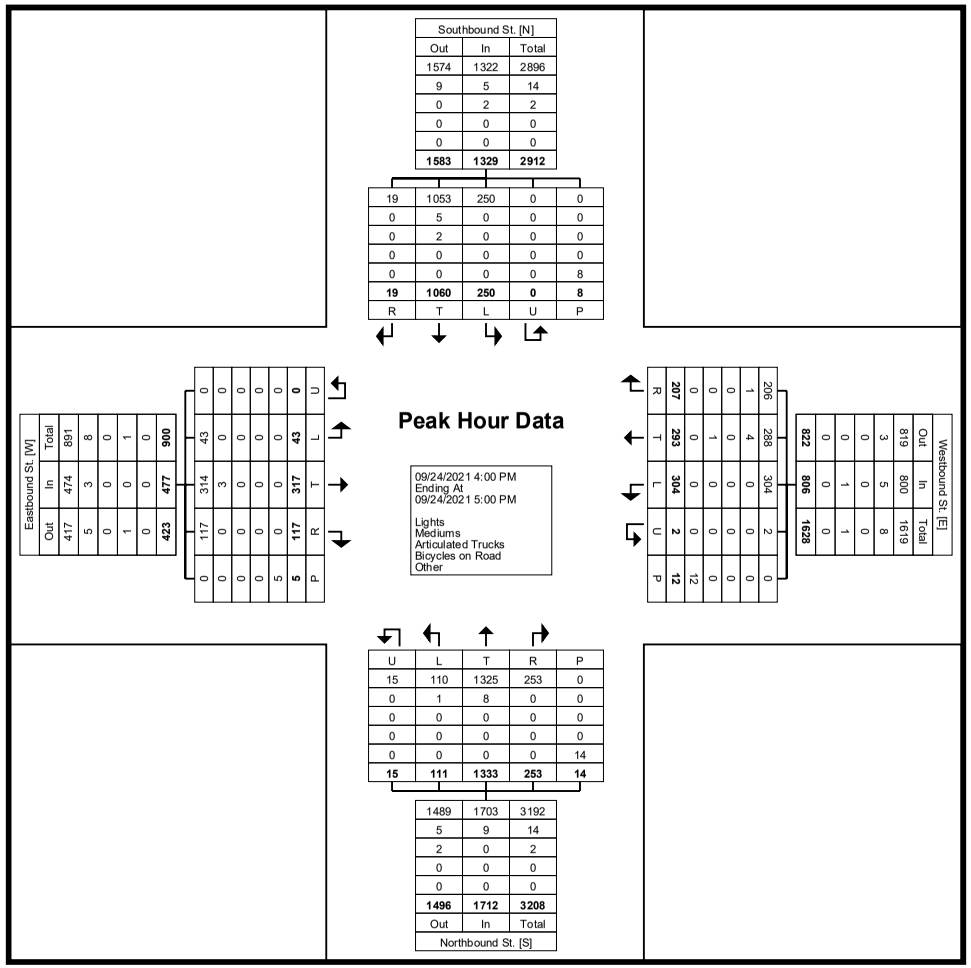
Count Name: NM 313.01
Site Code:
Start Date: 09/24/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:00 PM	7	0	274	60	0	1	341	38	19	80	78	1	2	216	57	13	346	36	2	3	454	21	9	80	13	0	3	123	1134
4:15 PM	1	0	246	56	0	1	303	31	16	82	69	1	3	199	50	16	316	27	3	2	412	25	10	87	11	0	2	133	1047
4:30 PM	4	2	293	63	0	1	362	35	10	62	71	0	2	178	33	27	329	22	4	4	415	23	2	79	9	0	0	113	1068
4:45 PM	4	1	247	71	0	5	323	38	20	69	86	0	5	213	35	22	342	26	6	5	431	22	5	71	10	0	0	108	1075
Total	16	3	1060	250	0	8	1329	142	65	293	304	2	12	806	175	78	1333	111	15	14	1712	91	26	317	43	0	5	477	4324
Approach %	1.2	0.2	79.8	18.8	0.0	-	-	17.6	8.1	36.4	37.7	0.2	-	-	10.2	4.6	77.9	6.5	0.9	-	-	19.1	5.5	66.5	9.0	0.0	-	-	-
Total %	0.4	0.1	24.5	5.8	0.0	-	30.7	3.3	1.5	6.8	7.0	0.0	-	18.6	4.0	1.8	30.8	2.6	0.3	-	39.6	2.1	0.6	7.3	1.0	0.0	-	11.0	-
PHF	0.571	0.375	0.904	0.880	0.000	-	0.918	0.934	0.813	0.893	0.884	0.500	-	0.933	0.768	0.722	0.963	0.771	0.625	-	0.943	0.910	0.650	0.911	0.827	0.000	-	0.897	0.953
Lights	16	3	1053	250	0	-	1322	141	65	288	304	2	-	800	175	78	1325	110	15	-	1703	91	26	314	43	0	-	474	4299
% Lights	100.0	100.0	99.3	100.0	-	-	99.5	99.3	100.0	98.3	100.0	100.0	-	99.3	100.0	100.0	99.4	99.1	100.0	-	99.5	100.0	100.0	99.1	100.0	-	-	99.4	99.4
Mediums	0	0	5	0	0	-	5	1	0	4	0	0	-	5	0	0	8	1	0	-	9	0	0	3	0	0	-	3	22
% Mediums	0.0	0.0	0.5	0.0	-	-	0.4	0.7	0.0	1.4	0.0	0.0	-	0.6	0.0	0.0	0.6	0.9	0.0	-	0.5	0.0	0.0	0.9	0.0	-	-	0.6	0.5
Articulated Trucks	0	0	2	0	0	-	2	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	2
% Articulated Trucks	0.0	0.0	0.2	0.0	-	-	0.2	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	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	1	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.3	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	12.5	-	-	-	-	-	-	0.0	-	-	-	-	-	-	21.4	-	-	-	-	-	-	20.0	-	-
Pedestrians	-	-	-	-	-	7	-	-	-	-	-	-	12	-	-	-	-	-	-	11	-	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	87.5	-	-	-	-	-	-	100.0	-	-	-	-	-	-	78.6	-	-	-	-	-	-	80.0	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/24/2021



Turning Movement Peak Hour Data Plot (4:00 PM)

Turning Movement Data
Indian School and Uptown Loop
9-23-2021

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021
Page No: 1

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							Int. Total
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	
7:00 AM	1	2	1	5	0	1	9	1	0	51	15	0	1	67	1	7	0	2	0	2	10	1	1	25	5	0	0	32	118
7:15 AM	3	6	1	5	0	0	15	0	1	80	15	0	1	96	2	4	0	3	0	0	9	1	0	38	3	0	0	42	162
7:30 AM	2	2	3	1	0	0	8	4	0	109	20	0	0	133	2	9	1	1	0	0	13	3	1	38	5	0	0	47	201
7:45 AM	1	6	5	6	1	0	19	5	2	158	25	0	0	190	5	7	3	2	0	0	17	6	1	58	7	0	0	72	298
Hourly Total	7	16	10	17	1	1	51	10	3	398	75	0	2	486	10	27	4	8	0	2	49	11	3	159	20	0	0	193	779
8:00 AM	3	3	7	6	0	1	19	14	2	138	12	1	0	167	1	12	4	1	0	1	18	0	1	74	26	0	1	101	305
8:15 AM	6	6	4	6	0	0	22	11	1	125	41	0	0	178	5	10	10	5	0	0	30	4	2	40	31	0	0	77	307
8:30 AM	3	5	4	12	0	0	24	12	2	93	19	2	0	128	1	9	4	4	0	1	18	7	1	50	16	1	0	75	245
8:45 AM	1	7	2	7	1	0	18	12	1	85	11	0	0	109	2	3	5	6	0	2	16	6	0	49	16	0	0	71	214
Hourly Total	13	21	17	31	1	1	83	49	6	441	83	3	0	582	9	34	23	16	0	4	82	17	4	213	89	1	1	324	1071
9:00 AM	1	8	3	8	1	1	21	8	1	74	14	4	1	101	3	6	3	6	0	2	18	8	0	53	22	0	2	83	223
9:15 AM	1	3	7	5	0	1	16	4	1	83	14	3	0	105	6	4	15	2	0	2	27	2	2	54	15	0	2	73	221
9:30 AM	4	4	4	8	0	1	20	4	1	92	24	1	0	122	2	14	9	5	0	1	30	8	0	60	14	0	0	82	254
9:45 AM	5	5	9	7	1	3	27	8	1	104	18	3	0	134	9	5	9	5	0	0	28	11	4	58	17	0	1	90	279
Hourly Total	11	20	23	28	2	6	84	24	4	353	70	11	1	462	20	29	36	18	0	5	103	29	6	225	68	0	5	328	977
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11:00 AM	1	13	10	11	0	2	35	11	1	120	20	2	1	154	6	6	7	13	0	1	32	13	2	72	20	0	0	107	328
11:15 AM	4	10	11	19	1	1	45	12	4	106	26	1	0	149	12	7	11	13	0	3	43	10	4	85	21	0	1	120	357
11:30 AM	2	12	10	17	0	2	41	12	2	133	32	2	2	181	12	3	6	17	0	1	38	9	2	87	18	0	1	116	376
11:45 AM	3	12	8	19	0	0	42	19	2	159	28	2	2	210	7	5	11	20	0	2	43	21	5	78	20	1	0	125	420
Hourly Total	10	47	39	66	1	5	163	54	9	518	106	7	5	694	37	21	35	63	0	7	156	53	13	322	79	1	2	468	1481
12:00 PM	22	3	14	18	0	1	57	17	1	122	34	1	2	175	9	11	14	22	0	1	56	21	1	83	16	0	1	121	409
12:15 PM	14	4	12	21	0	0	51	10	0	113	34	1	1	158	10	8	15	25	0	3	58	26	1	92	21	0	1	140	407
12:30 PM	7	2	20	20	0	2	49	12	0	131	25	1	4	169	11	8	16	23	0	3	58	19	0	71	29	0	0	119	395
12:45 PM	16	11	16	20	0	0	63	24	0	140	31	1	1	196	11	6	22	29	1	0	69	26	2	78	24	1	1	131	459
Hourly Total	59	20	62	79	0	3	220	63	1	506	124	4	8	698	41	33	67	99	1	7	241	92	4	324	90	1	3	511	1670
1:00 PM	5	12	12	23	0	2	52	13	4	125	28	1	2	171	10	8	14	23	0	1	55	21	3	94	23	0	2	141	419
1:15 PM	6	17	14	16	1	3	54	14	1	142	37	5	0	199	10	9	13	24	0	1	56	13	5	79	34	0	0	131	440
1:30 PM	3	16	10	25	1	1	55	12	0	126	20	4	1	162	8	10	12	24	0	4	54	21	3	73	15	1	0	113	384
1:45 PM	1	17	11	28	0	0	57	9	0	113	19	3	0	144	21	4	29	31	1	0	86	24	3	89	20	1	0	137	424
Hourly Total	15	62	47	92	2	6	218	48	5	506	104	13	3	676	49	31	68	102	1	6	251	79	14	335	92	2	2	522	1667
*** BREAK ***	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3:30 PM	1	10	14	29	0	3	54	14	1	163	24	2	0	204	16	7	9	24	0	1	56	14	4	105	11	1	0	135	449
3:45 PM	2	11	7	22	1	0	43	20	4	131	25	2	0	182	11	7	24	28	0	0	70	9	12	102	22	1	0	146	441
Hourly Total	3	21	21	51	1	3	97	34	5	294	49	4	0	386	27	14	33	52	0	1	126	23	16	207	33	2	0	281	890

4:00 PM	6	13	11	23	1	1	54	10	3	137	28	3	1	181	18	9	11	19	0	0	57	11	3	98	23	4	0	139	431
4:15 PM	2	7	10	20	1	2	40	14	2	116	22	2	2	156	25	8	18	19	0	4	70	13	7	105	29	1	0	155	421
4:30 PM	3	10	12	22	0	1	47	14	5	140	38	4	1	201	14	21	12	28	1	4	76	19	2	113	23	1	0	158	482
4:45 PM	11	14	15	26	1	0	67	14	7	129	22	2	0	174	11	12	18	24	1	1	66	17	3	125	29	0	1	174	481
Hourly Total	22	44	48	91	3	4	208	52	17	522	110	11	4	712	68	50	59	90	2	9	269	60	15	441	104	6	1	626	1815
5:00 PM	6	9	17	20	1	1	53	4	7	107	32	6	0	156	20	6	11	16	0	0	53	27	1	134	29	0	5	191	453
5:15 PM	7	11	15	24	0	2	57	7	5	123	27	3	1	165	14	14	13	21	0	2	62	25	1	120	20	1	0	167	451
5:30 PM	5	14	20	15	0	1	54	12	1	132	25	1	0	171	16	14	11	22	0	1	63	11	6	127	21	3	1	168	456
5:45 PM	10	10	20	30	2	0	72	12	3	143	25	2	0	185	7	14	18	21	0	1	60	16	3	87	24	2	1	132	449
Hourly Total	28	44	72	89	3	4	236	35	16	505	109	12	1	677	57	48	53	80	0	4	238	79	11	468	94	6	7	658	1809
6:00 PM	6	17	13	22	1	2	59	8	3	120	34	1	0	166	8	14	8	22	0	2	52	14	2	105	19	1	3	141	418
6:15 PM	9	16	20	14	2	5	61	6	0	94	20	2	2	122	20	6	18	25	0	0	69	21	7	69	18	0	1	115	367
Grand Total	183	328	372	580	17	40	1480	383	69	4257	884	68	26	5661	346	307	404	575	4	47	1636	478	95	2868	706	20	25	4167	12944
Approach %	12.4	22.2	25.1	39.2	1.1	-	-	6.8	1.2	75.2	15.6	1.2	-	-	21.1	18.8	24.7	35.1	0.2	-	-	11.5	2.3	68.8	16.9	0.5	-	-	-
Total %	1.4	2.5	2.9	4.5	0.1	-	11.4	3.0	0.5	32.9	6.8	0.5	-	43.7	2.7	2.4	3.1	4.4	0.0	-	12.6	3.7	0.7	22.2	5.5	0.2	-	32.2	-
Lights	175	325	369	579	17	-	1465	380	69	4226	877	68	-	5620	342	303	398	541	4	-	1588	456	87	2850	701	20	-	4114	12787
% Lights	95.6	99.1	99.2	99.8	100.0	-	99.0	99.2	100.0	99.3	99.2	100.0	-	99.3	98.8	98.7	98.5	94.1	100.0	-	97.1	95.4	91.6	99.4	99.3	100.0	-	98.7	98.8
Mediums	5	3	3	0	0	-	11	2	0	23	6	0	-	31	3	3	6	32	0	-	44	19	7	12	4	0	-	42	128
% Mediums	2.7	0.9	0.8	0.0	0.0	-	0.7	0.5	0.0	0.5	0.7	0.0	-	0.5	0.9	1.0	1.5	5.6	0.0	-	2.7	4.0	7.4	0.4	0.6	0.0	-	1.0	1.0
Articulated Trucks	2	0	0	1	0	-	3	1	0	1	1	0	-	3	1	1	0	2	0	-	4	3	1	4	1	0	-	9	19
% Articulated Trucks	1.1	0.0	0.0	0.2	0.0	-	0.2	0.3	0.0	0.0	0.1	0.0	-	0.1	0.3	0.3	0.0	0.3	0.0	-	0.2	0.6	1.1	0.1	0.1	0.0	-	0.2	0.1
Bicycles on Road	1	0	0	0	0	-	1	0	0	7	0	0	-	7	0	0	0	0	0	-	0	0	0	2	0	0	-	2	10
% Bicycles on Road	0.5	0.0	0.0	0.0	0.0	-	0.1	0.0	0.0	0.2	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.1	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	-	4	-	-	-	-	-	-	5	-	-	-	-	-	-	5	-	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	10.0	-	-	-	-	-	-	19.2	-	-	-	-	-	-	10.6	-	-	-	-	-	-	4.0	-	-
Pedestrians	-	-	-	-	-	36	-	-	-	-	-	-	21	-	-	-	-	-	-	42	-	-	-	-	-	-	24	-	-
% Pedestrians	-	-	-	-	-	90.0	-	-	-	-	-	-	80.8	-	-	-	-	-	-	89.4	-	-	-	-	-	-	96.0	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
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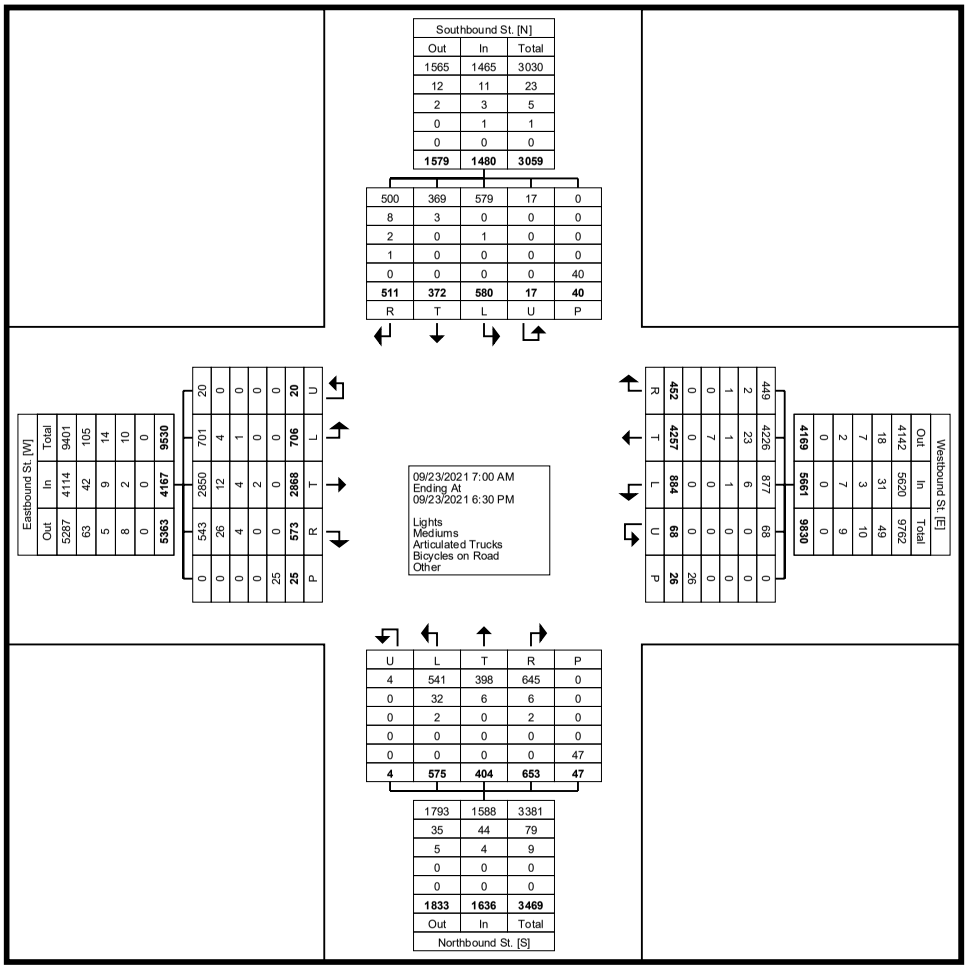
Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021



