

CITY OF ALBUQUERQUE



October 8, 2018

Terry Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199

Re: Maverik Store
SW Corner of Comanche Rd. and Princeton Dr.
Traffic Impact Study
Engineer's Stamp dated 9-17-18 (G16-D029)

Dear Mr. Brown

The subject Traffic Impact Study received on September 17, 2018 has been reviewed and approved by the Transportation Development Section. There are a few minor comments that should be addressed along with any comments NMDOT may have.

1. Page 9 – Last sentence of last paragraph shows trip distribution sheets are on pages A-9 thru A-16. These should be listed as A-12 thru A-20.
2. Pages 10 – Shows percentage trip assignment for commercial trips to be on pages A-15 thru A-16. These should be listed as A-18 thru A-20.
3. After Page 31 in the Appendix – There are two LOS Volume Analysis Maps that are not listed or numbered in the appendix table of contents.

Once this change and any required by NMDOT are complete please submit an electronic copy of the final Traffic Impact Study for our records. The final Traffic Impact Study shall be valid for a period of three years. Should significant modifications to the approved development proposal occur, the approved study shall be revised to incorporate these changes.

If you have any questions, please feel free to contact me at (505) 924-3633.

Sincerely,

Ernest Armijo, P.E.
Senior Engineer, Planning Dept.
Development Review Services

CITY OF ALBUQUERQUE



C: via: email
 Applicant, File

PO Box 1293

Albuquerque

NM 87103

www.cabq.gov



City of Albuquerque

Planning Department

Development & Building Services Division

DRAINAGE AND TRANSPORTATION INFORMATION SHEET (REV 09/2015)

Project Title: Maverik Store Building Permit #: _____ City Drainage #: 5160029

DRB#: _____ EPC#: _____ Work Order#: _____

Legal Description: _____

City Address: SW Corner of Comanche Rd. / Princeton Dr.

Engineering Firm: Tierra West, LLC Contact: Ronald R. Bohannon, P.E.

Address: 5571 Midway Park Pl. NE, Albuquerque, NM 87109

Phone#: 505-858-3100 Fax#: _____ E-mail: rrb@tierrawestllc.com

Owner: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Architect: _____ Contact: _____

Address: _____

Phone#: _____ Fax#: _____ E-mail: _____

Other Contact: Terry O. Brown, P.E. Contact: Terry Brown

Address: P. O. Box 92051, Albuquerque, NM 87199

Phone#: 505-883-8807 Fax#: N/A E-mail: tobe@swcp.com

Check all that Apply:

DEPARTMENT:

☐ HYDROLOGY/ DRAINAGE
☒ TRAFFIC/ TRANSPORTATION
☐ MS4/ EROSION & SEDIMENT CONTROL

CHECK TYPE OF APPROVAL/ACCEPTANCE SOUGHT:

☐ BUILDING PERMIT APPROVAL
☐ CERTIFICATE OF OCCUPANCY

☐ PRELIMINARY PLAT APPROVAL
☐ SITE PLAN FOR SUB'D APPROVAL
☐ SITE PLAN FOR BLDG. PERMIT APPROVAL
☐ FINAL PLAT APPROVAL
☐ SIA/ RELEASE OF FINANCIAL GUARANTEE
☐ FOUNDATION PERMIT APPROVAL
☐ GRADING PERMIT APPROVAL
☐ SO-19 APPROVAL
☐ PAVING PERMIT APPROVAL
☐ GRADING/ PAD CERTIFICATION
☐ WORK ORDER APPROVAL
☐ CLOMR/LOMR

☐ PRE-DESIGN MEETING
☐ OTHER (SPECIFY) _____

TYPE OF SUBMITTAL:

☐ ENGINEER/ ARCHITECT CERTIFICATION

☐ CONCEPTUAL G & D PLAN
☐ GRADING PLAN
☐ DRAINAGE MASTER PLAN
☐ DRAINAGE REPORT
☐ CLOMR/LOMR

☐ TRAFFIC CIRCULATION LAYOUT (TCL)
☒ TRAFFIC IMPACT STUDY (TIS)
☐ EROSION & SEDIMENT CONTROL PLAN (ESC)

☐ OTHER (SPECIFY) _____



IS THIS A RESUBMITTAL?: ☐ Yes ☒ No

DATE SUBMITTED: 09/17/2018 By: Terry O. Brown

COA STAFF: _____ ELECTRONIC SUBMITTAL RECEIVED: _____

Terry O. Brown P.E.

Maverik Gas / Convenience Store
(Comanche Rd. / Princeton Dr.)

Traffic Impact Study

September 07, 2018

Presented to:

City of Albuquerque
Transportation Development Section

NM Dept. of Transportation
District 3

Prepared for:

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



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

Terry O. Brown P.E.
P.O. Box 92051
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505 · 883 · 8807

**Maverik Gas / Convenience Store
(Comanche Rd. / Princeton Dr.)
Traffic Impact Study**

Executive Summary

The purpose of this study is to evaluate the transportation conditions before and after implementation of the proposed Maverik Gas / Convenience Store, 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 City of Albuquerque Transportation Dev. Section, Planning Dept. and the New Mexico Department of Transportation (NMDOT) associated with its review of the Maverik Gas / Convenience Store.

The proposed development is located at the northwest corner of Comanche Rd. / Princeton Dr. The study area includes the intersections of Comanche Rd. / Carlisle Bd., Candelaria Bd. / Princeton Dr., Candelaria Bd. / University Bd., Comanche Rd. / I-25 W. Ramp, Comanche Rd. / I-25 E. Ramp, Comanche Rd. / Princeton Dr. and the two re-aligned driveways for the project.

The North I-25 Freeway Operations Study (2011) demonstrates that a new westbound right turn lane is planned on Comanche Rd. at the I-25 East Ramp. The new right turn lane should reduce westbound queuing on Comanche at the East Ramp.

The proposed development is to be developed as a 20 fueling position gas station w/ convenience store. The anticipated implementation year for this site is the year 2019. According to the Institute of Traffic Engineers' (ITE) trip generation rates, the weekday AM Peak Hour period is anticipated to generate approximately 145 entering trips and 139 exiting trips. During the weekday PM Peak Hour period, it is anticipated that it will generate approximately 143 entering trips and 137 exiting trips.

There is an existing office use on the property (Rock Gap Engineering, Inc.). The comparative trip generation rates for the existing use and the proposed use are summarized in the following table:

Proposed C-Store (Comanche Rd. / Princeton)
Trip Generation Data (ITE Trip Generation Manual - 10th Edition)

COMMENT	USE (ITE CODE)	24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
	DESCRIPTION	GROSS	ENTER	EXIT	ENTER	EXIT
Summary Sheet		Units				
Proposed	Gasoline / Service Station w/ Convenience Market (945)	20.00	4,208	145	139	143
Existing	Small Office Building (712)	17.00	275	27	6	13
Increase (Decrease) in Trips Generated			3,933	118	133	130

The development will be accessed via two re-aligned driveways for this parcel of land, both on Princeton Dr. See the Appendix, Page A-3 for more details.

Analysis results for the implementation year (2019) are included in the following table:

EXECUTIVE SUMMARY RESULTS TABLE						
2019 AM(PM) PEAK HOUR						
INTERSECTION NO. & NAME	SIGNALIZATION	NO BUILD	BUILD	MITIGATED	2019 RECOMMENDATIONS	
1 - Comanche Rd. / Carlisle Blvd.	Signalized	C- 25.9 (C- 28.7)	C- 26.4 (C- 29.3)	A- 0.0 (A- 0.0)	No Recommendation	
2 - Candelaria Rd. / Princeton Dr.	Signalized	B- 14.1 (B- 10.9)	B- 13.0 (B- 10.4)	A- 0.0 (A- 0.0)	No Recommendation	
3 - Candelaria Rd. / University Blvd.	Signalized	B- 16.0 (C- 20.3)	B- 16.0 (C- 20.4)	A- 0.0 (A- 0.0)	No Recommendation	
4 - Comanche Rd. / I-25 W. Ramp	Signalized	C- 22.9 (C- 32.0)	C- 23.2 (C- 32.0)	A- 0.0 (C- 27.0)	Adjust Signal timing (+2 seconds EBLT, -2 seconds WBT)	
5 - Comanche Rd. / I-25 E. Ramp	Signalized	C- 21.2 (C- 23.6)	C- 21.1 (C- 23.9)	A- 0.0 (A- 0.0)	No Recommendation	
6 - Comanche Rd. / Princeton Dr.	Unsignalized	u- 1.1 (u- 1.2)	u- 3.4 (u- 3.2)	u- 0.0 (u- 0.0)	No Recommendation	
7 - Driveway "A" / Princeton Dr.	Unsignalized	u- 0.3 (u- 0.5)	u- 1.8 (u- 1.8)	u- 0.0 (u- 0.0)	No Recommendation	
8 - Driveway "B" / Princeton Dr.	Unsignalized	u- 0.3 (u- 0.7)	u- 3.1 (u- 3.4)	u- 0.0 (u- 0.0)	No Recommendation	

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:

Recommendations:

Construct all improvements associated with the proposed Maverik Store including driveways and landscaping so as to preserve adequate sight distances along Princeton Dr. and along Comanche Rd.

Comanche Rd. / Carlisle Blvd. – Lengthen northbound left turn lane from 85 feet long to 130 feet long.

Comanche Rd. / I-25 West Ramp - Adjust signal timing during the PM Peak Hour period to add two (2) seconds to the westbound left turn phase and subtract 2 seconds from the eastbound thru phase.

Comanche Rd. / Princeton Dr. – Stripe the Princeton St. approach (northbound) to Comanche Rd. to provide a 100 feet long northbound left turn lane.

Design and construct project to incorporate two full access driveways onto Princeton Dr. as depicted on the site development plan on Page A-3 in the Appendix of this report.

**Maverik Gas / Convenience Store
(Comanche Rd. / Princeton Dr.)
Traffic Impact Study**

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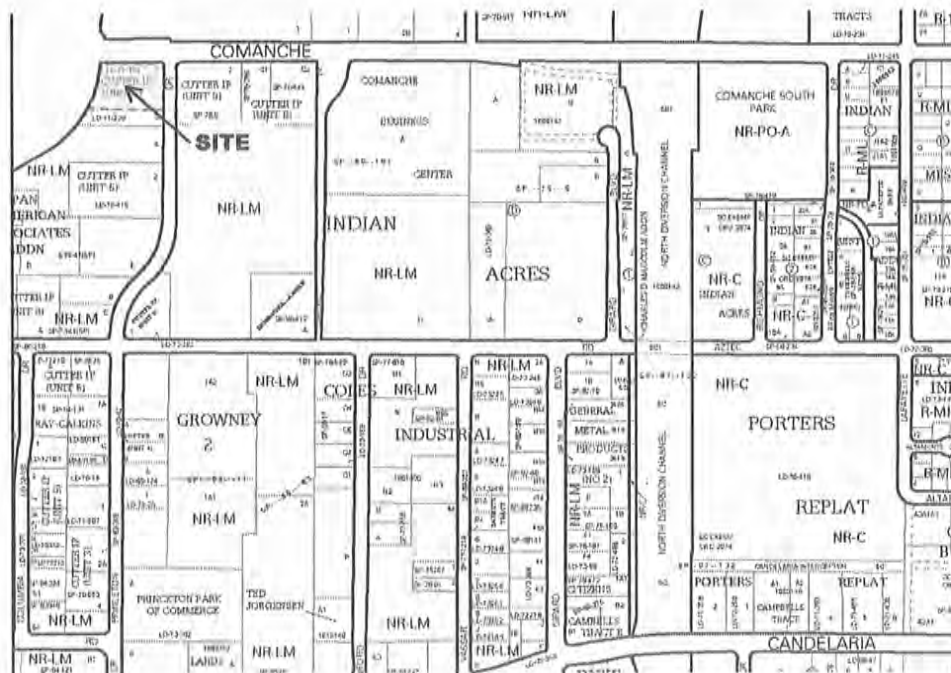
Maverik Gas / Convenience Store (Comanche Rd. / Princeton Dr.) Traffic Impact Study

Introduction

The purpose of this study is to evaluate the transportation conditions before and after implementation of the proposed Maverik Convenience Store 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 City of Albuquerque Transportation Development Section, Planning Department and the New Mexico Department of Transportation District 3 Traffic Engineer associated with their review of the Maverik Convenience Store as shown on the plan (Page A-3) in the Appendix of this report.

The proposed development is located at the southwest corner of Comanche Rd. / Princeton Dr. 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 City of Albuquerque Transportation Development Section and / or the New Mexico Department of Transportation.

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



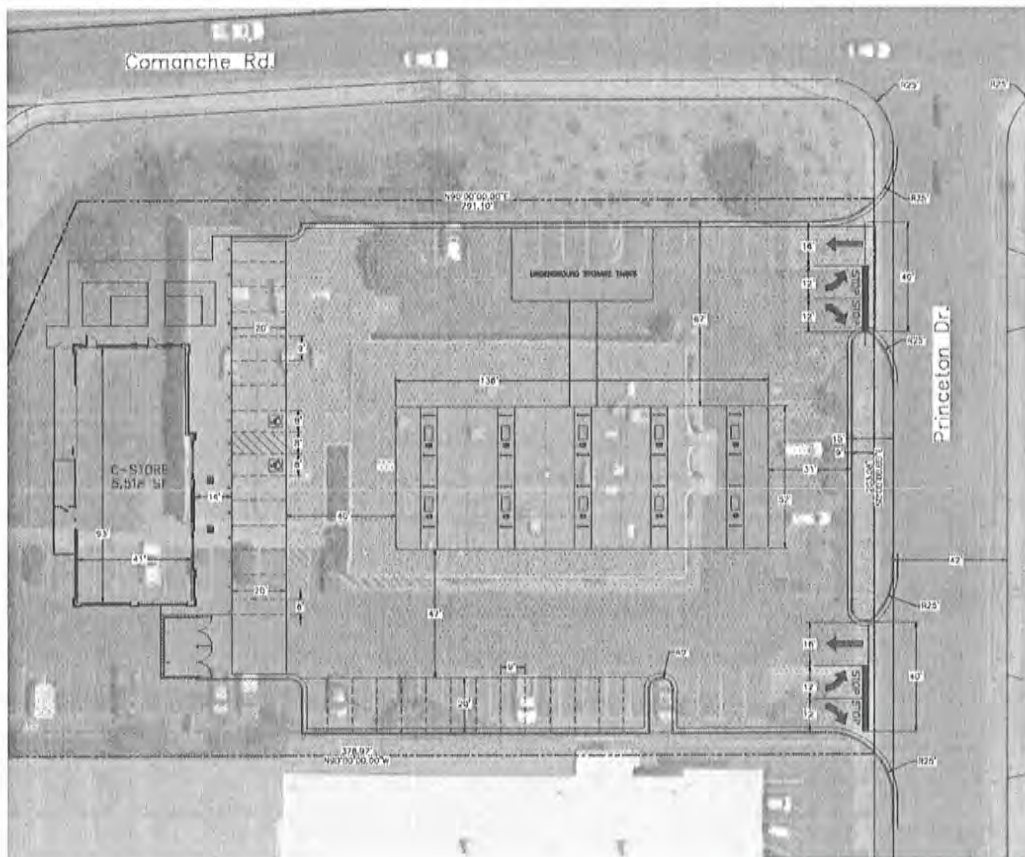
Description of Proposed Development

The proposed project is described as a 20 fueling position gas station w/ convenience store at the southwest corner of Comanche Rd. / Princeton Dr. The project lies in the city limits of Albuquerque, NM. The project will be required to comply with the requirements of the City of Albuquerque with regard to the overall development. The project includes the analysis of two ramps for Interstate 25 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 Interstate 25.

This development will be constructed in one phase. This study will analyze an implementation year of 2019. No horizon year analysis is required for this development.

The development will be accessed via two existing driveways for this parcel of land, which will be re-aligned as shown on the site plan.

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 with the City of Albuquerque Transportation Dev. Section, Planning Dept. with staff (Racquel Michel) and with the New Mexico Department of Transportation staff (Nancy Perea, District 3 Traffic Engineer and Margaret Haynes, Assistant District 3 Traffic Engineer). During the meeting, it was determined that the study area would include the following list of intersections to be analyzed in the Traffic Impact Study:

1. Comanche Rd. / Carlisle Bd.
2. Candelaria Bd. / Princeton Dr.
3. Candelaria Bd. / University Bd.
4. Comanche Rd. / I-25 W. Ramp
5. Comanche Rd. / I-25 E. Ramp
6. Comanche Rd. / Princeton Dr.

This scope of study was based on the assumption that the parcel in question would be developed as a 20 fueling position gas station w/ convenience store as shown on the proposed site plan.

There are no other known land development projects in the area which need to be incorporated into the background traffic model for this study. However, an existing diesel service center is located across Princeton Dr. & was included in the driveway analyses. There are no known Transportation Improvement Program projects in the area that need to be considered in the Traffic Impact Study.

This project is served by public transit services in the area; specifically Routes #5, 7 and 13. These routes run along Carlisle Bd. (5), Candelaria Bd. (7) and Comanche Rd. (13). The last two routes are commuter routes which run during the peak hours only.

Comanche Rd. and Candelaria Rd. are designated on the Futures 2040 Metropolitan Transportation Plan (2040 Long Range Bikeway System) as either Proposed or Existing Bicycle Routes or Lanes as shown on the following portion of the map.



2040 Long Range Bikeway System

- ⊗ Proposed Overpass/Underpass
- ⊙ Existing Overpass/Underpass
- Existing, Bicycle Boulevard
- Existing, Bicycle Lane
- Existing, Bicycle Route
- Existing, Paved Trail; Existing
- ⋯ Proposed, Bicycle Boulevard
- ⋯ Proposed, Bicycle Lane
- ⋯ Proposed, Bicycle Route
- ⋯ Proposed, Paved Trail
- 50 Mile Loop

There are pedestrian facilities in the project area – curb & gutter and sidewalks along the roads, as well as raised medians for pedestrians & bicyclists crossing against traffic.

Comanche Rd., Carlisle Bd. & University Bd. are classified as Minor Arterial Roadways on the Mid-Region Council of Government's Futures 2040 Long Range Roadway System Map. They are four-lane urban-type roadways with curb and gutter & sidewalks and some raised medians. Comanche Rd. & University Bd. become Major Collectors in the vicinity of this project. The posted speed limit along Carlisle Bd. is 35 MPH, along Comanche Rd. is 40 MPH and along University Bd. is 45 MPH.

Candelaria Rd. is classified as a Community Principal Arterial Roadway on the Mid-Region Council of Government's Futures 2040 Long Range Roadway System Map. Candelaria Rd. is a four-lane roadway with curb & gutter and sidewalks. The posted speed limit along this section of Candelaria Rd. is 40 MPH.

Analysis of Existing Conditions

Due to the fact that the Implementation Year is only one year in the future, no existing analysis was performed. The 2019 NO BUILD analysis results should closely approximate the analysis of existing conditions. Existing traffic volumes (turning movement counts) were collected at the

intersections targeted for analysis in this study in July 2018 and are included on Appendix Pages A-95 thru A-100.

Analysis of Implementation Year Conditions

Traffic Projections

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

Projected trips were calculated based on the Institute of Traffic Engineers (ITE) Trip Generation Manual (10th Edition). 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 following table summarized the trip generation rate for the project compared to the existing trip generation rate of the existing use (17,000 s.f. office) on the site:

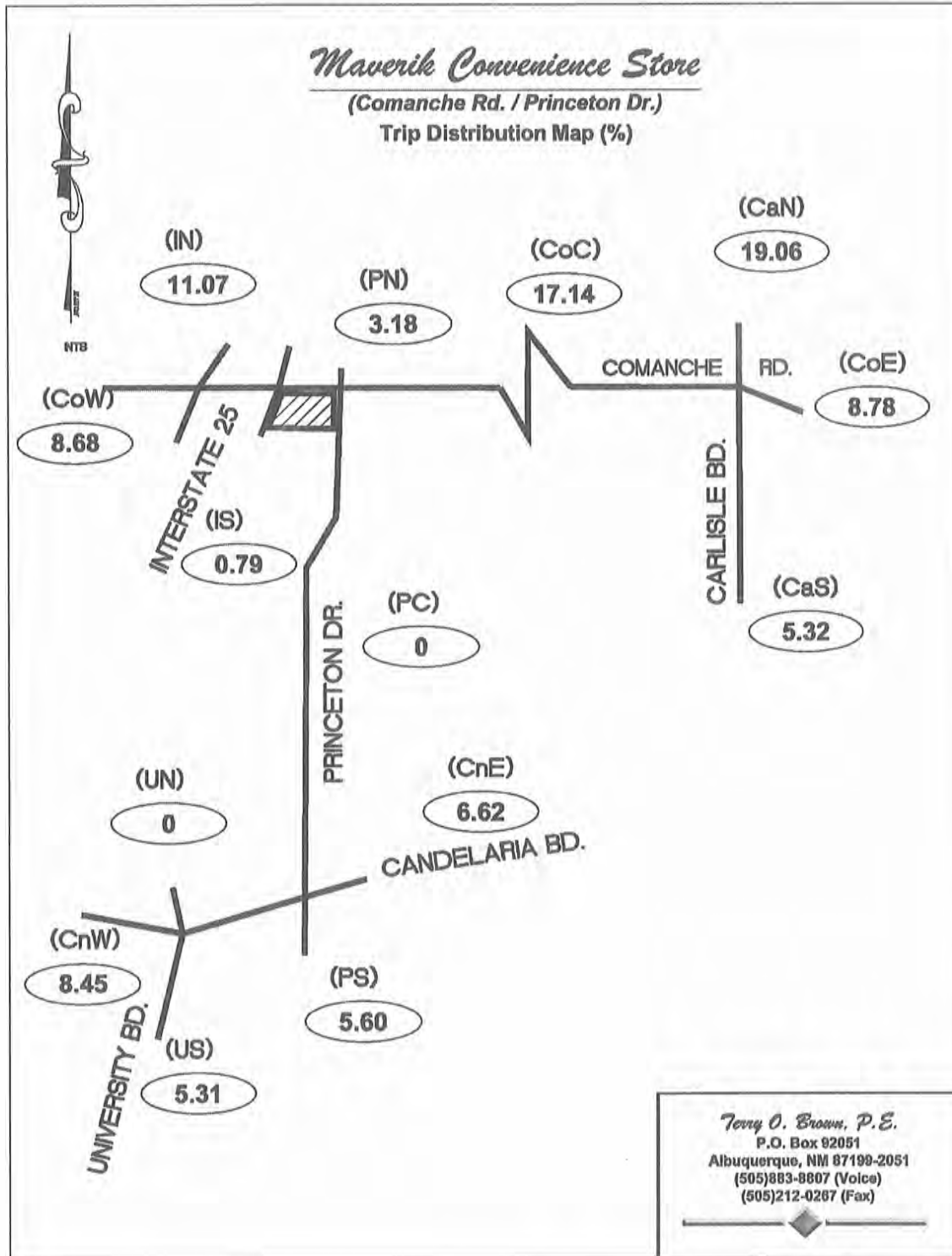
Proposed C-Store (Comanche Rd. / Princeton)
Trip Generation Data (ITE Trip Generation Manual - 10th Edition)

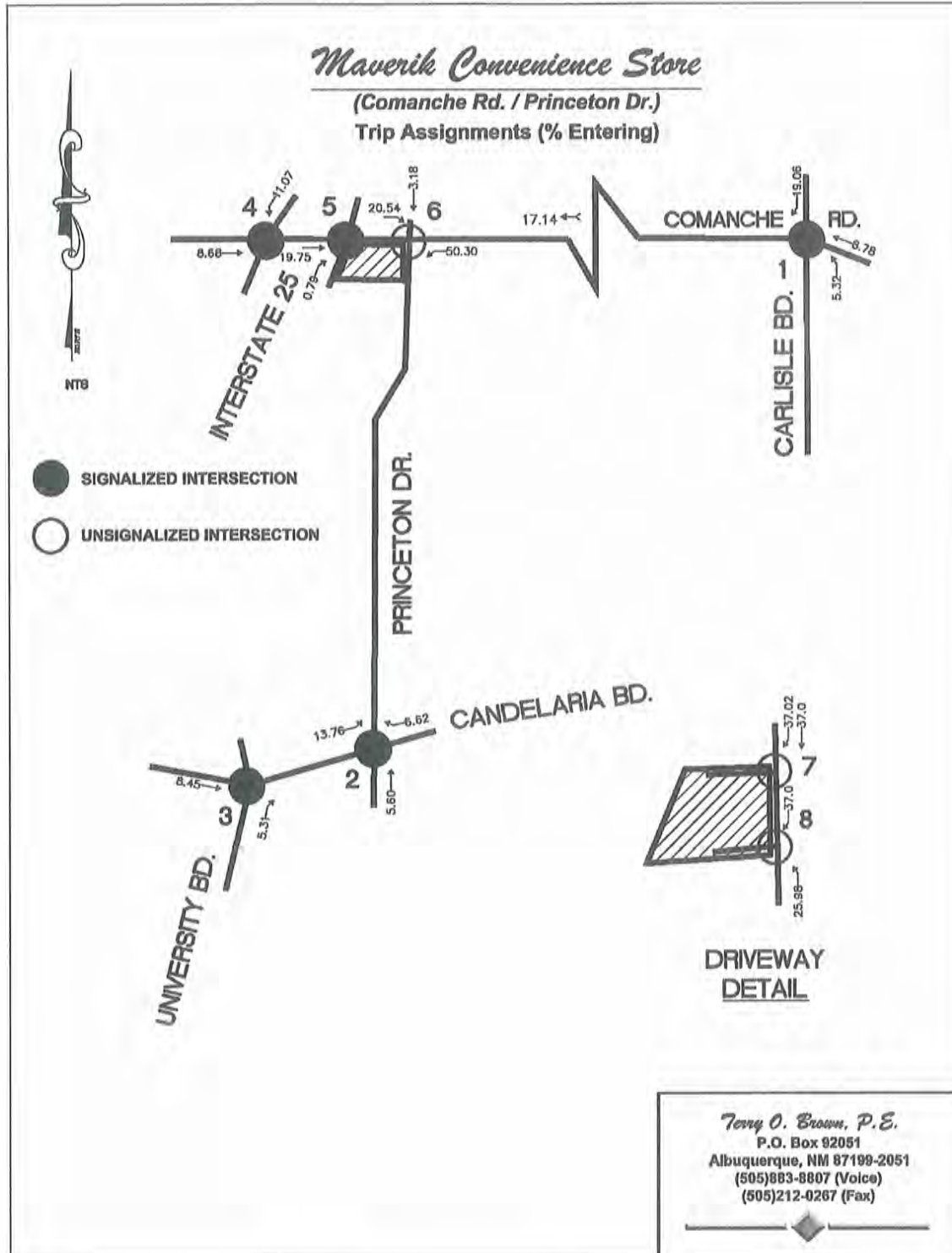
COMMENT	USE (ITE CODE)		24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
	DESCRIPTION		GROSS	ENTER	EXIT	ENTER	EXIT
	Summary Sheet	Units					
Proposed	Gasoline / Service Station w/ Convenience Market (945)	20	4,208	145	139	143	137
Existing	Small Office Building (712)	17.00	275	27	6	13	28
	Increase (Decrease) in Trips Generated		3,933	118	133	130	109

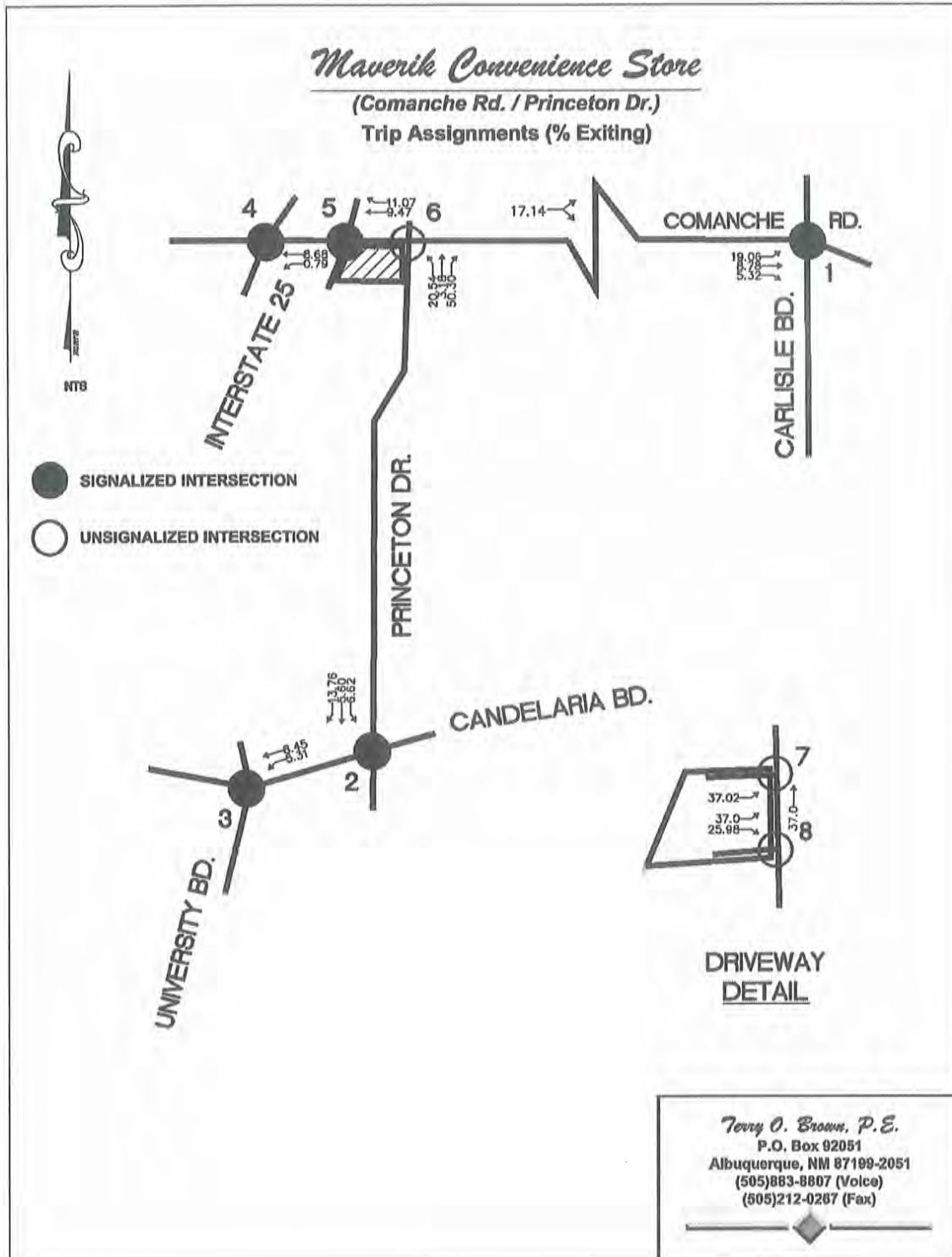
Pass-by trips were not applied to this project. A pass-by trip reduction of 50% could be supported based on ITE data, but was not applied to this analysis since the proposed driveways are located on Princeton Dr. with relatively low volumes. Pass-by trips for this project would more aptly be classified as diverted link trips, so were not applied. See Appendix Page A-7 for more information regarding the trip generation.

The Gravity Model was used to determine trip distribution where primary trips for the commercial land use development were distributed proportionally to the 2019 projected population of Data Analysis Subzones (DASZ) within a 1.5-mile radius. 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 Subzones 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-16.

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 commercial 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. Additionally, Trip Distribution Map and Trip Assignments Maps are located on the following pages.







Background traffic growth rates were considered for each individual approach to an intersection that was targeted for analysis based on data from the 2007 through 2016 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 either an inconsistent or 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-27. 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-31 thru A-46).

Traffic Analysis

A capacity analysis using existing traffic signal timing (see Appendix Pages A-50 thru A-82) was conducted for the Implementation Year (2019) NO BUILD and BUILD Conditions and the results are summarized as follows:

#1 – Comanche Rd. / Carlisle Bd. - Pages A-50 thru A-82

The results of the 2019 analyses of the signalized intersection of Comanche Rd. / Carlisle Bd. are summarized in the following tables:

Intersection: 1 - Comanche Rd. / Carlisle 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 - 38.5	1	D - 37.7	L	1	C - 27.9	1	C - 28.4	
	T	1	D - 47.1	1	D - 45.0	T	1	D - 45.8	1	D - 47.1	
	R	1	D - 39.1	1	D - 36.9	R	1	D - 36.8	1	D - 36.4	
WB	L	1	D - 38.0	1	D - 37.2	L	1	C - 31.1	1	C - 31.7	
	T	2	D - 49.2	2	D - 48.9	T	2	C - 34.9	2	D - 36.0	
	R	>	D - 49.8	>	D - 49.4	R	>	C - 35.0	>	D - 36.1	
NB	L	1	A - 9.7	1	B - 10.7	L	1	B - 17.4	1	B - 17.9	
	T	3	B - 11.6	3	B - 12.6	T	3	C - 20.9	3	C - 21.2	
	R	>	B - 11.8	>	B - 12.8	R	>	C - 21.6	>	C - 21.9	
SB	L	1	A - 9.1	1	B - 10.2	L	1	B - 17.5	1	B - 17.9	
	T	3	B - 12.7	3	B - 14.2	T	3	C - 23.1	3	C - 23.8	
	R	>	B - 13.0	>	B - 14.8	R	>	C - 23.9	>	C - 24.8	
Intersection:		C - 25.9		C - 26.4		C - 28.7		C - 29.3			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

The 2019 analysis of the intersection of Comanche Rd. / Carlisle Bd. 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 0.5 seconds during the AM Peak Hour and by 0.6 seconds during the PM Peak Hour. Therefore, no recommendations are made for the intersection of Comanche Rd. / Carlisle Bd.

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

Queueing Analysis Summary Sheet

Project: Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
 Intersection: Comanche Rd. / Carlisle Bd.

2019

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	70	115	1	156	Cont	1	133	999
AM NO BUILD Queue	1	71	71	1	158	178	1	135	38
AM BUILD Queue	1	97	88	1	170	185	1	142	36
Existing Lane Length	1	111	115	1	377	Cont	1	376	999
PM NO BUILD Queue	1	112	81	1	382	363	1	381	197
PM BUILD Queue	1	138	98	1	394	377	1	388	202
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	76	30	1	287	Cont	0	62	0
AM NO BUILD Queue	1	76	74	1	288	170	0	62	170
AM BUILD Queue	1	76	71	1	301	176	0	62	176
Existing Lane Length	1	90	30	1	342	Cont	0	58	0
PM NO BUILD Queue	1	90	68	1	344	165	0	58	165
PM BUILD Queue	1	90	68	1	357	173	0	58	173
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	156	85	2	408	Cont	0	25	0
AM NO BUILD Queue	1	157	97	2	410	98	0	25	98
AM BUILD Queue	1	165	107	2	410	102	0	25	102
Existing Lane Length	1	160	85	2	670	Cont	0	91	0
PM NO BUILD Queue	1	161	124	2	673	220	0	91	220
PM BUILD Queue	1	169	130	2	673	270	0	91	270
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	1	9	60	3	381	Cont	0	90	0
AM NO BUILD Queue	1	9	11	3	386	115	0	91	115
AM BUILD Queue	1	9	12	3	386	124	0	119	124
Existing Lane Length	1	76	60	3	628	Cont	0	102	0
PM NO BUILD Queue	1	77	65	3	636	210	0	103	210
PM BUILD Queue	1	77	65	3	636	216	0	130	216

NOTE: Queue lengths are in feet.

Queueing calculations are based on HCM 6 Methodology (95th Percentile Confidence Level)

Queueing Recommendations: Extend northbound left turn lane from 85 feet long to 130 feet long.

#2 – Candelaria Rd. / Princeton Dr. - Pages A-50 thru A-82

The results of the 2019 analyses of the full access signalized intersection of Candelaria Rd. / Princeton Dr. are summarized in the following tables:

Intersection: 2 - Candelaria Rd. / Princeton 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 - 17.9	1	B - 17.1	L	1	B - 10.4	1	A - 9.9	
	T	2	B - 13.5	2	B - 12.0	T	2	A - 4.9	2	A - 4.0	
	R	>	B - 13.5	>	B - 12.0	R	>	A - 4.9	>	A - 4.0	
WB	L	1	B - 19.2	1	B - 17.5	L	1	B - 13.9	1	B - 12.7	
	T	2	B - 16.6	2	B - 15.2	T	2	B - 15.7	2	B - 14.9	
	R	>	B - 16.5	>	B - 15.2	R	>	B - 15.7	>	B - 14.9	
NB	L	1	A - 8.6	1	A - 9.9	L	1	B - 11.4	1	B - 12.6	
	T	1	A - 7.9	1	A - 8.8	T	1	A - 9.4	1	A - 10.0	
	R	>	A - 7.9	>	A - 8.8	R	>	A - 9.4	>	A - 10.0	
SB	L	1	A - 8.6	1	A - 9.7	L	1	B - 10.3	1	B - 11.1	
	T	1	A - 8.0	1	A - 9.2	T	1	B - 10.6	1	B - 11.6	
	R	>	A - 8.0	>	A - 9.2	R	>	B - 10.6	>	B - 11.6	
Intersection:		B - 14.1		B - 13.0		B - 10.9		B - 10.4			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

The 2019 analysis of the intersection of Candelaria Rd. / Princeton Dr. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Candelaria Rd. / Princeton Dr.

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

Queueing Analysis Summary Sheet

Project: Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
 Intersection: Candelaria Rd. / Princeton Dr.

2019											
Approach	Left Turns			Thru Movements			Right Turns				
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	31	80	2	557	Cont	0	36	0		
AM NO BUILD Queue	1	31	39	2	560	229	0	36	229		
AM BUILD Queue	1	51	61	2	560	228	0	36	228		
Existing Lane Length	1	17	80	2	750	Cont	0	23	0		
PM NO BUILD Queue	1	17	2	2	754	34	0	23	34		
PM BUILD Queue	1	37	5	2	754	34	0	23	34		
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	22	120	2	557	Cont	0	60	0		
AM NO BUILD Queue	1	22	15	2	560	103	0	60	103		
AM BUILD Queue	1	22	15	2	560	103	0	70	103		
Existing Lane Length	1	22	120	2	971	Cont	0	28	0		
PM NO BUILD Queue	1	22	11	2	976	131	0	28	131		
PM BUILD Queue	1	22	1	2	976	131	0	37	131		
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	32	130	1	47	Cont	0	26	0		
AM NO BUILD Queue	1	32	23	1	47	33	0	26	33		
AM BUILD Queue	1	32	23	1	55	37	0	26	27		
Existing Lane Length	1	35	130	1	12	Cont	0	34	0		
PM NO BUILD Queue	1	35	28	1	12	23	0	34	23		
PM BUILD Queue	1	35	28	1	20	27	0	34	27		
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	50	190	1	28	Cont	0	59	0		
AM NO BUILD Queue	1	50	26	1	28	21	0	59	21		
AM BUILD Queue	1	59	29	1	36	27	0	78	27		
Existing Lane Length	1	66	190	1	27	Cont	0	123	0		
PM NO BUILD Queue	1	66	35	1	27	34	0	124	34		
PM BUILD Queue	1	75	38	1	35	44	0	143	44		

NOTE: Queue lengths are in feet.

Queueing calculations are based on HCM 6 Methodology (95th Percentile Confidence Level)

Queueing Recommendations: None.

#3 – Candelaria Rd. / University Bd. - Pages A-50 thru A-82

The results of the 2019 analyses of the full access signalized intersection of Candelaria Rd. / University Bd. are summarized in the following tables:

Intersection: 3 - Candelaria Rd. / University 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	>	A - 8.8	>	A - 9.0	L	>	B - 14.6	>	B - 14.8	
	T	1	B - 12.1	1	B - 12.4	T	1	C - 21.1	1	C - 21.4	
	R	>	A - 7.8	>	A - 8.0	R	>	B - 13.1	>	B - 13.3	
WB	L	>	A - 9.0	>	A - 9.1	L	>	B - 14.3	>	B - 14.5	
	T	1	A - 0.1	1	A - 0.1	T	1	A - 2.3	1	A - 2.5	
	R	>	A - 0.3	>	A - 0.4	R	>	A - 2.4	>	A - 2.6	
NB	L	>	D - 38.6	>	D - 38.2	L	>	C - 29.4	>	C - 29.2	
	T	1	D - 49.2	1	D - 49.0	T	1	D - 46.8	1	D - 47.0	
	R	>	D - 50.1	>	D - 49.9	R	>	D - 47.5	>	D - 47.7	
SB	L	>	D - 50.6	>	D - 50.8	L	>	D - 51.8	>	D - 51.8	
	T	1	D - 44.0	1	D - 43.6	T	1	D - 35.8	1	D - 35.5	
	R	>	A - 0.1	>	A - 0.0	R	>	A - 0.1	>	A - 0.1	
Intersection:		B - 16.0		B - 16.0		C - 20.3		C - 20.4			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

The 2019 analysis of the intersection of Candelaria Rd. / University Bd. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Candelaria Rd. / University Bd.

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

Queueing Analysis Summary Sheet

Project: Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
 Intersection: Candelaria Rd. / University Bd.

