

# Martineztown-Santa Barbara Traffic Study

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## APPENDICES



# 1. INTRODUCTION

The scope of this study is to perform a traffic analysis for the Martineztown - Santa Barbara neighborhood. The Santa Barbara-Martineztown neighborhood is located within the City of Albuquerque and is bounded by Menaul Boulevard on the north, Lomas Boulevard on the south, I-40 to the east, and the BNSF railroad tracks to the west (see Figure 1). The neighborhood association has been working closely with their City Councilor, Isaac Benton, on traffic issues that affect the neighborhood. The scope of this study addresses issues that the residents have raised as being of particular concern which include:

- Analysis of operations on the recently restriped area of Broadway, north of I-40.
- Analysis of operations and turn movements at the Broadway/Mountain and Broadway/Odelia intersections
- Count traffic and evaluate intersection Level of Service (LOS) at the locations shown in Figure 2.
- Monitor speeds and identify speed conditions and mitigation measures, especially on Broadway and Commercial (see Figure 2)
- Identify potential traffic calming measures on Mountain Road
- Review ADA conditions and identify improvements
- Study the feasibility of a new pedestrian access to Coronado Park
- Analyze alternatives to reduce truck use of Rosemont west of Broadway

Regional principal arterials in the study area consist of Broadway Boulevard in the north/south direction and Lomas Boulevard in the east/west direction. Menaul Boulevard is considered a community principal arterial which usually have lower speeds and fewer lanes than a regional principal arterial. Odelia Road is classified as a minor arterial and Mountain Road as a major collector.

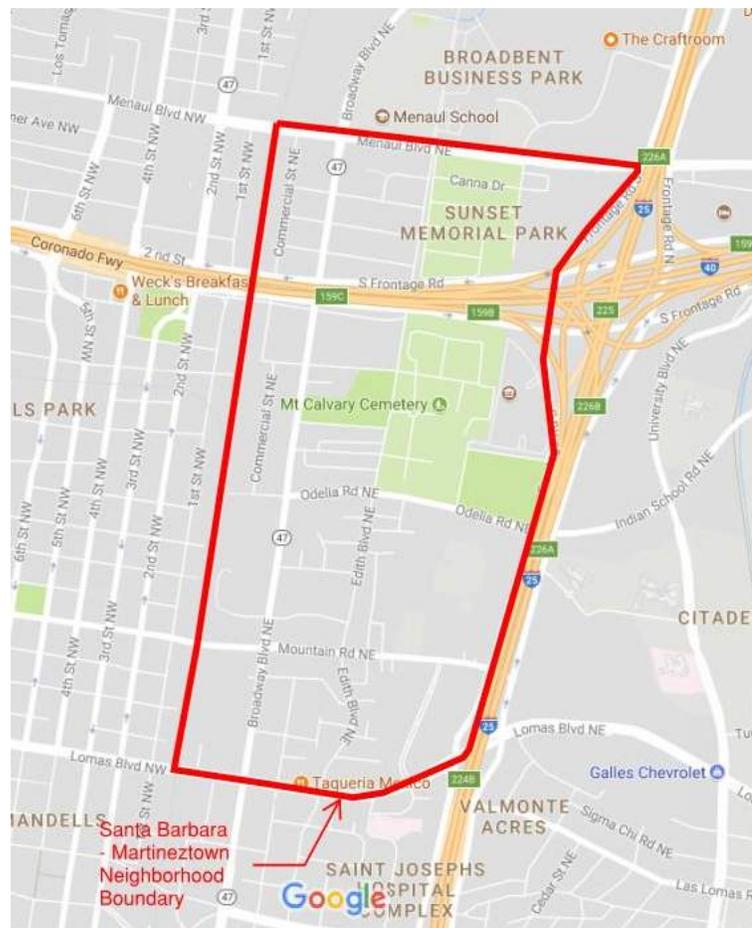


Figure 1. Study Limits

Truck traffic is restricted on several streets within the neighborhood:

- No trucks over 3 tons on Marble Avenue between Arno Street and Edith Boulevard
- No trucks over 5 tons on Mountain Road from I-40 to Broadway Boulevard
- No trucks on Edith Boulevard between Mountain Road and Odelia Road
- Trucks are also not allowed on the residential streets of Arvada, Cutler, and Prospect Avenues between Commercial Street and Edith Boulevard and on Towner Avenue west of Edith Boulevard.

## 2. DATA COLLECTION

Eight-hour turning movement counts were collected on September 5, 2017, at the following intersections (locations indicated by a “1” on Figure 2):

- Broadway/Arvada
- Broadway/Cutler
- Broadway/Prospect
- Broadway/Mountain
- Broadway/Odelia

Speed, volume, and classification data were collected using counting tubes on September 5-11, 2017, at the following locations (locations indicated by a “2” on Figure 2):

- Mountain (between Edith and Broadway)
- Broadway (between Prospect and Cutler)
- Commercial (between Prospect and Cutler)
- Edith (between Odelia and I-40)

This data is included in Appendix A and summarized in the figures in Section 3, Traffic Analysis.

In addition, Parametrix’ project engineer visited the site in September 2017 to observe existing traffic operations, existing signs, note ADA deficiencies, etc.



Figure 2. Traffic Count Locations

### 3. TRAFFIC ANALYSIS

#### 3.1 Operations of Broadway Blvd. between I-40 and Menaul

In 2016, the portion of Broadway Boulevard between I-40 and Menaul Boulevard was restriped to change the lane configuration. Prior to the restriping, Broadway had a single driving lane in each direction separated by a shared two-way left-turn lane. Now, Broadway is a two-lane undivided roadway with bicycle lanes. The roadway space that had been dedicated to the two-way left-turn lane has been reallocated to the outside of each driving lane as bicycle lanes. Vehicles making a left turn along this stretch of Broadway now make the turn out of the through driving lane. The bicycle lanes provide connectivity with the existing bicycle lanes on Broadway north of Menaul and the proposed bicycles lanes south of I-40 shown in the 2040 Long Range Bikeway System map.

As part of this study, motor vehicle, pedestrian, and bicyclist traffic at the three intersections along Broadway between I-40 and Menaul was counted in the morning, mid-day, and afternoon peak periods on Tuesday, September 5, 2017. The peak hour vehicle counts are shown in Figure 3 - Figure 5. All count data is presented in Appendix A.

Delays and levels of service (LOS) were evaluated at each of the three intersections in the morning, mid-day, and afternoon peak hours using methodologies from the 2010 *Highway Capacity Manual*. Two-way stop controlled intersection LOS is defined in terms of the average control delay for each minor-street movement (or shared movement) as well as major-street left-turns. This approach is used because major-street through vehicles are assumed to experience zero delay, so a weighted average of all movements results in very low overall average delay and this calculated low delay could mask deficiencies of minor movements. A LOS of D or better is typically considered acceptable. LOS criteria for unsignalized intersections are as follows:

<u>Average Control Delay (sec/veh)</u>	<u>LOS</u>
0 – 10	A
>10 – 15	B
>15 – 25	C
>25 – 35	D
>35 – 50	E
>50	F

Tables 1-3 show the existing delays and levels of service at each approach for each of the peak periods. The traffic analysis worksheets are included in Appendix B.

