CHAPTER 8: TECHNICAL ANALYSIS OF MOBILITY PLAN

The technical analysis of the proposed improvements included in the mobility plan is based on Year 2030 conditions. As noted in Chapter 7, since the alternative that considered the potential deletion of the connection of Chollas Parkway to University Avenue had a negative impact on the University Avenue/54th Street intersection and the segment of University Avenue between 54th Street and 58th Street (i.e. the proposed deletion resulted in a degradation in the level of service), only the alternative based on the existing roadway network was considered when developing the proposed improvements for the University Avenue Corridor. Thus only the 2030 conditions based on the existing roadway network were evaluated to determine how each of three (3) options of the proposed University Avenue Mobility Plan would impact the network.

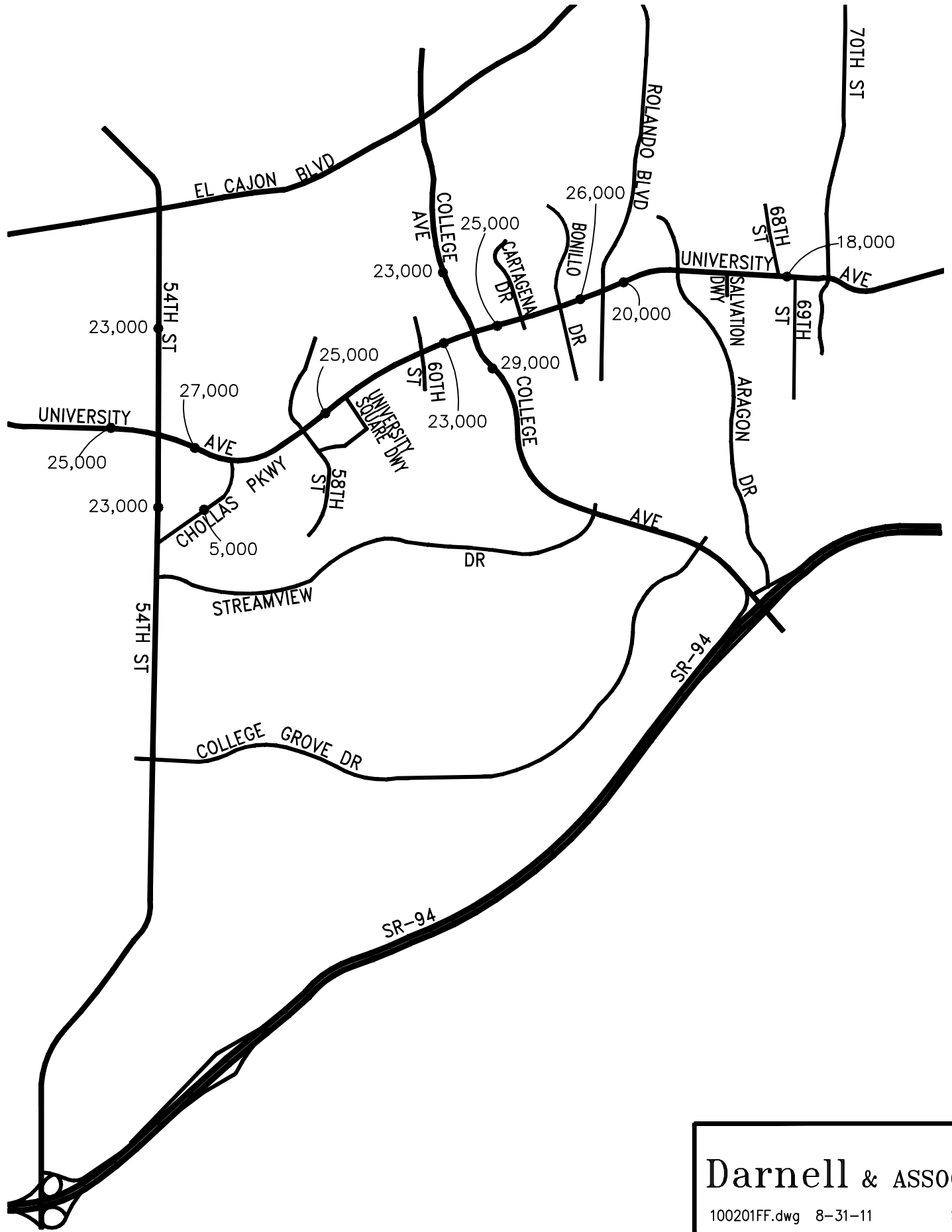
The three (3) options of the proposed University Avenue Mobility Plan were evaluated based on traffic operations, pedestrian access, bicycle connectivity, transit operations and transit ridership projections. The goal of the University Avenue Mobility Plan is to improve overall mobility within the University Avenue Corridor and reduce congestion for traffic where possible. This chapter summarizes the results of this analysis.

8.1 TRAFFIC OPERATIONAL ANALYSIS

Although the improved bicycle network may attract more bicycle riders to the area, it is unlikely that the proposed improvements associated with any of the three (3) improvement options for the University Avenue Mobility Plan would result in significant changes in travel patterns. Therefore, the daily and peak hour 2030 traffic volumes (based on the existing roadway network) previously provided in Chapter 4 would still be applicable. For convenience to the reader these volumes have been provided in Figures 8-1 and 8-2 for the daily and peak hour volumes, respectively. It should be noted that the peak hour volumes shown in Figure 8-2 reflect the proposed re-alignment of the University Avenue/Chollas Parkway intersection.

Year 2030 Roadway Segment Level of Service Analysis With Recommend Improvements

Although improvements along the study corridor with Option 2 result in the elimination of the third (3) eastbound through lane between 58th Street and College Avenue (this lane is converted into a transit only lane with Option 2), since the capacity of this third eastbound lane was not considered in the base 2030 conditions analysis, implementation of the proposed University Avenue Mobility Plan will not result in a change in the roadway capacity. For convenience to the reader, roadway capacity and levels of service for University Avenue are summarized in Table 8-1. As shown in Table 8-1, all segments of University Avenue along the study corridor will operate at an acceptable LOS C or better under 2030 conditions with either option of the proposed University Avenue Mobility Plan.



LEGEND

● Z,ZZZ – SERIES 11–SANDAG 2030 DAILY TRAFFIC VOLUME

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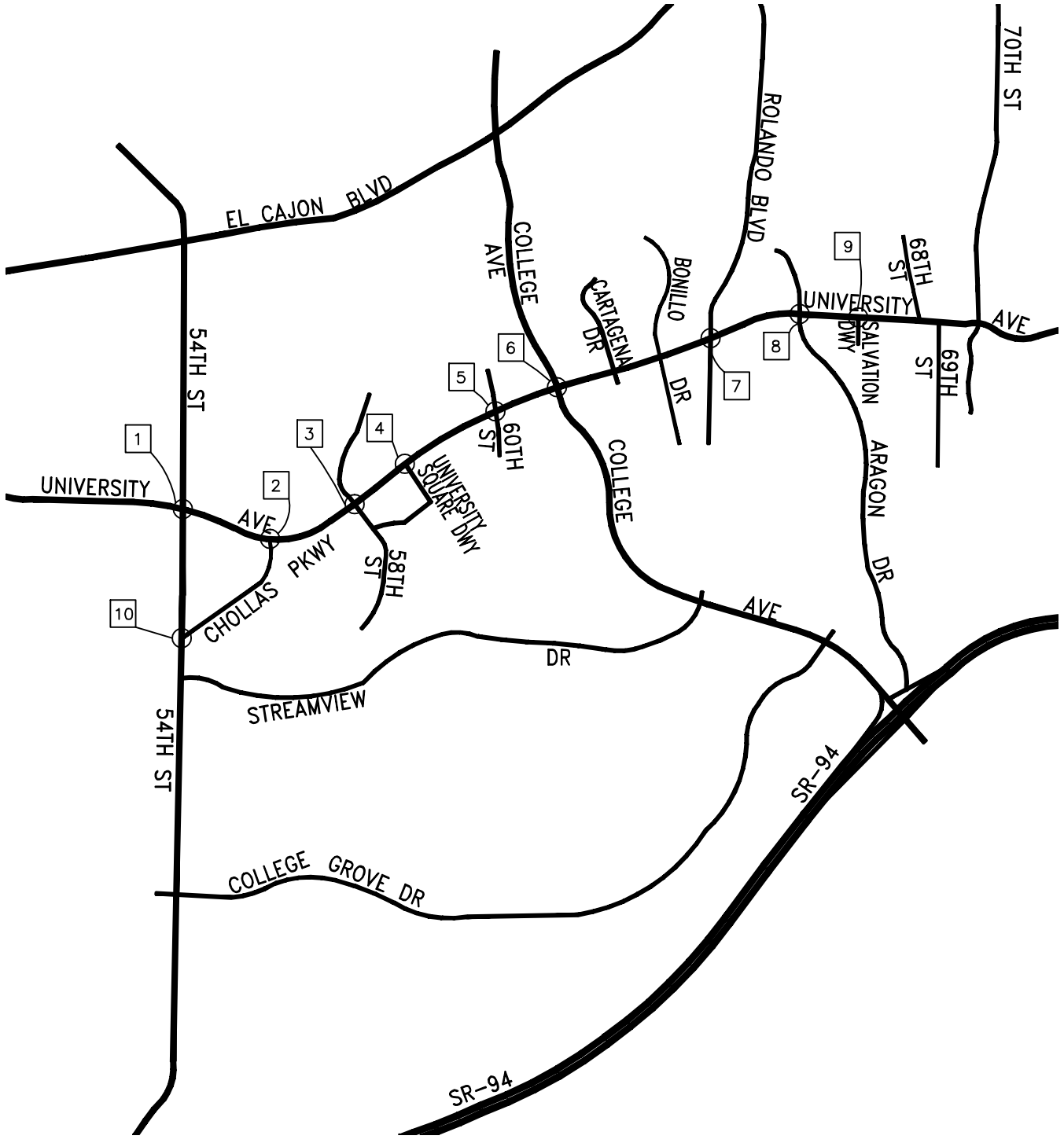
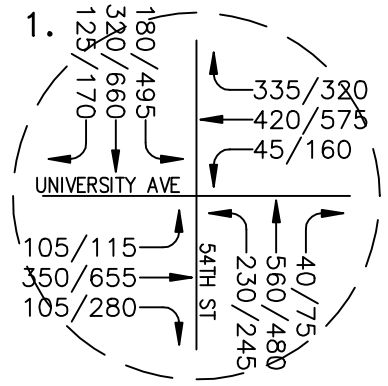
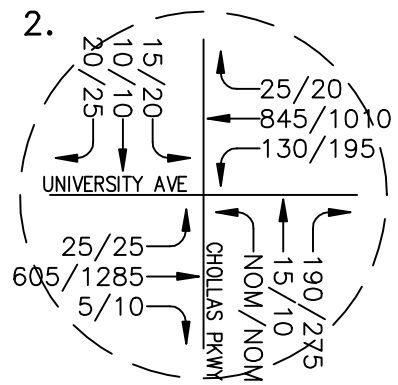
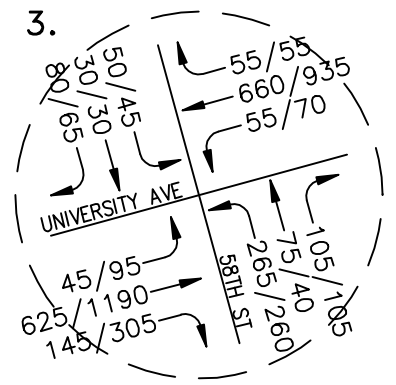
FIGURE 8–1