2019												
Approach		Left Turns			Thru Movements			Right Turns				
Eastbound		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		1	169	275	2	527	Cont	1	204	275		
AM NO BUILD Queue		1	170	89	2	530	184	1	205	25		
AM BUILD Queue		1	170	90	2	542	191	1	205	26		
Existing Lane Length		1	111	275	2	601	Cont	1	173	275		
PM NO BUILD Queue		1	112	86	2	604	292	1	174	38		
PM BUILD Queue		1	112	86	2	616	298	1	174	38		
Westbound		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		1	108	150	3	388	Cont	1	158	200		
AM NO BUILD Queue		1	109	69	3	390	81	1	159	56		
AM BUILD Queue		1	109	68	3	402	83	1	166	56		
Existing Lane Length		1	144	150	3	770	Cont	1	226	200		
PM NO BUILD Queue		1	145	99	3	774	252	1	227	98		
PM BUILD Queue		1	145	102	3	786	253	1	234	91		
Northbound		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		1	115	130	2	244	Cont	0	85	0		
AM NO BUILD Queue		1	116	117	2	247	156	0	86	156		
AM BUILD Queue		1	116	117	2	247	157	0	94	157		
Existing Lane Length		1	162	130	2	470	Cont	0	166	0		
PM NO BUILD Queue		1	164	126	2	476	274	0	168	274		
PM BUILD Queue		1	164	126	2	476	277	0	176	277		
Southbound		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		2	13	225	2	2	Cont	0	4	0		
AM NO BUILD Queue		2	13	15	2	2	4	0	4	0		
AM BUILD Queue		2	13	15	2	2	4	0	4	0		
Existing Lane Length		2	41	225	2	7	Cont	0	12	0		
PM NO BUILD Queue		2	41	35	2	7	8	0	12	0		
PM BUILD Queue		2	41	35	2	7	8	0	12	0		

NOTE: Queue lengths are in feet.

Queueing calculations are based on HCM 6 Methodology (95th Percentile Confidence Level)

Queueing Recommendations: None.

#4 – Comanche Rd. / I-25 W. Ramp – Pages A-50 thru A-82

The results of the 2019 analyses of the full access signalized intersection of Comanche Rd. / I-25 W. Ramp are summarized in the following tables:

Intersection: 4 - Comanche Rd. / I-25 W. Ramp

2019 AM Peak Hour BUILD						2019 PM Peak Hour BUILD							
(EXIST. GEOM.)						(EXIST. GEOM.)						(MIT. GEOM.)	
NO BUILD						NO BUILD						BUILD	
BUILD						BUILD						BUILD	
Lanes LOS-Delay						Lanes LOS-Delay						Lanes LOS-Delay	
EB	L		A - 0.0	0	A - 0.0	L	0	A - 0.0	0	A - 0.0	0	A - 0.0	
	T	2	C - 28.1	2	C - 29.8	T	2	C - 24.7	2	C - 25.2	2	C - 27.9	
	R	>	C - 28.6	>	C - 30.3	R	>	C - 34.7	>	C - 34.8	>	D - 41.0	
WB	L	2	D - 35.5	2	D - 35.4	L	2	F - 92.5	2	F - 91.9	2	D - 42.3	
	T	2	A - 0.9	2	A - 0.9	T	2	A - 0.2	2	A - 0.2	2	A - 0.2	
	R		A - 0.0	0	A - 0.0	R	0	A - 0.0	0	A - 0.0	0	A - 0.0	
NB	L		A - 0.0	0	A - 0.0	L	0	A - 0.0	0	A - 0.0	0	A - 0.0	
	T		A - 0.0	0	A - 0.0	T	0	A - 0.0	0	A - 0.0	0	A - 0.0	
	R		A - 0.0	0	A - 0.0	R	0	A - 0.0	0	A - 0.0	0	A - 0.0	
SB	L	1	C - 32.9	1	C - 33.3	L	1	C - 30.8	1	C - 31.9	1	C - 31.9	
	T	1	C - 31.0	1	C - 30.1	T	1	C - 31.5	1	C - 31.4	1	C - 31.4	
	R	1	C - 25.9	1	C - 25.3	R	1	C - 26.2	1	C - 26.1	1	C - 26.1	
Intersection:		C - 22.9		C - 23.2		C - 32.0		C - 32.0		C - 27.0			

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

Adjust Signal timing (+2 seconds WBLT; -2 seconds EBT)

The 2019 analysis of the intersection of Comanche Rd. / I-25 W. Ramp demonstrates that the delays will be acceptable for the 2019 AM Peak Hour conditions analyzed in this report. The 2019 PM Peak Hour conditions will experience long delays for the westbound left turn movement for both the NO BUILD and the BUILD conditions. The long delays for the westbound left turn movement can be mitigated with a signal timing adjustment adding two seconds to the westbound left turn movement green phase and reducing the green time for the eastbound thru movement by 2 seconds.

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

Queueing Analysis Summary Sheet

Project: Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
 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	0	Cont	0	378	0
AM NO BUILD Queue	0	0	0	2	510	434	0	380	434
AM BUILD Queue	0	0	0	2	523	444	0	380	444
Existing Lane Length	0	0	0	2	0	Cont	0	532	0
PM NO BUILD Queue	0	0	0	2	462	401	0	535	401
PM BUILD Queue	0	0	0	2	474	408	0	535	408

Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	2	360	220	2	0	Cont	0	0	0
AM NO BUILD Queue	2	362	160	2	865	334	0	0	0
AM BUILD Queue	2	363	160	2	877	338	0	0	0
Existing Lane Length	2	441	220	2	0	Cont	0	0	0
PM NO BUILD Queue	2	443	210	2	720	190	0	0	0
PM BUILD Queue	2	444	206	2	732	188	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	341	425	2	714	Cont	2	133	425
AM NO BUILD Queue	1	343	263	2	718	272	2	134	56
AM BUILD Queue	1	359	278	2	718	272	2	134	57
Existing Lane Length	1	331	425	2	774	Cont	2	158	425
PM NO BUILD Queue	1	333	244	2	778	287	2	159	41
PM BUILD Queue	1	349	257	2	778	287	2	159	41

NOTE: Queue lengths are in feet.

Queueing calculations are based on HCM 6 Methodology (95th Percentile Confidence Level)

Queueing Recommendations: None. However, modification of signal timing recommended in this report will reduce the westbound left turn queue length under the interchange.

#5 – Comanche Rd. / I-25 E. Ramp - Pages A-50 thru A-82

The results of the 2019 analyses of the full access signalized intersection of Comanche Rd. / I-25 E. Ramp are summarized in the following tables:

Intersection: 5 - Comanche Rd. / I-25 E. Ramp

<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	LOS-Delay			Lanes	LOS-Delay	Lanes	LOS-Delay
EB	L	2	D - 37.7	2	D - 37.5	L	2	D - 37.9	2	D - 37.8	
	T	2	A - 0.2	2	A - 0.2	T	2	A - 1.5	2	A - 1.5	
	R		A - 0.0	0	A - 0.0	R	0	A - 0.0	0	A - 0.0	
WB	L		A - 0.0	0	A - 0.0	L	0	A - 0.0	0	A - 0.0	
	T	2	C - 25.5	2	C - 26.1	T	2	D - 35.8	2	D - 37.6	
	R	>	C - 25.6	>	C - 26.2	R	>	D - 36.1	>	D - 37.9	
NB	L	2	C - 23.1	2	C - 23.1	L	2	C - 25.2	2	C - 25.2	
	T	3	C - 23.8	3	C - 23.8	T	3	C - 22.8	3	C - 22.7	
	R	1	C - 27.5	1	C - 27.5	R	1	C - 26.0	1	C - 26.1	
SB	L		A - 0.0	0	A - 0.0	L	0	A - 0.0	0	A - 0.0	
	T		A - 0.0	0	A - 0.0	T	0	A - 0.0	0	A - 0.0	
	R		A - 0.0	0	A - 0.0	R	0	A - 0.0	0	A - 0.0	
Intersection:		C - 21.2		C - 21.1				C - 23.6		C - 23.9	
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

The 2019 analysis of the intersection of Comanche Rd. / I-25 E. Ramp demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Comanche Rd. / I-25 E. Ramp

It should be noted that the westbound approach to the I-25 East Ramp on Comanche currently experiences queues that back up through the intersection of Comanche Rd. / Princeton Dr. However, the queues are able to clear the signalized intersection during the green interval. The following table summarizes the results of the queuing analysis for the auxiliary lanes at the intersection:

Queueing Analysis Summary Sheet

Project: Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
 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	241	60	2	608	Cont	0	0	0
AM NO BUILD Queue	2	242	107	2	611	150	0	0	0
AM BUILD Queue	2	242	107	2	640	156	0	0	0
Existing Lane Length	2	205	60	2	586	Cont	0	0	0
PM NO BUILD Queue	2	206	95	2	589	167	0	0	0
PM BUILD Queue	2	206	95	2	617	175	0	0	0
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	0	0	0	2	499	Cont	0	96	0
AM NO BUILD Queue	0	0	0	2	501	234	0	96	0
AM BUILD Queue	0	0	0	2	514	245	0	111	0
Existing Lane Length	0	0	0	2	611	Cont	0	165	0
PM NO BUILD Queue	0	0	0	2	614	376	0	166	0
PM BUILD Queue	0	0	0	2	627	397	0	181	0
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	2	717	375	3	814	Cont	1	392	150
AM NO BUILD Queue	2	726	316	3	824	256	1	397	199
AM BUILD Queue	2	726	316	3	824	256	1	398	208
Existing Lane Length	2	542	375	3	1,314	Cont	1	419	150
PM NO BUILD Queue	2	549	423	3	1,330	341	1	424	230
PM BUILD Queue	2	549	423	3	1,330	341	1	425	239
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

NOTE: Queue lengths are in feet.

Queueing calculations are based on HCM 6 Methodology (95th Percentile Confidence Level)

Queueing Recommendations: None. The eastbound left turn lanes cannot be extended due to physical constraints.

#6 – Comanche Rd. / Princeton Dr. – Pages A-50 thru A-82

The results of the analysis of the full access signalized intersection of Comanche Rd. / Princeton Dr. are summarized in the following table:

Intersection: 6 - Comanche Rd. / Princeton 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	A - 8.8	1	A - 8.8	L	1	A - 9.3	1	A - 9.3	
	T	2	A - 0.0	2	A - 0.0	T	2	A - 0.0	2	A - 0.0	
	R	>	A - 0.0	>	A - 0.0	R	>	A - 0.0	>	A - 0.0	
WB	L	1	A - 9.8	1	B - 10.6	L	1	A - 8.7	1	A - 9.1	
	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	
NB	L	>	C - 17.4	>	D - 27.7	L	>	C - 16.4	>	C - 24.9	
	T	1	C - 17.4	1	D - 27.7	T	1	C - 16.4	1	C - 24.9	
	R	>	C - 17.4	>	D - 27.7	R	>	C - 16.4	>	C - 24.9	
SB	L	>	B - 13.8	>	C - 22.9	L	>	B - 13.4	>	C - 16.9	
	T	1	B - 13.8	1	C - 22.9	T	1	B - 13.4	1	C - 16.9	
	R	>	B - 13.8	>	C - 22.9	R	>	B - 13.4	>	C - 16.9	
Intersection:		u - 1.1		u - 3.4		u - 1.2		u - 3.2			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

The 2019 analysis of the intersection of Comanche Rd. / Princeton Dr. demonstrates that the delays will be acceptable for all conditions analyzed in this report. Therefore, no recommendations are made for the intersection of Comanche Rd. / Princeton Dr. based on the levels-of-service analyses. However, it should be noted that the westbound queuing on Comanche Rd. at the I-25 East Ramp spills back through the intersection of Princeton Dr. This aspect of the intersection during the Peak Hour period makes the northbound left turn movement from Princeton Dr. onto Comanche westbound difficult. The northbound left turn movement off of Princeton Dr. will experience long delays during the Peak Hour period. Therefore, it is advisable to re-stripe the Princeton Dr. approach to Comanche with an exclusive left turn lane so as to allow the northbound right turn movement to occur more readily. The anticipated 95th Percentile northbound left turn queue length is just under 4 vehicles, so the northbound left turn lane should be designed and constructed to a length of 100 feet plus transition.

Additionally, it should be noted that the North I-25 Freeway Operations Study (2011) shows that the Comanche Rd. / I-25 Interchange is intended to be reconstructed in the future. The new

configuration incorporates a new westbound right turn lane on Comanche Rd. at the east ramp. This new right turn lane will reduce westbound queuing.

#7 – Driveway "A" / Princeton Dr. - Pages A-50 thru A-82

The results of the 2019 analyses of the signalized intersection of Driveway "A" / Princeton Dr. are summarized in the following tables:

Intersection: 7 - Driveway "A" / Princeton 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 - 0.0	1	C - 19.2	L	>	A - 0.0	1	B - 12.2	
	T		A - 0.0	1	B - 13.8	T	0	A - 0.0	1	B - 10.5	
	R	>	A - 0.0	>	B - 13.8	R	>	A - 0.0	>	B - 10.5	
WB	L	>	A - 9.7	1	C - 16.2	L	>	A - 9.0	1	B - 11.4	
	T		A - 0.0	1	B - 10.9	T	0	A - 0.0	1	A - 9.4	
	R	>	A - 9.7	>	B - 10.9	R	>	A - 9.0	>	A - 9.4	
NB	L	>	A - 0.0	>	A - 8.7	L	>	A - 0.0	>	A - 7.7	
	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	L	>	A - 7.4	>	A - 7.6	L	>	A - 7.4	>	A - 7.6	
	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	
Intersection:		u - 0.3		u - 1.8		u - 0.5		u - 1.8			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

Driveway "A" is proposed as a full access unsignalized driveway. The 2019 analysis of the intersection of Driveway "A" / Princeton 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. Therefore, no recommendations are made for the intersection of Driveway "A" / Princeton Dr.

#8 – Driveway “B” / Princeton Dr. - Pages A-50 thru A-82

The results of the 2019 analyses of the full access signalized intersection of Driveway “B” / Princeton Dr. are summarized in the following tables:

Intersection: 8 - Driveway “B” / Princeton 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 - 0.0	1	C - 18.6	L	>	A - 0.0	1	B - 11.9	
	T		A - 0.0	1	A - 0.0	T	0	A - 0.0	1	A - 9.3	
	R	>	A - 0.0	>	B - 11.8	R	>	A - 0.0	>	A - 9.3	
WB	L	>	B - 10.7	1	C - 17.3	L	>	A - 9.2	1	B - 11.7	
	T		A - 0.0	1	A - 0.0	T	0	A - 0.0	1	A - 9.1	
	R	>	B - 10.7	>	B - 10.6	R	>	A - 9.2	>	A - 9.1	
NB	L	>	A - 0.0	>	A - 8.6	L	>	A - 0.0	>	A - 7.7	
	T	1	A - 0.0	1	A - 0.0	T	1	A - 0.0	1	A - 0.0	
	R	>	A - 0.0	1	A - 0.0	R	>	A - 0.0	>	A - 0.0	
SB	L	>	A - 7.4	>	A - 7.4	L	>	A - 7.4	>	A - 7.4	
	T	1	A - 0.0	1	A - 0.0	T	1	A - 0.0	1	A - 0.0	
	R	>	A - 0.0	1	A - 0.0	R	>	A - 0.0	>	A - 0.0	
Intersection:		u = 0.3		u = 3.1		u = 0.7		u = 3.4			
Note: ">" designates a shared right or left turn lane.											
No Recommendation											

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

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. A summary of Levels-of-Service / Volumes / Intersection Geometry maps are included in the pages following the Recommendations for this study.

Access Design Specifications

Both proposed driveways for this development fall under the jurisdiction of the City of Albuquerque.

Comanche Rd. & Candelaria Rd. are also City of Albuquerque roadway facilities. The intersection of Comanche Rd. / Princeton is a long existing public roadway located approximately 400 feet east of the I-25 East Ramp (centerline to centerline). Comanche Rd. is classified as a Minor Arterial Roadway with a posted speed limit of 40 mph in the City of Albuquerque. Based on Table 18.C-1 (Access Spacing Standards for Intersections and Driveways) in the New Mexico Department of Transportation's State Access Management Manual, minimum intersection spacing along Comanche Rd. near the I-25 East Ramp should be a minimum of 325 feet (centerline to centerline). The intersection of Comanche Rd. / Princeton Dr. meets this minimum requirement.

Access to this retail commercial development is solely onto Princeton Dr. Princeton Dr. is required to be classified by the City as a major local roadway in order to provide access for a retail commercial facility. In order to qualify as a major local roadway the daily volumes on Princeton Dr. need to be in excess of 1,000 average daily traffic. Based on the volume data collected for Princeton Dr., the average daily traffic on Princeton Dr. south of Comanche is between 1,600 vpd and 2,400 vpd. New trips generated by the proposed Maverik Store will increase that volume slightly.

Summary of Deficiencies, Anticipated Impacts, and Recommendations

The existing 2019 analysis did not determine any significant deficiencies in the adjacent transportation system.

Recommendations:

Construct all improvements associated with the proposed Maverik Store including driveways and landscaping so as to preserve adequate sight distances along Princeton Dr. and along Comanche Rd.

Comanche Rd. / Carlisle Blvd. – Lengthen northbound left turn lane from 85 feet long to 130 feet long.

Comanche Rd. / I-25 West Ramp - Adjust signal timing during the PM Peak Hour period to add two (2) seconds to the westbound left turn phase and subtract 2 seconds from the eastbound thru phase.

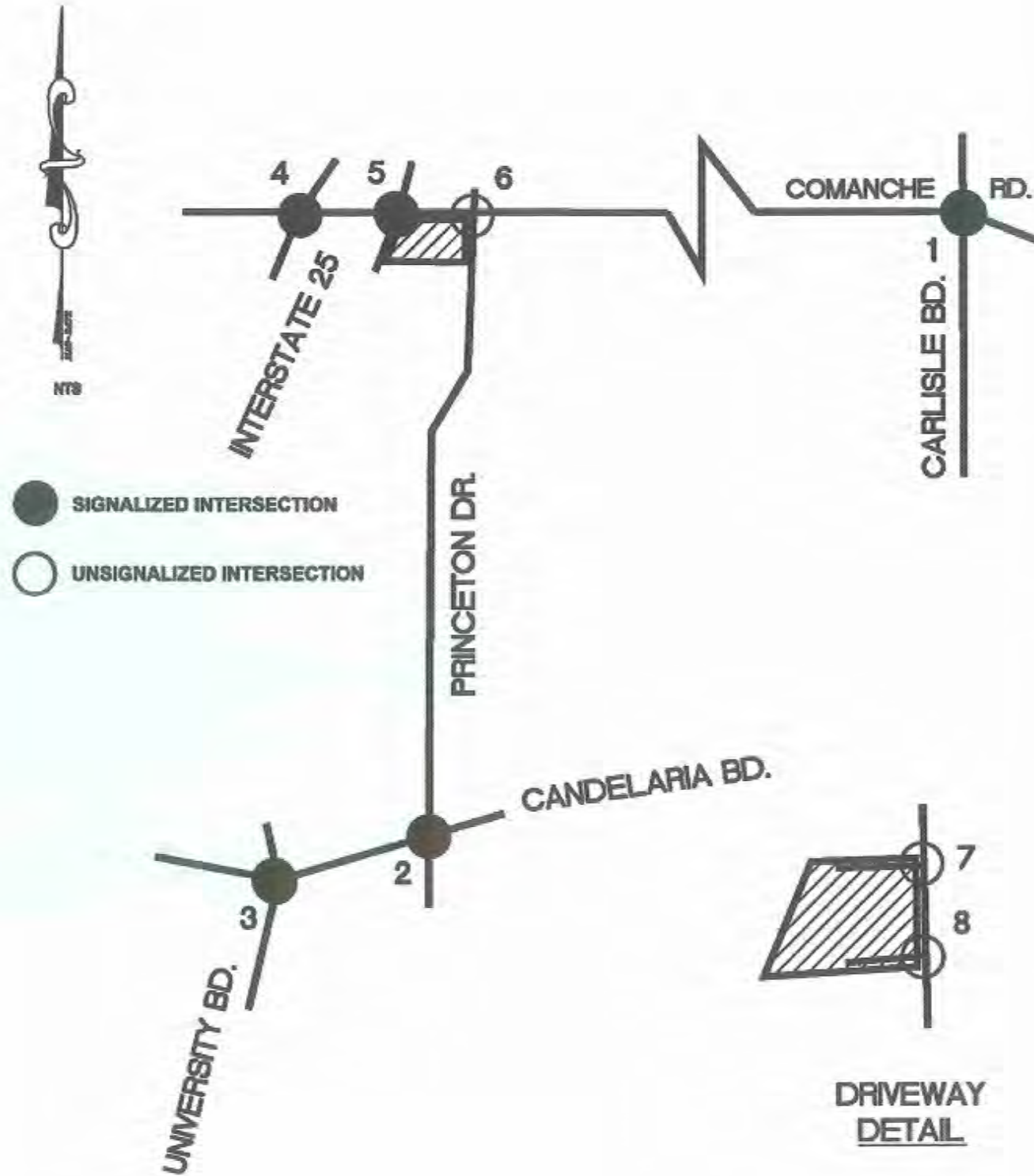
Comanche Rd. / Princeton Dr. – Stripe the Princeton St. approach (northbound) to Comanche Rd. to provide a 100 feet long northbound left turn lane.

Design and construct project to incorporate two full access driveways onto Princeton Dr. as depicted on the site development plan on Page A-3 in the Appendix of this report.

Appendix

<u>SITE INFORMATION</u>	
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APPENDIX



2019 NO BUILD Conditions	2019 BUILD Conditions	2019 BUILD Conditions (MITIGATED)
1: Carlisle Bd. & Comanche Rd. C(C) 25.9(28.7)	1: Carlisle Bd. & Comanche Rd. C(C) 26.4(29.2)	No Mitigation Needed
2: Princeton Dr. & Candelaria Bd. B(B) 14.1(10.9)	2: Princeton Dr. & Candelaria Bd. B(B) 13.0(10.4)	No Mitigation Needed
3: University Bd. & Candelaria Bd. B(C) 16.0(20.3)	3: University Bd. & Candelaria Bd. B(C) 16.0(20.4)	No Mitigation Needed
4: I-25 W. Ramp & Comanche Rd. C(C) 22.9(32.0)	4: I-25 W. Ramp & Comanche Rd. C(C) 23.2(32.0)	Adjust Signal Timing

Maverik Store
Comanche Rd. / Princeton Dr.
LOS / Volume Analysis Map

Maverik Convenience Store

(Comanche Rd. / Princeton Dr.)

Vicinity Map



For more details about the Integrated Development Ordinance visit: <http://www.cabq.gov/planning/codes-policies-regulations/integrated-development-ordinance>

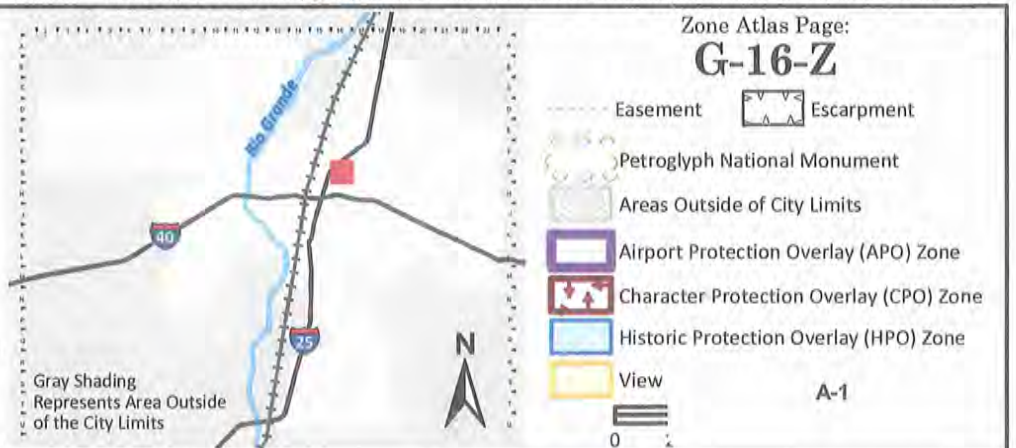
IDO Zone Atlas

May 2018



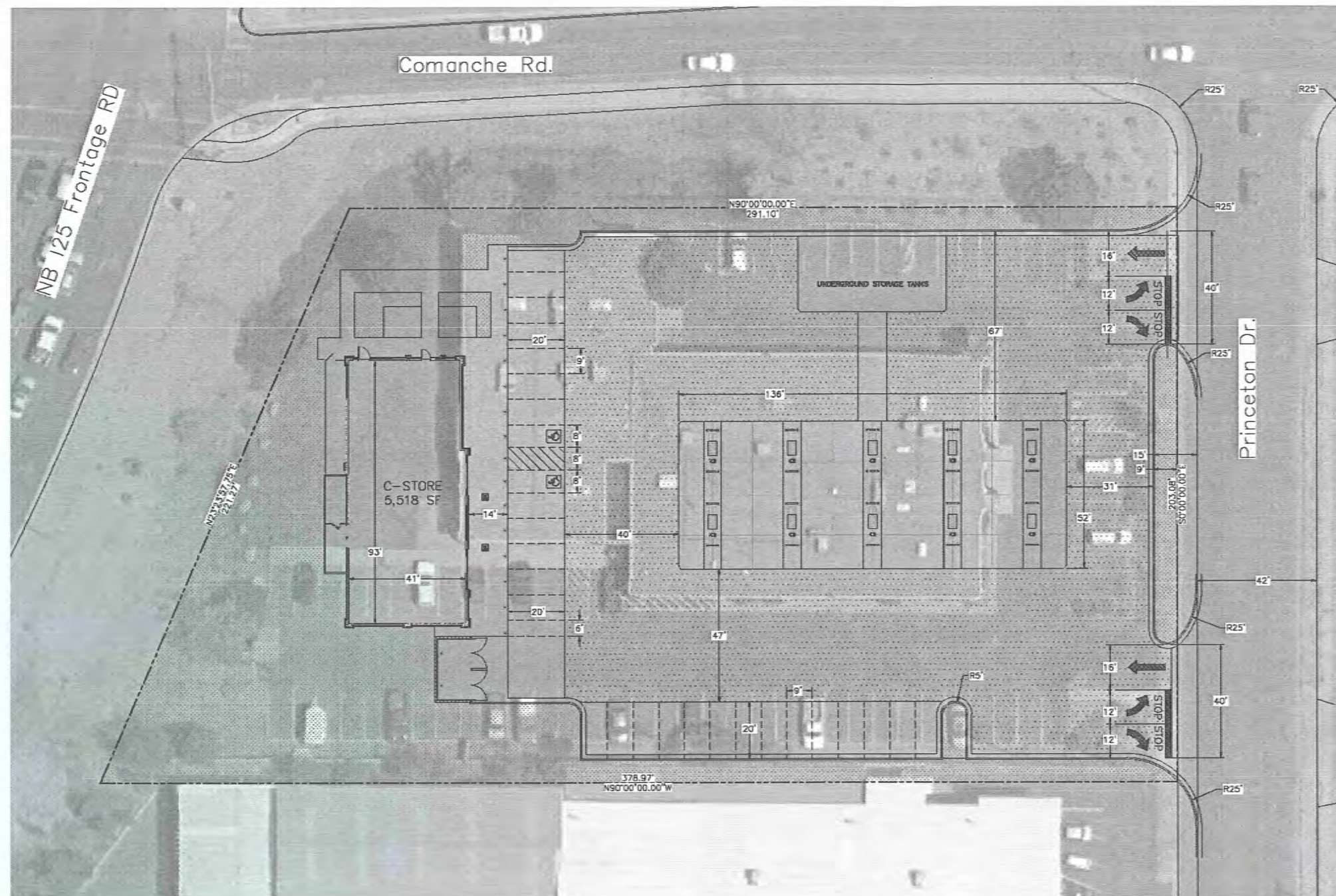
IDO Zoning information as of May 17, 2018

The Zone Districts and Overlay Zones are established by the Integrated Development Ordinance (IDO).





Maverik Convenience Store
(Comanche Rd. / Princeton Dr.)
Aerial Map



LEGAL DESCRIPTION

*0007 UNIT 6 SUBD OF POR CUTTER INDUSTRIAL PARK

NOTES

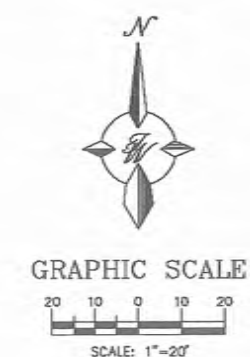
1. -

LEGEND

	CURB & GUTTER
	BOUNDARY LINE
	EASEMENT
	CENTERLINE
	RIGHT-OF-WAY
	BUILDING
	SIDEWALK
	SCREEN WALL
	RETAINING WALL
	STREET LIGHTS
	LANE
	STRIPING
	EXISTING CURB & GUTTER
	EXISTING BOUNDARY LINE
	EXISTING SIDEWALK
	EXISTING LANE
	EXISTING STRIPING

SITE DATA

PROPOSED USAGE:	GAS CONVENIENCE STORE
IDO CLASSIFICATION:	LIGHT VEHICLE FUELING STATION
LOT AREA:	68,037 SF (1.56 ACRES) (TBC)
BUILDING AREA:	5,518 SF
PARKING REQUIRED:	22 SPACES (4 SPACES PER 1,000 SF)
PARKING PROVIDED:	28 SPACES
HC PARKING REQUIRED:	2 SPACES
HC PARKING PROVIDED:	2 SPACES 1 SPACE VAN ACCESSIBLE
MC PARKING REQUIRED:	2 SPACES
MC PARKING PROVIDED:	2 SPACES
BICYCLE PARKING REQUIRED:	2 SPACES
BICYCLE PARKING PROVIDED:	2 SPACES
LANDSCAPE AREA REQUIRED:	10,205 SF
LANDSCAPE AREA PROVIDED:	17,270 SF



ENGINEER'S SEAL	Convenience Store w/Gasoline Stations	DRAWN BY
	Comanche And Princeton	RS
	OPTION A	DATE
	PRELIMINARY SITE PLAN	7/12/18
 TIERRA WEST, LLC 5571 MIDWAY PARK PLACE NE ALBUQUERQUE, NM 87109 (505) 555-3100 www.terrawestllc.com		DESIGN_REVISIONS_OPTION
		SHEET #
		C1
		JOB #
RONALD R. BOHANNAN P.E. #7868		2018039

2040 Long Range Roadway System

- Hand-drawn Corridor
- Interchange Corridor, Post 2040
- Interchange
- Regional Principal Arterial
- Community Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- Proposed Regional Principal Arterial
- Proposed Community Principal Arterial
- Proposed Minor Arterial
- Proposed Major Collector
- Proposed Minor Collector
- Proposed Regional Principal Arterial, Post 2040
- Proposed Community Principal Arterial, Post 2040
- Proposed Minor Arterial, Post 2040
- Proposed Major Collector, Post 2040
- Proposed Minor Collector, Post 2040

Legend

The 2040 Long Range Roadway System (LRS) is a conceptual plan for the future of the region's transportation infrastructure. It is based on the 2040 Long Range Transportation Plan (LRT) and the 2040 Long Range Land Use Plan (LRLU). The LRS is a conceptual plan and is not intended to be a final design. It is intended to provide a framework for the future of the region's transportation infrastructure. The LRS is a conceptual plan and is not intended to be a final design. It is intended to provide a framework for the future of the region's transportation infrastructure.

Notes

The 2040 Long Range Roadway System (LRS) is a conceptual plan for the future of the region's transportation infrastructure. It is based on the 2040 Long Range Transportation Plan (LRT) and the 2040 Long Range Land Use Plan (LRLU). The LRS is a conceptual plan and is not intended to be a final design. It is intended to provide a framework for the future of the region's transportation infrastructure.

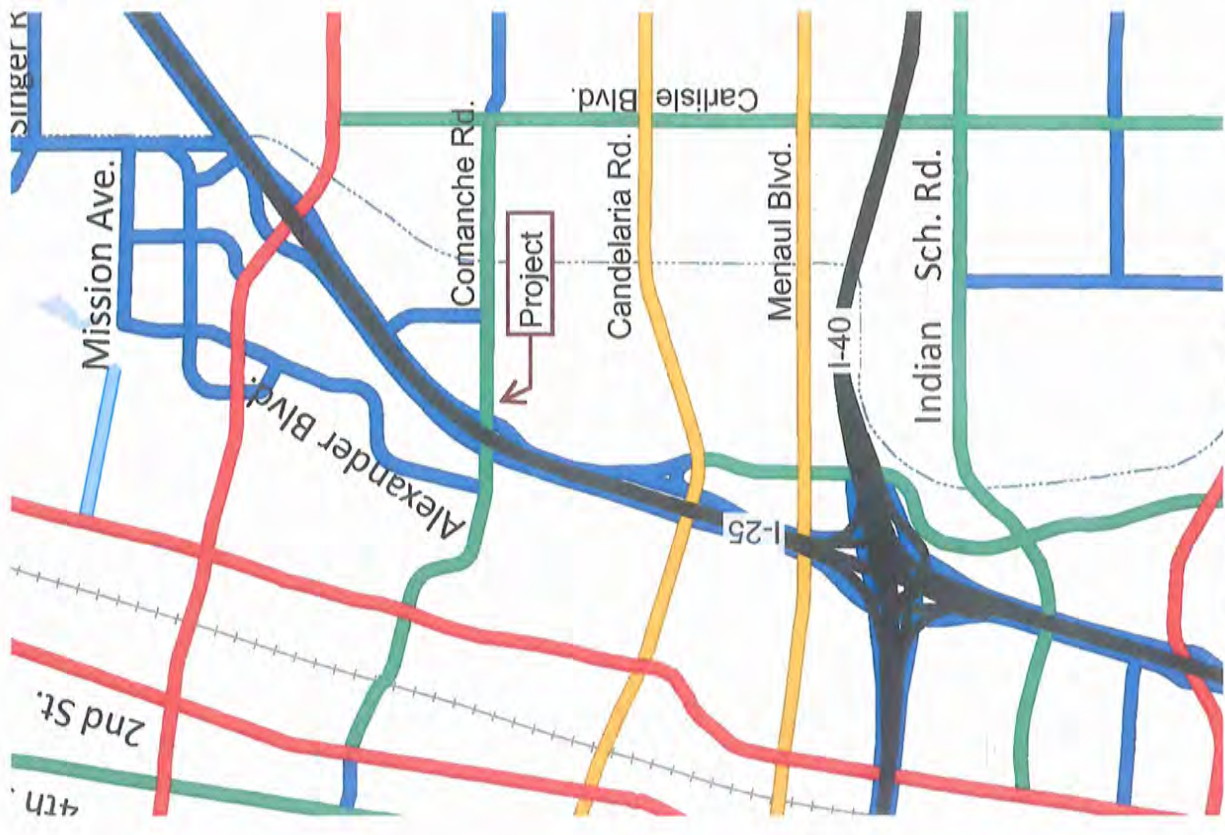
Map





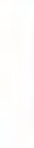
2040 Long Range Roadway System

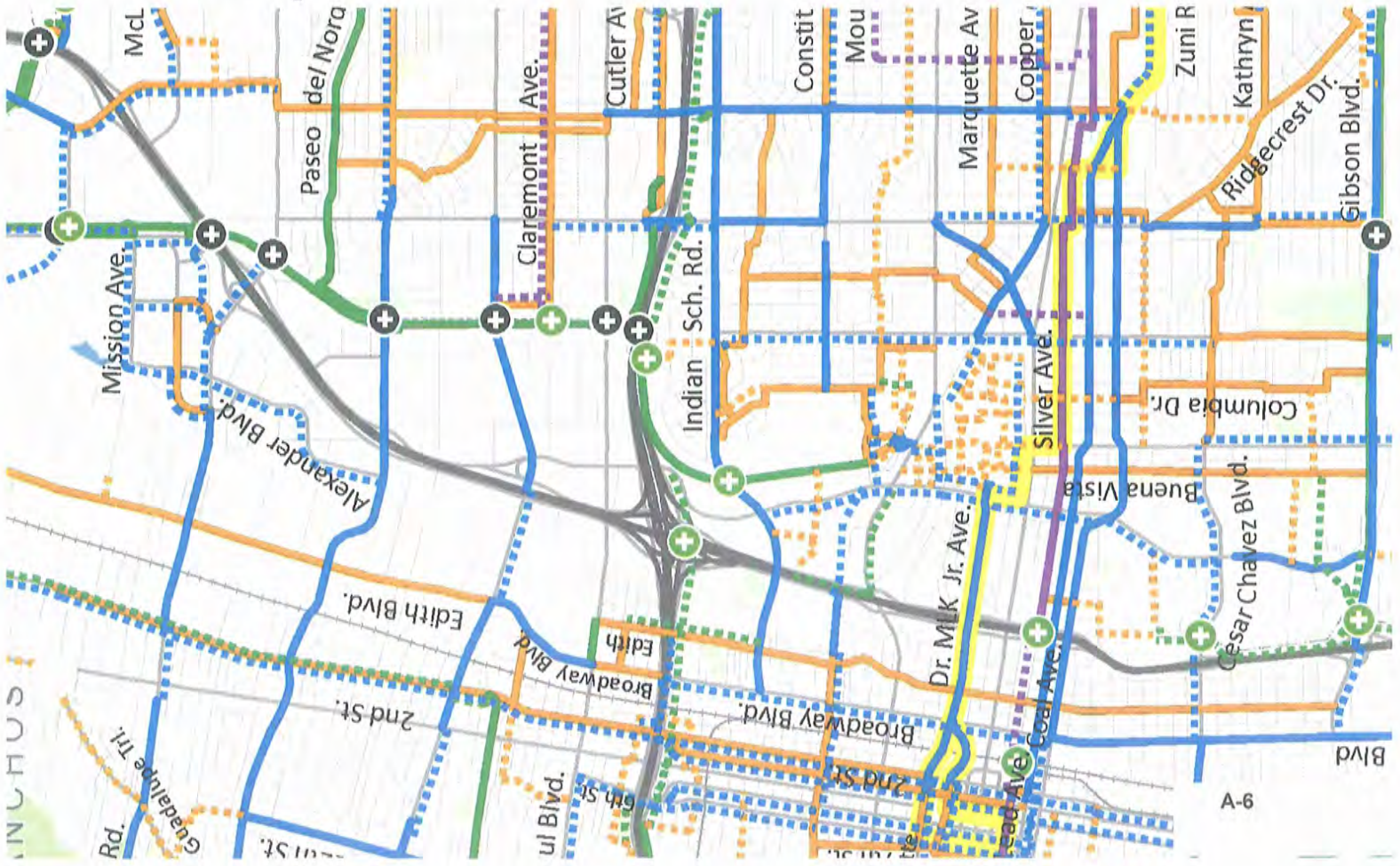
- ⊕ Interchange/Crossing
- ⊕ Interchange/Crossing, Post 2040
- Freeways
- Regional Principal Arterial
- Community Principal Arterial
- Minor Arterial
- Major Collector
- Minor Collector
- ⋯ Proposed Regional Principal Arterial
- ⋯ Proposed Community Principal Arterial
- ⋯ Proposed Minor Arterial
- ⋯ Proposed Major Collector
- ⋯ Proposed Minor Collector
- ⋯ Proposed Regional Principal Arterial, Post 2040
- ⋯ Proposed Community Principal Arterial, Post 2040
- ⋯ Proposed Minor Arterial, Post 2040
- ⋯ Proposed Major Collector, Post 2040
- ⋯ Proposed Minor Collector, Post 2040
- ⋯ Classification TBD, Post 2040



Portion of Futures 2040 Metropolitan Transportation Plan

2040 Long Range Bikeway System

-  Proposed Overpass/Underpass
-  Existing Overpass/Underpass
-  Existing, Bicycle Boulevard
-  Existing, Bicycle Lane
-  Existing, Bicycle Route
-  Existing, Paved Trail; Existing
-  Proposed, Bicycle Boulevard
-  Proposed, Bicycle Lane
-  Proposed, Bicycle Route
-  Proposed, Paved Trail
-  50 Mile Loop



*Proposed C-Store (Comanche Rd. / Princeton)
Trip Generation Data (ITE Trip Generation Manual - 10th Edition)*

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
	GROSS	ENTER	EXIT	ENTER	EXIT
Units					
	20	145	139	143	137

Gasoline / Service Station w/ Convenience Market (945)

Fueling Positions

ITE Trip Generation Equations:

Average Vehicle Trip Ends on a Weekday (24 HOUR TWO-WAY VOLUME)

$$T = 268.46 (X) + -1161$$

50% Enter, 50% Exit

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 7am and 9am (A.M. PEAK HOUR)

$$T = 19 (X) + -96.53$$

51% Enter, 49% Exit

Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4pm and 6pm (P.M. PEAK HOUR)

$$T = 13.99 (X) + 0$$

51% Enter, 49% Exit

Comments:
Tract No.