Turning Movement Data Plot

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (7:45 AM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
7:45 AM	1	6	5	6	1	0	19	5	2	158	25	0	0	190	5	7	3	2	0	0	17	6	1	58	7	0	0	72	298
8:00 AM	3	3	7	6	0	1	19	14	2	138	12	1	0	167	1	12	4	1	0	1	18	0	1	74	26	0	1	101	305
8:15 AM	6	6	4	6	0	0	22	11	1	125	41	0	0	178	5	10	10	5	0	0	30	4	2	40	31	0	0	77	307
8:30 AM	3	5	4	12	0	0	24	12	2	93	19	2	0	128	1	9	4	4	0	1	18	7	1	50	16	1	0	75	245
Total	13	20	20	30	1	1	84	42	7	514	97	3	0	663	12	38	21	12	0	2	83	17	5	222	80	1	1	325	1155
Approach %	15.5	23.8	23.8	35.7	1.2	-	-	6.3	1.1	77.5	14.6	0.5	-	-	14.5	45.8	25.3	14.5	0.0	-	-	5.2	1.5	68.3	24.6	0.3	-	-	-
Total %	1.1	1.7	1.7	2.6	0.1	-	7.3	3.6	0.6	44.5	8.4	0.3	-	57.4	1.0	3.3	1.8	1.0	0.0	-	7.2	1.5	0.4	19.2	6.9	0.1	-	28.1	-
PHF	0.542	0.833	0.714	0.625	0.250	-	0.875	0.750	0.875	0.813	0.591	0.375	-	0.872	0.600	0.792	0.525	0.600	0.000	-	0.692	0.607	0.625	0.750	0.645	0.250	-	0.804	0.941
Lights	12	20	20	29	1	-	82	42	7	510	97	3	-	659	10	37	21	9	0	-	77	14	5	220	80	1	-	320	1138
% Lights	92.3	100.0	100.0	96.7	100.0	-	97.6	100.0	100.0	99.2	100.0	100.0	-	99.4	83.3	97.4	100.0	75.0	-	-	92.8	82.4	100.0	99.1	100.0	100.0	-	98.5	98.5
Mediums	1	0	0	0	0	-	1	0	0	2	0	0	-	2	1	1	0	2	0	-	4	1	0	1	0	0	-	2	9
% Mediums	7.7	0.0	0.0	0.0	0.0	-	1.2	0.0	0.0	0.4	0.0	0.0	-	0.3	8.3	2.6	0.0	16.7	-	-	4.8	5.9	0.0	0.5	0.0	0.0	-	0.6	0.8
Articulated Trucks	0	0	0	1	0	-	1	0	0	0	0	0	-	0	1	0	0	1	0	-	2	2	0	1	0	0	-	3	6
% Articulated Trucks	0.0	0.0	0.0	3.3	0.0	-	1.2	0.0	0.0	0.0	0.0	0.0	-	0.0	8.3	0.0	0.0	8.3	-	-	2.4	11.8	0.0	0.5	0.0	0.0	-	0.9	0.5
Bicycles on Road	0	0	0	0	0	-	0	0	0	2	0	0	-	2	0	0	0	0	0	-	0	0	0	0	0	0	-	0	2
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.4	0.0	0.0	-	0.3	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.2
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	100.0	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	2	-	-	-	-	-	-	1	-	-
% Pedestrians	-	-	-	-	-	0.0	-	-	-	-	-	-	-	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-

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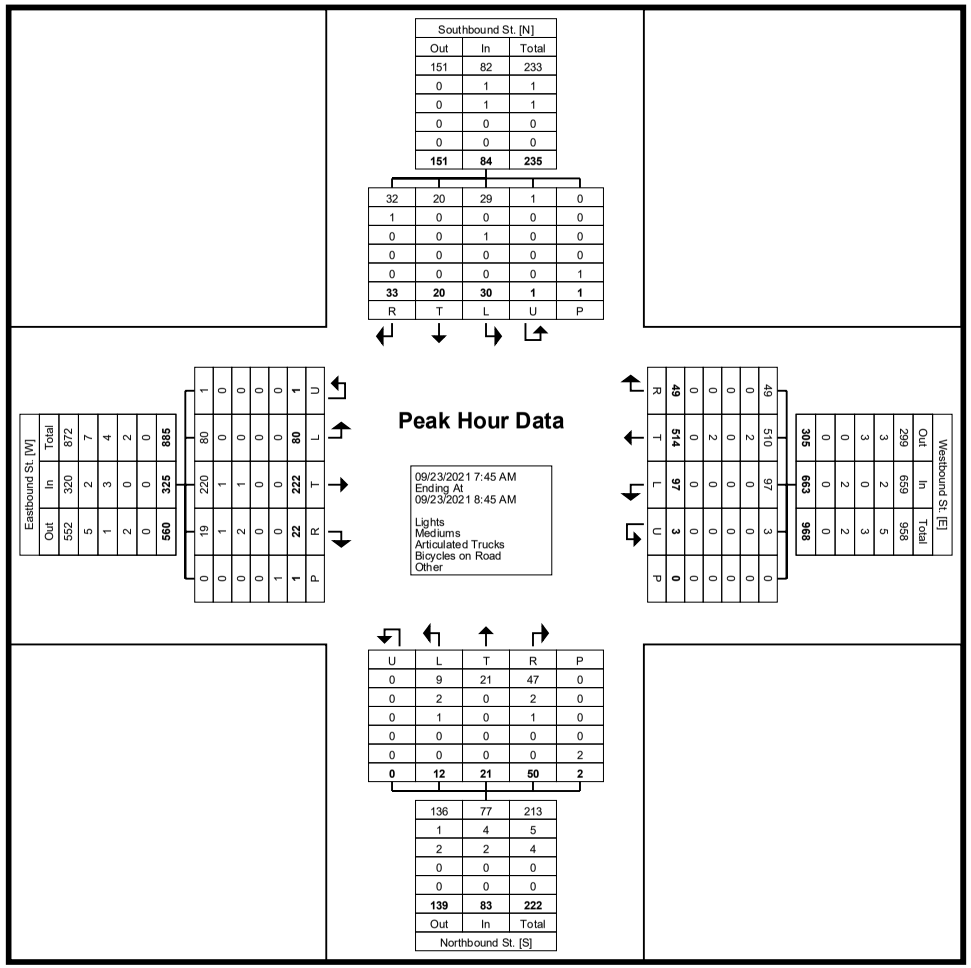

Turning Movement Peak Hour Data Plot (7:45 AM)

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (11:00 AM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
11:00 AM	1	13	10	11	0	2	35	11	1	120	20	2	1	154	6	6	7	13	0	1	32	13	2	72	20	0	0	107	328
11:15 AM	4	10	11	19	1	1	45	12	4	106	26	1	0	149	12	7	11	13	0	3	43	10	4	85	21	0	1	120	357
11:30 AM	2	12	10	17	0	2	41	12	2	133	32	2	2	181	12	3	6	17	0	1	38	9	2	87	18	0	1	116	376
11:45 AM	3	12	8	19	0	0	42	19	2	159	28	2	2	210	7	5	11	20	0	2	43	21	5	78	20	1	0	125	420
Total	10	47	39	66	1	5	163	54	9	518	106	7	5	694	37	21	35	63	0	7	156	53	13	322	79	1	2	468	1481
Approach %	6.1	28.8	23.9	40.5	0.6	-	-	7.8	1.3	74.6	15.3	1.0	-	-	23.7	13.5	22.4	40.4	0.0	-	-	11.3	2.8	68.8	16.9	0.2	-	-	-
Total %	0.7	3.2	2.6	4.5	0.1	-	11.0	3.6	0.6	35.0	7.2	0.5	-	46.9	2.5	1.4	2.4	4.3	0.0	-	10.5	3.6	0.9	21.7	5.3	0.1	-	31.6	-
PHF	0.625	0.904	0.886	0.868	0.250	-	0.906	0.711	0.563	0.814	0.828	0.875	-	0.826	0.771	0.750	0.795	0.788	0.000	-	0.907	0.631	0.650	0.925	0.940	0.250	-	0.936	0.882
Lights	9	47	39	66	1	-	162	53	9	515	103	7	-	687	37	20	34	59	0	-	150	50	12	320	78	1	-	461	1460
% Lights	90.0	100.0	100.0	100.0	100.0	-	99.4	98.1	100.0	99.4	97.2	100.0	-	99.0	100.0	95.2	97.1	93.7	-	-	96.2	94.3	92.3	99.4	98.7	100.0	-	98.5	98.6
Mediums	1	0	0	0	0	-	1	0	0	2	3	0	-	5	0	0	1	4	0	-	5	3	1	2	0	0	-	6	17
% Mediums	10.0	0.0	0.0	0.0	0.0	-	0.6	0.0	0.0	0.4	2.8	0.0	-	0.7	0.0	0.0	2.9	6.3	-	-	3.2	5.7	7.7	0.6	0.0	0.0	-	1.3	1.1
Articulated Trucks	0	0	0	0	0	-	0	1	0	0	0	0	-	1	0	1	0	0	0	-	1	0	0	0	1	0	-	1	3
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	-	0.0	1.9	0.0	0.0	0.0	0.0	-	0.1	0.0	4.8	0.0	0.0	-	-	0.6	0.0	0.0	0.0	1.3	0.0	-	0.2	0.2
Bicycles on Road	0	0	0	0	0	-	0	0	0	1	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	1
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.2	0.0	0.0	-	0.1	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.1
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	14.3	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	5	-	-	-	-	-	-	5	-	-	-	-	-	-	6	-	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	85.7	-	-	-	-	-	-	100.0	-	-

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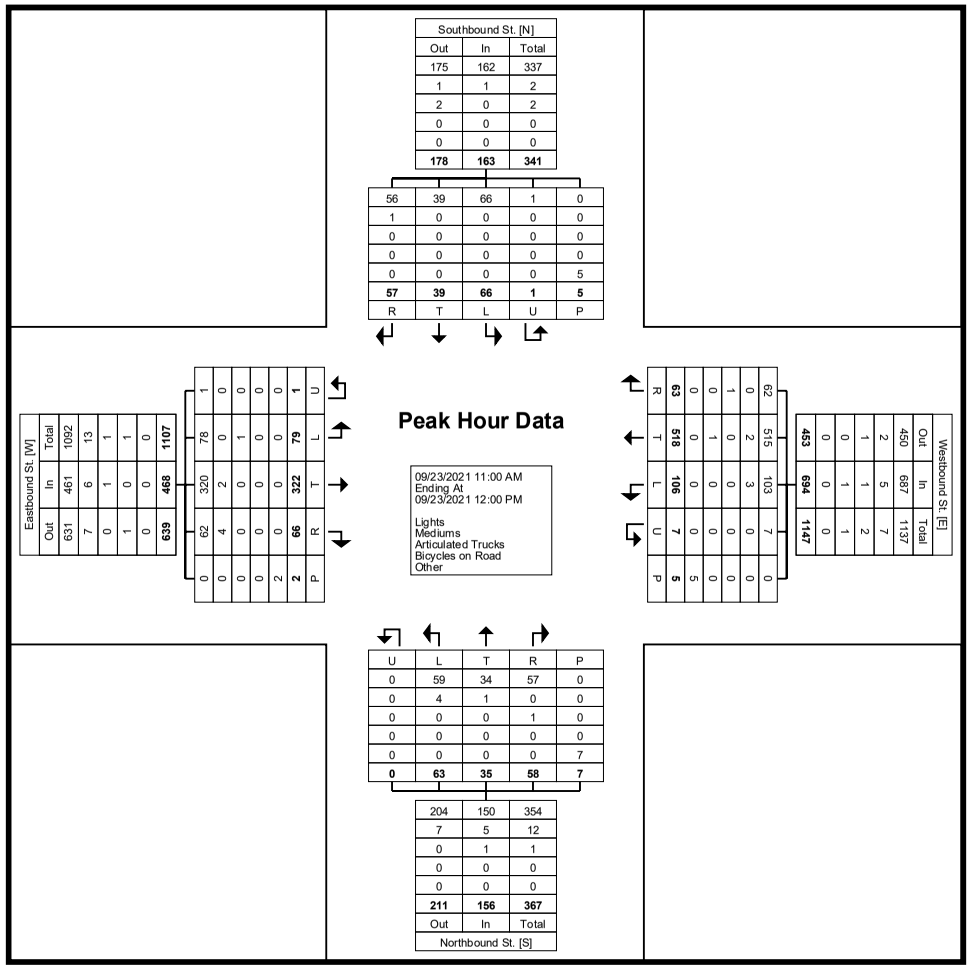

Turning Movement Peak Hour Data Plot (11:00 AM)

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Count Name: NM 313.01
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Start Date: 09/23/2021

Turning Movement Peak Hour Data (12:30 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
12:30 PM	7	2	20	20	0	2	49	12	0	131	25	1	4	169	11	8	16	23	0	3	58	19	0	71	29	0	0	119	395
12:45 PM	16	11	16	20	0	0	63	24	0	140	31	1	1	196	11	6	22	29	1	0	69	26	2	78	24	1	1	131	459
1:00 PM	5	12	12	23	0	2	52	13	4	125	28	1	2	171	10	8	14	23	0	1	55	21	3	94	23	0	2	141	419
1:15 PM	6	17	14	16	1	3	54	14	1	142	37	5	0	199	10	9	13	24	0	1	56	13	5	79	34	0	0	131	440
Total	34	42	62	79	1	7	218	63	5	538	121	8	7	735	42	31	65	99	1	5	238	79	10	322	110	1	3	522	1713
Approach %	15.6	19.3	28.4	36.2	0.5	-	-	8.6	0.7	73.2	16.5	1.1	-	-	17.6	13.0	27.3	41.6	0.4	-	-	15.1	1.9	61.7	21.1	0.2	-	-	-
Total %	2.0	2.5	3.6	4.6	0.1	-	12.7	3.7	0.3	31.4	7.1	0.5	-	42.9	2.5	1.8	3.8	5.8	0.1	-	13.9	4.6	0.6	18.8	6.4	0.1	-	30.5	-
PHF	0.531	0.618	0.775	0.859	0.250	-	0.865	0.656	0.313	0.947	0.818	0.400	-	0.923	0.955	0.861	0.739	0.853	0.250	-	0.862	0.760	0.500	0.856	0.809	0.250	-	0.926	0.933
Lights	33	41	62	79	1	-	216	63	5	535	119	8	-	730	42	31	65	93	1	-	232	75	10	320	110	1	-	516	1694
% Lights	97.1	97.6	100.0	100.0	100.0	-	99.1	100.0	100.0	99.4	98.3	100.0	-	99.3	100.0	100.0	100.0	93.9	100.0	-	97.5	94.9	100.0	99.4	100.0	100.0	-	98.9	98.9
Mediums	1	1	0	0	0	-	2	0	0	3	2	0	-	5	0	0	0	6	0	-	6	4	0	1	0	0	-	5	18
% Mediums	2.9	2.4	0.0	0.0	0.0	-	0.9	0.0	0.0	0.6	1.7	0.0	-	0.7	0.0	0.0	0.0	6.1	0.0	-	2.5	5.1	0.0	0.3	0.0	0.0	-	1.0	1.1
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	1	0	0	-	1	1
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.3	0.0	0.0	-	0.2	0.1
Bicycles on Road	0	0	0	0	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	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	1	-	-	-	-	-	-	1	-	-	-	-	-	-	0	-	-	-	-	-	-	1	-	-
% Bicycles on Crosswalk	-	-	-	-	-	14.3	-	-	-	-	-	-	14.3	-	-	-	-	-	-	0.0	-	-	-	-	-	-	33.3	-	-
Pedestrians	-	-	-	-	-	6	-	-	-	-	-	-	6	-	-	-	-	-	-	5	-	-	-	-	-	-	2	-	-
% Pedestrians	-	-	-	-	-	85.7	-	-	-	-	-	-	85.7	-	-	-	-	-	-	100.0	-	-	-	-	-	-	66.7	-	-

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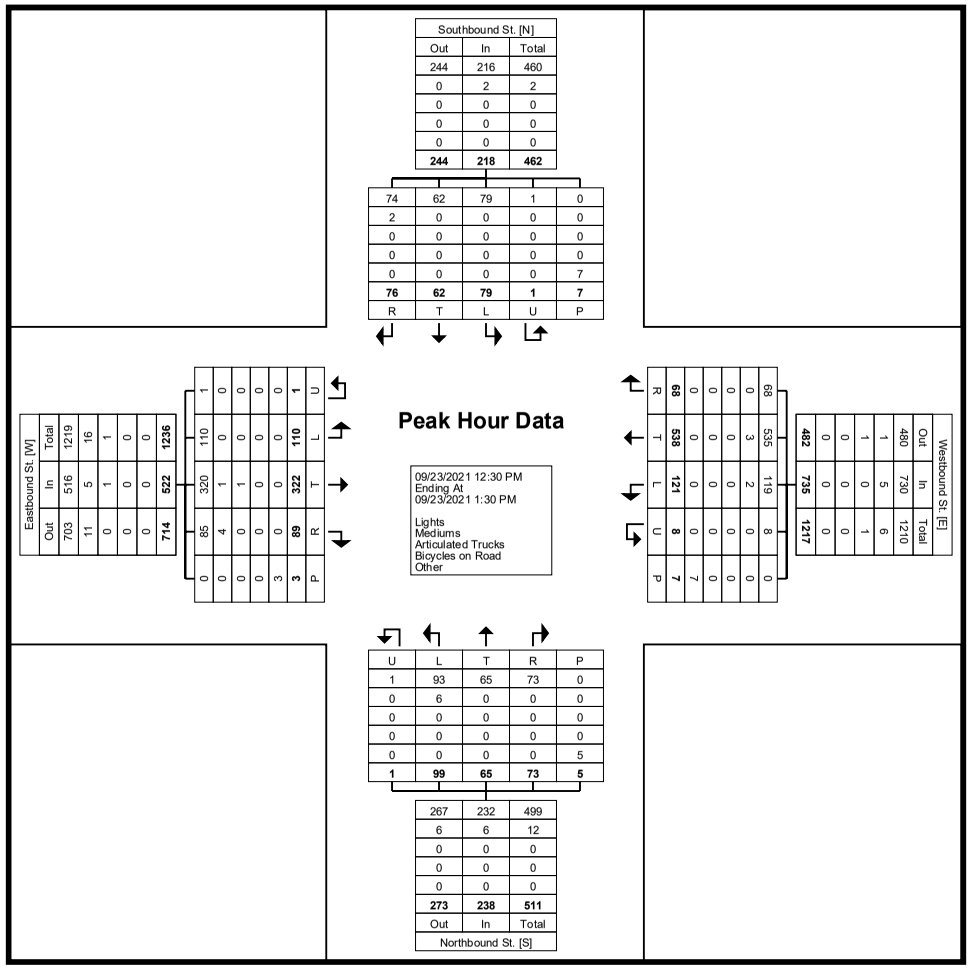
Start Date: 09/23/2021



Turning Movement Peak Hour Data Plot (12:30 PM)

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 313.01
Site Code:
Start Date: 09/23/2021