**Table 1. AM Peak Hour Delay (in seconds delay per vehicle) and Level of Service**

<b>Intersection</b>	<b>Eastbound</b>	<b>Westbound</b>	<b>Northbound</b>	<b>Southbound</b>
Broadway/Prospect	22/C	17/C	9/A	9/A
Broadway/Cutler	18/C	17/C	9/A	8/A
Broadway/Arvada	21/C	26/D	9/A	8/A

**Table 2. Noon Peak Hour Delay (in seconds delay per vehicle) and Level of Service**

Intersection	Eastbound	Westbound	Northbound	Southbound
Broadway/Prospect	17/C	16/C	8/A	8/A
Broadway/Cutler	18/C	15/C	8/A	8/A
Broadway/Arvada	15/C	18/C	8/A	8/A

**Table 3. PM Peak Hour Delay (in seconds delay per vehicle) and Level of Service**

Intersection	Eastbound	Westbound	Northbound	Southbound
Broadway/Prospect	29/D	22/C	8/A	11/B
Broadway/Cutler	30/D	17/C	8/A	10/B
Broadway/Arvada	40/E	36/E	8/A	10/B

The analyses show that most of the time the intersections operate well, with roadway level of services at a LOS C or better and vehicle delays of 22 seconds or less; however, in the afternoon peak (from 4:30 to 5:30 pm) vehicles turning off of the side streets may experience longer delays due to the heavier traffic on Broadway.

### 3.1.1 Two-Way Left-Turn Lane Warrants

Guidance for the use of two-way left-turn lanes (TWLTL) includes volume warrants, minimum and maximum access densities and minimum TWLTL length, among other considerations. The volume warrant cannot be verified with the available traffic count data collected along Broadway Boulevard in this area.

Access density is the number of access points on both sides of the street over a length of one mile. The minimum access density recommended is ten access points per mile; the maximum access density must be less than 85 access points per mile. Broadway Boulevard between I-40 and Menaul contains 31 access points over approximately 0.3 miles. (Those properties having two driveways were counted as a single access point.) The access density is calculated to be 103 access points per mile, which exceeds the recommended maximum of 85. High access densities have the potential to significantly increase the likelihood of conflicts between turning traffic and through traffic.

The recommended minimum length of a TWLTL is 425 feet. This length is based in part on providing adequate stopping sight distance at 35 mph in advance of a downstream intersection. The blocks between Arvada and Cutler, and Cutler and Prospect are approximately 285 feet long, which does not meet the minimum guideline.

The high access density along Broadway Boulevard and the short block lengths would compromise the safety of a TWLTL. These reasons support the current re-striped roadway section without the two-way left-turn lane.





Figure 3. Existing AM Peak Hour Vehicular Counts (7:30 to 8:30 am)



Figure 4. Existing Noon Peak Hour Vehicular Counts (12:00 to 1:00 pm)



Figure 5. Existing PM Peak Hour Vehicular Counts (4:30 to 5:30)

### 3.1.2 Potential for Moving Existing Bicycle Lanes on Broadway Blvd to Edith Blvd

It has been suggested that the existing bicycle lanes on Broadway Boulevard between I-40 and Menaul be relocated onto Edith Boulevard.

Bicycle lanes exist on Broadway north of Menaul and south of Iron Avenue. The Long-Range Bikeway System map shows Broadway Boulevard in the future having continuous bicycle lanes from I-25 to the south to Candelaria Road on the north. Relocating the bicycle lanes to Edith would require a through-cyclist on Broadway to travel about a quarter mile out of direction to the east and then back west, because the portion of Edith north of Menaul extending to Broadway is a gated private road. Edith Boulevard is already designated as a bicycle route that can be used by cyclists; if a cyclist prefers not to use the bicycle lanes on Broadway and Odelia, there are existing bicycle facilities on Prospect and Menaul that may be used for travel between Broadway and Edith.

Without a compelling reason to do so, it is not recommended to relocate the existing bicycle lanes on Broadway north of I-40 to Edith Boulevard.

## 3.2 Broadway/Odelia and Broadway/Mountain Intersections

The Broadway Boulevard approaches to the Odelia Road and Mountain Road intersections are each comprised of two lanes designated as a shared left/through lane and a shared right/through lane. The signal control at these approaches is a single phase; consequently, motorists making a left turn from the shared left/through lane will block and delay a through-moving vehicle behind them. Alternatively, through motorists will avoid that situation by not using the inside lane, which becomes a de facto (unofficial) left-turn lane.

As part of this study, motor vehicle, pedestrian, and bicyclist traffic at the two intersections was counted in the morning, mid-day, and afternoon peaks on Tuesday, September 5, 2017. The peak hour vehicle counts are shown in Figure 6 - Figure 8. All count data is presented in Appendix A.

As mentioned earlier, the 2040 Long Range Bikeway System Map shows that bicycle lanes are proposed on Broadway south of I-40, including through the intersections at Odelia Road and Mountain Road. With the available roadway width and average weekday traffic (AWDT) volume (approximately 10,500 to 12,000 vehicles per day [vpd] in 2016 according to the Mid-Region Council of Governments [MRCOG]), a “road diet” may be suitable for this corridor. (Also according to MRCOG, Odelia Road had an AWDT of 1,300 vpd and Mountain Road had an AWDT of 5,200 to 7,700 vpd in 2016.) According to the New Mexico Department of Transportation Road Diet Guide (November 2016), roadways with an average daily traffic volume of 10,000 to 19,000 vpd are candidates for a road diet if analysis of the key intersections along the roadway shows acceptable operations. A road diet cross section would consist of a single driving lane and bicycle lane in each direction and a shared two-way left-turn lane. This would formalize the de facto left turn lanes at the signalized intersections and would also create the desired bicycle lanes.

Delays and levels of service were evaluated at each of the intersections under existing conditions in the morning, mid-day, and afternoon peak hours using methodologies from the *Highway Capacity Manual*. A LOS of D or better is typically considered acceptable. A second capacity analysis was done for both intersections assuming a road diet section. Under the road diet option, one additional aspect of the geometry was also assumed to be changed at the westbound approach of Odelia at Broadway. Here there are currently three lanes: a left-turn lane, striped-out center lane, and shared through/right-turn lane. While the through movement volume here is low, any through

vehicle stopped at the signal will block vehicles behind it from making a right-turn on red. Opening the center lane for through vehicles will allow right turns on red and increase capacity. The results of these analyses are also shown in Tables 6-8. The traffic analysis worksheets are included in Appendix B

**Table 4. AM Peak Hour (7:00 to 8:00 am) Delay and Level of Service**

Broadway/ Odelia	Eastbound		Westbound			Northbound		Southbound		Overall Inter- section
	Left/ Thru	Right	Left	Thru	Right	Left	Shared	Left	Shared	
Existing Conditions	13/B	13/B	22/C	15/B		n/a	11/B	n/a	21/C	16/B
Broadway Road Diet	27/C	26/C	39/D	26/C	30/C	11/B	13/B	40/D	9/A	20/C

Broadway/ Mountain	Eastbound		Westbound			Northbound		Southbound		Overall Inter- section
	Left	Thru/ Right	Left	Thru	Right	Left	Shared	Left	Shared	
Existing Conditions	18/ B	17/B	23/C	15/B	14/B	n/a	8/A	n/a	9/A	12/B
Broadway Road Diet	18/ B	18/B	23/C	16/B	14/B	18/ B	11/B	13/B	15/B	15/B