Based on ITE Trip Generation Manual - 10th Edition

**Table E.36 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period
Land Use Code 944—Gasoline/Service Station**

SIZE (1,000 SQ. FT. GFA)	VEHICLE FUELING POSITIONS	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
—	—	Chicago suburbs, IL	1987	48	3:00–7:00 p.m.	21	—	—	79	—	Kenig, O'Hara, Humes, Flock
—	—	Chicago suburbs, IL	1987	34	3:00–6:00 p.m.	25	—	—	75	—	Kenig, O'Hara, Humes, Flock
—	—	Chicago suburbs, IL	1987	42	3:00–6:00 p.m.	20	—	—	80	—	Kenig, O'Hara, Humes, Flock
2.3	6	Galithersburg, MD	1992	55	4:00–6:00 p.m.	40	11	49	60	2,760	RBA
2.1	6	Bethesda, MD	1992	30	4:00–6:00 p.m.	53	20	27	47	1,080	RBA
1.7	6	Wheaton, MD	1992	18	4:00–6:00 p.m.	61	6	33	39	2,510	RBA
2.0	8	Galithersburg, MD	1992	47	4:00–6:00 p.m.	62	23	15	38	2,635	RBA
1.2	6	Damascus, MD	1992	26	4:00–6:00 p.m.	58	11	31	42	1,020	RBA
0.3	12	Wheaton, MD	1992	52	4:00–6:00 p.m.	38	10	52	62	3,835	RBA

Average Pass-By Trip Percentage: 42

"—" means no data were provided

**Table E.37 Pass-By and Non-Pass-By Trips Weekday, AM Peak Period
Land Use Code 945—Gasoline/Service Station with Convenience Market**

SIZE (1,000 SQ. FT. GFA)	VEHICLE FUELING POSITIONS	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
0.8	8	Louisville area, KY	1993	61	7:00–9:00 a.m.	60	15	25	40	4,000	Barton- Aschman Assoc.
0.6	8	Louisville, KY	1993	48	7:00–9:00 a.m.	68	13	19	32	1,307	Barton- Aschman Assoc.
0.7	10	Louisville, KY	1993	47	7:00–9:00 a.m.	67	11	22	33	1,105	Barton- Aschman Assoc.
0.7	8	Louisville area, KY	1993	—	7:00–9:00 a.m.	56	22	22	44	1,211	Barton- Aschman Assoc.
0.7	10	Louisville area, KY	1993	—	7:00–9:00 a.m.	46	42	12	54	1,211	Barton- Aschman Assoc.
0.3	—	Louisville area, KY	1993	75	7:00–9:00 a.m.	72	15	13	28	—	Barton- Aschman Assoc.
0.8	8	Silver Spring, MD	1992	36	7:00–9:00 a.m.	47	14	39	53	3,095	RBA
0.4	8	Derwood, MD	1992	46	7:00–9:00 a.m.	75	0	25	25	3,770	RBA
2.2	8	Kensington, MD	1992	31	7:00–9:00 a.m.	47	34	19	53	1,785	RBA
1	8	Silver Spring, MD	1992	35	7:00–9:00 a.m.	78	9	13	22	7,080	RBA

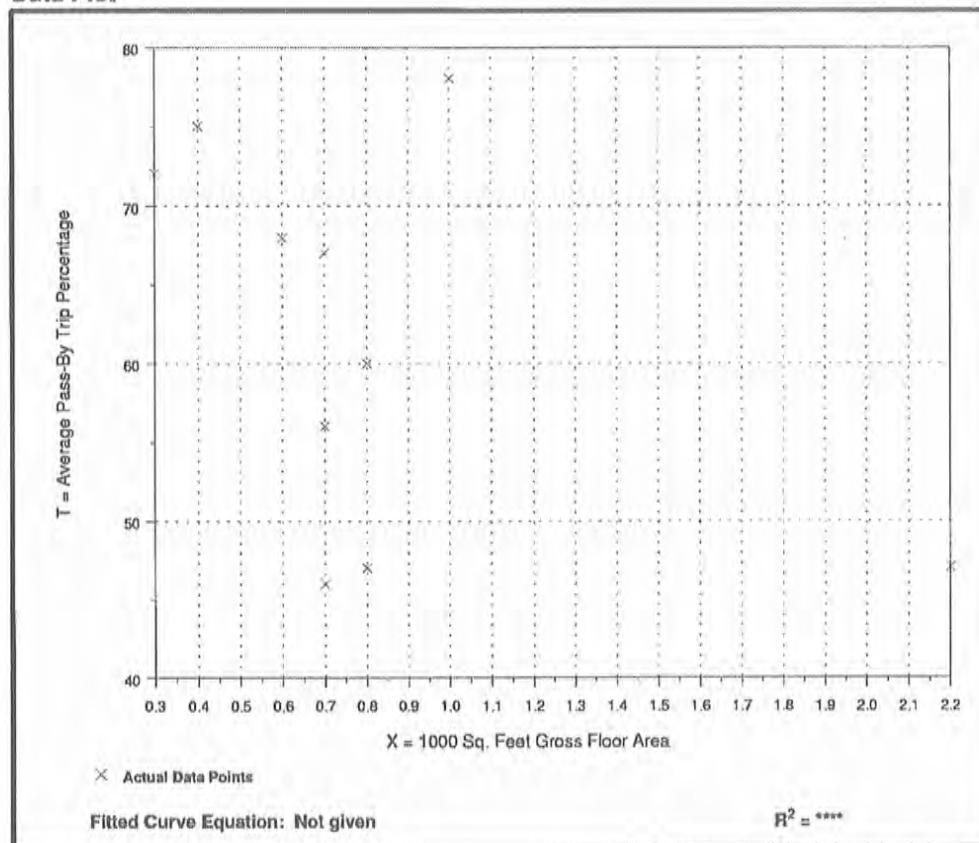
Average Pass-By Trip Percentage: 62

"—" means no data were provided

Figure E.18 Gasoline/Service Station with Convenience Market (945)

Average Pass-By-Trip Percentage vs: 1,000 Sq. Ft. Gross Floor Area
 On a: Weekday, AM Peak Period
 Number of Studies: 10
 Average 1,000 Sq. Ft. GFA: 0.8

Data Plot



**Table E.38 Pass-By and Non-Pass-By Trips Weekday, PM Peak Period
Land Use Code 945—Gasoline/Service Station with Convenience Market**

SIZE (1,000 SQ. FT. GFA)	VEHICLE FUELING POSITIONS	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PASS-BY TRIP (%)	NON-PASS-BY TRIPS (%)			ADJ. STREET PEAK HOUR VOLUME	SOURCE
							PRIMARY	DIVERTED	TOTAL		
0.8	8	Louisville area, KY	1993	83	4:00–6:00 p.m.	52	8	40	48	4,965	Barton- Aschman Assoc.
0.8	8	Louisville, KY	1993	60	4:00–6:00 p.m.	53	20	27	47	1,491	Barton- Aschman Assoc.
0.7	10	Louisville, KY	1993	—	4:00–6:00 p.m.	57	19	24	43	1,812	Barton- Aschman Assoc.
0.7	8	Louisville area, KY	1993	—	4:00–6:00 p.m.	72	7	21	28	2,657	Barton- Aschman Assoc.
0.7	10	Louisville area, KY	1993	—	4:00–6:00 p.m.	55	16	29	45	2,657	Barton- Aschman Assoc.
0.8	8	Silver Spring, MD	1992	36	4:00–6:00 p.m.	67	14	19	33	3,095	RBA
0.4	8	Derwood, MD	1992	46	4:00–6:00 p.m.	46	11	43	54	3,770	RBA
2.1	8	Kensington, MD	1992	31	4:00–6:00 p.m.	52	13	35	48	1,785	RBA
1	8	Silver Spring, MD	1992	35	4:00–6:00 p.m.	54	3	43	46	7,080	RBA

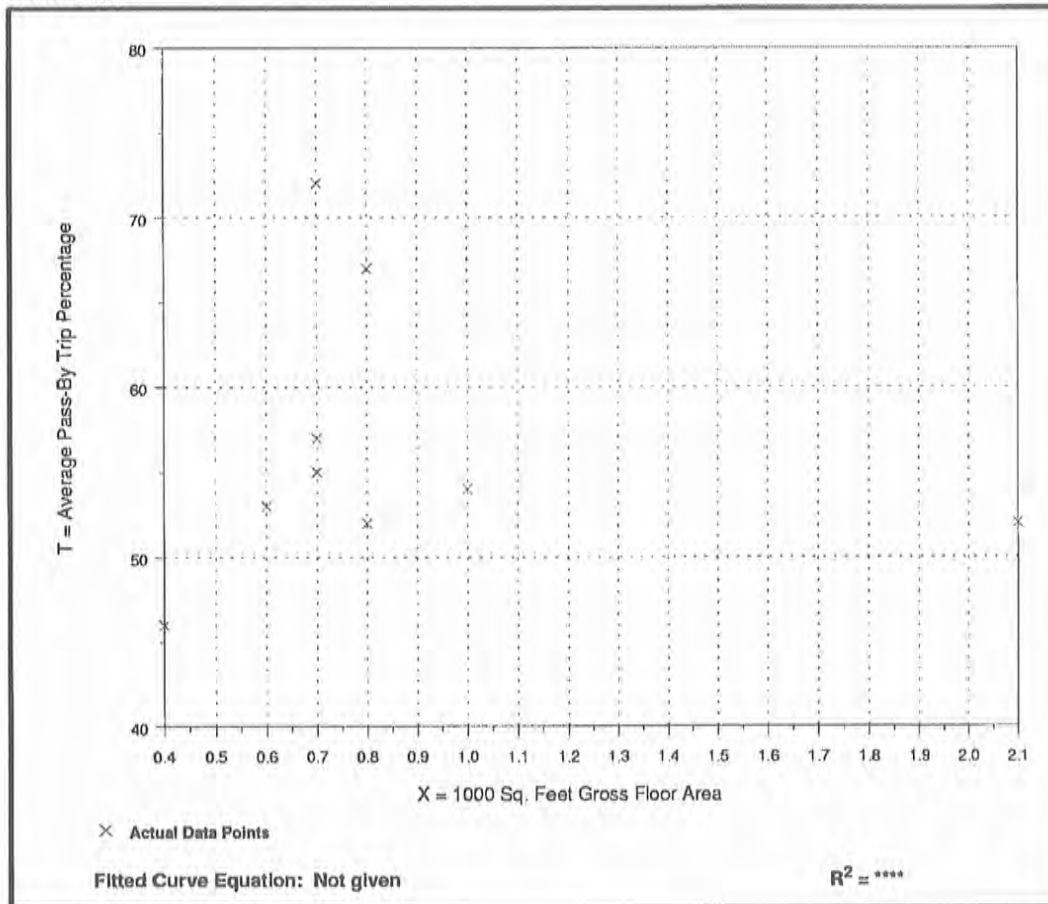
Average Pass-By Trip Percentage: 56

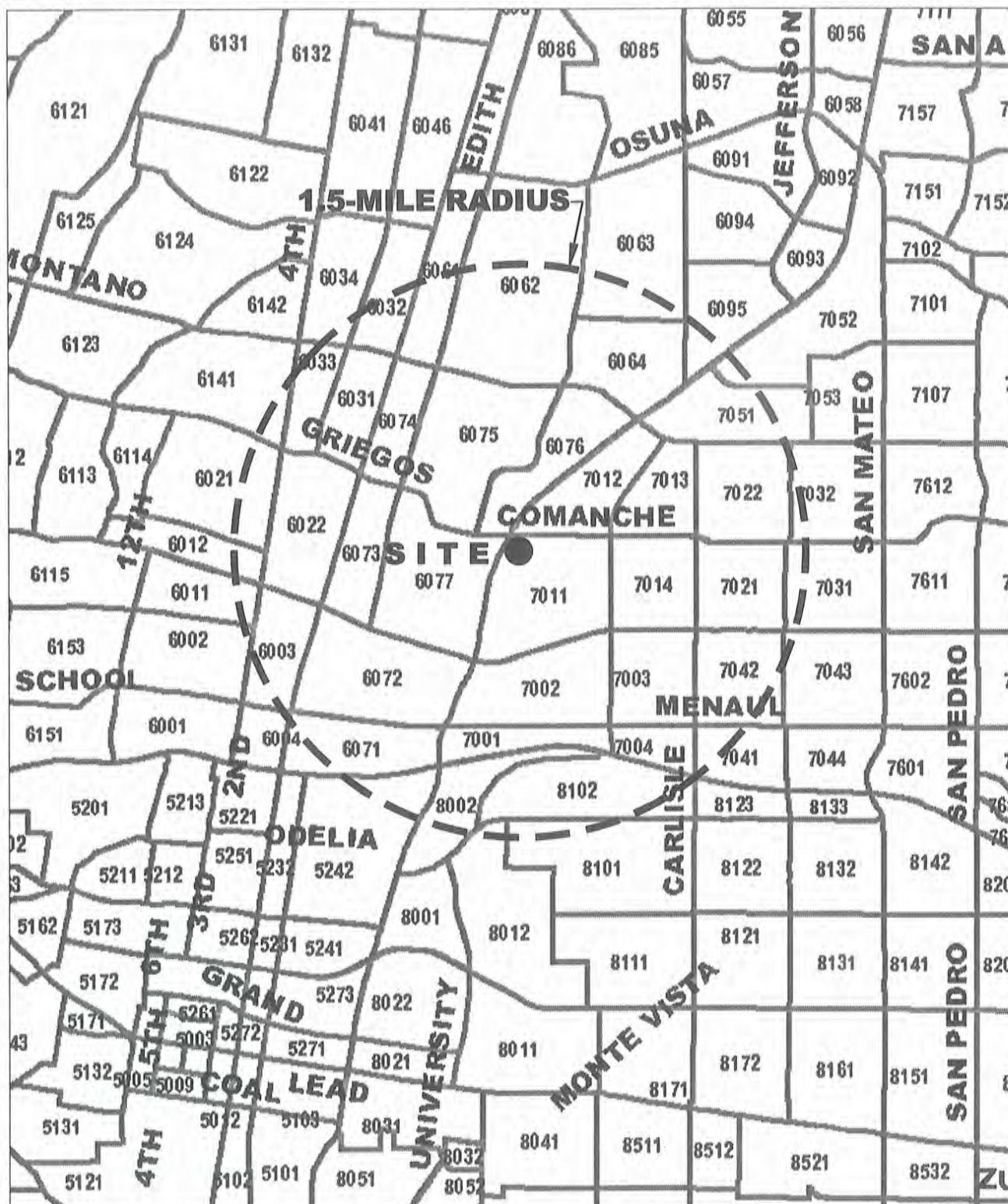
"—" means no data were provided

Figure E.19 Gasoline/Service Station with Convenience Market (945)

Average Pass-By-Trip Percentage vs: 1,000 Sq. Ft. Gross Floor Area
On a: Weekday, PM Peak Period
Number of Studies: 9
Average 1,000 Sq. Ft. GFA: 0.9

Data Plot





DATA ANALYSIS SUBZONE (DASZ) MAP

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Trip Distribution Table

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Data Analysis Subzone Population Data for Determination of Local Trip Distribution for Proposed Retail Commercial Trips

2012 and 2040 Data Taken from Mid-Region Council of Governments

2040 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

DASZ #	% Sub Area in Study	2012		2040 Population	Interpolated Population for the Year 2019	Population in Study	Percent Population	Carlisle Bld. North			Comanche Rd. East			Carlisle Bld. South		
		2012 Population	% Utilizing					% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing		
Boundary Specified on DASZ Map																
5242	10%	1473	1958	1,594	159	0.79%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6003	85%	607	723	636	541	2.70%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6011	10%	545	678	578	58	0.23%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6012	10%	1031	1031	1,031	103	0.51%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
8021	20%	2060	2275	2,114	423	2.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6022	100%	997	1079	1,018	1,018	5.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6031	100%	322	301	317	317	1.58%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6032	35%	597	626	604	211	1.05%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6033	95%	617	592	611	580	2.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6034	5%	593	800	587	29	0.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6061	50%	354	378	360	180	0.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6062	60%	1323	1733	1,426	856	4.28%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6063	15%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6064	100%	0	1967	492	492	2.46%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6071	85%	463	563	488	415	2.07%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6072	100%	471	550	491	491	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6073	100%	44	54	47	47	0.23%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6074	100%	42	43	42	42	0.21%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6075	100%	82	101	87	87	0.43%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6076	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6077	100%	290	377	312	312	1.55%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6095	10%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6141	5%	1999	2222	2,055	103	0.51%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7001	100%	0	16	4	4	0.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7002	100%	55	103	67	67	0.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7003	100%	125	201	144	144	0.72%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7004	100%	0	4	1	1	0.00%	0%	0.00%	0	0%	0.00%	0	100%	0.00%	1	
7011	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7012	100%	582	799	636	636	3.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7013	100%	1198	1230	1,206	1,206	6.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7014	100%	2145	2460	2,224	2,224	11.11%	0%	0.00%	0	50%	3.17%	634	50%	3.17%	634	
7021	100%	1285	1217	1,268	1,268	6.33%	0%	0.00%	0	50%	4.21%	844	0%	0.00%	0	
7022	100%	1668	1742	1,687	1,687	8.43%	0%	0.00%	0	50%	0.52%	105	0%	0.00%	0	
7031	10%	1976	2439	2,092	209	1.04%	0%	0.00%	0	100%	0.87%	175	0%	0.00%	0	
7032	10%	1649	2056	1,751	175	0.87%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7041	20%	201	236	210	42	0.21%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7042	90%	1104	1608	1,230	1,107	5.53%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7051	85%	3374	3960	3,495	2,972	14.85%	100%	14.85%	2,972	0%	0.00%	0	0%	0.00%	0	
7052	5%	0	3	1	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
8002	75%	418	745	500	375	1.87%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
8102	90%	1540	1760	1,595	1,436	7.17%	0%	0.00%	0	0%	0.00%	0	30%	2.15%	431	
						33,002	20,017	100.00%	3,816	19,08%	1,757	8.78%	1,066	5.32%	431	

Trip Distribution Table **Maverik Convenience Store (Comanche Rd. / Princeton Dr.)**

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed Retail Commercial 1

2012 and 2040 Data Taken from Mid-Region Council of Governments'
 2040 Socioeconomic Forecasts by Data Analysis Subzone for the Mid-Region of New Mexico

DASZ #	% Sub Area in Study	2012 Population	2040 Population	Interpolated Population for the Year 2019	Population in Study	Percent Population	Candelaria Bld. West			University Bld. North			(IS)		
							% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
Boundary Specified on DASZ Map															
5242	10%	1473	1958	1,594	159	0.79%	0%	0.00%	0	0%	0.00%	0	100%	0.79%	159
6003	85%	607	723	636	541	2.70%	100%	2.70%	541	0%	0.00%	0	0%	0.00%	0
6011	10%	545	678	578	58	0.29%	100%	0.29%	58	0%	0.00%	0	0%	0.00%	0
6012	10%	1031	1031	1,031	103	0.51%	100%	0.51%	103	0%	0.00%	0	0%	0.00%	0
6021	20%	2060	2275	2,114	423	2.11%	50%	1.06%	212	0%	0.00%	0	0%	0.00%	0
6022	100%	997	1079	1,018	1,018	5.09%	50%	2.54%	508	0%	0.00%	0	0%	0.00%	0
6031	100%	322	301	317	317	1.58%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6032	35%	597	626	604	211	1.05%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6033	95%	617	592	611	580	2.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6034	5%	583	600	587	29	0.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6061	50%	354	378	360	180	0.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6062	60%	1323	1733	1,426	856	4.28%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6063	15%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6064	100%	0	1967	492	492	2.46%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6071	85%	463	563	488	415	2.07%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6072	100%	471	550	491	491	2.45%	50%	1.23%	246	0%	0.00%	0	0%	0.00%	0
6073	100%	44	54	47	47	0.23%	50%	0.12%	24	0%	0.00%	0	0%	0.00%	0
6074	100%	42	43	42	42	0.21%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6075	100%	82	101	87	87	0.43%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6076	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6077	100%	290	377	312	312	1.56%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6095	10%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
6141	5%	1999	2222	2,055	103	0.51%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7001	100%	0	16	4	4	0.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7002	100%	55	103	67	67	0.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7003	100%	125	201	144	144	0.72%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7004	100%	0	4	1	1	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7011	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7012	100%	582	799	636	636	3.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7013	100%	1198	1230	1,206	1,206	6.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7014	100%	2145	2460	2,224	2,224	11.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7021	100%	1285	1217	1,268	1,268	6.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7022	100%	1668	1742	1,687	1,687	8.43%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7031	10%	1976	2439	2,092	209	1.04%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7032	10%	1649	2056	1,751	175	0.87%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7041	20%	201	236	210	42	0.21%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7042	90%	1104	1608	1,230	1,107	5.53%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7051	85%	3374	3860	3,496	2,972	14.85%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
7052	5%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
8002	75%	418	745	500	375	1.97%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
8102	90%	1540	1760	1,595	1,436	7.17%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
						100.00%	0%	0.00%	1,692	0%	0.00%	1,692	0.00%	0.79%	169
									8.45%						

Trip Distribution Table Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Data Analysis Subzone Population Data for determination of Local Trip Distribution for Proposed **Retail Commercial 1**

2012 and 2040 Data Taken from Mid-Region Council of Governments'

2040 Socioeconomic Forecasts by Data Analysis Subzone for the Mid-Region of New Mexico

DASZ #	% Sub Area in Study	2012 Population	2040 Population	Interpolated Population for the Year 2019	Population in Study	Percent Population	Comanche Rd. West			Interstate 25 North			Pinecroft Dr. North			
							% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	
Boundary Specified on DASZ Map																
5242	10%	1473	1953	1594	159	0.79%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6003	85%	607	723	636	541	2.70%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6011	10%	545	678	578	58	0.29%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6012	10%	1031	1031	1031	103	0.51%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6021	20%	2060	2275	2114	423	2.11%	50%	1.06%	212	0%	0.00%	0	0%	0.00%	0	
6022	100%	997	1079	1018	1,018	5.09%	50%	2.54%	509	0%	0.00%	0	0%	0.00%	0	
6031	100%	322	301	317	317	1.58%	50%	0.79%	159	50%	0.79%	159	0%	0.00%	0	
6032	35%	597	626	604	211	1.05%	0%	0.00%	0	100%	1.05%	211	0%	0.00%	0	
6033	95%	617	592	611	580	2.90%	50%	1.45%	290	50%	1.45%	290	0%	0.00%	0	
6034	5%	583	600	587	29	0.14%	0%	0.00%	0	100%	0.14%	29	0%	0.00%	0	
6061	50%	354	378	360	180	0.90%	0%	0.00%	0	100%	0.90%	180	0%	0.00%	0	
6062	60%	1323	1733	1426	856	4.28%	0%	0.00%	0	100%	4.28%	856	0%	0.00%	0	
6063	15%	0	0	0	0	0.00%	0%	0.00%	0	100%	0.00%	0	0%	0.00%	0	
6064	100%	0	1967	492	492	2.46%	0%	0.00%	0	100%	2.46%	492	0%	0.00%	0	
6071	85%	463	563	488	415	2.07%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6072	100%	471	550	491	491	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
6073	100%	44	54	47	47	0.23%	50%	0.12%	24	0%	0.00%	0	0%	0.00%	0	
6074	100%	42	43	42	42	0.21%	100%	0.21%	42	0%	0.00%	0	0%	0.00%	0	
6075	100%	82	101	87	87	0.43%	100%	0.43%	87	0%	0.00%	0	0%	0.00%	0	
6076	100%	0	0	0	0	0.00%	0%	0.00%	0	100%	0.00%	0	0%	0.00%	0	
6077	100%	290	377	312	312	1.56%	100%	1.56%	312	0%	0.00%	0	0%	0.00%	0	
6095	10%	0	0	0	0	0.00%	0%	0.00%	0	100%	0.00%	0	0%	0.00%	0	
6141	5%	1999	2222	2055	103	0.51%	100%	0.51%	103	0%	0.00%	0	0%	0.00%	0	
7001	100%	0	16	4	4	0.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7002	100%	55	103	67	67	0.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7003	100%	125	201	144	144	0.72%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7004	100%	0	4	1	1	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7011	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7012	100%	582	799	636	636	3.18%	0%	0.00%	0	0%	0.00%	0	100%	3.18%	636	
7013	100%	1198	1230	1206	1,206	6.02%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7014	100%	2145	2460	2224	2,224	11.11%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7021	100%	1285	1217	1268	1,268	6.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7022	100%	1669	1742	1687	1,687	8.43%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7031	10%	1976	2439	2092	209	1.04%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7032	10%	1649	2056	1751	175	0.87%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7041	20%	201	236	210	42	0.21%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7042	90%	1104	1608	1230	1,107	5.53%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7051	85%	3374	3860	3496	2,972	14.85%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
7052	5%	0	3	1	0	0.00%	0%	0.00%	0	100%	0.00%	0	0%	0.00%	0	
8002	75%	418	745	500	375	1.87%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
8102	90%	1540	1760	1595	1,436	7.17%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0	
					33,002	20,017	100.00%									
								1,737	8.68%	2,217	11.07%				636	3.18%

Trip Distribution Table Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Data Analysis Subzone Population Data for delimitation of Local Trip Distribution for Proposed Retail Commercial 1

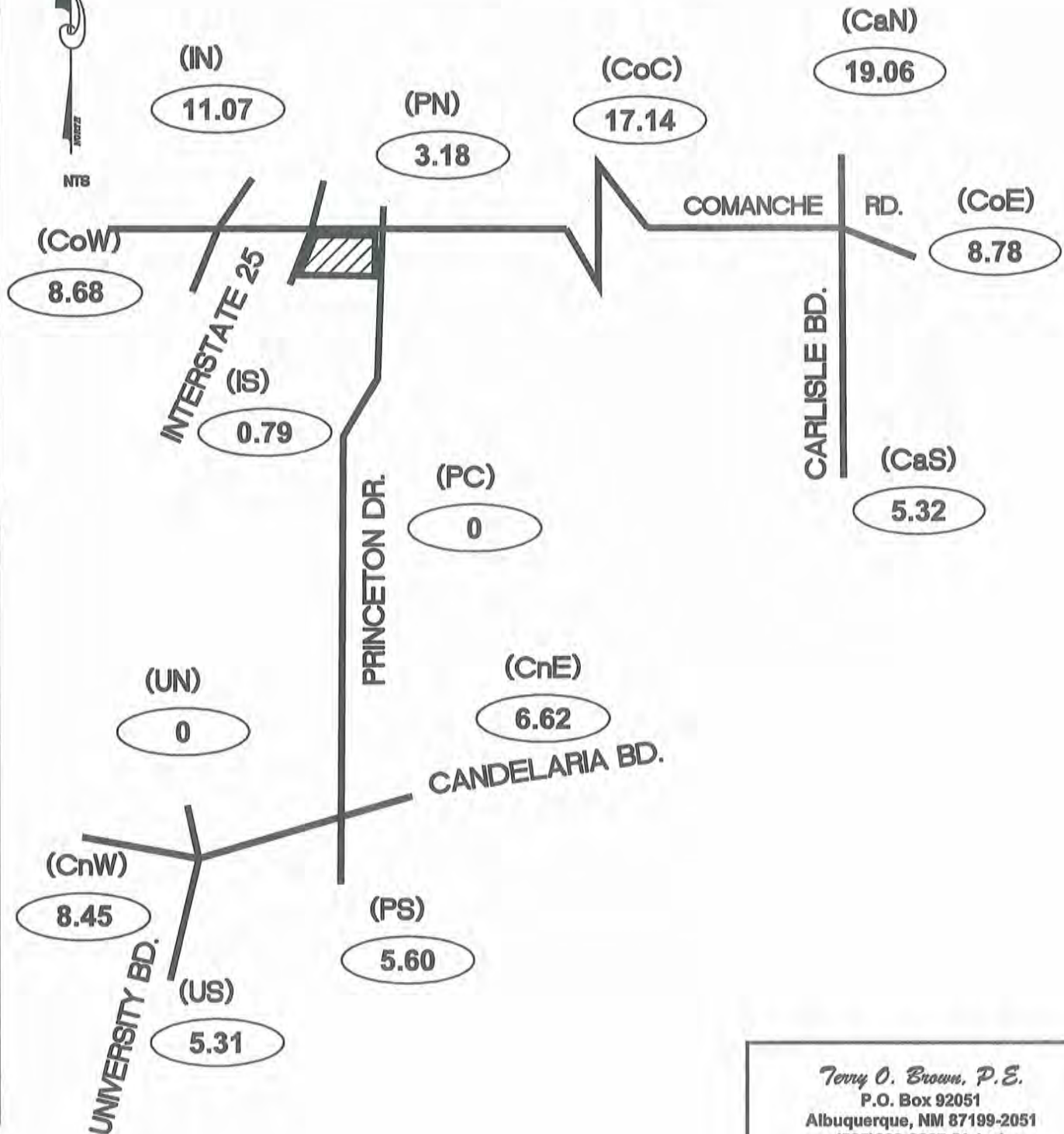
2012 and 2040 Data Taken from Mid-Region Council of Governments'
2040 Socioeconomic Forecasts by Data Analysis Subzone for the Mid-Region of New Mexico

DASZ #	% Sub Area in Study	2012 Population on DASZ Map	2040 Population	Interpolated Population for the Year 2019	Population in Study	Percent Population	(PC)			(CoC)		
							% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
Boundary Specified on DASZ Map												
5242	10%	1473	1958	1,594	159	0.79%	0%	0.00%	0	0%	0.00%	0
6003	85%	607	723	636	541	2.70%	0%	0.00%	0	0%	0.00%	0
6011	10%	545	678	578	58	0.29%	0%	0.00%	0	0%	0.00%	0
6012	10%	1031	1031	1,031	103	0.51%	0%	0.00%	0	0%	0.00%	0
6021	20%	2060	2275	2,114	423	2.11%	0%	0.00%	0	0%	0.00%	0
6022	100%	997	1079	1,018	1,018	5.09%	0%	0.00%	0	0%	0.00%	0
6031	100%	322	301	317	317	1.58%	0%	0.00%	0	0%	0.00%	0
6032	35%	597	626	604	211	1.05%	0%	0.00%	0	0%	0.00%	0
6033	95%	617	592	611	580	2.90%	0%	0.00%	0	0%	0.00%	0
6034	5%	583	600	587	29	0.14%	0%	0.00%	0	0%	0.00%	0
6061	50%	354	378	360	180	0.90%	0%	0.00%	0	0%	0.00%	0
6062	80%	1323	1733	1,426	856	4.28%	0%	0.00%	0	0%	0.00%	0
6063	15%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0
6064	100%	0	1967	492	492	2.45%	0%	0.00%	0	0%	0.00%	0
6071	85%	463	563	488	415	2.07%	0%	0.00%	0	0%	0.00%	0
6072	100%	471	550	491	491	2.45%	0%	0.00%	0	0%	0.00%	0
6073	100%	44	54	47	47	0.23%	0%	0.00%	0	0%	0.00%	0
6074	100%	42	43	42	42	0.21%	0%	0.00%	0	0%	0.00%	0
6075	100%	82	101	87	87	0.43%	0%	0.00%	0	0%	0.00%	0
6076	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0
6077	100%	250	377	312	312	1.58%	0%	0.00%	0	0%	0.00%	0
6095	10%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0
6141	5%	1989	2222	2,055	103	0.51%	0%	0.00%	0	0%	0.00%	0
7001	100%	0	16	4	4	0.02%	0%	0.00%	0	0%	0.00%	0
7002	100%	55	103	67	67	0.33%	0%	0.00%	0	0%	0.00%	0
7003	100%	125	201	144	144	0.72%	0%	0.00%	0	0%	0.00%	0
7004	100%	0	4	1	1	0.00%	100%	0.00%	0	0%	0.00%	0
7011	100%	0	0	0	0	0.00%	0%	0.00%	0	0%	0.00%	0
7012	100%	582	799	636	636	3.18%	0%	0.00%	0	0%	0.00%	0
7013	100%	1198	1230	1,208	1,208	6.02%	0%	0.00%	0	100%	6.02%	1,208
7014	100%	2145	2460	2,224	2,224	11.11%	0%	0.00%	0	100%	11.11%	2,224
7021	100%	1285	1217	1,268	1,268	6.33%	0%	0.00%	0	0%	0.00%	0
7022	100%	1668	1742	1,687	1,687	8.43%	0%	0.00%	0	0%	0.00%	0
7031	10%	1976	2439	2,092	209	1.04%	0%	0.00%	0	0%	0.00%	0
7032	10%	1649	2056	1,751	175	0.87%	0%	0.00%	0	0%	0.00%	0
7041	20%	201	236	210	42	0.21%	0%	0.00%	0	0%	0.00%	0
7042	90%	1104	1608	1,230	1,107	5.53%	0%	0.00%	0	0%	0.00%	0
7051	85%	3374	3860	3,496	2,972	14.85%	0%	0.00%	0	0%	0.00%	0
7052	5%	0	3	1	0	0.00%	0%	0.00%	0	0%	0.00%	0
8002	75%	418	745	500	375	1.87%	0%	0.00%	0	0%	0.00%	0
8102	90%	1540	1760	1,595	1,438	7.17%	0%	0.00%	0	0%	0.00%	0
						100.00%	0%	0.00%	0	0%	0.00%	0
						33,002	20,017	0.00%	0	0%	0.00%	0
												3,430
												17.14%

Maverik Convenience Store

(Comanche Rd. / Princeton Dr.)

Trip Distribution Map (%)



Terry O. Brown, P.E.

P.O. Box 92051

Albuquerque, NM 87199-2051

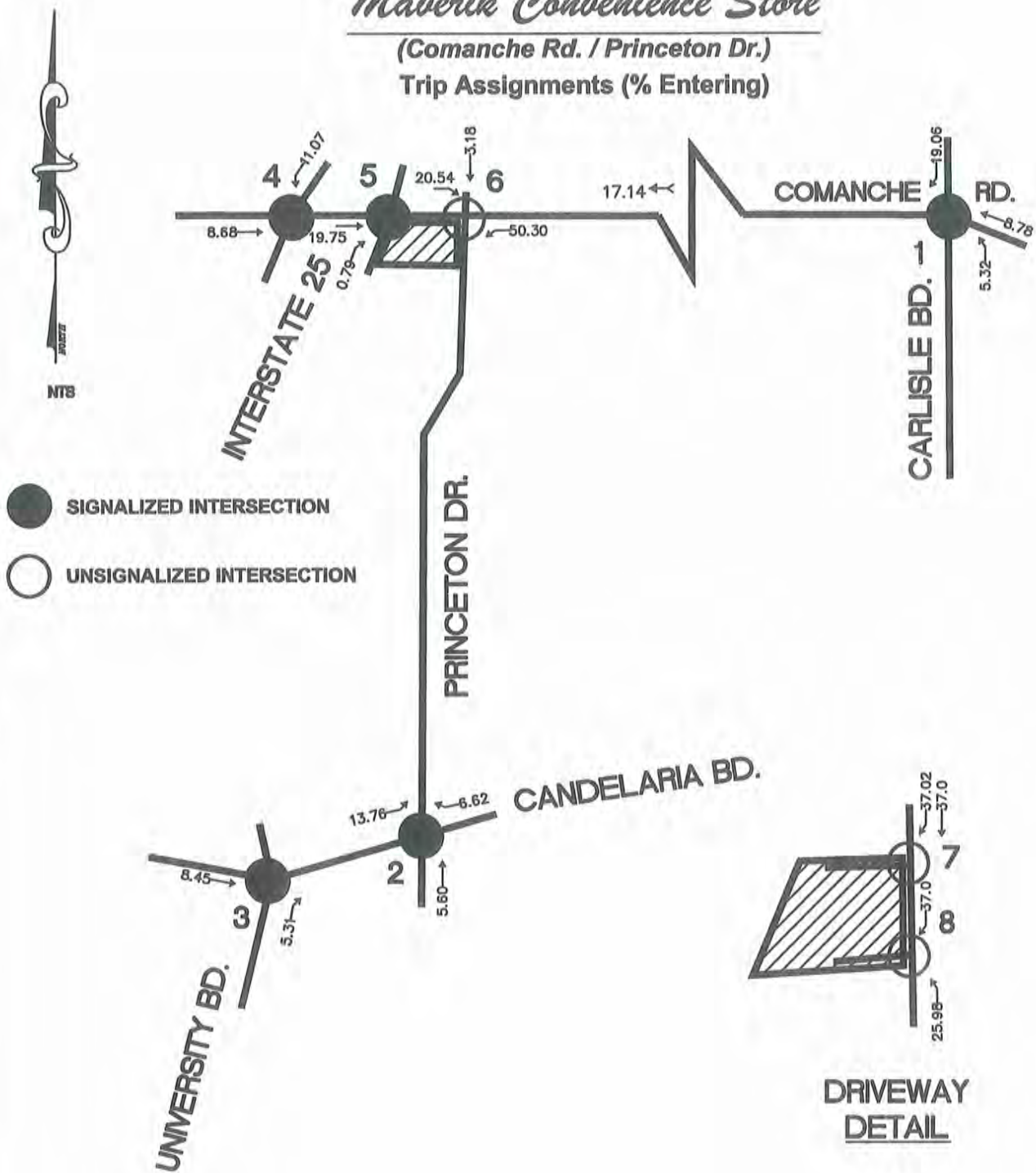
(505)883-8807 (Voice)

(505)212-0267 (Fax)

Maverik Convenience Store

(Comanche Rd. / Princeton Dr.)

Trip Assignments (% Entering)

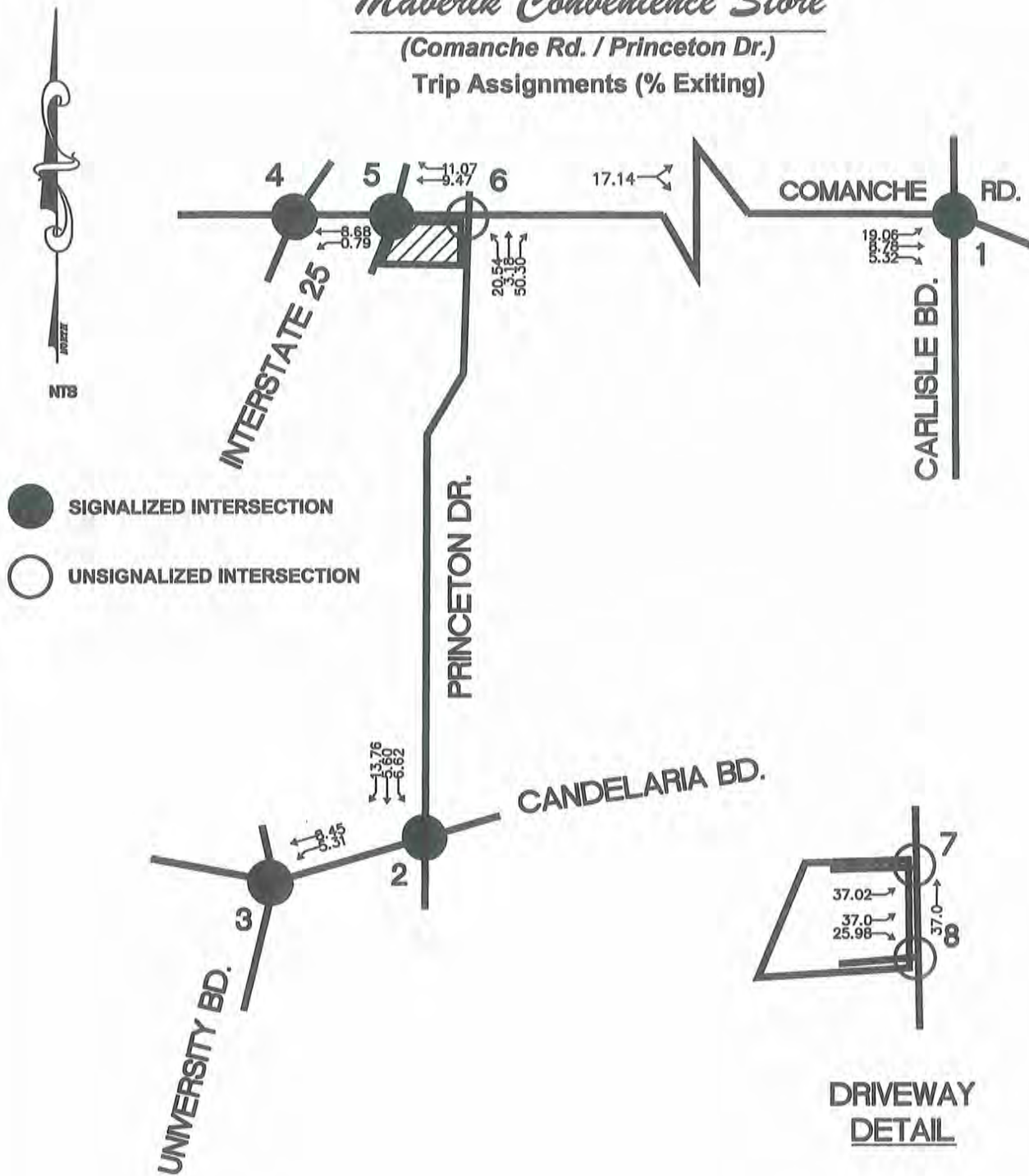


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Maverik Convenience Store

(Comanche Rd. / Princeton Dr.)

Trip Assignments (% Exiting)



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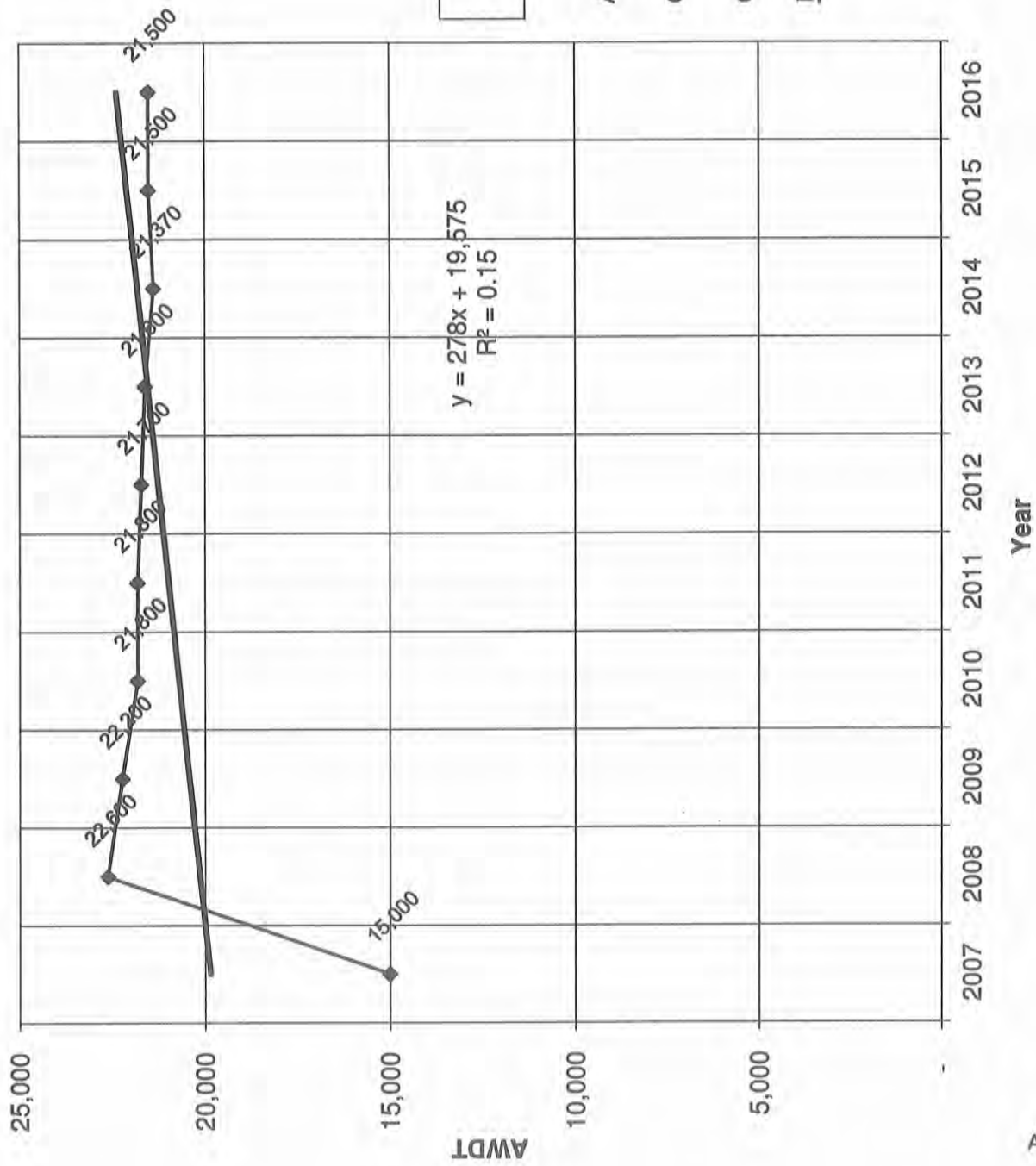
Maverik Gas Station / Convenience Store (Comanche Rd. / Princeton Dr.)

