Top Golf Development

(Montano Rd. / Interstate 25)

Traffic Impact Study

May 27, 2018

F I N A L (Revised)

Presented to:

NM Dept. of Transportation
District 3

&

City of Albuquerque
Transportation Development Section

Prepared for:

Ronald R. Bohannan, P.E.
Tierra West, LLC
5571 Midway Park Pl. NE
Albuquerque, NM 87109

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

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Executive Summary

The purpose of this study is to evaluate the transportation conditions before and after implementation of the proposed Top Golf Development, determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared to meet the requirements of the New Mexico Department of Transportation, District 3 associated with its review of the Top Golf Development. The trip generation rate for the Top Golf Development does not meet the threshold for a Traffic Impact Study for the City of Albuquerque.

The proposed development is located at the southwest corner of Montano Rd. / Interstate 25. The study area includes the intersections of Montgomery Blvd. / Carlisle Blvd., Jefferson St. / I-25 West Ramp, Montgomery Blvd. / I-25 East Ramp, Montano Rd. / I-25 West Ramp, Montano Rd. / Culture Dr., Montano Rd. / Renaissance Blvd., Comanche Rd. / I-25 East Ramp, Comanche Rd. / I-25 West Ramp, Comanche Rd. / Alexander Blvd., S. Desert Surf Cir. / Alexander Blvd., S. Renaissance Blvd. / Alexander Blvd., N. Desert Surf Cir. / Alexander Blvd., Driveway "A" / Desert Surf Cir., S. Desert Surf Cir. / Driveway "B" and Driveway "C" / I-25 West Ramp.

The proposed development is to be developed as a Top Golf facility. The anticipated implementation year for this site is the year 2019. According to the Fehr Peers Study in Scottsdale, AZ, the weekday AM Peak Hour period is anticipated to generate approximately 24 entering trips and 4 exiting trips. During the weekday PM Peak Hour period, it is anticipated that it will generate approximately 91 entering trips and 92 exiting trips.

The development will be accessed via four driveways for this parcel of land. The existing driveway on Montano Rd. is the south leg of Montano Rd. / Culture Dr. There are two proposed driveways on Desert Surf Circle (Driveways "A" & "B"). The fourth driveway (Driveway "C") is proposed as a right-in, right-out only driveway located along the west side of the I-25 West Ramp approximately 1,400 feet south of Montano Rd. (centerline to centerline).

Analysis results are included in the following table:

EXECUTIVE SUMMARY RESULTS TABLE

		2019 AM(PM) PEAK HOUR		
INTERSECTION NO. & NAME	SIGNALIZATION	NO BUILD	BUILD	2040 RECOMMENDATIONS
1 - Montgomery Blvd. / Carlisle Blvd.	Signalized	C- 23.4 (C- 27.7)	C- 23.4 (C- 27.7)	None
2 - Jefferson St. / I-25 W. Ramp	Signalized	B- 13.1 (D- 51.8)	B- 13.1 (D- 52.1)	None
3 - Montgomery Blvd. / I-25 E. Ramp	Signalized	C- 30.4 (E- 55.8)	C- 30.5 (E- 57.7)	None
4 - Montano Rd. / I-25 W. Ramp	Signalized	B- 16.1 (C- 23.5)	B- 16.1 (C- 23.8)	None
5 - Montano Rd. / Culture Dr.	Signalized	C- 20.2 (C- 28.2)	C- 20.3 (C- 27.2)	None
6 - Montano Rd. / N. Renaissance Blvd.	Signalized	B- 10.8 (B- 14.8)	B- 10.8 (B- 15.1)	None
7 - Comanche Rd. / I-25 E. Ramp	Signalized	C- 22.0 (C- 26.1)	C- 22.0 (C- 26.2)	None
8 - Comanche Rd. / I-25 W. Ramp	Signalized	C- 22.2 (C- 33.6)	C- 22.2 (C- 34.3)	None
9 - Comanche Rd. / Alexander Blvd.	Unsignalized	u- 0.6 (u- 0.9)	u- 0.6 (u- 0.9)	None
10 - S. Desert Surf Cir. / Alexander Blvd.	Unsignalized	u- 1.7 (u- 1.9)	u- 1.7 (u- 1.9)	None
11 - S. Renaissance / Alexander Blvd.	Unsignalized	u- 4.6 (u- 3.1)	u- 4.7 (u- 3.4)	None
12 - N. Desert Surf Cir. / Alexander Blvd.	Unsignalized	u- 0.6 (u- 0.9)	u- 0.6 (u- 0.9)	None
13 - Driveway "A" / N. Desert Surf Cir.	Unsignalized	u- 0.0 (u- 0.0)	u- 2.2 (u- 3.7)	None
14 - Desert Surf Cir. / Driveway "B"	Unsignalized	u- 0.0 (u- 0.0)	u- 0.2 (u- 1.3)	None
15 - Driveway "C" / I-25 W. Ramp	Unsignalized	u- 0.0 (u- 0.0)	u- 0.0 (u- 0.4)	Construct SB RT decel lane 400 FT plus 12.5:1 taper).

In summary, the proposed development does not have a significant adverse impact to the adjacent transportation system and the minimal impact to the transportation system can be mitigated by the recommended measures described in this report and summarized in the table above. In summary, the recommendations of this study are:

Driveway "C" / I-25 W. Ramp - Construct a southbound right turn deceleration lane, 400 feet long plus 12.5:1 taper.

Driveways "A" and "B" – Construct with one entering and one exiting lane, with curb return radii appropriate for delivery trucks, and with acceptable ADA ramps.

Driveway "C" – Construct with one entering lane and on existing lane and curb return radii acceptable for delivery trucks.

Desert Surf Circle – Construct sidewalks where missing and rehabilitate sidewalks where necessary to make ADA accessible.

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Traffic Impact Study

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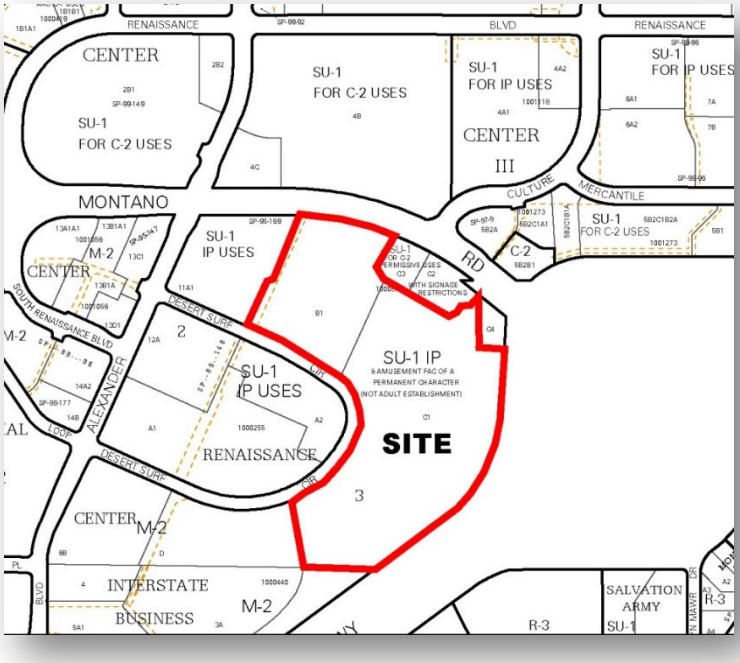
Introduction

The purpose of this study is to evaluate the transportation conditions before and after implementation of the proposed Top Golf Development and determine the impact of the development on the adjacent transportation system. The recommendations of this study will provide measures to mitigate the impact of the development of the site plan on critical intersections and street segments. This study is prepared to meet the requirements of the New Mexico Department of Transportation, District 3 associated with its review of the Top Golf Development as shown on the plan on Page A-3 in the Appendix of this report. The trip generation rate for the Top Golf Development does not meet the threshold for a Traffic Impact Study for the City of Albuquerque. Even though a Traffic Impact Study is not warranted by the City of Albuquerque, a complimentary copy of the Study will be provided to the City.

The proposed development is located at the southwest corner of Montano Rd. / Interstate 25 in Albuquerque, New Mexico. If the property was to develop in a manner significantly different than the proposed plan considered in this report such that the number of generated trips is significantly greater, then an update to this study may be required by the New Mexico Department of Transportation, District 3.

Following is a vicinity map depicting the location of the proposed project:



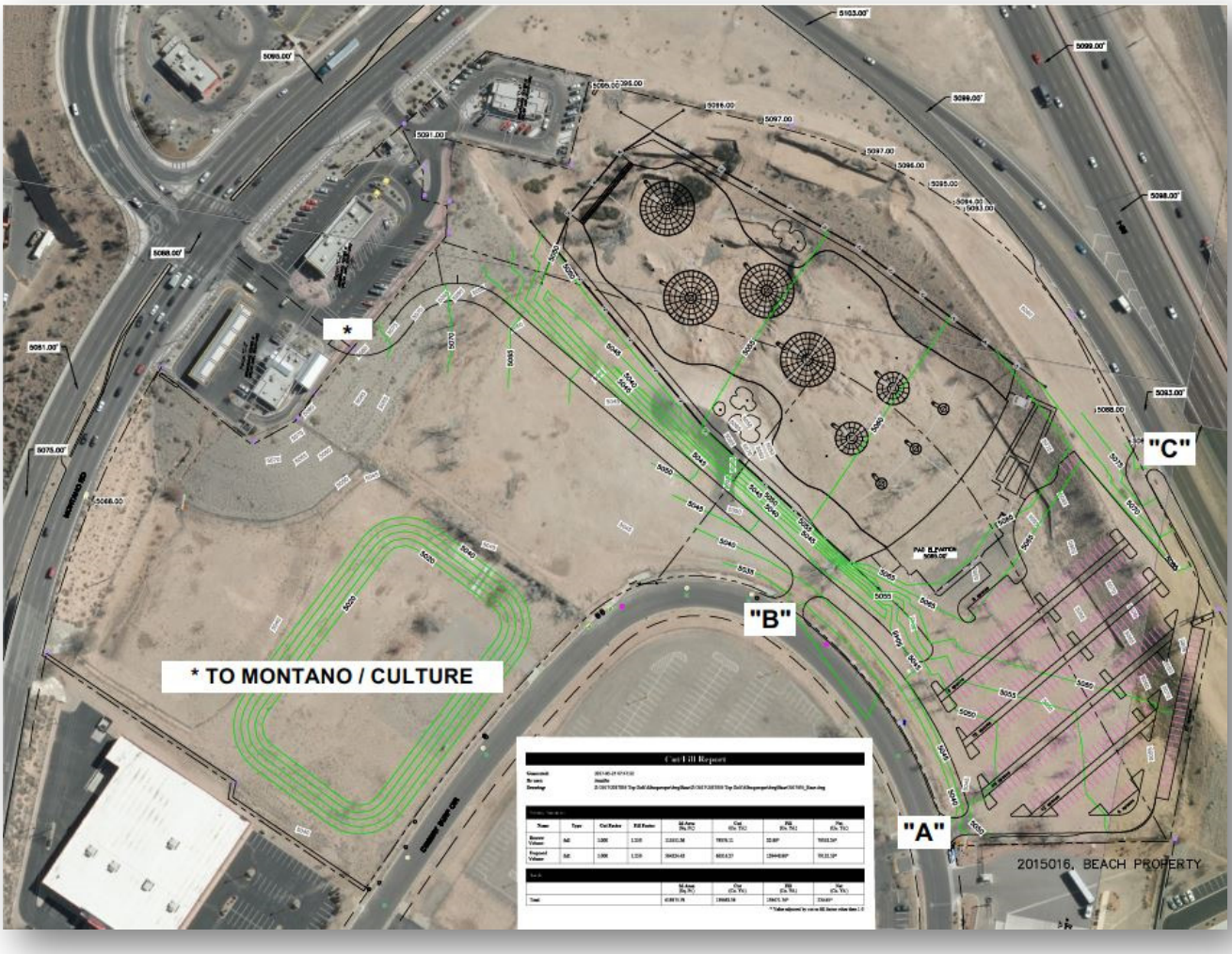
Description of Proposed Development

The proposed project is described as a Top Golf facility at the southwest corner of Montano Rd. / Interstate 25. The project lies in the city limits of Albuquerque, NM. The project fronts on a Regional Principal Arterial Roadway (Montano Rd.) and a Major Collector Roadway (I-25 West Ramp) which is maintained by the New Mexico Department of Transportation. Therefore, the project will be required to comply with the requirements of the City of Albuquerque with regard to the overall development and with the requirements of the New Mexico Department of Transportation with regard to transportation issues along the Interstate.

This development will be constructed in one phase. This study will analyze the implementation year of 2019. The development will be similar in nature to the existing Top Golf facility in Scottsdale, AZ, which includes private event spaces, meeting rooms, restaurant / bar, and golf ball hitting bays for lessons, classes and social events. Existing zoning is SU-1 IP.

The development will be accessed via four driveways for this parcel of land. The existing driveway on Montano Rd. is the south leg of the existing signalized intersection of Montano Rd. / Culture Dr. There are two proposed full access unsignalized driveways on Desert Surf Circle (Driveways “A” and “B”). The fourth driveway (Driveway “C”) is proposed as a right-in, right-out only driveway located along the I-25 West Frontage Rd. approximately 1,400 feet south of Montano Rd. (centerline to centerline).