**Table 5. Noon Peak Hour (12:00 to 1:00 pm) Delay and Level of Service**

<b>Broadway/ Odelia</b>	<b>Eastbound</b>		<b>Westbound</b>			<b>Northbound</b>		<b>Southbound</b>		<b>Overall Intersection</b>
	Left/ Thru	Right	Left	Thru	Right	Left	Shared	Left	Shared	
Existing Conditions	13/B	13/B	19/B	15/B		n/a	9/A	n/a	10/A	11/B
Broadway Road Diet	15/B	15/B	19/B	15/B	17/B	7/A	8/A	12/ B	7/A	11/B

<b>Broadway/ Mountain</b>	<b>Eastbound</b>		<b>Westbound</b>			<b>Northbound</b>		<b>Southbound</b>		<b>Overall Intersection</b>
	Left	Thru/ Right	Left	Thru	Right	Left	Shared	Left	Share d	
Existing Conditions	18/B	19/B	23/C	15/B	14/B	n/a	8/A	n/a	8/A	12/B
Broadway Road Diet	18/B	20/B	24/C	15/B	14/B	15/B	10/A	12/B	12/B	14/B

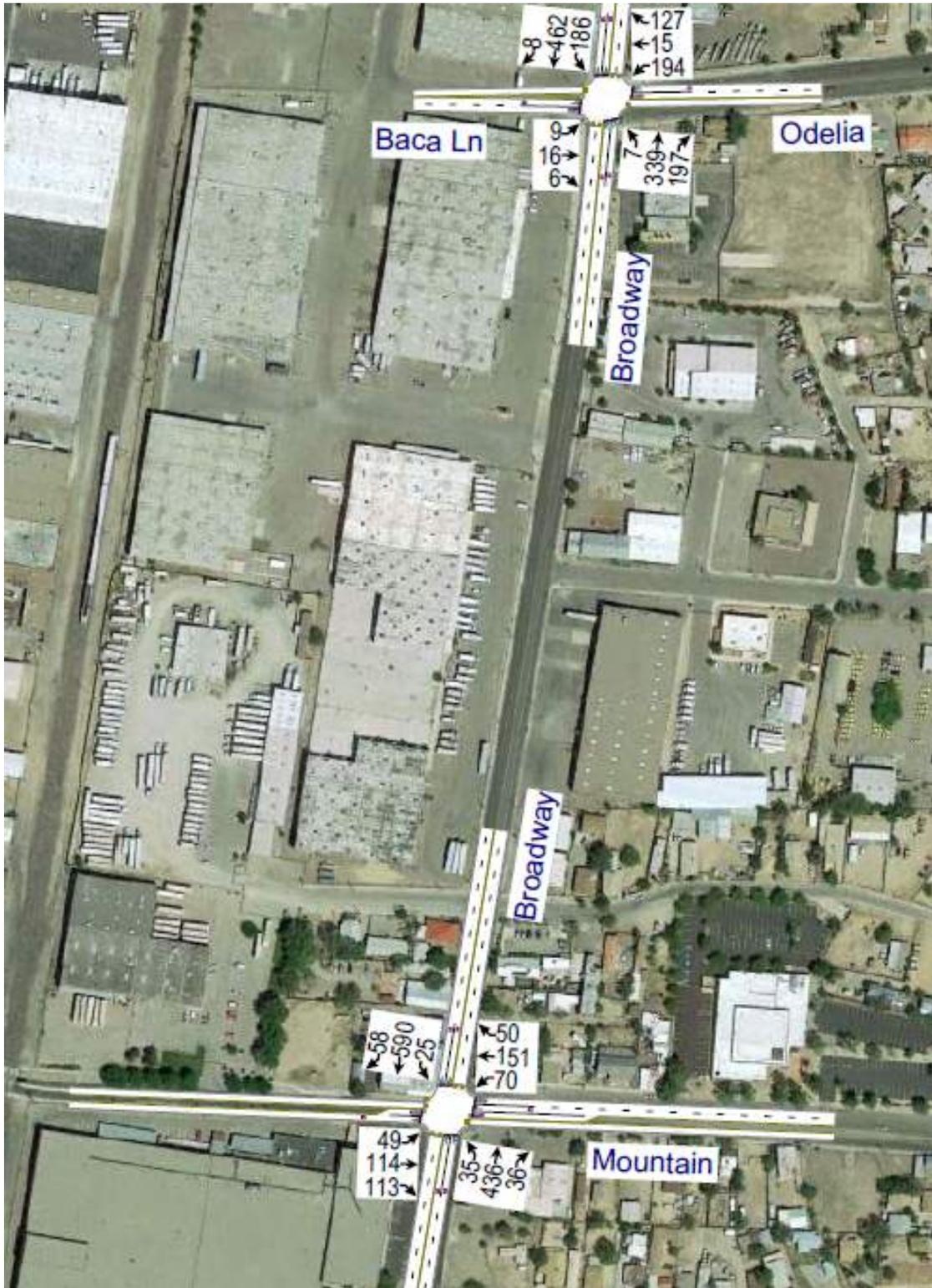


Figure 6. Existing AM Peak Hour Vehicular Counts (Sep. 5, 2017)



Figure 7. Existing Noon Peak Hour Vehicular Counts (Sep. 5, 2017)





Figure 8. Existing PM Peak Hour Vehicular Counts (Sep. 5, 2017)

**Table 6. PM Peak Hour (4:30 to 5:30 am) Delay and Level of Service**

Broadway/ Odelia	Eastbound		Westbound			Northbound		Southbound		Overall Intersection
	Left/ Thru	Right	Left	Thru	Right	Left	Shared	Left	Shared	
Existing Conditions	13/B	12/B	26/C	16/B		n/a	16/B	n/a	16/B	17/B
Broadway Road Diet	27/C	27/C	39/D	26/C	46/D	9/A	25/C	60/E	8/A	27/C

Broadway/ Mountain	Eastbound		Westbound			Northbound		Southbound		Overall Intersection
	Left	Thru/ Right	Left	Thru	Right	Left	Shared	Left	Shared	
Existing Conditions	19/B	19/B	23/C	15/B	16/B	n/a	9/A	n/a	8/A	12/B
Broadway Road Diet	19/B	19/B	23/C	16/B	16/B	18/B	17/B	19/B	14/B	17/B

The existing lane configuration results in a LOS of C or better for each movement. The road diet option also results in a LOS of C or better for each movement with the exception of three movements in the PM peak at the Broadway/Odelia intersection – the westbound left- and right-turn movements are expected to operate at a LOS D and the southbound left turn movement is expected to operate at a LOS E. This occurs because the cycle length is made longer to accommodate the northbound-southbound through movement which now has just one through lane (even though the inside through lane is currently shared with left turns, especially in the northbound direction the left-turn volume is so low that the through movement can typically use both of the two lanes). With the longer cycle length, and more of the cycle length assigned to the north-south movement, delay on the side streets increases and LOS worsens. The southbound left-turn movement delay increases substantially because there are fewer gaps in which to turn across the northbound through movement with one lane than there were with two.

The analyses with the road diet section on Broadway assumed that the signal phasing would still be a single phase in each direction (no protected left turn movements). Guidelines from FHWA, shown in Appendix D, list these reasons to consider a protected left turn phase:

1. A high number of crashes has occurred.
2. Adequate sight distance is not available for the left-turning motorist.
3. There are two or more left turn lanes.
4. There are four or more opposing through lanes.

- There is a high combination of left-turning vehicles and opposing through vehicles (per FHWA, more than 50,000 in a peak hour).