Historic Growth Rate Table

Traffic Flows from MRCOG Map

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Carlisle Bd. North of Comanche Rd.	15,000	22,600	22,200	21,800	21,800	21,700	21,600	21,370	21,500	21,500
Comanche Rd. East of Carlisle Bd.	8,300	8,700	8,500	8,400	8,400	8,300	8,300	8,780	8,800	8,800
Carlisle Bd. South of Comanche Rd.	24,900	24,000	23,600	22,400	22,500	23,100	23,000	22,400	22,100	22,200
Comanche Rd. West of Carlisle Bd.	14,500	15,200	14,900	14,700	14,700	14,600	14,600	16,330	16,400	16,400
Comanche Rd. East of Interstate 25	24,000	24,100	23,700	23,400	20,400	20,300	20,300	20,700	20,800	20,800
Candelaria Rd. East of Princeton Dr.	19,300	17,900	17,600	17,400	16,100	16,000	16,000	17,900	18,000	18,000
Interstate 25 South of Candelaria Rd.	189,700	174,000	172,700	168,300	193,900	188,100	190,100	176,300	204,000	202,000
Interstate 25 btwn Candelaria & Comanche	189,700	174,000	172,700	168,300	193,900	188,100	190,100	176,300	204,000	202,000
Comanche Rd. West of Interstate 25	17,500	18,800	18,700	18,500	16,900	16,700	16,500	16,300	19,600	19,700
Interstate 25 North of Comanche Rd.	193,100	182,700	180,800	174,900	182,800	182,100	179,400	164,300	176,100	179,800

Historic Growth Chart Carlisle Bd. North of Comanche Rd. (2007-2016)



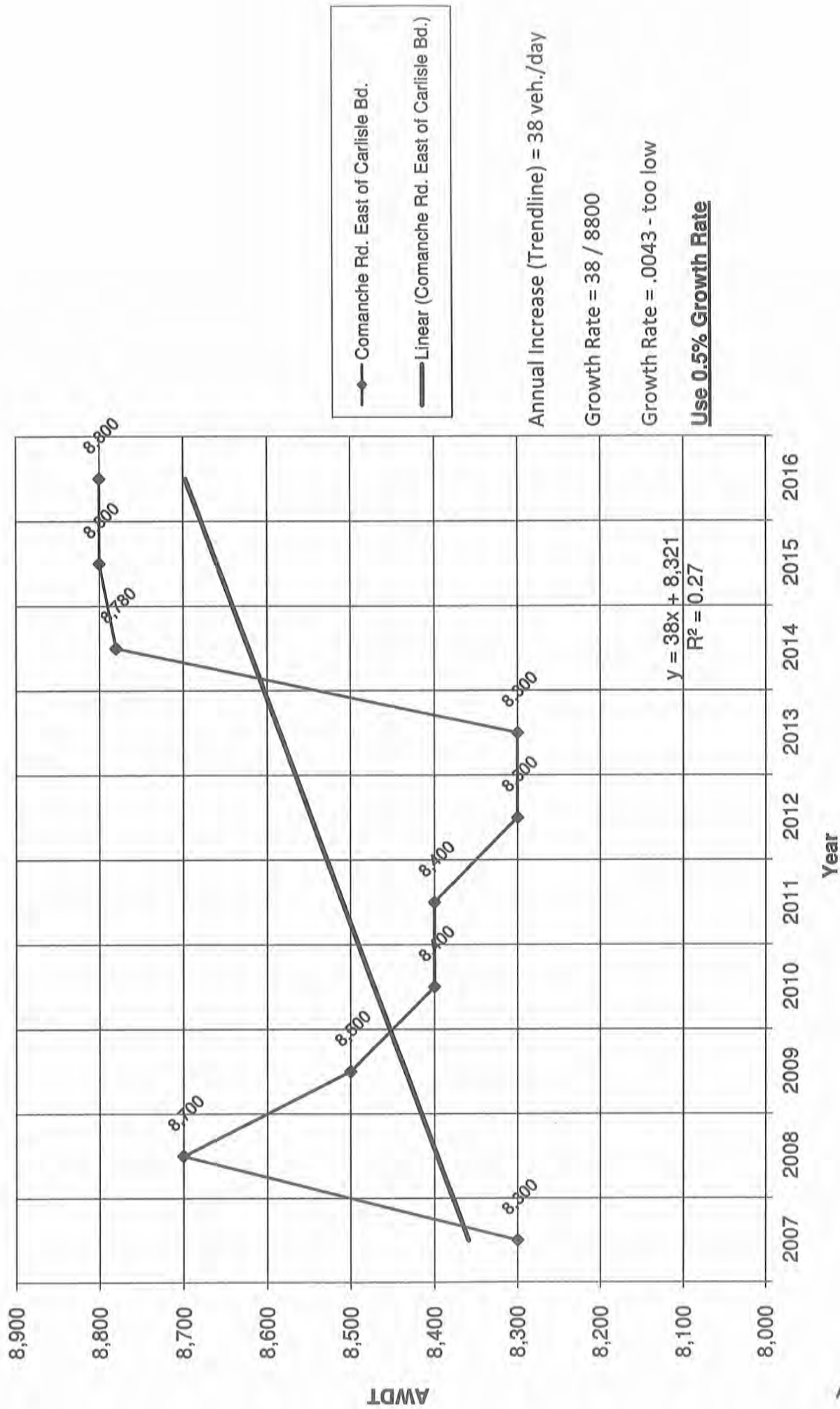
$$y = 278x + 19,575$$

$$R^2 = 0.15$$

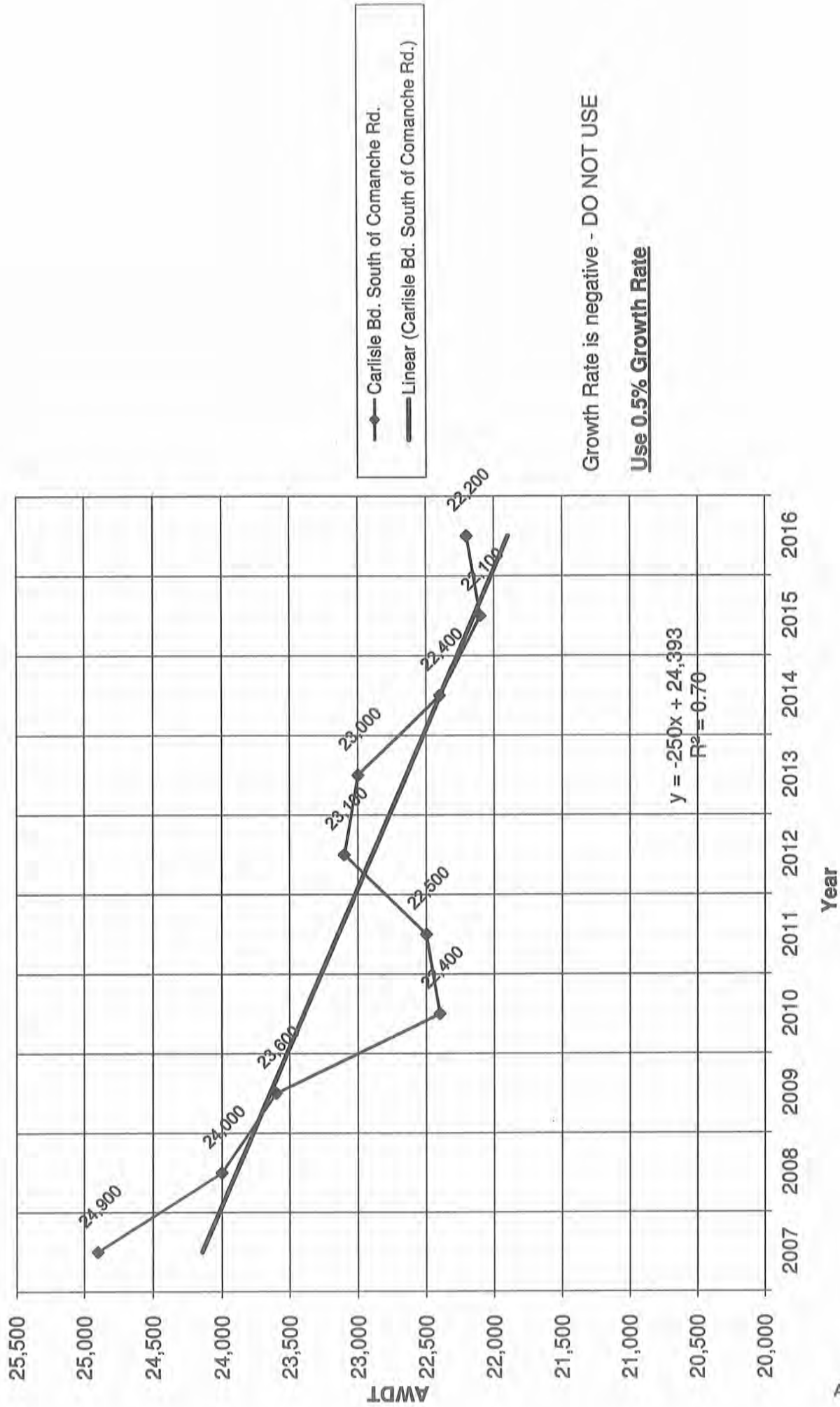
—◆— Carlisle Bd. North of Comanche Rd.
 — Linear (Carlisle Bd. North of Comanche Rd.)

Annual Increase (Trendline) = 278 veh./day
 Growth Rate = 278 / 21500
 Growth Rate = .0129
Use 1.3% Growth Rate

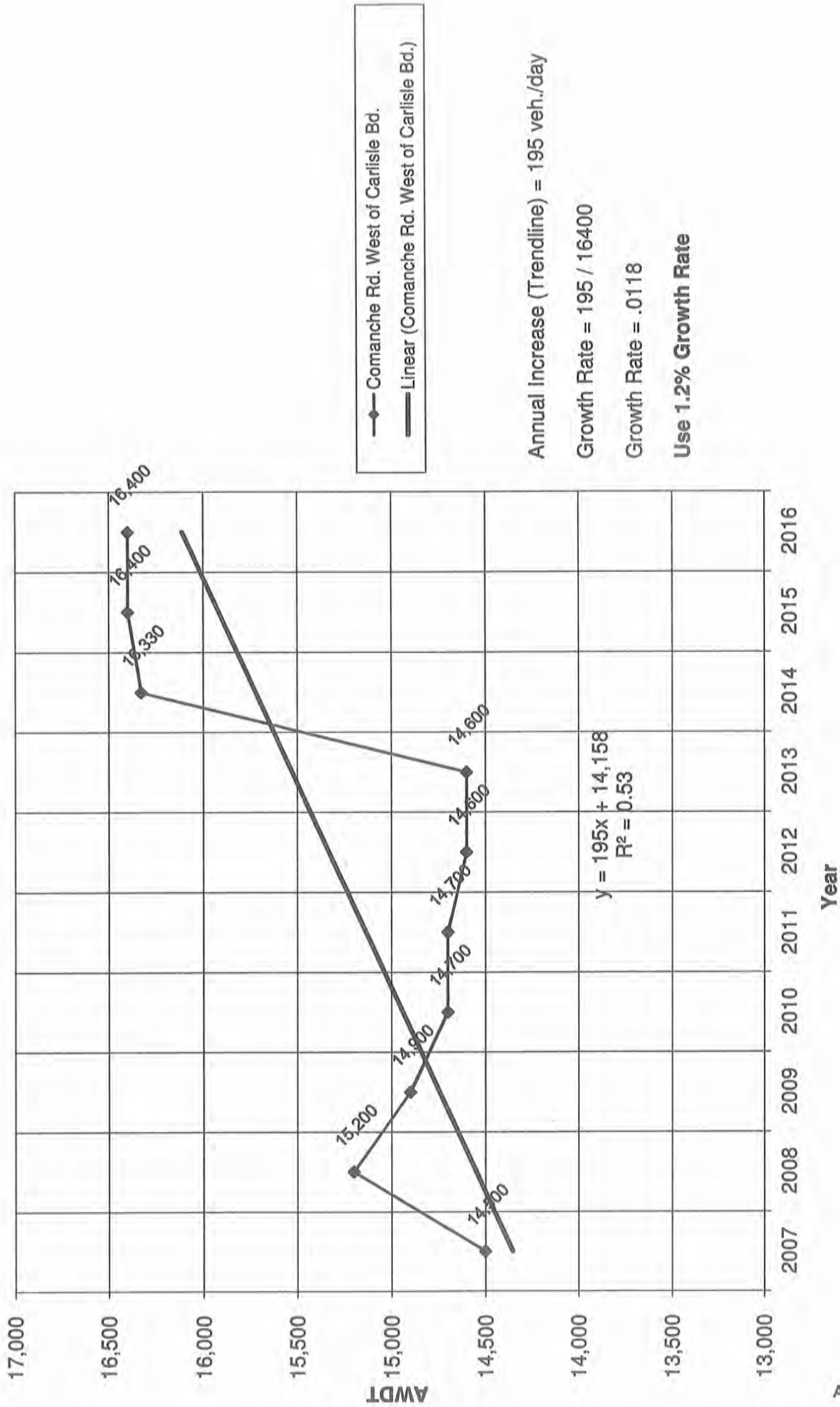
Historic Growth Chart Comanche Rd. East of Carlisle Blvd. (2007-2016)



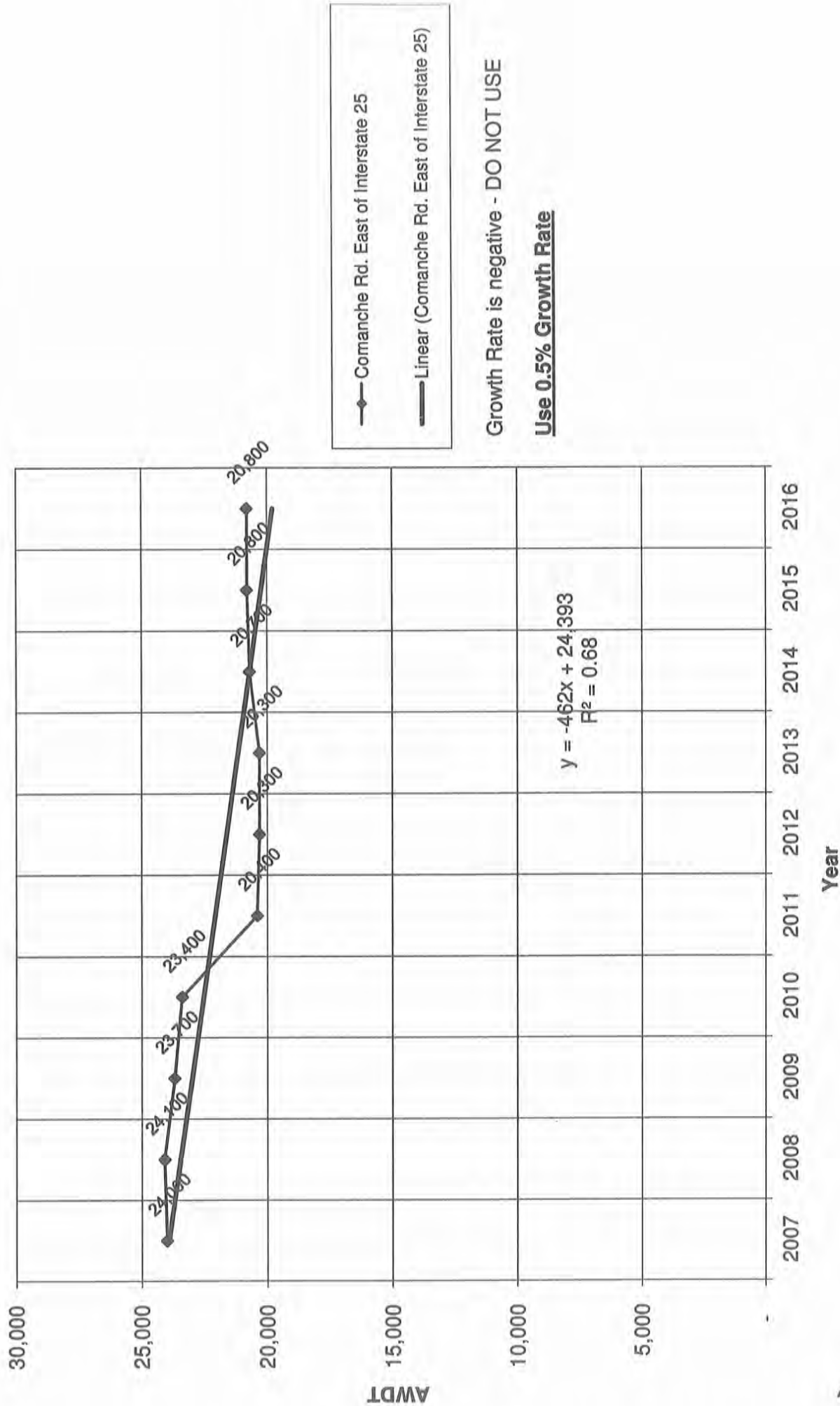
Historic Growth Chart Carlisle Blvd. South of Comanche Rd. (2007-2016)



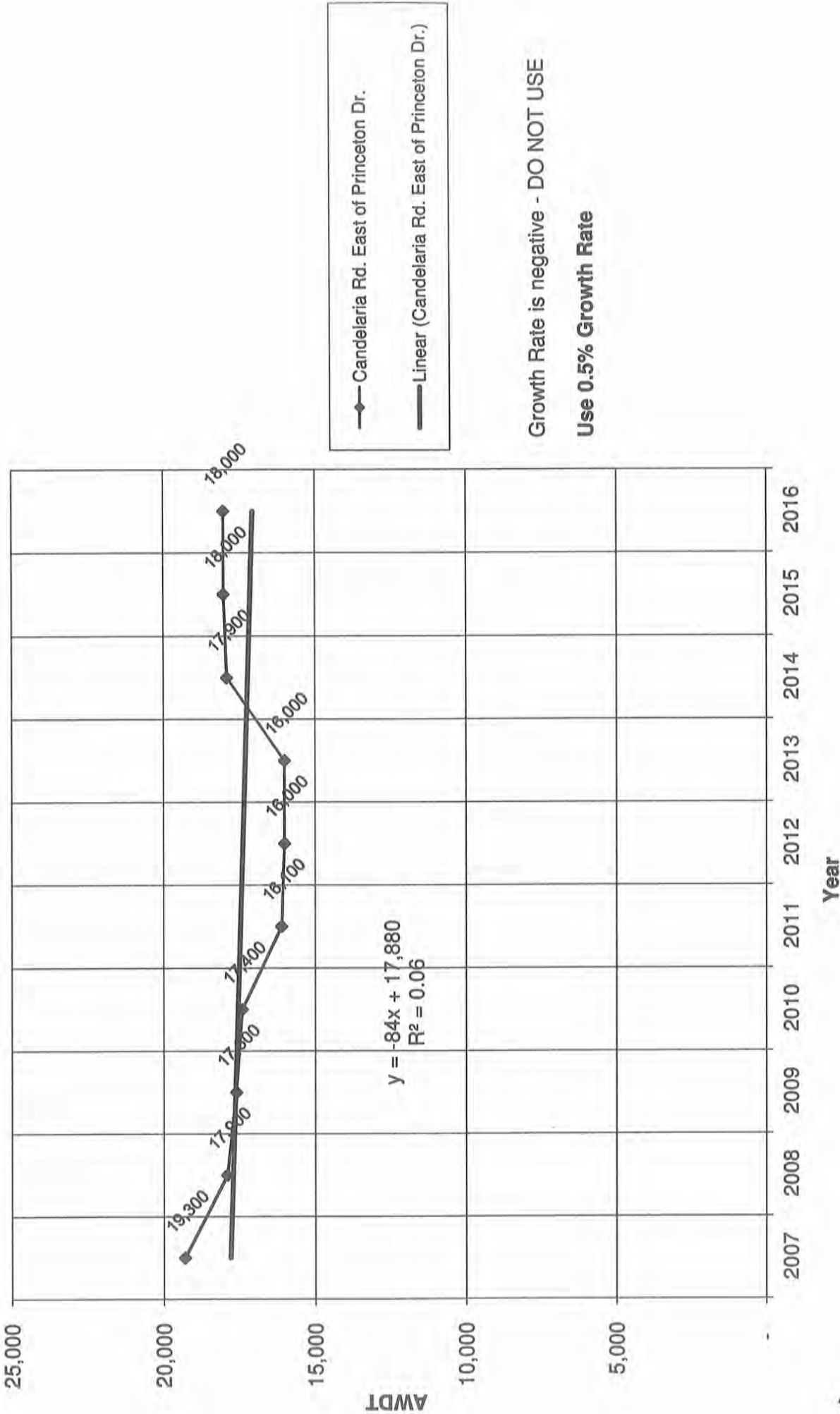
Historic Growth Chart Comanche Rd. West of Carlisle Blvd. (2007-2016)



Historic Growth Chart Comanche Rd. East of Interstate 25 (2007-2016)

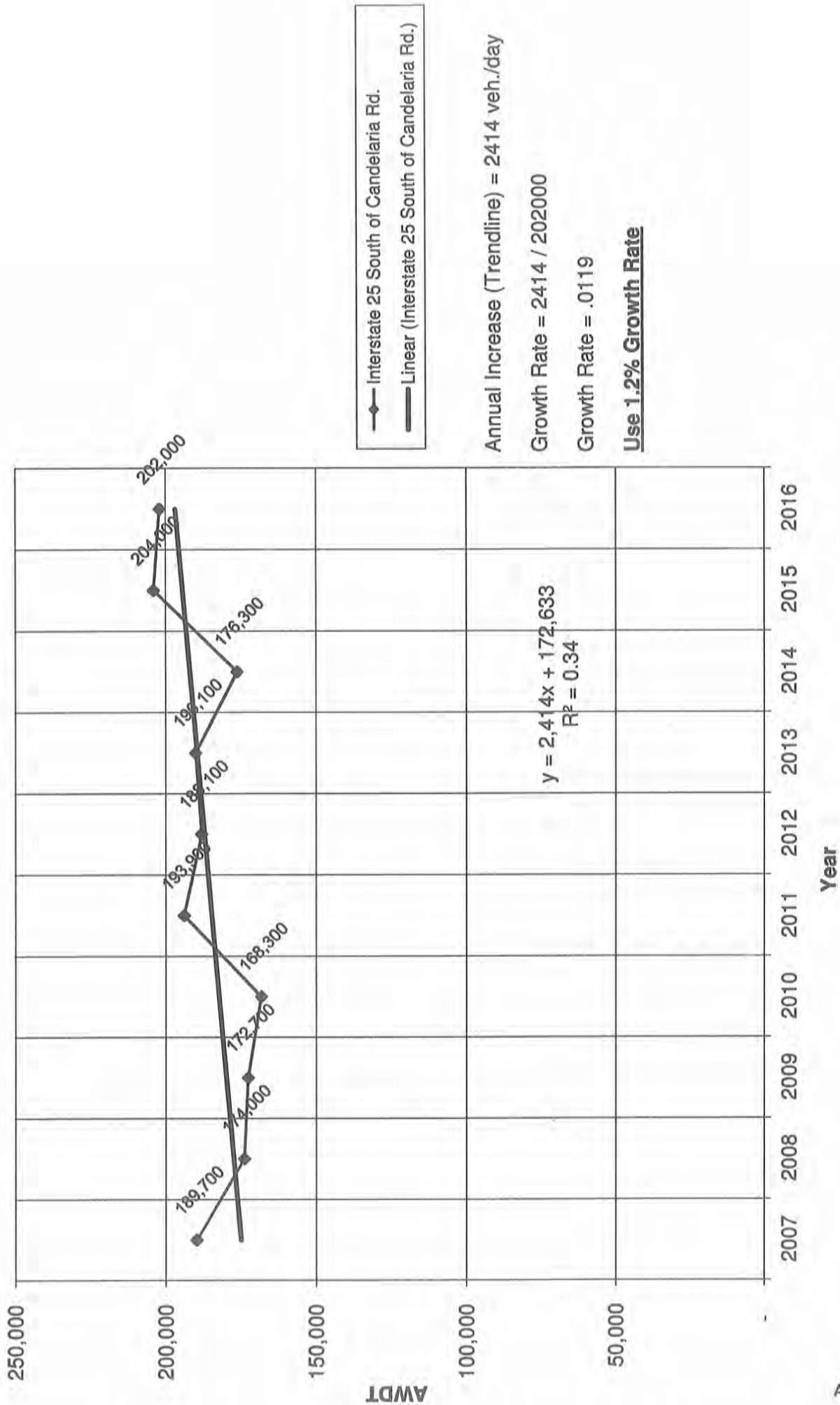


Historic Growth Chart Candelaria Rd. East of Princeton Dr. (2007-2016)

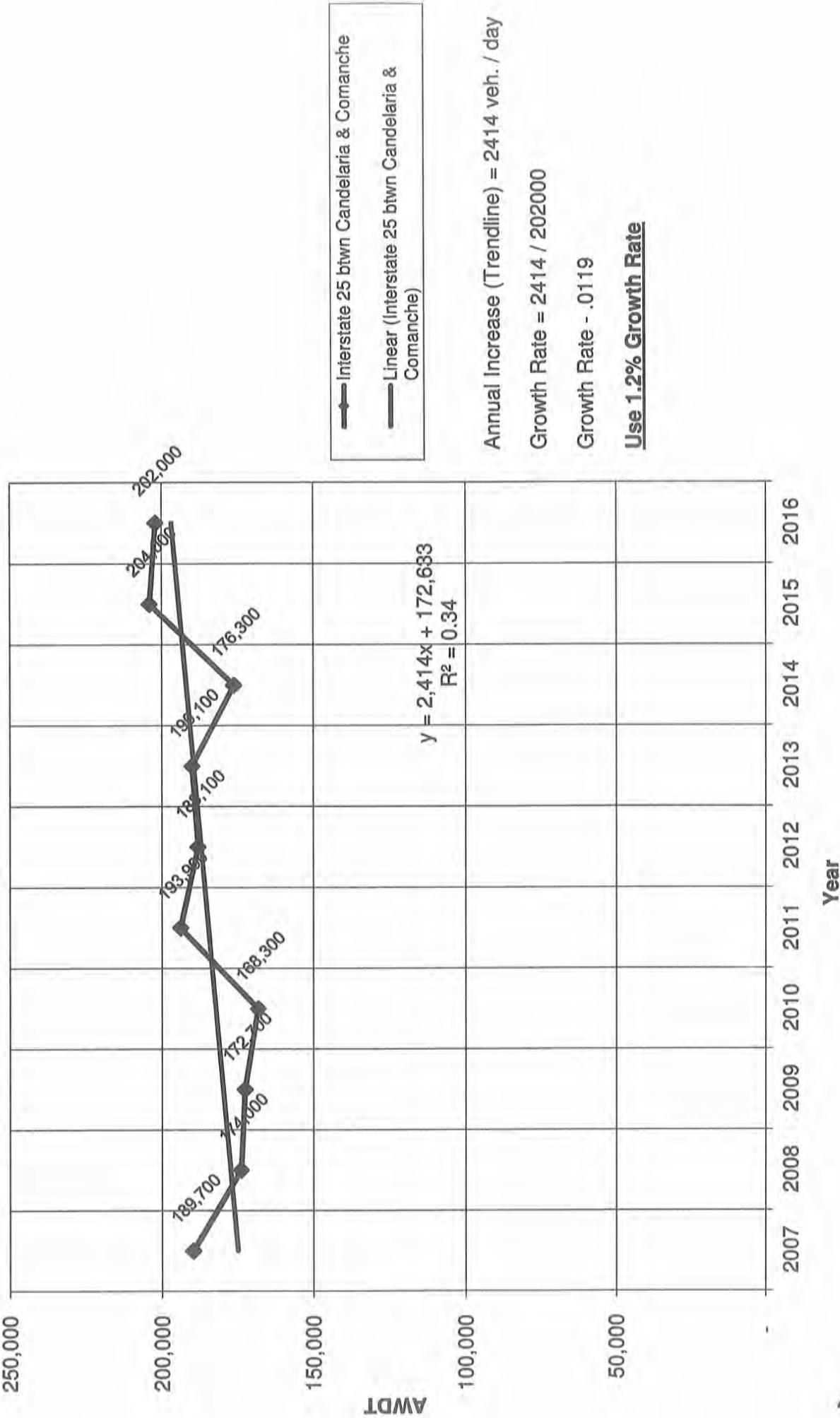


Growth Rate is negative - DO NOT USE
Use 0.5% Growth Rate

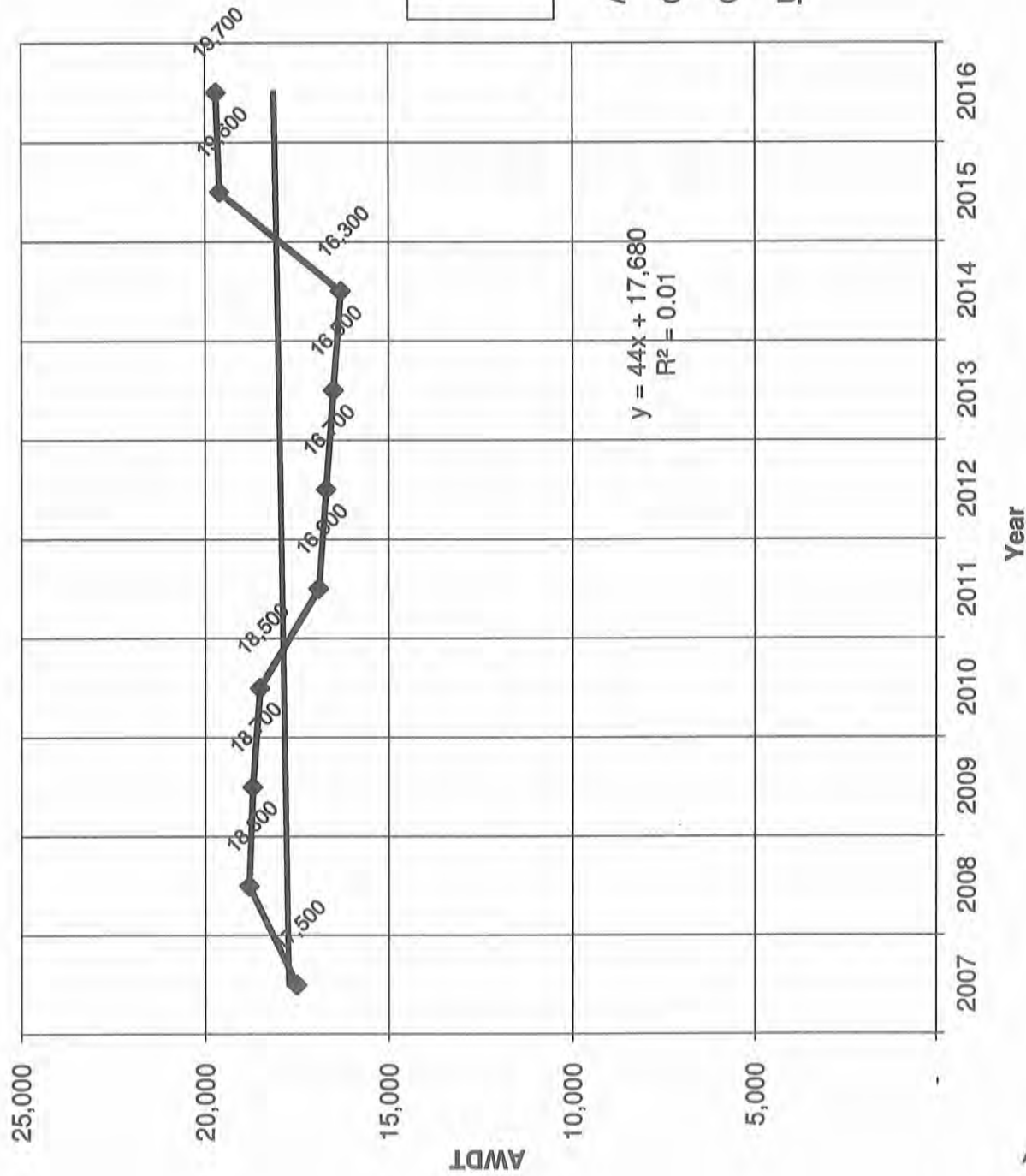
Historic Growth Chart Interstate 25 South of Candelaria Rd. (2007-2016)



Historic Growth Chart Interstate 4 btwn Candelaria & Comanche (2007-2016)

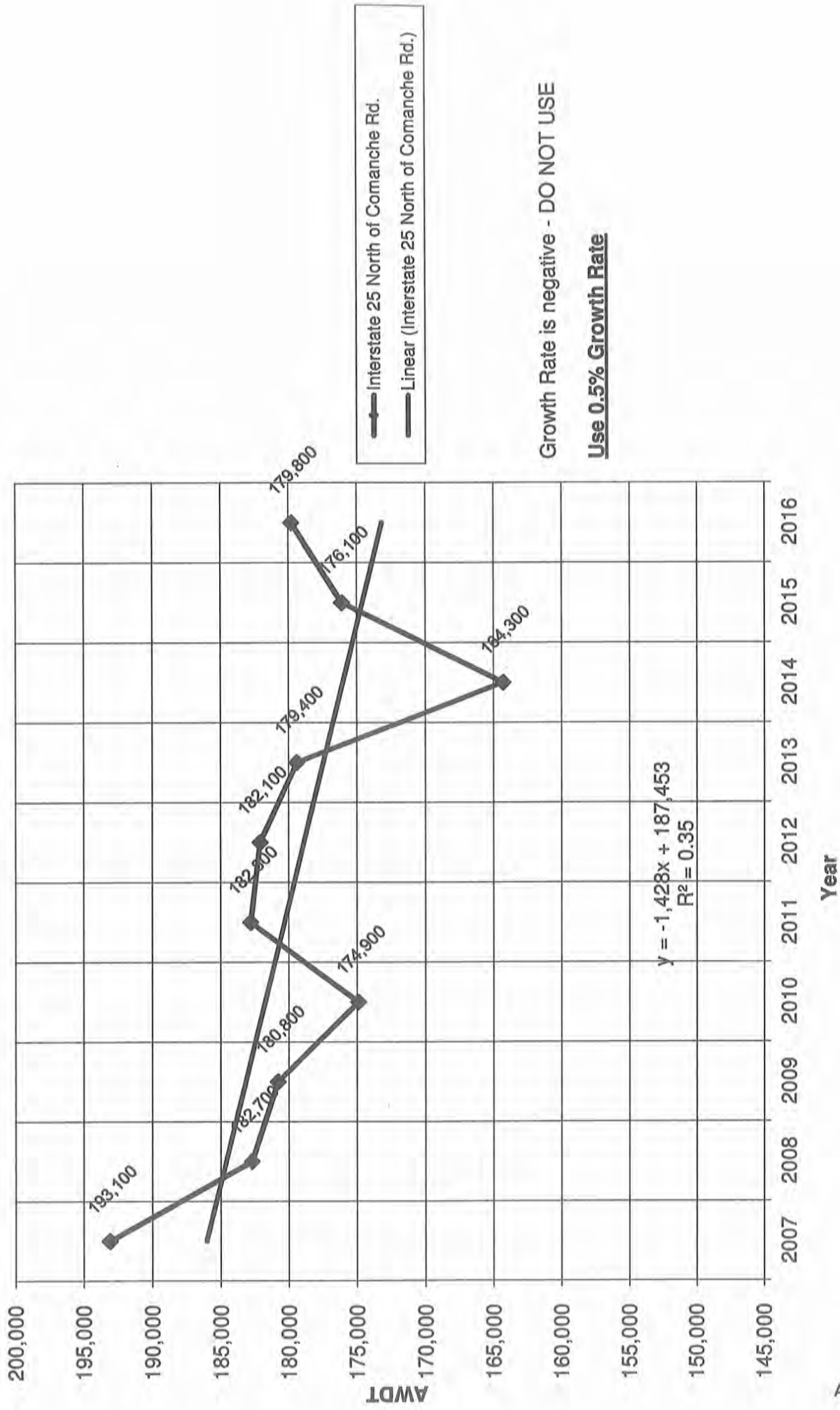


Historic Growth Chart Comanche Rd. West of Interstate 25 (2007-2016)



Annual Increase (Trendline) - 44 veh. / day
 Growth Rate = 44 / 18700
 Growth Rate = .0023 - too low
Use 0.5% Growth Rate

Historic Growth Chart Interstate 25 North of Comanche rd. (2007-2016)



Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2019) - 100% Development

INTERSECTION: Summary

Comanche Rd. / Carlisle Bd.												
0.88			0.88			0.88			0.88			PHF
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
70	156	133	76	287	62	156	408	25	9	381	90	
71	158	135	76	288	62	157	410	25	9	386	91	
97	170	142	76	301	62	165	410	25	9	386	119	
0.93			0.93			0.93			0.93			PHF
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
111	377	376	90	342	58	160	670	91	76	628	102	
112	382	381	90	344	58	161	673	91	77	636	103	
138	394	388	90	357	58	169	673	91	77	636	130	
Candelaria Rd. / Princeton Dr.												
0.85			0.85			0.85			0.85			PHF
Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
31	557	36	22	557	60	32	47	26	50	28	59	
31	560	36	22	560	60	32	47	26	50	28	59	
51	560	36	22	560	70	32	55	26	59	36	78	
0.99			0.99			0.99			0.99			PHF
Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
17	750	23	22	971	28	35	12	34	66	27	123	
17	754	23	22	976	28	35	12	34	66	27	124	
37	754	23	22	976	37	35	20	34	75	35	143	
Candelaria Rd. / University Bd.												
0.89			0.89			0.89			0.89			PHF
Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (University Bd.)			Southbound (University Bd.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
169	527	204	108	388	158	115	244	85	13	2	4	
170	530	205	109	390	159	116	247	86	13	2	4	
170	542	205	109	402	166	116	247	94	13	2	4	
0.90			0.90			0.90			0.90			PHF
Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (University Bd.)			Southbound (University Bd.)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
111	601	173	144	770	226	162	470	166	41	7	12	
112	604	174	145	774	227	164	476	168	41	7	12	
112	616	174	145	786	234	164	476	176	41	7	12	
Comanche Rd. / I-25 W.Ramp												
0.91			0.91			0.91			0.91			PHF
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	378	360	0	0	0	0	0	341	714	133	
0	510	380	362	865	0	0	0	0	343	718	134	
0	523	380	363	877	0	0	0	0	359	718	134	
0.96			0.96			0.96			0.96			PHF
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	532	441	0	0	0	0	0	331	774	158	
0	462	535	443	720	0	0	0	0	333	778	159	
0	474	535	444	732	0	0	0	0	349	778	159	

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)

Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2019) - 100% Development

INTERSECTION: Summary

		0.92			0.92			0.92			0.92			PHF
Comanche Rd. / I-25 E.Ramp		Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
(5)	3.0% Truck													
Existing (2018)		241	608	0	0	499	96	717	814	392	0	0	0	
2019 (NO BUILD - A.M.)		242	611	0	0	501	96	726	824	397	0	0	0	
2019 (BUILD - A.M.)		242	640	0	0	514	111	726	824	398	0	0	0	

		0.89			0.89			0.89			0.89			PHF
		Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing (2018)		205	586	0	0	611	165	542	1,314	419	0	0	0	
2019 (NO BUILD - P.M.)		206	589	0	0	614	166	549	1,330	424	0	0	0	
2019 (BUILD - P.M.)		206	617	0	0	627	181	549	1,330	425	0	0	0	

		0.75			0.75			0.75			0.75			PHF
Comanche Rd. / Princeton Dr.		Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
(6)	3.0% Truck													
Existing (2018)		8	0	308	37	0	0	46	0	27	1	0	4	
2019 (NO BUILD - A.M.)		8	690	310	37	547	0	46	0	27	1	0	4	
2019 (BUILD - A.M.)		8	690	340	110	547	0	75	4	97	1	5	4	

		0.95			0.95			0.95			0.95			PHF
		Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing (2018)		15	0	109	19	0	7	51	1	54	4	2	21	
2019 (NO BUILD - P.M.)		15	888	110	19	708	7	51	1	54	4	2	21	
2019 (BUILD - P.M.)		15	888	139	91	708	7	79	5	123	4	7	21	

		0.75			0.75			0.75			0.75			PHF
Driveway "A" / Princeton Dr.		Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
(7)	3.0% Truck													
Existing (2018)		0	0	0	0	0	0	0	0	0	0	0	0	
2019 (NO BUILD - A.M.)		0	0	0	0	0	3	0	70	0	9	338	0	
2019 (BUILD - A.M.)		51	0	0	0	0	3	0	121	0	9	392	54	

		0.95			0.95			0.95			0.95			PHF
		Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing (2018)		0	0	0	0	0	0	0	0	0	0	0	0	
2019 (NO BUILD - P.M.)		0	0	0	0	0	9	0	97	0	6	125	0	
2019 (BUILD - P.M.)		51	0	0	0	0	9	0	148	0	6	178	53	

		0.75			0.75			0.75			0.75			PHF
Driveway "B" / Princeton Dr.		Eastbound (Driveway "B")			Westbound (Driveway "B")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
(8)	3.0% Truck													
Existing (2018)		0	0	0	0	0	0	0	0	0	0	0	0	
2019 (NO BUILD - A.M.)		0	0	0	3	0	3	0	70	6	9	329	0	
2019 (BUILD - A.M.)		51	0	36	3	0	3	38	70	6	9	329	54	

		0.95			0.95			0.95			0.95			PHF
		Eastbound (Driveway "B")			Westbound (Driveway "B")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)			
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Existing (2018)		0	0	0	0	0	0	0	0	0	0	0	0	
2019 (NO BUILD - P.M.)		0	0	0	5	0	9	0	97	3	6	119	0	
2019 (BUILD - P.M.)		51	0	36	5	0	9	37	97	3	6	119	53	

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Comanche Rd. / Carlisle Bd.