Following is the proposed site development plan depicting driveway (access) locations (also, see Appendix Page A-3 for a more complete version of the proposed site development plan):



Study Area Conditions

A Traffic Impact Study Scoping Meeting was held via email with the New Mexico Department of Transportation, District 3 with staff (Nancy Perea) in May 2016. During the email exchange, it was determined that the study area would include the following list of intersections to be analyzed in the Traffic Impact Study:

1. Montgomery Blvd. / Carlisle Blvd.,
2. Jefferson St. / I-25 West Ramp
3. Montgomery Blvd. / I-25 East Ramp
4. Montano Rd. / I-25 West Ramp
5. Montano Rd. / Culture Dr.
6. Montano Rd. / Renaissance Blvd.
7. Comanche Rd. / I-25 East Ramp
8. Comanche Rd. / I-25 West Ramp

9. Comanche Rd. / Alexander Blvd.
10. S. Desert Surf Cir. / Alexander Blvd.
11. S. Renaissance Blvd. / Alexander Blvd.
12. N. Desert Surf Cir. / Alexander Blvd.
13. Driveway “A” / Desert Surf Cir.
14. S. Desert Surf Cir. / Driveway “B”
15. Driveway “C” / I-25 West Ramp

This scope of study was based on the assumption that the parcel in question would be developed as a retail commercial project at the time. This Study is an update to reflect the fact that it now is planned to be a Top Golf facility.

There are no other known land development projects in the area which need to be incorporated into the background traffic model for this study. The most current Statewide Transportation Improvement Program (STIP, dated October 13, 2017) includes the I-25 / Montgomery Blvd. Interchange Reconstruction – (Bridge #6261), CN: A301900. The STIP describes the scope as Reconstruct Interchange with Bridge Rehab or Replacement and includes no production or estimated letting dates.

The traffic signals along Montgomery Blvd. (Montano Rd.) are a part of an interconnect system. Analysis in this study emulates existing signal timing (Appendix Pages A-141 thru A-183).

Montano Rd. is served by public transit services in this area; specifically Route #157. This route runs from Gibson Blvd. north on Louisiana Blvd., west on Montano Rd. and north on Golf Course Rd. to the Northwest Transit Center (Park and Ride) near Cibola High School. See Appendix Pages A-139 thru A-140 for weekday and weekend times.

Montano Rd. and Alexander Blvd. are designated on the Futures 2040 Metropolitan Transportation Plan (2040 Long Range Bikeway System, Appendix Page A-6) as Proposed Bicycle Routes and I-25 West Ramp is designated as an Existing Trail.

There are pedestrian facilities in the project area – sidewalk along most roads, a trail along Interstate 25 and a proposed bike path on Montano Rd. and Alexander Blvd.

The I-25 West Ramp and Alexander Blvd. are classified as Major Collector Roadways on the Mid-Region Council of Government’s Futures 2040 Long Range Roadway System Map. The I-25 West Ramp is a two-lane southbound roadway with no raised median, curb and gutter or sidewalk. The posted speed limit along this section of the frontage road is 35 MPH. Alexander Blvd. is a four-lane urban-type roadway with medians, curb and gutter and sidewalk. The posted speed limit on Alexander Blvd. is 35 MPH.

Montano Rd. is classified as a Regional Principal Arterial Roadway on the Mid-Region Council of Government's Futures 2040 Long Range Roadway System Map. Montano Rd. is a six-lane roadway with raised median and curb and gutter and sidewalk. The posted speed limit along this section of Montano Rd. is 35 MPH.

Funds have been budgeted under the Statewide Transportation Improvement Program (STIP) for improvements to the interchanges on Interstate 25 at Montgomery Blvd. (Montano Rd.) and at Comanche Rd. (Griegos Rd.). Construction is scheduled to begin in 2020 and continue through 2021. Funds for Planning and Engineering are available in 2018. The stated purpose of the project is to add capacity / widening. The project control number is A301900 and the lead agency is the New Mexico Department of Transportation.

Analysis of Existing Conditions

Existing traffic volumes (turning movement counts) were collected at the intersections targeted for analysis in this study in April, 2016 and are included on Appendix Pages A-125 thru A-138. For this study, existing conditions were not analyzed since the implementation year is less than two years into the future. For this reason, the 2019 NO BUILD analysis should closely represent the existing conditions.

The traffic count data was taken prior to New Mexico Department of Transportation's requirement to collect queuing data during the count period. Therefore, an attempt was made to correlate the 2016 traffic count (turning movements volume) data with the Mid-Region Council of Governments' tube count data. Critical link volumes were compared between Mid-Region Council of Governments' tube count data and the turning movements volume data collected for this project. If the two were within about 15% of each other, then the count data was considered valid, since traffic count data can vary on a day-to-day basis by up to about 15%. If the new traffic count data resulted in a 15% or more lower value than Mid-Region Council of Governments' tube count data, then it is suspect that intersection turning movements volumes were constrained somewhat. Mid-Region Council of Governments' tube count data is on Page A-187 in the Appendix of this Study and the comparative analysis is on Page A-188 in the Appendix of this Study. In summary, only the AM Peak Hour eastbound volume on Montano Rd. at the I-25 W. Ramp is suspect for constrained volumes. The comparative analysis showed that the eastbound approach volumes from the recent traffic count for this Study were about 30% lower than the Mid-Region Council of Governments tube counts. All other comparative volumes were either within 15% or the turning movements volumes were higher than the tube counts. The only exceptions were for the northbound and southbound off-ramps on I-25 at Comanche Rd. (Griegos Rd.). There was a large variation between the tube count volumes and the turning movement volumes collected for this project. It is suspected that the Mid-Region Council of Governments volumes are incorrect.

As Interstate 25 is a New Mexico Department of Transportation maintained facility, analysis of signalized intersections along Interstate 25 frontage roads will need to meet the requirements of the New Mexico Department of Transportation's State Access Management Manual Table 15.C-1 (Minimum Acceptable Level of Service Standards) as follows:

Table 15.C-1
Minimum Acceptable Level of Service Standards

Facility Type[1]	Access Categories							
	UINT	UPA	UMA	UCOL	RINT	RPA	RMA	RCOL
Freeway Sections	D	-	-	-	C	-	-	-
Ramp Junctions	D	-[2]	-[2]	-[2]	C	-[2]	-[2]	-[2]
Weaving Areas	D	-[2]	-[2]	-[2]	C	-[2]	-[2]	-[2]
Multi-Lane Highways	-	D	D	C	-	C	C	B
Two-Lane Highways	-	D	D	C	-	C	C	B
Signalized Intersections	-	D	D	D	-	C	C	C
Unsignalized Intersections	-	D	D	D	-	D	D	C

Based on the above table, signalized intersections along Interstate 25 frontage roads should be level-of-service D or better.

Analysis of Implementation Year Conditions

Traffic Projections

Background traffic was taken from recent traffic counts conducted for this project and are included on Appendix Pages A-125 thru A-138.

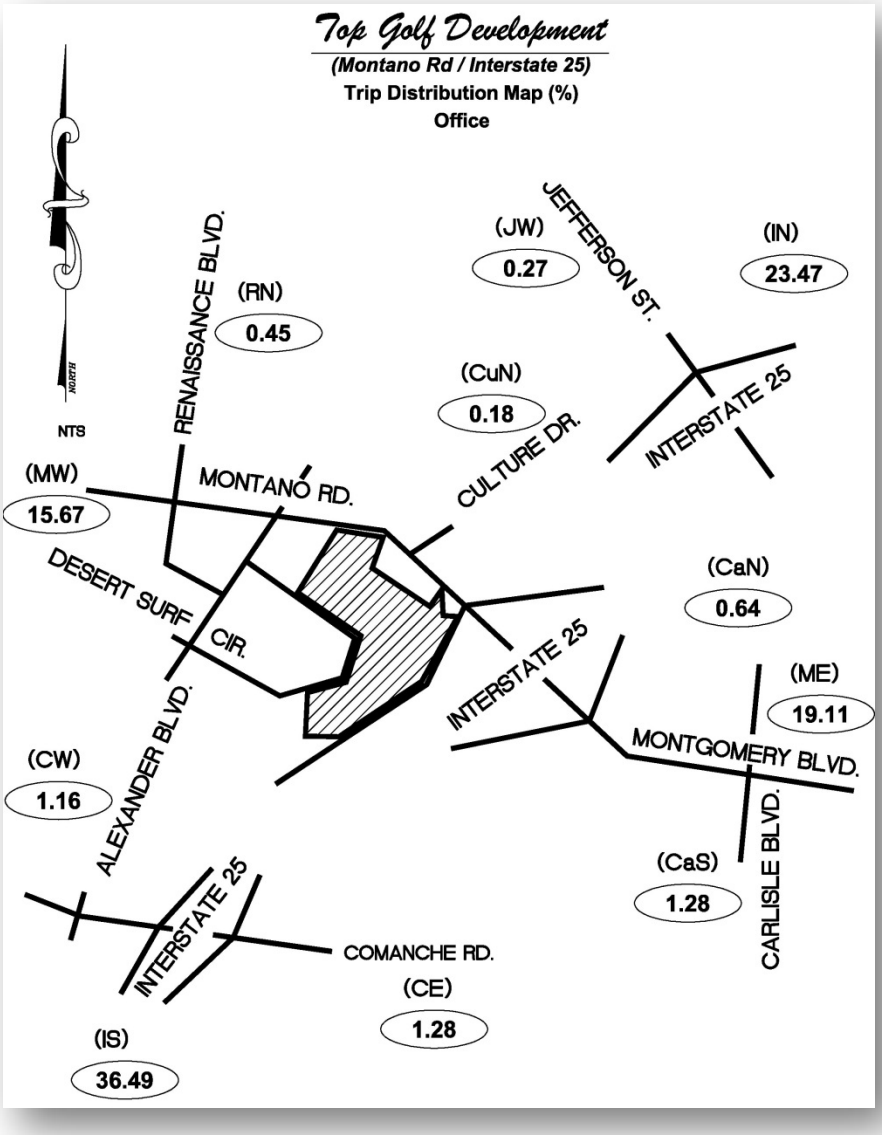
This study assumes that the development will be implemented in one phase with an implementation year of 2019.

Projected trips were calculated based on the Fehr Peers Study of the Top Golf facility in Scottsdale, AZ. Trips for the development were determined based on land use defined on the Conceptual Site Development Plan on Page A-3 in the Appendix of this report. The Fehr Peers Study determined there will be 24 AM Peak Hour entering trips and 4 exiting trips and 91 PM Peak Hour entering trips and 92 exiting trips.

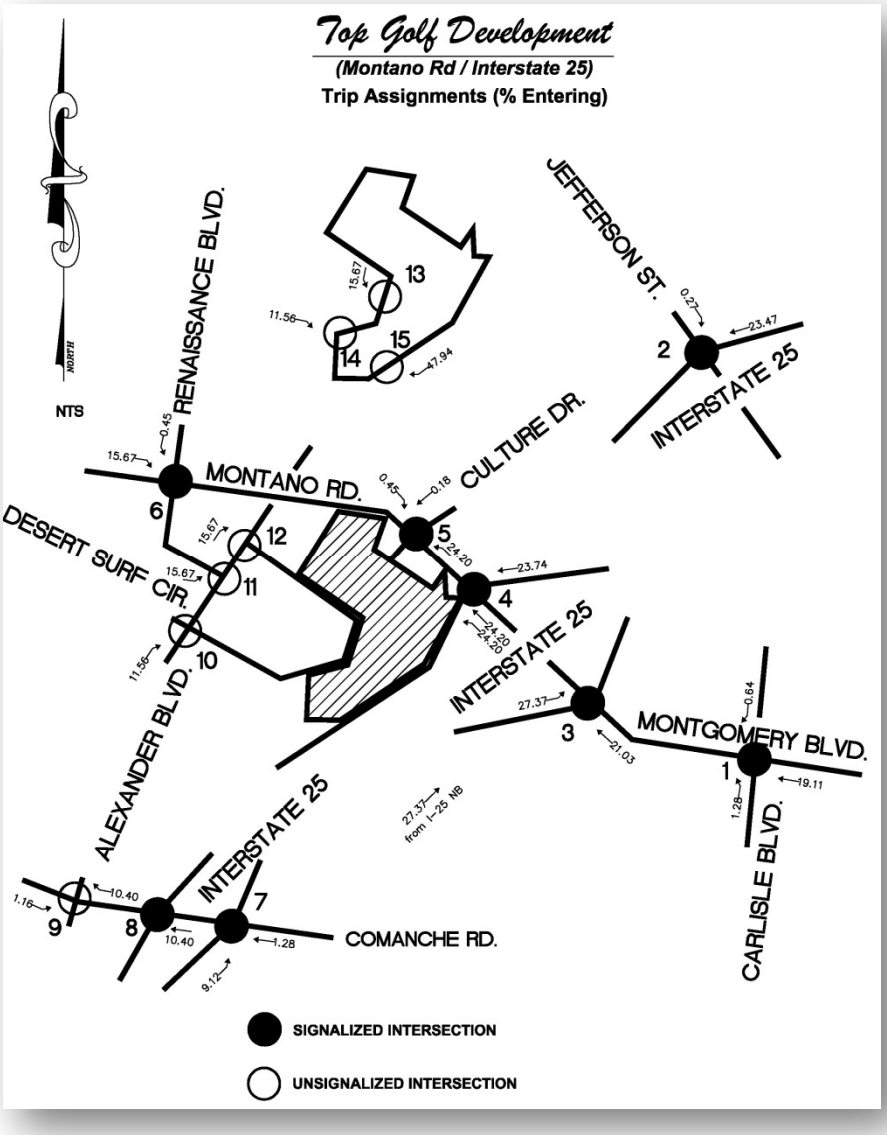
Pass-by trips were not applied to this project. See Appendix Page A-8 for more information regarding the trip generation.