While crash data was provided for the years 2013-2015 (in Appendix E), they do not assume a road-diet section in which the left turns on Broadway are removed from the through lane, so it would not be valid to consider these crashes as a factor for a protected left-turn phase for the north-south movements. The data showed two crashes in a year involving left turns from Mountain Road at Broadway, but the FHWA guidelines consider four left-turn crashes as the critical number in a year. The data showed no left-turn crashes from Odelia at the Broadway intersection. In general, converting a four-lane undivided roadway to a roadway with two through lanes and a shared left-turn lane (a road diet) is expected to result in a reduction of crashes from 19 to 47%, according to the FHWA’s Crash Modification Factors Clearinghouse. Conditions 2 through 4 listed above do not exist at either Broadway/Odelia or Broadway/Mountain.

The last condition listed above may exist in the morning and afternoon peaks for the combination of the southbound left turn and the northbound through movement at Broadway/Odelia; this results in the lower levels of service for that left turn movement in the morning and afternoon peaks (“D” and “E,” respectively). However, if the road diet is implemented it is recommended that the permitted-only lefts be observed first before installing any of the equipment that would be required for a new protected left turn phase.

## 4. SPEED CONTROL

### 4.1 Speeds on Broadway North of I-40

The posted speed limit on Broadway north of I-40 is 35 mph; it is classified as a Regional Principal Arterial. For this study, speeds on Broadway were collected for a seven-day period using pneumatic tubes at a location between Cutler and Prospect. Tables 4 and 5 summarize the data, which is provided in its entirety in Appendix C. One of the columns in the speed tables presents the 85<sup>th</sup> percentile speed; this is the speed below which 85 percent of drivers were traveling. The 85<sup>th</sup> percentile speed is used as a guideline for setting speed limits because it is assumed that the large majority of drivers are reasonable and prudent.

**Table 7. Broadway Boulevard NB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

Northbound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	<35 mph	35-45 mph	45-55 mph	Over 55 mph		
Tuesday	3,388	3,444	178	10	39.9	Speed of 80-85 mph recorded, 7 pm
Wednesday	3,843	3,018	146	17	39.6	Speed of 80-85 mph recorded, 12 am
Thursday	4,024	2,973	136	10	39.3	Speed of 70-75 mph recorded, 11 pm

Friday	3,636	3,338	180	9	39.9	Speed of 75-80 mph recorded, 11 am
Saturday	1,470	2,281	184	13	42.0	Speed of 65-70 mph recorded, 3 pm
Sunday	976	1,866	141	5	42.2	Speed of 75-80 mph recorded, 8 pm
Monday	3,230	3,377	148	5	39.9	

**Table 8. Broadway Boulevard SB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

Southbound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	<35 mph	35-45 mph	45-55 mph	Over 55 mph		
Tuesday	2,816	2,482	88	3	39.5	
Wednesday	2,793	2,415	79	1	39.4	
Thursday	2,961	2,391	71	4	39.2	
Friday	2,786	2,740	88	6	39.6	
Saturday	1,275	1,643	78	2	40.4	
Sunday	917	1,163	77	2	41.0	
Monday	2,450	2,675	91	3	39.8	Speed of 75-80 mph recorded, 3 pm

The data show that:

- 49% of vehicles were traveling below the 35 mph speed limit
- 98% of vehicles were traveling slower than 45 mph (10 mph over the speed limit)
- Several drivers were recorded traveling at higher speeds up to 80 mph

According to the Long Range Transportation System Guide, 35 mph is an appropriate posted speed limit for a Regional Principal Arterial with six-foot bicycle lanes; however, the 85<sup>th</sup> percentile speeds are closer to 40 mph than 35 mph.

## 4.2 Effectiveness of Speed Humps on Commercial Street

One block west of Broadway, Commercial Street between I-40 and Menaul, which is classified as a local road, has five speed humps which have been in place at least 15 years. One speed hump is

located in each block from I-40 to Arvada, Arvada to Cutler, and Cutler to Prospect, and two speed humps are located between Prospect and Menaul. The speed limit is posted for southbound traffic at 25 mph. There is no posted speed limit for northbound traffic, but Albuquerque’s City Traffic Code defines the speed limit on residential streets as 25 mph if not otherwise posted.

For this study, speeds on Commercial were collected for a seven-day period using pneumatic tubes at a location between Cutler and Prospect. Tables 9 and 10 summarize the data, which is provided in its entirety in Appendix C.

**Table 9. Commercial Street NB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

North-bound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	0-20 mph	20-25 mph	25-30 mph	30-40 mph		
Tuesday	138	159	48	14	26.5	
Wednesday	153	136	65	13	26.9	One speed of 85-90 mph recorded at 4 pm
Thursday	169	131	35	5	24.3	One speed of 80-85 mph recorded at 10 am
Friday	133	133	54	8	26.6	
Saturday	91	61	26	1	24.4	
Sunday	64	45	15	4	27.1	One speed of 80-85 mph recorded at 7 pm
Monday	137	120	54	5	26.6	One speed of 45-50 mph recorded at 3 pm

**Table 10. Commercial Street SB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

South-bound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	0-20 mph	20-25 mph	25-30 mph	30-40 mph		
Tuesday	130	97	41	5	26.5	
Wednesday	127	100	31	9	24.9	

Thursday	129	94	30	3	24.6	
Friday	107	109	37	6	26.7	One speed of 60-65 mph recorded at 1 pm
Saturday	69	33	21	2	27.1	
Sunday	68	25	7	2	22.9	
Monday	120	103	29	5	24.7	

The “Comments” column of the tables show that five outlying speeds, one up to 85 or 90 mph, were recorded during the seven-day period. However, the data also show that:

- volumes are much lower than on Broadway
- 84% of vehicles were traveling below the 25 mph speed limit
- 98% of vehicles were traveling slower than 30 mph
- 2% of vehicles were traveling 30 to 40 mph

The existing speed humps appear to be adequately keeping speeds down along this segment of Commercial Street, with the exception of the few outliers. Methods for deterring high speeds like these on Commercial are discussed later in this report.

### 4.3 Speeds on Edith Boulevard

Edith Boulevard between Odelia Road and I-40 has a posted speed limit of 30 mph and is classified as a local road. For this study, speeds on Edith were collected for a seven-day period using pneumatic tubes at a location between Odelia and Hannett. Tables 11 and 12 summarize the data, which is provided in its entirety in Appendix C.

