

Sequoia / Coors Retail Development
(Sequoia Rd. / Coors Blvd.)

Traffic Impact Study

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D R A F T

Presented to:

City of Albuquerque
Transportation Development Section

New Mexico Dept. of Transportation
District 3

Prepared for:

Sujay Thakur
Thakur Enterprises
7701 Bridge Blvd. SW
Albuquerque, NM 87121



A handwritten signature in blue ink that reads "Terry O. Brown".

Terry O. Brown P.E.
P.O. Box 92051
Albuquerque, NM 87199
505 · 883 · 8807

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TRAFFIC IMPACT STUDY

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Sequoia / Coors Retail Development

(Sequoia Rd. / Coors Blvd.)

TRAFFIC IMPACT STUDY

STUDY PURPOSE

This study is being conducted in conjunction with a request for approval of a site development plan for implementation of a retail development such as the one shown in the Appendix (Page A-3) of this report. The purpose of this study is to identify the impact of the proposed development on the adjacent transportation system and to make recommendations to mitigate any significant adverse impact on the adjacent transportation system. This study is being submitted to satisfy the requirements of the City of Albuquerque Transportation Development Section and the New Mexico Department of Transportation, District 3 Office.

STUDY PROCEDURES

A scoping meeting was held with City of Albuquerque Transportation staff members as well as with Nancy Perea at the New Mexico Department of Transportation, District 3 prior to beginning the study to discuss scope and methodology to be utilized within the proposed Sequoia Coors Retail Development Traffic Impact Study. Specific items included format, intersections to be studied, intersection analysis procedures, existing traffic counts, trip distribution methodology, and implementation year definition.

The basic procedure followed is described as follows:

- 1) Calculate the generated trips for the proposed development consisting of the following described land uses (See Appendix Pages A-7 thru A-10):
 - a. *7,000 SF Shopping Center*
 - b. *8,450 SF Shopping Center*
 - c. *A 25-parking space RV park*
- 2) Calculate trip distribution for the newly generated trips by this development. The new commercial trips will be distributed based on year 2019 population within a 3-mile radius of the new project (See Appendix Pages A-11 thru A-20).
- 3) Determine Trip Assignments for the newly generated trips based on the results of the Trip Distribution Analysis and logical routing to and from the site (See Appendix Pages A-21 thru A-23).
- 4) Acquire recent traffic counts for all intersections to be analyzed in this report (See Appendix Pages A-88 thru A-91).
- 5) Calculate growth rate for the area utilizing a Mid-Region Council of Governments' Traffic Flow Map Data to define area traffic growth rate (See Appendix Pages A-24 thru A-32).
- 6) Determine 2019 NO BUILD Volumes by growing the existing turning movement counts to the year 2019 utilizing the calculated annual historic growth rate for the area (See Appendix Pages A-33 thru A-48).
- 7) Add the trips generated by the development to the 2019 NO BUILD Volumes to obtain 2019 BUILD Volumes for this project (See Appendix Pages A-33 thru A-48).
- 8) Apply a 30% pass-by trips rate to the driveways (See Appendix Page A-23 and Pages A-33 thru A-48).

- 9) Provide signalized and / or unsignalized intersection analyses for the following intersections:

INTERSECTION	TYPE CONTROL	NO BUILD	BUILD
1) Sequoia Rd. / Coors Blvd.	Traffic Signal	2019	2019
2) St. Joseph's Dr. / Coors Blvd.	Traffic Signal	2019	2019
3) Sequoia Rd. / Ladera Dr.	Stop Sign	2019	2019
4) Sequoia Rd. / Atrisco Dr.	Stop Sign	2019	2019
5) Sequoia Rd. / Driveway "A"	Stop Sign	2019	2019
6) Driveway "B" / Coors Blvd.	Stop Sign	2019	2019
7) Driveway "C" / Atrisco Dr.	Stop Sign	2019	2019

PREVIOUS RELATED TRAFFIC IMPACT STUDIES

There are trips from previously approved projects to consider for this development.

1. Coors Pavilion Retail Development
2. Tucson / Coors Car Wash

GENERAL AREA CHARACTERISTICS

The proposed requested site development plan is for a property bounded on the east by Coors Blvd., on the west by Atrisco Dr., on the south by existing commercial development, and on the north by an existing commercial development as shown on the Vicinity Map on Page A-2 of the Appendix of this report. An aerial map of the adjacent transportation system to be considered and analyzed in this study may be found on Page A-1 in the Appendix of this report. The subject tract of land is in a rapidly developing area of Northwest Albuquerque. The surrounding development is a mix of residential, commercial, and office uses. Also, there is a public multi-use park to the east of Coors Blvd. along Sequoia Rd.

AREA STREET NETWORK

The impacted adjacent street network targeted for analysis in this study is defined on the Futures 2040 Long Range Roadway System from the Mid-Region Metropolitan Planning Organization (MRMPO). It includes the Coors Blvd. corridor and Atrisco Dr. from St. Joseph's Dr. to Sequoia Rd. Also included is Sequoia Rd., which has access to the project.

Coors Blvd is classified as a Regional Principal Arterial Roadway and is generally a six-lane urban facility with raised medians. The posted speed limit along Coors Blvd. in the vicinity of this project is 45 MPH.

Atrisco Dr. and Sequoia Rd. are classified as Major Collector Streets. They are generally two lane urban roadways with left turn lanes at major intersections. The posted speed limit along these roads in the vicinity of this project is 35 MPH.

St. Joseph's Dr. is classified as a Minor Arterial Roadway and is ultimately planned to be a divided four lane paved urban roadway section. St. Joseph's Dr. is currently a paved four

lane roadway section between Atrisco Dr. and Coors Blvd. The posted speed limit along St. Joseph's Dr. near Coors Blvd. is 25 MPH.

Ladera Dr. is classified as a Minor Arterial Roadway and is a four-lane urban roadway with raised median, curb and gutter and pedestrian facilities. The posted speed limit along Ladera Dr. is 35 MPH in the vicinity of the project.