INTERSECTION:

E-W Street: Comanche Rd.

(1)

N-S Street: Carlisle Bd.

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

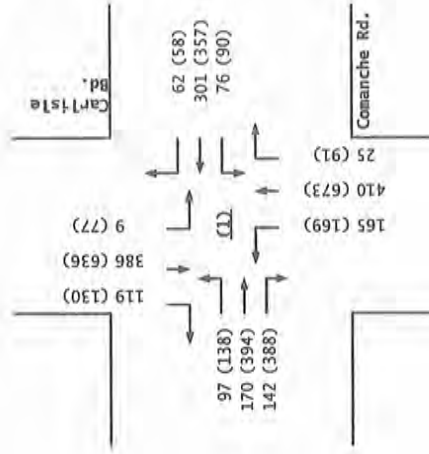
	1.20%			0.50%			0.50%			1.30%		
	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	70	156	133	76	287	62	156	408	25	9	381	90
Background Traffic Growth	1	2	2	0	1	0	1	2	0	0	5	1
Subtotal (NO BUILD - A.M.)	71	158	135	76	288	62	157	410	25	9	386	91
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	8.78%	0.00%	5.32%	0.00%	0.00%	0.00%	0.00%	19.06%
Percent Commercial Trips Generated(Exiting)	19.06%	8.78%	5.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	26	12	7	0	13	0	8	0	0	0	0	28
Total AM Peak Hour BUILD Volumes	97	170	142	76	301	62	165	410	25	9	386	119

	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	111	377	376	90	342	58	160	670	91	76	628	102
Background Traffic Growth	1	5	5	0	2	0	1	3	0	1	8	1
Subtotal (NO BUILD - P.M.)	112	382	381	90	344	58	161	673	91	77	636	103
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	8.78%	0.00%	5.32%	0.00%	0.00%	0.00%	0.00%	19.06%
Percent Commercial Trips Generated(Exiting)	19.06%	8.78%	5.32%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	26	12	7	0	13	0	8	0	0	0	0	27
Total PM Peak Hour BUILD Volumes	138	394	388	90	357	58	169	673	91	77	636	130

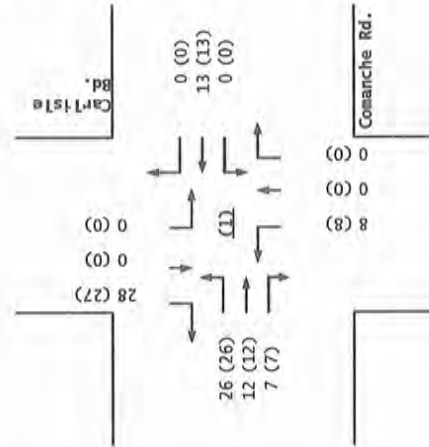
	Entering	Exiting		
Number of Commercial Trips Generated	145	139	A.M.	100% Commercial Development
	143	137	P.M.	

	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2018 AM Peak Hr. Volumes	70	156	133	76	287	62	156	408	25	9	381	90
2018 PM Peak Hr. Volumes	111	377	376	90	342	58	160	670	91	76	628	102

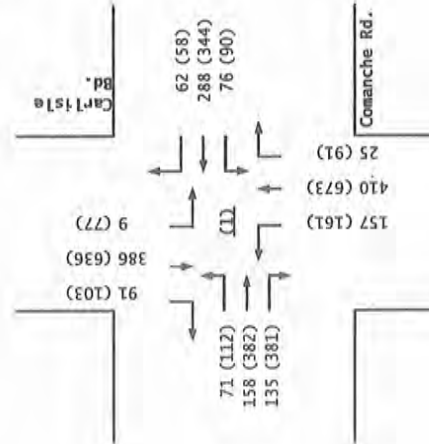
2019
BUILD



Trips



2019
NO BUILD



Comanche Rd. / Carlisle Rd.

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Candelaria Rd. / Princeton Dr.

INTERSECTION:

E-W Street: Candelaria Rd. (2)
 N-S Street: Princeton Dr.

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

	0.50%			0.50%			0.50%			0.50%		
	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	31	557	36	22	557	60	32	47	26	50	28	59
Background Traffic Growth	0	3	0	0	3	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	31	560	36	22	560	60	32	47	26	50	28	59
Percent Commercial Trips Generated(Entering)	13.76%	0.00%	0.00%	0.00%	0.00%	6.62%	0.00%	5.60%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.62%	5.60%	13.76%
Total Trips Generated	20	0	0	0	0	10	0	8	0	9	8	19
Total AM Peak Hour BUILD Volumes	51	560	36	22	560	70	32	55	26	59	36	78

	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	17	750	23	22	971	28	35	12	34	66	27	123
Background Traffic Growth	0	4	0	0	5	0	0	0	0	0	0	1
Subtotal (NO BUILD - P.M.)	17	754	23	22	976	28	35	12	34	66	27	124
Percent Commercial Trips Generated(Entering)	13.76%	0.00%	0.00%	0.00%	0.00%	6.62%	0.00%	5.60%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	6.62%	5.60%	13.76%
Total Trips Generated	20	0	0	0	0	9	0	8	0	9	8	19
Total PM Peak Hour BUILD Volumes	37	754	23	22	976	37	35	20	34	75	35	143

Number of Commercial Trips Generated

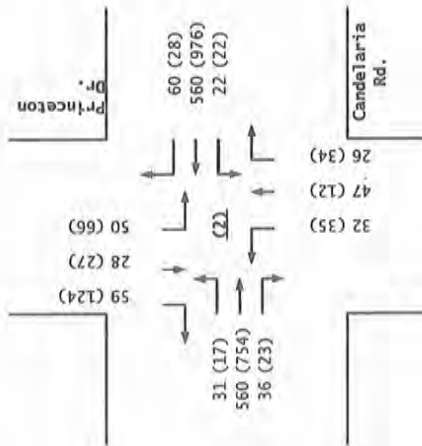
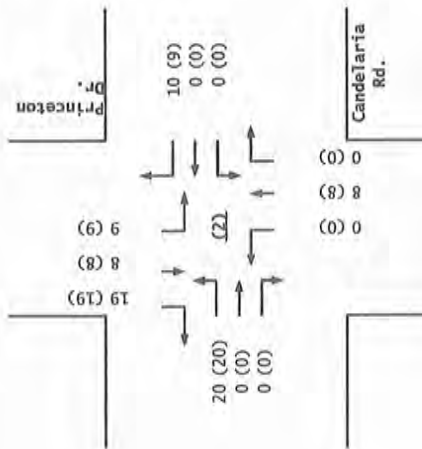
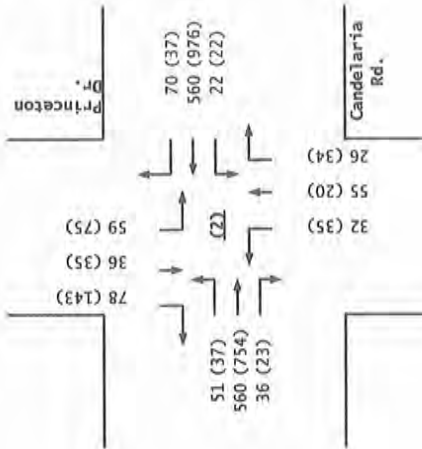
Entering	Exiting		
145	139	A.M.	100% Commercial Development
143	137	P.M.	

	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2018 AM Peak Hr. Volumes	31	557	36	22	557	60	32	47	26	50	28	59
2018 PM Peak Hr. Volumes	17	750	23	22	971	28	35	12	34	66	27	123

2019
BUILD

Trips

2019
NO BUILD



Candelaria Rd. / Princeton Dr.

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Candelaria Rd. / University Bd.

INTERSECTION:

E-W Street: Candelaria Rd.

(3)

N-S Street: University Bd.

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

	0.50%			0.50%			1.20%			1.20%		
	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (University Bd.)			Southbound (University Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	169	527	204	108	388	158	115	244	85	13	2	4
Background Traffic Growth	1	3	1	1	2	1	1	3	1	0	0	0
Subtotal (NO BUILD - A.M.)	170	530	205	109	390	159	116	247	86	13	2	4
Percent Commercial Trips Generated(Entering)	0.00%	8.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.31%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	8.45%	5.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	12	0	0	12	7	0	0	8	0	0	0
Total AM Peak Hour BUILD Volumes	170	542	205	109	402	166	116	247	94	13	2	4

	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (University Bd.)			Southbound (University Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	111	601	173	144	770	226	162	470	166	41	7	12
Background Traffic Growth	1	3	1	1	4	1	2	6	2	0	0	0
Subtotal (NO BUILD - P.M.)	112	604	174	145	774	227	164	476	168	41	7	12
Percent Commercial Trips Generated(Entering)	0.00%	8.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	5.31%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	8.45%	5.31%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	12	0	0	12	7	0	0	8	0	0	0
Total PM Peak Hour BUILD Volumes	112	616	174	145	786	234	164	476	176	41	7	12

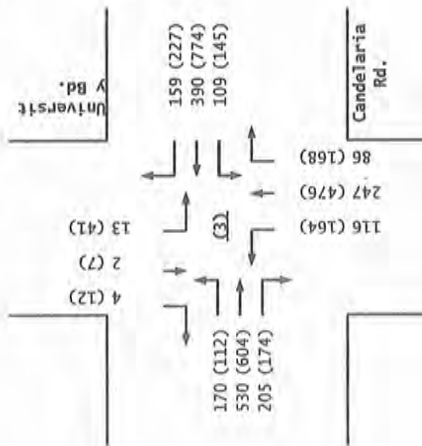
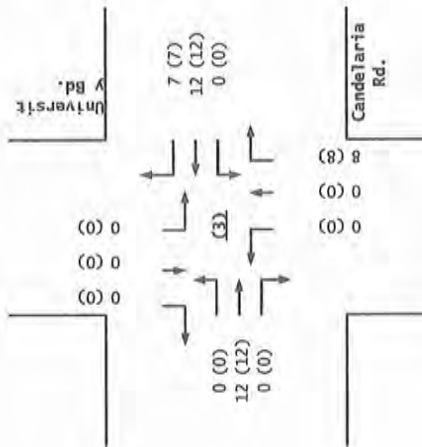
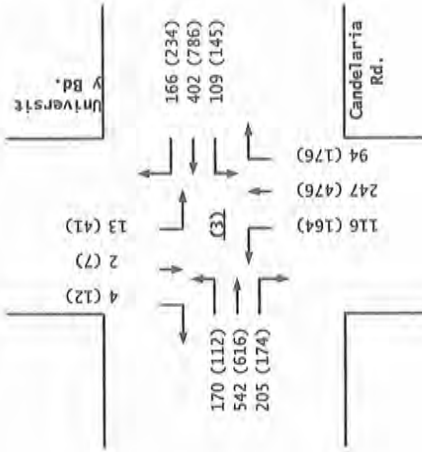
	Entering	Exiting		
Number of Commercial Trips Generated	145	139	A.M.	100% Commercial Development
	143	137	P.M.	

	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (University Bd.)			Southbound (University Bd.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2018 AM Peak Hr. Volumes	169	527	204	108	388	158	115	244	85	13	2	4
2018 PM Peak Hr. Volumes	111	601	173	144	770	226	162	470	166	41	7	12

2019
BUILD

Trips

2019
NO BUILD



Candelaria Rd. / University Bd.

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Comanche Rd. / I-25 W.Ramp

INTERSECTION:

E-W Street: Comanche Rd.

(4)

Due to the close proximity to the I-25 E.Ramp,

N-S Street: I-25 W.Ramp

these volumes were balanced with Intersection #5

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

0.50%			0.50%			0.50%			0.50%		
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	378	360	0	0	0	0	0	341	714	133
0	0	2	2	0	0	0	0	0	2	4	1
0	510	380	362	865	0	0	0	0	343	718	134
0.00%	8.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.07%	0.00%	0.00%
0.00%	0.00%	0.00%	0.79%	8.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	13	0	1	12	0	0	0	0	16	0	0
0	523	380	363	877	0	0	0	0	359	718	134

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	532	441	0	0	0	0	0	331	774	158
0	0	3	2	0	0	0	0	0	2	4	1
0	462	535	443	720	0	0	0	0	333	778	159
0.00%	8.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	11.07%	0.00%	0.00%
0.00%	0.00%	0.00%	0.79%	8.68%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	12	0	1	12	0	0	0	0	16	0	0
0	474	535	444	732	0	0	0	0	349	778	159

Number of Commercial Trips Generated

Entering Exiting

145 139

A.M.

100% Commercial Development

143 137

P.M.

2018 AM Peak Hr. Volumes

2018 PM Peak Hr. Volumes

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	378	360	0	0	0	0	0	341	714	133
0	0	532	441	0	0	0	0	0	331	774	158

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Comanche Rd. / I-25 E.Ramp

INTERSECTION :E-W Street: **Comanche Rd.** (5)N-S Street: **I-25 E.Ramp**

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

Number of Commercial Trips Generated

Entering	Exiting		
145	139	A.M.	100% Commercial Development
143	137	P.M.	

2018 AM Peak Hr. Volumes

2018 PM Peak Hr. Volumes

0.50%			0.50%			1.20%			0.50%		
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
241	608	0	0	499	96	717	814	392	0	0	0
1	3	0	0	2	0	9	10	5	0	0	0
242	611	0	0	501	96	726	824	397	0	0	0
0.00%	19.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.79%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	9.47%	11.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	29	0	0	13	15	0	0	1	0	0	0
242	640	0	0	514	111	726	824	398	0	0	0

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
205	586	0	0	611	165	542	1,314	419	0	0	0
1	3	0	0	3	1	7	16	5	0	0	0
206	589	0	0	614	166	549	1,330	424	0	0	0
0.00%	19.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.79%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	9.47%	11.07%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0	28	0	0	13	15	0	0	1	0	0	0
206	617	0	0	627	181	549	1,330	425	0	0	0

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
241	608	0	0	499	96	717	814	392	0	0	0
205	586	0	0	611	165	542	1,314	419	0	0	0



Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Comanche Rd. / Princeton Dr.

INTERSECTION:E-W Street: **Comanche Rd.**

(6)

Due to the close proximity to the I-25 E.Ramp,
these volumes were balanced with Intersection #5N-S Street: **Princeton Dr.**

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

0.50%			0.50%			0.50%			0.50%		
Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8	0	308	37	0	0	46	0	27	1	0	4
0	0	2	0	0	0	0	0	0	0	0	0
8	690	310	37	547	0	46	0	27	1	0	4
0.00%	0.00%	20.54%	50.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.18%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.54%	3.18%	50.30%	0.00%	0.00%	0.00%
0	0	30	73	0	0	29	4	70	0	5	0
8	690	340	110	547	0	75	4	97	1	5	4

Existing Volumes

Background Traffic Growth

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
15	0	109	19	0	7	51	1	54	4	2	21
0	0	1	0	0	0	0	0	0	0	0	0
15	888	110	19	708	7	51	1	54	4	2	21
0.00%	0.00%	20.54%	50.30%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	3.18%	0.00%
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	20.54%	3.18%	50.30%	0.00%	0.00%	0.00%
0	0	29	72	0	0	28	4	69	0	5	0
15	888	139	91	708	7	79	5	123	4	7	21

Number of Commercial Trips Generated

Entering Exiting

145 139 A.M.

143 137 P.M.

100% Commercial Development

2018 AM Peak Hr. Volumes

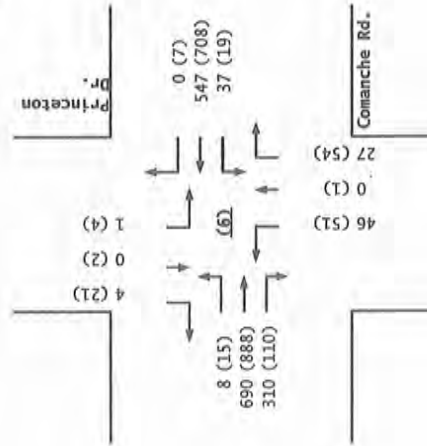
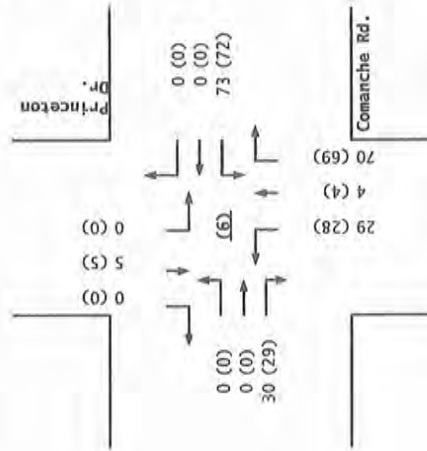
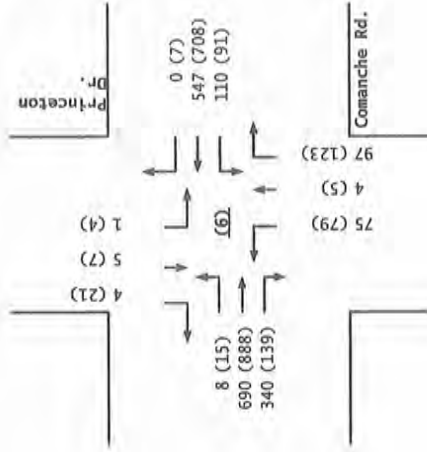
2018 PM Peak Hr. Volumes

Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
8	0	308	37	0	0	46	0	27	1	0	4
15	0	109	19	0	7	51	1	54	4	2	21

2019
BUILD

Trips

2019
NO BUILD



Comanche Rd. / Princeton Dr.

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Driveway "A" / Princeton Dr.

INTERSECTION:

E-W Street: Driveway "A"

(7)

N-S Street: Princeton Dr.

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

Existing Volumes

Background Traffic Growth

Subtotal

Diesel Service Center

Subtotal (NO BUILD - A.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total AM Peak Hour BUILD Volumes

0.50%			0.50%			0.50%			0.50%		
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	3	0	3	0	9	9	0
0	0	0	0	0	3	0	70	0	9	338	0
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	37.00%	37.02%
37.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	37.00%	0.00%	0.00%	0.00%	0.00%
51	0	0	0	0	0	0	51	0	0	54	54
51	0	0	0	0	3	0	121	0	9	392	54

Existing Volumes

Background Traffic Growth

Subtotal

Diesel Service Center

Subtotal (NO BUILD - P.M.)

Percent Commercial Trips Generated(Entering)

Percent Commercial Trips Generated(Exiting)

Total Trips Generated

Total PM Peak Hour BUILD Volumes

0.50%			0.50%			0.50%			0.50%		
Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	9	0	9	0	6	6	0
0	0	0	0	0	9	0	97	0	6	125	0
0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	37.00%	37.02%
37.02%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	37.00%	0.00%	0.00%	0.00%	0.00%
51	0	0	0	0	0	0	51	0	0	53	53
51	0	0	0	0	9	0	148	0	6	178	53

Number of Commercial Trips Generated

Entering Exiting

145 139 A.M.

143 137 P.M.

100% Commercial Development

2018 AM Peak Hr. Volumes

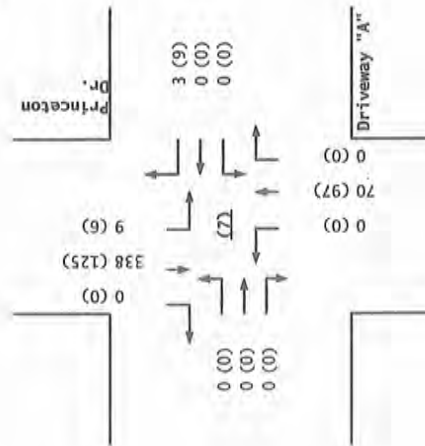
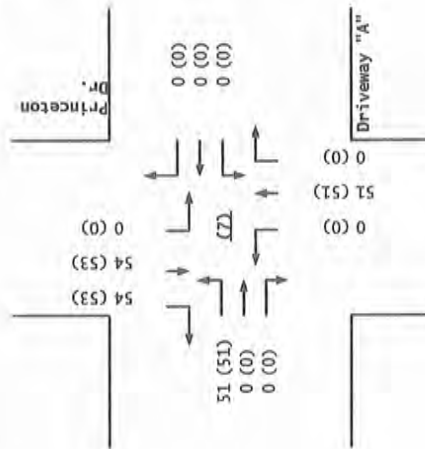
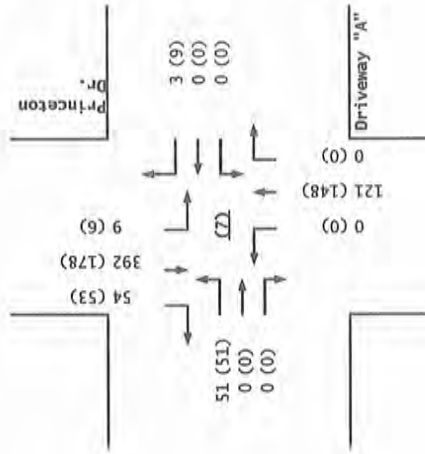
2018 PM Peak Hr. Volumes

Eastbound (Driveway "A")			Westbound (Driveway "A")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0

2019
BUILD

Trips

2019
NO BUILD



Driveway "A" / Princeton Dr.

Maverik Convenience Store (Comanche Rd. / Princeton Dr.)
Projected Turning Movements Worksheet
Driveway "B" / Princeton Dr.

INTERSECTION:

E-W Street: Driveway "B" (8)

N-S Street: Princeton Dr.

Year of Existing Counts

2018

Implementation Year

2019

Growth Rates

	0.50%			0.50%			0.50%			0.50%		
	Eastbound (Driveway "B")			Westbound (Driveway "B")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	0	0	0	0	0	0	0	0
Diesel Service Center	0	0	0	3	0	3	0	0	6	9	0	0
Subtotal (NO BUILD - A.M.)	0	0	0	3	0	3	0	70	6	9	329	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.98%	0.00%	0.00%	0.00%	0.00%	37.00%
Percent Commercial Trips Generated(Exiting)	37.00%	0.00%	25.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	51	0	36	0	0	0	38	0	0	0	0	54
Total AM Peak Hour BUILD Volumes	51	0	36	3	0	3	38	70	6	9	329	54

	Eastbound (Driveway "B")			Westbound (Driveway "B")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	0	0	0	0	0	0	0	0	0	0	0
Background Traffic Growth	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	0	0	0	0	0	0	0	0
Diesel Service Center	0	0	0	5	0	9	0	0	3	6	0	0
Subtotal (NO BUILD - P.M.)	0	0	0	5	0	9	0	97	3	6	119	0
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	25.98%	0.00%	0.00%	0.00%	0.00%	37.00%
Percent Commercial Trips Generated(Exiting)	37.00%	0.00%	25.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	51	0	36	0	0	0	37	0	0	0	0	53
Total PM Peak Hour BUILD Volumes	51	0	36	5	0	9	37	97	3	6	119	53

Number of Commercial Trips Generated

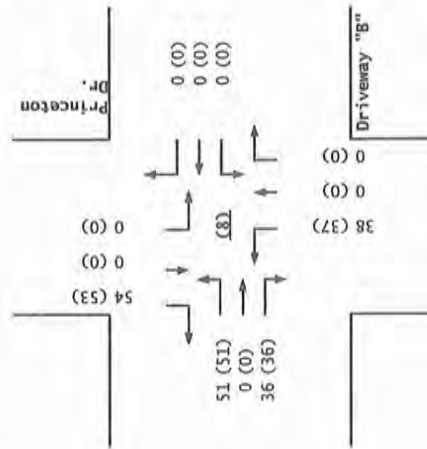
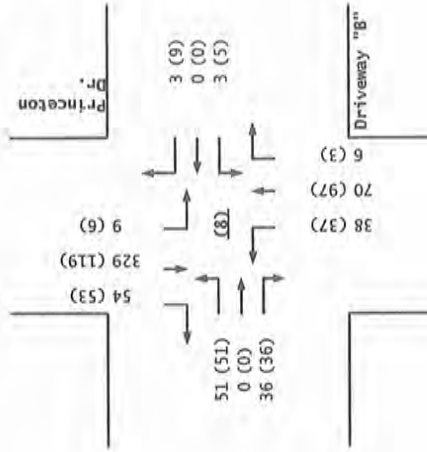
Entering	Exiting		
145	139	A.M.	100% Commercial Development
143	137	P.M.	

	Eastbound (Driveway "B")			Westbound (Driveway "B")			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
2018 AM Peak Hr. Volumes	0	0	0	0	0	0	0	0	0	0	0	0
2018 PM Peak Hr. Volumes	0	0	0	0	0	0	0	0	0	0	0	0

2019
BUILD

Trips

2019
NO BUILD



Driveway "B" / Princeton Dr.

HCM Level-of-Service Analyses

Timings 1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↑	↔	↔	↑	↔	↑	↔	↑
Traffic Volume (veh/h)	71	158	135	76	288	157	410	9	386
Future Volume (veh/h)	71	158	135	76	288	157	410	9	386
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	81	180	153	86	327	70	178	466	28
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	272	329	227	431	91	600	2772	165
Arrive On Green	0.06	0.15	0.15	0.06	0.15	0.15	0.06	0.57	0.55
Sat Flow, veh/h	1767	1856	1572	1767	2886	612	1767	4839	281
Grp Volume(V), veh/h	81	180	153	86	327	200	178	321	173
Grp Sat Flow(s), veh/hln	1767	1856	1572	1767	1763	1745	1767	1689	1803
Q Serve(g, s)	4.2	10.1	9.4	4.5	11.8	12.1	4.8	5.0	5.1
Cycle Q Clear(g, s)	4.2	10.1	9.4	4.5	11.8	12.1	4.8	5.0	5.1
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.35	1.00	0.16	1.00
Lane Grp Cap(c), veh/h	204	272	329	227	262	260	600	1915	1022
VIC Ratio(X)	0.40	0.66	0.46	0.38	0.75	0.77	0.30	0.17	0.17
Avail Cap(c), veh/h	280	574	585	299	545	539	665	1915	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Flare(t)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	44.4	38.1	37.0	44.9	45.0	9.4	11.4	11.4
Incr Delay (d2), s/veh	1.2	2.8	1.0	1.0	4.3	4.6	0.3	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/hln	1.9	4.8	3.7	2.0	5.5	5.6	1.8	1.9	2.1
Unsig. Movement Delay, s/veh	38.5	47.1	39.1	38.0	49.2	49.8	9.7	11.6	11.8
LnGrp Delay(d), s/veh	D	D	D	D	D	D	A	B	A
LnGrp LOS	D	D	D	D	D	D	A	B	A
Approach Vol, veh/h	414				483		672		552
Approach Delay, s/veh	42.5				47.5		11.1		12.8
Approach LOS	D				D		B		B
Timer - Assigned Phs	1	2	3	4	5	6	7	8	
Phs Duration (G+Y+Rc), s	10.0	67.4	11.5	21.1	12.0	65.4	11.3	21.4	
Charge Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Max Green Setting (Gmax), s	11.0	34.0	11.0	34.0	11.0	34.0	11.0	34.0	
Max Q Clear Time (g_c+11), s	2.3	7.1	6.5	12.1	6.8	8.1	6.2	14.1	
Green Ext Time (g_ext), s	0.0	3.3	0.1	1.5	0.2	3.7	0.1	2.3	
Intersection Summary									
HCM 6th Ctl Delay	25.9								
HCM 6th LOS	C								

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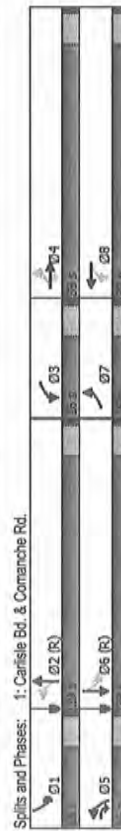
HCM 6th Signalized Intersection Summary 1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	↔	↑	↔	↔	↑	↔	↑	↔	↑
Traffic Volume (veh/h)	71	158	135	76	288	157	410	25	386
Future Volume (veh/h)	71	158	135	76	288	157	410	25	386
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	81	180	153	86	327	70	178	466	28
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3
Cap, veh/h	204	272	329	227	431	91	600	2772	165
Arrive On Green	0.06	0.15	0.15	0.06	0.15	0.15	0.06	0.57	0.55
Sat Flow, veh/h	1767	1856	1572	1767	2886	612	1767	4839	281
Grp Volume(V), veh/h	81	180	153	86	327	200	178	321	173
Grp Sat Flow(s), veh/hln	1767	1856	1572	1767	1763	1745	1767	1689	1803
Q Serve(g, s)	4.2	10.1	9.4	4.5	11.8	12.1	4.8	5.0	5.1
Cycle Q Clear(g, s)	4.2	10.1	9.4	4.5	11.8	12.1	4.8	5.0	5.1
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.35	1.00	0.16	1.00
Lane Grp Cap(c), veh/h	204	272	329	227	262	260	600	1915	1022
VIC Ratio(X)	0.40	0.66	0.46	0.38	0.75	0.77	0.30	0.17	0.17
Avail Cap(c), veh/h	280	574	585	299	545	539	665	1915	1022
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Flare(t)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.3	44.4	38.1	37.0	44.9	45.0	9.4	11.4	11.4
Incr Delay (d2), s/veh	1.2	2.8	1.0	1.0	4.3	4.6	0.3	0.2	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/hln	1.9	4.8	3.7	2.0	5.5	5.6	1.8	1.9	2.1
Unsig. Movement Delay, s/veh	38.5	47.1	39.1	38.0	49.2	49.8	9.7	11.6	11.8
LnGrp Delay(d), s/veh	D	D	D	D	D	D	A	B	A
LnGrp LOS	D	D	D	D	D	D	A	B	A
Approach Vol, veh/h	414				483		672		552
Approach Delay, s/veh	42.5				47.5		11.1		12.8
Approach LOS	D				D		B		B
Timer - Assigned Phs	1	2	3	4	5	6	7	8	
Phs Duration (G+Y+Rc), s	10.0	67.4	11.5	21.1	12.0	65.4	11.3	21.4	
Charge Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Max Green Setting (Gmax), s	11.0	34.0	11.0	34.0	11.0	34.0	11.0	34.0	
Max Q Clear Time (g_c+11), s	2.3	7.1	6.5	12.1	6.8	8.1	6.2	14.1	
Green Ext Time (g_ext), s	0.0	3.3	0.1	1.5	0.2	3.7	0.1	2.3	
Intersection Summary									
HCM 6th Ctl Delay	25.9								
HCM 6th LOS	C								

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Terrings 2: Princeton Dr. & Candalaria Bd.

Terry O. Brown, PE
08/27/2018

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	1	1	1	1	1	1	1	1
Traffic Volume (vph)	31	560	22	560	32	47	50	28
Future Volume (vph)	31	560	22	560	32	47	50	28
Turn Type	Perm	NA	Perm	NA	Perm	NA	Perm	NA
Protected Phases	4	4	8	8	2	2	6	6
Permitted Phases	4	4	8	8	2	2	6	6
Detector Phase	4	4	8	8	2	2	6	6
Switch Phase	4	4	8	8	2	2	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
Total Split (%)	65.5%	65.5%	65.5%	65.5%	34.5%	34.5%	34.5%	34.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimizer?								
Recall Mode	Min	Min	Min	Min	C-Min	C-Min	C-Min	C-Min
Act Effd Green (s)	18.6	18.6	18.6	18.6	26.4	26.4	26.4	26.4
Actual g/C Ratio	0.34	0.34	0.34	0.34	0.48	0.48	0.48	0.48
w/C Ratio	0.21	0.59	0.14	0.61	0.06	0.10	0.10	0.12
Control Delay	19.8	21.7	12.2	16.1	10.5	7.7	10.1	4.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	19.8	21.7	12.2	16.1	10.5	7.7	10.1	4.5
LOS	B	C	B	B	B	A	B	A
Approach Delay	21.6		15.9		8.6		6.5	
Approach LOS	C		B		A		A	
Intersection Summary								
Cycle Length: 55								
Actuated Cycle Length: 55								
Offset: 27.5 (50%), Referenced to phase 2-NBTL and 6-SBTL, Start of Green								
Neutral Cycle: 45								
Control Type: Actuated-Coordinated								
Maximum w/C Ratio: 0.61								
Intersection Signal Delay: 16.9								
Intersection Capacity Utilization: 43.5%								
Analysis Period (min): 15								
Spills and Phases: 2: Princeton Dr. & Candalaria Bd.								
LO2 (R)								
LO3 (R)								
LO4 (R)								
LO5 (R)								
LO6 (R)								

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HCM 6th Signalized Intersection Summary 2: Princeton Dr. & Candalaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	1	1	1	1	1	1	1	1
Traffic Volume (veh/h)	31	560	36	22	560	32	47	26
Future Volume (veh/h)	31	560	36	22	560	32	47	26
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0
Peak-Sat Adj (A _{ps}), pbT	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow (veh/h)	1855	1855	1855	1855	1855	1855	1855	1855
Adj Flow Rate, veh/h	36	659	42	26	659	71	38	55
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3
Cap, veh/h	245	1115	71	266	1063	114	712	543
Arrive On Green	0.44	0.44	0.44	0.33	0.33	0.33	0.49	0.49
Sat Flow, veh/h	720	3365	214	740	3211	346	1282	1114
Grp Volume(s), veh/h	36	345	36	26	361	38	86	59
Grp Sat Flow(s), veh/h	720	1763	1817	740	1763	1793	1282	0
Q Serve(g, s)	2.3	8.1	8.2	1.6	9.5	9.5	0.9	1.5
Cycle Q Clear(g, s)	11.6	8.1	8.2	9.8	9.5	2.8	0.0	1.5
Prop In Lane	1.00	0.12	1.00	0.19	1.00	0.36	1.00	0.68
Lane Grp Cap(s), veh/h	245	584	602	266	584	712	0	849
V/C Ratio(X)	0.15	0.59	0.59	0.10	0.62	0.05	0.00	0.10
Avail Cap(s), veh/h	412	994	1024	438	994	1011	712	0
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00
Upstream Filter(s)	0.96	0.96	0.96	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	17.6	12.6	12.6	19.0	15.5	8.5	0.0	7.6
Initial Delay (d ₀), s/veh	0.3	0.9	0.9	0.2	1.1	1.1	0.0	0.2
Initial Q Delay(d ₀), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQueue(50%), veh/h	0.3	2.7	2.8	0.3	3.5	3.6	0.2	0.5
Unsig. Movement Delay, s/veh	17.9	13.5	13.5	19.2	16.6	8.6	0.0	8.0
LnGrp Delay(d), s/veh	B	B	B	B	B	A	A	A
LnGrp LOS	B	B	B	B	B	A	A	A
Approach Vol, veh/h	737		736		124		161	
Approach Delay, s/veh	13.7		16.6		8.1		8.2	
Approach LOS	B		B		A		A	
Timer - Assigned Phs	2		4		6		8	
Phs Duration (G+Y+Rc), s	31.8		23.2		31.8		23.2	
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0	
Max Green Setting (G _{max}), s	14.0		31.0		14.0		31.0	
Max Q Clear Time (g _c +t ₁), s	4.8		13.8		4.9		11.8	
Green Ext Time (p _c), s	0.3		4.4		0.4		4.7	
Intersection Summary								
HCM 6th Ctrl Delay	14.1		B					
HCM 6th LOS								
Notes								
User approved pedestrian interval to be less than phase max green.								

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Timings 3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	170	530	205	109	390	159	116	247	13	2	4
Future Volume (veh/h)	170	530	205	109	390	159	116	247	13	2	4
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0
Post-Bike Adj(A, db7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	191	596	230	122	438	179	130	278	97	15	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	632	2040	1041	478	2850	956	362	372	127	155	375
Arrive On Green	0.07	0.58	0.58	0.10	1.00	1.00	0.08	0.14	0.14	0.05	0.11
Sat Flow, veh/h	1767	3526	1572	1767	3566	1572	1767	2580	880	3428	1572
Grp Volume(V), veh/h	191	596	230	122	438	179	130	188	187	15	2
Grp Sat Flow(s), veh/h	1767	1763	1572	1767	1689	1572	1767	1763	1897	1714	1763
Q Serve(g, s)	5.0	9.4	6.4	3.2	0.0	0.0	7.0	11.2	11.7	0.5	0.1
Cycle Q Clear(g, s)	5.0	9.4	6.4	3.2	0.0	0.0	7.0	11.2	11.7	0.5	0.1
Prop In Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.52	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	632	2040	1041	478	2850	956	362	255	245	156	375
V/C Ratio(X)	0.30	0.29	0.22	0.26	0.15	0.19	0.36	0.74	0.76	0.10	0.01
Avail Cap(c), veh/h	740	2040	1041	695	2850	956	503	577	555	249	833
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.5	11.8	7.4	8.7	0.0	0.0	37.9	45.1	45.3	50.3	43.9
Incr Delay (d2), s/veh	0.3	0.4	0.5	0.2	0.1	0.3	0.6	4.2	4.9	0.3	0.0
Incr Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(d0%), veh/h	1.9	3.7	2.1	1.1	0.0	0.1	3.1	5.2	5.2	0.2	0.0
Unsig. Movement Delay, s/veh	8.8	12.1	7.8	9.0	0.1	0.3	38.6	49.2	50.1	50.6	44.0
LnGrp Delay(d), s/veh	A	B	A	A	A	A	D	D	D	D	D
LnGrp LOS	A	B	A	A	A	A	D	D	D	D	D
Approach Vol, veh/h	1017	1017	739	739	739	739	505	505	505	17	A
Approach Delay, s/veh	10.5	10.5	1.6	1.6	1.6	1.6	46.8	46.8	46.8	49.8	A
Approach LOS	B	B	A	A	A	A	D	D	D	D	D
Timer - Assigned Phs	1	2	3	4	5	6	7	8			
Phs Duration (G+Y+R), s	10.0	20.9	10.5	68.6	14.2	18.7	12.2	66.9			
Charge Period (Y+R), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Max Green Setting (Gmax), s	8.0	36.0	19.0	27.0	18.0	26.0	14.0	32.0			
Max Q Clear Time (g_c+1), s	2.5	13.7	5.2	11.4	9.0	2.1	7.0	2.0			
Green Ext Time (g_e), s	0.0	2.2	0.2	4.4	0.2	0.0	0.3	3.8			
Intersection Summary											
HCM 6th Ctl Delay	16.0										
HCM 6th LOS	B										
Notes	Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.										

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HCM 6th Signalized Intersection Summary 3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	170	530	205	109	390	159	116	247	86	13	2
Future Volume (veh/h)	170	530	205	109	390	159	116	247	86	13	2
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0
Post-Bike Adj(A, db7)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	191	596	230	122	438	179	130	278	97	15	2
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	632	2040	1041	478	2850	956	362	372	127	155	375
Arrive On Green	0.07	0.58	0.58	0.10	1.00	1.00	0.08	0.14	0.14	0.05	0.11
Sat Flow, veh/h	1767	3526	1572	1767	3566	1572	1767	2580	880	3428	1572
Grp Volume(V), veh/h	191	596	230	122	438	179	130	188	187	15	2
Grp Sat Flow(s), veh/h	1767	1763	1572	1767	1689	1572	1767	1763	1897	1714	1763
Q Serve(g, s)	5.0	9.4	6.4	3.2	0.0	0.0	7.0	11.2	11.7	0.5	0.1
Cycle Q Clear(g, s)	5.0	9.4	6.4	3.2	0.0	0.0	7.0	11.2	11.7	0.5	0.1
Prop In Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.52	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	632	2040	1041	478	2850	956	362	255	245	156	375
V/C Ratio(X)	0.30	0.29	0.22	0.26	0.15	0.19	0.36	0.74	0.76	0.10	0.01
Avail Cap(c), veh/h	740	2040	1041	695	2850	956	503	577	555	249	833
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter	1.00	1.00	1.00	0.78	0.78	0.78	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	8.5	11.8	7.4	8.7	0.0	0.0	37.9	45.1	45.3	50.3	43.9
Incr Delay (d2), s/veh	0.3	0.4	0.5	0.2	0.1	0.3	0.6	4.2	4.9	0.3	0.0
Incr Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(d0%), veh/h	1.9	3.7	2.1	1.1	0.0	0.1	3.1	5.2	5.2	0.2	0.0
Unsig. Movement Delay, s/veh	8.8	12.1	7.8	9.0	0.1	0.3	38.6	49.2	50.1	50.6	44.0
LnGrp Delay(d), s/veh	A	B	A	A	A	A	D	D	D	D	D
LnGrp LOS	A	B	A	A	A	A	D	D	D	D	D
Approach Vol, veh/h	1017	1017	739	739	739	739	505	505	505	17	A
Approach Delay, s/veh	10.5	10.5	1.6	1.6	1.6	1.6	46.8	46.8	46.8	49.8	A
Approach LOS	B	B	A	A	A	A	D	D	D	D	D
Timer - Assigned Phs	1	2	3	4	5	6	7	8			
Phs Duration (G+Y+R), s	10.0	20.9	10.5	68.6	14.2	18.7	12.2	66.9			
Charge Period (Y+R), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0			
Max Green Setting (Gmax), s	8.0	36.0	19.0	27.0	18.0	26.0	14.0	32.0			
Max Q Clear Time (g_c+1), s	2.5	13.7	5.2	11.4	9.0	2.1	7.0	2.0			
Green Ext Time (g_e), s	0.0	2.2	0.2	4.4	0.2	0.0	0.3	3.8			
Intersection Summary											
HCM 6th Ctl Delay	16.0										
HCM 6th LOS	B										
Notes	Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.										