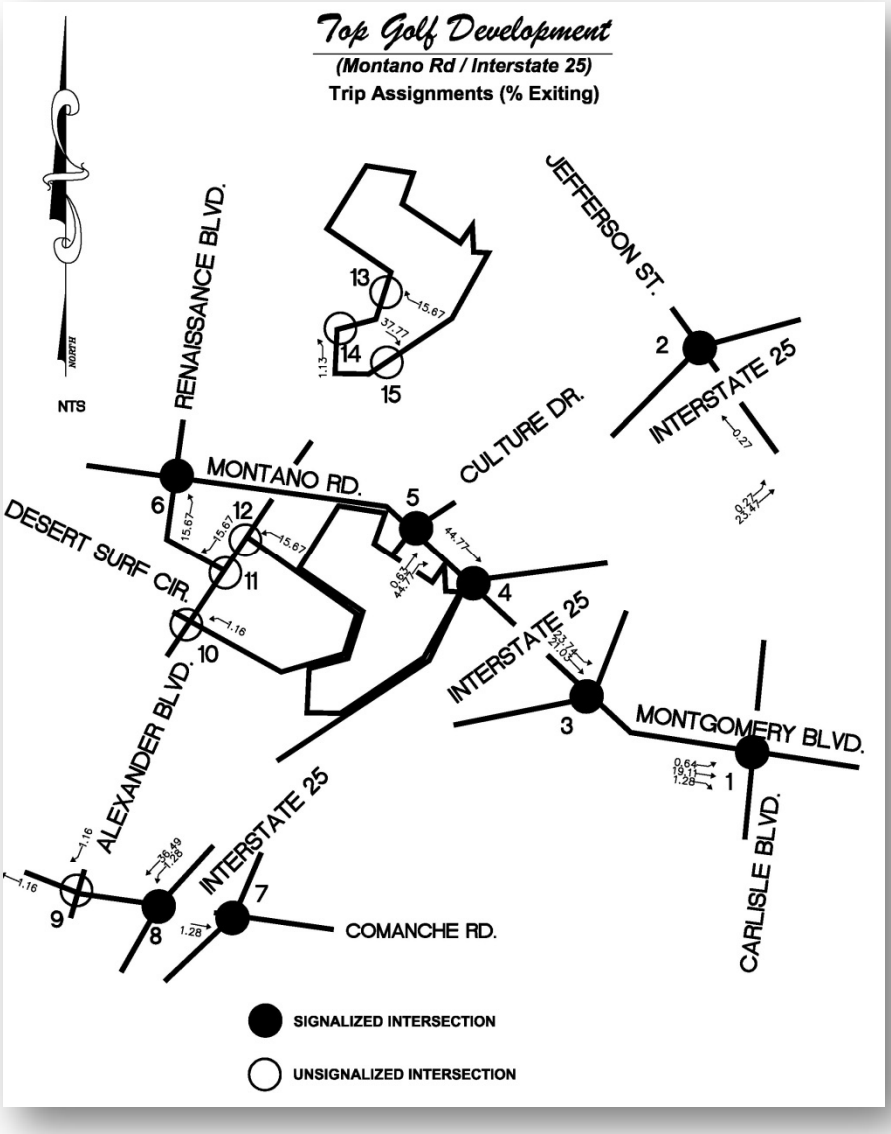
The Gravity Model was used to determine trip distribution where primary trips for the office land use development were distributed proportionally to the 2019 projected population of Subareas

citywide. Population data for the years 2012 and 2040 were taken from the 2040 Socioeconomic Forecasts by Subareas for the Mid-Region of New Mexico supplied by the Mid-Region Council of Governments (MRCOG). Population data from the years 2012 and 2040 was interpolated linearly to obtain 2019 population data to utilize for this analysis. Population Subareas were grouped based on the most likely major street(s) or route(s) to the subject development. The trip distribution worksheets and associated map of data analysis subzones are shown in the Appendix on Pages A-9 thru A-13. The office Trip Distribution map can be found below and in the Appendix on Page A-14.



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 assignments for office trips are shown below and in the Appendix on Pages A-15 thru A-16. No adjustments for pass-by trips on this project were applied.

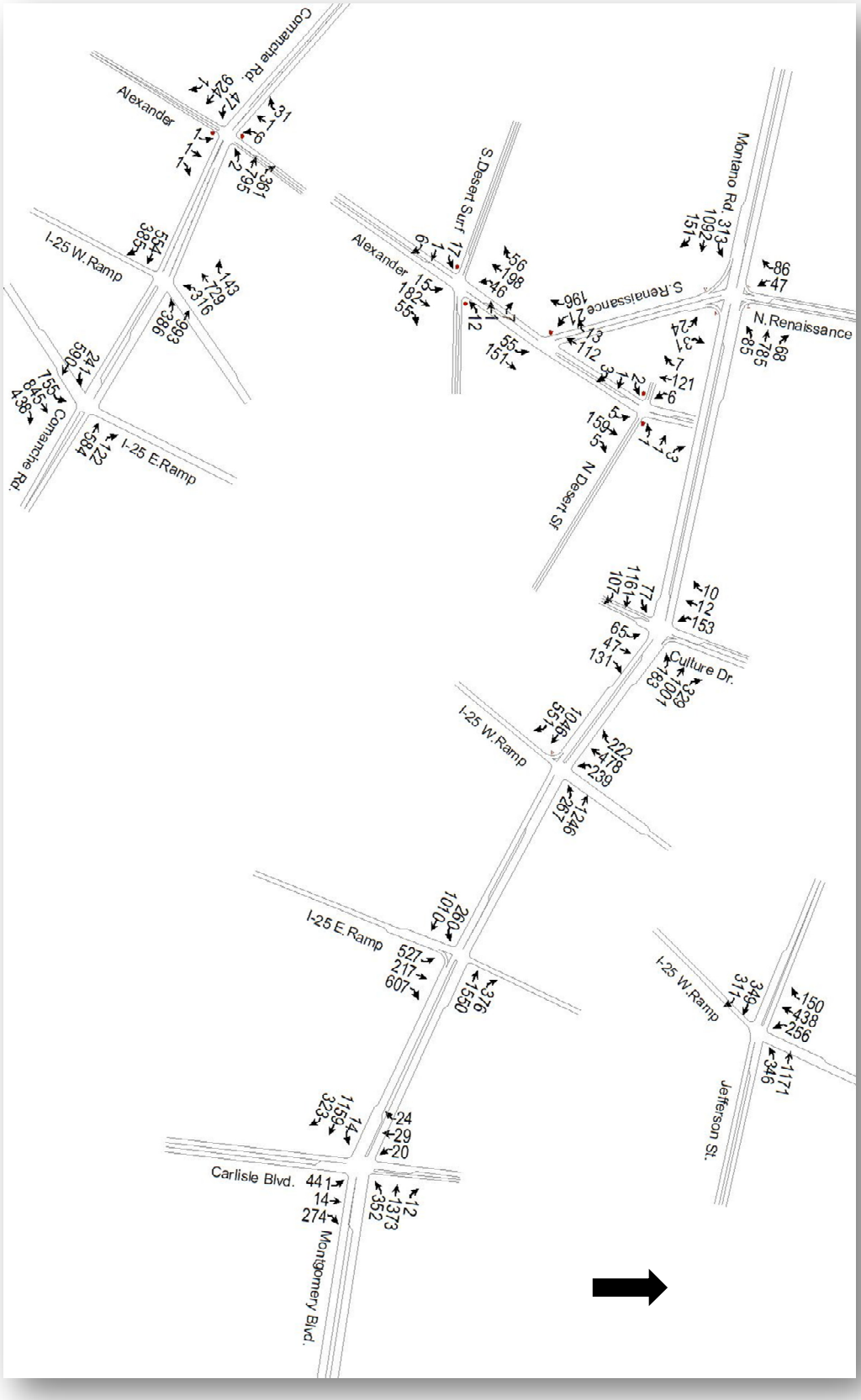




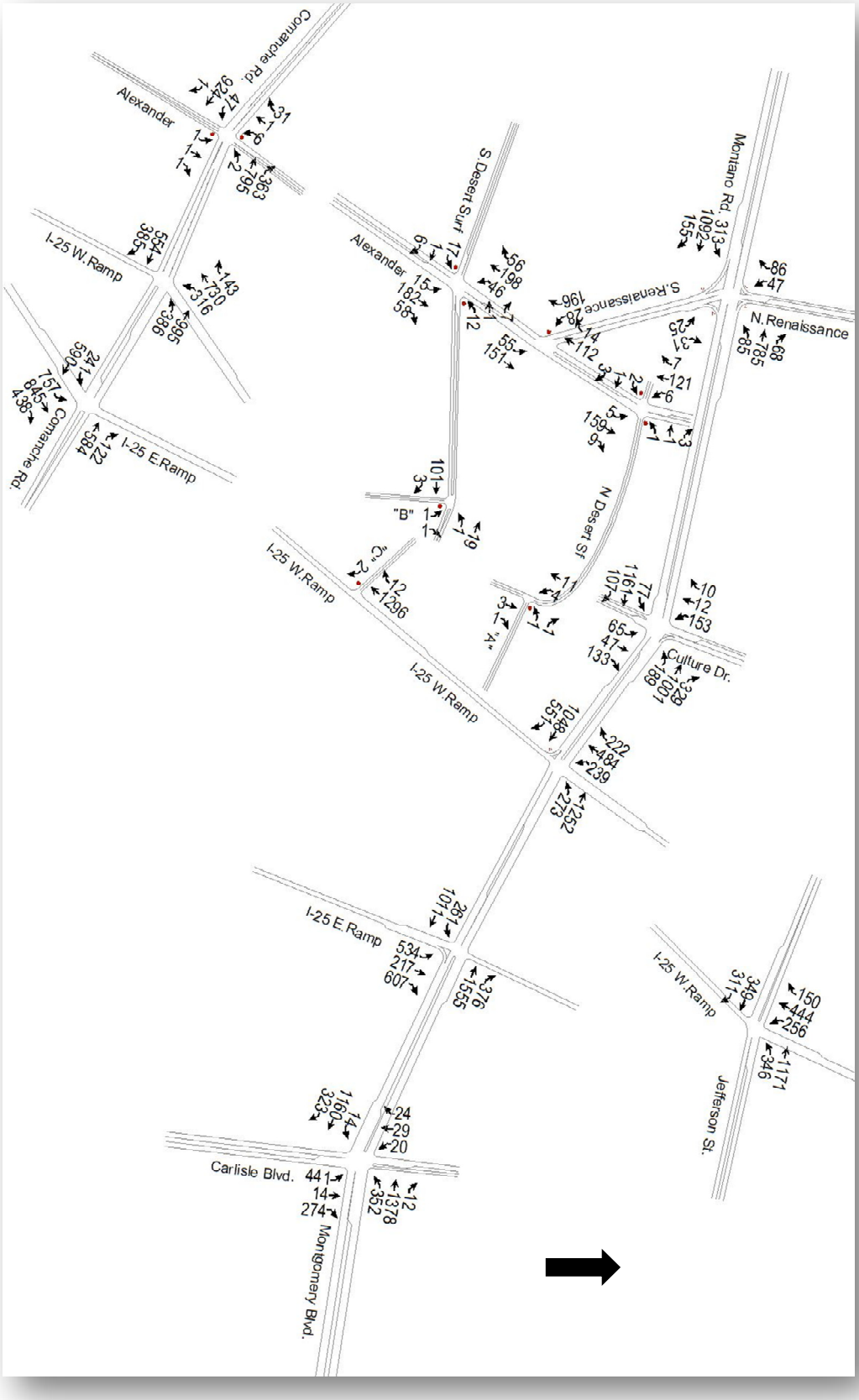
Background traffic growth rates were considered for each individual approach to an intersection that was targeted for analysis based on data from the 2005 through 2014 Traffic Flow maps prepared by the Mid-Region Council of Governments. Most of the Traffic Flow Data for those years taken from the MRCOG 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 annual growth rate for each approach if that calculated rate appeared feasible. However, in every roadway segment considered in this analysis, the rate indicated a negative growth trend; therefore, the growth rate was considered to be a generic 0.5%. Historical Growth Rate Graphs with linear regression trend lines are

shown in the Appendix on Pages A-18 thru A-28. The growth rate utilized for each approach to an intersection is printed on the Growth Rate Map (Appendix Page A-29) and at the top of the Turning Movement sheets for each intersection (Appendix Pages A-35 thru A-66).

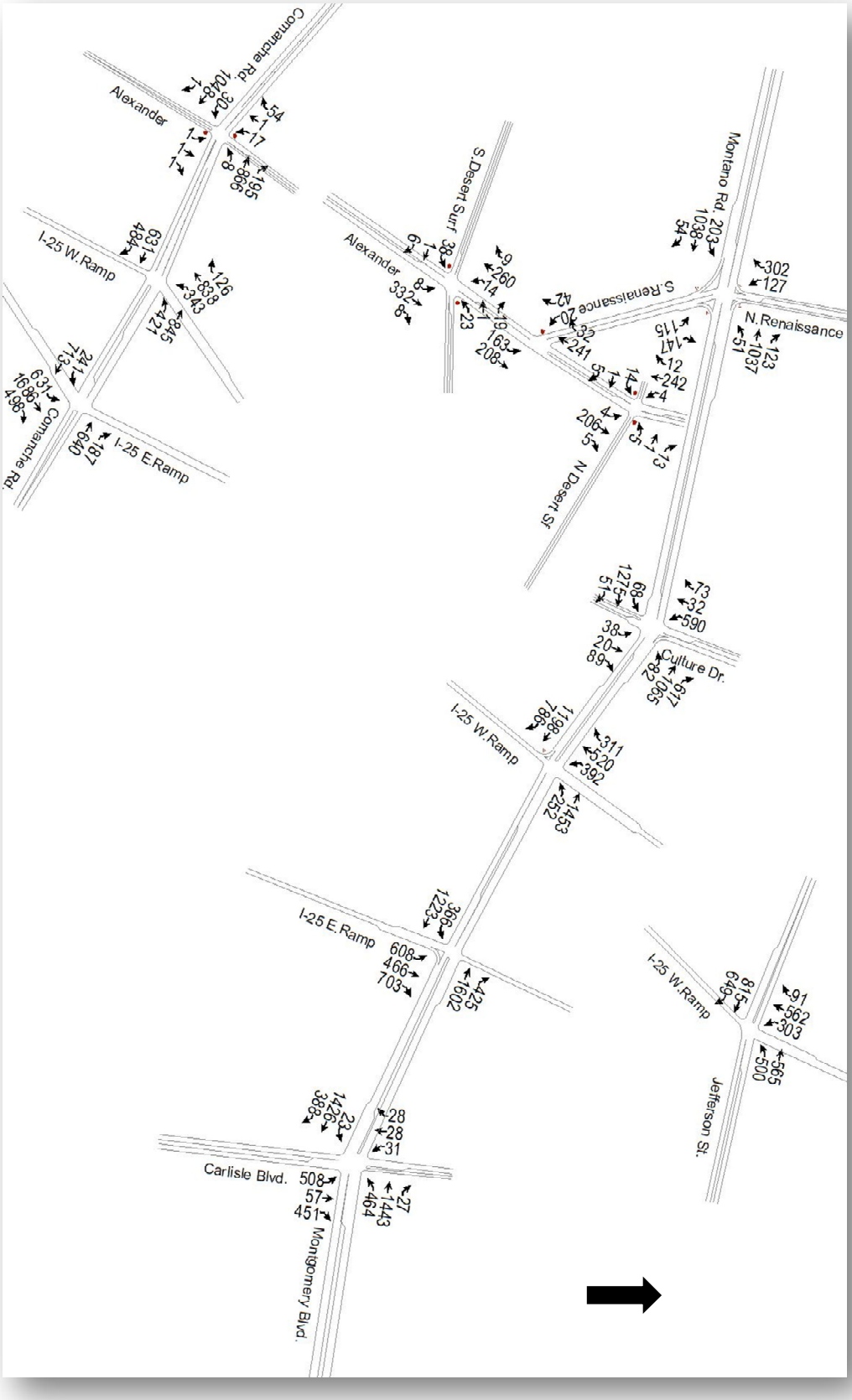
The trip generation, trip distribution and trip assignments were utilized along with the existing 2017 background traffic volumes and the historical traffic growth rates to determine the Implementation year NO BUILD and BUILD volumes, see Appendix Pages A-30 thru A-66. Implementation year AM Peak Hour and PM Peak Hour NO BUILD and BUILD volumes are displayed on the following graphics:



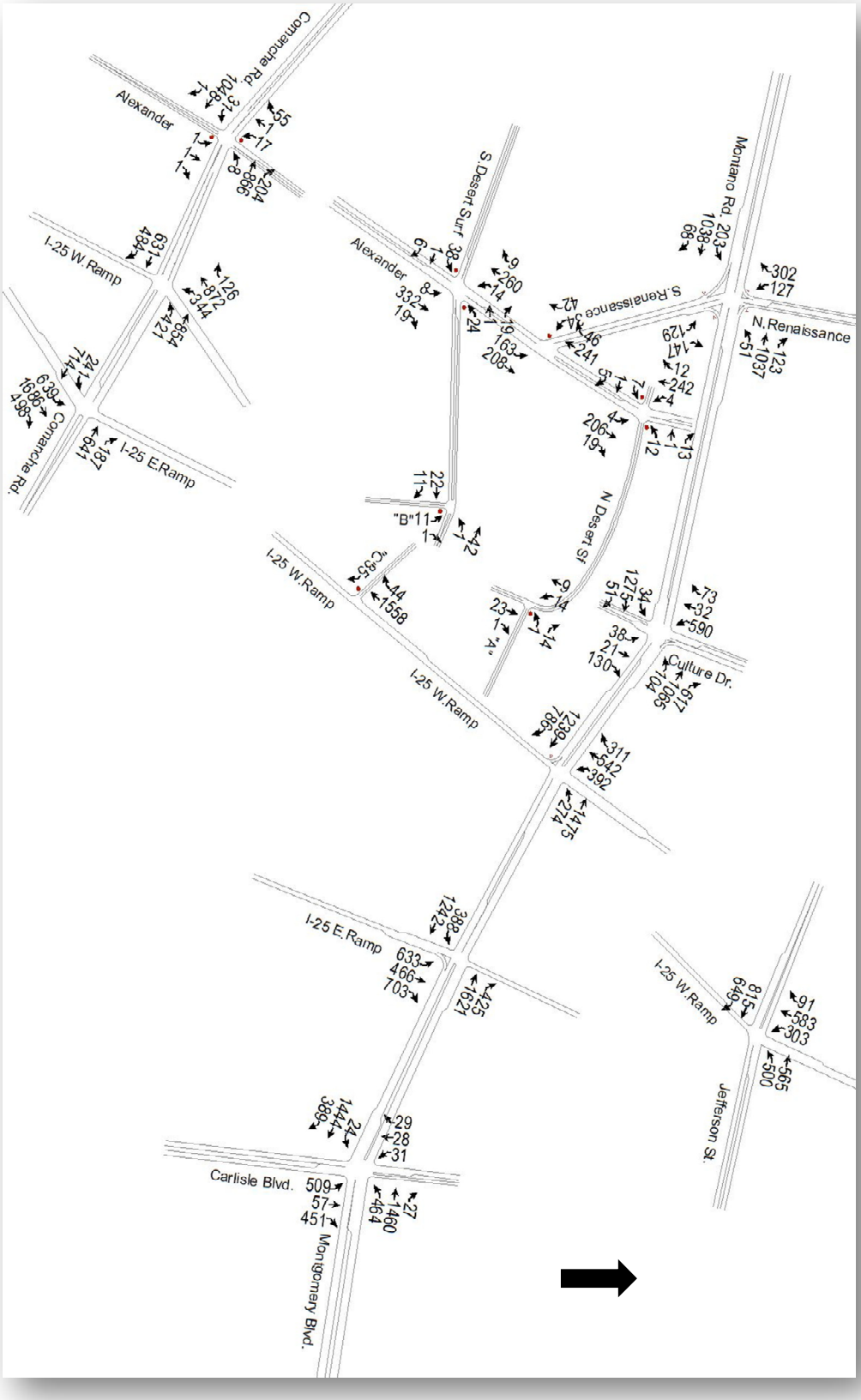
2019 AM Peak Hour NO BUILD Traffic Volumes



2019 AM Peak Hour BUILD Traffic Volumes



2019 PM Peak Hour NO BUILD Traffic Volumes



2019 PM Peak Hour BUILD Traffic Volumes

Traffic Analysis

A capacity analysis using existing traffic signal timing (see Appendix Pages A-141 thru A-183) was conducted for the Implementation Year (2019) NO BUILD and BUILD Conditions and the results are summarized as follows:

#1 – Montgomery Blvd. / Carlisle Blvd. - Pages A-67 thru A-*120*

The results of the 2019 analysis of the signalized intersection of Montgomery Blvd. / Carlisle Blvd. are summarized in the following table:

Intersection: 1 - Montgomery Blvd. / Carlisle Blvd.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 12.4	1	B - 12.4
EBT	3	B - 11.5	3	B - 11.5
EBR	1	B - 12.2	1	B - 12.2
WBL	2	D - 51.3	2	D - 51.3
WBT	3	B - 11.3	3	B - 11.3
WBR	>	B - 11.9	>	B - 12.0
NBL	2	D - 51.7	2	D - 51.7
NBT	1	A - 0.1	1	A - 0.1
NBR	1	E - 56.9	1	E - 56.9
SBL	1	D - 52.6	1	D - 52.6
SBT	2	D - 49.7	2	D - 49.7
SBR	>	D - 50.2	>	D - 50.2
Intersection:		***C - 23.4***		***C - 23.4***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 15.5	1	B - 15.5
EBT	3	A - 3.2	3	A - 3.2
EBR	1	A - 4.4	1	A - 4.4
WBL	2	E - 58.3	2	E - 58.3
WBT	3	B - 13.8	3	B - 13.9
WBR	>	B - 14.5	>	B - 14.7
NBL	2	D - 51.8	2	D - 52.2
NBT	1	A - 0.1	1	A - 0.1
NBR	1	**F** - 101	1	**F** - 101
SBL	1	E - 60.4	1	E - 60.4
SBT	2	D - 47.9	2	D - 47.9
SBR	>	D - 48.1	>	D - 48.2
Intersection:		***C - 27.7***		***C - 27.7***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Montgomery Blvd. / Carlisle Blvd. demonstrates that the level-of-service will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The northbound right turn movement will experience marginally excessive delays during the AM Peak Hour NO BUILD and BUILD conditions and excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. The westbound left turn movement will experience marginally excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. The implementation of the proposed development does not impact the delays for these movements. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour or PM Peak Hour. Therefore, no recommendations are made for the intersection of Montgomery Blvd. / Carlisle Blvd.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Montgomery Blvd. / Carlisle Blvd.**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*14*	*170*	*3*	*1,142*	*Cont*	*1*	*318*	*210*
AM NO BUILD Queue	1	14	50	3	1,159	500	1	323	375
AM BUILD Queue	**1**	**14**	**50**	**3**	**1,160**	**500**	**1**	**323**	**375**
Existing Lane Length	*1*	*23*	*170*	*3*	*1,405*	*Cont*	*1*	*382*	*210*
PM NO BUILD Queue	1	23	50	3	1,426	650	1	388	475
PM BUILD Queue	**1**	**24**	**50**	**3**	**1,444**	**650**	**1**	**389**	**475**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*347*	*220*	*3*	*1,353*	*Cont*	*0*	*12*	*0*
AM NO BUILD Queue	2	352	250	3	1,373	575	0	12	50
AM BUILD Queue	**2**	**352**	**250**	**3**	**1,378**	**575**	**0**	**12**	**50**
Existing Lane Length	*2*	*457*	*220*	*3*	*1,422*	*Cont*	*0*	*27*	*0*
PM NO BUILD Queue	2	464	350	3	1,443	650	0	27	75
PM BUILD Queue	**2**	**464**	**350**	**3**	**1,460**	**650**	**0**	**27**	**75**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*434*	*100*	*1*	*14*	*Cont*	*1*	*270*	*825*
AM NO BUILD Queue	2	441	300	1	14	50	1	274	325
AM BUILD Queue	**2**	**441**	**300**	**1**	**14**	**50**	**1**	**274**	**325**
Existing Lane Length	*2*	*500*	*100*	*1*	*56*	*Cont*	*1*	*444*	*825*
PM NO BUILD Queue	2	508	375	1	57	100	1	451	550
PM BUILD Queue	**2**	**509**	**375**	**1**	**57**	**100**	**1**	**451**	**550**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*20*	*160*	*2*	*29*	*Cont*	*0*	*24*	*0*
AM NO BUILD Queue	1	20	50	2	29	50	0	24	50
AM BUILD Queue	**1**	**20**	**50**	**2**	**29**	**50**	**0**	**24**	**50**
Existing Lane Length	*1*	*31*	*160*	*2*	*28*	*Cont*	*0*	*28*	*0*
PM NO BUILD Queue	1	31	75	2	28	50	0	28	75
PM BUILD Queue	**1**	**31**	**75**	**2**	**28**	**50**	**0**	**29**	**75**

	AM	PM
Cycle Length:	**110**	**120**

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 demonstrates that the eastbound right turn lane should be lengthened from 210 feet to 240 feet plus transition, the westbound left turn lane should be lengthened from 220 feet to 350 feet plus transition and the northbound left turn lane should be lengthened from 100 feet to 375 feet plus transition for both the NO BUILD and BUILD Conditions. Since these recommendations are not due to the proposed development, no recommendations are made for the auxiliary lanes at the intersection of Montgomery Blvd. / Carlisle Blvd.

#2 – Jefferson St. / I-25 West Ramp - Pages A-67 thru A-120

The results of the 2019 analysis of the full access signalized intersection of Jefferson St. / I-25 West Ramp are summarized in the following table:

Intersection: 2 - Jefferson St. / I-25 W. Ramp

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	B - 14.9	2	B - 14.9
EBR	1	B - 18.7	1	B - 18.7
WBL	1	A - 10.0	1	A - 10.0
WBT	2	A - 8.0	2	A - 8.1
SBL	1	B - 19.7	1	B - 19.7
SBT	2	B - 18.2	2	B - 18.2
SBR	1	B - 17.7	1	B - 17.7
Intersection:		***B - 13.1***		***B - 13.1***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	C - 28.2	2	C - 28.2
EBR	1	**F** - 130	1	**F** - 130
WBL	1	D - 50.1	1	D - 50.4
WBT	2	A - 6.5	2	A - 6.5
SBL	1	D - 54.9	1	D - 54.7
SBT	2	D - 44.1	2	D - 45.7
SBR	1	C - 34.7	1	C - 34.7
Intersection:		***D - 51.8***		***D - 52.1***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Jefferson St. / I-25 West Ramp demonstrates that the delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The eastbound right turn movement will experience excessive delays during the PM Peak Hour NO BUILD an BUILD conditions. The implementation of the proposed development does not impact the delays for this movement. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour or PM Peak Hour. Therefore, no recommendations are made for the intersection of Jefferson St. / I-25 West Ramp.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Jefferson St. / I-25 W. Ramp**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*2*	*344*	*Cont*	*1*	*306*	*350*
AM NO BUILD Queue	0	0	0	2	349	225	1	311	325
AM BUILD Queue	**0**	**0**	**0**	**2**	**349**	**225**	**1**	**311**	**325**
Existing Lane Length	*0*	*0*	*0*	*2*	*803*	*Cont*	*1*	*639*	*350*
PM NO BUILD Queue	0	0	0	2	815	475	1	649	650
PM BUILD Queue	**0**	**0**	**0**	**2**	**815**	**475**	**1**	**649**	**650**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*341*	*200*	*2*	*1,154*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	1	346	350	2	1,171	575	0	0	0
AM BUILD Queue	**1**	**346**	**350**	**2**	**1,171**	**575**	**0**	**0**	**0**
Existing Lane Length	*1*	*493*	*200*	*2*	*557*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	1	500	525	2	565	350	0	0	0
PM BUILD Queue	**1**	**500**	**525**	**2**	**565**	**350**	**0**	**0**	**0**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	0	0	0	0	0	0	0	0	0
AM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	0	0	0	0	0	0	0	0	0
PM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*252*	*575*	*2*	*432*	*Cont*	*1*	*148*	*300*
AM NO BUILD Queue	1	256	275	2	438	250	1	150	175
AM BUILD Queue	**1**	**256**	**275**	**2**	**444**	**250**	**1**	**150**	**175**
Existing Lane Length	*1*	*299*	*575*	*2*	*554*	*Cont*	*1*	*90*	*300*
PM NO BUILD Queue	1	303	350	2	562	**350**	1	91	150
PM BUILD Queue	**1**	**303**	**350**	**2**	**583**	**375**	**1**	**91**	**150**

	AM	PM
Cycle Length:	90	105

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 demonstrates that the westbound left turn lane should be lengthened from 200 feet to 525 feet plus transition for the NO BUILD and BUILD conditions. Since this recommendation is not due to the proposed development, no recommendations are made for the auxiliary lanes at the intersection of Jefferson St. / I-25 W. Ramp.