**Table 11. Edith Boulevard NB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

Northbound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	0-25 mph	25-30 mph	30-40 mph	40-50 mph		
Tuesday	184	350	734	82	37.8	3 speeds recorded between 50-65 mph
Wednesday	189	302	672	79	37.9	6 speeds recorded between 50-65 mph
Thursday	221	395	784	84	37.4	3 speeds recorded between 50-55 mph

						1 speed recorded between 70-75 mph, at 11 am
Friday	238	379	787	65	37.5	5 speeds recorded between 50-90 mph
Saturday	131	238	537	71	38.0	3 speeds recorded between 50-55 mph 1 speed recorded between 85-90 mph, at noon
Sunday	101	203	469	64	38.2	1 speed recorded between 45-50 mph 2 speeds recorded between 70-75 mph 1 speed recorded between 85-90 mph, at 6pm
Monday	207	331	772	71	37.7	4 speeds recorded between 50-65 mph

**Table 12. Edith Boulevard SB Driving Speeds Collected Week of Sep. 5 – Sep. 11, 2017**

Southbound Traffic	No. Vehicles Counted at Each Driving Speed				85 <sup>th</sup> Percentile Speed	Comments
	0-25 mph	25-30 mph	30-40 mph	40-50 mph		
Tuesday	148	266	1037	293	40.9	11 speeds recorded between 50 -65 mph
Wednesday	159	241	1055	256	40.5	20 speeds recorded between 50-70 mph
Thursday	169	258	1041	256	40.2	13 speeds recorded between 50-60 mph
Friday	168	240	1089	273	40.7	22 speeds recorded between 50-70 mph

Saturday	102	140	591	166	41.2	8 speeds recorded between 50-65 mph
Sunday	91	106	513	143	41.4	11 speeds recorded between 50-65 mph
Monday	164	290	1073	204	39.5	14 speeds recorded between 50-65 mph

The “Comments” column of the tables show that many drivers were recorded traveling at outlying speeds, many in the 65 mph range and one more than one of up to 85 or 90 mph. Additionally, the data show that:

- 31% of vehicles were traveling below the 30 mph speed limit
- 88% of vehicles were traveling slower than 40 mph (10 mph over the speed limit)
- 12% of vehicles were traveling over 40 mph (more than 10 mph over the speed limit)
- Nearly 1% of vehicles were traveling more than 20 mph over the speed limit (more southbound than northbound because of the location of the speed collection)

Speed humps have already been installed on Edith south of Odelia, and it appears the study segment to the north may also justify speed mitigation, as the 85<sup>th</sup> percentile speeds generally exceed the posted speed limit by more than eight to 10 mph. Speed humps or another traffic management strategy from the City’s Neighborhood Traffic Management Program should be considered. As the speeds collected on Commercial Street show, speed humps may still allow some drivers to travel excessively fast, but they should also lower the speeds of most vehicles into the desirable range.

## 5. PEDESTRIAN ACCESS TO CORONADO PARK

The feasibility of a new pedestrian access to Coronado Park located at 2<sup>nd</sup> Street and Indian School was reviewed as part of this study. The City of Albuquerque has made improvements to the park recently, including adding skateboard facilities. An existing sidewalk exists on the south side of Indian School but is not continuous from Broadway to 2<sup>nd</sup> Street. Rio Metro has updated the railroad crossing in this location to make safety improvements (see Photo 1).



**Photo 1. Looking west at RR crossing on Indian School**

Parametrix looked at the feasibility of a sidewalk on either the south or north side of Indian School from Broadway to 2<sup>nd</sup> Street. Based on the fact that portions of the roadway already have sidewalk on the south side, pedestrian access on the south side is more feasible and economical than the north side.



The conceptual layout on the following page (Figure 9) shows new sidewalk between 1<sup>st</sup> Street and McKnight Avenue. New curb ramps and crosswalk striping would be needed at the intersection of Indian School and 1<sup>st</sup> Street. In addition, several driveways in the area that are no longer in use should be removed and rebuilt as new sidewalk. The estimated construction cost for the sidewalk improvements is approximately \$45,000.

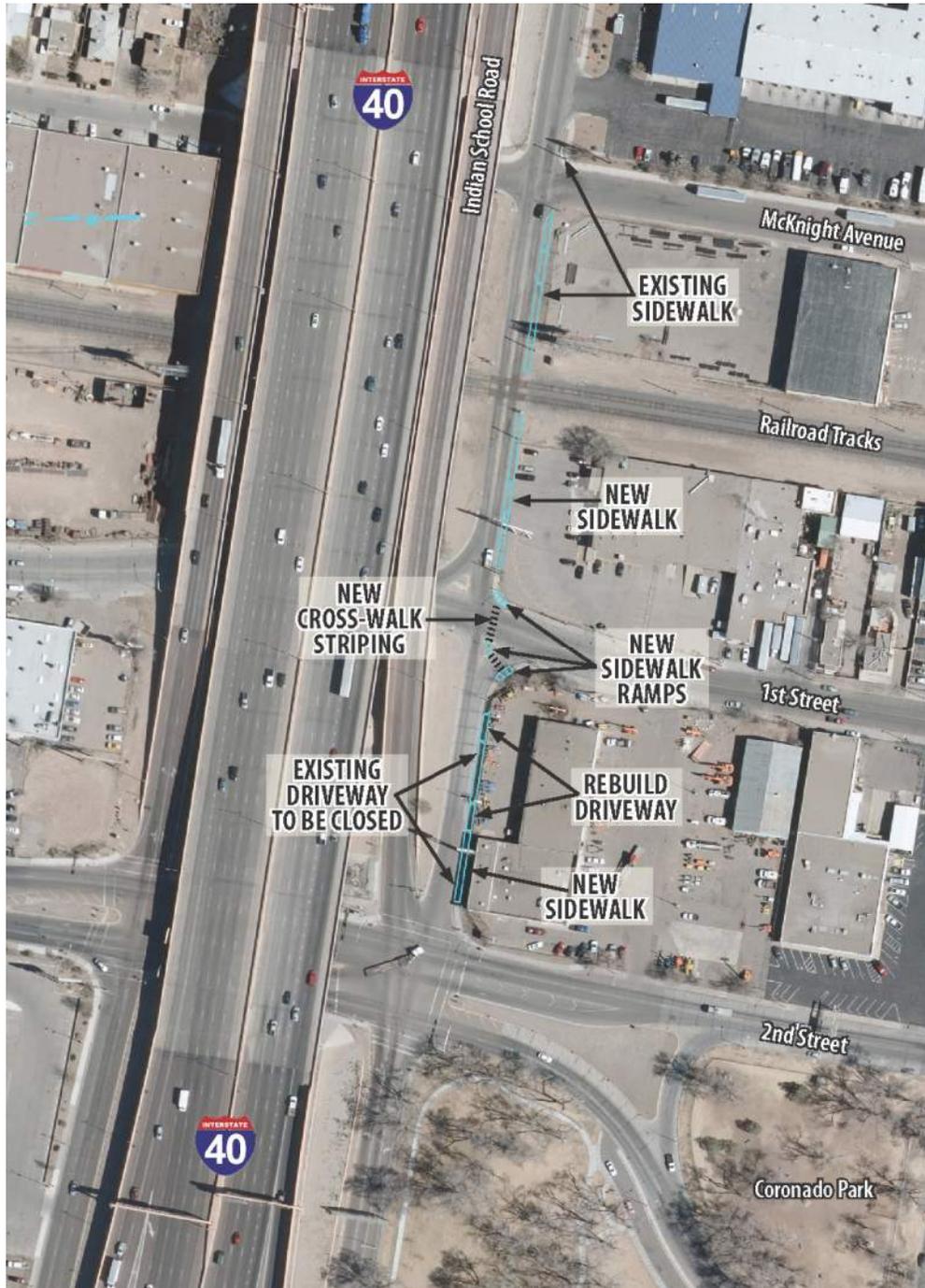


Figure 9. Conceptual Layout for Indian School Road

## 6. MOUNTAIN ROAD

Mountain Road between I-40 and the railroad corridor has truck restrictions that limit trucks to those less than 5 tons. Mountain Road between I-40 and Woodward Place is approximately 52 feet wide. At Woodward Place, Mountain starts to narrow to approximately 32 feet wide. At Edith Boulevard, the width widens again to approximately 66 feet and then narrows again at Broadway Boulevard to 32 feet. The wide section between Edith and Broadway Boulevards is confusing to drivers. The westbound lane is approximately 36 feet wide with no additional striping to delineate on-street parking or bike lanes. Parametrix has detailed two possible conceptual layouts to narrow this area of Mountain Road to provide more direction to drivers in the area. Narrowing the roadway may also reduce the truck traffic that is currently using the road because the extra width is convenient.