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Timings 4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
08/29/2018

Lane Group	EBT	WBL	WBT	SBL	SBL	SBL
Lane Configurations	←	←	←	←	←	←
Traffic Volume (vph)	510	362	865	343	718	134
Future Volume (vph)	510	362	865	343	718	134
Turn Type	NA	Prot	NA	Perm	NA	Perm
Protected Phases	4	3	8	6	6	6
Permitted Phases						
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	21.0	21.0	21.0
Total Split (s)	29.0	23.0	52.0	38.0	38.0	38.0
Total Split (%)	32.2%	25.6%	57.8%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead				
Lead-Lag Optimizes?						
Recall Mode	C-Min	Min	C-Min	Min	Min	Min
Act Elcd Green (s)	29.4	15.3	49.8	30.2	30.2	30.2
Actuated g/c Ratio	0.33	0.17	0.55	0.34	0.34	0.34
w/c Ratio	0.87	0.69	0.49	0.64	0.71	0.24
Control Delay	39.0	32.8	21.4	30.4	29.7	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	32.8	21.4	30.4	29.7	8.0
LOS	D	C	C	C	C	A
Approach Delay	39.0		24.7		27.7	
Approach LOS	D		C		C	
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 80						
Offset: 41.4 (46%), Referenced to Phase 4:EBT and 8:WBT, Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Maximum w/c Ratio: 0.87						
Intersection Signal Delay: 28.6						
Intersection Capacity Utilization 70.4%						
Analysis Period (min) 15						
Splits and Phases: 4: I-25 W. Ramp & Comanche Rd.						
	03	03	03	03	03	03
	03	03	03	03	03	03

2019 AM Peak NOBUILD Conditions
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HCM 6th Signalized Intersection Summary 4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
08/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	0	510	360	362	865	1	0	0	0	343	718	134
Future Volume (veh/h)	0	510	360	362	865	1	0	0	0	343	718	134
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	0	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855
Adj Flow Rate, veh/h	0	560	418	398	951	1	0	0	0	377	789	147
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh. %	0	3	3	3	3	3	3	3	3	3	3	3
Cap. veh/h	0	787	587	480	2185	2	0	0	0	502	1055	447
Arrive On Green	0.00	0.41	0.41	0.28	1.00	1.00	0.00	0.00	0.00	0.28	0.28	0.28
Sat Flow, veh/h	0	2017	1436	3428	3614	4	0	0	0	1767	3711	1572
Grp Volume(V), veh/h	0	513	465	398	464	486	0	0	0	377	789	147
Grp Sat Flow(s), veh/hln	0	1763	1597	1714	1763	1855	0	0	0	1767	1855	1572
Q Serve(g, s)	0.0	21.8	21.8	9.8	0.0	0.0	0.0	0.0	0.0	17.5	17.4	6.6
Cycle Q Clear(g, c), s	0.0	21.8	21.8	9.8	0.0	0.0	0.0	0.0	0.0	17.5	17.4	6.6
Prop In Lane	0.00	0.90	0.90	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	721	653	480	1066	1121	0	0	0	502	1055	447
V/C Ratio(X)	0.00	0.71	0.71	0.83	0.44	0.44	0.00	0.00	0.00	0.75	0.75	0.33
Avail Cap(c, al), veh/h	0	721	653	480	1066	1121	0	0	0	502	1055	447
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(i)	0.00	1.00	1.00	0.70	0.70	0.70	0.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.2	22.2	31.4	0.0	0.0	0.0	0.0	0.0	29.3	29.3	25.4
Initial Q Delay(d2), s/veh	0.0	5.9	6.5	4.2	0.9	0.9	0.0	0.0	0.0	3.6	1.7	0.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% BackOfFlood(s), veh/hln	0.0	9.8	9.0	3.7	0.3	0.3	0.0	0.0	0.0	7.7	7.8	2.5
Unsig. Movement Delay, s/veh	0.0	28.1	28.6	35.5	0.9	0.9	0.0	0.0	0.0	32.9	31.0	25.9
LnGrp Delay(d), s/veh	A	C	C	D	A	A	A	A	A	C	C	C
LnGrp LOS	A	C	C	D	A	A	A	A	A	C	C	C
Approach Vol, veh/h	978				1350					1313		
Approach Delay, s/veh	28.3				11.1					31.0		
Approach LOS	C				B					C		
Timer - Assigned Phs		3	4		6					8		
Phs Duration (G+Y+Rc), s		17.6	41.8		30.6					59.4		
Change Period (Y+Rc), s		5.0	5.0		5.0					5.0		
Max Green Setting (Gmax), s		18.0	24.0		33.0					47.0		
Max Q Clear Time (g, c+H1), s		11.8	23.8		19.5					2.0		
Green Ext Time (p, c), s		0.8	0.1		6.1					7.6		
Intersection Summary												
HCM 6th Ctrl Delay					22.9							
HCM 6th LOS					C							
Notes												
User approved volume balancing among the lanes for turning movement.												

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Timings 5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBT	NBL	NBT	NBR
Lane Configurations	↔	↔	↔	↔	↔	↔
Traffic Volume (vph)	242	611	501	726	824	397
Future Volume (vph)	242	611	501	726	824	397
Turn Type	Thru	Thru	Thru	Thru	Thru	Thru
Protected Phases	7	4	8	2	2	2
Permitted Phases	7	4	8	2	2	2
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Spill (s)	10.0	21.0	21.0	21.0	21.0	21.0
Total Spill (s)	17.0	45.0	28.0	45.0	45.0	45.0
Total Spill (%)	18.9%	50.0%	31.1%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag				
Lead/Lag Optimize?						
Recall Mode	Min	C-Min	C-Min	Min	Min	Min
Act Effct Green (s)	11.1	40.7	24.5	39.3	39.3	39.3
Actuated g/C Ratio	0.12	0.45	0.27	0.44	0.44	0.44
v/c Ratio	0.63	0.42	0.68	0.62	0.62	0.58
Control Delay	50.5	19.7	33.2	24.4	21.1	14.7
Queue Delay	50.5	19.7	33.2	24.4	21.1	14.7
Total Delay	50.5	19.7	33.2	24.4	21.1	14.7
LOS	D	B	C	C	C	B
Approach Delay	28.5	33.2	20.4			
Approach LOS	C	C	C			
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 90						
Offset: 47.7 (63%), Referenced to phase 4-EBT and 8-WBT, Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Maximum v/c Ratio: 0.68						
Intersection Signal Delay: 24.7						
Intersection Capacity Utilization 59.3%						
Analysis Period (min) 15						

HCM 6th Signalized Intersection Summary 5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBT	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔
Traffic Volume (veh/h)	242	611	0	0	501	96	726	824	397
Future Volume (veh/h)	242	611	0	0	501	96	726	824	397
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	0	0	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	263	664	0	0	545	104	789	896	432
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3
Cap, veh/h	337	1812	0	0	1064	202	1325	1391	589
Arrive On Green	0.20	1.00	0.00	0.00	0.36	0.37	0.37	0.37	0.37
Sat Flow, veh/h	3428	3618	0	0	3048	562	3534	3711	1572
Grp Volume(V), veh/h	263	664	0	0	324	325	789	896	432
Grp Sat Flow(s), veh/h	1714	1763	0	0	1763	1754	1767	1856	1572
Q Serve(g, s), s	6.6	0.0	0.0	0.0	13.0	13.1	16.2	17.9	21.3
Cycle Q Clear(g, s), s	6.6	0.0	0.0	0.0	13.0	13.1	16.2	17.9	21.3
Prop In Lane	1.00	0.00	0.00	0.00	0.32	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	337	1812	0	0	635	632	1325	1391	589
V/C Ratio(X)	0.78	0.37	0.00	0.00	0.51	0.51	0.60	0.64	0.73
Adj Cap(c), veh/h	457	1812	0	0	635	632	1571	1649	699
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.40	0.40	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.2	0.0	0.0	0.0	22.6	22.6	23.2	24.3	24.3
Initial Q Delay (d2), s/veh	2.5	0.2	0.0	0.0	2.9	3.0	0.4	0.7	3.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQueue(s), veh/h	2.6	0.1	0.0	0.0	5.7	6.5	7.7	8.1	8.1
Unsig. Movement Delay, s/veh	37.7	0.2	0.0	0.0	25.5	23.1	23.8	27.5	27.5
LnGrp Delay(d), s/veh	37.7	0.2	0.0	0.0	25.5	23.1	23.8	27.5	27.5
LnGrp LOS	D	A	A	A	C	C	C	C	C
Approach Vol, veh/h	927	10.9	649	25.3	2117	24.3			
Approach Delay, s/veh	10.9		25.3		24.3				
Approach LOS	B		C		C				
Timer - Assigned Pits	2		4		7				
Pis Duration (G+Y+Rc), s	38.7		51.3		13.8				
Change Period (Y+Rc), s	5.0		5.0		5.0				
Max Green Setting (Gmax), s	40.0		40.0		12.0				
Max Q Clear Time (g_c+1t), s	23.3		2.0		8.6				
Green Ext Time (g_c), s	10.4		5.3		0.3				
Intersection Summary									
HCM 6th Ctrl Delay	21.2								
HCM 6th LOS	C								
Notes									
User approved volume balancing among the lanes for turning movement.									

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Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱			↰	↱		↰	↱		↰	↱
Traffic Vol, veh/h	8	690	310	37	547	1	46	1	27	1	1	4
Future Vol, veh/h	8	690	310	37	547	1	46	1	27	1	1	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	784	352	42	622	1	52	1	31	1	1	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	623	0	0	1136	0	0	1374	1685	568	1118	1861	312
Stage 1	-	-	-	-	-	-	978	978	-	707	707	-
Stage 2	-	-	-	-	-	-	396	707	-	411	1154	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	947	-	-	799	-	-	104	92	*792	*160	72	681
Stage 1	-	-	-	-	-	-	538	513	-	*390	434	-
Stage 2	-	-	-	-	-	-	598	434	-	*747	402	-
Platoon blocked, %	-	-	-	1	-	-	-	-	1	-	-	-
Mov Cap-1 Maneuver	947	-	-	799	-	-	96	84	*792	*143	66	681
Mov Cap-2 Maneuver	-	-	-	-	-	-	288	239	-	*282	202	-
Stage 1	-	-	-	-	-	-	533	508	-	*386	399	-
Stage 2	-	-	-	-	-	-	545	399	-	*710	398	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.6	17.4	13.8
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	374	947	-	-	799	-	-	418
HCM Lane V/C Ratio	0.225	0.01	-	-	0.053	-	-	0.016
HCM Control Delay (s)	17.4	8.8	-	-	9.8	-	-	13.8
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.8	0	-	-	0.2	-	-	0.1

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	0.3					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	1	3	70	1	9	338
Future Vol, veh/h	1	3	70	1	9	338
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1	4	93	1	12	451

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	569	94	0	0	94
Stage 1	94	-	-	-	-
Stage 2	475	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	482	960	-	-	1494
Stage 1	927	-	-	-	-
Stage 2	624	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	477	960	-	-	1494
Mov Cap-2 Maneuver	477	-	-	-	-
Stage 1	917	-	-	-	-
Stage 2	624	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.7	0	0.2
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	766	1494
HCM Lane V/C Ratio	-	-	0.007	0.008
HCM Control Delay (s)	-	-	9.7	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
8: Princeton Dr. & "B"

Terry O. Brown, PE
08/28/2018

Intersection

Int Delay, s/veh 0.3

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	3	3	70	6	9	329
Future Vol, veh/h	3	3	70	6	9	329
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	4	4	93	8	12	439

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	560	97	0
Stage 1	97	-	-
Stage 2	463	-	-
Critical Hdwy	6.43	6.23	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.327	-
Pot Cap-1 Maneuver	488	956	-
Stage 1	924	-	-
Stage 2	632	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	483	956	-
Mov Cap-2 Maneuver	483	-	-
Stage 1	914	-	-
Stage 2	632	-	-

Approach	WB	NB	SB
HCM Control Delay, s	10.7	0	0.2
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	642	1485
HCM Lane V/C Ratio	-	-	0.012	0.008
HCM Control Delay (s)	-	-	10.7	7.4
HCM Lane LOS	-	-	B	A
HCM 95th %tile Q(veh)	-	-	0	0

Timings Terry O. Brown, PE 08/27/2018

1: Carlisle Bd. & Comanche Rd.

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	97	170	142	76	301	165	410	9	386
Traffic Volume (veh/h)	97	170	142	76	301	165	410	9	386
Future Volume (veh/h)	97	170	142	76	301	165	410	9	386
Turn Type	pm+pt	NA	pm+tr	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	5	3	8	5	2	1	6
Permitted Phases	4	4	4	8	8	2	6	6	6
Detector Phase	7	4	5	3	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0
Minimum Split (s)	16.0	39.0	16.0	39.0	16.0	39.0	16.0	39.0	16.0
Total Split (%)	14.5%	35.5%	14.5%	14.5%	35.5%	14.5%	35.5%	14.5%	35.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?									
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Elcd Green (s)	30.1	19.5	35.6	27.7	18.3	65.2	55.3	55.8	50.0
Actuated g/C Ratio	0.27	0.18	0.32	0.25	0.17	0.59	0.50	0.51	0.45
v/c Ratio	0.42	0.59	0.26	0.29	0.70	0.37	0.20	0.02	0.26
Control Delay	31.5	48.6	4.4	28.5	47.1	13.3	16.1	12.2	17.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	48.6	4.4	28.5	47.1	13.3	16.1	12.2	17.9
LOS	C	D	A	C	D	B	B	B	B
Approach Delay	29.2			43.9		15.4		17.8	
Approach LOS	C			D		B		B	
Intersection Summary									
Cycle Length: 110									
Actuated Cycle Length: 110									
Offset: 55 (50%), Referenced to phase 2(NBT) and 6(SBT), Start of Green									
Natural Cycle: 65									
Control Type: Actuated-Coordinated									
Maximum v/c Ratio: 0.70									
Intersection Signal Delay: 25.3									
Intersection Capacity Utilization 51.6%									
Analysis Period (min) 15									
Spills and Phases: 1: Carlisle Bd. & Comanche Rd.									
01	02 (R)	03	04	05	06 (R)	07	08	09	10

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HCM 6th Signalized Intersection Summary Terry O. Brown, PE 08/27/2018

1: Carlisle Bd. & Comanche Rd.

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SSR
Lane Configurations	97	170	142	76	301	165	410	25	9	386
Traffic Volume (veh/h)	97	170	142	76	301	165	410	25	9	386
Future Volume (veh/h)	97	170	142	76	301	165	410	25	9	386
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A _p pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow (veh/h)	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	110	193	161	86	342	70	188	466	28	10
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh. %	3	3	3	3	3	3	3	3	3	3
Cap. veh/h	228	305	365	239	448	91	571	2684	160	595
Arrive On Green	0.07	0.16	0.16	0.06	0.15	0.15	0.07	0.55	0.05	0.53
Sat Flow, veh/h	1767	1856	1572	1767	2921	591	1767	4889	291	1767
Grp Volume(V), veh/h	110	193	161	86	205	207	188	321	173	10
Grp Sat Flow(s), veh/h	1767	1856	1572	1767	1763	1749	1767	1689	1803	1767
Q Serve(g, s)	5.7	10.7	9.6	4.4	12.2	12.5	5.3	5.2	5.3	0.3
Cycle Q Clear(g, s)	5.7	10.7	9.6	4.4	12.2	12.5	5.3	5.2	5.3	0.3
Prop In Lane	1.00	1.00	1.00	1.00	1.00	0.34	1.00	0.16	1.00	0.70
Lane Grp Cap(c), veh/h	228	305	366	239	270	268	571	1854	990	595
V/C Ratio(X)	0.48	0.63	0.44	0.36	0.76	0.77	0.33	0.17	0.18	0.02
Area Cap(c), veh/h	280	574	593	311	545	541	628	1854	990	691
HCM Parson Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(i)	36.2	42.8	36.1	36.3	44.6	44.7	10.4	12.4	12.4	13.9
Uniform Delay (d), s/veh	1.5	2.2	0.8	0.9	4.3	4.7	0.3	0.2	0.4	0.3
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% BackOfQueue(BOQ) veh/h	2.5	5.1	3.8	2.0	5.7	5.8	2.0	2.2	0.1	2.5
Unsig. Movement Delay, s/veh	37.7	45.0	36.9	37.2	48.9	49.4	10.7	12.8	12.8	14.2
LnGrp Delay(d), s/veh	D	D	D	D	D	D	B	B	B	B
LnGrp LOS	D	D	D	D	D	D	B	B	B	B
Approach Vol, veh/h	464			498			882		584	
Approach Delay, s/veh	40.5			47.1			12.1		14.2	
Approach LOS	D			D			B		B	
Timer - Associated Phs	1	2	3	4	5	6	7	8		
Phs Duration (G+Y+Rc), s	10.0	65.4	11.5	23.1	12.5	62.9	12.7	21.9		
Charge Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0		
Max Green Setting (G _{max}), s	11.0	34.0	11.0	34.0	11.0	34.0	11.0	34.0		
Max Q Clear Time (g_c+H1), s	2.3	7.3	6.4	12.7	7.3	8.9	7.7	14.5		
Green Ext Time (g_c), s	0.0	3.3	0.1	1.5	0.2	4.0	0.1	2.4		
Intersection Summary										
HCM 6th Ctrl Delay										
HCM 6th LOS										

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Timings
2: Princeton Dr. & Candelaria Bd.

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
51 560 22 560 32 55 59 36								
Future Volume (vph)	51	560	22	560	32	55	59	36
Perm	NA	Permi	NA	Permi	NA	Permi	NA	Permi
Protected Phases	4	8	8	2	2	2	6	6
Permitted Phases	4	4	8	8	2	2	6	6
Detector Phase								
Switch Phase								
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	36.0	36.0	36.0	36.0	19.0	19.0	19.0	19.0
Total Sppt (%)	65.5%	65.5%	65.5%	65.5%	34.5%	34.5%	34.5%	34.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag								
Lead-Lag Optimizes?								
Recall Mode								
Act/Grd Green (s)	18.9	18.9	18.9	18.9	26.1	26.1	26.1	26.1
Actuated g/C Ratio	0.34	0.34	0.34	0.34	0.47	0.47	0.47	0.47
W/C Ratio	0.35	0.58	0.14	0.61	0.06	0.11	0.11	0.16
Control Delay	24.0	21.5	11.9	15.7	10.8	8.2	10.3	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	21.5	11.9	15.7	10.8	8.2	10.3	4.2
LOS	C	C	B	B	B	A	B	A
Approach Delay	21.7		15.6		8.9		6.3	
Approach LOS	C		B		A		A	
Intersection Summary								
Cycle Length: 55								
Actuated Cycle Length: 55								
Offset: 27.5 (50%), Referenced to phase 2NBT1 and 6SBTL Start of Green								
Natural Cycle: 45								
Control Type: Actuated-Coordinated								
Maximum W/C Ratio: 0.61								
Intersection Signal Delay: 18.6								
Intersection Capacity Utilization 44.3%								
Analysis Period (min) 15								
Intersection LOS: B								
ICU Level of Service A								
Solits and Phases: 2: Princeton Dr. & Candalaria Rd.								

HCM 6th Signalized Intersection Summary
2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔		↔	↔			↔		↔	↔	
Traffic Volume (veh/h)	51	560	36	22	560	70	32	55	26	59	35	78
Future Volume (veh/h)	51	560	36	22	560	70	32	55	26	59	36	78
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone on Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855
Adj Flow Rate, veh/h	60	659	42	26	659	82	38	85	31	69	42	92
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	264	1203	77	292	1128	140	646	547	261	665	239	522
Arrive on Green	0.46	0.48	0.48	0.36	0.36	0.36	0.46	0.46	0.46	0.46	0.46	0.46
Sat Flow, veh/h	712	3365	214	740	3155	392	1246	1167	555	1269	518	1134
Grp Volume(V), veh/h	60	345	356	26	368	373	38	0	96	69	0	134
Grp Sat Flow(s),veh/h/m	712	1763	1817	740	1763	1785	1246	0	1754	1269	0	1651
Q Served(s), s	3.9	7.6	7.6	1.6	9.3	9.3	1.0	0.0	1.7	1.8	0.0	2.6
Cycle Q Clearing, s	13.3	7.6	7.6	9.2	9.3	9.3	3.6	0.0	1.7	3.5	0.0	2.8
Prop In Lane	1.00	0.12	1.00	0.22	1.00	0.22	1.00	0.32	1.00	0.69	0.32	1.00
Lane Grp Cap(c), veh/h	264	630	649	292	630	638	646	0	808	685	0	761
V/C Ratio(X)	0.23	0.55	0.55	0.09	0.58	0.59	0.06	0.00	0.12	0.10	0.00	0.18
Avail Cap(c), veh/h	411	994	1024	445	994	1066	646	0	908	685	0	761
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(i)	0.98	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.7	11.3	11.3	17.4	14.4	14.4	9.8	0.0	8.5	9.5	0.0	8.7
Incr Delay (d2), s/veh	0.4	0.7	0.7	6.1	0.9	0.9	0.2	0.0	0.3	0.3	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Size Back(Q/50%),veh/m	0.5	2.4	2.5	0.3	3.4	3.4	0.3	0.0	0.6	0.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGr Delay(d),s/veh	17.1	12.0	12.0	17.5	15.2	15.2	9.9	0.0	8.8	9.7	0.0	9.2
LnGr LOS	B	B	B	B	B	B	A	A	A	A	A	A
Approach Vol, veh/h	761			767				134			203	
Approach Delay, s/veh	12.4			15.3				9.1			9.4	
Approach LOS	B			B				A			A	
Time - Assigned Pts	2	4	4	6	6	6	6	8				
Pts Duration (G+Y+Rc), s	30.3	24.7	24.7	30.3	24.7	30.3	24.7	30.3				
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Selling (Gmax), s	14.0	31.0	31.0	14.0	31.0	14.0	31.0	31.0				
Max Q Clear Time (g_c+1), s	5.6	15.3	15.3	5.5	5.5	5.5	11.3	11.3				
Green Ext Time (p_c), s	0.3	4.4	4.4	0.6	0.6	0.6	4.8	4.8				
Intersection Summary												
HCM 6th Ctrl Delay	13.0											
HCM 6th LOS	B											

Timings 4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
08/29/2018

Lane Group	EBT	WBL	WBT	SBL	SBT	SBT
Lane Configurations	←	←	←	←	←	←
Traffic Volume (vph)	523	363	877	359	718	134
Future Volume (vph)	523	363	877	359	718	134
Turn Type	NA	Prot	NA	Perm	NA	Perm
Protected Phases	4	3	8	6	6	6
Permitted Phases	4	3	8	6	6	6
Detector Phase	4	3	8	6	6	6
Switch Phase	4	3	8	6	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	21.0	21.0	21.0
Total Split (s)	29.0	23.0	52.0	38.0	38.0	38.0
Total Spill (%)	32.2%	25.6%	57.8%	42.2%	42.2%	42.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?						
Recall Mode	C-Min	Min	C-Min	Min	Min	Min
Act Eff Green (s)	29.4	15.3	49.8	30.2	30.2	30.2
Actuated g/C Ratio	0.33	0.17	0.55	0.34	0.34	0.34
W/C Ratio	0.69	0.69	0.50	0.67	0.71	0.24
Control Delay	40.2	32.6	21.6	31.4	29.7	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	32.6	21.6	31.4	29.7	8.3
LOS	D	C	C	C	C	A
Approach Delay	40.2		24.8		28.1	
Approach LOS	D		C		C	
Intersection Summary						
Cycle Length: 90						
Actual Cycle Length: 90						
Offset: 41.4 (46%), Referenced to phase 4:EBT and 8:WBT; Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Maximum W/C Ratio: 0.69						
Intersection Signal Delay: 30.1						
Intersection Capacity Utilization: 70.8%						
ICU Level of Service: C						
Analysis Period (min): 15						
Splits and Phases: 4: I-25 W. Ramp & Comanche Rd.						
	03	03	03	03	03	03
	03	03	03	03	03	03
	03	03	03	03	03	03

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HCM 6th Signalized Intersection Summary 4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
08/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	0	523	363	877	1	0	0	0	0	359	718	134
Future Volume (veh/h)	0	523	363	877	1	0	0	0	0	359	718	134
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _p , pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	0	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855	1855
Adj Flow Rate, veh/h	0	575	418	399	984	1	0	0	0	395	789	147
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	3	3	3	3	3	3	3	3	3	3	3
Cap, veh/h	0	781	568	481	2157	2	0	0	0	516	1384	459
Arrive On Green	0.00	0.40	0.40	0.28	1.00	1.00	0.00	0.00	0.00	0.29	0.29	0.29
Sat Flow, veh/h	0	2040	1416	3428	3614	4	0	0	0	1767	3711	1572
Grp Volume (V), veh/h	0	520	473	399	470	465	0	0	0	395	789	147
Grp Sat Flow (S), veh/h	0	1763	1601	1714	1763	1855	0	0	0	1767	1855	1572
Q Serve (g, s)	0.0	22.6	22.6	9.8	0.0	0.0	0.0	0.0	0.0	18.3	17.2	6.6
Cycle Q Clear (g, s)	0.0	22.6	22.6	9.8	0.0	0.0	0.0	0.0	0.0	18.3	17.2	6.6
Prop In Lane	0.00	0.88	0.88	1.00	0.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Lane Grp Cap (c), veh/h	0	707	642	481	1052	1107	0	0	0	516	1384	459
V/C Ratio (X)	0.00	0.74	0.74	0.83	0.45	0.45	0.00	0.00	0.00	0.77	0.73	0.32
Avail Cap (c, s), veh/h	0	707	642	686	1052	1107	0	0	0	648	1361	577
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter (t)	0.00	1.00	1.00	0.68	0.68	0.68	0.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	22.9	31.4	0.0	0.0	0.0	0.0	0.0	29.0	28.6	24.9
Inc Delay (d ₂), s/veh	0.0	6.7	7.4	4.1	0.9	0.9	0.0	0.0	0.0	4.2	1.5	0.4
Initial Q Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%)veh/h	0.0	10.3	9.4	3.7	0.3	0.3	0.0	0.0	0.0	8.1	7.7	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay (d), s/veh	A	C	C	D	A	A				C	C	C
LnGrp LOS	A	C	C	D	A	A				C	C	C
Approach Vol, veh/h		993			1364							
Approach Delay, s/veh		29.9			11.0							
Approach LOS		C			B							
Timer - Assigned Phs			3	4		6						
Phs Duration (G+Y+Rc), s			17.6	41.1		31.3						
Change Period (Y+Rc), s			5.0	5.0		5.0						
Max Green Setting (G _{max}), s			18.0	24.0		33.0						
Max Q Clear Time (g, c+1), s			11.8	24.6		20.3						
Green Ext Time (p, c), s			0.8	0.0		5.9						
Intersection Summary												
HCM 6th Ctrl Delay			23.2									
HCM 6th LOS			C									
Notes												
User approved volume balancing among the lanes for turning movement.												

2019 AM Peak BUILD Conditions

Synchro 10 Report
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Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖	↑↑			↑↑			↕			↕	
Traffic Vol, veh/h	8	690	340	110	547	1	75	4	97	1	5	4
Future Vol, veh/h	8	690	340	110	547	1	75	4	97	1	5	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	88	88	88	88	88	88	88	88	88	88	88	88
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	9	784	386	125	622	1	85	5	110	1	6	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	623	0	0	1170	0	0	1559	1868	585	1286	2061	312
Stage 1	-	-	-	-	-	-	995	995	-	873	873	-
Stage 2	-	-	-	-	-	-	564	873	-	413	1188	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	947	-	-	769	-	-	~ 75	71	*792	*121	54	681
Stage 1	-	-	-	-	-	-	522	501	-	*309	363	-
Stage 2	-	-	-	-	-	-	475	363	-	*747	382	-
Platoon blocked, %	-	-	-	1	-	-	-	-	1	-	-	-
Mov Cap-1 Maneuver	947	-	-	769	-	-	~ 58	53	*792	*82	40	681
Mov Cap-2 Maneuver	-	-	-	-	-	-	212	179	-	*209	138	-
Stage 1	-	-	-	-	-	-	517	496	-	*306	273	-
Stage 2	-	-	-	-	-	-	347	273	-	*631	379	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1.8	27.7	22.9
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	353	947	-	-	769	-	-	213
HCM Lane V/C Ratio	0.567	0.01	-	-	0.163	-	-	0.053
HCM Control Delay (s)	27.7	8.8	-	-	10.6	-	-	22.9
HCM Lane LOS	D	A	-	-	B	-	-	C
HCM 95th %tile Q(veh)	3.3	0	-	-	0.6	-	-	0.2

Notes			
~: Volume exceeds capacity	\$. Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			↕			↱	
Traffic Vol, veh/h	51	1	1	1	1	3	1	121	1	9	392	54
Future Vol, veh/h	51	1	1	1	1	3	1	121	1	9	392	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	1	1	1	1	4	1	161	1	12	523	72

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	749	747	559	748	783	162	595	0	0	162	0	0
Stage 1	583	583	-	164	164	-	-	-	-	-	-	-
Stage 2	166	164	-	584	619	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	327	340	527	327	324	880	976	-	-	1411	-	-
Stage 1	496	497	-	836	761	-	-	-	-	-	-	-
Stage 2	834	761	-	496	479	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	321	335	527	322	319	880	976	-	-	1411	-	-
Mov Cap-2 Maneuver	321	335	-	322	319	-	-	-	-	-	-	-
Stage 1	496	491	-	835	760	-	-	-	-	-	-	-
Stage 2	828	760	-	487	473	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19	12	0.1	0.1
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	976	-	-	321	410	322	611	1411	-	-
HCM Lane V/C Ratio	0.001	-	-	0.212	0.007	0.004	0.009	0.009	-	-
HCM Control Delay (s)	8.7	0	-	19.2	13.8	16.2	10.9	7.6	-	-
HCM Lane LOS	A	A	-	C	B	C	B	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.8	0	0	0	0	-	-

HCM 6th TWSC
8: Princeton Dr. & "B"

Terry O. Brown, PE
08/28/2018

Intersection												
Int Delay, s/veh	3.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	1	36	3	1	3	38	70	6	9	329	54
Future Vol, veh/h	51	1	36	3	1	3	38	70	6	9	329	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	75	75	75	75	75	75	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	68	1	48	4	1	4	51	93	8	12	439	72

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	701	702	475	723	734	97	511	0	0	101	0	0
Stage 1	499	499	-	199	199	-	-	-	-	-	-	-
Stage 2	202	203	-	524	535	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	352	361	588	340	346	956	1049	-	-	1485	-	-
Stage 1	552	542	-	801	735	-	-	-	-	-	-	-
Stage 2	798	732	-	535	522	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	333	339	588	296	325	956	1049	-	-	1485	-	-
Mov Cap-2 Maneuver	333	339	-	296	325	-	-	-	-	-	-	-
Stage 1	523	536	-	759	697	-	-	-	-	-	-	-
Stage 2	752	694	-	485	516	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	13.5	2.9	0.2
HCM LOS	C	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1049	-	-	333	577	296	644	1485	-	-
HCM Lane V/C Ratio	0.048	-	-	0.204	0.085	0.014	0.008	0.008	-	-
HCM Control Delay (s)	8.6	0	-	18.6	11.8	17.3	10.6	7.4	0	-
HCM Lane LOS	A	A	-	C	B	C	B	A	A	-
HCM 95th %tile Q(veh)	0.2	-	-	0.8	0.3	0	0	0	-	-

Timings 1: Carlisle Bld. & Comanche Rd.

Terry O. Brown, PE
08/27/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	112	382	381	90	344	161	673	77	636
Traffic Volume (vph)	112	382	381	90	344	161	673	77	636
Future Volume (vph)	112	382	381	90	344	161	673	77	636
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	5	3	8	5	2	1	6
Permitted Phases	4	4	4	6	2	2	5	6	6
Detector Phase	7	4	5	3	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	10.0	10.0	21.0	10.0	10.0	10.0	21.0
Total Split (s)	16.0	39.0	16.0	16.0	39.0	16.0	39.0	16.0	39.0
Total Split (%)	14.5%	35.5%	14.5%	14.5%	35.5%	14.5%	35.5%	14.5%	35.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?									
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effct Green (s)	29.5	29.3	44.9	37.5	28.3	53.8	43.2	49.2	40.9
Actual g/C Ratio	0.36	0.27	0.41	0.34	0.26	0.49	0.39	0.45	0.37
W/C Ratio	0.35	0.84	0.56	0.41	0.48	0.49	0.42	0.26	0.43
Control Delay	22.9	53.1	16.2	24.9	34.2	21.4	26.1	18.3	27.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.9	53.1	16.2	24.9	34.2	21.4	26.1	18.3	27.4
LOS	C	D	B	C	C	C	C	B	C
Approach Delay	33.2			32.5		25.3		26.5	
Approach LOS	C			C		C		C	
Intersection Summary									
Cycle Length: 110									
Actual Cycle Length: 110									
Offset: 55 (50%), Referenced to phase 2: NBT and 6: SBT, Start of Green									
Natural Cycle: 65									
Control Type: Actuated-Coordination									
Maximum w/C Ratio: 0.84									
Intersection Signal Delay: 23.0									
Intersection Capacity Utilization: 65.3%									
Analysis Period (min): 15									
Splits and Phases: 1: Carlisle Bld. & Comanche Rd.									
	01	02 (R)	03	04	05	06 (R)	07	08	
	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	

2019 PM Peak NOBUILD Conditions

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HCM 6th Signalized Intersection Summary 1: Carlisle Bld. & Comanche Rd.

Terry O. Brown, PE
08/27/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	112	382	381	90	344	161	673	77	636
Traffic Volume (veh/h)	112	382	381	90	344	161	673	77	636
Future Volume (veh/h)	112	382	381	90	344	161	673	77	636
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0
Peak-Bike Adj (A _{pbT})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	120	411	410	97	370	62	173	724	98
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh. %	3	3	3	3	3	3	3	3	3
Cap, veh/h	334	502	542	210	750	131	404	2005	269
Arrive On Green	0.07	0.27	0.27	0.06	0.26	0.26	0.07	0.44	0.05
Sat Flow, veh/h	1767	1856	1572	1767	3025	503	1767	4517	606
Grp Volume (V), veh/h	120	411	410	97	214	216	173	540	282
Grp Sat Flow (S), veh/h	1767	1856	1572	1767	1763	1765	1767	1688	1746
Q Serve (g, s)	5.4	22.8	25.4	4.3	11.2	11.4	6.1	11.6	11.8
Cycle Q Clear (g, c), s	5.4	22.8	25.4	4.3	11.2	11.4	6.1	11.6	11.8
Prop in Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap (c), veh/h	334	502	542	210	460	461	404	1499	775
V/C Ratio (X)	0.36	0.82	0.76	0.46	0.47	0.47	0.43	0.36	0.23
Avail Cap (c, a), veh/h	391	574	603	284	545	546	449	1499	775
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter (f)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.3	37.6	31.9	29.5	34.2	34.3	16.7	20.2	22.3
Incr Delay (d ₂), s/veh	0.7	8.2	4.9	1.6	0.7	0.8	0.7	1.3	0.8
Initial Q Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back (Q/d ₂), veh/h	2.3	11.4	10.2	1.9	4.9	5.0	2.5	4.7	5.0
Unsig. Movement Delay, s/veh									
LnGrp Delay (d), s/veh	27.9	45.8	36.8	31.1	34.9	35.0	17.4	20.9	21.6
LnGrp LOS	C	D	D	C	C	D	B	C	C
Approach Vol, veh/h	941			529			985		878
Approach Delay, s/veh	39.6			34.3			20.5		22.8
Approach LOS	D			C			C		C
Timer - Assigned Phs	1	2	3	4	5	6	7	8	
Phs Duration (G+Y+Rc), s	10.0	53.8	11.4	34.7	13.2	50.6	12.5	33.7	
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Max Green Setting (G _{max}), s	11.0	34.0	11.0	34.0	11.0	34.0	11.0	34.0	
Max Q Clear Time (g _c +t ₁), s	4.9	13.8	6.3	27.4	8.1	14.0	7.4	13.4	
Green Ext Time (p _c), s	0.1	5.5	0.1	2.3	0.1	5.3	0.1	2.5	
Intersection Summary									
HCM 6th Ctrl Delay									
HCM 6th LOS									

2019 PM Peak NOBUILD Conditions

Synchro 10 Report
2019PNX.syn

Timings 2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	17	754	22	976	35	12	66	27
Traffic Volume (veh/h)	17	754	22	976	35	12	66	27
Future Volume (veh/h)	17	754	22	976	35	12	66	27
Initial Q (Qb), veh	0	0	0	0	0	0	0	0
Initial Q (Qc), veh	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, adjT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	17	762	23	986	28	35	12	34
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3
Cap, veh/h	214	1360	41	338	1363	39	594	183
Arrive On Green	0.78	0.78	0.78	0.39	0.39	0.43	0.43	0.43
Sat Flow, veh/h	552	3494	105	684	3501	99	1225	427
Grp Volume(V), veh/h	17	384	401	22	486	35	0	46
Grp Sat Flow(s), veh/h	552	1763	1837	684	1783	1225	0	1638
Q Serve(g, s), s	1.3	4.7	4.7	1.3	13.2	13.2	1.0	0.9
Cycle Q Clear(g, s), s	14.4	4.7	4.7	6.0	13.2	13.2	4.3	0.9
Prop In Lane	1.00	0.06	1.00	0.05	1.00	0.74	1.00	0.82
Lane Grp Cap(c), veh/h	214	686	715	338	686	715	594	0
V/C Ratio(X)	0.08	0.56	0.56	0.06	0.72	0.72	0.06	0.07
Avail Cap(c), veh/h	310	994	1035	458	994	1035	594	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.88	0.88	0.88	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.2	4.2	4.2	13.8	14.3	11.2	0.0	9.2
Initial Q Delay (d2), s/veh	0.1	0.6	0.6	0.1	1.5	1.4	0.2	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQueue(s), veh/h	0.1	1.1	1.1	0.2	4.7	4.9	0.3	0.0
Unsig. Movement Delay, s/veh	10.4	4.9	4.9	13.9	15.7	11.4	0.0	9.4
LnGrp Delay(d), s/veh	B	A	A	B	B	B	A	B
LnGrp LOS	B	A	A	B	B	B	A	B
Approach Vol, veh/h	802	1036	1036	81	1036	1036	219	10.5
Approach Delay, s/veh	5.0	15.7	15.7	B	B	B	B	B
Approach LOS	A	B	B	B	B	B	B	B
Timer - Assigned Phs	2	4	4	6	6	6	8	8
Phs Duration (G+Y+Rc), s	28.6	26.4	26.4	28.6	26.4	26.4	28.6	26.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	31.0	31.0	14.0	14.0	14.0	31.0	31.0
Max Q Clear Time (g_c+1), s	6.3	16.4	16.4	5.3	5.3	5.3	15.2	15.2
Green Ext Time (p_c), s	0.1	4.5	4.5	0.7	0.7	0.7	6.2	6.2
Intersection Summary								
HCM 6th Ctrl Delay	10.9							
HCM 6th LOS	B							
Notes	User approved pedestrian interval to be less than phase max green.							

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HCM 6th Signalized Intersection Summary 2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	17	754	23	976	28	35	12	34
Traffic Volume (veh/h)	17	754	23	976	28	35	12	34
Future Volume (veh/h)	17	754	23	976	28	35	12	34
Initial Q (Qb), veh	0	0	0	0	0	0	0	0
Initial Q (Qc), veh	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, adjT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	17	762	23	986	28	35	12	34
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3
Cap, veh/h	214	1360	41	338	1363	39	594	183
Arrive On Green	0.78	0.78	0.78	0.39	0.39	0.43	0.43	0.43
Sat Flow, veh/h	552	3494	105	684	3501	99	1225	427
Grp Volume(V), veh/h	17	384	401	22	486	35	0	46
Grp Sat Flow(s), veh/h	552	1763	1837	684	1783	1225	0	1638
Q Serve(g, s), s	1.3	4.7	4.7	1.3	13.2	13.2	1.0	0.9
Cycle Q Clear(g, s), s	14.4	4.7	4.7	6.0	13.2	13.2	4.3	0.9
Prop In Lane	1.00	0.06	1.00	0.05	1.00	0.74	1.00	0.82
Lane Grp Cap(c), veh/h	214	686	715	338	686	715	594	0
V/C Ratio(X)	0.08	0.56	0.56	0.06	0.72	0.72	0.06	0.07
Avail Cap(c), veh/h	310	994	1035	458	994	1035	594	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(f)	0.88	0.88	0.88	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	10.2	4.2	4.2	13.8	14.3	11.2	0.0	9.2
Initial Q Delay (d2), s/veh	0.1	0.6	0.6	0.1	1.5	1.4	0.2	0.3
Initial Q Delay (d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQueue(s), veh/h	0.1	1.1	1.1	0.2	4.7	4.9	0.3	0.0
Unsig. Movement Delay, s/veh	10.4	4.9	4.9	13.9	15.7	11.4	0.0	9.4
LnGrp Delay(d), s/veh	B	A	A	B	B	B	A	B
LnGrp LOS	B	A	A	B	B	B	A	B
Approach Vol, veh/h	802	1036	1036	81	1036	1036	219	10.5
Approach Delay, s/veh	5.0	15.7	15.7	B	B	B	B	B
Approach LOS	A	B	B	B	B	B	B	B
Timer - Assigned Phs	2	4	4	6	6	6	8	8
Phs Duration (G+Y+Rc), s	28.6	26.4	26.4	28.6	26.4	26.4	28.6	26.4
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	14.0	31.0	31.0	14.0	14.0	14.0	31.0	31.0
Max Q Clear Time (g_c+1), s	6.3	16.4	16.4	5.3	5.3	5.3	15.2	15.2
Green Ext Time (p_c), s	0.1	4.5	4.5	0.7	0.7	0.7	6.2	6.2
Intersection Summary								
HCM 6th Ctrl Delay	10.9							
HCM 6th LOS	B							
Notes	User approved pedestrian interval to be less than phase max green.							