#3 –Montgomery Blvd. / I-25 East Ramp – Pages A-67 thru A-120

The results of the 2019 analysis of the signalized intersection of Montgomery Blvd. / I-25 East Ramp are summarized in the following table:

Intersection: 3 - Montgomery Blvd. / I-25 E. Ramp

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
EBL	1	B - 12.9	1	B - 13.3
EBT	2	A - 0.4	2	A - 0.4
WBT	3	D - 43.7	3	D - 43.7
WBR	1	D - 39.7	1	D - 39.7
NBL	1	D - 46.1	1	D - 46.2
NBT	2	D - 42.3	2	D - 42.0
NBR	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***C - 30.4***		***C - 30.5***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
EBL	1	C - 35.0	1	D - 40.7
EBT	2	A - 0.9	2	A - 0.9
WBT	3	**F** - 88.6	3	**F** - 93.2
WBR	1	E - 65.0	1	E - 64.9
NBL	1	D - 43.0	1	D - 44.3
NBT	2	**F** - 112	2	**F** - 112
NBR	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***E - 55.8***		***E - 57.7***

NOTE: ">" designates a shared lane with adjacent thru lane.

The northbound right turn movement at this intersection is a free right turn ramp with an add lane. Therefore, there should be no delays for the movement. The 2019 analysis of the intersection of Montgomery Blvd. / I-25 East Ramp demonstrates that the delays will be acceptable for the AM Peak Hour NO BUILD and BUILD conditions and will be marginally excessive for the PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The westbound and northbound thru movements will experience excessive delays and the westbound right turn movement will experience marginally excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. New Mexico Department of Transportation has stated that these issues will be mitigated with the implementation of the North Corridor Study and the proposed I-25 / Montgomery Interchange Project. The implementation of the proposed development increases the delay at the intersection during the AM Peak Hour by only 0.1 seconds and during the PM Peak Hour by only 1.9 seconds. Therefore, no recommendations are made for the intersection of Montgomery Blvd. / I-25 East Ramp.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Montgomery Blvd. / I-25 E. Ramp**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*256*	*250*	*2*	*995*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	1	260	325	2	1,010	600	0	0	0
AM BUILD Queue	**1**	**261**	**325**	**2**	**1,011**	**600**	**0**	**0**	**0**
Existing Lane Length	*1*	*361*	*250*	*2*	*1,205*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	1	366	**450**	2	1,223	**750**	0	0	0
PM BUILD Queue	**1**	**388**	**475**	**2**	**1,242**	**775**	**0**	**0**	**0**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*3*	*1,527*	*Cont*	*1*	*370*	*175*
AM NO BUILD Queue	0	0	0	3	1,550	625	1	376	425
AM BUILD Queue	**0**	**0**	**0**	**3**	**1,555**	**625**	**1**	**376**	**425**
Existing Lane Length	*0*	*0*	*0*	*3*	*1,578*	*Cont*	*1*	*419*	*175*
PM NO BUILD Queue	0	0	0	3	1,602	700	1	425	525
PM BUILD Queue	**0**	**0**	**0**	**3**	**1,621**	**700**	**1**	**425**	**525**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*519*	*1,075*	*2*	*214*	*Cont*	*1*	*598*	*315*
AM NO BUILD Queue	1	527	575	2	217	175	1	607	650
AM BUILD Queue	**1**	**534**	**575**	**2**	**217**	**175**	**1**	**607**	**650**
Existing Lane Length	*1*	*599*	*1,075*	*2*	*459*	*Cont*	*1*	*693*	*315*
PM NO BUILD Queue	1	608	**700**	2	466	350	1	703	800
PM BUILD Queue	**1**	**633**	**725**	**2**	**466**	**350**	**1**	**703**	**800**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	0	0	0	0	0	0	0	0	0
AM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	0	0	0	0	0	0	0	0	0
PM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	AM	PM
Cycle Length:	110	120

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 demonstrates that the eastbound left turn lane should be lengthened from 250 feet to 450 feet plus transition for the NO BUILD conditions and to 475 feet plus transition

for the BUILD conditions. The eastbound left turn cannot be lengthened without adversely affecting the westbound left turn bay at the intersection of Montano Rd. / I-25 W. Ramp. The queuing analysis also recommends lengthening the westbound right turn lane from 175 feet to 260 feet plus transition and the northbound right turn lane from 315 feet to 400 feet plus transition for both the NO BUILD and BUILD conditions. Since both of these recommendations are not due to the proposed development, no recommendations are made for the auxiliary lanes at the intersection of Montgomery Blvd. / I-25 E. Ramp.

#4 – Montano Rd. / I-25 West Ramp – Pages A-67 thru A-120

The results of the 2019 analysis of the full access signalized intersection of Montano Rd. / I-25 West Ramp are summarized in the following table:

Intersection: **4 - Montano Rd. / I-25 W. Ramp**

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	A - 0.9	2	A - 0.9
EBR	1	A - 0.1	1	A - 0.1
WBL	1	A - 6.8	1	A - 6.8
WBT	3	A - 6.0	3	A - 6.0
SBL	1	D - 50.9	1	D - 50.9
SBT	2	D - 45.2	2	D - 45.5
SBR	1	D - 54.8	1	D - 54.7
Intersection:		***B - 16.1***		***B - 16.1***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	A - 1.2	2	A - 1.4
EBR	1	A - 0.1	1	A - 0.1
WBL	1	A - 7.7	1	A - 7.9
WBT	3	A - 7.9	3	A - 7.9
SBL	1	E - 62.8	1	E - 65.9
SBT	2	E - 55.2	2	E - 56.8
SBR	1	**F** - 90.9	1	**F** - 90.9
Intersection:		***C - 23.5***		***C - 23.8***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Montano Rd. / I-25 West Ramp demonstrates that the intersection delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The southbound left turn and thru movements will experience marginally excessive delays and the southbound right turn movement will experience excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour and increases the delay during the PM Peak Hour by only 0.3 seconds. Therefore, no recommendations are made for the intersection of Montano Rd. / I-25 West Ramp.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Montano Rd. / I-25 W. Ramp**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*2*	*1,031*	*Cont*	*1*	*543*	*725*
AM NO BUILD Queue	0	0	0	2	1,046	625	1	551	600
AM BUILD Queue	**0**	**0**	**0**	**2**	**1,048**	**625**	**1**	**551**	**600**
Existing Lane Length	*0*	*0*	*0*	*2*	*1,180*	*Cont*	*1*	*774*	*725*
PM NO BUILD Queue	0	0	0	2	1,198	**750**	1	786	875
PM BUILD Queue	**0**	**0**	**0**	**2**	**1,239**	**775**	**1**	**786**	**875**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*263*	*275*	*3*	*1,228*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	1	267	325	3	1,246	525	0	0	0
AM BUILD Queue	**1**	**273**	**325**	**3**	**1,252**	**525**	**0**	**0**	**0**
Existing Lane Length	*1*	*248*	*275*	*3*	*1,432*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	1	252	**325**	3	1,453	650	0	0	0
PM BUILD Queue	**1**	**274**	**350**	**3**	**1,475**	**650**	**0**	**0**	**0**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	0	0	0	0	0	0	0	0	0
AM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	0	0	0	0	0	0	0	0	0
PM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*235*	*1,000*	*2*	*471*	*Cont*	*1*	*219*	*450*
AM NO BUILD Queue	2	239	200	2	478	325	1	222	275
AM BUILD Queue	**2**	**239**	**200**	**2**	**484**	**325**	**1**	**222**	**275**
Existing Lane Length	*2*	*386*	*1,000*	*2*	*512*	*Cont*	*1*	*306*	*450*
PM NO BUILD Queue	2	392	300	2	520	375	1	311	400
PM BUILD Queue	**2**	**392**	**300**	**2**	**542**	**375**	**1**	**311**	**400**

	AM	PM
Cycle Length:	110	120

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 demonstrates that the westbound left turn lane should be lengthened from 250 feet to 325 feet for the NO BUILD conditions and to 350 feet plus transition for the BUILD conditions. The westbound left turn lane cannot be lengthened without adversely affecting the eastbound left turn lane at the intersection of Montgomery Blvd. / I-25 E. Ramp. Therefore, no recommendations are made for the auxiliary lanes at the intersection of Montano Rd. / I-25 W. Ramp.

The eastbound right turn to southbound movement is a non-signalized movement controlled by a yield sign at the end of the right turn ramp onto the I-25 Frontage Rd. southbound. It is anticipated that the eastbound to southbound right turn movement may be modified as part of the STIP project so that the subject right turn movement may be signalized. The existing eastbound to southbound right turn volume for the movement is 473 vph during the AM Peak Hour and 774 vph during the PM Peak Hour. If the eastbound right turn YIELD ramp movement is eliminated in favor of a signal-controlled right turn, then the volumes would suggest that dual eastbound right turn lanes may be needed to handle the projected volumes. Other geometric improvements may be incorporated into the STIP project to increase capacity including reconstruction / widening of the Montgomery Blvd. / Montano Rd. bridge.

Some of the eastbound and westbound thru movements on Montgomery Blvd. (Montano Rd.) at the I-25 Interchange as well as some of the ramp movements are projected to experience significant average delays due to the fact that Montgomery Blvd. / Montano Rd. is a river crossing roadway with high volumes of traffic carrying Albuquerque residents to and from the East Side and the West Side of the city. It is anticipated that the STIP project will address this regional issue.

#5 – Montano Rd. / Culture Dr. - Pages A-67 thru A-120

The results of the 2019 analyses of the signalized intersection of Montano Rd. / Culture Dr. are summarized in the following tables:

Intersection: 5 - Montano Rd. / Culture Dr.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	A - 8.8	1	A - 9.0
EBT	3	C - 29.4	3	C - 29.6
EBR	1	C - 22.1	1	C - 22.2
WBL	1	B - 14.7	1	B - 15.4
WBT	3	A - 0.3	3	A - 0.3
WBR	1	A - 0.1	1	A - 0.1
NBL	1	D - 40.8	1	D - 40.7
NBT	1	D - 45.2	1	D - 45.1
NBR	1	E - 56.5	1	E - 56.5
SBL	2	D - 39.7	2	D - 39.6
SBT	1	D - 42.7	1	D - 42.6
SBR	>	D - 42.7	>	D - 42.6
Intersection:		***C - 20.2***		***C - 20.3***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	A - 8.1	1	A - 9.1
EBT	3	C - 30.1	3	C - 32.0
EBR	1	C - 20.2	1	C - 21.8
WBL	1	B - 11.6	1	B - 13.5
WBT	3	A - 0.3	3	A - 0.3
WBR	1	A - 0.1	1	A - 0.1
NBL	1	E - 75.2	1	E - 75.2
NBT	1	D - 52.3	1	D - 49.1
NBR	1	E - 64.1	1	E - 62.8
SBL	2	E - 67.3	2	D - 54.9
SBT	1	D - 47.1	1	D - 43.8
SBR	>	D - 47.1	>	D - 43.8
Intersection:		***C - 28.2***		***C - 27.2***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Montano Rd. / Culture Dr. demonstrates that the level-of-service will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The implementation of the proposed development increases the delay at the intersection by 0.1 seconds during the AM Peak Hour and does not increase the delay during the PM Peak Hour. Therefore, no recommendations are made for the intersection of Montano Rd. / Culture Dr.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Montano Rd. / Culture Dr.**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*76*	*50*	*3*	*1,144*	*Cont*	*1*	*105*	*50*
AM NO BUILD Queue	1	77	125	3	1,161	500	1	107	150
AM BUILD Queue	**1**	**77**	**125**	**3**	**1,161**	**500**	**1**	**107**	**150**
Existing Lane Length	*1*	*67*	*50*	*3*	*1,256*	*Cont*	*1*	*50*	*50*
PM NO BUILD Queue	1	68	125	3	1,275	575	1	51	100
PM BUILD Queue	**1**	**68**	**125**	**3**	**1,275**	**575**	**1**	**51**	**100**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*180*	*170*	*3*	*986*	*Cont*	*1*	*324*	*200*
AM NO BUILD Queue	1	183	250	3	1,001	450	1	329	400
AM BUILD Queue	**1**	**189**	**250**	**3**	**1,001**	**450**	**1**	**329**	**400**
Existing Lane Length	*1*	*81*	*170*	*3*	*1,049*	*Cont*	*1*	*608*	*200*
PM NO BUILD Queue	1	82	**150**	3	1,065	500	1	617	700
PM BUILD Queue	**1**	**104**	**175**	**3**	**1,065**	**500**	**1**	**617**	**700**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*64*	*50*	*1*	*46*	*Cont*	*1*	*129*	*50*
AM NO BUILD Queue	1	65	125	1	47	100	1	131	200
AM BUILD Queue	**1**	**65**	**125**	**1**	**47**	**100**	**1**	**133**	**200**
Existing Lane Length	*1*	*37*	*50*	*1*	*20*	*Cont*	*1*	*88*	*50*
PM NO BUILD Queue	1	38	75	1	20	50	1	89	**150**
PM BUILD Queue	**1**	**38**	**75**	**1**	**21**	**50**	**1**	**130**	**200**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*151*	*1,000*	*1*	*12*	*Cont*	*0*	*10*	*0*
AM NO BUILD Queue	2	153	125	1	12	50	0	10	25
AM BUILD Queue	**2**	**153**	**125**	**1**	**12**	**50**	**0**	**10**	**25**
Existing Lane Length	*2*	*581*	*1,000*	*1*	*32*	*Cont*	*0*	*72*	*0*
PM NO BUILD Queue	2	590	400	1	32	75	0	73	125
PM BUILD Queue	**2**	**590**	**400**	**1**	**32**	**75**	**0**	**73**	**125**

	AM	PM
Cycle Length:	110	120

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 demonstrates that the eastbound left turn lane should be lengthened from 50 feet to 125 feet plus transition, the eastbound right turn lane from 50 feet to 80 feet plus

transition, the westbound left turn lane should be lengthened from 170 feet to 250 feet plus transition, the westbound right turn lane from 200 feet to 350 feet plus transition, the northbound left turn lane should be lengthened from 50 feet to 125 feet plus transition and the northbound right turn lane from 50 feet to 100 feet plus transition for both the NO BUILD and BUILD conditions. Since these recommendations are not due to the proposed development, no recommendations are made for the auxiliary lanes at Montano Rd. / Culture Dr.