Turning Movement Peak Hour Data (4:30 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:30 PM	3	10	12	22	0	1	47	14	5	140	38	4	1	201	14	21	12	28	1	4	76	19	2	113	23	1	0	158	482
4:45 PM	11	14	15	26	1	0	67	14	7	129	22	2	0	174	11	12	18	24	1	1	66	17	3	125	29	0	1	174	481
5:00 PM	6	9	17	20	1	1	53	4	7	107	32	6	0	156	20	6	11	16	0	0	53	27	1	134	29	0	5	191	453
5:15 PM	7	11	15	24	0	2	57	7	5	123	27	3	1	165	14	14	13	21	0	2	62	25	1	120	20	1	0	167	451
Total	27	44	59	92	2	4	224	39	24	499	119	15	2	696	59	53	54	89	2	7	257	88	7	492	101	2	6	690	1867
Approach %	12.1	19.6	26.3	41.1	0.9	-	-	5.6	3.4	71.7	17.1	2.2	-	-	23.0	20.6	21.0	34.6	0.8	-	-	12.8	1.0	71.3	14.6	0.3	-	-	-
Total %	1.4	2.4	3.2	4.9	0.1	-	12.0	2.1	1.3	26.7	6.4	0.8	-	37.3	3.2	2.8	2.9	4.8	0.1	-	13.8	4.7	0.4	26.4	5.4	0.1	-	37.0	-
PHF	0.614	0.786	0.868	0.885	0.500	-	0.836	0.696	0.857	0.891	0.783	0.625	-	0.866	0.738	0.631	0.750	0.795	0.500	-	0.845	0.815	0.583	0.918	0.871	0.500	-	0.903	0.968
Lights	26	44	58	92	2	-	222	39	24	497	119	15	-	694	58	53	53	86	2	-	252	85	7	490	101	2	-	685	1853
% Lights	96.3	100.0	98.3	100.0	100.0	-	99.1	100.0	100.0	99.6	100.0	100.0	-	99.7	98.3	100.0	98.1	96.6	100.0	-	98.1	96.6	100.0	99.6	100.0	100.0	-	99.3	99.3
Mediums	0	0	1	0	0	-	1	0	0	2	0	0	-	2	1	0	1	3	0	-	5	3	0	1	0	0	-	4	12
% Mediums	0.0	0.0	1.7	0.0	0.0	-	0.4	0.0	0.0	0.4	0.0	0.0	-	0.3	1.7	0.0	1.9	3.4	0.0	-	1.9	3.4	0.0	0.2	0.0	0.0	-	0.6	0.6
Articulated Trucks	1	0	0	0	0	-	1	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	1	0	0	-	1	2
% Articulated Trucks	3.7	0.0	0.0	0.0	0.0	-	0.4	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.2	0.0	0.0	-	0.1	0.1
Bicycles on Road	0	0	0	0	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	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	4	-	-	-	-	-	-	2	-	-	-	-	-	-	7	-	-	-	-	-	-	6	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-

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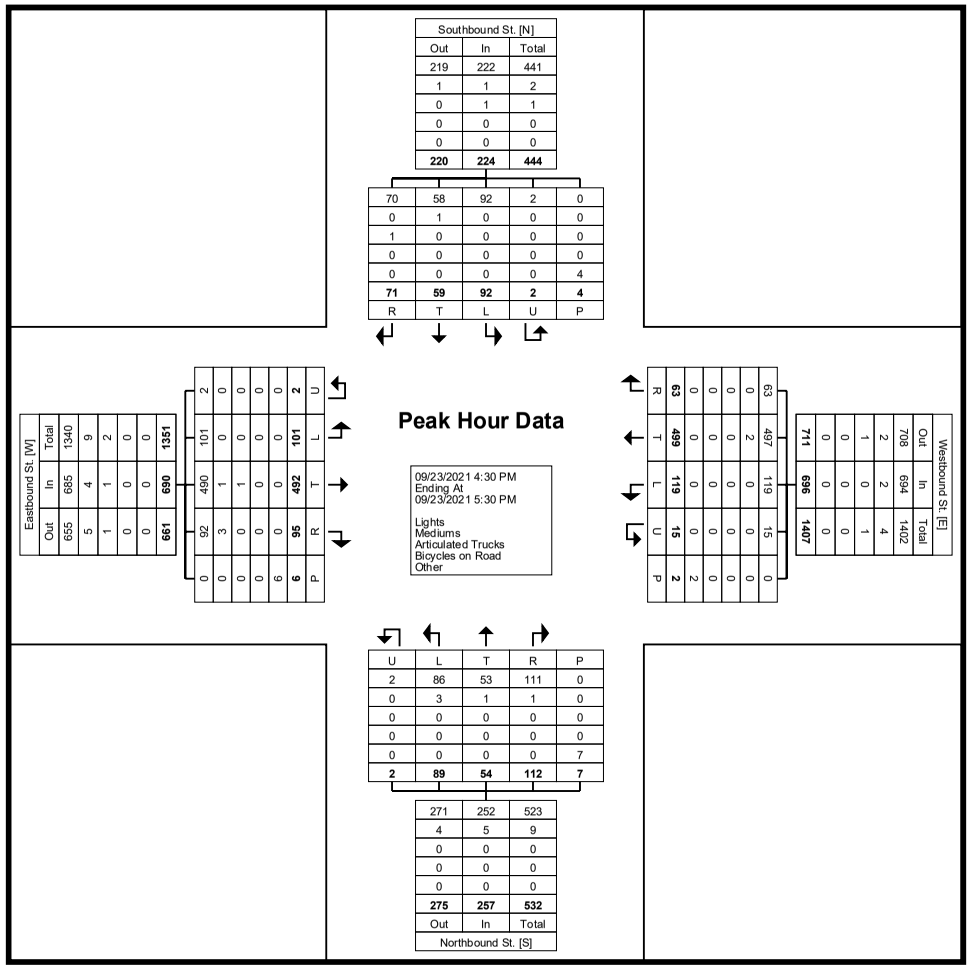
Start Date: 09/23/2021



Turning Movement Peak Hour Data Plot (4:30 PM)

Turning Movement Data
Indian School and Uptown Loop
9-24-2021

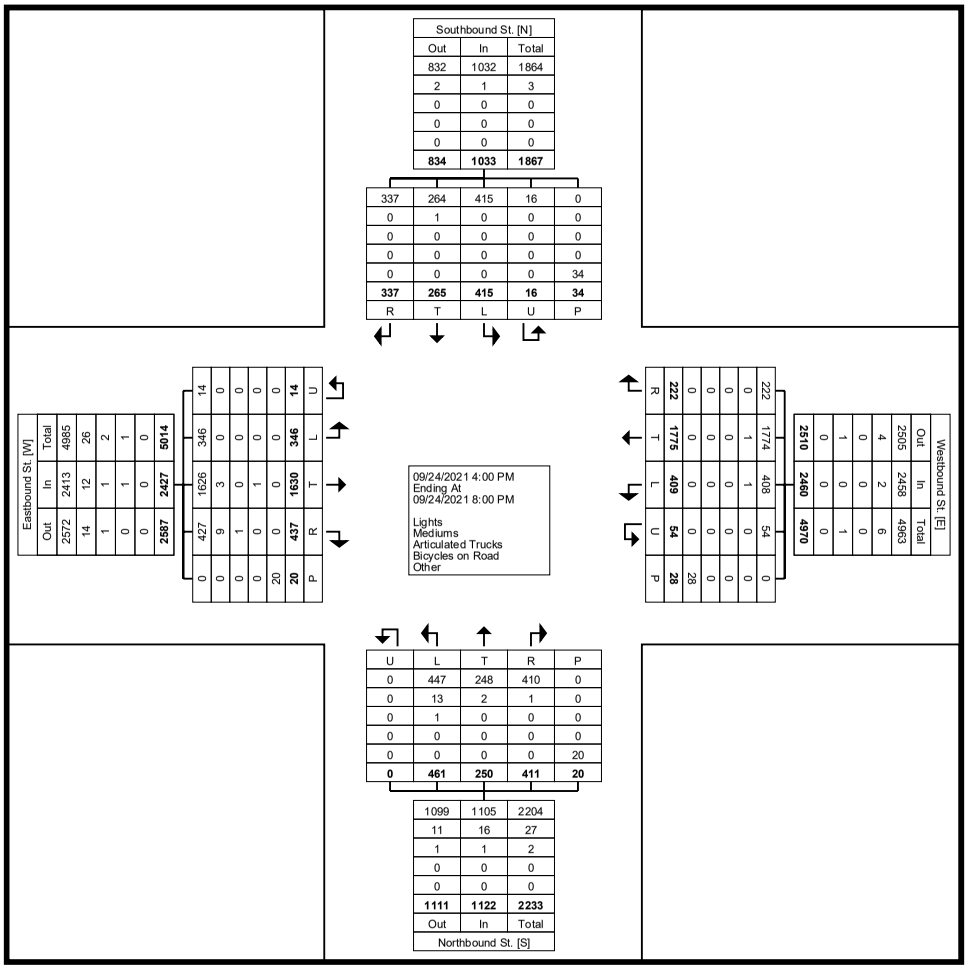
Count Name: NM 3131.01
Site Code:
Start Date: 09/24/2021
Page No: 1

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:00 PM	12	14	19	24	0	1	69	13	3	132	34	3	3	185	18	11	22	28	0	1	79	21	7	118	23	0	3	169	502
4:15 PM	2	18	13	28	2	3	63	13	3	128	25	6	4	175	18	8	12	29	0	2	67	26	0	115	24	0	0	165	470
4:30 PM	4	15	19	26	2	4	66	14	1	124	37	5	2	181	10	13	17	23	0	0	63	25	3	125	23	0	0	176	486
4:45 PM	5	18	21	37	0	1	81	16	6	127	30	4	2	183	9	13	17	35	0	3	74	34	0	103	17	0	1	154	492
Hourly Total	23	65	72	115	4	9	279	56	13	511	126	18	11	724	55	45	68	115	0	6	283	106	10	461	87	0	4	664	1950
5:00 PM	8	14	21	28	0	3	71	6	3	128	29	2	1	168	10	12	14	21	0	3	57	22	4	128	21	4	5	179	475
5:15 PM	12	12	22	30	0	3	76	11	1	104	27	1	1	144	25	13	15	34	0	0	87	14	5	123	24	0	1	166	473
5:30 PM	6	8	12	25	1	1	52	8	4	142	28	3	0	185	9	14	19	18	0	2	60	17	8	132	25	1	2	183	480
5:45 PM	5	11	15	25	1	2	57	15	2	104	35	4	0	160	7	7	10	24	0	2	48	17	7	107	30	3	3	164	429
Hourly Total	31	45	70	108	2	9	256	40	10	478	119	10	2	657	51	46	58	97	0	7	252	70	24	490	100	8	11	692	1857
6:00 PM	14	14	11	22	1	1	62	8	3	103	27	7	3	148	10	9	10	31	0	0	60	23	3	101	28	1	3	156	426
6:15 PM	8	23	15	30	1	1	77	7	7	103	29	1	1	147	21	9	12	40	0	1	82	24	3	85	19	2	0	133	439
6:30 PM	8	16	24	28	2	4	78	7	1	98	29	4	0	139	23	5	20	38	0	5	86	25	3	91	17	2	1	138	441
6:45 PM	5	11	20	23	0	0	59	17	1	110	17	4	2	149	23	8	21	23	0	1	75	28	4	82	29	0	0	143	426
Hourly Total	35	64	70	103	4	6	276	39	12	414	102	16	6	583	77	31	63	132	0	7	303	100	13	359	93	5	4	570	1732
7:00 PM	6	19	15	26	0	0	66	16	1	117	18	4	1	156	19	3	16	26	0	0	64	26	8	81	15	0	0	130	416
7:15 PM	11	13	16	27	1	6	68	4	5	92	14	1	7	116	12	11	16	36	0	0	75	22	7	76	17	0	0	122	381
7:30 PM	9	6	16	25	3	2	59	14	5	84	14	3	0	120	20	11	17	31	0	0	79	26	4	85	17	0	1	132	390
7:45 PM	3	7	6	11	2	2	29	6	1	79	16	2	1	104	17	13	12	24	0	0	66	17	4	78	17	1	0	117	316
Hourly Total	29	45	53	89	6	10	222	40	12	372	62	10	9	496	68	38	61	117	0	0	284	91	23	320	66	1	1	501	1503
Grand Total	118	219	265	415	16	34	1033	175	47	1775	409	54	28	2460	251	160	250	461	0	20	1122	367	70	1630	346	14	20	2427	7042
Approach %	11.4	21.2	25.7	40.2	1.5	-	-	7.1	1.9	72.2	16.6	2.2	-	-	22.4	14.3	22.3	41.1	0.0	-	-	15.1	2.9	67.2	14.3	0.6	-	-	-
Total %	1.7	3.1	3.8	5.9	0.2	-	14.7	2.5	0.7	25.2	5.8	0.8	-	34.9	3.6	2.3	3.6	6.5	0.0	-	15.9	5.2	1.0	23.1	4.9	0.2	-	34.5	-
Lights	118	219	264	415	16	-	1032	175	47	1774	408	54	-	2458	251	159	248	447	0	-	1105	360	67	1626	346	14	-	2413	7008
% Lights	100.0	100.0	99.6	100.0	100.0	-	99.9	100.0	100.0	99.9	99.8	100.0	-	99.9	100.0	99.4	99.2	97.0	-	-	98.5	98.1	95.7	99.8	100.0	100.0	-	99.4	99.5
Mediums	0	0	1	0	0	-	1	0	0	1	1	0	-	2	0	1	2	13	0	-	16	7	2	3	0	0	-	12	31
% Mediums	0.0	0.0	0.4	0.0	0.0	-	0.1	0.0	0.0	0.1	0.2	0.0	-	0.1	0.0	0.6	0.8	2.8	-	-	1.4	1.9	2.9	0.2	0.0	0.0	-	0.5	0.4
Articulated Trucks	0	0	0	0	0	-	0	0	0	0	0	0	-	0	0	0	0	1	0	-	1	0	1	0	0	0	-	1	2
% Articulated Trucks	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.2	-	-	0.1	0.0	1.4	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	1	0	0	-	1	1
% Bicycles on Road	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.1	0.0	0.0	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	3	-	-	-	-	-	-	0	-	-

% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	15.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	34	-	-	-	-	-	-	28	-	-	-	-	-	-	17	-	-	-	-	-	-	20	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	85.0	-	-	-	-	-	-	100.0	-	-

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 3131.01
Site Code:
Start Date: 09/24/2021
Page No: 3



Turning Movement Data Plot

Lee Engineering, LLC
Phoenix, Arizona - Dallas, Texas
Oklahoma City, Oklahoma - San Antonio, Texas
Albuquerque, New Mexico, United States
jkruse@lee-eng.com

Count Name: NM 3131.01
Site Code:
Start Date: 09/24/2021

Turning Movement Peak Hour Data (4:00 PM)

Start Time	Southbound St. Southbound							Westbound St. Westbound							Northbound St. Northbound							Eastbound St. Eastbound							
	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Right	Right on Red	Thru	Left	U-Turn	Peds	App. Total	Int. Total
4:00 PM	12	14	19	24	0	1	69	13	3	132	34	3	3	185	18	11	22	28	0	1	79	21	7	118	23	0	3	169	502
4:15 PM	2	18	13	28	2	3	63	13	3	128	25	6	4	175	18	8	12	29	0	2	67	26	0	115	24	0	0	165	470
4:30 PM	4	15	19	26	2	4	66	14	1	124	37	5	2	181	10	13	17	23	0	0	63	25	3	125	23	0	0	176	486
4:45 PM	5	18	21	37	0	1	81	16	6	127	30	4	2	183	9	13	17	35	0	3	74	34	0	103	17	0	1	154	492
Total	23	65	72	115	4	9	279	56	13	511	126	18	11	724	55	45	68	115	0	6	283	106	10	461	87	0	4	664	1950
Approach %	8.2	23.3	25.8	41.2	1.4	-	-	7.7	1.8	70.6	17.4	2.5	-	-	19.4	15.9	24.0	40.6	0.0	-	-	16.0	1.5	69.4	13.1	0.0	-	-	-
Total %	1.2	3.3	3.7	5.9	0.2	-	14.3	2.9	0.7	26.2	6.5	0.9	-	37.1	2.8	2.3	3.5	5.9	0.0	-	14.5	5.4	0.5	23.6	4.5	0.0	-	34.1	-
PHF	0.479	0.903	0.857	0.777	0.500	-	0.861	0.875	0.542	0.968	0.851	0.750	-	0.978	0.764	0.865	0.773	0.821	0.000	-	0.896	0.779	0.357	0.922	0.906	0.000	-	0.943	0.971
Lights	23	65	71	115	4	-	278	56	13	510	125	18	-	722	55	45	66	112	0	-	278	104	9	461	87	0	-	661	1939
% Lights	100.0	100.0	98.6	100.0	100.0	-	99.6	100.0	100.0	99.8	99.2	100.0	-	99.7	100.0	100.0	97.1	97.4	-	-	98.2	98.1	90.0	100.0	100.0	-	-	99.5	99.4
Mediums	0	0	1	0	0	-	1	0	0	1	1	0	-	2	0	0	2	3	0	-	5	2	1	0	0	0	-	3	11
% Mediums	0.0	0.0	1.4	0.0	0.0	-	0.4	0.0	0.0	0.2	0.8	0.0	-	0.3	0.0	0.0	2.9	2.6	-	-	1.8	1.9	10.0	0.0	0.0	-	-	0.5	0.6
Articulated Trucks	0	0	0	0	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	0.0	-	0.0	0.0	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	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	0.0	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0	0.0	0.0	0.0	-	-	0.0	0.0
Bicycles on Crosswalk	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-	-	-	-	-	0	-	-
% Bicycles on Crosswalk	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-	-	-	-	-	0.0	-	-
Pedestrians	-	-	-	-	-	9	-	-	-	-	-	-	11	-	-	-	-	-	-	6	-	-	-	-	-	-	4	-	-
% Pedestrians	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-	-	-	-	-	100.0	-	-

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Count Name: NM 3131.01
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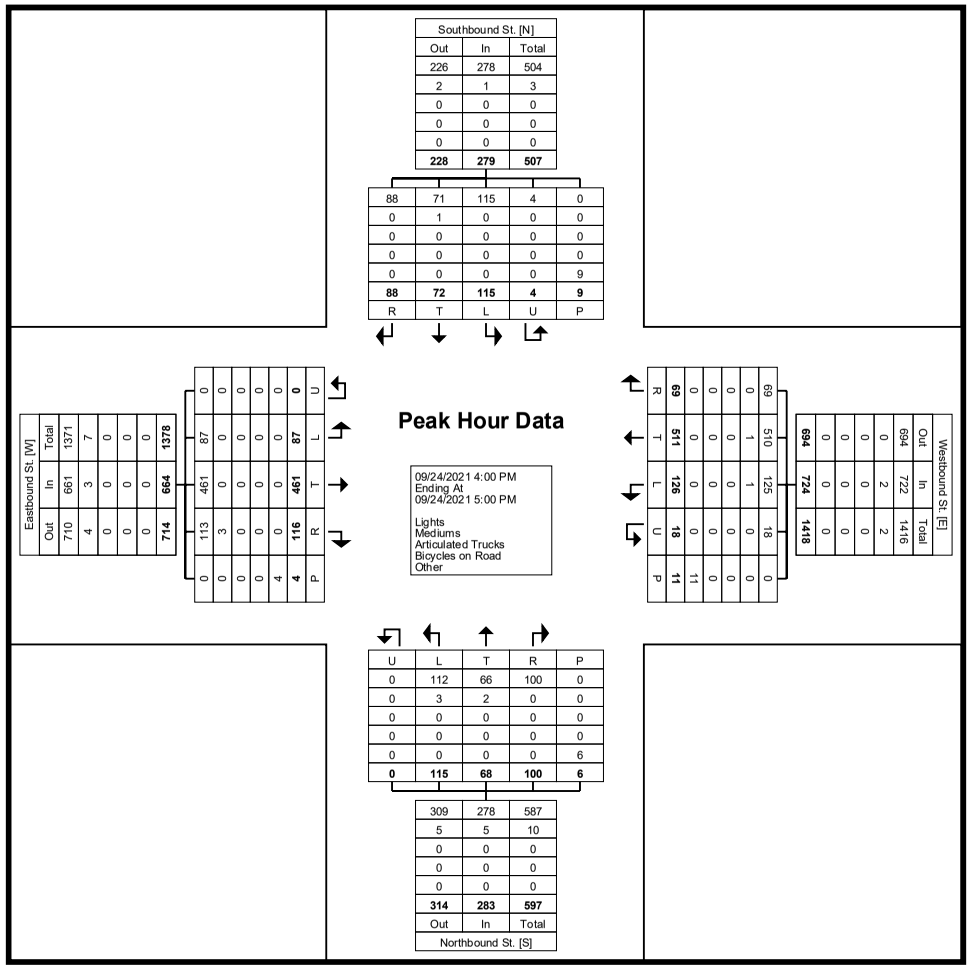


Turning Movement Peak Hour Data Plot (4:00 PM)

Appendix B

Preliminary Geotechnical Report

Draft Preliminary Geotechnical Report

Uptown Intersection Improvements

Indian School Road NE – Americas Parkway NE and Uptown Loop NE

NMDOT CN A302250

Albuquerque, Bernalillo County, New Mexico

January 18, 2022

Terracon Project No. 66215129

Prepared for:

Parametrix

Albuquerque, New Mexico

Prepared by:

Terracon Consultants, Inc.