EXISTING TRAFFIC VOLUMES

2015 Average Weekday Traffic Volumes (AWDT) for major streets in the site plan area are shown on Page A-5 of the Appendix.

Current turning movement volumes obtained during the AM and PM Peak Hours for the following intersections were acquired from recent field counts for the following intersections:

*Sequoia Rd. / Coors Blvd.
St. Joseph's Dr. / Coors Blvd.
Sequoia Rd. / Ladera Dr.
Sequoia Rd. / Atrisco Dr.
the existing driveways on Coors Blvd. and Sequoia Rd.*

The counts are included in Appendix Pages A-88 thru A-91.

EXISTING TRANSIT SERVICE

This area is serviced by the Coors #155 bus route which provides service approximately every 30 minutes from 6:30 a.m. to 10:00 p.m. 6 days a week and limited service from 10:00 a.m. to 5:00 p.m. on Sunday, and the Westside Rapid Ride bus route (#790) which provides hourly service during the AM and PM Peak Hour periods 6 days a week. (See Appendix Pages A-84 thru A-87).

PROPOSED DEVELOPMENT

The proposed conceptual site development plan associated with this project consists of the land uses summarized in the following table:

Land Use Description	Size Proposed
Shopping Center	15,450 S.F.
RV Storage	25 parking spaces

See the conceptual site development plan on Page A-3 in the Appendix of this report to acquire more detailed information about the proposed development. This site plan is conceptual at this point in time and is subject to some changes as progress takes place in the design process. The plan should, however, provide a reliable basis upon which to analyze the impact of the development on the adjacent transportation system and provide guidelines for mitigating the impact and establishing access criteria. The conceptual site plan as it is shown in this report proposes three primary access points into the site. One access will be through an existing full access driveway from Sequoia Rd. to the south (Driveway "A"). The second access (Driveway "B") will be an existing right-in, right-out driveway from Coors Blvd which is a shared access with the existing development to the

north. The last driveway (Driveway "C") will be a full access driveway from Atrisco Dr. for the exclusive use of the RV Storage.

TRIP GENERATION

Projected trips were calculated from data in the Institute of Transportation Engineers Trip Generation Manual (9th Edition). Trips for the development were determined based on land uses defined on the Conceptual Site Development Plan on Page A-3 in the Appendix of this report.

The resulting number of trips generated for the proposed development is summarized in the following table:

Sequoia / Coors Development

Trip Generation Data (ITE Trip Generation Manual - 9th Edition)

	USE (ITE CODE)	24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.		
COMMENT	DESCRIPTION	GROSS	ENTER	EXIT	ENTER	EXIT	
Summary Sheet		Units					
Shops 1	Shopping Center (820)	7.00	1,206	19	12	48	52
Shops 2	Shopping Center (820)	8.45	1,363	21	13	55	59
RV Storage	Campground / Recreational Vehicle Park	25	-	2	4	6	3
Subtotal		2,569	42	29	109	114	
Pass-By Trips*		30%	-13	-9	-33	-34	
Total Primary Trips			29	20	76	80	

* - Pass-by Trip Reduction rate based on Figure 5.5 from Trip Generation Handbook, 2nd Edition

As noted, an adjustment was made for Pass-By Trips.

TRIP DISTRIBUTION

Primary and Diverted Linked Trips:

Commercial Land Uses

Primary and diverted linked trips for office / commercial development have been distributed proportionally to the 2019 projected population of Subareas area wide. Population data for 2015 and 2025 were taken from the 2035 Socioeconomic Forecasts for Data Analysis Subzones for the Mid-Region of New Mexico, supplied by the Mid-Region Council of Governments (MRCOG). Population Data was interpolated linearly to obtain 2019 values and adjusted for distance from the proposed new facility. The trip distribution worksheets and associated map of subareas are shown in the Appendix on Pages A-11 thru A-19. The Trip Distribution Map for Commercial use can be found in the Appendix on Page A-20.

TRIP ASSIGNMENTS

Trip assignments are first made on a percentage basis derived from data established in the trip distribution determination process and logical routing. Those percentages are then

applied to the projected trips to determine individual traffic movements. Percentage trip assignment maps are shown in the Appendix on Pages A-21 thru A-22.

BACKGROUND TRAFFIC GROWTH

Background traffic growth rates were considered for the study area that was targeted for analysis based on data from the 2006 through 2015 Traffic Flow maps prepared by the Mid-Region Council of Governments.

Most of the Traffic Flow Data for the years 2006 through 2015 taken from the MRCOG Traffic Flow Maps were Standard Data. The data from those years for each approach was plotted on a graph and a linear “regression trend line” calculated using the equation format $y=mx+b$. The growth rate was determined by calculating the average volume increase per year during the time period considered and dividing that volume into the most recent AWDT used in the analysis from which future volumes will be calculated. The rate of growth of that trend line was utilized as the growth rate for each approach if that calculated rate appeared feasible. However, there may be some instances where the rate indicated a negative growth trend or appeared to be unreasonably high or low. In those cases, an appropriate growth rate from an adjacent segment of the same roadway was used, a shorter time span was used to determine the growth rate, or the growth rate was considered to be zero or a generic 0.5% if appropriate. Due to the potential for growth in the area, it was believed that a zero percent growth rate was inappropriate for this study. Therefore, a growth rate of 0.5% was often used if the linear regression analysis showed the growth rate to be negative. Additionally, if the R^2 value of the trend line was low, other means of establishing a probable growth rate from the data accumulated was considered. Historical Growth Rate Graphs with linear regression trendlines are shown in the Appendix on Pages A-24 through A-32. Additionally, the growth rate utilized for each approach to an intersection is printed at the top of the Turning Movement sheets for each intersection (Appendix Pages A-35 through A-47).

PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2019 BUILDOUT

The calculated growth rates were applied to the most recent peak hour traffic counts (conducted for this study) to establish the 2019 background NO BUILD traffic volumes. To these volumes, the generated trips based on implementation of the proposed Sequoia / Coors Retail Development (100% development) were added to obtain 2019 BUILD volumes for the intersection analyses. See Appendix Pages A-33 thru A-48 for further information regarding 2019 turning movement counts.

INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses were performed in accordance with the procedures for signalized and unsignalized intersections in the Highway Capacity Manual, 2010, Transportation Research Board, using Trafficware’s Synchro version 9 Highway Capacity Software for signalized and unsignalized intersections.

Capacity analyses were performed for the following traffic conditions.

2019 without development of the subject property (2019 NO BUILD)
2019 with total development as per the Proposed Site Plan (2019 BUILD).

The results of the 2019 NO BUILD and BUILD capacity analyses are summarized in the following sections - *Results and Discussion of Intersection Capacity Analyses*.

The Highway Capacity Manual (2010) defines Level of Service (LOS) for signalized and unsignalized intersections in terms of average controlled delay per vehicle as follows:

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

<u>Average Delay</u> <u>(secs)</u>	<u>Level-of-Service</u>
≤ 10	A
> 10 and ≤ 20	B
> 20 and ≤ 35	C
> 35 and ≤ 55	D
> 55 and ≤ 80	E
> 80	F

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

<u>Average Delay</u> <u>(secs)</u>	<u>Level-of-Service</u>
≤ 10	A
> 10 and ≤ 15	B
> 15 and ≤ 25	C
> 25 and ≤ 35	D
> 35 and ≤ 50	E
> 50	F

Level of Service D is generally considered acceptable in urban areas and is the desirable base condition for analysis in a traffic study. In addition to consideration of the overall level-of-service of the signalized intersection, the levels-of-service of each individual movement should be considered.

RESULTS OF SIGNALIZED INTERSECTION CAPACITY ANALYSES

IMPLEMENTATION YEAR (2019)

Intersection #1 - Sequoia Rd. / Coors Blvd. - Pages A-49 thru A-78

The results of the implementation year analysis of the signalized intersection of Sequoia Rd. / Coors Blvd. are summarized in the following table:

Intersection: 1 - SEQUOIA RD. / COORS BLVD.

2019 AM Peak Hour BUILD					2019 PM Peak Hour BUILD						
		(EXIST. GEOM.)						(EXIST. GEOM.)			
		NO BUILD		BUILD				NO BUILD		BUILD	
		Lanes	LOS-Delay	Lanes	LOS-Delay			Lanes	LOS-Delay	Lanes	LOS-Delay
EB	L	1	D - 51.6	1	D - 51.9	L	1	F - 104	1	F - 117	
	T	1	D - 46.8	1	D - 46.8	T	1	D - 52.6	1	D - 51.8	
	R	1	E - 55.2	1	E - 57.4	R	1	D - 51.4	1	D - 52.0	
WB	L	1	D - 52.9	1	D - 53.0	L	1	F - 108	1	F - 103	
	T	1	D - 46.3	1	D - 46.3	T	1	D - 54.8	1	D - 53.8	
	R	1	D - 41.9	1	D - 41.9	R	1	D - 47.4	1	D - 46.5	
NB	L	1	C - 20.7	1	C - 24.7	L	1	C - 21.1	1	C - 28.3	
	T	3	B - 10.5	3	B - 10.5	T	3	C - 27.5	3	C - 29.6	
	R	1	A - 6.0	1	A - 6.0	R	1	A - 7.4	1	A - 7.7	
SB	L	1	A - 9.2	1	A - 9.2	L	1	F - 82.7	1	F - 84.2	
	T	3	A - 4.1	3	A - 4.1	T	3	C - 22.4	3	C - 23.3	
	R	1	A - 0.1	1	A - 0.1	R	1	B - 12.5	1	B - 13.1	
Intersection:		B - 10.4			B - 10.7		C - 31.5			C - 33.5	

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this signalized intersection will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour NO BUILD and BUILD Conditions considered in this report, except for the eastbound right turn movement during the AM Peak Hour NO BUILD and BUILD conditions which will experience moderate delays and the eastbound left and right turn movements and the southbound left turn movement during the PM Peak Hour NO BUILD and BUILD conditions which will experience excessive delays. The newly generated traffic from this development will only increase the delay by 0.3 seconds during the AM Peak Hour and by 2 seconds during the PM Peak Hour. The moderate and excessive delays will exist for the NO BUILD conditions and are not due to the proposed development. Therefore, no recommendation is made for the Sequoia Rd. / Coors Blvd. intersection.

The results of the queueing analysis for this intersection is summarized in the following table:

Queueing Analysis Summary Sheet

Project: Sequoia / Coors Retail Development (Sequoia Rd. / Coors Blvd.)
 Intersection: Sequoia Rd. / Coors Blvd.

2019											
Approach		Left Turns			Thru Movements			Right Turns			
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	66	75	1	47	Cont	1	173	800		
AM NO BUILD Queue	1	77	125	1	48	100	1	176	250		
AM BUILD Queue	1	81	150	1	48	100	1	184	250		
Existing Lane Length	1	122	75	1	80	Cont	1	139	800		
PM NO BUILD Queue	1	134	225	1	82	150	1	142	250		
PM BUILD Queue	1	151	250	1	83	150	1	174	275		
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	68	125	1	34	Cont	1	12	125		
AM NO BUILD Queue	1	69	125	1	35	75	1	30	75		
AM BUILD Queue	1	69	125	1	35	75	1	30	75		
Existing Lane Length	1	164	125	1	129	Cont	1	51	125		
PM NO BUILD Queue	1	167	275	1	132	225	1	72	150		
PM BUILD Queue	1	167	275	1	133	225	1	72	150		
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	86	100	3	1,565	Cont	1	87	150		
AM NO BUILD Queue	1	97	150	3	1,984	850	1	98	150		
AM BUILD Queue	1	109	175	3	1,984	850	1	98	150		
Existing Lane Length	1	100	100	3	2,663	Cont	1	105	150		
PM NO BUILD Queue	1	113	200	3	3,267	>1,000 *	1	119	200		
PM BUILD Queue	1	143	250	3	3,267	>1,000 *	1	119	200		
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	30	90	3	2,609	Cont	1	40	255		
AM NO BUILD Queue	1	48	100	3	2,850	>1,000 *	1	51	100		
AM BUILD Queue	1	48	100	3	2,850	>1,000 *	1	51	100		
Existing Lane Length	1	86	90	3	1,647	Cont	1	76	255		
PM NO BUILD Queue	1	108	200	3	1,942	>1,000 *	1	88	175		
PM BUILD Queue	1	108	200	3	1,942	>1,000 *	1	88	175		

AM PM
 Cycle Length: **120** **140**

NOTE: Queue lengths are in feet.

Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

The queuing analysis recommends lengthening the eastbound left turn lane from 75 feet to 250 feet plus transition, the westbound left turn lane from 125 to 275 feet plus transition, the northbound left turn lane from 100 feet to 250 feet plus transition and the southbound left turn lane from 90 feet to 200 feet plus transition for both the NO BUILD and BUILD conditions. The eastbound, westbound and northbound left turn lanes cannot be lengthened without

adversely affecting the adjacent driveways. According to aerial photography, it appears that the southbound left turn lane can be lengthened to the recommended length. The southbound left turn lane is being extended by the Coors Pavilion developer. Therefore, no recommendations are made for the queue lengths at the intersection of Sequoia Rd. / Coors Blvd.

Intersection #2 - St. Joseph's Dr. / Coors Blvd. - Pages A-49 thru A-78

The results of the implementation year analysis of the signalized intersection of St. Joseph's Dr. / Coors Blvd. are summarized in the following table:

Intersection: 2 - ST. JOSEPH'S DR. / COORS BLVD.

2019 AM Peak Hour BUILD						2019 PM Peak Hour BUILD					
		(EXIST. GEOM.)						(EXIST. GEOM.)			
		NO BUILD		BUILD				NO BUILD		BUILD	
		Lanes	LOS-Delay	Lanes	LOS-Delay			Lanes	LOS-Delay	Lanes	LOS-Delay
EB	L	2	D - 48.2	2	D - 48.2	L	2	D - 54.7	2	D - 54.8	
	T	1	D - 49.5	1	D - 49.5	T	1	E - 55.5	1	E - 55.5	
	R	1	D - 40.5	1	D - 40.5	R	1	D - 39.4	1	D - 39.4	
WB	L	1	F - 95.7	1	F - 95.7	L	1	D - 53.9	1	D - 53.9	
	T	2	D - 45.7	2	D - 45.7	T	2	E - 55.2	2	E - 55.2	
	R	>	D - 45.7	>	D - 45.7	R	>	E - 55.2	>	E - 55.2	
NB	L	1	F - 179	1	F - 179	L	1	F - 117	1	F - 117	
	T	3	D - 39.1	3	D - 39.5	T	3	C - 31.1	3	C - 33.0	
	R	1	A - 0.0	1	A - 0.0	R	1	A - 0.0	1	A - 0.0	
SB	L	1	D - 42.1	1	D - 43.3	L	1	D - 38.3	1	D - 49.7	
	T	3	E - 79.5	3	E - 79.5	T	3	E - 64.5	3	E - 64.7	
	R	1	B - 11.7	1	B - 11.7	R	1	B - 19.8	1	B - 19.8	
Intersection:		E - 67.6		E - 67.7				D - 48.7		D - 49.7	

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this signalized intersection will experience moderate delays for the 2019 AM Peak Hour NO BUILD and BUILD conditions and will operate at acceptable levels-of-service for the 2019 PM Peak Hour NO BUILD and BUILD Conditions considered in this report. The newly generated traffic from this development will only increase the delay by 0.1 seconds during the AM Peak Hour and by 1 second during the PM Peak Hour. The moderate and excessive delays will exist for the NO BUILD conditions and are not due to the proposed development. Therefore, no recommendation is made for the St. Joseph's Dr. / Coors Blvd. intersection.

The results of the queueing analysis for this intersection is summarized in the following table:

Queueing Analysis Summary Sheet

Project: Sequoia / Coors Retail Development (Sequoia Rd. / Coors Blvd.)
 Intersection: St. Joseph's Dr. / Coors Blvd.

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	2	297	130	1	95	Cont	1	85	130
AM NO BUILD Queue	2	303	250	1	101	175	1	185	250
AM BUILD Queue	2	303	250	1	101	175	1	185	250
Existing Lane Length	2	178	130	1	7	Cont	1	65	130
PM NO BUILD Queue	2	182	175	1	12	50	1	203	325
PM BUILD Queue	2	183	175	1	12	50	1	203	325
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	161	320	2	31	Cont	0	126	0
AM NO BUILD Queue	1	174	250	2	36	50	0	129	200
AM BUILD Queue	1	174	250	2	36	50	0	129	200
Existing Lane Length	1	58	320	2	11	Cont	0	36	0
PM NO BUILD Queue	1	69	150	2	16	25	0	37	100
PM BUILD Queue	1	69	150	2	16	25	0	37	100
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	80	415	3	1,404	Cont	1	212	330
AM NO BUILD Queue	1	287	375	3	1,457	650	1	226	300
AM BUILD Queue	1	287	375	3	1,461	650	1	226	300
Existing Lane Length	1	142	415	3	3,007	Cont	1	38	330
PM NO BUILD Queue	1	392	550	3	3,092	>1,000 *	1	49	100
PM BUILD Queue	1	392	550	3	3,108	>1,000 *	1	49	100
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	263	560	3	2,423	Cont	1	111	280
AM NO BUILD Queue	1	276	350	3	2,647	>1,000 *	1	116	175
AM BUILD Queue	1	282	375	3	2,647	>1,000 *	1	116	175
Existing Lane Length	1	52	560	3	2,072	Cont	1	272	280
PM NO BUILD Queue	1	54	125	3	2,316	>1,000 *	1	285	425
PM BUILD Queue	1	69	150	3	2,317	>1,000 *	1	285	425

AM
PM
 Cycle Length: 120
140

NOTE: Queue lengths are in feet.

Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

The queueing analysis recommends lengthening the eastbound left turn lane from 130 feet to 250 feet plus transition, the eastbound right turn lane from 130 feet to 160 feet plus transition and the northbound left turn lane from 415 feet to 550 feet plus transition for both the NO BUILD and BUILD conditions. According to aerial photography, it appears that all of these recommendations may be accomplished. However; these recommendations are not due to

the proposed development and are needed in the NO BUILD condition. The eastbound dual left turn lanes are being extended by the Coors Pavilion developer. Therefore, no recommendations are made for the queue lengths at the intersection of St. Joseph's Dr. / Coors Blvd.

Intersection #3 - Sequoia Rd. / Ladera Dr. - Pages A-49 thru A-78

This intersection is scheduled to be signalized in the near future. Therefore, it will be analyzed as such. (See Appendix Page A-83).

The results of the implementation year analysis of the signalized intersection of Sequoia Rd. / Ladera Dr. are summarized in the following table:

Intersection: 3 - SEQUOIA RD. / LADERA DR.

2019 AM Peak Hour BUILD						2019 PM Peak Hour BUILD					
		(EXIST. GEOM.)						(EXIST. GEOM.)			
		NO BUILD		BUILD				NO BUILD		BUILD	
		Lanes	LOS-Delay	Lanes	LOS-Delay			Lanes	LOS-Delay	Lanes	LOS-Delay
EB	L	>	A - 8.8	>	A - 8.9	L	>	A - 7.6	>	A - 7.6	
	T	1	A - 8.8	1	A - 8.9	T	1	A - 7.6	1	A - 7.6	
	R	>	A - 8.8	>	A - 8.9	R	>	A - 7.6	>	A - 7.6	
WB	L	1	A - 9.2	1	A - 9.4	L	1	A - 8.6	1	A - 8.7	
	T	1	A - 8.8	1	A - 8.9	T	1	A - 7.5	1	A - 7.5	
	R	1	A - 9.0	1	A - 9.1	R	1	A - 8.0	1	A - 8.1	
NB	L	1	A - 4.9	1	A - 4.8	L	1	A - 5.7	1	A - 5.8	
	T	2	A - 5.3	2	A - 5.2	T	2	A - 5.5	2	A - 5.6	
	R	>	A - 5.3	>	A - 5.3	R	>	A - 5.6	>	A - 5.7	
SB	L	1	A - 6.3	1	A - 6.3	L	1	A - 6.1	1	A - 6.3	
	T	2	A - 4.6	2	A - 4.6	T	2	A - 5.4	2	A - 5.5	
	R	>	A - 4.6	>	A - 4.6	R	>	A - 5.4	>	A - 5.5	
Intersection:		A - 5.6		A - 5.6		A - 6.2		A - 6.3			

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this signalized intersection will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour NO BUILD and BUILD Conditions considered in this report. The newly generated traffic from this development will not increase the delay during the AM Peak Hour and will only increase the delay by 0.1 seconds during the PM Peak Hour. The analysis demonstrates that there will be no adverse impact to the intersection. Therefore, no recommendation is made for the Sequoia Rd. / Ladera Dr. intersection.

The results of the queueing analysis for this intersection is summarized in the following table:

Queueing Analysis Summary Sheet

Project: Sequoia / Coors Retail Development (Sequoia Rd. / Coors Blvd.)
 Intersection: Sequoia Rd. / Ladera Dr.

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	0	1	0	1	5	Cont	0	3	0
AM NO BUILD Queue	0	1	0	1	5	25	0	3	0
AM BUILD Queue	0	1	0	1	5	25	0	3	0
Existing Lane Length	0	1	0	1	11	Cont	0	7	0
PM NO BUILD Queue	0	1	0	1	11	50	0	7	25
PM BUILD Queue	0	1	0	1	11	50	0	7	25
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	51	100	1	7	Cont	1	19	100
AM NO BUILD Queue	1	52	100	1	7	25	1	19	50
AM BUILD Queue	1	56	100	1	7	25	1	20	50
Existing Lane Length	1	144	100	1	5	Cont	1	58	100
PM NO BUILD Queue	1	147	250	1	5	25	1	59	125
PM BUILD Queue	1	161	275	1	5	25	1	61	125
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	5	150	2	322	Cont	0	97	0
AM NO BUILD Queue	1	5	25	2	328	250	0	99	175
AM BUILD Queue	1	5	25	2	328	250	0	104	175
Existing Lane Length	1	6	150	2	217	Cont	0	111	0
PM NO BUILD Queue	1	6	25	2	221	225	0	113	200
PM BUILD Queue	1	6	25	2	221	225	0	126	225
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	38	125	2	169	Cont	0	9	0
AM NO BUILD Queue	1	39	75	2	172	150	0	9	25
AM BUILD Queue	1	40	75	2	172	150	0	9	25
Existing Lane Length	1	28	125	2	290	Cont	0	6	0
PM NO BUILD Queue	1	29	75	2	296	275	0	6	25
PM BUILD Queue	1	31	75	2	296	275	0	6	25

AM PM
 Cycle Length: 120 140

NOTE: Queue lengths are in feet.

Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

The queueing analysis recommends lengthening the westbound left turn lane from 100 feet to 275 feet plus transition for both the NO BUILD and BUILD conditions. The westbound left turn lane cannot be lengthened without adversely affecting the intersection with Grogan St. to the east. Therefore, no recommendations are made for the queue lengths at the intersection of Sequoia Rd. / Ladera Dr.

RESULTS OF UNSIGNALIZED INTERSECTION CAPACITY ANALYSES

IMPLEMENTATION YEAR (2019)

Intersection #4 - Sequoia Rd. / Atrisco Dr. - Pages A-49 thru A-78

The results of the implementation year analysis of the signalized intersection of Sequoia Rd. / Atrisco Dr. are summarized in the following table:

Intersection: 4 - SEQUOIA RD. / ATRISCO DR.