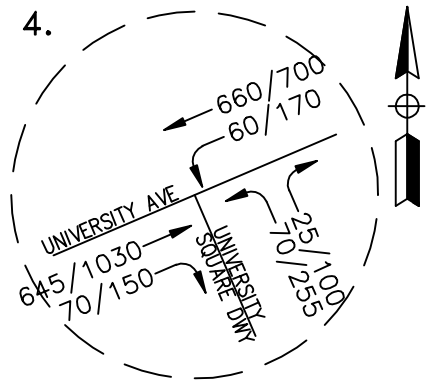
SUMMARY OF YEAR 2030
DAILY TRAFFIC VOLUMES (WITH PROPOSED IMPROVEMENTS)

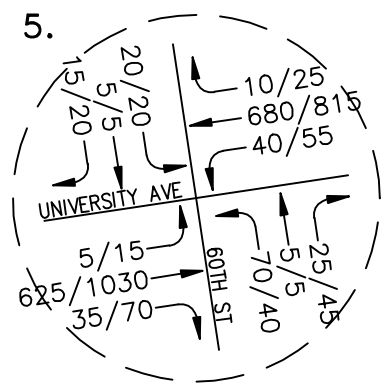


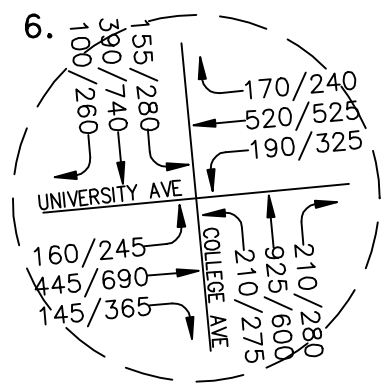


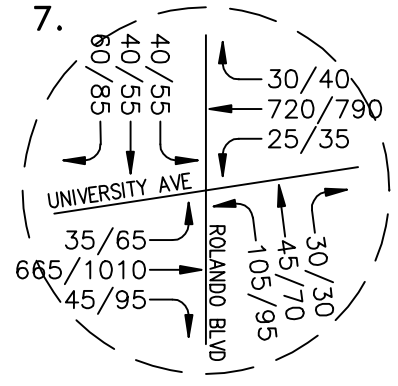


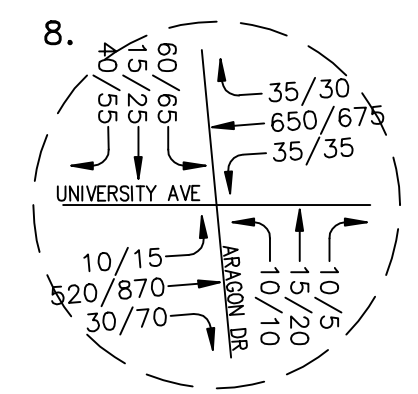


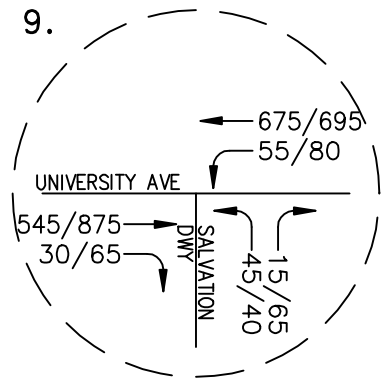


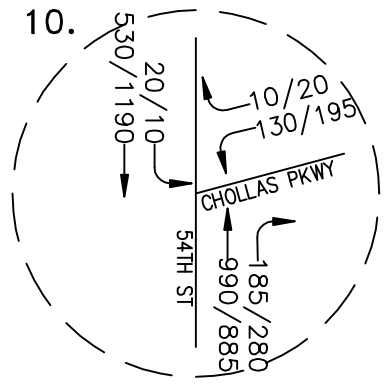












LEGEND

→ – DIRECTION OF TRAVEL

VV/WW – AM/PM PEAK HOUR TRAFFIC VOLUME

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FIGURE 8-2

SUMMARY OF YEAR 2030 PEAK HOUR TRAFFIC VOLUMES (WITH PROPOSED IMPROVEMENTS)

Table 8-1 – Future (2030) With Recommend Improvements Roadway Segment LOS Summary

Segment	Class	LOS E Capacity	ADT	Mobility Plan – Option 1			Mobility Plan – Option 2			Mobility Plan – Option 3		
				# of Lanes	V/C	LOS	# of Lanes	V/C	LOS	# of Lanes	V/C	LOS
University Avenue												
West of 54th St.	4M	40,000	25,000	4	0.63	C	4	0.63	C	4	0.63	C
54th St. to 58th St.	4M	40,000	27,000	4	0.68	C	4	0.68	C	4	0.68	C
58th St. to 60th St.	4M	40,000	25,000	5	0.63	C	4+	0.63	C	5	0.63	C
60th St. to College Ave.	4M	40,000	23,000	5	0.58	C	4+	0.58	C	5	0.58	C
College Ave. to Cartagena Dr.	4M	40,000	25,000	4	0.63	C	4	0.63	C	4	0.63	C
Cartagena Dr. to Rolando Blvd.	4M	40,000	26,000	4	0.65	C	4	0.65	C	4	0.65	C
Rolando Blvd. to Aragon Dr.	4M	40,000	20,000	4	0.50	B	4	0.50	B	4	0.50	B

Class = roadway classification; ADT = average daily traffic/trips; V/C = volume to LOS E capacity; LOS = level of service
4M = 4-Lane Major Arterial
4+ = 4 standard travel lanes plus the addition of 1 transit lane (Option 2)

Year 2030 Intersection Level of Service Analysis With Recommend Improvements

Improvements in the study corridor which are common to all three (3) improvement options that impact the intersection operation include the following:

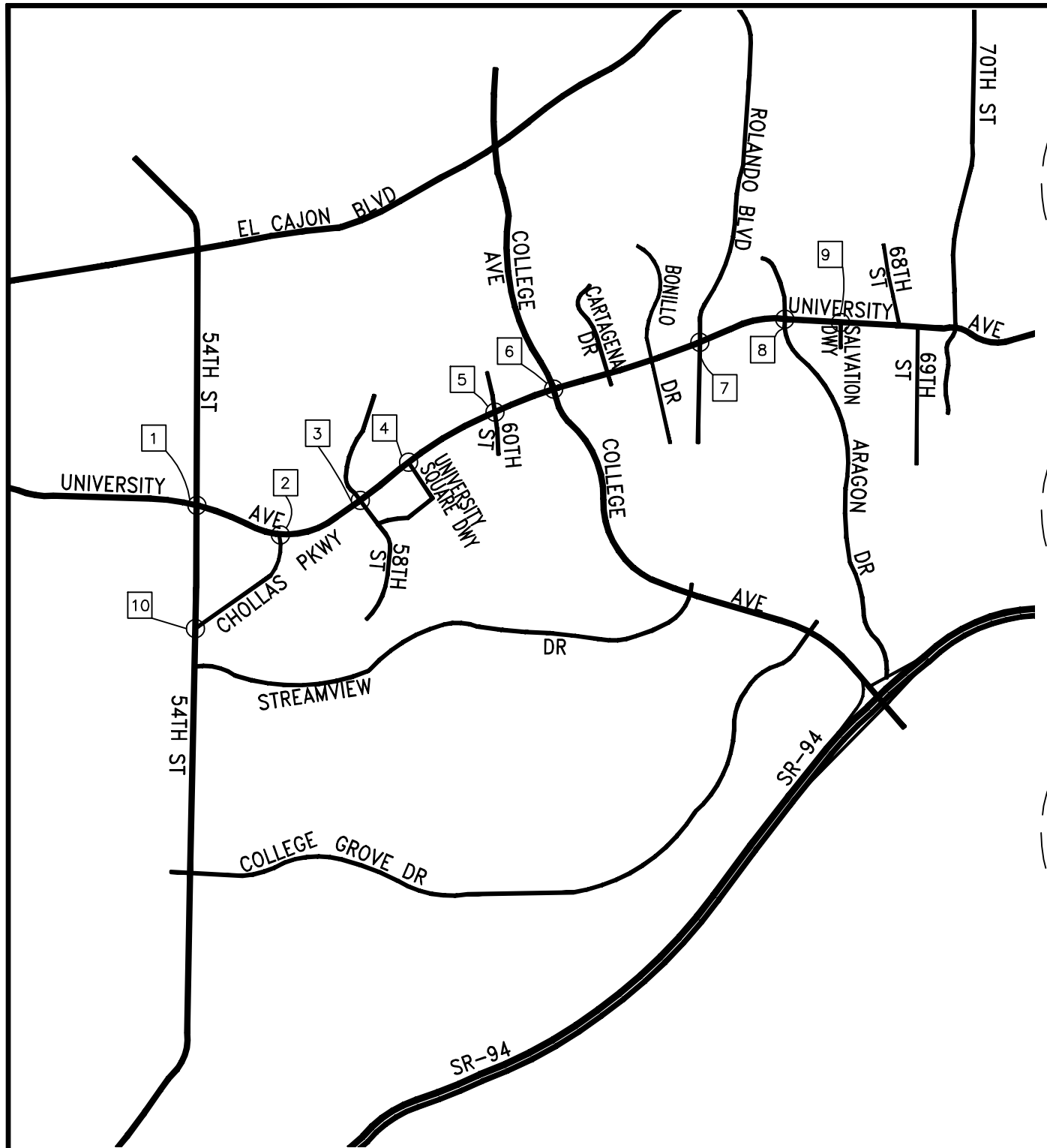
- The elimination of the westbound and southbound free right turn lane and the addition of dual westbound left turn lanes at the University Avenue/54th Street intersection;
- The re-alignment of the University Avenue/Chollas Parkway intersection to form a 90-degree T-intersection with a new traffic signal;
- The elimination of the eastbound free right turn lane and the addition of the northbound and southbound left turn lanes at the University Avenue/58th Street intersection; and
- The addition of dual eastbound and westbound left turn lanes and northbound and southbound right turn lanes at the University Avenue/College Avenue intersection.

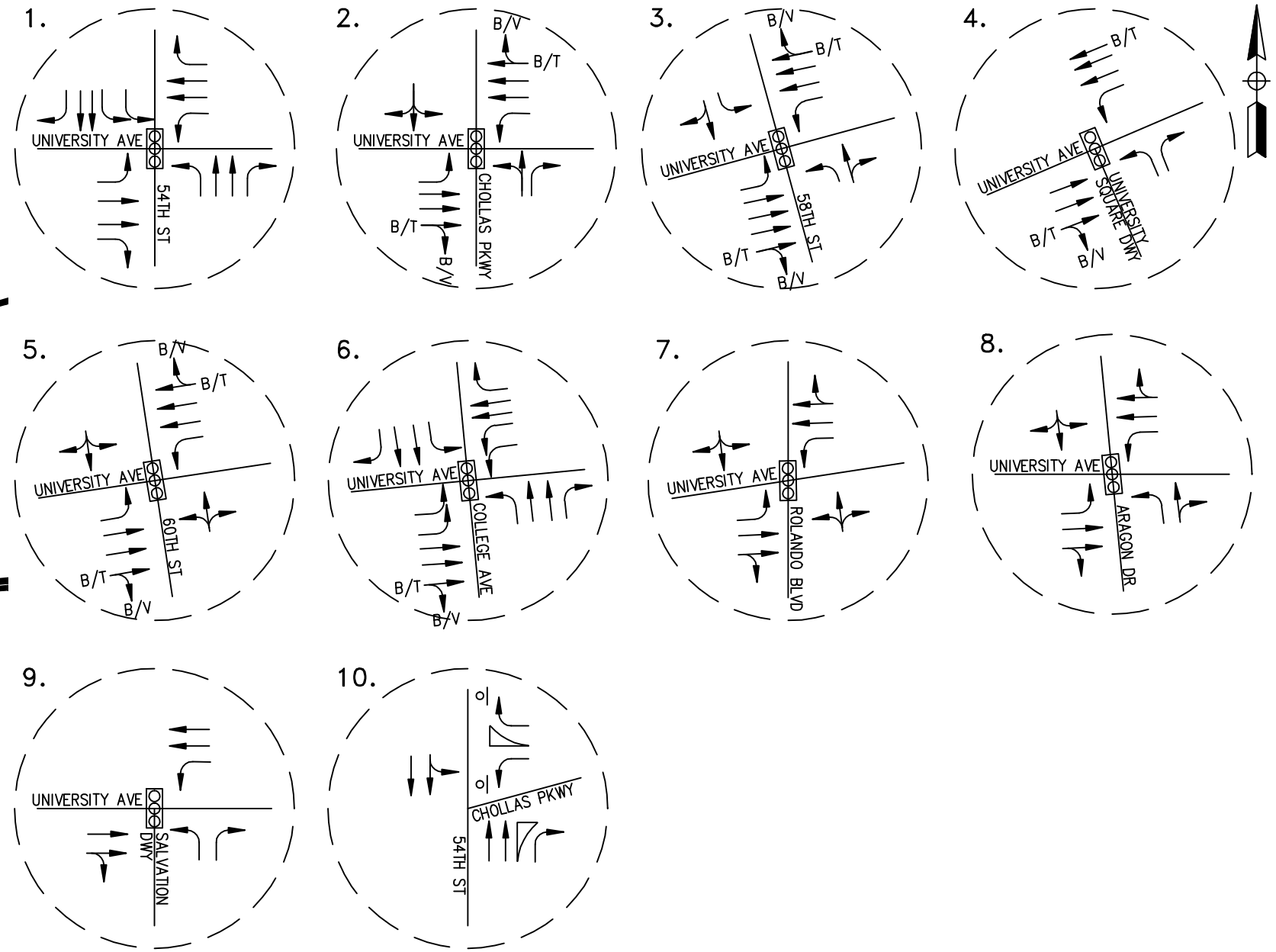
Additionally, the addition of the eastbound transit only lane between 58th Street and College Avenue with Option 2 could also potentially impact the operation of the intersections along the corridor.

Figures 8-3, 8-4, and 8-5 provide an illustration of the intersection geometrics under 2030 year conditions with the proposed Mobility Plan Improvement Options 1, 2, and 3, respectively.

As discussed in Chapter 2, the Synchro, version 6.0, software (which is based on the methodology outlined in the 2000 Highway Capacity Manual) was utilized to analyze the key intersections in the vicinity of the project.

The intersections levels of service for Year 2030 conditions were analyzed based on the intersection geometry illustrated in Figures 8-3, 8-4, and 8-5 and the future traffic volumes depicted in Figure 8-2. The results of the level of service analysis are presented in Table 8-2. The Synchro analysis worksheets are provided in Appendix E.





LEGEND

- TRAVEL LANE
- TRAFFIC SIGNAL
- STOP SIGN
- B/V – MOVEMENT ALLOWED FOR BIKES & VEHICLES
- B/T – MOVEMENT ALLOWED FOR BIKES & TRANSIT