Albuquerque, New Mexico

January 18, 2022

Parametrix
9600 San Mateo Boulevard NE
Albuquerque, New Mexico 87113

Attn: Ms. Stephanie Miller
P: (505) 998-5580
E: SMiller@parametrix.com

Re: Preliminary Geotechnical Report
Uptown Intersection Improvements
Indian School Road NE – Americas Parkway NE to Uptown Loop NE
NMDOT CN A302250
Albuquerque, Bernalillo County, New Mexico
Terracon Project No. 66215129

Dear Ms. Miller:

Terracon Consultants, Inc. (Terracon) has completed the Preliminary Geotechnical Report for the above referenced project. These services were performed in general accordance with our Proposal Number P66215129 dated June 16, 2021 and the Parametrix Subconsultant Agreement For Professional Services dated September 7, 2021. This preliminary geotechnical report presents the results of literature research, geologic and geotechnical literature searches, site reconnaissance, review of Geotechnical data in the area, and current field exploration and laboratory testing being performed along the project alignment.

This report provides preliminary geotechnical information concerning the evaluation and conceptual and preliminary design of the geotechnical-related phases of the project.

Terracon will also be performing the geotechnical services for the Final Geotechnical Report and Pavement Design Report as part of future phases of the project. The results of these studies will be submitted under separate cover and include boring logs, laboratory test results, and final design parameters and recommendations.

We appreciate the opportunity to be of service to you on this project. If you have any questions concerning this report, or if we may be of further service, please contact us.

Sincerely,
Terracon Consultants, Inc.

Stenson D. Lee
Staff Engineer

Michael E. Anderson, P.E.
Principal

TABLE OF CONTENTS

EXECUTIVE SUMMARY

This geotechnical executive summary should be used in conjunction with the entire report for conceptual and preliminary design purposes. It should be recognized that specific details were not included or fully developed in this section, and the report must be read in its entirety for a comprehensive understanding of the items contained herein. The section titled General Comments should be read for an understanding of the report limitations.

A Preliminary Geotechnical Report based upon geologic and geotechnical literature searches, site reconnaissance, review of Geotechnical data in the area, and the current field exploration and laboratory testing services being performed along the project alignment for the proposed Uptown Intersection Improvements Project located along Indian School Road NE from Americas Parkway NE to Uptown Loop Road in Albuquerque, Bernalillo County, New Mexico

Based on the information obtained from our literature search, site reconnaissance, Terracon geotechnical reports in the area and current field exploration and laboratory testing programs being performed along the project alignment, it is our opinion that the project is suitable for the planned roadway improvements. The following geotechnical considerations were identified:

Existing Pavement Section Thickness: Based upon our current field exploration, the existing pavement section along the project alignment consists of approximately 6 to 9 inches of asphalt concrete overlying 0 to 8 inches of base course.

Site Soils: Based upon our current field exploration program, the site subsurface consist predominantly of sand with varying amounts of clay, silt and gravel with some interbedded clay and silt layers to the full depth of exploration of about 26.5 feet below existing site grade. The surface and shallow subsurface soils at the project site exhibit a low to moderate tendency for compression with increasing load and when elevated in moisture content. The shallow and deeper soils exhibit low to moderate bearing capacity. The soils may be recompacted to increase bearing capacity and reduce settlement. It is our opinion that the sand soils have relatively good quality pavement support characteristics.

Groundwater: Groundwater was not encountered in the borings during field exploration.

Construction and Excavation: On-site sands are anticipated to be suitable for use as structural backfill for pavements. Existing pavements, concrete curb, gutter, and sidewalks, utilities, and possibly landscaping will require removal prior to new construction. Shallow excavations into the on-site soils are expected to be accomplished with conventional earthwork equipment. Caving soils will likely be encountered during construction.

Foundations: The light and traffic structures are anticipated to be supported on a deep foundation consisting of drilled shafts bearing on undisturbed soil. The foundations can be designed per NMDOT or COA Standard Drawings. Casing and/or drilling slurry may be required for drilled shaft construction.

Pavement: The subgrade soils consist predominantly of relatively high quality sand subgrade. The anticipated pavement thickness will be based upon the subgrade materials and traffic types and volumes along the project alignment. Thicker pavement sections will be associated with poorer quality subgrades associated with clayey sand subgrade.

Terracon will also be performing the geotechnical services for the Final Geotechnical Report and Pavement Design Report as part of future phases of the project. The results of these studies will be submitted under separate cover and include boring logs, laboratory test results, and final design parameters and recommendations.

PRELIMINARY GEOTECHNICAL REPORT
UPTOWN INTERSECTION IMPROVEMENTS
INDIAN SCHOOL ROAD NE – AMERICAS PARKWAY NE TO UPTOWN LOOP ROAD
CN A30100
ALBUQUQUERQUE, BERNALILLO COUNTY, NEW MEXICO

Terracon Project No. 66215129
January 18, 2022

1.0 INTRODUCTION

This report presents the results of our preliminary geotechnical report performed for proposed Uptown Intersection Improvements Project located along Indian School Road NE from Americas Parkway NE to Uptown Loop Road in Albuquerque, Bernalillo County, New Mexico. The report addresses the following:

- Subsurface soil conditions
- Groundwater levels
- Geologic conditions that could impact the proposed alignment and structures
- Possible impacts, effects, and possible mitigation measures associated with improvements within the project area
- Construction difficulties
- Preliminary foundation considerations
- Preliminary pavement design and construction considerations

The scope of the work performed for this project included site reconnaissance by a Terracon geotechnical engineer, a search of available geologic literature, geologic and geotechnical literature searches, site reconnaissance, review of Geotechnical data in the area, and current field exploration and laboratory testing (currently in progress) performed along the project alignment.

Terracon will also be performing the geotechnical services for the Final Geotechnical Report and Pavement Design Report as part of future phases of the project. The results of these studies will be submitted under separate cover and include boring logs, laboratory test results, and final design parameters and recommendations.

2.0 PROJECT INFORMATION

2.1 Site Location and Description

ITEM	DESCRIPTION
Location	Indian School Road NE from Americas Parkway NE to Uptown Loop Road NE including the north and south legs of the intersection of Louisiana Boulevard NE in Albuquerque, New Mexico.
Existing Improvements	Majority 4-lane asphalt concrete paved roadway with narrow paved shoulders/bike lanes, center medians and turn lanes, Portland cement concrete curb, gutter, and sidewalk, landscaping, and utilities.
Length of improvements	Indian School - Approximately 1,800 lineal feet Louisiana Boulevard – 900 lineal feet
Current Ground Cover	Asphalt concrete, Portland cement concrete, and landscaping
Existing Topography	Relatively flat sloping gently down to the west (assumed).
Geotechnical Conditions	The subsurface soils are anticipated to consist of loose to medium dense sands with some stiff to very stiff clay and silt layers.

2.2 Project Description

ITEM	DESCRIPTION
Improvements	At this time, the improvements will generally consist of the following: ■ Expanded sidewalk, ADA ramps, and landscaping ■ Pedestrian crosswalk improvements ■ Roundabout at Indian School Road and Q Street ■ Traffic signal and intersection lighting improvements
Grading	At or near existing roadway alignment grade
New Traffic Signals	Intersections at: ■ Indian School Road and Louisiana Boulevard ■ Indian School Road and Q Street
Pavement Wearing Surface	Asphalt concrete overlying aggregate base course
New traffic signal foundations	Drilled shafts per NMDOT Standard Drawings

ITEM	DESCRIPTION
Design Requirements	2020 NMDOT Design Manual NMDOT IDD -2008-05 Pavement Design Guideline
Material Specifications	2019 NMDOT Standard Specifications for Highway and Bridge Construction

3.0 GEOLOGIC CONDITIONS

3.1 Regional Geology

The site occupies a position on a gently sloping piedmont surface on the east side of the Albuquerque-Belen basin. The piedmont surface extends from the Sandia Mountains to the Rio Grande. The Albuquerque-Belen basin is part of an interconnected series of north-south aligned grabens and structural basins which have subsided between mountain and highland uplifts comprising the Rio Grande Rift. The complex structural basin was formed during the Tertiary Period, more than seven million years ago, when the Sandia-Manzano fault block was uplifted and tilted. The basin is approximately 100 miles long and varies from 20 to 40 miles wide. The sloping surface of the valley fill consists of a series of coalescing alluvial fans deposited unconformably on the formations of the Santa Fe Group. The Santa Fe Group consists of beds of unconsolidated to loosely consolidated sediments (detritus consisting of gravel, sand, silt, clay, and caliche) locally interbedded with volcanic rocks.

The piedmont soils at and around the site are composed of valley-fill alluvium. The valley-fill alluvium (silt, clay, sand, and gravel) was deposited as arroyo channel fill and lenticular interchannel deposits. These soils range from poorly-sorted mudflow material to well-sorted stream gravel. The variable depositional conditions occasionally created low density/loose layers within the recent arroyo deposits.

3.2 Site Geology

Geologic conditions at the project site are consistent with the regional geology. The surficial geologic formations at or near the project site are comprised of the following.

- **Qay – Young Slope Alluvium (Upper Pleistocene)** – Poorly consolidated deposits of light brown to yellowish brown sand, sandy clay, and local gravel foriming low gradient alluvial slopes.

- **Qpy – Young Piedmont-Slope Alluvium (Upper Pleistocene)** – Poorly consolidated deposits of sand and gravel

- **Qpo – Old Piedmont-Slope Alluvium (Middle to Lower Pleistocene)** – Moderately consolidated deposists of sand and gravel

A Geologic Map and descriptions of the geologic units is included on the Geologic Map Legend in Appendix A.

Review of geologic information from the U.S. Geological Survey and New Mexico Bureau of Mines and Mineral Resources, 1997, Quaternary fault and fold database for the United States, accessed January 17, 2021, from USGS web site: http://earthquake.usgs.gov/regional/qfaults/ indicates that there are no Quaternary faults passing within about 4 to 5 miles of the project alignment. The Quaternary Fault Map is included in Appendix A.

3.3 Soil Conservation Service Soil Maps

The soils along the proposed alignment have been surveyed and classified by the USDA Natural Resource Conservation Service (NRCS). The report of this survey is presented in the "Custom Soil Resource Report for Bernalillo County, New Mexico" issued November 18, 2020. The soil survey maps of this report indicate that the soils in the area are as follows:

- **Embudo-Tijeras Complex (EtC)** makes up 86.21 percent of the map area. Slopes are 0 to 9 percent. This component is located on fan remnants. The parent material consists of recent alluvium derived from igneous and sedimentary bedrock. Depth to a restrictive layer (bedrock) is greater than 80 inches. Depth to water table is more than 80 inches. The natural drainage class is well drained. The AASHTO soil classifications are A-1, A-2, A-4, and A-6.

- **Cut and Fill Land (Cu)** makes up 13.8 percent of the map unit. Slopes are 0 to 5 percent. This component is located in various landforms. The parent material consists is variable. Depth to a restrictive layer (bedrock) is greater than 80 inches. Depth to water table is more than 80 inches. The natural drainage class is poorly drained. The AASHTO soil classification is variable.

Detailed descriptions of the soil survey units are shown on the Soil Survey Maps and Legends in Appendix B.

3.4 Intersection and Pavement Conditions

Photo 1: Indian School Road at Americas Parkway - Looking North. Low to moderate severity of raveling, oxidation, and weathering. Low severity transverse cracking of asphalt concrete.

Photo 2: Indian School Road at Louisiana Boulevard - Looking North. Low to moderate severity raveling, oxidation, weathering, and lifting/stripping of overlay/OGFC. Low to moderate severity longitudinal and transverse cracking of asphalt concrete.

Photo 3: Indian School Road at Q Street - Looking North. Low severity raveling, oxidation, and weathering. Low severity to moderate transverse cracking of asphalt concrete.

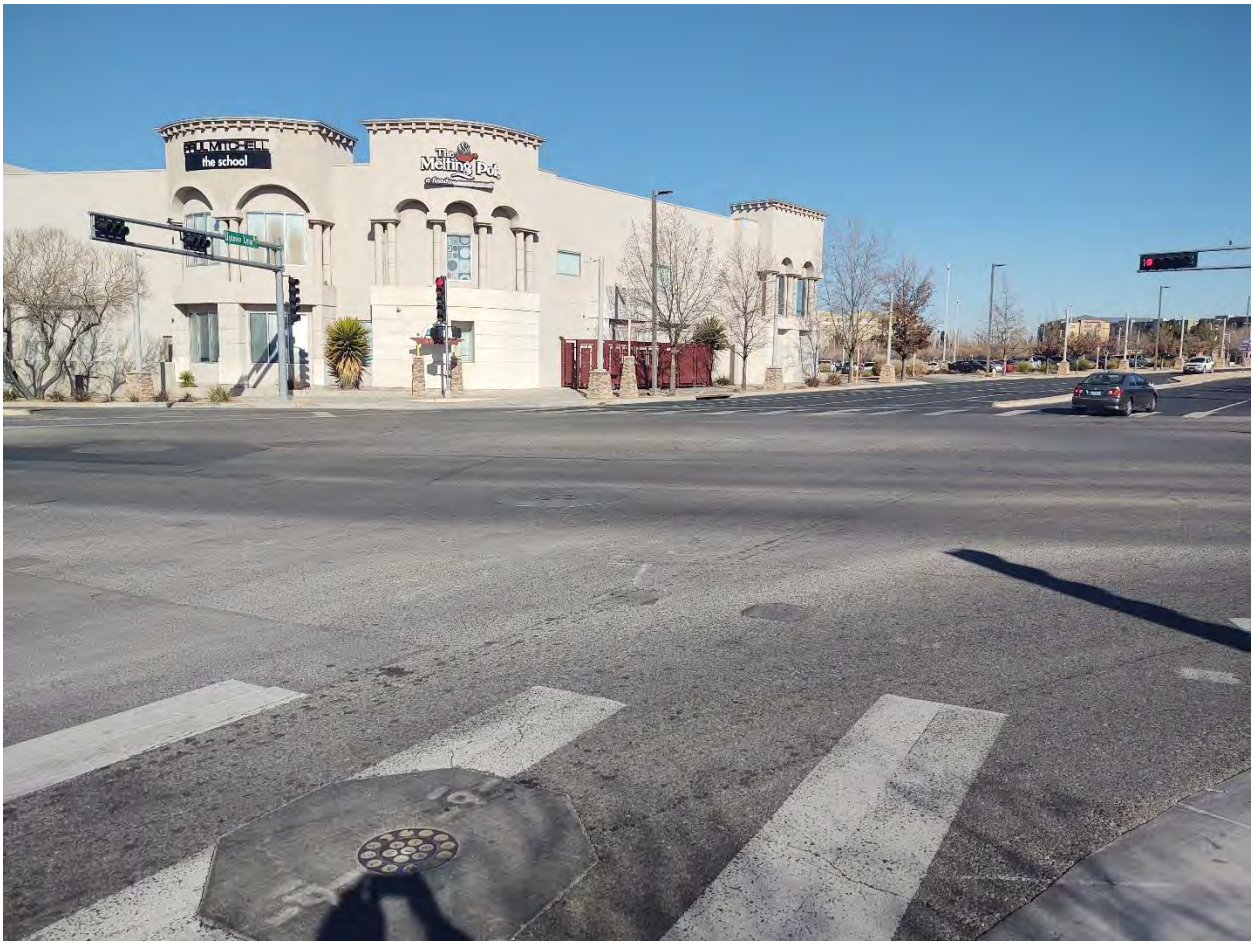


Photo 4: Indian School Road at Q Street - Looking North. Low to moderate severity raveling, oxidation, weathering, and patching. Low severity longitudinal and transverse cracking of asphalt concrete.

4.0 SUBSURFACE CONDITIONS

4.1 Typical Subsurface Profile

Based upon borings performed as part of our geotechnical study (currently in progress), a summary of the subsurface conditions is outlined below:

Description [1]	Approximate Depth to Bottom of Stratum (feet)	Material Encountered	AASHTO Soil Classification	Relative Density, Consistency, and Hardness
Stratum 1	0.6 to 1	Asphalt Concrete – about 6" to 9" Aggregate Base Course – about 0" to 8"	N/A	N/A
Stratum 2	5 to 12	Sand. The clay, silt, and gravel content varied	A-2-4 A-4 A-6	Loose to Medium Dense
Stratum 3	18	Clay and Silt. The sand and gravel content varied.	N/A	Stiff to Very Stiff
Stratum 4	26.5	Sand. The silt and gravel content varied	N/A	Loose Medium

1. *Data obtained from boring logs conducted by Terracon as part of the current field exploration program

Based upon the laboratory testing completed to date as part of our current study, the on-site soils exhibit R-values ranging from 33 to 80.

4.2 Groundwater

Groundwater was not observed in the borings at the time of field exploration. These observations represent groundwater conditions at the time of the field exploration and may not be indicative of other times, or at other locations. Groundwater conditions can change with varying seasonal and weather conditions, and other factors.

5.0 PRELIMINARY RECOMMENDATIONS FOR DESIGN AND CONSTRUCTION

Terracon will also be performing the geotechnical services for the Final Geotechnical Report and Pavement Design Report as part of future phases of the project. The results of these studies will be submitted under separate cover and include boring logs, laboratory test results, and final design parameters and recommendations.

The geotechnical conditions encountered along the project alignment appear to be suitable for the proposed improvements. Loose soils, shallow low bearing capability soils to moderate depths, and caving soil conditions will require particular attention in the design and construction.

5.1 Preliminary Geotechnical Design and Construction Considerations

Preliminary geotechnical engineering recommendations for earth connected phases of the project are outlined below. The preliminary recommendations contained in this report are based upon the results of our literature research, our experience in the area, current field exploration, and our current understanding of the proposed project.

Based upon our current field exploration, the existing pavement section along the project alignment consists of approximately 6 to 9 inches of asphalt concrete overlying 0 to 8 inches of base course. These material will require removal prior to new pavement construction.

On-site sands are anticipated to be suitable for use as structural backfill for pavements. Excavations into the on-site soils are expected to be accomplished with conventional earthwork equipment. Caving soils should be anticipated during construction.