#6 – Montano Rd. / Renaissance Blvd. - Pages A-67 thru A-120

The results of the 2019 analyses of the full access signalized intersection of Montano Rd. / Renaissance Blvd. are summarized in the following tables:

Intersection: 6 - Montano Rd. / N. Renaissance Blvd.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 10.6	1	B - 10.6
EBT	3	A - 4.1	3	A - 4.1
EBR	1	N/A - 0.0	1	N/A - 0.0
WBL	1	A - 3.2	1	A - 3.2
WBT	3	B - 17.2	3	B - 17.2
WBR	1	N/A - 0.0	1	N/A - 0.0
NBL	2	D - 51.2	2	D - 51.2
NBR	1	N/A - 0.0	1	N/A - 0.0
SBL	2	D - 52.5	2	D - 52.5
SBR	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***B - 10.8***		***B - 10.8***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	A - 5.7	1	A - 5.8
EBT	3	A - 3.9	3	A - 4.0
EBR	1	N/A - 0.0	1	N/A - 0.0
WBL	1	A - 2.4	1	A - 2.5
WBT	3	B - 17.7	3	B - 17.8
WBR	1	N/A - 0.0	1	N/A - 0.0
NBL	2	E - 58.5	2	E - 59.7
NBR	1	N/A - 0.0	1	N/A - 0.0
SBL	2	E - 59.7	2	E - 59.5
SBR	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***B - 14.8***		***B - 15.1***

NOTE: ">" designates a shared lane with adjacent thru lane.

The eastbound, westbound, northbound, and southbound right turn movements are free right turn ramps with yield conditions. Therefore, there is no signalized analysis for those movements. The 2019 analysis of the intersection of Montano Rd. / Renaissance Blvd. demonstrates that the delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour and increases the delay during the PM Peak Hour by only 0.3 seconds. Therefore, no recommendations are made for the intersection of Montano Rd. / Renaissance Blvd.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Montano Rd. / N.Resaissance Bd.**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*308*	*200*	*3*	*1,076*	*Cont*	*1*	*149*	*350*
AM NO BUILD Queue	1	313	375	3	1,092	475	1	151	200
AM BUILD Queue	**1**	**313**	**375**	**3**	**1,092**	**475**	**1**	**155**	**225**
Existing Lane Length	*1*	*200*	*200*	*3*	*1,023*	*Cont*	*1*	*53*	*350*
PM NO BUILD Queue	1	203	275	3	1,038	500	1	54	**100**
PM BUILD Queue	**1**	**203**	**275**	**3**	**1,038**	**500**	**1**	**68**	**125**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*84*	*175*	*3*	*773*	*Cont*	*1*	*67*	*440*
AM NO BUILD Queue	1	85	125	3	785	350	1	68	125
AM BUILD Queue	**1**	**85**	**125**	**3**	**785**	**350**	**1**	**68**	**125**
Existing Lane Length	*1*	*50*	*175*	*3*	*1,022*	*Cont*	*1*	*121*	*440*
PM NO BUILD Queue	1	51	100	3	1,037	475	1	123	200
PM BUILD Queue	**1**	**51**	**100**	**3**	**1,037**	**475**	**1**	**123**	**200**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*24*	*150*	*0*	*0*	*Cont*	*1*	*31*	*475*
AM NO BUILD Queue	2	24	50	0	0	0	1	31	75
AM BUILD Queue	**2**	**25**	**50**	**0**	**0**	**0**	**1**	**31**	**75**
Existing Lane Length	*2*	*113*	*150*	*0*	*0*	*Cont*	*1*	*145*	*475*
PM NO BUILD Queue	2	115	125	0	0	0	1	147	225
PM BUILD Queue	**2**	**129**	**125**	**0**	**0**	**0**	**1**	**147**	**225**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*46*	*150*	*0*	*0*	*Cont*	*1*	*85*	*475*
AM NO BUILD Queue	2	47	50	0	0	0	1	86	150
AM BUILD Queue	**2**	**47**	**50**	**0**	**0**	**0**	**1**	**86**	**150**
Existing Lane Length	*2*	*125*	*150*	*0*	*0*	*Cont*	*1*	*298*	*475*
PM NO BUILD Queue	2	127	125	0	0	0	1	302	400
PM BUILD Queue	**2**	**127**	**125**	**0**	**0**	**0**	**1**	**302**	**400**

	AM	PM
Cycle Length:	110	120

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 demonstrates that the eastbound left turn lane should be lengthened from 200 feet to 375 feet plus transition for the NO BUILD and BUILD conditions. Since this recommendation is not due to the proposed development, no recommendations are made for the auxiliary lanes at the intersection of Montano Rd. / N. Renaissance Rd.

#7 –Comanche Rd. / I-25 East Ramp – Pages A-67 thru A-120

The results of the 2019 analysis of the signalized intersection of Comanche Rd. / I-25 East Ramp are summarized in the following table:

Intersection: 7 - Comanche Rd. / I-25 E. Ramp

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	2	D - 38.4	2	D - 38.4
EBT	2	A - 0.3	2	A - 0.3
WBT	2	C - 27.9	2	C - 27.9
WBR	>	C - 28.0	>	C - 28.0
NBL	1	C - 22.7	1	C - 22.7
NBT	3	C - 23.3	3	C - 23.3
NBR	1	C - 29.0	1	C - 29.0
Intersection:		***C - 22.0***		***C - 22.0***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	2	D - 36.8	2	D - 36.8
EBT	2	A - 2.5	2	A - 2.5
WBT	2	D - 44.6	2	D - 44.9
WBR	>	D - 45.0	>	D - 45.3
NBL	1	C - 29.3	1	C - 29.4
NBT	3	C - 23.8	3	C - 23.9
NBR	1	C - 28.0	1	C - 27.9
Intersection:		***C - 26.1***		***C - 26.2***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Comanche Rd. / I-25 East Ramp demonstrates that the delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour and increases the delay during the PM Peak Hour by only 0.1 seconds. Therefore, no recommendations are made for the intersection of Comanche Rd. / I-25 East Ramp.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Comanche Rd. / I-25 E. Ramp**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*237*	*50*	*2*	*581*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	2	241	175	2	590	325	0	0	0
AM BUILD Queue	**2**	**241**	**175**	**2**	**590**	**325**	**0**	**0**	**0**
Existing Lane Length	*2*	*237*	*50*	*2*	*702*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	2	241	175	2	713	375	0	0	0
PM BUILD Queue	**2**	**241**	**175**	**2**	**714**	**375**	**0**	**0**	**0**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*2*	*575*	*Cont*	*0*	*120*	*0*
AM NO BUILD Queue	0	0	0	2	584	325	0	122	150
AM BUILD Queue	**0**	**0**	**0**	**2**	**584**	**325**	**0**	**122**	**150**
Existing Lane Length	*0*	*0*	*0*	*2*	*631*	*Cont*	*0*	*184*	*0*
PM NO BUILD Queue	0	0	0	2	640	350	0	187	200
PM BUILD Queue	**0**	**0**	**0**	**2**	**641**	**350**	**0**	**187**	**200**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*744*	*340*	*3*	*833*	*Cont*	*1*	*432*	*150*
AM NO BUILD Queue	2	755	400	3	845	325	1	438	425
AM BUILD Queue	**2**	**757**	**400**	**3**	**845**	**325**	**1**	**438**	**425**
Existing Lane Length	*2*	*622*	*340*	*3*	*1,661*	*Cont*	*1*	*491*	*150*
PM NO BUILD Queue	2	631	350	3	1,686	575	1	498	475
PM BUILD Queue	**2**	**639**	**350**	**3**	**1,686**	**575**	**1**	**498**	**475**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	0	0	0	0	0	0	0	0	0
AM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	0	0	0	0	0	0	0	0	0
PM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

	AM	PM
Cycle Length:	90	90

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 demonstrates that the eastbound left turn lane should be lengthened from 50 feet to 175 feet plus transition, the northbound left turn lane from 340 feet to 400 feet plus

transition and the northbound right turn lane from 150 feet to 240 feet plus transition for both the NO BUILD and BUILD conditions. Since these recommendations are not due to the proposed development, no recommendations are made for the auxiliary lanes at the intersection of Montano Rd. / N. Renaissance Rd.

#8 – Comanche Rd. / I-25 West Ramp – Pages A-67 thru A-120

The results of the 2019 analysis of the full access signalized intersection of Comanche Rd. / I-25 West Ramp are summarized in the following table:

Intersection: 8 - Comanche Rd. / I-25 W. Ramp

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	C - 28.0	2	C - 28.1
EBR	>	C - 28.6	>	C - 28.6
WBL	2	D - 36.3	2	D - 36.3
WBT	2	A - 0.5	2	A - 0.5
SBL	1	C - 31.3	1	C - 31.2
SBT	2	C - 31.7	2	C - 31.7
SBR	1	C - 26.6	1	C - 26.6
Intersection:		***C - 22.2***		***C - 22.2***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBT	2	D - 40.6	2	D - 43.4
EBR	>	D - 42.8	>	D - 45.9
WBL	2	**F** - 87.6	2	**F** - 87.5
WBT	2	A - 0.2	2	A - 0.2
SBL	1	C - 30.3	1	C - 29.5
SBT	2	C - 32.2	2	C - 32.4
SBR	1	C - 24.1	1	C - 23.6
Intersection:		***C - 33.6***		***C - 34.3***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Comanche Rd. / I-25 West Ramp demonstrates that the delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. The westbound left turn movement will experience excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. The implementation of the proposed development does not increase the delay at the intersection during the AM Peak Hour and increases the delay during the PM Peak Hour by only 0.7 seconds. Therefore, no recommendations are made for the intersection of Comanche Rd. / I-25 West Ramp.

The westbound left turn movement for the projected 2019 PM Peak Hour NO BUILD and BUILD Conditions is expected to experience excessive delays. In consideration that the overall intersection LOS is “C” with an average delay of less than 35 seconds, it should be the case that the LOS “F” for the westbound left turn lane can be mitigated by increasing the green time for the subject left turn movement phase by about 2 seconds to mitigate the long delays and also reduce queuing associated with the movement.

The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Top Golf Development (Montano Rd. / Interstate 25)

Intersection: **Comanche Rd. / I-25 W. Ramp**

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*2*	*546*	*Cont*	*0*	*379*	*0*
AM NO BUILD Queue	0	0	0	2	554	300	0	385	375
AM BUILD Queue	**0**	**0**	**0**	**2**	**554**	**300**	**0**	**385**	**375**
Existing Lane Length	*0*	*0*	*0*	*2*	*622*	*Cont*	*0*	*477*	*0*
PM NO BUILD Queue	0	0	0	2	631	350	0	484	450
PM BUILD Queue	**0**	**0**	**0**	**2**	**631**	**350**	**0**	**484**	**450**
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*2*	*380*	*250*	*2*	*978*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	2	386	225	2	993	500	0	0	0
AM BUILD Queue	**2**	**386**	**225**	**2**	**995**	**500**	**0**	**0**	**0**
Existing Lane Length	*2*	*415*	*250*	*2*	*833*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	2	421	250	2	845	**425**	0	0	0
PM BUILD Queue	**2**	**421**	**250**	**2**	**854**	**450**	**0**	**0**	**0**
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
AM NO BUILD Queue	0	0	0	0	0	0	0	0	0
AM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Existing Lane Length	*0*	*0*	*0*	*0*	*0*	*Cont*	*0*	*0*	*0*
PM NO BUILD Queue	0	0	0	0	0	0	0	0	0
PM BUILD Queue	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	*1*	*311*	*1,000*	*2*	*718*	*Cont*	*1*	*141*	*500*
AM NO BUILD Queue	1	316	325	2	729	375	1	143	175
AM BUILD Queue	**1**	**316**	**325**	**2**	**730**	**400**	**1**	**143**	**175**
Existing Lane Length	*1*	*338*	*1,000*	*2*	*826*	*Cont*	*1*	*124*	*500*
PM NO BUILD Queue	1	343	350	2	838	**425**	1	126	150
PM BUILD Queue	**1**	**344**	**350**	**2**	**872**	**450**	**1**	**126**	**150**

	AM	PM
Cycle Length:	90	90

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.

No recommendations are made for the auxiliary lanes at the intersection of Comanche Rd. / I-25 W. Ramp.