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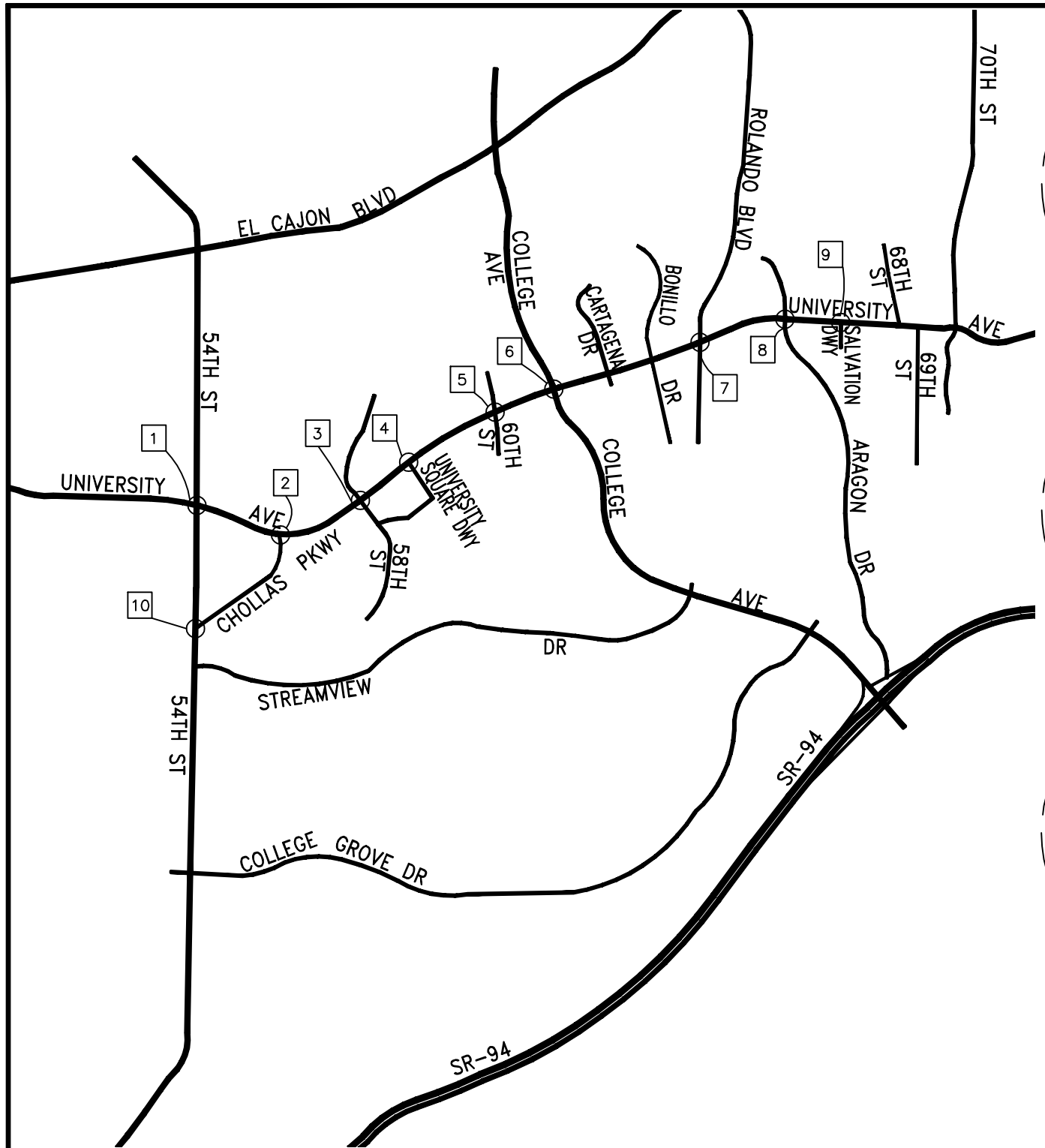
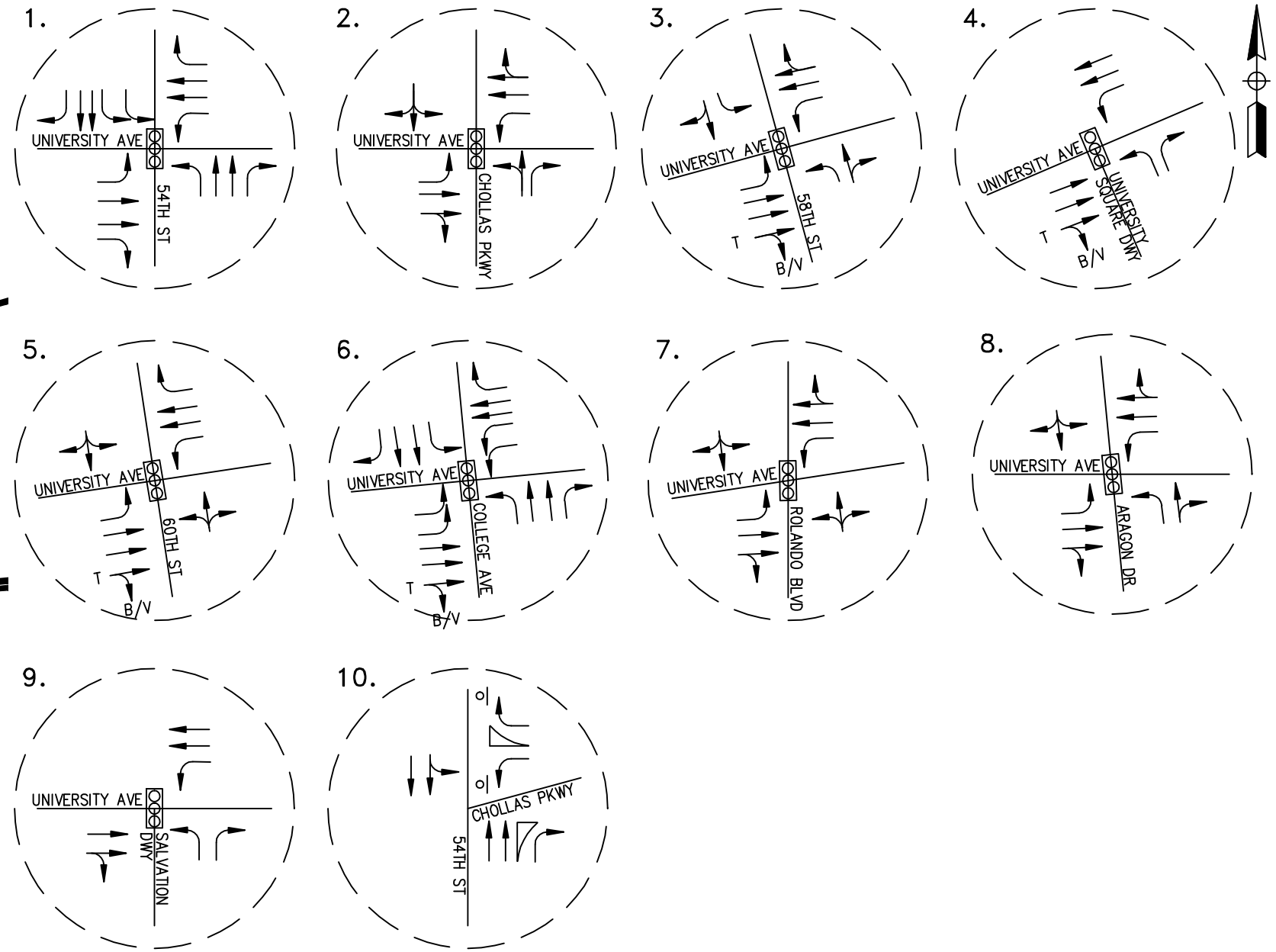
FIGURE 8-3

YEAR 2030 INTERSECTION GEOMETRICS (WITH PROPOSED OPTION 1 IMPROVEMENTS)