The light and traffic structures are anticipated to be supported on a deep foundation consisting of drilled shafts bearing on undisturbed soil. The foundations can be designed per NMDOT or COA Standard Drawings. Casing and/or drilling slurry may be required for drilled shaft construction.

The subgrade soils consist predominantly of relatively high quality sand subgrade. The anticipated pavement thickness will be based upon the subgrade materials and traffic types and volumes along the project alignment. Thicker pavement sections will be associated with poorer quality subgrades associated with clayey sand subgrade.

5.2 Earthwork and Construction Considerations

Existing pavements, concrete curb, gutter, and sidewalks, utilities, and possibly landscaping will require removal prior to new construction. On-site sands are anticipated to be suitable for use as structural backfill for pavements. Shallow excavations into the on-site soils are expected to be accomplished with conventional earthwork equipment. Caving soils will likely be encountered during construction.

5.3 Preliminary Foundation Recommendations

It is our opinion that deep foundation systems consisting of drilled shafts can be used for support of the proposed traffic and light pole structures. The foundations can be designed per NMDOT or COA Standard Drawings.

Drilled shaft excavations for foundation construction will likely encounter caving soils. Therefore, a slurry or temporary casing may be required during installation.

5.4 Seismic Considerations

Ground Motion Parameter	Value [1]
PGA	0.148
S_s	0.352
S_1	0.101
F_{pga}	1.505
F_a	1.518
F_v	2.397
A_S	0.222
S_{DS}	0.534
S_{D1}	0.241

1. Latitude 35.1019 and Longitude -106.5680 degrees.

5.5 Pavement Design Considerations

Based upon our current field exploration, the existing pavement section along the project alignment consists of approximately 6 to 9 inches of asphalt concrete overlying 0 to 8 inches of base course. These material will require removal prior to new pavement construction.

The anticipated pavement thickness will be based upon the subgrade materials and traffic types and volumes at the project site.

The subgrade soils will consist predominantly of relatively high quality sand subgrade. The anticipated pavement thickness will be based upon the subgrade materials and traffic types and volumes along the project alignment. Thicker pavement sections will be associated with poorer quality subgrades associated with clayey sand subgrade. Subgrade stabilization may be required in lower quality subgrade soils and/or in areas of loose or elevated moisture contents present within some of the subgrade soils at the project site.

Terracon is performing the geotechnical services for the Pavement Design Report as part of this phase of the project. The results of this study will be submitted under separate cover.

5.6 Corrosion Potential

Based upon the laboratory testing completed to date as part of our current study, the on-site soils exhibit soluble sulfate concentrations ranging from about 33 to 253 mg/kg, chloride concentrations ranging from about 45 to 92 mg/kg resistivity values ranging from about 17,342 to 37,352 ohm-

cms, and pH values ranging from about 8.5 to 8.6. Therefore, ASTM Type I-II or II Portland cement will likely be required for all concrete on and below grade. Foundation concrete will need to be designed for low to high sulfate exposure in accordance with the provisions of the ACI Design Manual, Section 318, Chapter 4.

The results of the pH and minimum resistivity testing indicate a moderate to mild corrosion potential to metal piping or conduits. Therefore, the site specific corrosion test results will need to be considered in the selection of driven piles, metal conduits/drainage structures, other metal elements for the project.

6.0 GENERAL COMMENTS

Terracon be providing supplemental geotechnical services for future phases of the project. In addition, Terracon should be retained to review the final design plans and specifications so comments can be made regarding interpretation and implementation of our geotechnical recommendations in the preliminary design and specifications. Terracon also should be retained to provide observation and testing services during grading, excavation, foundation construction and other earth-related construction phases of the project.

The preliminary recommendations presented in this report are based upon the data obtained from information discussed in this report. This report does not reflect variations that may occur across the corridor study areas, or due to the modifying effects of construction or weather. The nature and extent of such variations may not become evident until further corridor specific studies have been completed or during or after construction. If variations appear, we should be immediately notified so that further evaluation and supplemental recommendations can be provided.

The scope of services for this project does not include either specifically or by implication any environmental or biological (e.g., mold, fungi, bacteria) assessment of the site or identification or prevention of pollutants, hazardous materials or conditions. If the owner is concerned about the potential for such contamination or pollution, other studies should be undertaken.

This preliminary report has been prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted geotechnical engineering practices. No warranties, either express or implied, are intended or made. In the event that changes in the nature, design, or location of the project as outlined in this report are planned, the recommendations contained in this report shall not be considered valid unless Terracon reviews the changes and either verifies or modifies the conclusions of this report in writing.

7.0 REFERENCES

Williams, Paul L. and Cole, James C. “Geologic Amp[of the Albuquerque 30’x60’ Quadrangle, North- central, New Mexico” USGS, 2007.

New Mexico Bureau of Geology and Mineral Resources, Peter A. Scholle, State Geologist. “Geologic Map of New Mexico.” 2003.

U.S. Geological Survey, Quaternary fault and fold database for the United States, accessed January 17, 2022, from USGS web site: http://earthquake.usgs.gov/hazards/qfaults/

Sean Connell, “GM-78 — Geologic map of the Albuquerque–Rio Rancho metropolitan area and vicinity, Bernalillo and Sandoval Counties, New Mexico”, 2008.

APPENDIX A

SITE LOCATION MAP

GEOLOGIC MAP AND LEGEND

QUATERNARY FAULT MAP

SITE LOCATION

Uptown Intersection Improvements ■ Albuquerque, NM
January 18, 2022 ■ Terracon Project No. 66215129

Terracon GeoReport

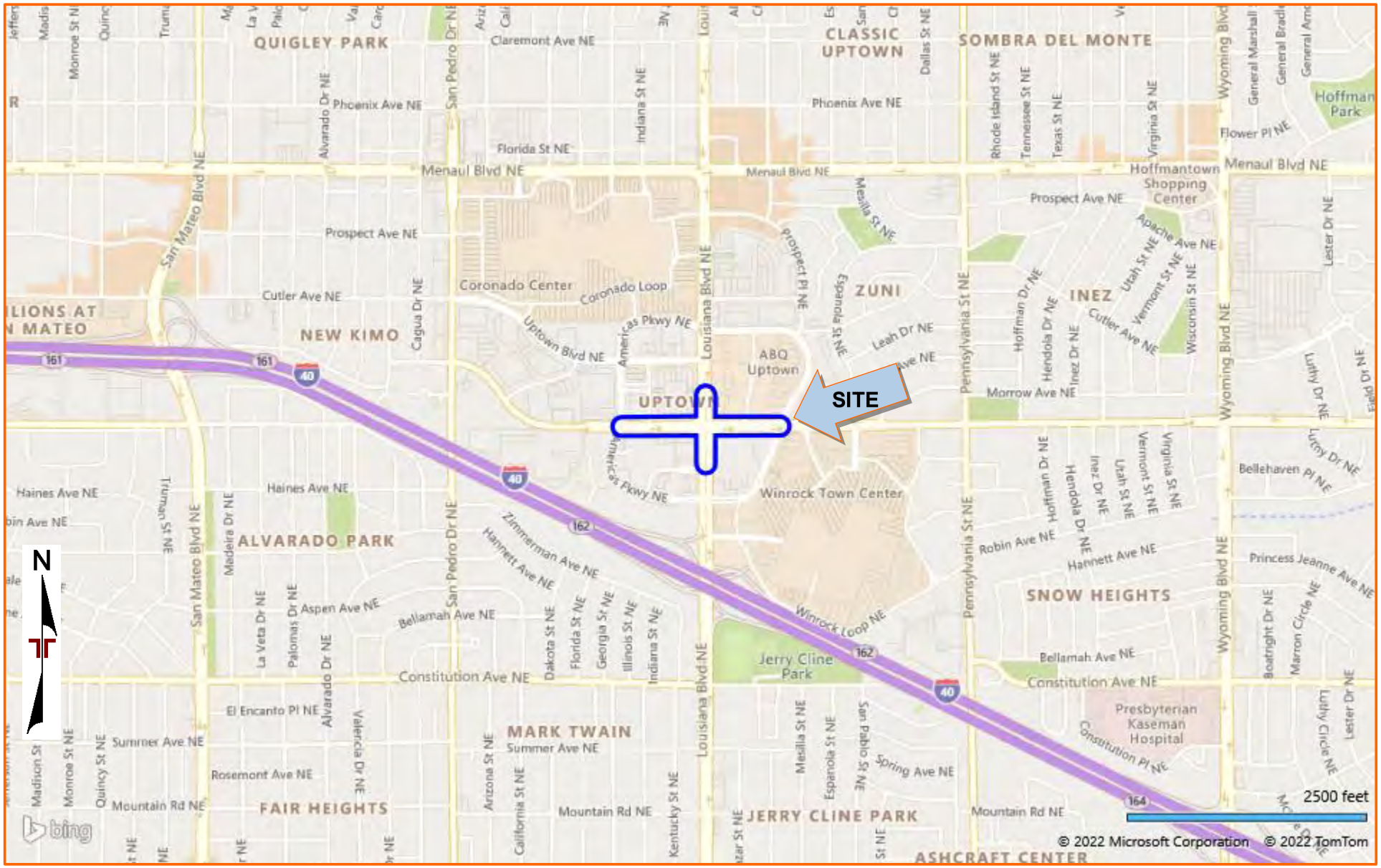


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

ROAD MAP PROVIDED BY MICROSOFT BING MAPS

EXPLORATION PLAN

Uptown Intersection Improvements ■ Albuquerque, NM
January 18, 2022 ■ Terracon Project No. 66215129

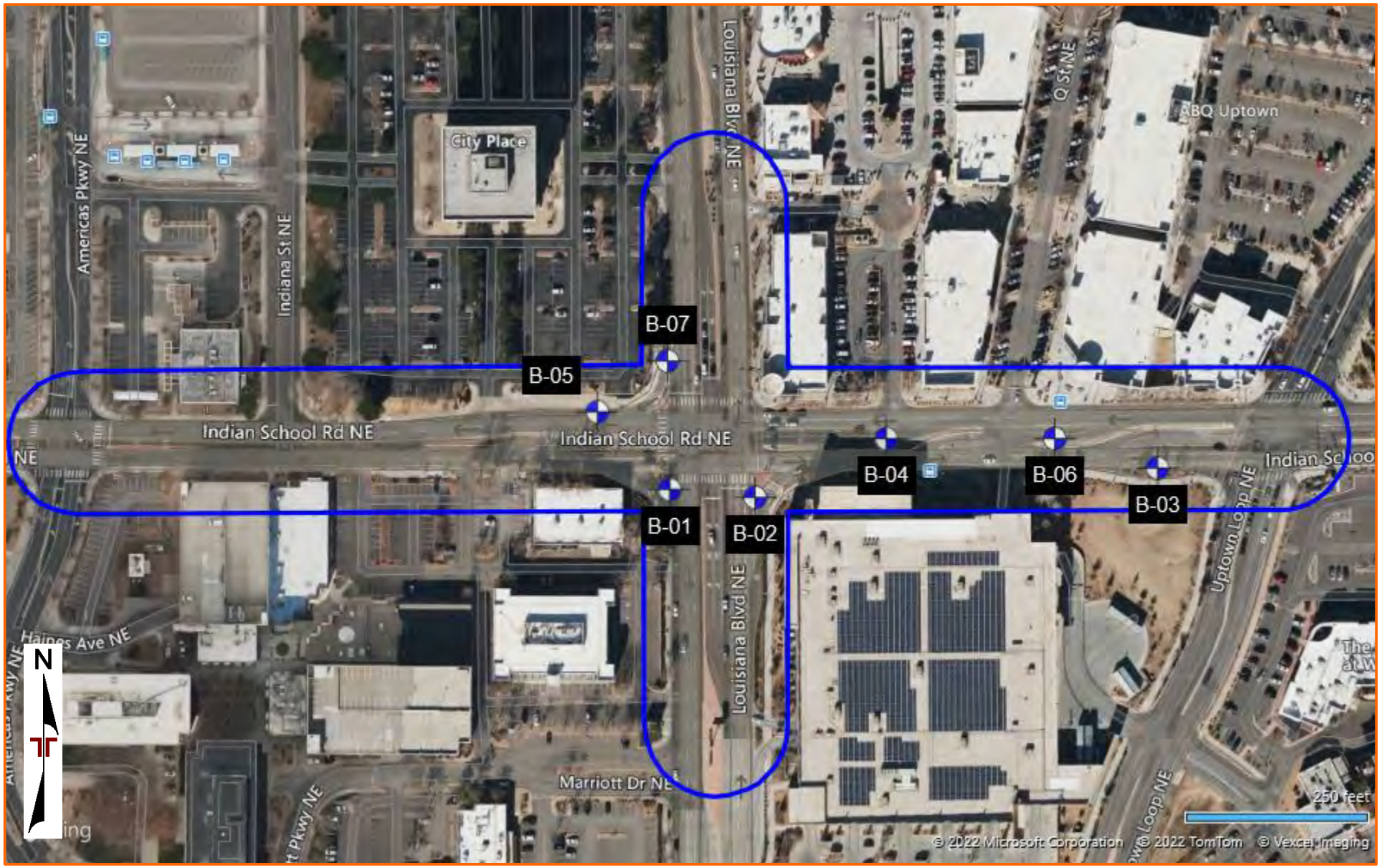


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

AERIAL PHOTOGRAPHY PROVIDED BY MICROSOFT BING MAPS

Note: Boring Nos. B-01 through B-05 drilled as part of our current study (in progress). All boring logs, lab testing results, engineering analysis, design parameters, and final recommendations will be included in the Final Geotechnical Report and Pavement Design Report .

SITE LOCATION

Uptown Intersection Improvements ■ Albuquerque, NM
January 17, 2022 ■ Terracon Project No. 66215129

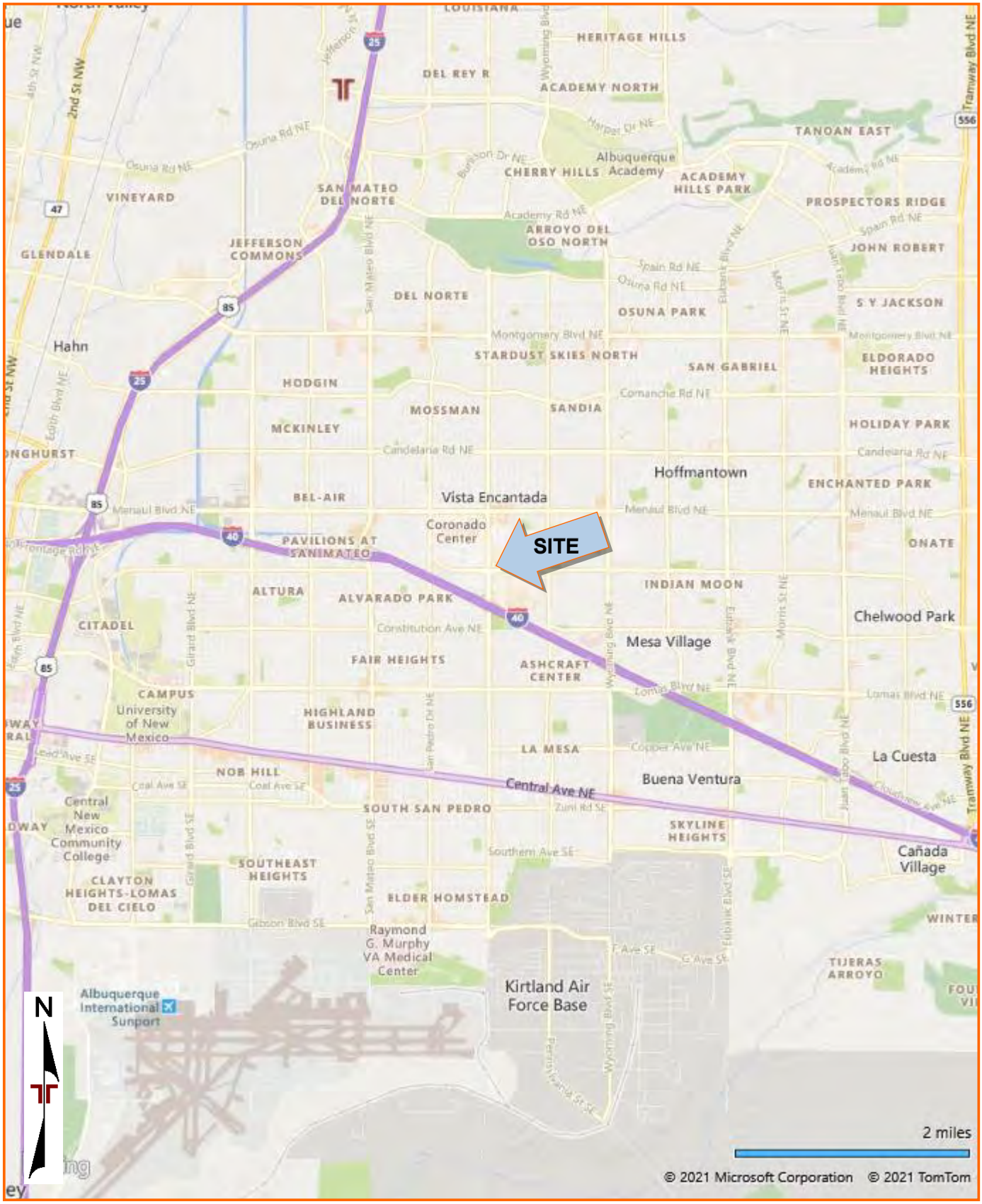


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

TOPOGRAPHIC MAP IMAGE COURTESY OF THE U.S. GEOLOGICAL SURVEY QUADRANGLES INCLUDE: ALAMEDA, NM (1/1/1990) and ALBUQUERQUE EAST, NM (1/1/1990).