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Timings 3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	112	604	174	145	774	227	164	476	41	7	12	12
Future Volume (vph)	112	604	174	145	774	227	164	476	41	7	12	12
Turn Types	pm-trl	NA	pm-toy	pm-trl	NA	pm-trl	pm-trl	NA	pm-trl	NA	pm-trl	pm-trl
Protected Phases	7	4	5	3	8	1	5	2	1	6		
Permitted Phases	4	4	4	8	8	2	2	1	6	6		
Detector Phase	7	4	5	3	8	1	5	2	1	6		
Switch Phase												
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	10.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	21.0
Total Split (s)	19.0	32.0	23.0	24.0	37.0	13.0	23.0	41.0	13.0	31.0	31.0	31.0
Total Split (%)	17.3%	29.1%	20.9%	21.8%	33.6%	11.8%	20.9%	37.3%	11.8%	28.2%	28.2%	28.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?												
Recall Mode	Min	C-Min	Min	Min	C-Min	Min	Min	C-Min	Min	Min	C-Min	Min
Act Effct Green (s)	52.4	42.8	61.1	55.7	44.4	58.3	40.7	29.1	6.8	22.7	22.7	22.7
Actuated g/C Ratio	0.48	0.39	0.56	0.51	0.40	0.51	0.37	0.26	0.06	0.21	0.21	0.21
v/c Ratio	0.36	0.48	0.20	0.42	0.27	0.37	0.37	0.22	0.01	0.03	0.03	0.03
Control Delay	17.8	29.0	2.8	19.1	27.1	9.6	25.2	40.4	51.1	32.6	0.1	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	29.0	2.8	19.1	27.1	9.6	25.2	40.4	51.1	32.6	0.1	0.1
LOS	B	C	A	B	C	A	C	D	D	C	A	A
Approach Delay	22.4			22.7			37.4			39.0		
Approach LOS	C			C			D			D		
Intersection Summary												
Cycle Length: 110												
Actuated Cycle Length: 110												
Offset: 24.2 (22%), Referenced to phase 4-EBTL and 8-WBTL Start of Green												
Neutral Cycle: 65												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.77												
Intersection Signal Delay: 27.0												
Intersection Capacity Utilization 55.8%												
Analysis Period (min) 15												
Spills and Phases: 3: University Bd. & Candelaria Bd.												
	01	02	03	04	05	06	07	08	09	10	11	12
	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2

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HCM 6th Signalized Intersection Summary 3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (veh/h)	112	604	174	145	774	227	164	476	41	7	12	12
Future Volume (veh/h)	112	604	174	145	774	227	164	476	41	7	12	12
Initial Q (Q ₀) veh	0	0	0	0	0	0	0	0	0	0	0	0
Peak-Bike Adj(A _{pbT})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow (veh/h)	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Sat Flow (veh/h)	124	671	193	161	860	252	182	529	187	46	8	0
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh. %	3	3	3	3	3	3	3	3	3	3	3	3
Cap. veh/h	392	1601	871	396	2368	806	511	636	224	155	686	686
Arrive On Green	0.06	0.45	0.45	0.14	0.93	0.93	0.10	0.25	0.25	0.05	0.19	0.00
Sat Flow, veh/h	1767	3626	1572	1767	5066	1572	1767	2556	900	3428	3526	1572
Grp Volume(V), veh/h	124	671	193	161	860	252	182	364	352	46	8	0
Grp Sat Flow(s), veh/h	1767	1763	1572	1767	1688	1572	1767	1763	1694	1714	1763	1572
Q Serve(g, s)	4.1	14.1	6.9	5.4	1.8	1.5	8.7	21.5	21.7	1.4	0.2	0.0
Cycle Q Clear(g, s)	4.1	14.1	6.9	5.4	1.8	1.5	8.7	21.5	21.7	1.4	0.2	0.0
Prop In Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	392	1601	871	396	2368	806	511	438	421	155	686	686
V/C Ratio(X)	0.32	0.42	0.22	0.41	0.36	0.31	0.36	0.83	0.84	0.30	0.01	0.01
Avail Cap(c, a), veh/h	517	1601	871	578	2368	806	624	577	554	249	833	833
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter	1.00	1.00	1.00	0.75	0.75	0.75	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.2	20.3	12.5	13.8	2.0	1.6	29.0	39.1	39.2	50.8	35.8	0.0
Incr Delay (d2), s/veh	0.5	0.8	0.6	0.5	0.3	0.3	0.4	7.7	8.3	1.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back(Q/600), veh/h	1.7	5.9	2.5	1.9	0.6	0.5	3.7	10.2	9.9	0.6	0.1	0.0
Unsig. Movement Delay, s/veh	14.6	21.1	13.1	14.3	2.3	2.4	29.4	46.8	47.5	51.8	35.8	0.0
LnGrp Delay(d), s/veh	B	C	B	B	A	A	C	D	D	D	D	D
LnGrp LOS	B	C	B	B	A	A	C	D	D	D	D	D
Approach Vol, veh/h	988			1273			898			54		
Approach Delay, s/veh	18.7			3.8			43.6			49.5		
Approach LOS	B			A			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+R), s	10.0	32.4	12.7	54.9	16.0	26.4	11.2	56.4				
Change Period (Y+R), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0				
Max Green Setting (G _{max}), s	8.0	36.0	19.0	27.0	18.0	26.0	14.0	32.0				
Max Q Clear Time (g_c+H1), s	3.4	23.7	7.4	16.1	10.7	2.2	6.1	3.8				
Green Ext Time (g_c), s	0.0	3.7	0.3	4.0	0.3	0.0	0.2	7.9				
Intersection Summary												
HCM 6th Cn Delay				20.3								
HCM 6th LOS				C								
Notes												
Unsignalized Delay for [SBR] is excluded from calculations of the approach delay and intersection delay.												

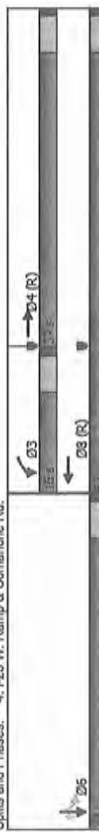
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Timings Terry O. Brown, PE 08/29/2018

4: I-25 W. Ramp & Comanche Rd.

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←
Traffic Volume (vph)	462	443	720	333	778	159
Future Volume (vph)	462	443	720	333	778	159
Turn Type	NA	Prof	NA	Perm	NA	Perm
Protected Phases	4	3	8	6	6	6
Permitted Phases	4	3	8	6	6	6
Detector Phase	4	3	8	6	6	6
Switch Phase	4	3	8	6	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	21.0	21.0	21.0
Total Split (s)	37.0	16.0	53.0	37.0	37.0	37.0
Total Split (%)	41.1%	17.8%	58.9%	41.1%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead				
Lead-Lag Optimize?						
Recall Mode	C-Min	Min	C-Min	Min	Min	Min
Act Eff Green (s)	31.4	13.8	50.2	29.8	29.8	29.8
Actuated g/C Ratio	0.35	0.15	0.56	0.33	0.33	0.33
w/c Ratio	0.954	0.89	0.38	0.60	0.75	0.26
Control Delay	38.8	48.2	16.2	29.5	31.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	48.2	16.2	29.5	31.1	4.9
LOS	D	D	B	C	C	A
Approach Delay	38.8		28.4		27.7	
Approach LOS	D		C		C	
Intersection Summary						
Cycle Length: 90						
Actual Cycle Length: 90						
Offset: 80.1 (89%). Referenced to phase 4:EBT and 8:WBT; Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Maximum w/c Ratio: 0.90						
Intersection Signal Delay: 31.1						
Intersection Capacity Utilization: 78.3%						
Analysis Period (min): 15						
dr Defacto Right Lane. Records with 1 through lane as a right lane.						

Splits and Phases: 4: I-25 W. Ramp & Comanche Rd.



2019 PM Peak NOBUILD Conditions

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HCM 6th Signalized Intersection Summary Terry O. Brown, PE 08/29/2018

4: I-25 W. Ramp & Comanche Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	←	←	←	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	0	462	535	443	720	0	0	0	0	333	778	159
Future Volume (veh/h)	0	462	535	443	720	0	0	0	0	333	778	159
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _p), veh	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h/m	0	1856	1856	1856	1856	0	0	0	0	1856	1856	1856
Adj Flow Rate, veh/h	0	481	557	461	750	0	0	0	0	347	810	166
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	3	3	3	3	0	0	0	0	3	3	3
Cap, veh/h	0	749	868	419	2125	0	0	0	0	505	1061	450
Arrive On Green	0.00	0.43	0.43	0.24	1.00	0.00	0.00	0.00	0.00	0.29	0.29	0.29
Sat Flow, veh/h	0	1856	1572	3428	3618	0	0	0	0	1767	3711	1572
Grp Volume (V), veh/h	0	481	557	461	750	0	0	0	0	347	810	166
Grp Sat Flow (S), veh/h/m	0	1763	1572	1714	1763	0	0	0	0	1767	1856	1572
Q Serve (g, s)	0.0	19.4	28.4	11.0	0.0	0.0	0.0	0.0	0.0	15.7	17.9	7.6
Cycle Q Clear (g, s)	0.0	19.4	28.4	11.0	0.0	0.0	0.0	0.0	0.0	15.7	17.9	7.6
Prop In Lane	0.00	1.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Lane Grp Cap (c), veh/h	0	749	868	419	2125	0	0	0	0	505	1061	450
V/C Ratio (X)	0.00	0.64	0.83	1.10	0.35	0.00	0.00	0.00	0.00	0.69	0.76	0.37
Avail Cap (c, s), veh/h	0	749	868	419	2125	0	0	0	0	505	1061	450
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Delay (d ₁), s/veh	0.00	1.00	1.00	0.37	0.37	0.00	0.00	0.00	0.00	28.5	29.3	25.6
Uniform Delay (d ₂), s/veh	0.0	4.2	11.6	58.5	0.2	0.0	0.0	0.0	0.0	2.3	2.1	0.5
Inc Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Q Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile Back (Q/d ₃), veh/m	0.0	8.5	12.1	7.2	0.1	0.0	0.0	0.0	0.0	6.8	8.1	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay (d ₄), s/veh	0.0	24.7	34.7	92.5	0.2	0.0	0.0	0.0	0.0	30.8	31.5	26.2
LnGrp LOS	A	C	C	F	A	A	A	A	A	C	C	C
Approach Vol, veh/h		1038			1211						1323	
Approach Delay, s/veh		30.0			35.3						30.6	
Approach LOS		C			D						C	
Timer - Assigned Phs		3	4		6						8	
Phs Duration (G+Y+R _c), s		16.0	43.3		30.7						59.3	
Change Period (Y+R _c), s		5.0	5.0		5.0						5.0	
Max Green Setting (G _{max}), s		11.0	32.0		32.0						48.0	
Max Q Clear Time (g, c+11), s		13.0	30.4		19.9						2.0	
Green Ext Time (p, c), s		0.0	1.1		5.8						6.3	
Intersection Summary												
HCM 6th Ctrl Delay					32.0							
HCM 6th LOS					C							
Notes												
User approved volume balancing among the lanes for turning movement.												

2019 PM Peak NOBUILD Conditions

Synchro 10 Report
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HCM 6th Signalized Intersection Summary
5: I-25 E.Ramp & Comanche Rd.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↔↔			↔↔			↔↔	↔	↔	↔	↔
Traffic Volume (veh/h)	206	589	0	0	614	166	549	1330	424	0	0	0
Future Volume (veh/h)	206	589	0	0	614	166	549	1330	424	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj (A _p , p/h)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	0	0	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	231	662	0	0	690	187	528	1619	476	0	0	0
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	0	0	3	3	3	3	3	3	3	3
Cap, veh/h	307	1690	0	0	909	246	729	2296	649	0	0	0
Arrive On Green	0.18	0.95	0.00	0.00	0.33	0.33	0.41	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	3428	3516	0	0	2635	743	1767	5567	1572	0	0	0
Grp Volume(V), veh/h	231	662	0	0	443	434	528	1619	476	0	0	0
Grp Sat Flow(s), veh/h	1714	1763	0	0	1763	1722	1767	1856	1572	0	0	0
Q Serve(g, s), s	5.8	1.3	0.0	0.0	20.2	20.2	22.5	21.7	23.0	0.0	0.0	0.0
Cycle Q Clearing (s), s	5.8	1.3	0.0	0.0	20.2	20.2	22.5	21.7	23.0	0.0	0.0	0.0
Prop In Lane	1.00	1.00	0.00	0.00	0.43	0.43	1.00	1.00	1.00	0.00	0.00	0.00
Lane Grp Cap(c), veh/h	307	1690	0	0	584	571	729	2296	649	0	0	0
V/C Ratio(X)	0.75	0.39	0.00	0.00	0.76	0.76	0.72	0.71	0.73	0.00	0.00	0.00
Avail Cap(c), veh/h	457	1690	0	0	584	571	785	2474	699	0	0	0
HCN Pardon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Flare(t)	0.48	0.48	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	1.1	0.0	0.0	26.9	26.9	22.2	21.9	22.3	0.0	0.0	0.0
Incr Delay (d2), s/veh	1.9	0.3	0.0	0.0	9.0	9.2	3.1	0.9	3.7	0.0	0.0	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/h	2.3	0.4	0.0	0.0	9.6	9.5	9.5	9.5	9.2	0.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	37.9	1.5	0.0	0.0	35.8	36.1	25.2	22.8	26.0	0.0	0.0	0.0
LnGrp LOS	D	A	A	A	D	D	C	C	C	C	C	C
Approach Vol, veh/h	893				877			2623				
Approach Delay, s/veh	10.9				36.0			23.8				
Approach LOS	B				D			C				
Timer - Assigned Phs	2			4				7		8		
Phs Duration (G+Y+R), s	42.1			47.9				13.0		34.8		
Charge Period (Y+R), s	5.0			5.0				5.0		5.0		
Max Green Setting (Gmax), s	40.0			40.0				12.0		23.0		
Max Q Clear Time (g, c+11), s	25.0			5.3				7.8		22.2		
Green Ext Time (p, c), s	12.2			5.2				0.3		0.4		
Innessed Summary	23.6											
HCN 6th Ch Delay	C											
HCN 6th LOS												

ESL	EST	WBT	NBL	NBT	NSR
11	11	11	11	11	11
206	589	614	549	1330	424
206	589	614	549	1330	424
Prot	NA	NA	Perm	NA	Perm
7	4	8	2	2	2
7	4	8	2	2	2
5.0	5.0	5.0	5.0	5.0	5.0
10.0	21.0	21.0	21.0	21.0	21.0
17.0	45.0	28.0	45.0	45.0	45.0
18.9%	50.0%	31.1%	50.0%	50.0%	50.0%
4.0	4.0	4.0	4.0	4.0	4.0
1.0	1.0	1.0	1.0	1.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0
5.0	5.0	5.0	5.0	5.0	5.0
Lead	Lead	Lead	Lead	Lead	Lead
Min	C-Min	C-Min	Min	Min	Min
10.7	40.0	24.3	40.0	40.0	40.0
0.12	0.44	0.27	0.44	0.44	0.44
0.57	0.43	0.93	0.77	0.76	0.61
47.6	20.9	49.6	30.3	23.9	16.3
0.0	0.0	0.0	0.0	0.0	0.0
47.6	20.9	49.6	30.3	23.9	16.3
D	C	D	C	C	B
27.8	49.6	23.8	C	C	C
Cycle Length: 90	Actuated Cycle Length: 90	Officer: 88.2 (98%), Referenced to phase 4:EBT and 8:WBT, Start of Green	Natural Cycle: 60	Control Type: Actuated-Coordinated	Intersection LOS: C
Maximum v/c Ratio: 0.83	Intersection Signal Delay: 29.8	Intersection Capacity Utilization 99.3%	Analysis Period (min): 15	Spills and Phases: 5: 1-25 E Ramp & Comanche Rd.	

HCM 6th TWSC
6: Princeton Dr. & Comanche Rd.

Terry O. Brown, PE
08/28/2018

Intersection												
Int Delay, s/veh	1.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑		↰	↑↑			↰			↰	
Traffic Vol, veh/h	15	888	110	19	708	7	51	1	54	4	2	21
Future Vol, veh/h	15	888	110	19	708	7	51	1	54	4	2	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	16	935	116	20	745	7	54	1	57	4	2	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	752	0	0	1051	0	0	1439	1817	526	1289	1872	376
Stage 1	-	-	-	-	-	-	1025	1025	-	789	789	-
Stage 2	-	-	-	-	-	-	414	792	-	500	1083	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	847	-	-	1001	-	-	93	76	*723	*120	70	619
Stage 1	-	-	-	-	-	-	637	568	-	*348	398	-
Stage 2	-	-	-	-	-	-	584	396	-	*682	521	-
Platoon blocked, %	-	-	-	1	-	-	-	-	1	-	-	-
Mov Cap-1 Maneuver	847	-	-	1001	-	-	86	73	*723	*107	67	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	302	235	-	*242	229	-
Stage 1	-	-	-	-	-	-	625	557	-	*341	390	-
Stage 2	-	-	-	-	-	-	549	388	-	*615	511	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	0.2	16.4	13.4
HCM LOS			C	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	428	847	-	-	1001	-	-	456
HCM Lane V/C Ratio	0.261	0.019	-	-	0.02	-	-	0.062
HCM Control Delay (s)	16.4	9.3	-	-	8.7	-	-	13.4
HCM Lane LOS	C	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	1	0.1	-	-	0.1	-	-	0.2

Notes			
~: Volume exceeds capacity	\$. Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
7: Princeton Dr. & "A"

Terry O. Brown, PE
08/28/2018

Intersection						
Int Delay, s/veh	0.5					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	W		T			T
Traffic Vol, veh/h	1	9	97	1	6	125
Future Vol, veh/h	1	9	97	1	6	125
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	1	9	102	1	6	132

Major/Minor	Minor1	Major1	Major2
Conflicting Flow All	247	103	0
Stage 1	103	-	-
Stage 2	144	-	-
Critical Hdwy	6.43	6.23	-
Critical Hdwy Stg 1	5.43	-	-
Critical Hdwy Stg 2	5.43	-	-
Follow-up Hdwy	3.527	3.327	-
Pot Cap-1 Maneuver	739	949	-
Stage 1	919	-	-
Stage 2	881	-	-
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	736	949	-
Mov Cap-2 Maneuver	736	-	-
Stage 1	915	-	-
Stage 2	881	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9	0	0.3
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	922	1483
HCM Lane V/C Ratio	-	-	0.011	0.004
HCM Control Delay (s)	-	-	9	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0	0

HCM 6th TWSC
8: Princeton Dr. & "B"

Terry O. Brown, PE
08/28/2018

Intersection						
Int Delay, s/veh	0.7					
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations	Y		Y			Y
Traffic Vol, veh/h	5	9	97	3	6	119
Future Vol, veh/h	5	9	97	3	6	119
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	5	9	102	3	6	125

Major/Minor	Minor1	Major1	Major2		
Conflicting Flow All	241	104	0	0	105
Stage 1	104	-	-	-	-
Stage 2	137	-	-	-	-
Critical Hdwy	6.43	6.23	-	-	4.13
Critical Hdwy Stg 1	5.43	-	-	-	-
Critical Hdwy Stg 2	5.43	-	-	-	-
Follow-up Hdwy	3.527	3.327	-	-	2.227
Pot Cap-1 Maneuver	745	948	-	-	1480
Stage 1	918	-	-	-	-
Stage 2	887	-	-	-	-
Platoon blocked, %			-	-	-
Mov Cap-1 Maneuver	742	948	-	-	1480
Mov Cap-2 Maneuver	742	-	-	-	-
Stage 1	914	-	-	-	-
Stage 2	887	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	9.2	0	0.4
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBRWBLn1	SBL	SBT
Capacity (veh/h)	-	-	862	1480
HCM Lane V/C Ratio	-	-	0.017	0.004
HCM Control Delay (s)	-	-	9.2	7.4
HCM Lane LOS	-	-	A	A
HCM 95th %tile Q(veh)	-	-	0.1	0

Timings 1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE

08/27/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	138	394	388	90	357	169	673	77	636
Traffic Volume (vph)	138	394	388	90	357	169	673	77	636
Future Volume (vph)	138	394	388	90	357	169	673	77	636
Turn Type	pm+pt	NA	pm+ov	pm+pt	NA	pm+pt	NA	pm+pt	NA
Protected Phases	7	4	5	3	8	5	2	1	6
Permitted Phases	4	4	4	8	8	2	5	2	1
Detector Phase	7	4	5	3	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	10.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	16.0	39.0	16.0	16.0	39.0	16.0	39.0	16.0	39.0
Total Split (%)	14.5%	35.5%	14.5%	14.5%	35.5%	14.5%	35.5%	14.5%	35.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag
Lead/Lag Optimizes?	Min	Min	Min	Min	Min	Min	Min	Min	Min
Recall Mode	41.1	29.5	45.8	37.1	27.9	53.5	42.6	48.4	40.1
Act Eltd Green (s)	0.37	0.27	0.42	0.34	0.25	0.49	0.39	0.44	0.36
Actualized g/C Ratio	0.43	0.85	0.56	0.41	0.51	0.53	0.43	0.26	0.45
Control Delay	24.0	53.5	16.1	24.8	35.1	23.0	26.5	18.6	27.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	53.5	16.1	24.8	35.1	23.0	26.5	18.6	27.8
LOS	C	D	B	C	D	C	C	B	C
Approach Delay	33.3			33.3			25.8		27.0
Approach LOS	C			C			C		C

HCM 6th Signalized Intersection Summary 1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE

08/27/2018

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	138	394	388	90	357	169	673	77	636
Traffic Volume (veh/h)	138	394	388	90	357	169	673	77	636
Future Volume (veh/h)	138	394	388	90	357	169	673	77	636
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0
Peak-Bike Adj (A _{pbT})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	148	424	417	97	384	62	182	724	98
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	3	3	3	3	3	3	3	3	3
Cap, veh/h	341	507	552	207	768	123	395	1988	267
Arrive On Green	0.03	0.27	0.27	0.06	0.25	0.08	0.44	0.44	0.05
Sat Flow, veh/h	1767	1856	1572	1767	3943	487	1767	4517	606
Grp Volume (V), veh/h	148	424	417	97	221	225	182	540	282
Grp Sat Flow (S), veh/h	1767	1856	1572	1767	1763	1768	1767	1689	1702
Q Serve (g, s)	6.7	23.7	25.8	4.4	11.8	12.0	6.4	11.7	11.9
Cycle Q Clear (g, s)	6.7	23.7	25.8	4.4	11.8	12.0	6.4	11.7	11.9
Prop In Lane	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap (c), veh/h	341	507	552	207	445	445	395	1487	769
V/C Ratio (X)	0.43	0.84	0.76	0.47	0.50	0.50	0.46	0.36	0.37
Avail Cap (c, s), veh/h	376	574	608	260	545	545	435	1487	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	27.5	37.6	31.5	30.0	35.2	35.2	17.0	20.5	20.6
Incir Delay (d ₂), s/veh	0.9	9.5	4.9	1.6	0.9	0.8	0.7	1.4	0.3
Initial Q Delay (d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfTide (d ₃), s/veh	2.9	12.0	10.4	2.0	5.2	5.3	2.7	4.7	5.1
Unsig. Movement Delay, s/veh	28.4	47.1	36.4	31.7	36.0	36.1	17.9	21.2	21.9
LnGrp Delay (d), s/veh	C	D	D	C	D	D	B	C	C
LnGrp LOS	C	D	D	C	D	D	B	C	C
Approach Vol, veh/h	989			543			1004		907
Approach Delay, s/veh	39.8			35.3			20.8		23.6
Approach LOS	D			D			C		C
Timer - Assigned Phs	1	2	3	4	5	6	7	8	
Phs Duration (G+Y+Rc), s	10.0	53.4	11.5	35.1	13.6	49.9	13.8	32.8	
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Max Green Setting (G _{max}), s	11.0	34.0	11.0	34.0	11.0	34.0	11.0	34.0	
Max Q Clear Time (g, c+1), s	5.0	13.9	6.4	27.8	8.4	14.8	8.7	14.0	
Green Ext Time (p, c), s	0.1	5.5	0.1	2.3	0.1	5.4	0.1	2.6	
Intersection Summary									
HCM 6th Ctrl Delay									
HCM 6th LOS									

2019 PM Peak BUILD Conditions

Synchro 10 Report

2019PBX.syn

Timings 2: Princeton Dr. & Candalaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	37	754	22	976	35	20	75	35
Future Volume (veh/h)	37	754	22	976	35	20	75	35
Initial Q (Qb), veh	0	0	0	0	0	0	0	0
Peak-Hour Adj (A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Perk Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	37	762	23	996	37	20	34	76
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3
Cap, veh/h	223	1417	43	368	1405	53	537	255
Arrive On Green	0.81	0.81	0.81	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	547	3494	105	684	3465	130	1195	617
Grp Volume(s), veh/hln	37	384	401	22	502	521	35	0
Grp Sat Flow(s), veh/hln	547	1763	1837	684	1763	1832	1196	0
Q Serve(s), s	2.8	4.0	4.0	1.2	13.0	13.0	1.1	0.0
Cycle Q Clear(s), s	15.9	4.0	4.0	5.2	13.0	13.0	5.1	0.0
Prop In Lane	1.00	0.06	1.00	0.07	1.00	0.07	1.00	0.06
Lane Grp Cap(s), veh/h	223	715	745	358	715	743	537	0
V/C Ratio(X)	0.17	0.54	0.54	0.06	0.70	0.70	0.07	0.00
Avail Cap(s), veh/h	310	994	1035	465	994	1033	537	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(s)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	3.5	3.5	12.7	13.6	13.6	12.3	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.5	0.1	1.3	1.3	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% BackOfQ(60%), veh/h	0.2	0.9	1.0	0.2	4.6	4.8	0.3	0.0
Unsig. Movement Delay, s/veh	9.9	4.0	4.0	12.7	14.9	14.9	12.6	0.0
LnGrp Delay(d), s/veh	A	A	A	B	B	B	A	B
LnGrp LOS	A	A	A	B	B	B	A	B
Approach Vol, veh/h	822			1045			89	255
Approach Delay, s/veh	4.3			14.8			11.0	11.5
Approach LOS	A			B			B	B
Timer - Assigned Phs	2		4		5		8	
Phs Duration (G+Y+Rc), s	27.7		27.3		27.7		27.3	
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0	
Max Green Setting (Gmax), s	14.0		31.0		14.0		31.0	
Max Q Clear Time (q_c+1), s	7.1		17.9		6.0		15.0	
Green Ext Time (g_c), s	0.2		4.4		0.8		6.3	
Intersection Summary								
HCM 6th Ctrl Delay			10.4					
HCM 6th LOS			B					
Notes								
User approved pedestrian interval to be less than phase max green.								

2019 PM Peak BUILD Conditions
Synchro 10 Report
2019PBX syn

HCM 6th Signalized Intersection Summary 2: Princeton Dr. & Candalaria Bd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	←	←	←	←	←	←	←	←
Traffic Volume (veh/h)	37	754	23	976	37	20	34	75
Future Volume (veh/h)	37	754	23	976	37	20	34	75
Initial Q (Qb), veh	0	0	0	0	0	0	0	0
Peak-Hour Adj (A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Perk Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	1856	1856	1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	37	762	23	996	37	20	34	76
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Percent Heavy Veh, %	3	3	3	3	3	3	3	3
Cap, veh/h	223	1417	43	368	1405	53	537	255
Arrive On Green	0.81	0.81	0.81	0.41	0.41	0.41	0.41	0.41
Sat Flow, veh/h	547	3494	105	684	3465	130	1195	617
Grp Volume(s), veh/hln	37	384	401	22	502	521	35	0
Grp Sat Flow(s), veh/hln	547	1763	1837	684	1763	1832	1196	0
Q Serve(s), s	2.8	4.0	4.0	1.2	13.0	13.0	1.1	0.0
Cycle Q Clear(s), s	15.9	4.0	4.0	5.2	13.0	13.0	5.1	0.0
Prop In Lane	1.00	0.06	1.00	0.07	1.00	0.07	1.00	0.06
Lane Grp Cap(s), veh/h	223	715	745	358	715	743	537	0
V/C Ratio(X)	0.17	0.54	0.54	0.06	0.70	0.70	0.07	0.00
Avail Cap(s), veh/h	310	994	1035	465	994	1033	537	0
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(s)	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.6	3.5	3.5	12.7	13.6	13.6	12.3	0.0
Incr Delay (d2), s/veh	0.3	0.5	0.5	0.1	1.3	1.3	0.2	0.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% BackOfQ(60%), veh/h	0.2	0.9	1.0	0.2	4.6	4.8	0.3	0.0
Unsig. Movement Delay, s/veh	9.9	4.0	4.0	12.7	14.9	14.9	12.6	0.0
LnGrp Delay(d), s/veh	A	A	A	B	B	B	A	B
LnGrp LOS	A	A	A	B	B	B	A	B
Approach Vol, veh/h	822			1045			89	255
Approach Delay, s/veh	4.3			14.8			11.0	11.5
Approach LOS	A			B			B	B
Timer - Assigned Phs	2		4		5		8	
Phs Duration (G+Y+Rc), s	27.7		27.3		27.7		27.3	
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0	
Max Green Setting (Gmax), s	14.0		31.0		14.0		31.0	
Max Q Clear Time (q_c+1), s	7.1		17.9		6.0		15.0	
Green Ext Time (g_c), s	0.2		4.4		0.8		6.3	
Intersection Summary								
HCM 6th Ctrl Delay			10.4					
HCM 6th LOS			B					
Notes								
User approved pedestrian interval to be less than phase max green.								

2019 PM Peak BUILD Conditions
Synchro 10 Report
2019PBX syn

Timings Terry O. Brown, PE 08/29/2018

4: I-25 W. Ramp & Comanche Rd.

Lane Group	EBT	WBT	SBL	SBR	SSR
Lane Configurations	4/4	4/4	4/4	4/4	4/4
Traffic Volume (vph)	474	444	732	349	778
Future Volume (vph)	474	444	732	349	778
Turn Type	NA	Prot	NA	Perm	NA
Protected Phases	4	3	8	6	6
Permitted Phases	4	3	8	6	6
Switch Phase	4	3	8	6	6
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	21.0	21.0
Total Split (s)	37.0	15.0	53.0	37.0	37.0
Total Split (%)	41.1%	17.8%	58.9%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lead			
Recall Mode	C-Min	Min	Min	Min	Min
Act Effd Green (s)	31.4	13.7	50.2	29.8	29.8
Actuated g/C Ratio	0.35	0.15	0.56	0.33	0.33
W/C Ratio	0.96	0.89	0.39	0.63	0.75
Control Delay	39.8	48.2	16.5	30.4	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	48.2	16.5	30.4	31.1
LOS	D	D	B	C	C
Approach Delay	39.8		28.4		28.0
Approach LOS	D		C		C
Intersection Summary					
Cycle Length: 90					
Actual Cycle Length: 90					
Offset: 80.1 (89%), Referenced to Phase 4:EBT and 8:WBT; Start of Green					
Natural Cycle: 65					
Control Type: Actuated-Coordinated					
Maximum v/c Ratio: 0.91					
Intersection Signal Delay: 31.6					
Intersection Capacity Utilization: 78.7%					
ICU Level of Service: D					
Analysis Period (min): 15					
dr Defacto Right Lane. Records with 1 though lane as a right lane.					
Spills and Phases: 4: I-25 W. Ramp & Comanche Rd.					
	03	04 (R)	05	06	07

2019 PM Peak BUILD Conditions

Synchro 10 Report
2019PBX.syn

HCM 6th Signalized Intersection Summary Terry O. Brown, PE 08/29/2018

4: I-25 W. Ramp & Comanche Rd.

Movement	EBL	EBT	EBR	WBL	WBT	NBL	NBT	NBR	SBL	SBR	SST
Lane Configurations	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4	4/4
Traffic Volume (veh/h)	0	474	535	444	732	0	0	0	349	778	159
Future Volume (veh/h)	0	474	535	444	732	0	0	0	349	778	159
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A, pbT)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	0	1856	1856	1856	1856	0	0	0	1856	1856	1856
Adj Flow Rate, veh/h	0	494	557	462	762	0	0	0	364	810	166
Peak Hour Factor	0.98	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh. %	0	3	3	3	3	0	0	0	3	3	3
Cap. veh/h	0	749	668	419	2124	0	0	0	506	1863	450
Arrive On Green	0.00	0.42	0.42	0.24	1.00	0.00	0.00	0.00	0.29	0.29	0.29
Sat Flow, veh/h	0	1856	1572	3428	3618	0	0	0	1767	3711	1572
Grp Volume(V), veh/h	0	494	557	462	762	0	0	0	364	810	166
Grp Sat Flow(S), veh/hln	0	1763	1572	1714	1763	0	0	0	1767	1856	1572
Q Serve(g, s)	0.0	20.2	28.4	11.0	0.0	0.0	0.0	0.0	16.7	17.9	7.6
Cycle Q Clear(g, c), s	0.0	20.2	28.4	11.0	0.0	0.0	0.0	0.0	16.7	17.9	7.6
Prop In Lane	0.00	1.00	1.00	1.00	0.00	0.00	0.00	0.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	749	668	419	2124	0	0	0	506	1863	450
V/C Ratio(X)	0.00	0.66	0.83	1.10	0.36	0.00	0.00	0.00	0.72	0.76	0.37
Avail Cap(c, at), veh/h	0	749	668	419	2124	0	0	0	628	1319	559
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(i)	0.00	1.00	1.00	0.32	0.32	0.00	0.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	20.7	23.1	34.0	0.2	0.0	0.0	0.0	28.9	29.3	25.6
Incr Delay (d2), s/veh	0.0	4.5	11.7	57.9	0.2	0.0	0.0	0.0	3.0	2.1	0.5
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQueue(s/veh)	0.0	8.8	12.1	7.2	0.0	0.0	0.0	0.0	7.3	8.1	2.8
Unsig. Movement Delay, s/veh											
LnGrp Delay(d), s/veh	0.0	25.2	34.8	91.9	0.2	0.0	0.0	0.0	31.9	31.4	26.1
LnGrp LOS	A	C	C	F	A	A	A	A	C	C	C
Approach Vol, veh/h		1051			1224						
Approach Delay, s/veh		30.3			34.8						
Approach LOS		C			C						
Timer - Assigned Phs			3	4	6		8				
Phs Duration (G+Y+Rc), s			16.0	43.2	30.8		59.2				
Change Period (Y+Rc), s			5.0	5.0	5.0		5.0				
Max Green Setting (Gmax), s			11.0	32.0	32.0		48.0				
Max Q Clear Time (g, c+11), s			13.0	30.4	19.9		2.0				
Green Ext Time (p, c), s			0.0	1.1	5.8		6.4				
Intersection Summary											
HCM 6th Ctrl Delay					32.0						
HCM 6th LOS					C						
Notes											
User approved volume balancing among the lanes for turning movement.											

2019 PM Peak BUILD Conditions

Synchro 10 Report
2019PBX.syn

4:1-25 W. Ramp & Comanche Rd.

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Configurations	4 ⁺ 4 ⁺	4 ⁺ 4 ⁺	4 ⁺ 4 ⁺	4 ⁺ 4 ⁺	4 ⁺ 4 ⁺	4 ⁺ 4 ⁺
Traffic Volume (vph)	474	444	732	349	778	159
Future Volume (vph)	474	444	732	349	778	159
Turn Type	NA	Prot	NA	Perm	NA	Perm
Protected Phases	4	3	8		6	6
Permitted Phases						
Detector Phase	4	3	8	6	6	6
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	21.0	10.0	21.0	21.0	21.0	21.0
Total Split (s)	35.0	18.0	53.0	37.0	37.0	37.0
Total Split (%)	38.9%	20.0%	58.9%	41.1%	41.1%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lag		Lead				
Lead-Lag Optimizer?						
Recall Mode	C-Min	Min	C-Min	Min	Min	Min
Act Effrd Green (s)	31.3	13.9	50.2	29.8	29.8	29.8
Actuated g/C Ratio	0.35	0.15	0.56	0.33	0.33	0.33
w/c Ratio	0.86	0.88	0.39	0.53	0.75	0.26
Control Delay	41.4	44.2	17.5	30.4	31.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	44.2	17.5	30.4	31.1	4.9
Approach Delay	D	D	B	C	C	A
Approach LOS	D		C			C
Intersection Summary						
Cycle Length: 90						
Actuated Cycle Length: 90						
Offset: 30.1 (89%), Referenced to phase 4-EBT and 8-WBT, Start of Green						
Natural Cycle: 65						
Control Type: Actuated-Coordinated						
Maximum w/c Ratio: 0.92						
Intersection Signal Delay: 31.8						
Intersection Capacity Utilization 78.7%						
Analysis Period (min) 15						
or Detector Right Lane. Record with 1 though lane as a right lane.						
Splits and Phases: 4: 1-25 W. Ramp & Comanche Rd.						

HCM 6th Signalized Intersection Summary
4: I-25 W. Ramp & Comanche Rd.

4:1-25 W. Ramp & Comanche Rd.

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement												
Lane Configurations	←	←		←	←			←	←	←	←	←
Transf. Volume (veh/h)	0	474	535	444	732	0	0	0	0	349	778	159
Future Volume (veh/h)	0	474	535	444	732	0	0	0	0	349	778	159
Initial Q (Q _B) veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/hln	0	1856	1856	1856	1856	0	0	0	0	1856	1856	1856
Adj Flow Rate, veh/h	0	494	557	462	762	0	0	0	0	364	810	166
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	0	3	3	3	3	0	0	0	0	3	3	3
Cap. veh/hn	0	709	633	495	2124	0	0	0	0	506	1063	450
Arrive On Green	0.00	0.40	0.40	0.29	1.00	0.00	0.00	0.29	0.29	0.29	0.29	0.29
Sat Flow, veh/h	0	1856	1572	3428	3618	0	0	1767	3711	1572	1767	1572
Gp Volume(v), veh/h	0	494	557	462	762	0	0	364	810	166	364	166
Gp Sat Flow(s)veh/hln	0	1763	1572	1714	1763	0	0	167	1856	1572	167	1572
Q Served, sl, s	0.0	20.9	29.5	11.8	0.0	0.0	0.0	16.7	17.9	7.6	16.7	7.6
Cycle Q Clear(g-cl), s	0.0	20.9	29.5	11.8	0.0	0.0	0.0	16.7	17.9	7.6	16.7	7.6
Prop In Lane	0.00	1.00	1.00	1.00	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	709	633	495	2124	0	0	506	1063	450	506	450
V/C Ratio(X)	0.00	0.70	0.88	0.93	0.36	0.00	0.00	0.72	0.76	0.37	0.72	0.37
Avail Capacit, al, veh/h	0	709	633	495	2124	0	0	628	1319	559	628	1319
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(t)	0.00	1.00	1.00	0.32	0.32	0.00	0.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), veh/h	0.0	22.3	24.9	31.6	0.0	0.0	0.0	28.9	29.3	25.6	28.9	25.6
Incr Delay (d2), veh/h	0.0	5.6	16.1	10.7	0.2	0.0	0.0	3.0	2.1	0.5	3.0	2.1
Initial Q Delay(d3) veh/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOf(50%)veh/hln	0.0	9.4	13.2	4.7	0.0	0.0	0.0	7.3	8.1	2.8	7.3	8.1
Unsig. Movement Delay, veh/h	0.0	27.9	41.0	42.3	0.2	0.0	0.0	31.9	31.4	26.1	31.9	26.1
LnGrp Delay(d)veh/h	A	C	D	D	A	A	A	C	C	C	C	C
Approach Vol, veh/h	1051				1224			1340				
Approach Delay, veh/h	34.8				16.0			30.9				
Approach LOS	C				B			C				
Timer - Assigned Phis	3	4			8							
Phs Duration (G+Y+Rc), s	18.0	41.2			30.8			50.2				
Change Period (Y+Rcl), s	5.0	5.0			5.0			5.0				
Max Green Setting (Gmax), s	13.0	30.0			32.0			48.0				
Max Q Clear Time [g_crl], s	13.8	31.5			19.9			2.0				
Green Ext Time [p-cl], s	0.0	0.0			5.8			6.4				
Intersection Summary												
HCM 6th Ctrl Delay	27.0											
HCM 6th LOS	C											
Notes												

Timings 5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Configurations	TT	TT	TT	TT	TT	TT
Traffic Volume (vph)	206	617	627	549	1330	425
Future Volume (vph)	206	617	627	549	1330	425
Turn Type	Prot	NA	NA	Perm	NA	Perm
Protected Phases	7	4	8	2	2	2
Permitted Phases	7	4	8	2	2	2
Detector Phase						
Switch Phase						
Minimum Initial (s)	5.0	5.0	5.0	5.0	5.0	5.0
Minimum Split (s)	10.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	17.0	45.0	28.0	45.0	45.0	45.0
Total Spill (%)	18.9%	50.0%	31.1%	50.0%	50.0%	50.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag				
Lead-Lag Optimize?						
Recall Mode	Min	C-Min	Min	Min	Min	Min
Act Elrd Green (s)	10.7	40.0	24.3	40.0	40.0	40.0
Actuated g/C Ratio	0.12	0.44	0.27	0.44	0.44	0.44
w/C Ratio	0.57	0.45	0.97	0.77	0.76	0.82
Control Delay	47.2	21.1	55.6	30.3	23.9	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.2	21.1	55.6	30.3	23.9	17.2
LOS	D	C	E	C	C	B
Approach Delay		27.6	55.6		23.9	
Approach LOS		C	E		C	
Intersection Summary						
Cycle Length: 90						
Actual Cycle Length: 90						
Offset: 88.2 (88%), Referenced to phase 4:EBT and 8:WBT Start of Green						
Natural Cycle: 60						
Control Type: Actuated-Coordinated						
Maximum w/C Ratio: 0.97						
Intersection Signal Delay: 31.2						
Intersection Capacity Utilization 99.6%						
Analysis Period (min) 15						
Splits and Phases: 5: I-25 E.Ramp & Comanche Rd.						
	02					
	07					
	08 (R)					

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HCM 6th Signalized Intersection Summary 5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
08/27/2018

Movement	EBL	EBT	WBT	NBL	NBT	NBR	SSB	SSB
Lane Configurations	TT	TT	TT	TT	TT	TT	TT	TT
Traffic Volume (veh/h)	206	617	0	0	627	181	549	1330
Future Volume (veh/h)	206	617	0	0	627	181	549	1330
Initial Q (Q ₀), veh	0	0	0	0	0	0	0	0
Ped-Bike Adj(A _{pbt})	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No	No	No	No	No	No	No	No
Adj Sat Flow, veh/h	1856	1856	0	0	1856	1856	1856	1856
Adj Flow Rate, veh/h	231	693	0	0	704	203	528	1619
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	3	3	0	0	3	3	3	3
Cap, veh/h	307	1678	0	0	894	258	730	2288
Arrive On Green	0.18	0.95	0.00	0.00	0.33	0.33	0.41	0.41
Sat Flow, veh/h	3428	3618	0	0	2793	778	1767	5567
Grp Volume(V), veh/h	231	693	0	0	460	447	528	1619
Grp Sat Flow(s), veh/h	1714	1763	0	0	1763	1715	1767	1856
Q Serve(g/s), s	5.8	1.4	0.0	0.0	21.2	21.2	22.5	21.7
Cycle Q Clear(g _c), s	5.8	1.4	0.0	0.0	21.2	21.2	22.5	21.7
Prop In Lane	1.00	0.00	0.00	0.00	0.45	1.00	1.00	1.00
Lane Grp Cap(c), veh/h	307	1678	0	0	583	568	730	2298
V/C Ratio(X)	0.75	0.41	0.00	0.00	0.79	0.79	0.72	0.74
Avail Cap(c _a), veh/h	457	1678	0	0	583	568	785	2474
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter	0.46	0.46	0.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.0	1.2	0.0	0.0	27.2	22.1	21.9	22.3
Inter Delay (d ₂), s/veh	1.8	0.3	0.0	0.0	10.3	10.6	3.1	6.8
Initial Q Delay(d ₃), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/h	2.3	0.4	0.0	0.0	10.3	10.1	9.5	8.8
Unsig. Movement Delay, s/veh	37.8	1.5	0.0	0.0	37.6	37.9	25.2	26.1
LnGrp Delay(d), s/veh								
LnGrp LOS	D	A	A	A	D	C	C	C
Approach Vol, veh/h	924				907			2625
Approach Delay, s/veh	10.6				37.7			23.8
Approach LOS	B				D			C
Timer - Assigned Phs	2		4		7		8	
Phs Duration (G+Y+Rc), s	42.2		47.8		13.0		34.8	
Change Period (Y+Rc), s	5.0		5.0		5.0		5.0	
Max Green Setting (G _{max}), s	40.0		40.0		12.0		23.0	
Max Q Clear Time (q _{c+1}), s	25.1		3.4		7.8		23.2	
Green Ext Time (p _c), s	12.1		5.5		0.3		0.0	
Intersection Summary								
HCM 6th Ctl Delay					23.9			
HCM 6th LOS					C			
Notes								
User approved volume balancing among the lanes for turning movement.								