#9 – Comanche Rd. / Alexander Blvd. - Pages A-67 thru A-120

The results of the 2019 analyses of the full access unsignalized intersection of Comanche Rd. / Alexander Blvd. are summarized in the following tables:

Intersection: 9 - Comanche Rd. / Alexander Blvd.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	A - 9.9	1	A - 9.9
EBT	2	N/A - 0.0	2	N/A - 0.0
EBR	>	N/A - 0.0	>	N/A - 0.0
WBL	1	B - 10.1	1	B - 10.1
WBT	2	N/A - 0.0	2	N/A - 0.0
WBR	>	N/A - 0.0	>	N/A - 0.0
NBL	>	E - 44.2	>	E - 44.2
NBT	1	E - 44.2	1	E - 44.2
NBR	>	E - 44.2	>	E - 44.2
SBL	1	D - 34.3	1	D - 34.3
SBT	1	B - 11.8	1	B - 11.8
SBR	>	B - 11.8	>	B - 11.8
Intersection:		***u - 0.6***		***u - 0.6***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		(EXIST. GEOM.) BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	A - 9.3	1	A - 9.4
EBT	2	N/A - 0.0	2	N/A - 0.0
EBR	>	N/A - 0.0	>	N/A - 0.0
WBL	1	B - 11.1	1	B - 11.1
WBT	2	N/A - 0.0	2	N/A - 0.0
WBR	>	N/A - 0.0	>	N/A - 0.0
NBL	>	**F** - 58.1	>	**F** - 58.1
NBT	1	**F** - 58.1	1	**F** - 58.1
NBR	>	**F** - 58.1	>	**F** - 58.1
SBL	1	E - 45.1	1	E - 46.0
SBT	1	B - 12.2	1	B - 12.1
SBR	>	B - 12.2	>	B - 12.1
Intersection:		***u - 0.9***		***u - 0.9***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Comanche Rd. / Alexander Blvd. demonstrates that the delays will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report, except for the northbound movements which will experience marginally excessive delays during the AM Peak Hour NO BUILD and BUILD conditions and excessive delays during the PM Peak Hour BUILD and NO BUILD conditions. The southbound left turn movement will also experience marginally excessive delays during the PM Peak Hour NO BUILD and BUILD conditions. The delays are not due to the implementation of the proposed development. Therefore, no recommendations are made for the intersection of Comanche Rd. / Alexander Blvd.

#10 – S. Desert Surf Cir. / Alexander Blvd. – Pages A-67 thru A-120

The results of the 2019 analysis of the unsignalized intersection of S. Desert Surf Cir. / Alexander Blvd. are summarized in the following table:

Intersection: **10 - S. Desert Surf Cir. / Alexander Blvd.**

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 13.1	1	B - 13.1
EBT	1	A - 9.8	1	A - 9.9
EBR	>	A - 9.8	>	A - 9.9
WBL	1	B - 12.9	1	B - 12.9
WBT	1	A - 9.7	1	A - 9.7
WBR	>	A - 9.7	>	A - 9.7
NBL	1	A - 7.8	1	A - 7.8
NBT	2	N/A - 0.0	2	N/A - 0.0
NBR	>	N/A - 0.0	>	N/A - 0.0
SBL	1	A - 7.9	1	A - 7.9
SBT	2	N/A - 0.0	2	N/A - 0.0
SBR	>	N/A - 0.0	>	N/A - 0.0
Intersection:		***u - 1.7***		***u - 1.7***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 14.8	1	B - 14.8
EBT	1	B - 10.1	1	B - 10.1
EBR	>	B - 10.1	>	B - 10.1
WBL	1	B - 14.8	1	B - 14.9
WBT	1	A - 9.8	1	A - 9.9
WBR	>	A - 9.8	>	A - 9.9
NBL	1	A - 7.9	1	A - 7.9
NBT	2	N/A - 0.0	2	N/A - 0.0
NBR	>	N/A - 0.0	>	N/A - 0.0
SBL	1	A - 8.1	1	A - 8.2
SBT	2	N/A - 0.0	2	N/A - 0.0
SBR	>	N/A - 0.0	>	N/A - 0.0
Intersection:		***u - 1.9***		***u - 1.9***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of S. Desert Surf Cir. / Alexander Blvd. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of S. Desert Surf Cir. / Alexander Blvd.

#11 – S. Renaissance Blvd. / Alexander Blvd. – Pages A-67 thru A-120

The results of the analysis of the full access unsignalized intersection of S. Renaissance Blvd. / Alexander Blvd. are summarized in the following table:

Intersection: **11 - S. Renaissance / Alexander Blvd.**

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	B - 11.1	1	B - 11.2
EBR	1	A - 9.7	1	A - 9.7
NBL	1	A - 7.6	1	A - 7.6
NBT	2	N/A - 0.0	2	N/A - 0.0
SBT	2	N/A - 0.0	2	N/A - 0.0
SBR	>	N/A - 0.0	>	N/A - 0.0
Intersection:		***u - 4.6***		***u - 4.7***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD		BUILD	
	Lanes	LOS-Delay	Lanes	LOS-Delay
EBL	1	C - 19.2	1	C - 20.4
EBR	1	A - 9.5	1	A - 9.5
NBL	1	A - 8.4	1	A - 8.5
NBT	2	N/A - 0.0	2	N/A - 0.0
SBT	2	N/A - 0.0	2	N/A - 0.0
SBR	>	N/A - 0.0	>	N/A - 0.0
Intersection:		***u - 3.1***		***u - 3.4***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of S. Renaissance Blvd. / Alexander Blvd. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of S. Renaissance Blvd. / Alexander Blvd.

#12 – N. Desert Surf Cir. / Alexander Blvd. - Pages A-67 thru A-120

The results of the 2019 analyses of the unsignalized intersection of N. Desert Surf Cir. / Alexander Blvd. are summarized in the following tables:

Intersection: 12 - N. Desert Surf Cir. / Alexander Blvd.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD			BUILD		
	Lanes	LOS-Delay		Lanes	LOS-Delay	
EBL	>	A	9.6	>	A	9.6
EBT	1	A	9.6	1	A	9.6
EBR	>	A	9.6	>	A	9.6
WBL	>	A	9.6	>	A	9.6
WBT	1	A	9.6	1	A	9.6
WBR	>	A	9.6	>	A	9.6
NBL	1	A	7.5	1	A	7.5
NBT	2	N/A	0.0	2	N/A	0.0
NBR	>	N/A	0.0	>	N/A	0.0
SBL	1	A	7.6	1	A	7.6
SBT	2	N/A	0.0	2	N/A	0.0
SBR	>	N/A	0.0	>	N/A	0.0
Intersection:		***u***	***0.6***		***u***	***0.6***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD			BUILD		
	Lanes	LOS-Delay		Lanes	LOS-Delay	
EBL	>	B	11.8	>	B	11.3
EBT	1	B	11.8	1	B	11.3
EBR	>	B	11.8	>	B	11.3
WBL	>	B	10.1	>	B	10.8
WBT	1	B	10.1	1	B	10.8
WBR	>	B	10.1	>	B	10.8
NBL	1	A	7.9	1	A	7.9
NBT	2	N/A	0.0	2	N/A	0.0
NBR	>	N/A	0.0	>	N/A	0.0
SBL	1	A	7.8	1	A	7.8
SBT	2	N/A	0.0	2	N/A	0.0
SBR	>	N/A	0.0	>	N/A	0.0
Intersection:		***u***	***0.9***		***u***	***0.9***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of N. Desert Surf Cir. / Alexander Blvd. demonstrates that the level-of-service will be acceptable for both the AM Peak Hour and PM Peak Hour NO BUILD and BUILD conditions analyzed in this report. Therefore, no recommendations are made for the intersection of N. Desert Surf Cir. / Alexander Blvd.

#13 – Driveway "A" / Desert Surf Cir. - Pages A-67 thru A-120

The results of the 2019 analyses of the full access unsignalized intersection of Driveway "A" / Desert Surf Cir. are summarized in the following tables:

Intersection: 13 - Driveway "A" / N. Desert Surf Cir.

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
WBL	1	N/A - 0.0	1	A - 8.5
WBR	>	N/A - 0.0	>	A - 8.5
NBT	1	N/A - 0.0	1	N/A - 0.0
NBR	>	N/A - 0.0	>	N/A - 0.0
SBL	>	N/A - 0.0	>	A - 7.2
SBT	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***u - 0.0***		***u - 2.2***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
WBL	1	N/A - 0.0	1	A - 8.5
WBR	>	N/A - 0.0	>	A - 8.5
NBT	1	N/A - 0.0	1	N/A - 0.0
NBR	>	N/A - 0.0	>	N/A - 0.0
SBL	>	N/A - 0.0	>	A - 7.3
SBT	1	N/A - 0.0	1	N/A - 0.0
Intersection:		***u - 0.0***		***u - 3.7***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Driveway "A" / Desert Surf Cir. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Driveway "A" / Desert Surf Cir.

#14 – S. Desert Surf Cir. / Driveway "B" – Pages A-67 thru A-120

The results of the 2019 analysis of the unsignalized intersection of S. Desert Surf Cir. / Driveway "B" are summarized in the following table:

Intersection: 14 - Desert Surf Cir. / Driveway "B"

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
EBT	1	N/A - 0.0	1	N/A - 0.0
EBR	>	N/A - 0.0	>	N/A - 0.0
WBL	>	N/A - 0.0	>	A - 7.5
WBT	1	N/A - 0.0	1	N/A - 0.0
NBL	1	N/A - 0.0	1	A - 9.0
NBR	>	N/A - 0.0	>	A - 9.0
Intersection:		***u - 0.0***		***u - 0.2***

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD Lanes	LOS-Delay	BUILD Lanes	LOS-Delay
EBT	1	N/A - 0.0	1	N/A - 0.0
EBR	>	N/A - 0.0	>	N/A - 0.0
WBL	>	N/A - 0.0	>	A - 7.3
WBT	1	N/A - 0.0	1	N/A - 0.0
NBL	1	N/A - 0.0	1	A - 8.9
NBR	>	N/A - 0.0	>	A - 8.9
Intersection:		***u - 0.0***		***u - 1.3***

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of S. Desert Surf Cir. / Driveway “B” demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of S. Desert Surf Cir. / Driveway “B”.

#15 – Driveway “C” / I-25 West Ramp – Pages A-67 thru A-120

The results of the 2019 analysis of the right-in, right-out only unsignalized intersection of Driveway “C” / I-25 West Ramp are summarized in the following table:

Intersection: **15 - Driveway "C" / I-25 W. Ramp**

2019 AM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD			BUILD		
	Lanes	LOS	Delay	Lanes	LOS	Delay
EBR	1	N/A	0.0	1	B	13.9
SBT	2	N/A	0.0	2	N/A	0.0
SBR	1	N/A	0.0	1	N/A	0.0
Intersection:		***u***	***0.0***		***u***	***0.0***
		Unsignalized			Unsignalized	

2019 PM Peak Hour BUILD

	(EXIST. GEOM.) NO BUILD			BUILD		
	Lanes	LOS	Delay	Lanes	LOS	Delay
EBR	1	N/A	0.0	1	C	19.9
SBT	2	N/A	0.0	2	N/A	0.0
SBR	1	N/A	0.0	1	N/A	0.0
Intersection:		***u***	***0.0***		***u***	***0.4***
		Unsignalized			Unsignalized	

NOTE: ">" designates a shared lane with adjacent thru lane.

The 2019 analysis of the intersection of Driveway “C” / I-25 West Ramp demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Driveway “C” / I-25 West Ramp.

Impact Assessment

The proposed development will have minimal adverse impact on the adjacent transportation system. All the levels-of-service were determined to be acceptable for the overall intersections and any individual movements at any particular intersections that is described as having long delays are not due to the implementation of the Top Golf Development, but are present in the NO BUILD condition.

Access Design Specifications

A Determination of Warrants for Deceleration Lanes was performed for Driveway “C” / I-25 West Ramp. A southbound right turn deceleration lane is warranted at a length of 400 feet plus a 12.5:1 taper. A left turn deceleration lane is not warranted. See Appendix Pages A-121 thru A-124 for associated worksheets.

Sight distance at Driveway “C” is adequate. There are no vertical or horizontal curves along this portion of I-25 W. Frontage Rd. and there are no structures that are blocking sight distance into and out of the driveway.

Montano Rd. and Alexander Blvd. are designated on the Futures 2040 Metropolitan Transportation Plan (2040 Long Range Bikeway System) as Proposed Bicycle Routes and I-25 West Ramp is designated as an Existing Trail.

Site access improvements / modifications are recommended along Desert Surf Circle due to the dilapidation of some sections of the unused sidewalk fronting the property. See the examples in the following photographs.

Sections Damaged Due to Expansion

Missing Manhole Lids

Not ADA Accessible due to Fire Hydrant Location

Missing Section of Sidewalk

Sidewalk and curb ramps fronting the proposed development should be made ADA accessible and sections should be constructed / rehabilitated.

Driveway "C" is located approximately 1,200 feet south of the Montano Rd. / I-25 W. Ramp intersection and approximately 1,800 feet north of the Midtown, Rd. / I-25 W. Frontage Rd. intersection. Table 18.C-1 of the State Access Management Manual requires that driveway spacing along an Urban Minor Arterial Roadway posted at 45 MPH be 275 feet for a traversable median, full access driveway. The SAMM also requires signalized intersection spacing of 2,640 feet and unsignalized intersection spacing of 660 feet. Although some of these spacing requirements are not met, the Driveway "A" is already an approved existing driveway that the proposed development will share.

Summary of Deficiencies, Anticipated Impacts, and Recommendations

The 2019 NO BUILD Analysis determined that several of the intersections analyzed in this study, including Montgomery Blvd. / Carlisle Blvd., Jefferson St. / I-25 W. Ramp, Montgomery Blvd. / I-25 W. Ramp, Montano Rd. / Culture Dr., Montano Rd. / Renaissance Blvd., Comanche Rd. / I-25 W. Ramp and Comanche Rd. / Alexander Blvd. will experience marginally delays for specific movements but will have acceptable delays and levels-of-service for the overall intersection without the implementation of the proposed development. However, the intersection of Montgomery Blvd. / I-25 E. Ramp will have marginally excessive delays for the

PM Peak Hour NO BUILD condition for the overall intersection. Since this is less than two years into the future, this is a reasonable representation of the 2017 existing condition deficiencies.