2019 AM Peak Hour BUILD						2019 PM Peak Hour BUILD					
		(EXIST. GEOM.)						(EXIST. GEOM.)			
		NO BUILD		BUILD				NO BUILD		BUILD	
		Lanes	LOS-Delay	Lanes	LOS-Delay			Lanes	LOS-Delay	Lanes	LOS-Delay
EB	L	1	B - 11.5	1	B - 11.6	L	1	B - 11.6	1	B - 11.8	
	T	2	B - 13.3	2	B - 13.6	T	2	B - 12.3	2	B - 12.9	
	R	>	B - 12.6	>	B - 12.8	R	>	B - 11.9	>	B - 12.3	
WB	L	1	B - 12.6	1	B - 12.7	L	1	B - 12.1	1	B - 12.4	
	T	1	B - 12.0	1	B - 12.2	T	1	B - 14.6	1	C - 15.8	
	R	1	B - 11.1	1	B - 11.3	R	1	B - 11.7	1	B - 12.3	
NB	L	1	B - 11.6	1	B - 11.7	L	1	B - 11.5	1	B - 11.9	
	T	1	B - 13.5	1	B - 13.7	T	1	D - 26.2	1	D - 28.6	
	R	1	B - 10.7	1	B - 10.9	R	1	B - 10.8	1	B - 11.2	
SB	L	1	B - 11.7	1	B - 12.0	L	1	B - 12.3	1	B - 13.0	
	T	2	F - 52.3	2	F - 54.7	T	2	B - 13.8	2	B - 14.3	
	R	>	F - 52.3	>	F - 54.7	R	>	B - 13.8	>	B - 14.3	
Intersection:		u - 27.1		u - 27.8				u - 16.3		u - 17.2	

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this unsignalized intersection will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour NO BUILD and BUILD Conditions considered in this report, except for the southbound shared thru/right turn movement which will experience excessive delays during the AM Peak Hour for the NO BUILD and BUILD conditions. The excessive delays will exist for the NO BUILD conditions and are not due to the proposed development. Therefore, no recommendations are made for the Sequoia Rd. / Atrisco Dr. intersection.

Intersection #5 – Sequoia Rd. / Driveway “A” - Pages A-49 thru A-78

This driveway is an existing full access drive utilized by the commercial development to the north of Sequoia Rd. and to the south of the proposed development.

The results of the analysis of the unsignalized intersection of Sequoia Rd. / Driveway "A" are summarized in the following table:

Intersection: 5 - SEQUOIA RD. / DRIVEWAY "A"

<u>2019 AM Peak Hour BUILD</u>					<u>2019 PM Peak Hour BUILD</u>				
(EXIST. GEOM.)					(EXIST. GEOM.)				
		NO BUILD		BUILD			NO BUILD		BUILD
		Lanes	LOS-Delay	Lanes			Lanes	LOS-Delay	Lanes
SB	EB	L	> A - 7.5	> A - 7.6	L	> A - 7.8	> A - 8.0	L	> A - 8.0
	EB	T	2 A - 0.0	2 A - 0.0	T	2 A - 0.0	2 A - 0.1	T	2 A - 0.1
WB	EB	T	2 A - 0.0	2 A - 0.0	T	2 A - 0.0	2 A - 0.0	T	2 A - 0.0
	EB	R	> A - 0.0	> A - 0.0	R	> A - 0.0	> A - 0.0	R	> A - 0.0
SB	WB	L	1 A - 9.6	1 B - 10.2	L	1 B - 10.9	1 B - 13.1	L	1 B - 13.1
	WB	R	> A - 9.6	> B - 10.2	R	> B - 10.9	> B - 13.1	R	> B - 13.1
Intersection:		<u>u - 0.0</u>		<u>u - 0.6</u>	<u>u - 0.6</u>		<u>u - 2.3</u>		

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this unsignalized driveway will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour BUILD Conditions considered in this report. Therefore, no recommendations are made for the intersection of Sequoia Rd. / Driveway "A".

Intersection #6 - Driveway "B" / Coors Blvd. - Pages A-49 thru A-78

This driveway is an existing right-in / right-out only drive utilized by the commercial development to the north of the proposed development.

The results of the analysis of the unsignalized intersection of Driveway "B" / Coors Blvd. are summarized in the following table:

Intersection: 6 - DRIVEWAY "B" / COORS BLVD.

<u>2019 AM Peak Hour BUILD</u>					<u>2019 PM Peak Hour BUILD</u>				
(EXIST. GEOM.)					(EXIST. GEOM.)				
		NO BUILD		BUILD			NO BUILD		BUILD
		Lanes	LOS-Delay	Lanes			Lanes	LOS-Delay	Lanes
SB	EB	R	1 C - 22.4	1 C - 23.2	R	1 B - 13.8	1 B - 14.4	R	1 B - 14.4
	EB	T	3 A - 0.0	3 A - 0.0	T	3 A - 0.0	3 A - 0.0	T	3 A - 0.0
WB	EB	T	3 A - 0.0	3 A - 0.0	T	3 A - 0.0	3 A - 0.0	T	3 A - 0.0
	EB	R	1 A - 0.0	1 A - 0.0	R	1 A - 0.0	1 A - 0.0	R	1 A - 0.0
Intersection:		<u>u - 0.1</u>		<u>u - 0.1</u>	<u>u - 0.0</u>		<u>u - 0.1</u>		

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this unsignalized driveway will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour BUILD Conditions considered in this

report. A determination of Warrants determined that this driveway warrants a southbound right turn lane (400 feet with a 12.5:1 taper) for both the NO BUILD and Build conditions. It currently has a 110-foot turn lane. This is warranted for the NO BUILD condition and is not due to the proposed development. Therefore, no recommendations are made for the intersection of Driveway "B" / Coors Blvd.

Intersection #7 – Driveway "C" / Atrisco Dr. - Pages A-49 thru A-78

This driveway is a proposed full access drive to be utilized by the RV Storage only.

The results of the analysis of the unsignalized intersection of Driveway "C" / Atrisco Rd. are summarized in the following table:

Intersection: 7 - DRIVEWAY "C" / ATRISCO DR.