GEOLOGIC MAP

Uptown Intersection Improvements ■ Albuquerque, NM
January 18, 2022 ■ Terracon Project No. 66215129

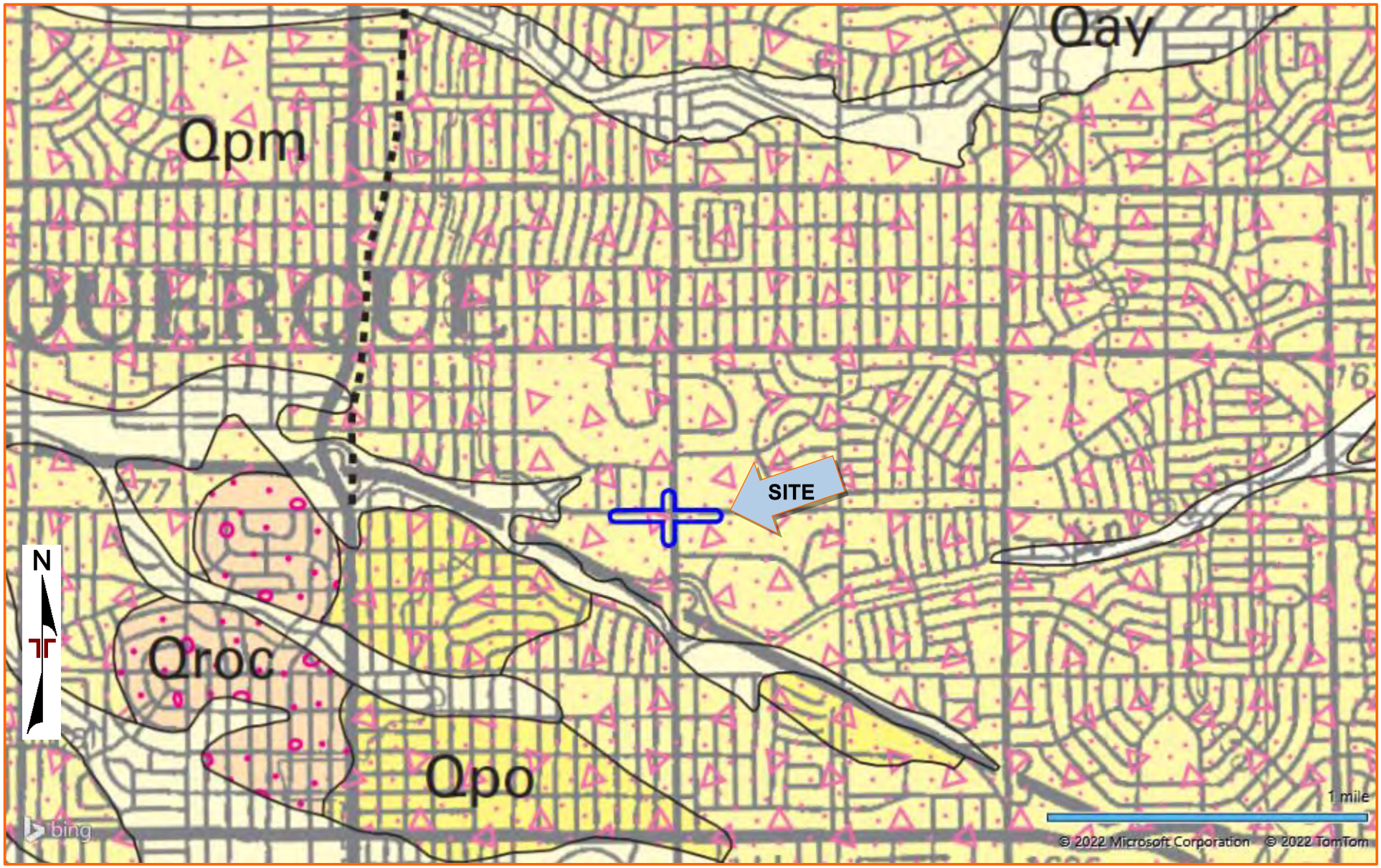


DIAGRAM IS FOR GENERAL LOCATION ONLY, AND IS NOT INTENDED FOR CONSTRUCTION PURPOSES

Geologic Map of Albuquerque 30' X 60' Quadrangle, North-Central New Mexico
Compiled by
Paul L. Williams and James C. Cole
2007

Description of Map Units

River Alluvium of the Rio Grande and Major Tributaries

: **Older river alluvium (lower Pleistocene)—**Light-grayish-brown, coarse, heterolithic bouldery gravel, and light-brown to yellowish-gray sand, cobble gravel, pebbly sand, and silt; weakly cemented, moderately sorted; coarse sand deposits typically display conspicuous planar and trough crossbedding at meter scale. Gravel clasts are highly diverse and include fine-grained quartzose metamorphic rocks, metaquartzite, granite and mylonite gneiss, intermediate and felsic volcanic porphyries, basalt, quartz sandstone, limestone, "Pedernal chert," and petrified wood as well as conspicuous pebbles and cobbles of Bandelier Tuff pumice. Top of these deposits forms an extensive terrace surface at Albuquerque International Airport (the Cuarto Alto surface of Stone and others, 2001a, b; Sunport surface of Lambert, 1968, and Bachman and Machette, 1977) about 370 ft above the modern floodplain. North and east of Bernalillo, the uppermost fluvial deposits that contain Bandelier pumice are similarly situated above the local Rio Grande floodplain, although the relict terrace surface is covered by younger piedmont-slope materials (Cather and others, 2000). Relict calcareous soils display stage III–IV morphology in Bk horizons. Vertebrate fossils recovered from this unit are early Irvingtonian (early Pleistocene; Morgan and Lucas, 2000); clasts and tephra of the older and younger Bandelier Tuff eruptions indicate the terrace-fill deposits accumulated over an extended period of early Pleistocene time between about 1.6 Ma and 1.2 Ma. Deposits are commercially significant sand and gravel resources in the valley. Thickness highly variable, but may exceed 400 ft in total.

Alluvium Deposits on Eroded Slopes

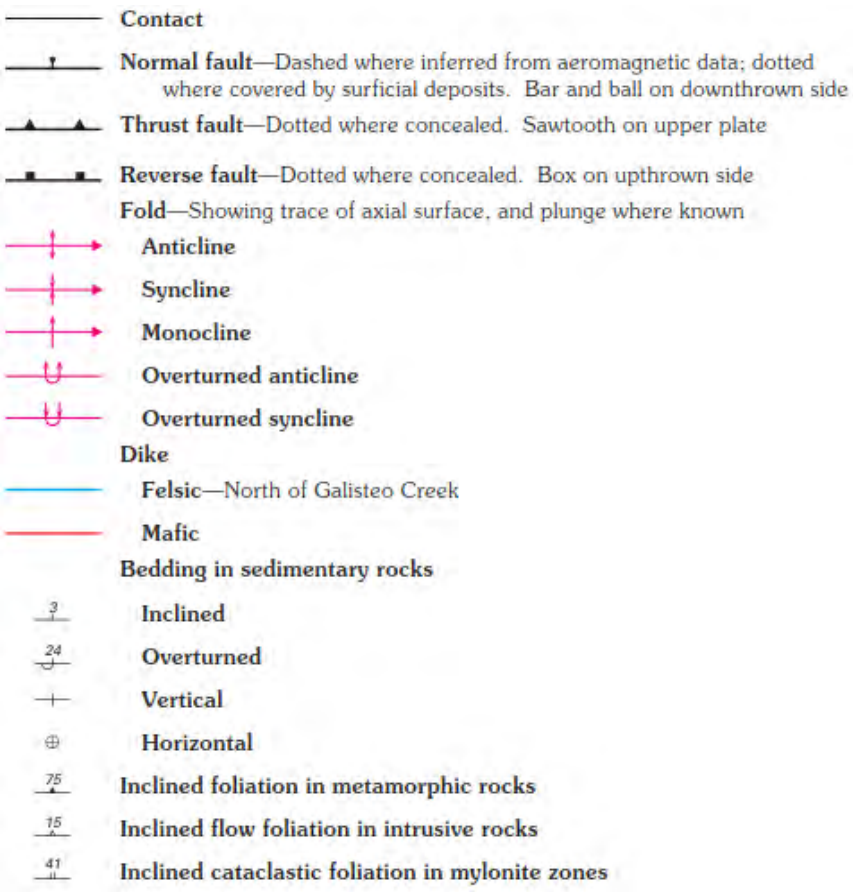
: **Young slope alluvium (upper Pleistocene)—**Poorly consolidated deposits of light-brown to yellowish-brown sand, sandy clay, and local gravel. Deposits form low-gradient alluvial slopes adjacent to floodplains of the Rio Grande and major tributary drainages, and form the youngest stream channels and terraces along minor tributary valleys. Calcareous soils weakly developed.

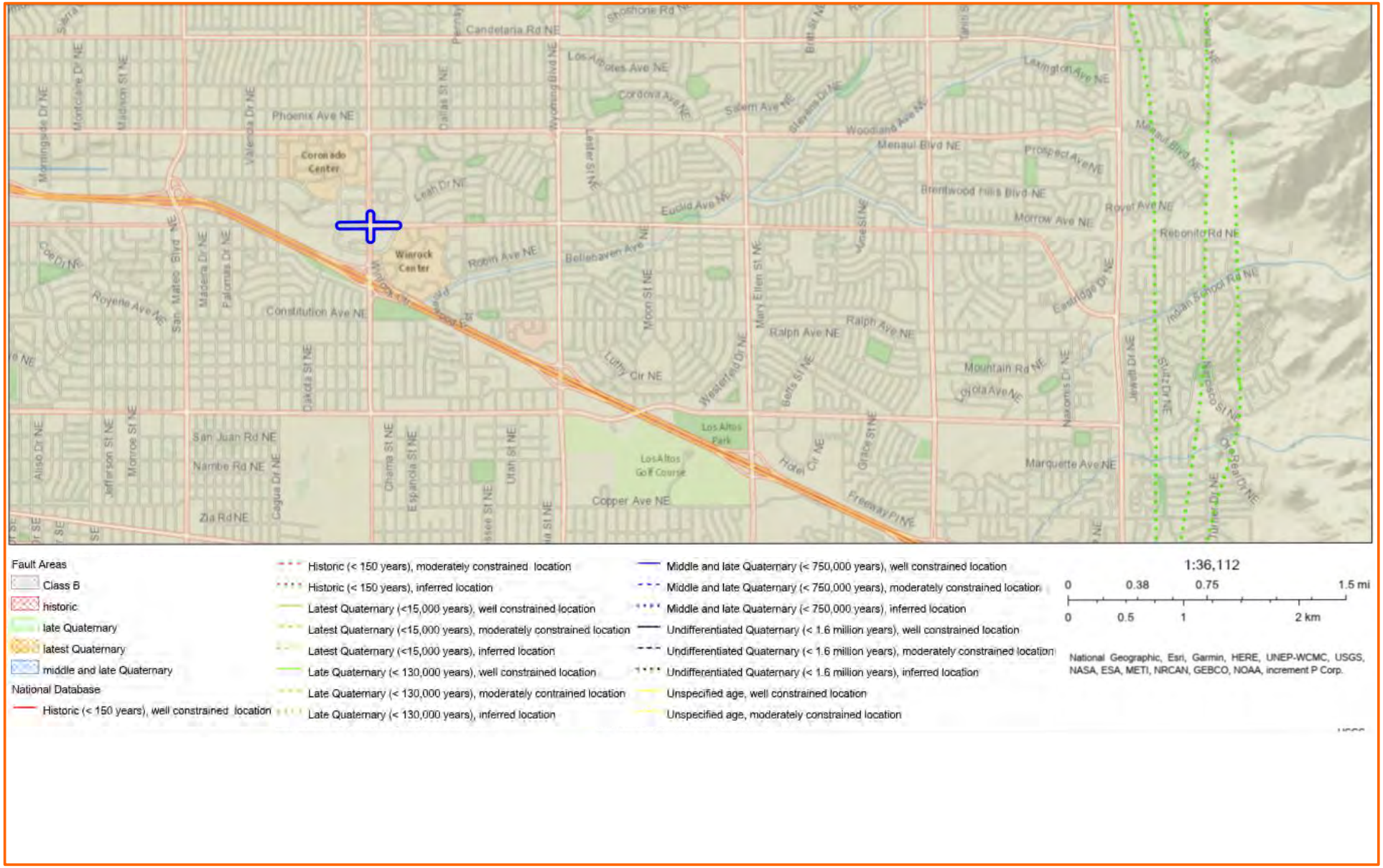
Alluvial Deposits on Piedmont Slopes West of Sandia Mountains

:**Medial-age piedmont-slope alluvium (middle Pleistocene)—**Poorly consolidated deposits of sand and gravel in intermediate geomorphic positions; gravels contain subangular clasts near foot of Sandia Mountains. Calcareous soils moderately developed and display stage II–III morphology in Bk horizon. Unit may locally include some upper Pleistocene deposits.

Qpo:**Old piedmont-slope alluvium (middle to lower Pleistocene)—** Moderately consolidated deposits of sand and gravel in high geomorphic positions near foot of Sandia Mountains; deposits are chiefly erosional remnants inset by younger piedmont-slope units. Clasts commonly show physical deterioration; calcareous soils strongly devloped and display stage III–IV morphology in Bk horizon.

Map Symbols




Candelaria Rd NE
Phoenix Ave NE
Coronado Center
Winrock Center
Constitution Ave NE
Los Altos Park
Los Altos Golf Course
Copper Ave NE
Menaul Blvd NE
Ralph Ave NE
Mountain Rd NE
Marquette Ave NE
Fault Areas
Class B
historic
late Quaternary
latest Quaternary
middle and late Quaternary
National Database
Historic (< 150 years), well constrained location
Historic (< 150 years), moderately constrained location
Historic (< 150 years), inferred location
Latest Quaternary (<15,000 years), well constrained location
Latest Quaternary (<15,000 years), moderately constrained location
Latest Quaternary (<15,000 years), inferred location
Late Quaternary (< 130,000 years), well constrained location
Late Quaternary (< 130,000 years), moderately contrained location
Late Quaternary (< 130,000 years), inferred location
Middle and late Quaternary (< 750,000 years), well constrained location
Middle and late Quaternary (< 750,000 years), moderately constrained location
Middle and late Quaternary (< 750,000 years), inferred location
Undifferentiated Quaternary (< 1.6 million years), well constrained location
Undifferentiated Quaternary (< 1.6 million years), moderately constrained location
Undifferentiated Quaternary (< 1.6 million years), inferred location
Unspecified age, well constrained location
Unspecified age, moderately constrained location
1:36,112
0 0.38 0.75 1.5 mi
0 0.5 1 2 km
National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.

APPENDIX B

USDA NCRS SOIL SURVEY

United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

January 17, 2022

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

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Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map

Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 16, Sep 12, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background

MAP LEGEND	MAP INFORMATION
	imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cu	Cut and fill land	0.9	13.8%
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	5.9	86.2%
Totals for Area of Interest		**6.9**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however,

onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico

Cu—Cut and fill land

Map Unit Setting

National map unit symbol: 1vwr
Elevation: 4,850 to 6,000 feet
Mean annual precipitation: 7 to 10 inches
Mean annual air temperature: 58 to 60 degrees F
Frost-free period: 170 to 195 days
Farmland classification: Not prime farmland

Map Unit Composition

Cut and fill land: 100 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Cut And Fill Land

Setting

Landform: Scarp slopes
Down-slope shape: Linear
Across-slope shape: Linear

EtC—Embudo-Tijeras complex, 0 to 9 percent slopes

Map Unit Setting

National map unit symbol: 1vwt
Elevation: 2,700 to 7,000 feet
Mean annual precipitation: 5 to 16 inches
Mean annual air temperature: 48 to 70 degrees F
Frost-free period: 130 to 250 days
Farmland classification: Not prime farmland

Map Unit Composition

Embudo and similar soils: 50 percent
Tijeras and similar soils: 35 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Embudo

Setting

Landform: Terraces
Landform position (three-dimensional): Tread
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: gravelly fine sandy loam
H2 - 4 to 20 inches: gravelly sandy loam
H3 - 20 to 60 inches: stratified gravelly loamy coarse sand to very gravelly loamy sand

Properties and qualities

Slope: 0 to 5 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: RareNone
Frequency of ponding: None
Calcium carbonate, maximum content: 7 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 3.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: A
Ecological site: R042XA051NM - Sandy
Hydric soil rating: No

Description of Tijeras

Setting

Landform: Fan remnants
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous and sedimentary rock

Typical profile

H1 - 0 to 4 inches: gravelly fine sandy loam
H2 - 4 to 14 inches: sandy clay loam
H3 - 14 to 19 inches: gravelly sandy loam
H4 - 19 to 60 inches: stratified very gravelly sand to very gravelly sandy loam

Properties and qualities

Slope: 1 to 9 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Medium
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.60 to 2.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate, maximum content: 5 percent
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 2.0
Available water supply, 0 to 60 inches: Low (about 5.2 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7c
Hydrologic Soil Group: B
Ecological site: R042XA051NM - Sandy
Hydric soil rating: No

Minor Components

Tesajo

Percent of map unit: 5 percent
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Millett

Percent of map unit: 5 percent
Ecological site: R035XG114NM - Gravelly
Hydric soil rating: No

Wink

Percent of map unit: 5 percent
Ecological site: R042XA052NM - Loamy
Hydric soil rating: No

References

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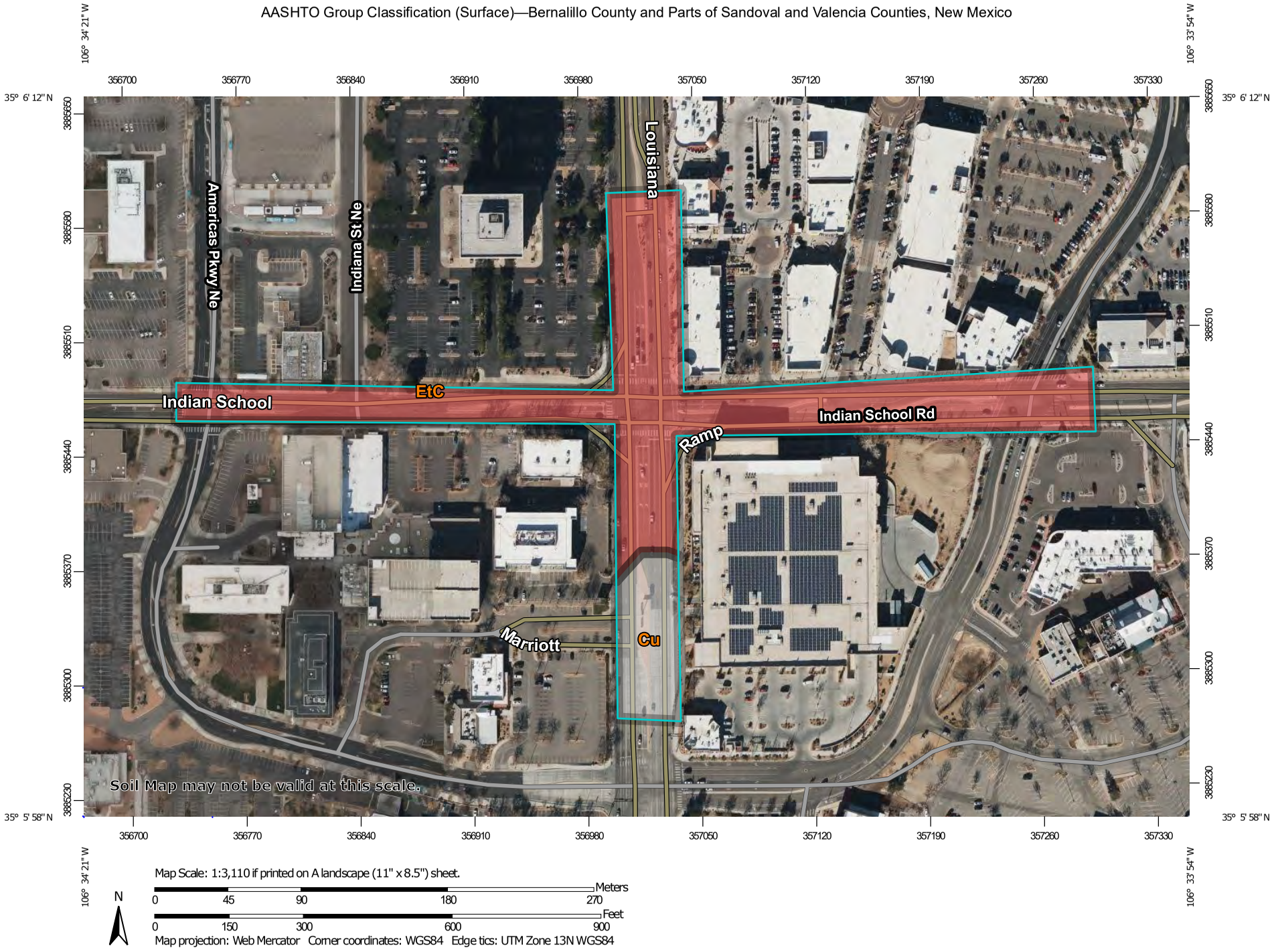


Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Lines

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Points

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 16, Sep 12, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

AASHTO Group Classification (Surface)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cu	Cut and fill land		0.9	13.8%
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	A-2	5.9	86.2%
Totals for Area of Interest			**6.9**	**100.0%**

Description

AASHTO group classification is a system that classifies soils specifically for geotechnical engineering purposes that are related to highway and airfield construction. It is based on particle-size distribution and Atterberg limits, such as liquid limit and plasticity index. This classification system is covered in AASHTO Standard No. M 145-82. The classification is based on that portion of the soil that is smaller than 3 inches in diameter.