LEGEND

——→ – TRAVEL LANE

▯ – TRAFFIC SIGNAL

o| – STOP SIGN

B/V – MOVEMENT ALLOWED FOR BIKES & VEHICLES

T – MOVEMENT ALLOWED FOR TRANSIT ONLY

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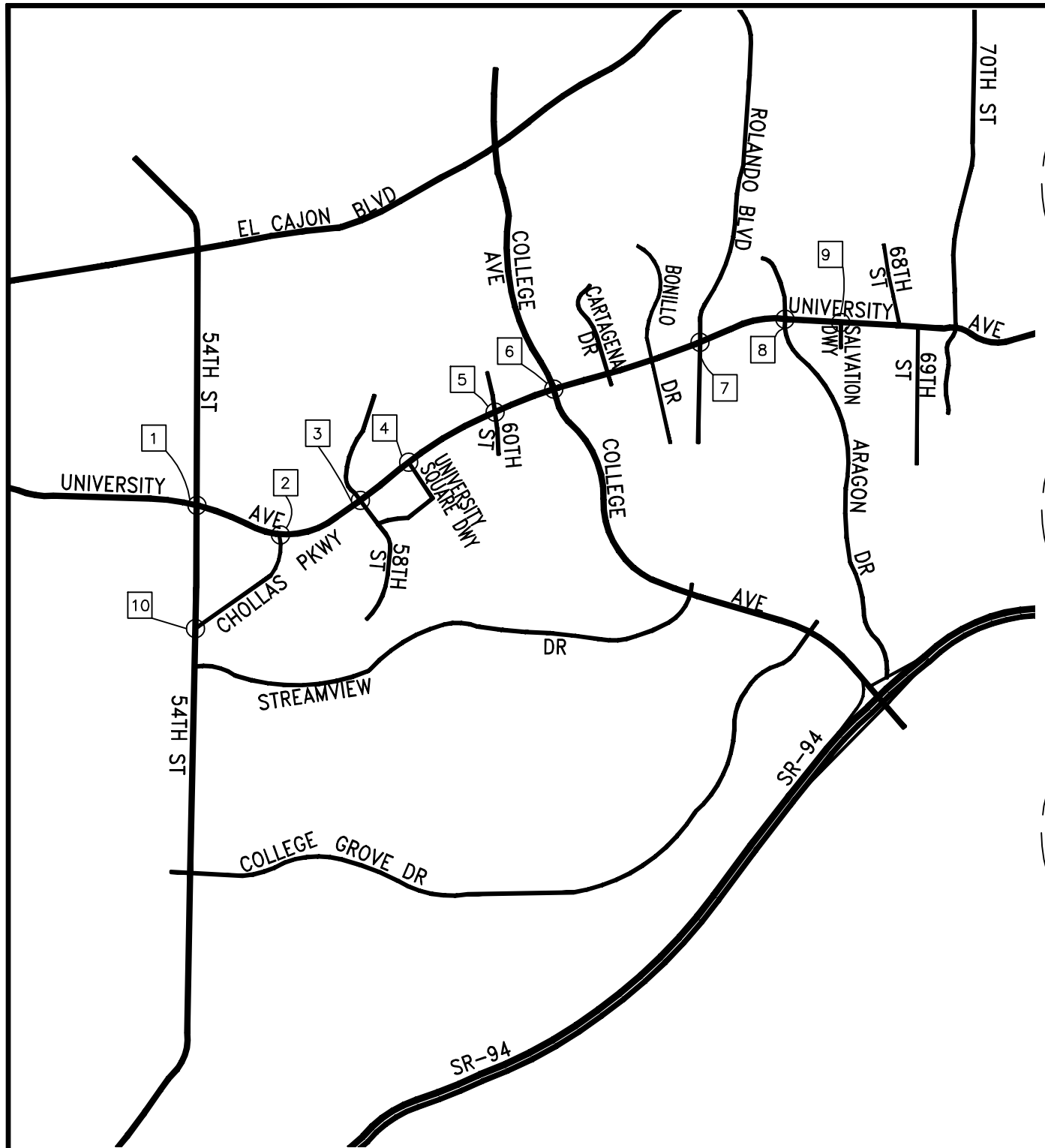
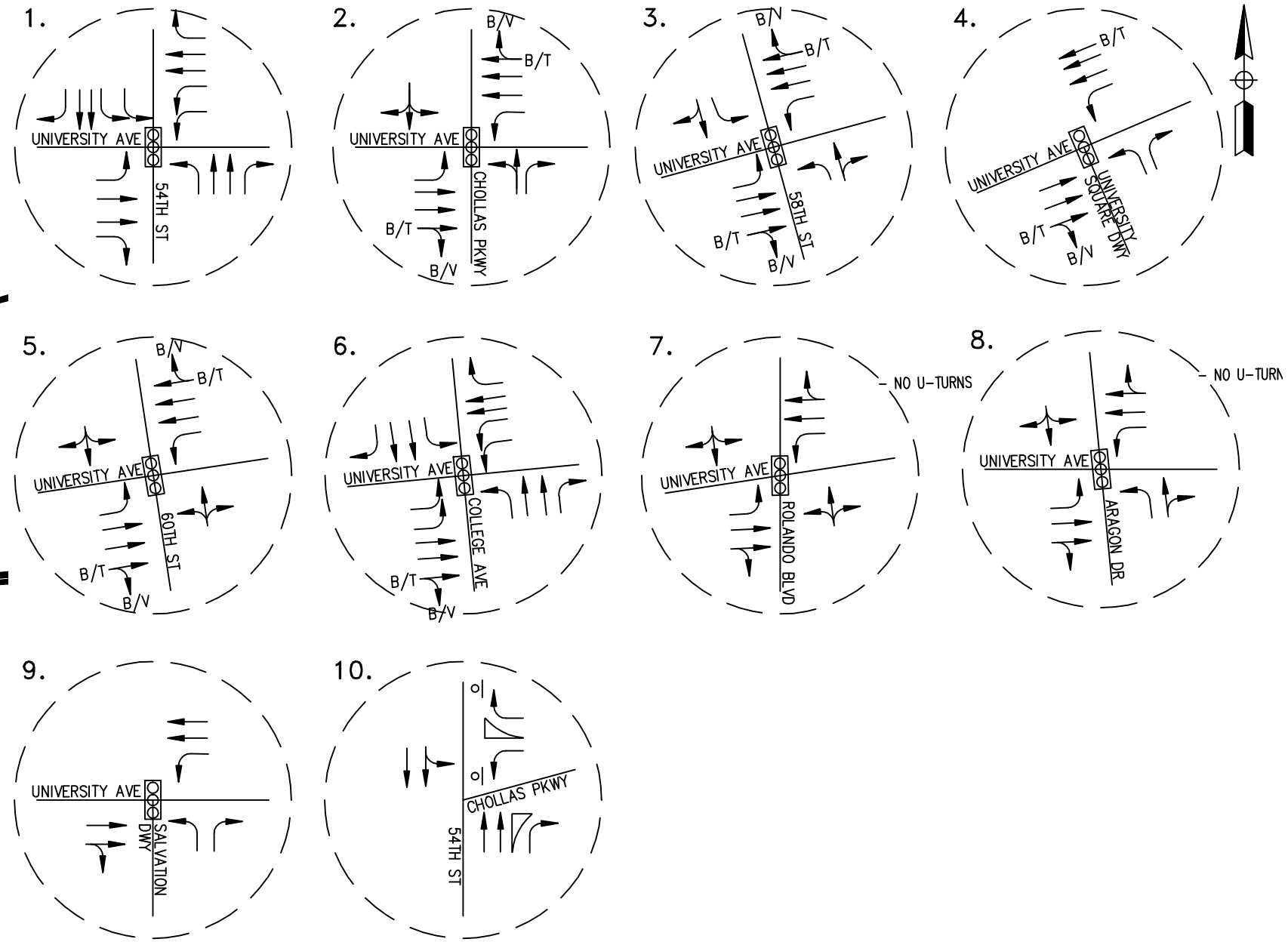
FIGURE 8-4

YEAR 2030 INTERSECTION GEOMETRICS (WITH PROPOSED OPTION 2 IMPROVEMENTS)





LEGEND

——→ – TRAVEL LANE

▯ – TRAFFIC SIGNAL

o| – STOP SIGN

B/V – MOVEMENT ALLOWED FOR BIKES & VEHICLES

B/T – MOVEMENT ALLOWED FOR BIKES & TRANSIT

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FIGURE 8–5

YEAR 2030 INTERSECTION GEOMETRICS (WITH PROPOSED OPTION 3 IMPROVEMENTS)

As shown in Table 8-2, implementation of the proposed University Avenue Mobility Plan, regardless of the option, will allow all signalized intersections along the University Avenue Corridor to operate at an acceptable LOS D or better under Year 2030 conditions.

Table 8-2 – Future (2030) With Recommend Improvements Intersection LOS Summary

Intersection	Traffic Control	Crit. Move	Existing		2030 (No Build)		2030 With Recommend Plan					
							Option 1		Option 2		Option 3	
			Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
AM Peak Hour												
University (E-W) @ 54th (N-S)	Sig.	Int.	28.2	C	30.1	C	28.9	C	28.9	C	28.9	C
University (E-W) @ Chollas (N-S) [a]	OWSC	WBL	25.2	D	33.3	D	(a)	(a)	(a)	(a)	(a)	(a)
	Sig.	Int.	(a)	(a)	(a)	(a)	10.3	B	10.3	B	10.3	B
University (E-W) @ 58th (N-S)	Sig.	Int.	20.2	C	24.3	C	17.0	B	17.3	B	17.0	B
University (E-W) @ University Sq. (N-S)	Sig.	Int.	9.2	A	10.8	B	6.0	A	5.9	A	6.0	A
University (E-W) @ 60th (N-S)	Sig.	Int.	13.5	B	15.0	B	8.4	A	8.5	A	8.4	A
University (E-W) @ College (N-S)	Sig.	Int.	41.5	D	53.9	D	38.9	D	38.9	D	38.9	D
University (E-W) @ Rolando (N-S)	Sig.	Int.	14.7	B	17.6	B	17.4	B	17.4	B	17.4	B
University (E-W) @ Aragon (N-S)	Sig.	Int.	10.3	B	11.0	B	11.0	B	11.0	B	11.0	B
University (E-W) @ Salvation (N-S)	Sig.	Int.	7.0	A	7.4	A	7.5	A	7.5	A	7.5	A
PM Peak Hour												
University (E-W) @ 54th (N-S)	Sig.	Int.	34.3	C	42.5	D	36.4	C	36.4	D	36.4	D
University (E-W) @ Chollas (N-S) [a]	OWSC	WBL	**40.6**	**E**	**221.3**	**F**	(a)	(a)	(a)	(a)	(a)	(a)
	Sig.	Int.	(a)	(a)	(a)	(a)	13.4	B	13.4	B	13.4	B
University (E-W) @ 58th (N-S)	Sig.	Int.	21.5	C	28.7	C	17.5	B	18.0	B	17.5	B
University (E-W) @ University Sq. (N-S)	Sig.	Int.	16.2	B	16.5	B	15.6	B	16.3	B	15.6	B
University (E-W) @ 60th (N-S)	Sig.	Int.	7.5	A	9.0	A	10.1	B	11.2	B	10.1	B
University (E-W) @ College (N-S)	Sig.	Int.	53.8	D	**88.3**	**F**	45.9	D	45.9	D	45.9	D
University (E-W) @ Rolando (N-S)	Sig.	Int.	16.5	B	21.3	C	20.6	C	20.6	C	20.5	C
University (E-W) @ Aragon (N-S)	Sig.	Int.	10.9	B	12.7	B	12.9	B	12.9	B	12.9	B
University (E-W) @ Salvation (N-S)	Sig.	Int.	8.6	A	9.7	A	9.9	A	9.9	A	9.9	A

sec/veh = seconds of delay per vehicle; LOS = Level of Service; E-W = East-West Street; N-S = North-South Street
WBL = Westbound Left; Int. = Intersection; Sig. = Signalized; OWSC = One-Way Stop-Controlled
(a) University Avenue/Chollas Parkway intersection is one-way stop-controlled under existing and 2030 (no build) conditions but is signalized under 2030 conditions with the recommended plan

Year 2030 Travel Speed Assessment With Recommended Improvements

Under existing conditions, the average travel speeds during the peak periods were evaluated based on a floating car assessment. Under future conditions, however, a traffic model has to be utilized to predict the average travel speeds of the traffic based on procedures outlined in the HCM. As discussed in Chapter 2, per the HCM, the average travel speed for a segment is based on the running times for the arterial street and the control delay of the through movements at the signalized intersections. The running time is the total time that the vehicle spends on the street and is influenced by, the street's classification, the segment length, and side street friction.