The 2019 implementation year analysis determined that there are no deficiencies beyond the 2017 existing / 2019 NO BUILD condition deficiencies, except to implement the following recommendations:

Driveway "C" / **I-25 W. Ramp** - Construct a southbound right turn deceleration lane, 400 feet long plus 12.5:1 taper.

Driveways "A" and "B" – Construct with one entering and one exiting lane, with curb return radii appropriate for delivery trucks, and with acceptable ADA ramps.

Driveway "C" – Construct with one entering lane and on existing lane and curb return radii acceptable for delivery trucks.

Desert Surf Circle – Construct sidewalks where missing and rehabilitate sidewalks where necessary to make ADA accessible.

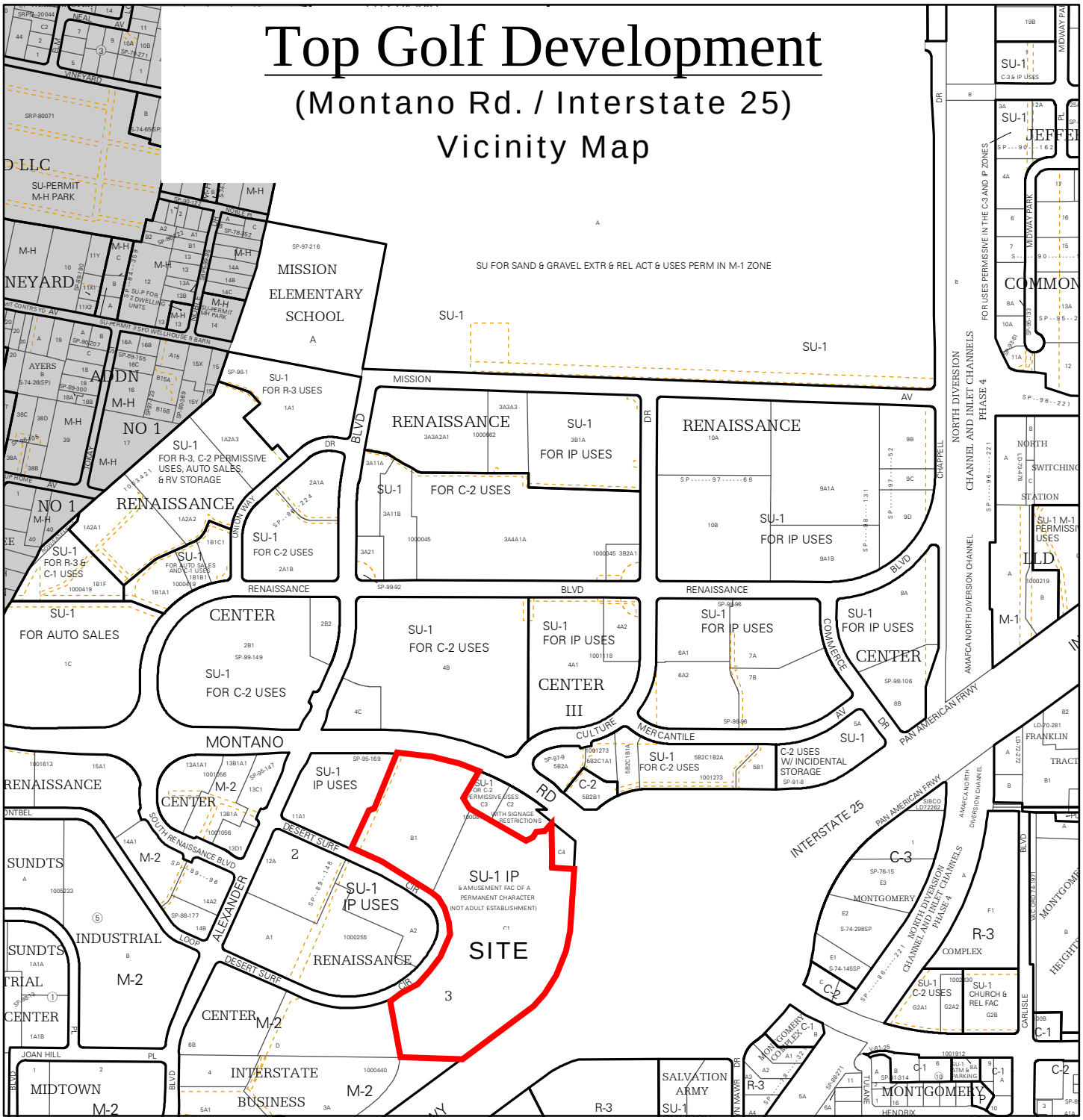
Appendix

APPENDIX

Top Golf Development

(Montano Rd. / Interstate 25)

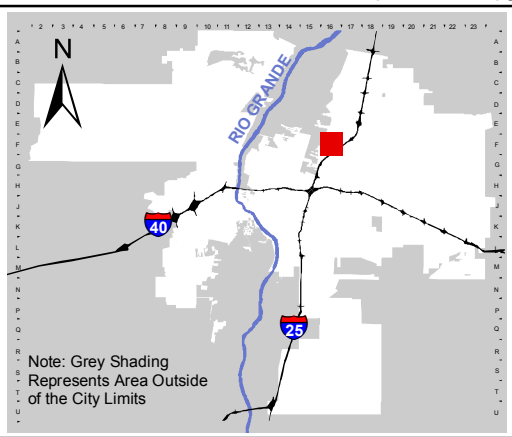
Vicinity Map



For more current information and details visit: http://www.cabq.gov/gis

Albuquerque Geographic Information System

Map amended through: 9/2/2014



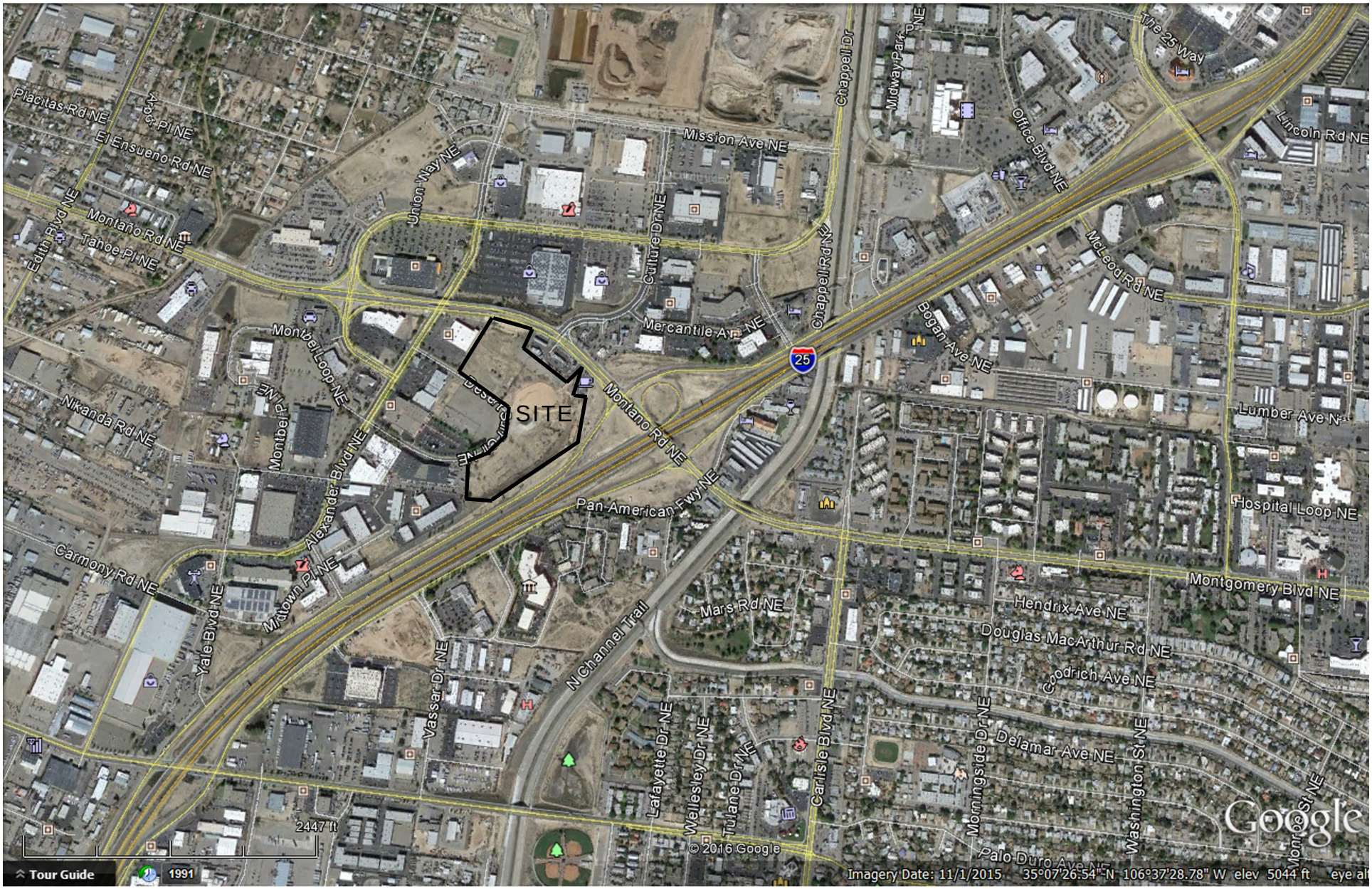
Zone Atlas Page:

F-16-Z

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

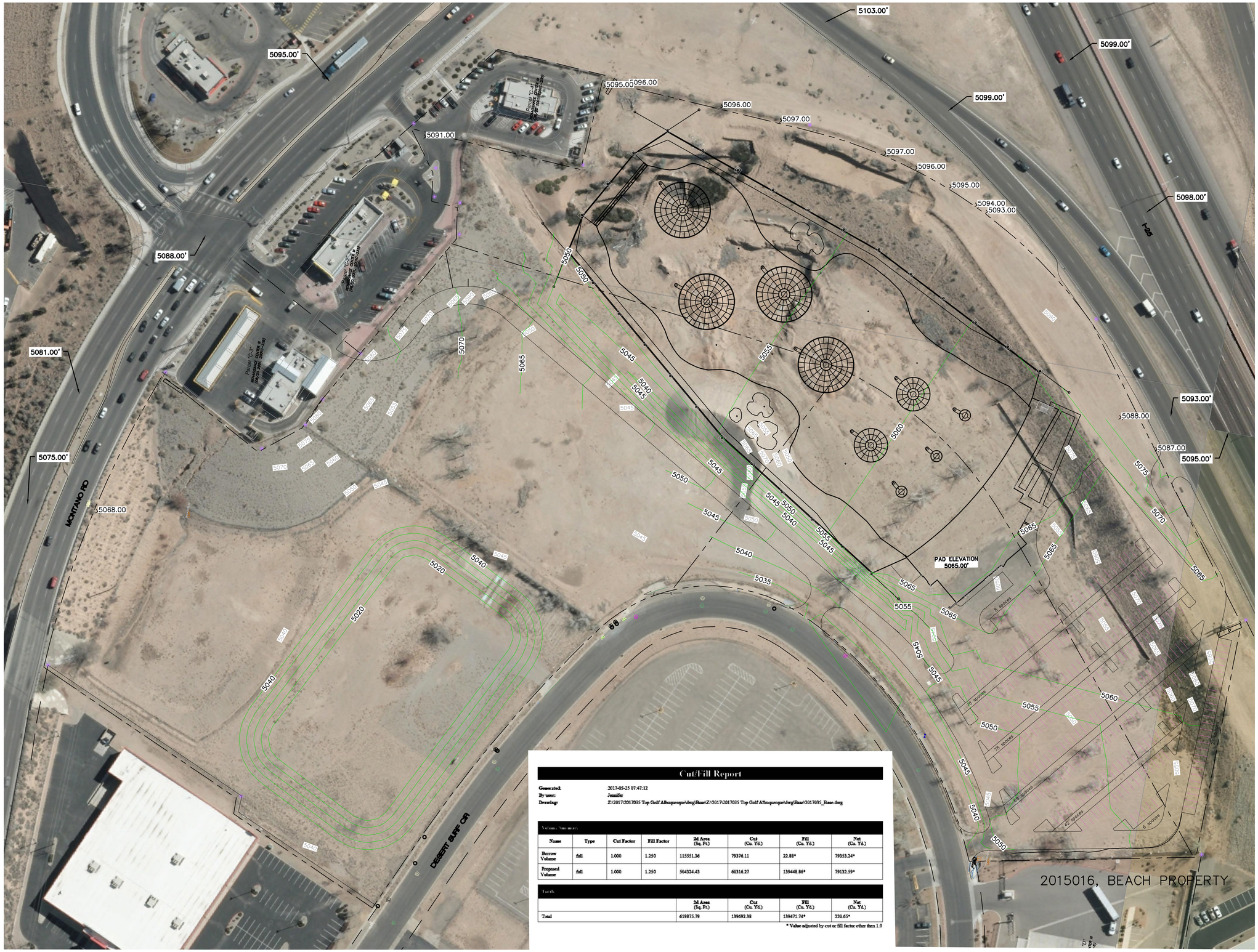
0 750 1,500 Feet



Top Golf Development

(Montano Rd. / Interstate 25)

Aerial Map



GRAPHIC SCALE

60 30 0 30 60

SCALE: 1"=60'

Cut/Fill Report

Generated: 2017-05-25 07:47:12
By user: Jennifer
Drawing: Z:\2017\2017035 Top Golf Albuquerque\dwg\Base\Z\2017\2017035 Top Golf Albuquerque\dwg\Base\2017035_Base.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Borrow Volume	full	1.000	1.250	115551.36	79376.11	22.88*	79353.24*
Proposed Volume	full	1.000	1.250	504324.43	60316.27	139448.86*	79132.59*

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	619875.79	139692.38	139471.74*	220.65*

* Value adjusted by cut or fill factor other than 1.0