The AASHTO classification system has two general classifications: (i) granular materials having 35 percent or less, by weight, particles smaller than 0.074 mm in diameter and (ii) silt-clay materials having more than 35 percent, by weight, particles smaller than 0.074 mm in diameter. These two divisions are further subdivided into seven main group classifications, plus eight subgroups, for a total of fifteen for mineral soils. Another class for organic soils is used.

For each soil horizon in the database one or more AASHTO Group Classifications may be listed. One is marked as the representative or most commonly occurring. The representative classification is shown here for the surface layer of the soil.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

Engineering Properties

This table gives the engineering classifications and the range of engineering properties for the layers of each soil in the survey area.

Hydrologic soil group is a group of soils having similar runoff potential under similar storm and cover conditions. The criteria for determining Hydrologic soil group is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Listing HSGs by soil map unit component and not by soil series is a new concept for the engineers. Past engineering references contained lists of HSGs by soil series. Soil series are continually being defined and redefined, and the list of soil series names changes so frequently as to make the task of maintaining a single national list virtually impossible. Therefore, the criteria is now used to calculate the HSG using the component soil properties and no such national series lists will be maintained. All such references are obsolete and their use should be discontinued. Soil properties that influence runoff potential are those that influence the minimum rate of infiltration for a bare soil after prolonged wetting and when not frozen. These properties are depth to a seasonal high water table, saturated hydraulic conductivity after prolonged wetting, and depth to a layer with a very slow water transmission rate. Changes in soil properties caused by land management or climate changes also cause the hydrologic soil group to change. The influence of ground cover is treated independently. There are four hydrologic soil groups, A, B, C, and D, and three dual groups, A/D, B/D, and C/D. In the dual groups, the first letter is for drained areas and the second letter is for undrained areas.

The four hydrologic soil groups are described in the following paragraphs:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Depth to the upper and lower boundaries of each layer is indicated.

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is 15 percent or more, an appropriate modifier is added, for example, "gravelly."

Classification of the soils is determined according to the Unified soil classification system (ASTM, 2005) and the system adopted by the American Association of State Highway and Transportation Officials (AASHTO, 2004).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to particle-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of particle-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Percentage of rock fragments larger than 10 inches in diameter and 3 to 10 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination. Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

References:

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

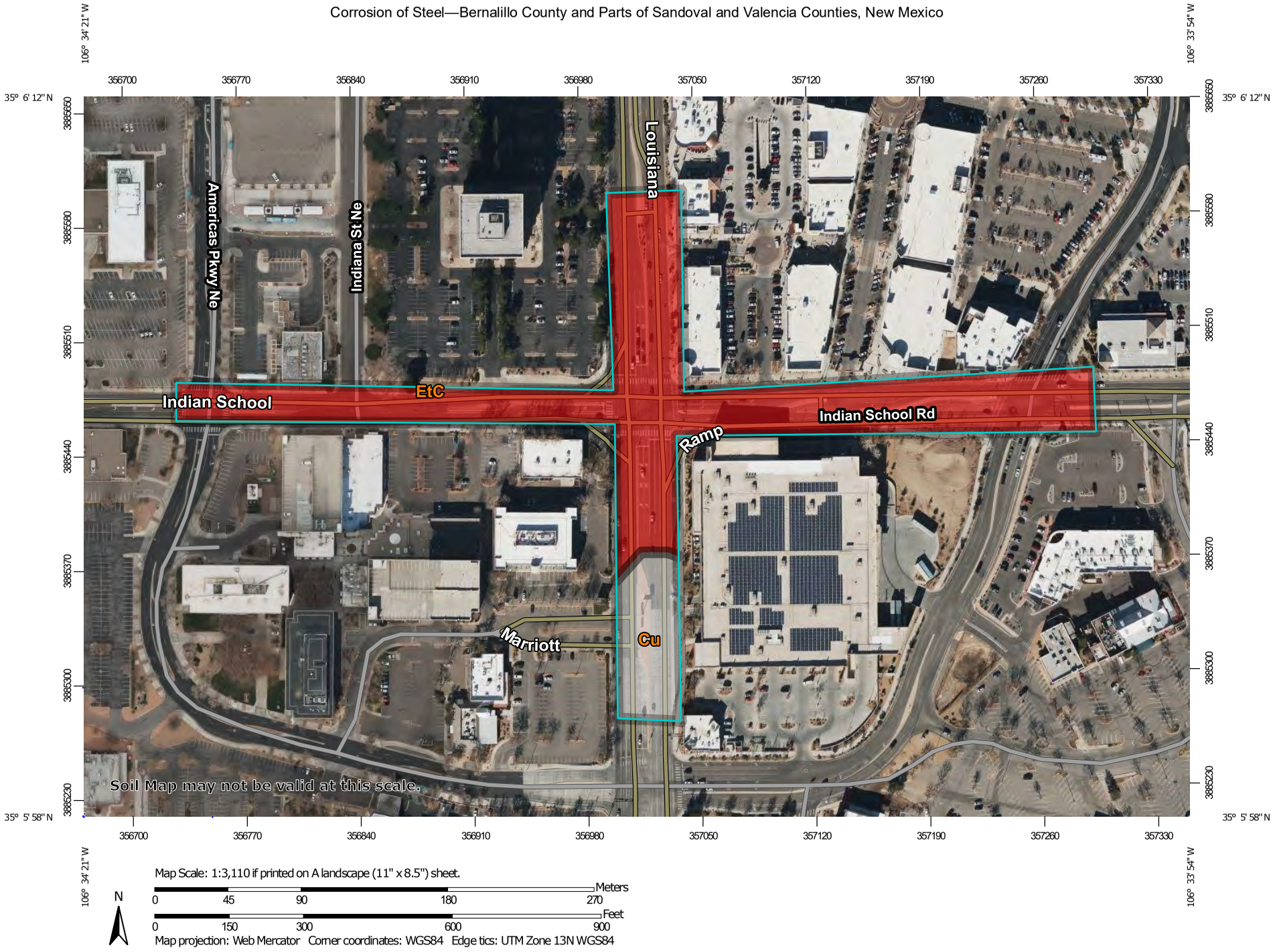
Report—Engineering Properties

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash. The criteria for determining the hydrologic soil group for individual soil components is found in the National Engineering Handbook, Chapter 7 issued May 2007(http://directives.sc.egov.usda.gov/OpenNonWebContent.aspx?content=17757.wba). Three values are provided to identify the expected Low (L), Representative Value (R), and High (H).

Engineering Properties–Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico														
Map unit symbol and soil name	Pct. of map unit	Hydrologic group	Depth	USDA texture	Classification		Pct Fragments		Percentage passing sieve number—				Liquid limit	Plasticity index
					Unified	AASHTO	>10 inches	3-10 inches	4	10	40	200		
			In				*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*	*L-R-H*
EtC—Embudo-Tijeras complex, 0 to 9 percent slopes														
Embudo	50	A	0-4	Gravelly fine sandy loam	SM	A-2, A-4	0- 0- 0	0- 0- 0	65-78-90	50-63-75	40-48-55	30-35-40	17-23-28	2-6 -10
			4-20	Gravelly sandy loam, gravelly coarse sandy loam	SM	A-2	0- 0- 0	0- 0- 0	65-78-90	50-63-75	35-40-45	25-30-35	17-22-27	2-6 -10
			20-60	Stratified gravelly loamy coarse sand to very gravelly loamy sand	SM, SP-SM	A-1	0- 0- 0	0- 0- 0	64-69-76	29-49-76	15-27-44	6-11- 19	16-19-23	2-4 -6
Tijeras	35	B	0-4	Gravelly fine sandy loam	SC	A-2, A-4	0- 0- 0	0- 8- 15	80-88-95	60-68-75	45-50-55	30-35-40	21-25-28	6-8 -10
			4-14	Sandy clay loam	CL, SC	A-2, A-6	0- 0- 0	0- 0- 0	85-93-100	75-83-90	40-58-75	30-48-65	29-35-40	13-17-21
			14-19	Gravelly sandy loam	SC	A-2	0- 0- 0	0- 0- 0	85-90-95	65-70-75	45-48-50	25-28-30	20-24-27	6-8 -10
			19-60	Stratified very gravelly sand to very gravelly sandy loam	SM	A-1	0- 0- 0	0- 0- 0	78-82-90	34-56-88	25-43-69	12-21-36	16-19-23	2-4 -6

Data Source Information

Soil Survey Area: Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico
Survey Area Data: Version 16, Sep 12, 2021



Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Survey Area Data: Version 16, Sep 12, 2021

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

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Corrosion of Steel

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cu	Cut and fill land		0.9	13.8%
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	High	5.9	86.2%
Totals for Area of Interest			**6.9**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens uncoated steel. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the steel in installations that are entirely within one kind of soil or within one soil layer.

The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils

Soil Rating Polygons
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Lines
- High
- Moderate
- Low
- Not rated or not available

Soil Rating Points
- High
- Moderate
- Low
- Not rated or not available

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

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Survey Area Data: Version 16, Sep 12, 2021

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Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

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Corrosion of Concrete

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
Cu	Cut and fill land		0.9	13.8%
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	Low	5.9	86.2%
Totals for Area of Interest			**6.9**	**100.0%**

Description

"Risk of corrosion" pertains to potential soil-induced electrochemical or chemical action that corrodes or weakens concrete. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors results in a severe hazard of corrosion. The concrete in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than the concrete in installations that are entirely within one kind of soil or within one soil layer.

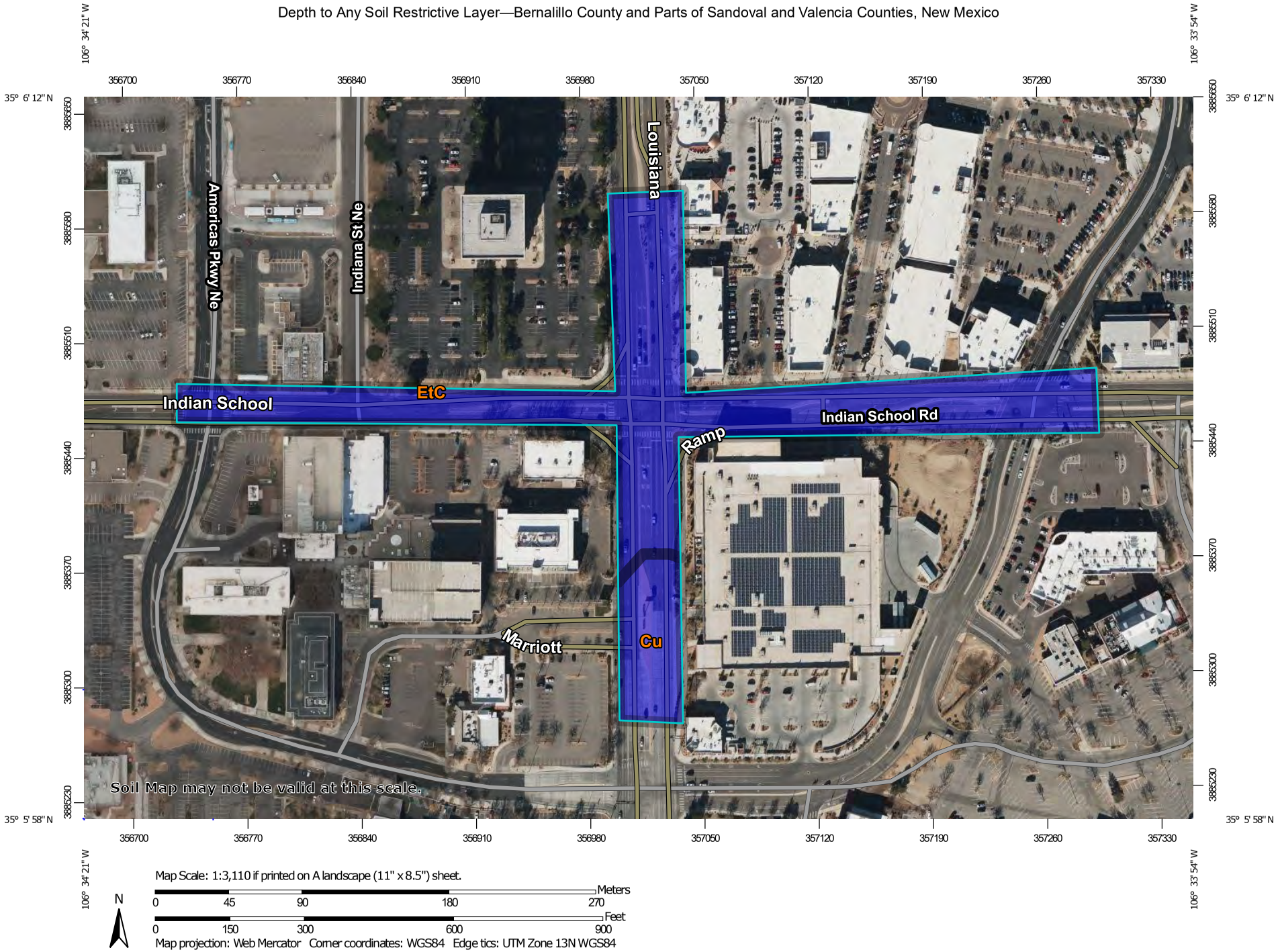
The risk of corrosion is expressed as "low," "moderate," or "high."

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher



Map Scale: 1:3,110 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 45 90 180 270

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 13N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Lines

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Soil Rating Points

0 - 25

25 - 50

50 - 100

100 - 150

150 - 200

> 200

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

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Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

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Date(s) aerial images were photographed: Nov 22, 2020—Jan 1, 2021

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Depth to Any Soil Restrictive Layer

Map unit symbol	Map unit name	Rating (centimeters)	Acres in AOI	Percent of AOI
Cu	Cut and fill land	>200	0.9	13.8%
EtC	Embudo-Tijeras complex, 0 to 9 percent slopes	>200	5.9	86.2%
Totals for Area of Interest			**6.9**	**100.0%**

Description

A "restrictive layer" is a nearly continuous layer that has one or more physical, chemical, or thermal properties that significantly impede the movement of water and air through the soil or that restrict roots or otherwise provide an unfavorable root environment. Examples are bedrock, cemented layers, dense layers, and frozen layers.

This theme presents the depth to any type of restrictive layer that is described for each map unit. If more than one type of restrictive layer is described for an individual soil type, the depth to the shallowest one is presented. If no restrictive layer is described in a map unit, it is represented by the "greater than 200" depth class.

This attribute is actually recorded as three separate values in the database. A low value and a high value indicate the range of this attribute for the soil component. A "representative" value indicates the expected value of this attribute for the component. For this soil property, only the representative value is used.

Rating Options

Units of Measure: centimeters

Aggregation Method: Dominant Component

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Interpret Nulls as Zero: No

Appendix C

Preliminary Cost Estimate

ENGINEER'S CONCEPTUAL ESTIMATE - LOUISIANA BLVD AND INDIAN SCHOOL RD INTERSECTION

CITY ITEM NO.	DESCRIPTION	UNIT	QTY.	ESTIMATE	
				UNIT PRICE	EST. COST
4.01	CONSTRUCTION STAKING, COMPL	LS	1	$5,547.66	$6,000.00
6.01	CONSTRUCTION PROJECT SIGN, PER CONTRACT SPECIAL PROVISIONS, CIP	EA	2	$275.00	$550.00
19.010	CONSTRUCTION TRAFFIC CONTROL & BARRICADING, COMPL	LS	1	$8,321.48	$9,000.00
116.012	ASPHALT CONCRETE, MATERIAL ARTERIAL, GRADATION SP-III, COMPL	TON	50	$80.00	$4,000.00
301.011	ANY COMBINATION OF CUT/FILL AND/OR BALANCE AND/OR GRADING, LESS THAN 2' EXCAV, NO IMPORT OR EXPORT OF MATERIAL, CIP AT 95% COMPACTION	SY	325	$3.00	$975.00
301.02	SUBGRADE PREP 12" AT 95% COMPACTION	SY	225	$6.50	$1,462.50
302.01	AGGREGATE BASE COURSE, CRUSHED, 6" AT 95% COMPACTION, CIP. SD 2408	SY	225	$7.50	$1,687.50
336.01	PRIME COAT, EMULSIFIED ASPHALT, CIP	SY	225	$1.00	$225.00
336.08	ASPHALT CONCRETE, PLACEMENT, 3" THICK, ARTERIAL GRADATION SP-III OR SP-IV W/O MACHINE LAYDOWN, MATERIALS PAID SEPARATELY, CIP	SY	675	$40.00	$27,000.00
336.12	TACK COAT, CATIONIC EMULSIFIED ASPHALT, CIP	SY	225	$1.00	$225.00
340.01	SIDEWALK, 4" THICK, PCC, INCL. SUBGRADE COMPACTION, CIP, SD 2430	SY	345	$40.00	$13,800.00
340.023	CURB ACCESS RAMP, 4" PCC, STD. CURB, CIP	SY	30	$60.00	$1,800.00
340.029	DETECTABLE WARNING SURFACES FOR ADA RAMPS	SF	50	$25.00	$1,250.00
340.05	CURB & GUTTER, STANDARD, PORTLAND CEMENT CONCRETE, INCL. SUBGRADE PREPARATION, CIP, SD 2415	LF	5,710	$20.00	$114,200.00
340.11	HEADER CURB, PORTLAND CEMENT CONCRETE, INCL. SUBGRADE, CIP, SD 2415	LF	90	$20.00	$1,800.00
343.03	EXISTING PAVEMENT, ASPHALT CONCRETE, MORE THAN 4" THICK, SAWCUT, REMOVE AND DISPOSE, COMPL	SY	1,050	$10.00	$10,500.00
343.04	EXISTING PAVEMENT, PC CONCRETE, UP TO 6" THICK, SAWCUT, REMOVE AND DISPOSE, COMPL	SY	20	$15.00	$300.00
343.08	EXISTING CURB & GUTTER OR VALLEY GUTTER, PC CONCRETE, REMOVE & DISPOSE, COMPL.	LF	1,020	$6.50	$6,630.00
343.085	EXISTING SIDEWALK, 4" PC CONCRETE, REMOVE & DISPOSE	SY	300	$6.50	$1,950.00
421.015	SERVICE CONNECTION (SIGNAL), CIP	EA	1	$300.00	$300.00
422.002	TRAFFIC SIGNAL PEDESTAL POLE, 10', CIP	EA	3	$800.00	$2,400.00
422.11X	TRAFFIC SIGNAL MASTARM, ANY SIZE, REMOVE & RELOCATE, COMPL	EA	3	$8,500.00	$25,500.00
423.001	TRAFFIC SIGNAL FOUNDATION FOR PEDESTAL POLE, CIP	EA	3	$500.00	$1,500.00
423.101	TRAFFIC SIGNAL FOUNDATION MASTARM, REMOVE & DISPOSE, COMPL	EA	3	$650.00	$1,950.00
424.012	ELECTRICAL CONDUIT, 3", INCLUDING PUSHING, BORING, AND JACKING, CIP.	LF	590	$10.00	$5,900.00
425.003	ELECTRICAL PULL BOX (LARGE) CIP.	EA	2	$550.00	$1,100.00
425.1	ELECTRICAL PULL BOX, ANY TYPE, ADJUST TO GRADE, CIP	EA	7	$300.00	$2,100.00
425.101	ELECTRICAL PULL BOX, ANY TYPE, REMOVE & DISPOSE, CIP	EA	4	$100.00	$400.00
426.003	SINGLE CONDUCTOR #6, CIP	LF	1,755	$2.00	$3,510.00
426.010	MULTI-CONDUCTOR CABLE, #5, CIP	LF	1,000	$1.50	$1,500.00
426.014	MULTI-CONDUCTOR CABLE, #20, CIP	LF	1,500	$4.00	$6,000.00
426.02X	COMMUNICATION CABLE, ONE PAIR, CIP	LF	40	$3.00	$120.00
426.101	EXISTING WIRING, REMOVE & DISPOSE, COMPL	LS	1	$1,500.00	$1,500.00
427.023	PEDESTRIAN SIGNAL, L.E.D., COUNTDOWN, CIP	EA	4	$600.00	$2,400.00
427.121	PEDESTRIAN SIGNAL, ANY TYPE, REMOVE & SALVAGE, COMPL	EA	4	$75.00	$300.00
428.01	PUSH BUTTON STATION, CIP	EA	4	$350.00	$1,400.00
428.011	PUSH BUTTON STATION, REMOVE & SALVAGE, COMPL	EA	4	$75.00	$300.00
428.078	OPTICAL DETECTOR CABLE, CIP	LF	135	$1.25	$168.75
441.001	REFLECTORIZED PLASTIC PAVEMENT MARKINGS, 4" WIDTH, CIP	LF	250	$1.30	$325.00
441.002	REFLECTORIZED PLASTIC PAVEMENT MARKINGS, 6" WIDTH, CIP	LF	50	$1.55	$77.50
441.005	REFLECTORIZED PLASTIC PAVEMENT MARKINGS, 24" WIDTH, CIP	LF	90	$6.85	$616.50
441.031	REFLECTORIZED PLASTIC SYMBOL, BICYCLE, CIP	EA	2	$210.00	$420.00
450.101	SIGN, POST & BASE POST, REMOVE AND SALVAGE, COMPL	EA	3	$50.00	$150.00
621.4.1	MOBILIZATION, COMPL	LS	1	$13,869.14	$14,000.00
701.1	TRENCHING, BACKFILLING & COMPACTION, FOR 18" TO 36" SEWER PIPE, UP TO 8' IN DEPTH, PIPE NOT INCL., COMPL	LF	12	$30.00	$360.00
701.32	BACKFILL MATERIAL, SELECT, INCL. COMPACTION, CIP	CY	5	$20.00	$100.00