2019 AM Peak Hour BUILD						2019 PM Peak Hour BUILD					
(EXIST. GEOM.)						(EXIST. GEOM.)					
NO BUILD			BUILD			NO BUILD			BUILD		
Lanes	LOS-Delay		Lanes	LOS-Delay		Lanes	LOS-Delay		Lanes	LOS-Delay	
WB	L	1	A - 0.0	1	B - 12.7	L	1	A - 0.0	1	B - 12.7	
	R	>	A - 0.0	>	B - 12.7	R	>	A - 0.0	>	B - 12.7	
NB	T	1	A - 0.0	1	A - 0.0	T	1	A - 0.0	1	A - 0.0	
	R	>	A - 0.0	>	A - 0.0	R	>	A - 0.0	>	A - 0.0	
SB	T	1	A - 0.0	1	A - 7.6	T	1	A - 0.0	1	A - 8.4	
	R	>	A - 0.0	>	A - 0.0	R	>	A - 0.0	>	A - 0.0	
Intersection:		u - 0.0		u - 0.0		u - 0.0		u - 0.1			

Note: ">" designates a shared right or left turn lane.

This study demonstrates that this unsignalized driveway will operate at acceptable levels-of-service for the 2019 AM Peak Hour and PM Peak Hour BUILD Conditions considered in this report. Therefore, no recommendations are made for the intersection of Driveway "C" / Atrisco Dr.

CONCLUSIONS

This analysis was conducted using the following methodology: Trip Generation was established using the Institute of Transportation Engineers' (ITE's) Trip Generation Manual (9th Edition). Generated Trips were distributed proportionately based on the Population Data Analysis Subzones for Commercial Land Use; NO BUILD volumes were established based on recent traffic count data grown at historical growth rate; and the intersection analyses were performed in accordance with the 2010 Highway Capacity Manual. The Traffic Impact Study showed a minimal to moderate increase in traffic volumes for the adjacent transportation network based on 100% buildout of the proposed project.

In summary, the proposed plan for the Sequoia / Coors Retail Development presents no significant adverse impact to the adjacent transportation system provided that the following recommendations are followed:

RECOMMENDATIONS

- All site design and construction including driveways and landscaping shall maintain adequate sight distances at the driveways and the existing intersections.
- Access to the site should be via the extension of the driveway from the south through the project site (St. Joseph's Dr. / Driveway "A"), via the connection to the driveway from the north (Driveway "B" / Coors Blvd.), as well as implementation of a driveway (Driveway "C" / Atrisco Dr.) as defined on the conceptual site plan on Page A-3 of the Appendix of this report.
- Driveway "C" onto Atrisco Dr. should be constructed as a full access intersection with one entering lane and one exiting lane.

Appendix

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APPENDIX



Sequoia / Coors Retail Development

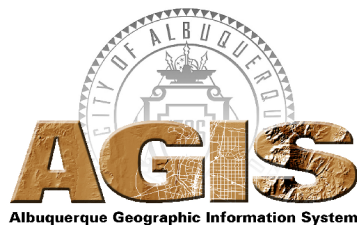
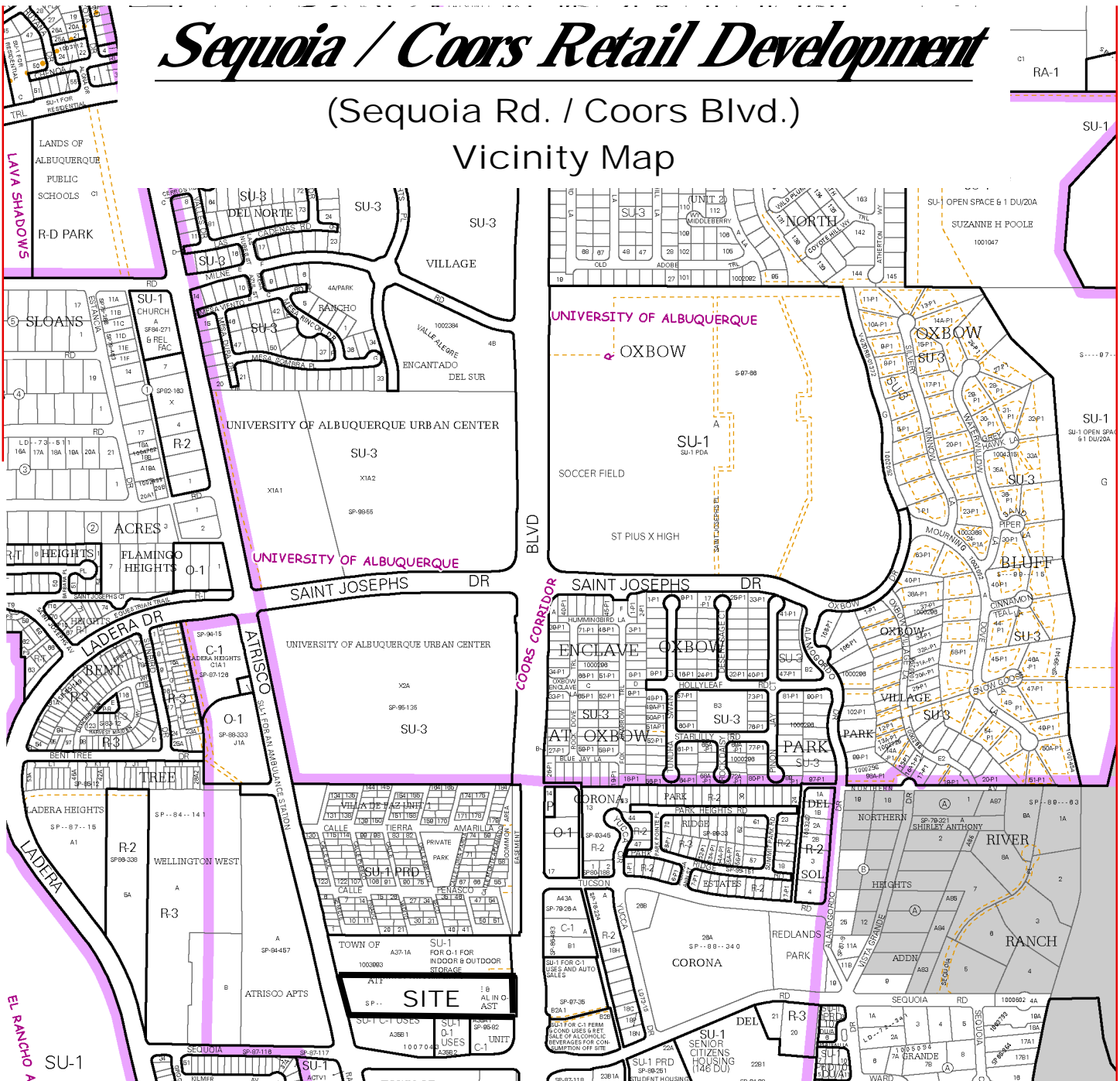
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Aerial Map