As previously discussed in Chapter 4 to make sure that the model utilized under future conditions with the implementation of the recommended improvements from the University Avenue Mobility Plan was accurate, D&A first created the traffic model in Synchro for existing conditions. The Synchro data base files that were created for the existing conditions were imported into the SimTraffic Simulation software. Five (5) simulation runs were conducted for the existing conditions to review the models forecasted travel speeds for the corridor. The results of the Synchro and SimTraffic model runs for existing conditions were compared to the average travel speeds collected in the field in order to validate the model.

Review of the Synchro and SimTraffic model runs to the average travel speeds collected in the field found that the Synchro model was more comparable to the actual field data and was thus utilized to calculate the Year 2030 travel speeds with the recommended improvements. The Year 2030 average travel speeds with the recommended improvements and associated levels of service are summarized in Table 8-3

Table 8-3 – Forecast Year 2030 Average Travel Speeds With Recommended Improvements

Segment	Direction of Travel	Existing (a)		2030 (No Build)		2030 With Recommend Plan					
						Option 1		Option 2		Option 3	
		Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS	Speed (mph)	LOS
AM Peak Hour											
University Avenue – 54th St. to College Ave.	Eastbound	19.9	D	18.3	D	20.6	D	20.4	D	20.6	D
	Westbound	21.7	D	20.9	D	20.9	D	20.9	D	20.9	D
University Avenue – College Ave. to Salvation Dwy.	Eastbound	25.4	C	24.7	C	24.6	C	24.7	C	24.7	C
	Westbound	18.8	D	**16.1**	**E**	19.1	D	19.1	D	19.1	D
University Avenue – 54th St. to Salvation Dwy.	Eastbound	22.0	D	20.6	D	22.2	D	22.0	D	22.2	D
	Westbound	20.3	D	18.5	D	20.1	D	20.1	D	20.1	D
PM Peak Hour											
University Avenue – 54th St. to College Ave.	Eastbound	19.8	D	18.1	D	18.2	D	17.4	D	18.2	D
	Westbound	21.4	D	20.2	D	19.8	D	19.8	D	19.8	D
University Avenue – College Ave. to Salvation Dwy.	Eastbound	24.7	C	23.1	C	23.1	C	23.1	C	23.1	C
	Westbound	17.5	D	**12.6**	**F**	19.8	D	19.8	D	19.8	D
University Avenue – 54th St. to Salvation Dwy.	Eastbound	21.7	D	19.9	D	20.0	D	19.5	D	20.0	D
	Westbound	19.5	D	**16.0**	**E**	19.8	D	19.8	D	19.8	D

(a) The travel speeds shown for the existing conditions are based on the synchro analysis and not the actual travel time studies conducted in the field in order to provide an equal assessment of the recommended improvements
Speed = average travel speeds per synchro in miles per hour (mph); LOS = level of service

As shown in Table 8-3, with the implementation of either option of the University Avenue Mobility Plan, the Year 2030 average travel speeds along the study corridor are projected to operate at an acceptable LOS D or better.

8.2 TRAFFIC SIGNAL WARRANTS

A traffic signal warrant analysis was conducted for the University Avenue/Chollas Parkway intersection to justify the need for the proposed traffic signal at this intersection. The traffic signal warrants were conducted in accordance with the guidelines published in the January 21, 2010 Edition of the California Manual of Uniform Traffic Control Devices for Streets and Highways (2010 CA MUTCD). Chapter 4C of the CA MUTCD identifies various warrants that if met, provide the justification needed for the installation of a traffic signal. To determine if the installation of a traffic signal at the University Avenue/Chollas Parkway intersection is justified, it must meet at least one of the warrants outline in Chapter 4C of the 2010 CA MUTCD.

The individual traffic signal warrants that are being analyzed in this study include:

- Warrant 2 – Four-Hour Vehicular Volume
- Warrant 3 – Peak Hour
- Warrant 4 – Pedestrian Volume
- Warrant 7 – Crash Experience

The traffic signal warrants were conducted under existing conditions and future year 2030 conditions with the proposed re-alignment of Chollas Parkway. (A copy of the signal warrant worksheets are provided in Appendix F.) The results of the traffic signal warrants are summarized in Table 8-4.

Table 8-4 – Summary of Traffic Signal Warrant Analysis

Intersection	Warrant	Warrant Satisfied?	
		Existing Conditions	2030 Conditions With Re-Aligned Chollas Parkway
University Avenue @ Chollas Parkway	Warrant 2- Four Hour Vehicular Volume	No	Yes
	Warrant 3 – Peak Hour	Yes (PM Peak)	Yes
	Warrant 4 – Pedestrian Volume	No	No
	Warrant 7 – Crash Experience	No	Not Analyzed
Warrants Per 2010 CA MUTCD			

As shown in Table 8-4, a traffic signal is currently warranted at the University Avenue/Chollas Parkway intersection under existing conditions based on the PM peak hour traffic volumes. Under 2030 conditions, a traffic signal is warranted based on the four-hour volume warrant as well as the peak hour (both the AM and PM peak hour volumes satisfy the warrant) volume warrant.

Based on concerns raised by the community, the University Avenue Corridor was reviewed to determine if there were any locations that would warrant the installation of a pedestrian only signal. However, the pedestrian volumes along the University Avenue Corridor were not high enough to warrant the installation of pedestrian only signals between the existing traffic signals along the corridor.

8.3 PEDESTRIAN CROSSINGS WARRANTS

The City of San Diego's Council Policy 200-07 titled "Comprehensive Pedestrian Crossing Policy" was reviewed to determine whether marked crosswalks should be installed at the uncontrolled intersections or at mid-block locations along the University Avenue Corridor. (A copy of Council Policy 200-07 is provided in Appendix F.) The evaluation for determining whether crosswalks should be installed consists of two components, basic warrants and point warrants.

The basic warrants component considers pedestrian volumes, the approach speeds, the motorist ability to visibly see the pedestrian, and the illumination of the proposed crosswalk site. The point warrants assigns a point value to the location based on the volume of pedestrians with the more points being assigned to a location with a higher pedestrian volume. In addition, the points warrant considers the general condition of where the crosswalk will be installed (i.e. will the crosswalk help clarify/define the pedestrian routes across complex intersections, will it channelize pedestrians into a significantly shorter path, will it legalize mid-block crossing where justified between adjacent signalized intersections, etc.). The number of unimpeded vehicle time gaps is also considered in the points warrant system, with the larger point value being assigned to the location with the fewest gaps.

Once all of the warrants included in Council Policy 200-07 were considered, it was determined that additional marked crosswalks would not be warranted at any mid-block locations or unsignalized intersections along the University Avenue Corridor.

8.4 PARKING ASSESSMENT

As discussed in Chapter 3, under existing conditions there is approximately 8,944 feet of curb along the University Avenue Corridor where parking is permitted. Based on a rate of 25 feet per parking space, this is equivalent to approximately 359 parking spaces. Parking demand surveys found that the highest parking demand along the University Avenue Corridor occurs east of College Avenue on the north side of the road, with the majority of the vehicles parking on either the block between Cartagena Drive and Rolando Boulevard or on the block between Aragon Drive and 69th Street.

All three (3) options of the University Avenue Mobility Plan propose various parking restrictions along University Avenue. A summary of the parking restrictions that are proposed with each option of the University Avenue Mobility Plan are summarized below.

Option 1: Option 1 proposes to restrict parking on the following segment of University Avenue:

1. 54th Street to College Avenue with the exception of the 300 foot long segment on the north side of the road west of 58th Street (both sides of the street).

Option 2: Option 2 proposes to restrict parking on the following segments of University Avenue:

1. 54th Street to College Avenue with the exception of the 300 foot long segment on the north side of the road west of 58th Street (both sides of the street);
2. College Avenue to Cartagena Drive (south side of the street);
3. Rolando Boulevard to Aragon Drive (south side of the street); and
4. Aragon Drive to 69th Street (both sides of the street).

Option 3: Option 3 proposes to restrict parking on the following segments of University Avenue:

1. 54th Street to College Avenue with the exception of the 300 foot long segment on the north side of the road west of 58th Street (both sides of the street);
2. Rolando Boulevard to Aragon Drive (north side of the street); and
3. Aragon Drive to 69th Street (south side of the street).

As indicated above, none of the three options propose any parking restrictions on the block of University Avenue between Cartagena Drive and Rolando Boulevard, the block that was found to have one of the highest parking demands under existing conditions. Table 8-5 provides a comparison of the number of parking spaces provided along the University Avenue Corridor by block for existing conditions and each of the three (3) options of the University Avenue Mobility Plan.

As summarized in Table 8-5, Option 1 results in the loss of approximately 192 parking spaces, Option 2 results in the loss of approximately 273 parking spaces, and Option 3 results in the loss of approximately 246 parking spaces.