ENGINEER'S CONCEPTUAL ESTIMATE - LOUISIANA BLVD AND INDIAN SCHOOL RD INTERSECTION

CITY ITEM NO.	DESCRIPTION	UNIT	QTY.	ESTIMATE	
				UNIT PRICE	EST. COST
801.111	VALVE BOX, ADJUST TO GRADE, CIP	EA	1	$500.00	$500.00
910.005	18" REINFORCED CONCRETE PIPE, CLASS III, FURNISH & PLACE IN OPEN TRENCH, CIP	LF	12	$40.00	$480.00
910.103	DRAINLINE REMOVAL, 10" TO 18", EXCL. TRENCHING, COMPL	LF	14	$25.00	$350.00
915.03	CATCH BASIN, TYPE "C", SINGLE GRATE, CIP, SD 2205	EACH	1	$3,500.00	$3,500.00
915.04	CATCH BASIN, TYPE "C", DOUBLE GRATE, CIP, SD 2205	EACH	2	$5,000.00	$10,000.00
915.07	CATCH BASIN, EXISTING, REMOVE & DISPOSE, ANY TYPE, INCL. CLEANUP, COMPL, SD 2200	EACH	3	$800.00	$2,400.00
920.01	MANHOLE, 4' DIA, TYPE "C", LESS THAN 6' DEEP, CIP, SD 2101	EACH	2	$3,000.00	$6,000.00
920.42	EXISTING MANHOLE FRAME & COVER, ADJUST TO PAVEMENT GRADE WHERE ADJUSTMENT OF CONCRETE OR BLOCK BARREL IS REQUIRED, CIP	EACH	1	$1,000.00	$1,000.00
1005.32	GRAVEL MULCH 2"-4" CANYON GOLD, INCL. FILTER FABRIC, CIP	SY	325	$12.00	$3,900.00
1006.3	REMOVE ABOVE GRADE SEDIMENT AND DEBRIS FROM EXISTING CULVERTS AND DRAINAGE STRUCTURES, COMPL	LS	1	$500.00	$500.00
				SUBTOTAL	$306,382.75

CONSTRUCTION SUBTOTAL	$306,382.75
CONTINGENCY, 30%	$91,914.83
SUBTOTAL	$398,297.58
NMGRT, 7.875%	$31,365.93
SUBTOTAL	$429,663.51
CITY/ENGINEERING FEES/CM, 6%	$25,779.81
INSPECTION, SURVEY, TESTING, 2%	$8,593.27
TOTAL	**$464,036.59**

UPTOWN INTERSECTION IMPROVEMENTS
NMDOT CN A302250

ENGINEER'S CONCEPTUAL ESTIMATE - HAWK SIGNAL INDIAN SCHOOL RD AND Q STREET

CITY ITEM NO.	DESCRIPTION	UNIT	QTY.	ESTIMATE	
				UNIT PRICE	EST. COST
4.01	CONSTRUCTION STAKING, COMPL	LS	1	$5,308.10	$6,000.00
4.02	CONSTRUCTION SURVEYING, COMPL	LS	1	$7,962.14	$8,000.00
6.01	CONSTRUCTION PROJECT SIGN, PER CONTRACT SPECIAL PROVISIONS	EA	2	$650.00	$1,300.00
19.01	CONSTRUCTION TRAFFIC CONTROL & BARRICADING, COMPL	LS	1	$24,000.00	$24,000.00
116.012	ARTERIAL ASPHALT CONCRETE TYPE B, COMPL	TON	2	$500.00	$1,000.00
301.02	SUBGRADE PREP. 12" AT 95% COMPACTION, CIP	SY	75	$7.00	$525.00
302.01	AGGREGATE BASE COURSE, CRUSHED, 6" AT 95% COMPACTION, CIP. SD 2408	SY	75	$13.00	$975.00
336.01	PRIME COAT, EMULSIFIED ASPHALT, CIP	SY	75	$1.25	$93.75
336.08	ASPHALT CONCRETE, PLACEMENT, 3" THICK, ARTERIAL, GRADATION SP-II AND SP-III OR SP-IV W/O MACHINE LAYDOWN, MATERIALS PAID SEPARATELY, CIP	SY	75	$40.00	$3,000.00
336.12	TACK COAT, CATIONIC EMULSIFIED ASPHALT, CIP	SY	75	$1.25	$93.75
340.01	SIDEWALK, 4" THICK, PCC, INCL. SUBGRADE COMPACTION, CIP SD 2430	SY	43	$55.00	$2,365.00
340.023	ACCESS RAMP, 4" PCC, STD. CURB, CIP. SD 2418	SY	75	$75.00	$5,625.00
340.029	DETECTABLE WARNING SURFACE FOR ADA RAMPS, CIP	SF	120	$31.00	$3,720.00
340.05	CURB & GUTTER, STANDARD, PORTLAND CEMENT CONCRETE, INCL. SUBGRADE PREPARATION, CIP SD 2415	LF	35	$40.00	$1,400.00
340.06	CURB & GUTTER, MEDIAN, PORTLAND CEMENT CONCRETE, CIP SD 2408	LF	650	$34.00	$22,100.00
340.11	HEADER CURB, PORTLAND CEMENT CONCRETE, INCL. SUBGRADE, CIP, SD 2415	LF	95	$27.00	$2,565.00
343.02	EXISTING PAVEMENT, ASPHALT CONCRETE, REMOVE AND DISPOSE, SAWCUT NOT REQUIRED, ANY THICKNESS, COMPL.	SY	425	$12.00	$5,100.00
343.08	EXISTING CURB & GUTTER OR VALLEY GUTTER, PC CONCRETE, REMOVE & DISPOSE, COMPL.	LF	480	$12.00	$5,760.00
343.09	REMOVE AND DISPOSE EXISTING PCC SIDEWALK AND DRIVEPAD	SY	260	$15.00	$3,900.00
346.1	TEXTURED PAVEMENT, 4" THICK, COLORED PC CONCRETE, INCL. SUBGRADE COMPACTION, CIP SD 2408	SF	3,000	$12.00	$36,000.00
421.005	SERVICE RISER (SIGNAL), CIP	EA	1	$1,650.00	$1,650.00
421.010	METER PEDESTAL (SIGNAL), CIP	EA	1	$6,800.00	$6,800.00
421.015	SERVICE CONNECTION (SIGNAL), CIP	EA	1	$335.00	$335.00
422.004	TRAFFIC SIGNAL PEDESTAL POLE, 13', CIP	EA	4	$1,900.00	$7,600.00
422.017	TRAFFIC SIGNAL MASTARM, 30' ARM, TYPE III, TROMBONE, CIP	EA	2	$11,300.00	$22,600.00
423.001	TRAFFIC SIGNAL FOUNDATION FOR PEDESTAL POLE, CIP	EA	4	$705.00	$2,820.00
423.002	TRAFFIC SIGNAL MASTARM FOUNDATION, CIP	EA	2	$2,330.00	$4,660.00
423.003	TRAFFIC SIGNAL CONTROLLER FOUNDATION (TYPE M & P CABINET), CIP	EA	1	$775.00	$775.00
424.011	ELECTRICAL CONDUIT, 3", INCLUDING TRENCHING, BACKFILL, AND PATCHING, CIP	LF	890	$38.00	$33,820.00
425.003	ELECTRICAL PULL BOX (LARGE) CIP.	EA	11	$935.00	$10,285.00
426.001	SINGLE CONDUCTOR, #2, CIP.	LF	495	$2.00	$990.00
426.003	SINGLE CONDUCTOR, #6, CIP.	LF	1,385	$2.25	$3,116.25
426.010	MULTI-CONDUCTOR, #5, CIP.	LF	720	$2.25	$1,620.00
426.014	MULTI-CONDUCTOR, #20, CIP.	LF	880	$8.50	$7,480.00
427.001	1 SECTION TRAFFIC ASSEMBLY, CIP.	EA	18	$313.00	$5,634.00
427.023	PEDESTRIAN SIGNAL (COUNTDOWN), CIP.	EA	2	$890.00	$1,780.00
427.030	1 SECTION BACKPLATE , CIP.	EA	12	$100.00	$1,200.00
428.010	PEDESTRIAN PUSH BUTTON STATION, CIP.	EA	4	$790.00	$3,160.00
429.001	TRAFFIC ACTUATED CONTROLLER, CIP	EA	1	$6,150.00	$6,150.00
429.021	8 PHASE TRAFFIC CONTROL CABINET, CIP	EA	1	$37,900.00	$37,900.00
432.00X	LED ROADWAY LUMINAIRE, 250S EQUIVALENT, CIP	EA	2	$1,000.00	$2,000.00
440.015	REFLECTORIZED PAINT FOR MEDIAN NOSE, CIP.	SF	30	$5.00	$150.00
441.001	REFLECTORIZED PLASTIC PAVEMENT MARKINGS, 4" WIDTH, CIP	LF	500	$3.50	$1,750.00
441.005	REFLECTORIZED PLASTIC PAVEMENT MARKINGS, 24" WIDTH, CIP	LF	150	$7.00	$1,050.00
443.101	REMOVAL OF PAVEMENT STRIPE , ANY WIDTH, PAINTED OR PLASTIC, COMPL.	LF	260	$3.00	$780.00
450.010	ALUMINUM PANEL SIGN	SF	135	$15.00	$2,025.00
450.01	SQUARE TUBE STEEL POSTS & BASE POSTS FOR ALUMINUM PANEL SIGN, CIP	LF	250	$12.00	$3,000.00
450.101	SIGN, POST & BASE POST, REMOVE AND SALVAGE, COMPL	EA	1	$52.00	$52.00
621.4.1	MOBILIZATION, COMPL	LS	1	$13,270.24	$14,000.00
920.410	EXISTING MANHOLE FRAME AND COVER, ADJUST TO GRADE WITH MASONRY, OVER 2", CIP SD 2111	EACH	4	$1,500.00	$6,000.00
		SUBTOTAL CITY OF ALBUQUERQUE			$324,704.75
				SUBTOTAL	$324,704.75

CONSTRUCTION SUBTOTAL	$324,704.75
CONTINGENCY, 30%	$97,411.43
SUBTOTAL	$422,116.18
NMGRT, 7.875%	$33,241.65
SUBTOTAL	$455,357.82
CITY/ENGINEERING FEES/CM, 6%	$27,321.47
INSPECTION, SURVEY, TESTING, 2%	$9,107.16
TOTAL	**$491,786.45**

UPTOWN INTERSECTION IMPROVEMENTS
PRELIMINARY ITS COST ESTIMATE
4/20/2022

BID ITEM #	ITEM ID NO.	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL
1	422.341	TYPE IV STEEL ITS 40' POLE (FOR PTZ CAMERAS), CIP.	EA	2	$ 5,250.00	$ 10,500.00
2	422.342	INSTALL NEW TRAFFIC SIGNAL POLE EXTENSION	EA	1	$ 2,000.00	$ 2,000.00
3	423.022	FOUNDATION FOR 40' TYPE IV ITS POLE	EA	2	$ 1,575.00	$ 3,150.00
4	424.042	ELECTRICAL CONDUIT, 4" INCL TRENCHING, BACKFILL PATCHING, PUSHING, BORING & JACKING, CIP	LF	1,800	$ 17.00	$ 30,600.00
5	425.004	INSTALL NEW TYPE C SIGNAL PULLBOX	EA	5	$ 2,000.00	$ 10,000.00
6	425.021	ITS SPLICE VAULT, CIP	EA	3	$ 3,000.00	$ 9,000.00
7	428.210	INSTALL CCTV (PTZ) CAMERA INCLUDING MOUNT, CIP.	EA	3	$ 5,100.00	$ 15,300.00
8	435.006	SINGLE MODE FIBER OPTIC CABLE (6)	LF	150	$ 1.50	$ 225.00
9	435.096	SINGLE MODE FIBER OPTIC CABLE (24)	LF	2,000	$ 2.00	$ 4,000.00
10	435.600	SPLICE CLOSURE, WITH CABLE SPLICE	EA	3	$ 3,000.00	$ 9,000.00
11	435.610	EXISTING SPLICE CLOSURE RESPLICE	EA	1	$ 3,000.00	$ 3,000.00
12	435.702	MANAGED FIELD ETHERNET SWITCH (FS)	EA	3	$ 4,700.00	$ 14,100.00
					SUBTOTAL BID ITEMS	**$ 95,225.00**
					CONTINGENCY (30%)	**$ 28,567.50**
					SUBTOTAL	**$ 123,792.50**
					NMGRT Albuquerque (7.875%)	**$ 9,748.66**
					SUBTOTAL	**$ 133,541.16**
					CITY/ENGINEERING FEES/CM (6%)	**$ 8,012.47**
					INSPECTION, SURVEY, TESTING, (2%)	**$ 2,670.82**
					GRAND TOTAL	**$ 144,224.45**

Appendix D

Bicycle and Trail Crossings Guide Memo

City of Albuquerque

Department of Municipal Development

Patrick Montoya, Director

Timothy M. Keller, Mayor

Interoffice Memorandum

April 11, 2022

To: Patrick Montoya, Department Director, Department of Municipal Development

From: Paula Dodge-Kwan, Engineering Division Manager, Department of Municipal Development, Engineering Division PDK 4/13/22
Tim Brown, Traffic Engineering Manager, Department of Municipal Development, Traffic Engineering Division TJB

Subject: City of Albuquerque Bicycle and Trail Crossing Guide Recommendations

Purpose

As part of the City of Albuquerque's commitment to safety for all roadway users and Vision Zero efforts, the City worked with Bohannon Huston to take national guidance and best practices for bicycle and pedestrian crossings and adapt it locally to consider Albuquerque's roadways – particularly wide, multi-lane arterials and locations with long block lengths between signalized crossings that create challenges for pedestrians to cross the street.

The result of this effort is the Bicycle and Trail Crossing Guide, which provides clear and consistent guidance for the prioritization, design, and application of bicycle and pedestrian crossings within the City of Albuquerque. It is also an easy-to-use tool to help determine appropriate crossing treatments while also allowing for some flexibility and engineering judgment depending on the context and location of the crossing.

The Guide will serve as a useful tool for staff to prioritize, evaluate, and implement consistent bicycle and pedestrian crossing infrastructure and also work toward achieving Vision Zero improvements. It is organized in two sections:

- Crossing Design Elements - identifies safety countermeasures to improve safety at crossing locations. It's organized from least comprehensive to most comprehensive and includes visibility treatments, signal treatments, and infrastructure treatments.
- Three-Step Decision-Making Tool:
  1. Site Selection : Determine if site is a desired location for a crossing
  2. Site Feasibility: Determine if crossing is technically feasible at selected location
  3. Crossing Design: Determine appropriate treatments and designs

Background
New Mexico regularly has the highest (or among the highest) rate of pedestrian fatalities per capita in the nation, and Albuquerque crashes account for 42% of the state's fatal pedestrian-involved crashes. In 2019, 13% of pedestrians involved in a crash died as a result (NMDOT, 2019). Additionally, New Mexico ranks as the fifth worst state for bicyclist fatalities per capita and bicycle fatalities per bicycle miles traveled (Streetlight Data, 2021).

At least 52% of pedestrian fatal crashes in New Mexico occurred at locations without traffic signals or stop signs (the actual percentage is likely much higher, as over a quarter of police reports did not include crash location). Given the high rates of pedestrian and bicyclist fatalities, especially fatalities where no traffic control exists, creating safe pedestrian and bicyclist crossing opportunities throughout the City of Albuquerque is of high importance.

Albuquerque has hundreds of miles of off-street multi-use paths, providing excellent opportunities for walking and biking within the city. However, with the exception of the Bosque Trail and North Diversion Channel Trail (which have grade-separated crossings along their entire lengths), multi-use trails frequently intersect with wide, high-speed arterial roadways. Long block lengths in many parts of the city also create challenges for pedestrians trying to cross, as signalized pedestrian crossings are often placed over a half mile apart. More frequent and safer designated crossing locations are a means of addressing these safety issues and enhancing conditions for pedestrians, bicyclists, and trail users across Albuquerque.

Consistency with FHWA, Adopted Plans, and Policies
The Bicycle and Trail Crossing Guide recommendations are adapted from the Federal Highway Administration (FHWA) Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations, which compiled recommendations based on the Manual of Uniform Traffic Control Devices (MUTCD) and studies of safety and driver compliance at crossing locations. The Guide takes national best practices and provides nuance and adapts them to consider Albuquerque's wide, multi-lane arterials.

The Guide is also consistent with and supports the implementation of the following plans and policies:

- Comprehensive Plan
- Development Process Manual
- Complete Streets Ordinance
- Vision Zero Action Plan and Executive Order

Staff Recommendation
Staff recommend formalizing the Bicycle and Trail Crossing Guide, so that staff and/or consultants that work on City of Albuquerque projects will work from a consistent framework.

This Guide will also help to prioritize bicycle and pedestrian, and Vision Zero projects.