- **Conceptual Layout 1 - New Striping**  
This conceptual layout adds on-street parking, a bike lane with buffer, a right turn lane, and a center left turn lane in addition to the eastbound and westbound thru lanes. This visually narrows the road which may slow traffic and reduce truck traffic. This concept uses striping to make the changes and is relatively inexpensive. The estimated construction cost for this concept is approximately \$13,500. See Figure 10 below.
- **Conceptual Layout 2 - New Curb**  
This conceptual layout provides new concrete curb on the north side to narrow the street. The area between the existing sidewalk and new curb can be landscaped. The new curb narrows the roadway while still providing a bike lane with buffer, a center left turn lane, and east and westbound thru lanes. This concept does not include on-street parking and will cost more to implement than Conceptual Layout 1. The estimated construction cost for this concept is approximately \$51,600, which includes for landscaping. See Figure 11.
- **Conceptual Layout 3 - New Curb and Reconstructed Sidewalk**  
This conceptual layout is the same as Conceptual Layout 2 on the north side of the street. On the south side, to address community concerns with the existing sidewalk, reconstruction of the sidewalk is proposed. In this concept, we assumed that the back of the existing sidewalk would be held and that the existing power poles currently obstructing the sidewalk would also remain (these assumptions translate to no new right-of-way acquisition and no significant utility relocation costs for the pedestrian improvements). This would require that the existing sidewalk be replaced with a 5' to 6.5' sidewalk to meet minimum width requirements. Though the 5-foot width does not meet Development Process Manual requirements, in order to limit the amount of lane shift between the through lanes at the Broadway intersection, this narrower sidewalk width is proposed. The wider reconstructed sidewalk results in a lane offset of over six feet at the intersections of Broadway and Edith. Another important component of this layout is that the eastbound shared driving lane and bike lane (sharrow) is extended through to Edith; a separate bike lane is not provided in this direction. This is proposed in order to minimize the amount of lane offset between the through lanes at the Broadway and Edith intersections, otherwise, reconstruction of the west leg at Broadway and the east leg at Edith would be required to construct the geometric modifications needed to align the through lanes. The estimated construction cost for this concept is approximately \$113,000. See Figure 12.



Figure 10. Mountain Road - Conceptual Layout #1



Figure 11. Mountain Rd - Conceptual Layout #2

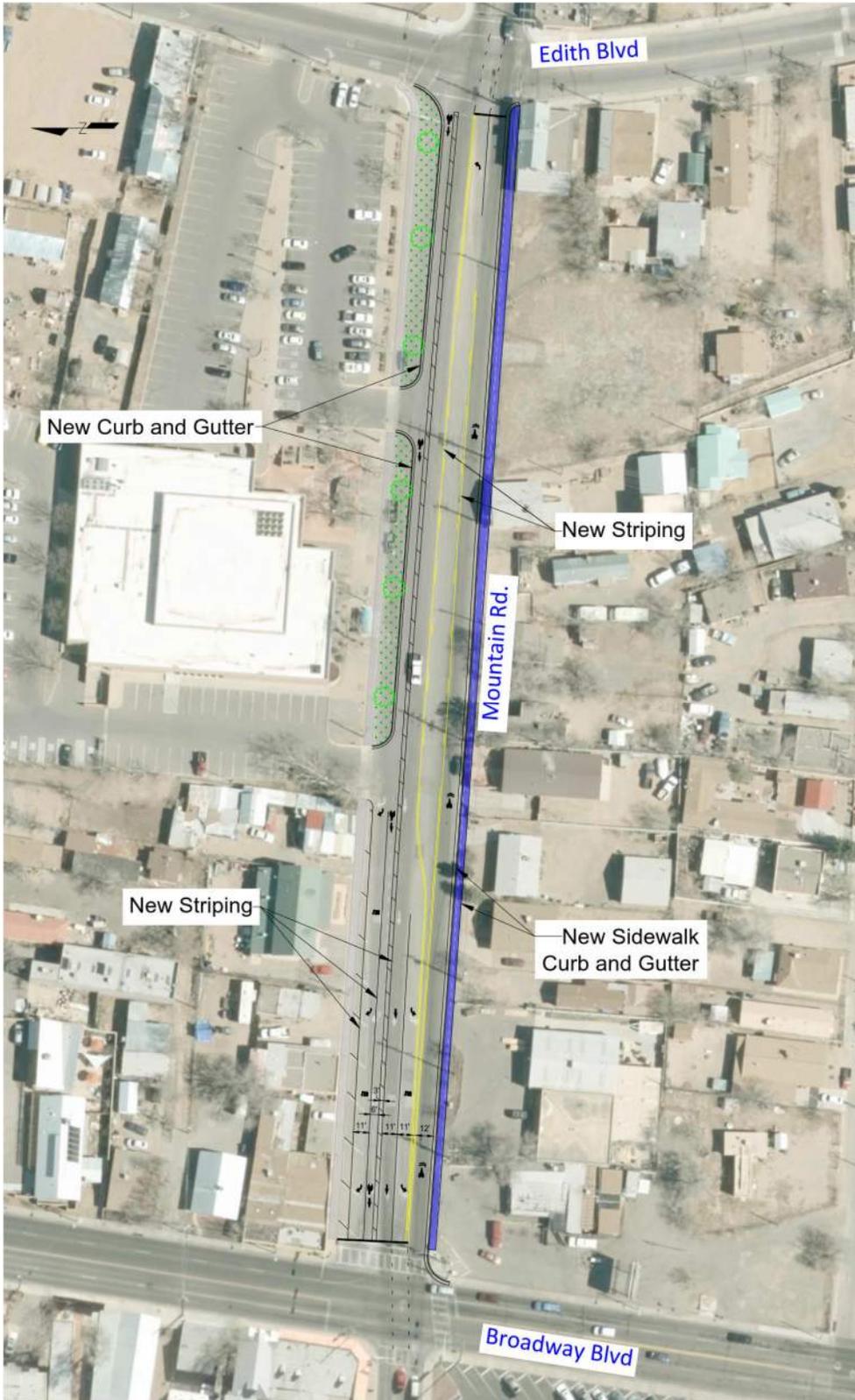


Figure 12. Mountain Rd - Conceptual Layout #3

## 7. ROSEMONT AVENUE

The residents along Rosemont Avenue have indicated that trucks use Rosemont Avenue to access the post office and industrial areas west of Broadway Boulevard. One alternative considered was to extend Commercial Drive to Rosemont to provide an alternate access point to the properties adjacent to Rosemont. However, there is no existing right-of-way or easement in that location. The City of Albuquerque would need to acquire the right-of-way from the adjacent property owners to extend Commercial Drive. See Figure 13 showing the properties in the area.



Figure 13. Properties near Rosemont Avenue

## 8. ADA DEFICIENCIES

ADA deficiencies based on the requirements and recommendations of the *Public Right-of-Way Accessibility Guidelines (PROWAG)* were evaluated throughout the neighborhood. At this time, PROWAG has not been officially adopted by the City of Albuquerque, however, the City is following these guidelines as “best practice”. This ADA review looked at general problems throughout the neighborhood and did not individually evaluate every curb ramp and driveway ramp. Common problems are noted below with accompanying typical photos.