Table 8-5 – Summary of Proposed Parking Supply

Segment	Side of Street	Number of Parking Spaces (a)				Change in Number of Parking Spaces (b)		
		Existing Conditions	2030 Conditions With University Avenue Mobility Plan			Compared to 2030 With University Avenue Mobility Plan		
			Option 1	Option 2	Option 3	Option 1	Option 2	Option 3
54th St. to Chollas Pkwy.	South	4	0	0	0	(4)	(4)	(4)
	North	14	0	0	0	(14)	(14)	(14)
	Total:	**18**	**0**	**0**	**0**	**(18)**	**(18)**	**(18)**
Chollas Pkwy. to 58th St.	South	20	0	0	0	(20)	(20)	(20)
	North	14	12	12	12	(2)	(2)	(2)
	Total:	**34**	**12**	**12**	**12**	**(22)**	**(22)**	**(22)**
58th St .to 60th St.	South	59	0	0	0	(59)	(59)	(59)
	North	64	0	0	0	(64)	(64)	(64)
	Total:	**123**	**0**	**0**	**0**	**(123)**	**(123)**	**(123)**
60th St. to College Ave.	South	12	0	0	0	(12)	(12)	(12)
	North	17	0	0	0	(17)	(17)	(17)
	Total:	**29**	**0**	**0**	**0**	**(29)**	**(29)**	**(29)**
College Ave. to Cartagena Dr.	South	9	9	0	9	0	(9)	0
	North	16	16	16	16	0	0	0
	Total:	**25**	**25**	**16**	**25**	**0**	**(9)**	**0**
Cartagena Dr. to Rolando Blvd	South	7	7	7	7	0	0	0
	North	23	23	23	23	0	0	0
	Total:	**30**	**30**	**30**	**30**	**0**	**0**	**0**
Rolando Blvd. to Aragon Dr.	South	15	15	0	15	0	(15)	0
	North	28	28	28	0	0	0	(28)
	Total:	**43**	**43**	**28**	**15**	**0**	**(15)**	**(28)**
Aragon Dr. to 69th St.	South	26	26	0	0	0	(26)	(26)
	North	31	31	0	31	0	(31)	0
	Total:	**57**	**57**	**0**	**31**	**0**	**(57)**	**(26)**
Total Parking Supply	**South**	**152**	**57**	**7**	**31**	**(95)**	**(145)**	**(121)**
	North	**207**	**110**	**79**	**82**	**(97)**	**(128)**	**(125)**
	Total:	**359**	**167**	**86**	**113**	**(192)**	**(273)**	**(246)**

(a) Number of parking spaces estimated based on the feet of yellow, green, blue, and unmarked (unrestricted) parking curb along the street assuming there was 25 feet per parking space
(b) Change in number of parking spaces is the increase (decrease) in parking spaces between 2030 and existing conditions

All of the 192 parking spaces that are lost as the result of implementing Option 1 were on the segments of University Avenue west of College Avenue. Thus, implementation of Option 1 would avoid impacting the segments of University Avenue between Cartagena Drive and Rolando Boulevard and the segment between Aragon Drive and 69th Street, the two segments with the highest parking existing parking demand. In other words, implementation of Option 1 maximizes parking east of College Avenue.

Of the 273 parking spaces that are lost as a result of implementing Option 2, 192 were located west of College Avenue and 81 were located between College Avenue and 69th Street. As previously mentioned, no additional parking restrictions would be placed on the segment of University Avenue between Cartagena Drive and Rolando Boulevard as a result of the implementation of Option 2; however, Option 2 would result in the loss of 57 additional parking spaces on the segment of University Avenue between Aragon Drive and 69th Street. Thirty-one (31) of these 51 parking spaces are from the north side of University Avenue, the side that had the highest parking demand under existing conditions.

Of the 246 parking spaces that are lost as a result of implementing Option 3, 192 were located west of College Avenue and 54 were located between Rolando Boulevard and 69th Street. As previously mentioned, no additional parking restrictions would be placed on the segment of University Avenue between Cartagena Drive and Rolando Boulevard as a result of the implementation of Option 3; however, Option 3 would result in the loss of 26 additional parking spaces on the segment of University Avenue between Aragon Drive and 69th Street. All of these 26 parking spaces are from the south side of University Avenue, the side of the street that had the lowest parking demand under existing conditions.

Although implementation of each of the three (3) options of the University Avenue Mobility Plan results in the loss of between 192 to 273 parking spaces along the University Avenue Corridor, future redevelopment of the land adjacent to the University Avenue Corridor should allow for adequate off-street parking to be provided thus reducing the need for on-street parking in the future.

It should also be noted that the removal of parking may serve as a benefit to the flow of traffic as there will be less interaction between vehicles traveling straight though on University Avenue and those making a parking maneuver to get into/out of the parallel parking space. Further, the reduction in parking spaces will reduce the number of locations where there are conflict points between parked vehicles and though traffic, which may help to reduce some of the collisions associated with parked vehicles.

Although the reduction in parking spaces may reduce the number of locations where there are conflict points between parked vehicles and through traffic, with all three options on the segment of University Avenue between College Avenue and Aragon Drive potential conflict points may occur as vehicles will need to cross the dedicated bike lanes to get into the parking lanes. With Option 1, on the segment of University Avenue between Aragon Drive and 69th Street the parking lane on both sides of the street is shared with vehicles and bicycles (sharrow) which could also create potential conflicts. With Option 2, no conflicts would exist with parking east of Aragon Drive as parking will be eliminated on both sides of the street. With Option 3, on the segment of University Avenue between Aragon Drive and 69th Street potential conflicts with parking may exist on the north side of the street as the parking lane is shared with vehicles and bicycles (sharrow).

8.5 PEDESTRIAN ACCESSIBILITY ASSESSMENT

As summarized in Chapter 4 of this document, the following intersections are anticipated to have more than 100 pedestrian crossings during the peak AM or PM peak period:

- University Avenue/54th Street – 490 AM, 360 PM
- University Avenue/Chollas Parkway – 60 AM, 110 PM
- University Avenue/58th Street – 140 AM, 240 PM
- University Avenue/University Square Driveway – 80 AM, 200 PM
- University Avenue/60th Street – 70 AM, 120 PM
- University Avenue/College Avenue – 200 AM, 390 PM
- University Avenue/Rolando Boulevard – 80 AM, 120 PM

Based on 2011 pedestrian data only there were only four (4) intersections (University Avenue at 54th Street, 58th Street, University Square Driveway, and College Avenue) where pedestrian crossings exceeded 100 during the AM or PM peak period. The increase in pedestrian activity warrants further evaluation to ensure that pedestrian capacity on sidewalks is being met.

To meet the forecast demand for pedestrians by the year 2030, a number of pedestrian related improvements were identified for the study corridor under all three (3) options of the University Avenue Mobility Plan. As previously discussed in Chapter 7 these improvements include:

- New or improved curb ramps to meet current ADA Standards. (This improvement is part of all three options.)
- New sidewalks. (This improvement is part of all three options, although some options have more sidewalks added than others.)
- Upgraded traffic signals with ADA push buttons and pedestrian countdown heads. (This improvement is part of all three options.)
- Reduced pedestrian crossing distances by eliminating free right turns at 54th Street and 58th Street. (This improvement is part of all three options.)
- New signal at re-aligned University Avenue/Chollas Parkway intersection provides additional protected pedestrian crossing. (This improvement is part of all three options.)
- The northeast corner of 58th Street and northwest corner of 60th Street would be widened to provide a wider plaza area for pedestrians (This improvement is part of all three options.)
- Curb pop outs would be provided at intersections to provide traffic calming and shorten the pedestrian crossing lengths. (Curb pop-outs are generally only provided as part of Option 3.)

The most noticeable of these pedestrian improvements will probably be the addition of the approximately 12,550 linear feet of new/improved sidewalk with Option 1, 11,800 linear feet of new/improved sidewalk with Option 2, and 13,370 linear feet of new/improved sidewalk with Option 3. The second most noticeable pedestrian improvement will probably be the addition of 52 new/improved curb ramps along the with Option 1, 58 new/improved curb ramps with Option 2 and 61 new/improved curb ramps with Option 3.

8.6 BICYCLE CONNECTIVITY ASSESSMENT

As summarized in Chapter 4 of this document, the University Avenue/54th Street intersection and University Avenue/Chollas Parkway intersection are the only intersections along the University Avenue Corridor projected to have more than 100 bicycle crossings during the AM or PM peak period by the Year 2030. The University Avenue/54th Street intersection is projected to have 120 bicycle crossings during the AM peak period and 190 bicycle crossings during the PM peak period. The University Avenue/Chollas Parkway intersection is projected to have 80 bicycle crossings during the AM peak period and 120 bicycle crossings during the PM peak period. All other intersections are projected to have 80 or fewer bicycle crossings during the AM or PM peak periods.

It should be noted, however, that the Year 2030 bicycle crossings were based on a growth of 100% from the existing bicycle travel patterns along University Avenue. The existing bicycle travel pattern are based on the existing bicycle network which does not have any bike lanes, bikeways, or posted bike routes along the University Avenue Corridor. Both the Mid-Cities Community Plan and the City of San Diego's Bicycle Master Plan (Project 27); however, identify Class II Bike Lanes along the University Avenue Corridor. If bicycle lanes were to be added along University Avenue the bicycle patterns/activity along University Avenue may be impacted (i.e. they may increase in some areas more than others) as it may become a more desirable route for bicyclers.