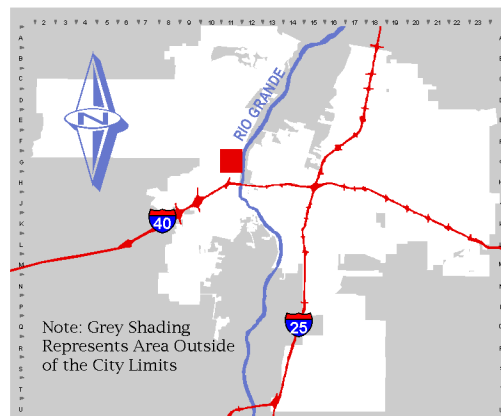
Sequoia / Coors Retail Development

(Sequoia Rd. / Coors Blvd.)

Vicinity Map



Map amended through: 1/24/2011

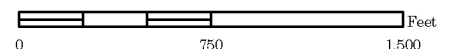


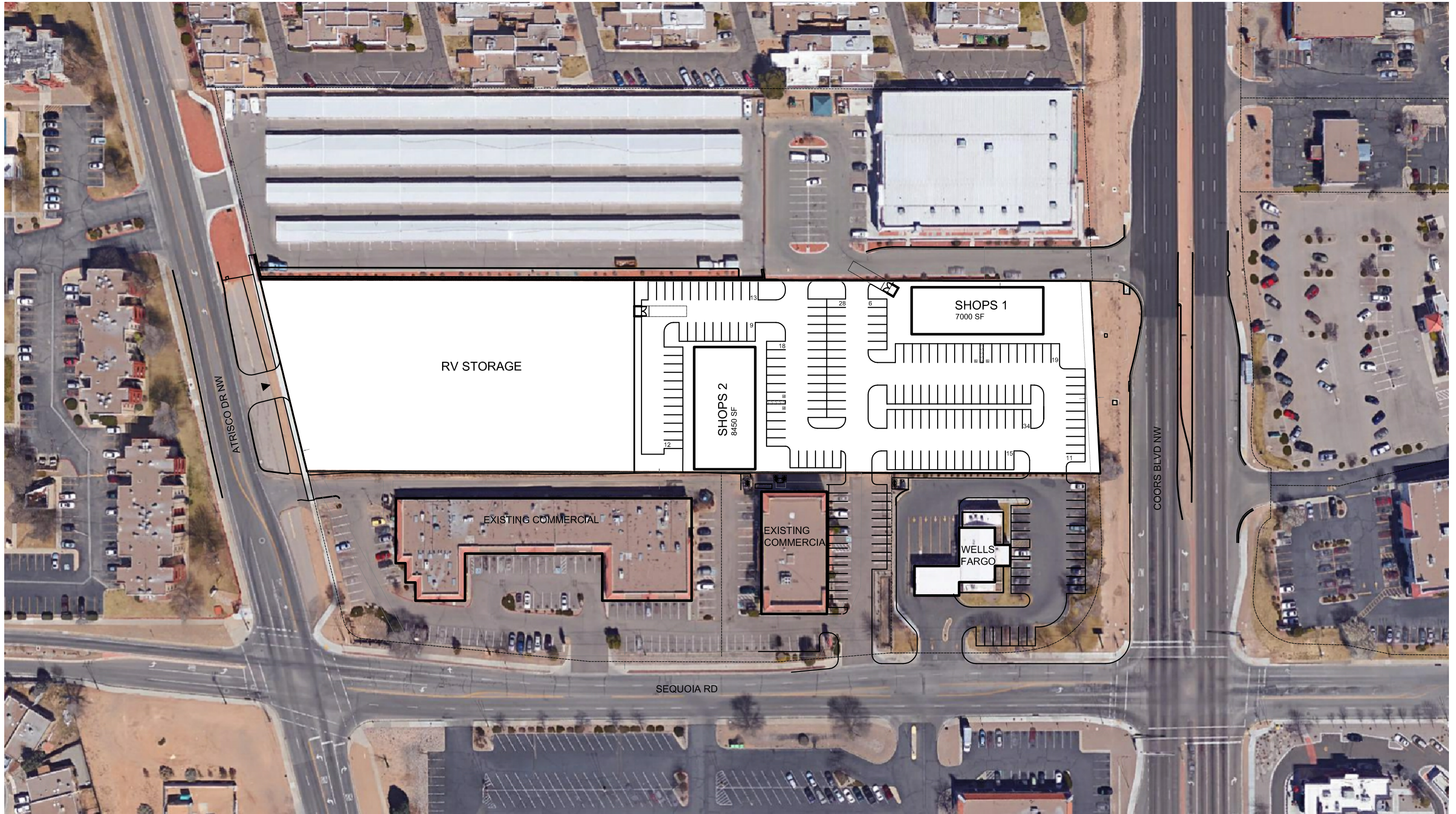
Zone Atlas Page:

F&G 10 & 11Z

Selected Symbols

- SECTOR PLANS**
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone



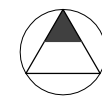


armando lopez
architecture

575. 650. 5540
armando@alopezarc.com

SITE CONCEPT

3421 Coors Road NW
Albuquerque, New Mexico



NORTH

0 50 100 200