### 8.1 PROWAG Assessment

PROWAG uses the same general requirements as the 2010 ADA Standards for Accessible Design. Key requirements of PROWAG that affect the project are listed below:

- The continuous clear width of pedestrian access routes shall be 4.0 feet minimum.
- The clear width of pedestrian access routes within medians and pedestrian refuge islands shall be 5.0 feet minimum.
- The maximum cross-slope for existing sidewalks shall be 2% maximum.
- Curb ramp maximum shall be 8.3% slopes
- Pedestrian pushbutton requirements
- Vertical Surface Discontinuities

### 8.1.1 Minimum Width

As stated above, PROWAG R302.3 states that a minimum clear width of 4 feet must be provided for pedestrian access routes and 5 feet must be provided for refuge islands (PROWAG R302.3.1). Observations are as follows:

- The sidewalks along Arvada, Cutler, and Prospect mostly meet the 4' minimum requirement.
- Some areas are narrower than 4-feet but can be rectified with maintenance such as trimming vegetation and cleaning sediment off sidewalks, see Photo 2.
- Sidewalks on Edith north of I-40 were estimated with spot field measurements and appear to range from 5-6 feet wide.
- Sidewalks on Broadway north of I-40 were estimated with spot field measurements appear to be at least 5-feet wide in most places.



**Photo 2. Arvada Street**

### 8.1.2 Maximum Cross Slope

Per PROWAG R302.6 and R407.3 the cross slope of pedestrian access routes shall be 2 percent maximum. Spot field measurements of the sidewalk cross slopes were performed using a two-foot smart level. These show that there is wide variability in the cross-slopes throughout the project area. A more detailed study with a topographic survey would be necessary to pinpoint the exact locations where the maximum cross slope is exceeded.

### 8.1.3 Vertical Surface Discontinuities

Per PROWAG R302.7.2, vertical surface discontinuities shall be 0.5 inch maximum. Vertical surface discontinuities between 0.25 inch and 0.5 inch shall be beveled with a slope not steeper than 50 percent. The bevel shall be applied across the entire vertical surface discontinuity.

Although the majority of the sidewalks in the project area are in good repair, a walking, visual survey indicates that many sidewalks are older and have shifted over time which has caused vertical discontinuities over the maximum allowable.

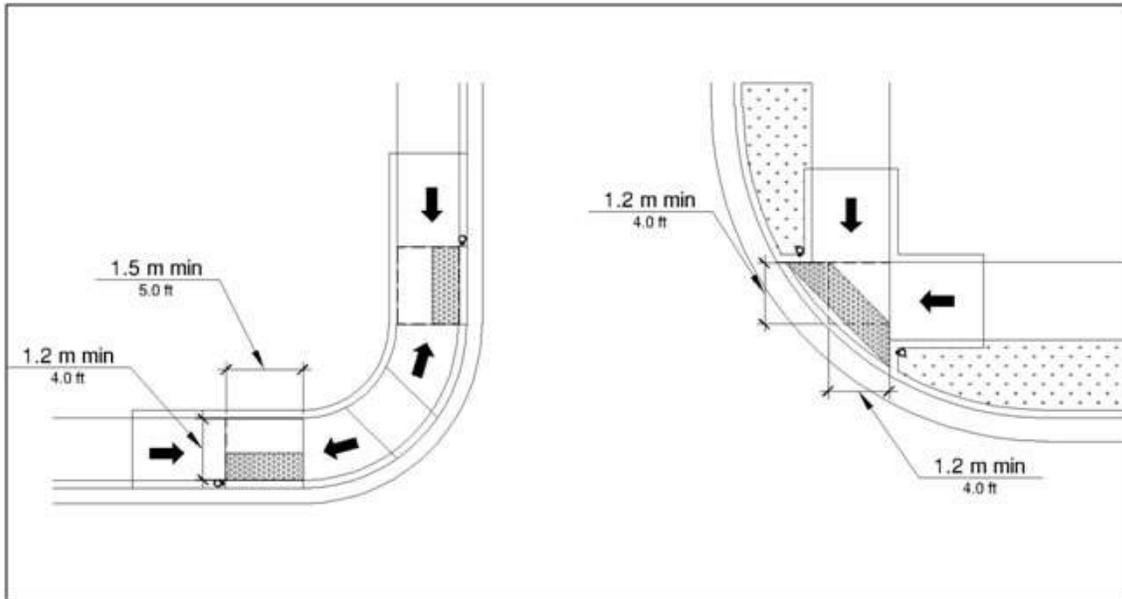
### 8.1.4 Curb Ramps

Per PROWAG R304.2.2 & R304.3.2, the running slope of the curb ramp shall be a maximum of 8.3 percent. Per PROWAG R304.5.3, the cross slope of curb ramps shall be 2 percent maximum. Per PROWAG R304.5.1, the clear width of curb ramp runs (excluding any flared sides) shall be 4 ft. minimum. In addition, PROWAG R305 states that detectable warning surfaces need to be placed at all curb ramps and extend the width of the ramp and be a minimum of 2 feet wide.

Many of the existing curb ramps exceed the maximum slope requirements. In addition, detectable warning surfaces are only located on the curb ramps located along the larger arterial streets such as Mountain and Menaul. Many of the existing curb ramps are the diagonal types as opposed to the directional type preferred by the City of Albuquerque, as shown in Figure 14 below. However, diagonal ramps can meet PROWAG requirements if constructed correctly.



**Photo 3. Typical Diagonal Curb Ramp**



**Figure 14. PROWAG Preferred Ramp Configuration**

### 8.1.5 Drivepads

To have continuous Pedestrian Access Routes (PAR) throughout the project area, requirements from PROWAG Section R302.3 and R302.6/R407.3 (four foot minimum width and 2 percent maximum cross slope) are required. Many drivepads in the project area do not meet either of these requirements.



### 8.1.6 Obstacles

PROWAG R302.3 requires a clear path of 4 feet. Many of the sidewalks and ramps in the project area are obstructed by utility poles, fire hydrants, and other infrastructure. See the adjacent photo for a typical example, that is relatively common throughout the project area. Sidewalks should be widened where possible to provide a four-foot path around the obstacle. Ramps may need to be rebuilt to provide the recommended dimensions.



Photo 4. Utility Pole Within Curb Ramp

### 8.1.7 Accessible Pedestrian Pushbuttons

Where pedestrian signals are provided at pedestrian street crossings, they shall include accessible pedestrian pushbuttons complying with Sections 4E.08 through 4E.13 of the Manual of Uniform Traffic Control Devices (MUTCD). The requirements for pedestrian pushbuttons are summarized below:

- *Unobstructed and adjacent to a level all-weather surface to provide access from a wheelchair.*
- *Where there is an all-weather surface, a wheelchair accessible route from the pushbutton to the ramp.*
- *Between the edge of the crosswalk line (extended) farthest from the center of the intersection and the curb ramp if present, but not greater than 5 feet from said crosswalk line;*
- *Between 1.5 and 6 feet from the edge of the curb, shoulder, or pavement;*
  - *Where there are physical constraints that make it impractical to place the pedestrian pushbutton between 1.5 and 6 feet from the edge of the curb, shoulder, or pavement, it should not be farther than 10 feet from the edge of the curb, shoulder, or pavement.*
- *With the face of the pushbutton parallel to the crosswalk to be used; and*
- *At a mounting height of approximately 3.5 feet, but no more than 4 feet, above the sidewalk.*
- *Where two pedestrian pushbuttons are provided on the same corner of a signalized location, the pushbuttons should be separated by a distance of at least 10 feet.*
  - *Where there are physical constraints on a particular corner that make it impractical to provide the 10-foot separation between the two pedestrian pushbuttons, the pushbuttons may be placed closer together or on the same pole.*

There are six existing traffic signals within the project boundaries. They are listed below along with observations regarding ADA accessibility at each location:

- **Menaul/Broadbent** – No crosswalk is striped on the east leg of the intersection.
- **Menaul/Broadway** – The pushbuttons for the ramp at the southeast corner are too far from the ramp to meet ADA requirements. In addition there is no pushbutton for the pedestrians crossing the intersection in an east/west direction on the south leg.