It should be noted that Rick Engineering is currently working on a Design/Build project to construct the 54th Street/Euclid Avenue Bikeway project which will stripe approximately 2.25 miles of Class II Bike Lanes on 54th Street from Trojan Avenue to Euclid Avenue. All three options of the University Avenue Mobility Plan can accommodate the proposed design of the 54th Street/Euclid Avenue Bikeway project.

To meet the goals of the Mid-Cities Community Plan and to be consistent with the City's Bicycle Master Plan, which shows a Class II Bike Lane along University Avenue within the project study area, and to address the community's concerns about the need to increase safety for the bicycle riders along University Avenue, a number of bicycle related improvements were identified for the study corridor under all three (3) options of the University Avenue Mobility Plan. As previously discussed in Chapter 7 these improvements include:

- Option 1 includes the provision for a five-foot (5') dedicated bike lane with a two-foot (2') striped buffer between the adjacent travel lane along both the north and south sides of University Avenue between 54th Street and College Avenue. Between College Avenue and Aragon Drive, Option 1 provides for a five-foot (5') bike lane adjacent to a seven-foot (7') parking lane along both the north and south sides of University Avenue. Between Aragon Drive and 69th Street, Option 1 provides for one (1) twenty-one-foot (21') wide sharrow lane (shared bike/vehicle/parking lane) along both the north and south sides of University Avenue.

- Option 2 includes the provision for a five-foot (5') minimum dedicated bike lane along both the north and south sides of University Avenue along the entire University Avenue Corridor between 54th Street and 69th Street.

- Option 3 includes the provision for a five-foot (5') dedicated bike lane with a two-foot (2') striped buffer between the adjacent travel lane along both the north and south sides of University Avenue between 54th Street and College Avenue. Between College Avenue and Rolando Boulevard, Option 3 provides for a five-foot (5') bike lane adjacent to a seven-foot (7') parking lane along both the north and south sides of University Avenue. Between Rolando Boulevard and Aragon Drive, Option 3 provides for a five-foot (5') bike lane adjacent to a seven-foot (7') parking lane along the south side of University Avenue and a five-foot (5') bike lane with no parking along the north side of University Avenue. Between Aragon Drive and 69th Street, Option 3 provides for one (1) twenty-one-foot (21') wide sharrow lane (shared bike/vehicle/parking lane) along the north side of University Avenue and a dedicated six-foot (6') bike lane along the south side of University Avenue.

As noted above, currently there are no bike lanes, bikeways, or posted bike routes along the University Avenue Corridor. Implementation of the proposed University Avenue Mobility Plan would provide for either dedicated bike lanes or sharrow lanes (shared bike/vehicle/parking) along the entire study corridor. This would provide significant improvement in the bicycle network and satisfy the goals of the Mid-Cities Community Plan.

8.6 TRANSIT ANALYSIS

As summarized in Chapter 4, future transit ridership in the study area is estimated to grow at a rate of 1% per year for a total growth of 19% by the Year 2030. Thus by the Year 2030, Route 7 is anticipated to have a total of 3,100 trip ends (1,510 eastbound, 1,590 westbound) while Route 10 is anticipated to have a total of 730 trip ends (520 eastbound, 210 westbound). The headways for Route 10 is proposed to decrease from the existing 15 minute headways (an average of 4 buses per hour per direction) to 10 minute headways by the Year 2030 (an Average of 6 buses per hour per direction). The headways for Route 7 is proposed to decrease from the existing 12 minute headways (an average of 5 buses per hour per direction) to 10 minute headways by the Year 2030 (an average of 6 buses per hour per direction).

To address the future transit needs and to help achieve the 10 minute headways, a number of transit related improvements were identified for the study corridor under all three (3) options of the University Avenue Mobility Plan. As previously discussed in Chapter 7 these improvements include:

- Consideration was given to providing a combined transit and bike lane along both the north and south sides of University Avenue between 54th Street and College Avenue. There is adequate room within the existing right-of-way to accommodate this type of scenario. Joint uses of bicycle and transit have been tried in several other jurisdictions; however, this use is not currently allowed per the California Vehicle Code and was therefore not included in any of the proposed options at this time.

- Option 2 would provide a dedicated transit lane along the south side of University Avenue lane between 58th Street and College Avenue. The dedicated transit lane should help decrease the delay experienced by the transit vehicles which could help improve the efficiency of the transit vehicles operating schedule and thus make transit more appealing.

- Bus Pads would be added at all transit stops.

- Several bus stops along the corridor would be relocated to provide a more accessible/appealing location. Please refer to the University Avenue Mobility Plan illustrations located at the end of Chapter 7 for the specific bus stops that are being relocated.

- The station area at the University Square Bus Stop on the north side of University Avenue (Bus Stop 4W) would be enlarged and a pedestrian ramp would be added to provide direct access for the housing located to the north on the frontage road between 58th Street and 60th Street.

- The bus stop areas at 54th Street, 58th Street, 60th Street westbound, Cartagena Drive westbound, and Aragon Drive westbound would be enlarged to improve the waiting area.

- Access to all bus stops along the corridor would be improved.

As was illustrated in Table 8-3, the implementation of either option of the University Avenue Mobility Plan will allow both the eastbound and westbound directions of travel along University Avenue between 54th Street and Salvation Driveway to have average travel speeds that correlate to LOS D or better under 2030 conditions. If the average travel speeds along the corridor are operating at a LOS D or better, than the transit vehicles will be able to travel along the corridor more efficiently. Further as noted above, the dedicated transit lane that is provided in Option 2 will allow the transit vehicles to avoid most of the delay that is experienced by vehicles traveling in the standard travel lanes. Providing a more efficient transit service may make transit a more appealing travel mode choice for the community.

8.7 SUMMARY OF TECHNICAL ANALYSIS OF MOBILITY PLAN

The roadway segment operations analysis found that all segments along the University Avenue Corridor will operate at an acceptable LOS C or better under Year 2030 conditions with the implementation of either option of the University Avenue Mobility Plan.

The findings of the intersection operational analysis found that all signalized intersections along the study corridor will operate at an acceptable LOS D or better under Year 2030 conditions with the implementation of either option of the University Avenue Mobility Plan.

The travel time assessment found that implementation of either option of the University Avenue Mobility Plan will improve the Year 2030 (no build) travel times such that all segments will continue to operate at an acceptable LOS D or better under 2030 conditions during both the AM and PM peak hours in both directions of travel.

The results of the traffic signal warrant analysis found that a traffic signal is currently warranted at the University Avenue/Chollas Parkway intersection under existing conditions based on the PM peak hour traffic volumes. Under 2030 conditions when the Chollas Parkway is re-aligned, a traffic signal is warranted at the University Avenue/Chollas Parkway based on the four-hour volume warrant as well as the peak hour (both the AM and PM peak hour volumes satisfy the warrant) volume warrant.

Option 1 results in the loss of approximately 192 parking spaces, Option 2 results in the loss of approximately 273 parking spaces, and Option 3 results in the loss of approximately 246 parking spaces. Although implementation of each of the three (3) options of the University Avenue Mobility Plan results in the loss of between 192 to 273 parking spaces along the University Avenue Corridor, future redevelopment of the land adjacent to the University Avenue Corridor should allow for adequate off-street parking to be provided thus reducing the need for on-street parking in the future.

The loss of parking could have potential benefits to traffic flow along the corridor by reducing the interaction between parked cars and through traffic. Further, the reduction in parking spaces would reduce the number of conflict points between parked cars and through traffic which may reduce the number of collisions associated with parked vehicles.

The findings of the pedestrian accessibility assessment show that by the Year 2030 seven (7) intersections along the corridor will experience 100 or more pedestrian crossings during the AM or PM peak period. All three (3) options of the University Avenue Mobility Plan include several pedestrian related improvements along the corridor. The most noticeable of the pedestrian improvements would probably be the addition of the approximately 12,550 linear feet of new/improved sidewalk with Option 1, 11,800 linear feet of new/improved sidewalk with Option 2, and 13,370 linear feet of new/improved sidewalk with Option 3. The second most noticeable pedestrian improvement will probably be the addition of 52 new/improved curb ramps along the with Option 1, 58 new/improved curb ramps with Option 2 and 61 new/improved curb ramps with Option 3.

Currently there are no bike lanes, bikeways, or posted bike routes along the University Avenue Corridor. Implementation of the proposed University Avenue Mobility Plan would provide for either dedicated bike lanes or sharrow lanes (shared bike/vehicle/parking lanes) along the entire study corridor. This would provide significant improvement in the bicycle network and satisfy the goals of the community plan.

The transit analysis findings show that transit ridership in the area is expected to increase by approximately 1% per year (for a total growth of 19%) and that the headways for Routes 10 and 7 are projected to decrease from 15 and 12 minute headways, respectively to 10 minute headways. As traffic operations are expected to worsen by the Year 2030 along much of the corridor (if no improvements are made), transit operations will be hampered by slower run times and longer wait times for buses. To help avoid this potential problem, the University Avenue Mobility Plan proposes several transit improvements including the addition of a transit only lane with Option 2, new bus pads at all transit stops, and relocated bus stops which provide more accessible/appealing locations. Intersection and roadway improvements that are proposed as part of the plan would also help improve the operation of the transit along the corridor.