- **Broadway/Odelia** – Pushbuttons are the older, smaller type and do not meet ADA standards. In addition, pushbutton locations on the southeast signal are too far from the curb ramp. No crosswalk is located on the south leg of the intersection.
- **Broadway/Mountain** – There are no curb ramps at the northeast corner although there is a pedestrian pushbutton for pedestrians crossing north/south.
- **Edith/Mountain** – Pushbuttons are too small to meet ADA requirements. There is no ramp at the southwest corner for pedestrians crossing the west leg in a north/south direction. There are pushbuttons and a pedestrian signal head facing north but no ramp.
- **Edith/Odelia** – The signal mastarm with the pedestrian pushbuttons at the southeast corner is located adjacent to the sloped portion of the curb ramp. There is a fire hydrant in the curb ramp at the northwest corner.

## 9. PUBLIC MEETING

A public meeting for this project was held on November 16, 2017. The meeting was held at the Santa Barbara School located at 1420 Edith Boulevard, NE as part of the Santa Barbara – Martineztown Neighborhood Association meeting. The meeting was attended by area residents, SBM board members, City of Albuquerque staff, and consultant staff. The meeting included a short presentation summarizing the recommendations from the draft traffic study with a question and answer session afterwards. Residents were encouraged to submit comments on either the provided comment form or as an email to the City of Albuquerque Project Manager. All comments received are compiled and shown in Appendix F. Below is a summary of the comments and how each comment has been addressed.

- Restripe Broadway Boulevard, north of I-40, to previous configuration with center turn lane and no bike lanes. **See discussion in Sections 3.1.1 and 3.1.2.**
- Mountain Road between Edith Boulevard and Broadway Boulevard – Add third option that widens sidewalk on south side of roadway. **A discussion and sketch has been added to Section 6.**
- Several questions regarding poor lighting in parts of the neighborhood. **This is not in the scope of this traffic study but the concerns were noted by staff from Councilor Benton’s office to be forwarded to the correct personnel.**
- The railroad crossing has been updated. **The updated crossing has been added to this report.**
- Add speed humps on Commercial Street south of I-40. **These are recommended in Section 11.2.**
- There were several comments regarding the intersection of Mountain Road and the I-25 Frontage Road. The comments received from the public were both for and against closing the intersection. **This intersection is actually outside the scope of this project and is an ongoing project of the NMDOT. The NMDOT is currently doing improvements to the Frontage Road to try to reduce speeds and prevent accidents at the intersection.**
- Add speed humps on Edith Boulevard north of Odelia Road. **These are recommended in Section 11.2.**

## 10. CONCLUSIONS

The Santa Barbara – Martineztown neighborhood is one of the older areas of Albuquerque. ADA deficiencies are found throughout the corridor due to the age of the facilities. Many of the streets, sidewalks, and driveways were constructed prior to ADA standards being developed. Due to the large area of the neighborhood and the many ADA deficiencies, one project to correct all the problems is probably not feasible. ADA corrections could be completed as part of smaller projects that are initiated within the neighborhood.

The analysis shows that Broadway Boulevard, north of I-40 is functioning well with some longer delays during the afternoon peak hours. Moving the bike lanes to Edith Boulevard is not recommended due to the inconvenience to bicyclists. Edith Boulevard is approximately a quarter mile to the east of Broadway and it is unlikely that bicyclists will detour that far. In addition, the current location of the bicycle lanes provides connectivity to existing and proposed bicycle improvements on Broadway Boulevard. The bike lanes increase safety for pedestrians as well by providing a buffer for pedestrians between the driving lanes and the sidewalk.

The analysis shows that the intersections of Broadway/Odelia and Broadway/Mountain could benefit from a “road diet” that reduces the two through lanes in each direction, to one through lane in each direction. This would allow for left turn lanes at the intersections to improve the intersection operations.

The existing speed humps on Commercial north of I-40 and Edith south of Odelia appear to be adequately keeping speeds down in these roadway segments. The analysis shows that the 85<sup>th</sup> percentile speeds on Edith south of Odelia exceed the posted speed limit by up to 10 mph. This segment of Edith could benefit from speed humps to reduce speeds to a more desirable range. The standards of the City’s Traffic Management Program would need to be followed for new speed humps to be implemented.

The feasibility of pedestrian access on Indian School Road to Coronado Park was evaluated with this study. In conclusion, additional sidewalk on the south side of Indian School Road is the most economical alternative as portions of sidewalk already exist.

## 11. RECOMMENDATIONS

The recommendations have been divided into two categories – short term and long-term. Short-term recommendations are those that can be done in a shorter time frame using readily available funds. Long-term improvements typically cost more and will require the acquisition of funding from additional sources. Public input was considered in the formulation of study recommendations. Costs are based on the City of Albuquerque unit prices and do not include miscellaneous costs for mobilization, demobilization, utility relocations, right-of-way needs, constructing staking and surveying, and traffic control fees.

### 11.1 Long Term

1. **Construct pedestrian access to Coronado Park along the south side of Indian School Road.** This is estimated to cost approximately \$45,000.

2. **Construct improvements to narrow Mountain Road between Edith and Broadway.** Three options were presented in the report. Two of those options are long term improvements with extensive curb and gutter reconstruction.
  - a. Option 2 – Add curb and gutter to north side, this will cost approximately \$52,000.
  - b. Option 3 – Add curb and gutter and rebuild sidewalk on south side. This will cost approximately \$113,000.
  
3. **Construct ADA improvements.** The costs for various improvements such as reconstructing sidewalk, reconstructing drivepads, reconstruction curb ramps, etc. are presented below. These costs are for individual improvements that can be combined together into separate projects, depending on available funding.

**Table 13. ADA Improvement Costs**

Improvement	Cost
Remove and Replace Deficient Curb Ramp	\$2,900
Remove and Replace Deficient Drivepad	\$4,700
Remove and Replace Sidewalk	\$40/LF (for new 6' SW)
Remove and Reset Light Pole	\$2,300
Remove and Reset Pedestal Pole	\$2,100
New Pedestal Pole	\$2,300
Push Button Station	\$300

## 11.2 Short Term

1. **Restripe Mountain Road between Edith and Broadway to narrow the roadway.** This would cost approximately \$14,000.
  
2. **Restripe Broadway Boulevard between Mountain Road and Odelia Road.** The restriping will reduce the through lanes to one lane and add left turn bays at Mountain and Odelia. This will cost approximately \$33,000.
  
3. **Add speed humps on Commercial between McKnight Avenue and Odelia Road.** This will cost approximately \$15,000.
  
4. **Add speed humps on Edith between I-40 and Odelia Road.** This will cost approximately \$33,000.