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Intersection												
Int Delay, s/veh	3.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱↰		↰	↱↰			↱↰			↱↰	
Traffic Vol, veh/h	15	888	139	91	708	7	79	5	123	4	7	21
Future Vol, veh/h	15	888	139	91	708	7	79	5	123	4	7	21
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	60	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	1	-	-	1	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	16	935	146	96	745	7	83	5	129	4	7	22

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	752	0	0	1081	0	0	1608	1984	541	1443	2054	376
Stage 1	-	-	-	-	-	-	1040	1040	-	941	941	-
Stage 2	-	-	-	-	-	-	568	944	-	502	1113	-
Critical Hdwy	4.16	-	-	4.16	-	-	7.56	6.56	6.96	7.56	6.56	6.96
Critical Hdwy Stg 1	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.56	5.56	-	6.56	5.56	-
Follow-up Hdwy	2.23	-	-	2.23	-	-	3.53	4.03	3.33	3.53	4.03	3.33
Pot Cap-1 Maneuver	847	-	-	964	-	-	~ 69	60	*723	*92	54	619
Stage 1	-	-	-	-	-	-	618	556	-	*281	338	-
Stage 2	-	-	-	-	-	-	472	337	-	*682	498	-
Platoon blocked, %	-	-	-	1	-	-	-	-	1	-	-	-
Mov Cap-1 Maneuver	847	-	-	964	-	-	~ 59	53	*723	*67	48	619
Mov Cap-2 Maneuver	-	-	-	-	-	-	240	193	-	*184	178	-
Stage 1	-	-	-	-	-	-	607	546	-	*276	304	-
Stage 2	-	-	-	-	-	-	400	303	-	*544	489	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.1	1	24.9	16.9
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	394	847	-	-	964	-	-	337
HCM Lane V/C Ratio	0.553	0.019	-	-	0.099	-	-	0.1
HCM Control Delay (s)	24.9	9.3	-	-	9.1	-	-	16.9
HCM Lane LOS	C	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	3.2	0.1	-	-	0.3	-	-	0.3

Notes			
~: Volume exceeds capacity	\$. Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	1.8											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↱		↰	↱			↕			↱	
Traffic Vol, veh/h	51	1	1	1	1	9	1	148	1	6	178	53
Future Vol, veh/h	51	1	1	1	1	9	1	148	1	6	178	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	54	1	1	1	1	9	1	156	1	6	187	56

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	391	386	215	387	414	157	243	0	0	157	0	0
Stage 1	227	227	-	159	159	-	-	-	-	-	-	-
Stage 2	164	159	-	228	255	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	566	547	822	570	527	886	1317	-	-	1417	-	-
Stage 1	773	714	-	841	764	-	-	-	-	-	-	-
Stage 2	836	764	-	772	695	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	556	544	822	566	524	886	1317	-	-	1417	-	-
Mov Cap-2 Maneuver	556	544	-	566	524	-	-	-	-	-	-	-
Stage 1	772	710	-	840	763	-	-	-	-	-	-	-
Stage 2	825	763	-	766	692	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.1	9.6	0.1	0.2
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1317	-	-	556	655	566	829	1417	-	-
HCM Lane V/C Ratio	0.001	-	-	0.097	0.003	0.002	0.013	0.004	-	-
HCM Control Delay (s)	7.7	0	-	12.2	10.5	11.4	9.4	7.6	-	-
HCM Lane LOS	A	A	-	B	B	B	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0	0	0	0	-	-

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	51	1	36	5	1	9	37	97	3	6	119	53
Future Vol, veh/h	51	1	36	5	1	9	37	97	3	6	119	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	0	-	-	0	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	54	1	38	5	1	9	39	102	3	6	125	56

Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	352	348	153	367	375	104	181	0	0	105	0	0
Stage 1	165	165	-	182	182	-	-	-	-	-	-	-
Stage 2	187	183	-	185	193	-	-	-	-	-	-	-
Critical Hdwy	7.13	6.53	6.23	7.13	6.53	6.23	4.13	-	-	4.13	-	-
Critical Hdwy Stg 1	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.13	5.53	-	6.13	5.53	-	-	-	-	-	-	-
Follow-up Hdwy	3.527	4.027	3.327	3.527	4.027	3.327	2.227	-	-	2.227	-	-
Pot Cap-1 Maneuver	601	574	890	587	554	948	1388	-	-	1480	-	-
Stage 1	835	760	-	817	747	-	-	-	-	-	-	-
Stage 2	812	746	-	814	739	-	-	-	-	-	-	-
Platoon blocked, %								-	-	-	-	-
Mov Cap-1 Maneuver	578	554	890	546	535	948	1388	-	-	1480	-	-
Mov Cap-2 Maneuver	578	554	-	546	535	-	-	-	-	-	-	-
Stage 1	810	756	-	792	725	-	-	-	-	-	-	-
Stage 2	779	724	-	774	735	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	10.8	10	2.1	0.3
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	EBLn2	WBLn1	WBLn2	SBL	SBT	SBR
Capacity (veh/h)	1388	-	-	578	876	546	880	1480	-	-
HCM Lane V/C Ratio	0.028	-	-	0.093	0.044	0.01	0.012	0.004	-	-
HCM Control Delay (s)	7.7	0	-	11.9	9.3	11.7	9.1	7.4	0	-
HCM Lane LOS	A	A	-	B	A	B	A	A	A	-
HCM 95th %tile Q(veh)	0.1	-	-	0.3	0.1	0	0	0	-	-

HCM Queuing Analyses

Queues
1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	81	180	153	86	397	178	494	10	542
Lane Group Flow (vph)	0.34	0.82	0.27	0.31	0.70	0.33	0.19	0.02	0.23
v/c Ratio	31.4	52.2	5.0	30.4	47.5	11.8	14.9	11.0	16.8
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	31.4	52.2	5.0	30.4	47.5	11.8	14.9	11.0	16.8
Total Delay	43	120	0	45	132	49	83	3	71
Queue Length 50th (ft)	71	178	38	74	170	97	98	11	115
Queue Length 95th (ft)	125	4620		140	540		692		448
Internal Link Dist (ft)	269	570	593	310	1071	555	2608	582	2366
Turn Bay Length (ft)	0	0	0	0	0	0	0	0	0
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.32	0.26	0.28	0.37	0.32	0.19	0.02	0.23

Intersection Summary

Queues
2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	36	701		26	730	38	86	59	102
Lane Group Flow (vph)	0.21	0.59		0.14	0.81	0.06	0.10	0.10	0.12
v/c Ratio	19.8	21.7		12.2	16.1	10.5	7.7	10.1	4.5
Control Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	19.8	21.7		12.2	16.1	10.5	7.7	10.1	4.5
Total Delay	17	186		6	97	6	9	10	6
Queue Length 50th (ft)	39	229		15	103	23	33	26	21
Queue Length 95th (ft)	90	811		120	408		311		3044
Internal Link Dist (ft)	286	1965		305	1960	611	852	619	830
Turn Bay Length (ft)	0	0		0	0	0	0	0	0
Base Capacity (vph)	0	0		0	0	0	0	0	0
Starvation Cap Reductn	0	0		0	0	0	0	0	0
Spillback Cap Reductn	0	0		0	0	0	0	0	0
Storage Cap Reductn	0	0		0	0	0	0	0	0
Reduced v/c Ratio	0.13	0.36		0.09	0.37	0.06	0.10	0.10	0.12

Intersection Summary

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Queues
3: University Bld. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	191	596	230	122	438	179	130	375	15	2	4
W/C Ratio	0.30	0.32	0.20	0.24	0.17	0.17	0.41	0.89	0.08	0.01	0.01
Control Delay	9.3	15.9	1.4	9.4	15.9	8.6	36.4	45.2	50.1	44.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.3	15.9	1.4	9.4	15.9	8.6	36.4	45.2	50.1	44.0	0.0
Queue Length 50th (ft)	46	117	0	40	60	21	75	117	5	0	0
Queue Length 95th (ft)	89	184	25	69	81	56	117	156	15	4	0
Internal Link Dist (ft)	660										
Turn Bay Length (ft)	280										
Base Capacity (vph)	883										
Starvation Cap Reductn	0										
Spillback Cap Reductn	0										
Storage Cap Reductn	0										
Reduced W/C Ratio	0.26										

Intersection Summary

Queues
4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	978	398	952	377	804	132
W/C Ratio	0.87	0.69	0.49	0.64	0.71	0.24
Control Delay	39.0	32.8	21.4	30.4	29.7	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.0	32.8	21.4	30.4	29.7	8.0
Queue Length 50th (ft)	271	118	256	170	205	14
Queue Length 95th (ft)	434	160	334	263	272	56
Internal Link Dist (ft)	484					
Turn Bay Length (ft)	255					
Base Capacity (vph)	1118					
Starvation Cap Reductn	0					
Spillback Cap Reductn	0					
Storage Cap Reductn	0					
Reduced W/C Ratio	0.87					

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

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Queues
5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	263	664	649	410	1275	432
v/c Ratio	0.63	0.42	0.68	0.62	0.62	0.56
Control Delay	51.8	19.5	33.2	24.4	21.1	14.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.8	19.5	33.2	24.4	21.1	14.7
Queue Length 50th (ft)	84	120	171	200	207	109
Queue Length 95th (ft)	m107	m150	234	316	266	199
Internal Link Dist (ft)		435	351		735	
Turn Bay Length (ft)	60			100		140
Base Capacity (vph)	453	1606	963	679	2114	791
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.56	0.41	0.67	0.60	0.60	0.55
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

Queues
1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	110	193	161	86	412	188	484	10	574
Lane Group Flow (vph)	0.42	0.59	0.26	0.29	0.70	0.37	0.20	0.02	0.26
v/c Ratio	31.5	48.6	4.4	28.5	47.1	13.3	16.1	12.2	17.9
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	31.5	48.6	4.4	28.5	47.1	13.3	16.1	12.2	17.9
Total Delay	57	127	0	44	138	55	66	3	75
Queue Length 50th (ft)	88	185	36	71	176	107	102	12	124
Queue Length 95th (ft)	4620			540			692		448
Internal Link Dist (ft)	125			140			350		140
Turn Bay Length (ft)	279	570	531	924	1072	523	2511	552	2248
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.34	0.26	0.27	0.38	0.36	0.20	0.02	0.26
Intersection Summary									

2019 AM Peak BUILD Conditions

Synchro 10 Report
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Queues
2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
09/05/2018

	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	60	701	26	741	38	96	69	134
Lane Group Flow (vph)	0.35	0.58	0.14	0.61	0.06	0.11	0.11	0.16
v/c Ratio	24.0	21.5	11.9	15.7	10.8	8.2	10.3	4.2
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	24.0	21.5	11.9	15.7	10.8	8.2	10.3	4.2
Total Delay	30	197	6	98	6	11	12	7
Queue Length 50th (ft)	61	228	15	103	23	37	29	27
Queue Length 95th (ft)								
Internal Link Dist (ft)	90	811		408		311		3064
Turn Bay Length (ft)			120		140		185	
Base Capacity (vph)	284	1965	308	1959	587	849	608	833
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.21	0.36	0.06	0.38	0.06	0.11	0.11	0.16
Intersection Summary								

2019 AM Peak BUILD Conditions

Synchro 10 Report
2019ABX.syn

Queues
3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SSR
Lane Group Flow (vph)	191	609	230	122	452	187	130	384	15	2	4
v/c Ratio	0.31	0.33	0.20	0.24	0.17	0.18	0.41	0.70	0.08	0.01	0.01
Control Delay	9.4	16.2	1.4	9.3	15.9	8.3	36.2	44.5	50.1	44.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	16.2	1.4	9.3	15.9	8.3	36.2	44.5	50.1	44.0	0.0
Queue Length 50th (ft)	47	121	0	40	62	21	75	117	5	0	0
Queue Length 95th (ft)	90	191	26	68	83	56	117	157	15	4	0
Internal Link Dist (ft)	660				611			772		274	
Turn Bay Length (ft)	280	280	155	155	145	145	190	190	190	95	
Base Capacity (vph)	674	1665	1222	648	2614	1067	369	1136	247	528	499
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.26	0.33	0.19	0.19	0.17	0.18	0.35	0.34	0.06	0.00	0.01

Intersection Summary

Queues
4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
09/05/2018

Lane Group	EBT	WBL	WBT	SBL	SSR
Lane Group Flow (vph)	993	399	965	395	804
v/c Ratio	0.89	0.89	0.50	0.87	0.71
Control Delay	40.2	32.6	21.6	31.4	29.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	40.2	32.6	21.6	31.4	29.7
Queue Length 50th (ft)	277	118	262	181	205
Queue Length 95th (ft)	444	160	338	278	272
Internal Link Dist (ft)	484		435		849
Turn Bay Length (ft)		255		435	520
Base Capacity (vph)	1118	680	1938	642	1228
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.59	0.50	0.62	0.65

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

2019 AM Peak BUILD Conditions

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2019 AM Peak BUILD Conditions

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Queues
 5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
 09/06/2018

	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	263	696	680	410	1275	433
Wt Ratio	0.63	0.44	0.71	0.62	0.62	0.57
Control Delay	51.6	19.7	33.8	24.5	21.2	15.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.6	19.7	33.8	24.5	21.2	15.7
Queue Length 50th (ft)	84	127	181	200	207	116
Queue Length 95th (ft)	m107	m156	245	316	256	208
Internal Link Dist (ft)	435	351		735		
Turn Bay Length (ft)	60		100			140
Base Capacity (vph)	453	1606	962	677	2107	780
Starvation Cap Reductn	0	0	0	0	0	0
Spillover Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced Wt Ratio	0.58	0.43	0.71	0.61	0.61	0.56
Intersection Summary						
m Volume for 95th percentile queue is metered by upstream signal.						

2019 AM Peak BUILD Conditions
 Synchro 10 Report
 2019ABX.syn

Queues
1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	120	411	410	97	432	173	822	83	795
Lane Group Flow (vph)	0.35	0.84	0.58	0.41	0.48	0.49	0.42	0.26	0.43
v/c Ratio	22.9	53.1	16.2	24.9	34.2	21.4	26.1	18.3	27.4
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	22.9	53.1	16.2	24.9	34.2	21.4	26.1	18.3	27.4
Total Delay	54	273	124	43	130	64	148	29	149
Queue Length 50th (ft)	81	383	197	68	165	124	220	65	210
Queue Length 95th (ft)	4620								
Internal Link Dist (ft)	125		140		350		140		
Turn Bay Length (ft)	362	576	750	268	1076	370	1980	367	1887
Base Capacity (vph)	0	0	0	0	0	0	0	0	0
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.33	0.71	0.55	0.36	0.40	0.47	0.42	0.23	0.42

Intersection Summary

Queues
2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Group	17	785	22	1014	35	46	67	152	
Lane Group Flow (vph)	0.10	0.49	0.09	0.84	0.08	0.07	0.14	0.23	
v/c Ratio	4.6	11.3	7.4	12.9	15.0	8.2	14.5	5.8	
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Queue Delay	4.6	11.3	7.4	12.9	15.0	8.2	14.5	5.8	
Total Delay	5	195	4	123	7	3	14	9	
Queue Length 50th (ft)	m2	34	11	131	28	23	35	34	
Queue Length 95th (ft)	811			408		311		3044	
Internal Link Dist (ft)	90		120		140		185		
Turn Bay Length (ft)	203	1976	311	1976	446	622	491	661	
Base Capacity (vph)	0	0	0	0	0	0	0	0	
Starvation Cap Reductn	0	0	0	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	0	0	0	
Reduced v/c Ratio	0.08	0.40	0.07	0.51	0.06	0.07	0.14	0.23	

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

2019 PM Peak NOBUILD Conditions

Synchro 10 Report
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2019 PM Peak NOBUILD Conditions

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Queues
3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SSR
Lane Group Flow (vph)	124	671	193	151	860	252	182	716	46	13
v/c Ratio	0.36	0.49	0.20	0.42	0.42	0.27	0.37	0.77	0.22	0.01
Control Delay	17.8	29.0	2.8	19.1	27.1	9.6	25.2	40.4	51.1	32.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.8	29.0	2.8	19.1	27.1	9.6	25.2	40.4	51.1	32.6
Queue Length 50th (ft)	42	185	0	60	145	29	89	231	16	2
Queue Length 95th (ft)	86	292	38	99	252	98	126	274	35	8
Internal Link Dist (ft)	660				811			772		274
Turn Bay Length (ft)	280	280	155	155	155	145	145	190	190	95
Base Capacity (vph)	410	1352	1015	489	2033	932	524	1134	247	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.49	0.19	0.33	0.42	0.27	0.35	0.63	0.19	0.01

Intersection Summary

- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Delacoe Right Lane. Recode with 1 through lane as a right lane.

2019 PM Peak NOBUILD Conditions

Synchro 10 Report
2019PNX.syn

Queues
4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
09/05/2018

Lane Group	EBT	WBL	WBT	SBL	SSR
Lane Group Flow (vph)	1038	461	750	347	827
v/c Ratio	0.960r	0.89	0.38	0.60	0.75
Control Delay	38.8	48.2	16.2	29.5	31.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	38.8	48.2	16.2	29.5	31.1
Queue Length 50th (ft)	278	~160	164	156	217
Queue Length 95th (ft)	#401	m#210	m190	244	287
Internal Link Dist (ft)	484		435		849
Turn Bay Length (ft)	255		435		520
Base Capacity (vph)	1172	519	1954	622	1191
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.89	0.89	0.38	0.56	0.69

Intersection Summary

- Volume exceeds capacity, queue is theoretically infinite.
- Queue shown is maximum after two cycles.
- # 95th percentile volume exceeds capacity, queue may be longer.
- Queue shown is maximum after two cycles.
- m Volume for 95th percentile queue is metered by upstream signal.
- dr Delacoe Right Lane. Recode with 1 through lane as a right lane.

2019 PM Peak NOBUILD Conditions

Synchro 10 Report
2019PNX.syn

Queues
5: I-25 E.Ramp & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	←	→	←	↑	↗
Lane Group	EBL	EBT	WBT	NBL	NBT
Lane Group Flow (vph)	231	682	877	512	1599
v/c Ratio	0.57	0.43	0.93	0.77	0.76
Control Delay	47.7	21.0	49.6	30.3	23.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	47.7	21.0	49.6	30.3	23.9
Queue Length 50th (ft)	73	132	250	275	288
Queue Length 95th (ft)	m95	m167	#376	423	341
Internal Link Dist (ft)		435	351		735
Turn Bay Length (ft)	60		100		140
Base Capacity (vph)	453	1557	939	669	2106
Starvation Cap Reductn	0	0	0	0	0
Spillover Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.51	0.43	0.93	0.77	0.76
Intersection Summary					
#	95th percentile volume exceeds capacity, queue may be longer.				
	Queue shown is maximum after two cycles.				
m	Volume for 95th percentile queue is metered by upstream signal.				

Queues
1: Carlisle Bd. & Comanche Rd.

Terry O. Brown, PE
09/06/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	148	424	417	97	446	182	822	83
W/C Ratio	0.43	0.85	0.58	0.41	0.51	0.53	0.43	0.26
Control Delay	24.0	53.5	16.1	24.8	35.1	23.0	26.5	18.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	24.0	53.5	16.1	24.8	35.1	23.0	26.5	18.6
Queue Length 50th (ft)	67	281	125	42	135	69	150	30
Queue Length 95th (ft)	98	377	202	68	173	130	220	65
Internal Link Dist (ft)	4620			540			692	448
Turn Bay Length (ft)	125			140			350	140
Base Capacity (vph)	360	578	760	265	1072	358	1952	363
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillover Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced W/C Ratio	0.41	0.73	0.55	0.37	0.42	0.51	0.42	0.23

Intersection Summary

Queues
2: Princeton Dr. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018



Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	SBL	SBT
Lane Group Flow (vph)	37	785	22	1023	35	54	76	179
W/C Ratio	0.23	0.49	0.09	0.64	0.08	0.09	0.16	0.27
Control Delay	7.5	11.1	7.3	12.9	15.2	8.9	14.1	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.5	11.1	7.3	12.9	15.2	8.9	14.1	6.7
Queue Length 50th (ft)	14	183	4	123	7	4	16	15
Queue Length 95th (ft)	25	34	11	131	28	27	38	44
Internal Link Dist (ft)	811			408			311	304
Turn Bay Length (ft)	90			120			140	185
Base Capacity (vph)	201	1977	312	1976	433	631	486	660
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillover Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced W/C Ratio	0.18	0.40	0.07	0.52	0.08	0.09	0.16	0.27

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Queues
3: University Bd. & Candelaria Bd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR
Lane Group Flow (vph)	124	684	193	161	873	260	182	725	46	8	13
v/c Ratio	0.37	0.51	0.20	0.42	0.43	0.28	0.37	0.78	0.22	0.01	0.03
Control Delay	18.0	29.5	2.8	19.1	27.2	9.7	25.1	40.4	51.1	32.4	0.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	29.5	2.8	19.1	27.2	9.7	25.1	40.4	51.1	32.4	0.1
Queue Length 50th (ft)	42	191	0	50	155	41	89	233	16	2	0
Queue Length 95th (ft)	86	298	38	102	253	91	126	277	35	8	0
Internal Link Dist (ft)	680				811			772		274	
Turn Bay Length (ft)	290	280	155	155	145	145	145	145	190	95	
Base Capacity (vph)	405	1350	1010	482	2024	929	526	1134	247	834	501
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.31	0.51	0.19	0.33	0.43	0.28	0.35	0.64	0.19	0.01	0.03

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Detached Right Lane. Record with 1 through lane as a right lane.

2019 PM Peak BUILD Conditions

Synchro 10 Report
2019PBX.syn

Queues
4: I-25 W. Ramp & Comanche Rd.

Terry O. Brown, PE
09/06/2018

Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	1051	463	763	364	827	149
v/c Ratio	0.96dr	0.89	0.39	0.63	0.75	0.26
Control Delay	39.8	48.2	16.5	30.4	31.1	4.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	39.8	48.2	16.5	30.4	31.1	4.9
Queue Length 50th (ft)	284	~161	170	166	217	0
Queue Length 95th (ft)	#408	m#206	m188	257	287	41
Internal Link Dist (ft)	484		435		849	
Turn Bay Length (ft)		255		435		520
Base Capacity (vph)	1173	518	1954	622	1191	603
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.90	0.89	0.39	0.59	0.69	0.25

Intersection Summary

Volume exceeds capacity, queue is theoretically infinite.

Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

m Volume for 95th percentile queue is metered by upstream signal.

dr Detached Right Lane. Record with 1 through lane as a right lane.

2019 PM Peak BUILD Conditions

Synchro 10 Report
2019PBX.syn

Queues
5: I-25 E. Ramp & Comanche Rd.

Terry O. Brown, PE
09/06/2018

	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group	EBL	EBT	WBT	NBL	NBT	NBR
Lane Group Flow (vph)	231	683	907	512	1599	478
v/c Ratio	0.57	0.45	0.97	0.77	0.76	0.62
Control Delay	47.3	21.3	55.6	30.3	23.9	17.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	47.3	21.3	55.6	30.3	23.9	17.2
Queue Length 50th (ft)	73	140	262	275	286	140
Queue Length 95th (ft)	m95	m175	#397	423	341	239
Internal Link Dist (ft)		435	351		735	
Turn Bay Length (ft)	60		100			140
Base Capacity (vph)	453	1557	937	689	2108	774
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.51	0.45	0.97	0.77	0.76	0.62
Intersection Summary						
#	95th percentile volume exceeds capacity, queue may be longer.					
	Queue shown is maximum after two cycles.					
m	Volume for 95th percentile queue is metered by upstream signal.					

Traffic Count Data Sheet

Year Counts Taken: 2018

E-W Street: Comanche Rd.
N-S Street: Carlisle Bd.Speed Limit (Comanche Rd.)= 40 MPH
Speed Limit (Carlisle Bd.)= 35 MPH
8/2/18

Signalized

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)		
		L	T	R	Pedestrians	L	T	R	Pedestrians	L	T	R	Pedestrians
7:00 AM	7:15 AM	43	33	24	4	0	49	8	0	29	66	3	65
7:15 AM	7:30 AM	22	23	26	0	13	55	8	0	27	77	4	82
7:30 AM	7:45 AM	25	28	25	0	49	69	42	0	46	93	49	98
7:45 AM	8:00 AM	19	35	35	1	20	85	21	2	50	136	5	92
8:00 AM	8:15 AM	18	35	31	2	17	84	13	0	44	93	7	91
8:15 AM	8:30 AM	20	42	23	0	22	56	13	0	30	97	7	83
8:30 AM	8:45 AM	13	44	44	0	17	62	15	1	32	82	6	115
8:45 AM	9:00 AM	22	45	42	0	46	62	43	0	38	92	9	134
AM Peak Hour Volumes		70	156	133	3	76	287	62	3	156	408	25	381
% of Total Traffic		3.8%	8.4%	7.2%		4.1%	15.4%	3.3%		8.4%	21.9%	1.3%	20.5%
% Directional			19.3%				22.9%				31.7%		25.8%
AM Peak Hour Factor			0.89				0.84				0.77		0.86
									Intersection				
									0.88				

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Carlisle Bd.)			Southbound (Carlisle Bd.)		
		L	T	R	Pedestrians	L	T	R	Pedestrians	L	T	R	Pedestrians
4:00 PM	4:15 PM	23	96	79	4	42	84	44	0	34	104	43	488
4:15 PM	4:30 PM	46	84	88	2	22	72	49	4	23	164	44	456
4:30 PM	4:45 PM	34	86	77	5	18	67	13	0	32	166	17	148
4:45 PM	5:00 PM	22	94	68	0	20	94	15	3	44	155	19	154
5:00 PM	5:15 PM	15	83	122	1	21	73	13	0	54	186	31	180
5:15 PM	5:30 PM	40	114	109	2	31	108	17	0	30	163	24	146
5:30 PM	5:45 PM	48	84	69	0	46	75	44	0	35	176	25	430
5:45 PM	6:00 PM	45	82	57	3	24	76	49	2	34	122	22	439
PM Peak Hour Volumes		111	377	376	8	90	342	58	3	160	670	91	628
% of Total Traffic		3.6%	12.2%	12.2%		2.9%	11.1%	1.9%		5.2%	21.7%	2.9%	20.3%
% Directional			28.0%				15.9%				23.8%		26.1%
PM Peak Hour Factor			0.82				0.79				0.85		0.90
									Intersection				
									0.93				

Traffic Count Data Sheet

Year Counts Taken: 2018

E-W Street:
N-S Street:Comanche Rd.
Princeton Dr.Speed Limit (Comanche Rd.)= 40 MPH
Speed Limit (Princeton Dr.)= 25 MPH
7/9/18

Unsignalized

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	3	440	64	5	400	4	5	0	0	4	0	4
7:15 AM	7:30 AM	2	442	62	40	448	0	3	0	2	4	0	4
7:30 AM	7:45 AM	0	444	76	7	437	0	4	0	2	0	0	0
7:45 AM	8:00 AM	0	187	77	9	167	0	6	0	5	0	0	0
8:00 AM	8:15 AM	4	328	114	18	247	0	13	0	6	1	0	2
8:15 AM	8:30 AM	1	186	56	3	124	0	11	0	6	0	0	1
8:30 AM	8:45 AM	3	191	61	7	120	0	16	0	10	0	0	1
8:45 AM	9:00 AM	4	443	62	7	420	4	43	0	40	2	0	4
AM Peak Hour Volumes		8	892	308	37	658	0	46	0	27	1	0	4
% of Total Traffic		0.4%	45.0%	15.5%	1.9%	33.2%	0.0%	2.3%	0.0%	1.4%	0.1%	0.0%	0.2%
% Directional			60.9%			35.1%			3.7%			0.3%	
AM Peak Hour Factor			0.68			0.66			0.70			0.42	

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	4	444	49	0	88	3	0	0	4	4	0	4
4:15 PM	4:30 PM	6	473	34	3	460	3	7	0	5	2	4	0
4:30 PM	4:45 PM	3	190	30	4	178	1	12	0	12	0	2	4
4:45 PM	5:00 PM	6	219	27	6	163	2	16	0	12	0	0	4
5:00 PM	5:15 PM	2	222	25	4	191	2	13	1	16	3	0	7
5:15 PM	5:30 PM	4	229	27	5	173	2	10	0	14	1	0	6
5:30 PM	5:45 PM	7	487	27	0	464	3	40	0	4	3	0	4
5:45 PM	6:00 PM	40	453	47	6	444	2	4	4	0	4	2	0
PM Peak Hour Volumes		15	860	109	19	705	7	51	1	54	4	2	21
% of Total Traffic		0.8%	46.5%	5.9%	1.0%	38.1%	0.4%	2.8%	0.1%	2.9%	0.2%	0.1%	1.1%
% Directional			53.2%			39.5%			5.7%			1.5%	
PM Peak Hour Factor			0.95			0.93			0.88			0.68	

Traffic Count Data Sheet

Year Counts Taken: 2018 E-W Street: Candelaria Rd. Speed Limit (Candelaria Rd.)= 40 MPH
 N-S Street: Princeton Dr. Speed Limit (Princeton Dr.)= 25 MPH
 7/9/18

Signalized

Begin Time	End Time	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	7	95	43	2	87	4	7	4	6	6	6	5
7:15 AM	7:30 AM	49	433	44	5	97	42	6	7	8	7	8	40
7:30 AM	7:45 AM	5	126	10	1	145	18	8	17	8	8	9	19
7:45 AM	8:00 AM	9	182	9	3	157	16	7	17	7	13	6	15
8:00 AM	8:15 AM	12	125	10	6	127	14	7	6	5	15	8	13
8:15 AM	8:30 AM	5	124	7	12	128	12	10	7	6	14	5	12
8:30 AM	8:45 AM	8	94	40	8	448	7	8	6	7	24	44	47
8:45 AM	9:00 AM	5	440	26	4	449	46	5	9	6	9	9	47
AM Peak Hour Volumes		31	557	36	22	557	60	32	47	26	50	28	59
% of Total Traffic		2.1%	36.9%	2.4%	1.5%	36.9%	4.0%	2.1%	3.1%	1.7%	3.3%	1.9%	3.9%
% Directional			41.4%			42.4%			7.0%			9.1%	
AM Peak Hour Factor			0.78			0.91			0.80			0.95	
		Intersection 0.85											

Begin Time	End Time	Eastbound (Candelaria Rd.)			Westbound (Candelaria Rd.)			Northbound (Princeton Dr.)			Southbound (Princeton Dr.)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	7	474	5	4	482	7	7	7	7	23	8	24
4:15 PM	4:30 PM	42	444	8	4	243	40	46	44	44	49	43	26
4:30 PM	4:45 PM	3	191	5	6	233	8	8	6	8	19	10	38
4:45 PM	5:00 PM	7	198	8	6	234	6	11	1	11	14	12	27
5:00 PM	5:15 PM	5	175	4	6	233	10	6	2	9	22	4	28
5:15 PM	5:30 PM	2	186	6	4	271	4	10	3	6	11	1	30
5:30 PM	5:45 PM	4	493	3	4	242	8	2	2	7	40	5	44
5:45 PM	6:00 PM	3	426	4	2	478	3	5	4	8	6	5	40
PM Peak Hour Volumes		17	750	23	22	971	28	35	12	34	66	27	123
% of Total Traffic		0.8%	35.6%	1.1%	1.0%	46.0%	1.3%	1.7%	0.6%	1.6%	3.1%	1.3%	5.8%
% Directional			37.5%			48.4%			3.8%			10.2%	
PM Peak Hour Factor			0.93			0.91			0.88			0.81	
		Intersection 0.99											

Traffic Count Data Sheet

Year Counts Taken: 2018

E-W Street:
N-S Street:Candelaria Bd.
University Bd.Speed Limit (Candelaria Bd.)=
Speed Limit (University Bd.)=40 MPH
45 MPH
8/2/18

Signalized

Begin Time	End Time	Eastbound (Candelaria Bd.)			Westbound (Candelaria Bd.)			Northbound (University Bd.)			Southbound (University Bd.)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	27	99	30	45	62	30	47	54	46	2	0	3
7:15 AM	7:30 AM	38	436	43	24	63	29	29	50	20	2	0	0
7:30 AM	7:45 AM	36	140	50	33	91	43	42	63	21	0	0	2
7:45 AM	8:00 AM	54	162	55	26	111	39	33	58	26	1	3	0
8:00 AM	8:15 AM	45	110	37	28	92	36	20	64	22	0	1	2
8:15 AM	8:30 AM	34	115	62	21	94	40	20	59	16	1	1	0
8:30 AM	8:45 AM	46	402	29	23	96	34	23	64	24	0	0	2
8:45 AM	9:00 AM	32	433	36	36	97	40	24	54	20	3	4	0
AM Peak Hour Volumes		169	527	204	108	388	158	115	244	85	2	13	4
% of Total Traffic		8.4%	26.1%	10.1%	5.3%	19.2%	7.8%	5.7%	12.1%	4.2%	0.6%	0.1%	0.2%
% Directional			44.6%			32.4%			22.0%			0.9%	
AM Peak Hour Factor			0.83			0.93			0.88			0.59	

Begin Time	End Time	Eastbound (Candelaria Bd.)			Westbound (Candelaria Bd.)			Northbound (University Bd.)			Southbound (University Bd.)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	26	463	34	35	430	54	25	93	27	0	0	4
4:15 PM	4:30 PM	38	443	47	25	458	55	48	109	30	2	4	2
4:30 PM	4:45 PM	32	455	34	33	485	54	27	96	35	2	3	6
4:45 PM	5:00 PM	26	137	70	39	186	60	43	128	39	0	0	3
5:00 PM	5:15 PM	32	152	28	33	171	58	50	89	51	2	2	1
5:15 PM	5:30 PM	32	137	43	47	225	75	44	138	43	1	3	2
5:30 PM	5:45 PM	21	175	32	25	188	33	25	115	33	0	2	6
5:45 PM	6:00 PM	32	445	34	28	455	44	44	440	28	4	0	3
PM Peak Hour Volumes		111	601	173	144	770	226	162	470	166	3	41	12
% of Total Traffic		3.8%	20.8%	6.0%	5.0%	26.7%	7.8%	5.6%	16.3%	5.7%	1.4%	0.2%	0.4%
% Directional			30.6%			39.5%			27.6%			2.1%	
PM Peak Hour Factor			0.95			0.82			0.89			0.79	

Traffic Count Data Sheet

Year Counts Taken: 2018

E-W Street: Comanche Rd.
N-S Street: I-25 E.RampSpeed Limit (Comanche Rd.) = 40 MPH
Speed Limit (I-25 E.Ramp) = 45 MPH
7/9/18

Signalized

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)		
		L	T	R	Pedestrians	L	T	R	Pedestrians	L	T	R	Pedestrians
7:00 AM	7:15 AM	39	432	0	0	0	02	23	0	490	437	97	0
7:15 AM	7:30 AM	62	140	0	0	0	126	18	0	216	186	81	0
7:30 AM	7:45 AM	53	151	0	0	0	116	29	0	178	203	94	0
7:45 AM	8:00 AM	61	170	0	0	0	146	26	0	184	215	117	0
8:00 AM	8:15 AM	65	147	0	0	0	111	23	0	139	210	100	0
8:15 AM	8:30 AM	64	153	0	0	0	100	36	0	437	492	111	0
8:30 AM	8:45 AM	52	166	0	0	0	99	39	0	426	485	105	0
8:45 AM	9:00 AM	50	180	0	4	0	106	26	0	433	488	105	0
AM Peak Hour Volumes		241	608	0	0	0	499	96	0	717	814	392	0
% of Total Traffic		7.2%	18.1%	0.0%	0.0%	0.0%	14.8%	2.9%	0	21.3%	24.2%	11.6%	0.0%
% Directional		Intersection											
AM Peak Hour Factor		0.92											

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 E.Ramp)			Southbound (I-25 E.Ramp)		
		L	T	R	Pedestrians	L	T	R	Pedestrians	L	T	R	Pedestrians
4:00 PM	4:15 PM	44	437	46	0	0	424	46	0	427	303	86	4
4:15 PM	4:30 PM	46	435	0	0	0	431	54	0	442	291	83	0
4:30 PM	4:45 PM	52	135	0	0	0	138	44	0	149	318	94	1
4:45 PM	5:00 PM	44	139	0	0	0	162	43	0	129	306	116	0
5:00 PM	5:15 PM	72	170	0	0	0	168	45	0	132	385	103	0
5:15 PM	5:30 PM	37	142	0	0	0	143	33	0	132	305	106	0
5:30 PM	5:45 PM	30	433	0	0	6	430	43	0	404	238	70	0
5:45 PM	6:00 PM	42	78	0	0	0	415	29	0	404	217	71	0
PM Peak Hour Volumes		205	586	0	0	0	611	165	0	542	1314	419	1
% of Total Traffic		5.3%	15.3%	0.0%	0.0%	0.0%	15.9%	4.3%	0	14.1%	34.2%	10.9%	0.0%
% Directional		Intersection											
PM Peak Hour Factor		0.82											

Traffic Count Data Sheet

Year Counts Taken: 2018 E-W Street: Comanche Rd. Speed Limit (Comanche Rd.)= 40 MPH
 N-S Street: I-25 W.Ramp Speed Limit (I-25 W.Ramp)= 45 MPH
 8/2/18

Signalized

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	0	84	76	0	208	0	0	0	0	84	442	27
7:15 AM	7:30 AM	0	95	447	0	208	0	0	0	0	63	450	47
7:30 AM	7:45 AM	0	86	93	2	234	0	0	0	0	67	156	41
7:45 AM	8:00 AM	0	110	87	0	254	0	0	0	0	86	211	45
8:00 AM	8:15 AM	0	120	99	0	205	0	0	0	0	99	177	18
8:15 AM	8:30 AM	0	120	99	2	166	0	0	0	0	89	170	29
8:30 AM	8:45 AM	0	400	403	0	467	0	0	0	0	78	464	34
8:45 AM	9:00 AM	0	87	72	0	472	0	0	0	0	74	474	34
AM Peak Hour Volumes		0	436	378	4	859	0	0	0	0	341	714	133
% of Total Traffic		0.0%	13.5%	11.7%		26.7%	0.0%	0.0%	0.0%	0.0%	10.6%	22.2%	4.1%
% Directional			25.3%			37.8%		0.0%	0.0%			36.9%	
AM Peak Hour Factor			0.93			0.88		Intersection	0.91	#DIV/0!		0.87	

Begin Time	End Time	Eastbound (Comanche Rd.)			Westbound (Comanche Rd.)			Northbound (I-25 W.Ramp)			Southbound (I-25 W.Ramp)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	0	434	446	0	200	0	0	0	0	89	489	43
4:15 PM	4:30 PM	0	128	130	2	228	0	0	0	0	78	164	39
4:30 PM	4:45 PM	0	125	152	0	180	0	0	0	0	86	211	36
4:45 PM	5:00 PM	0	133	112	0	223	0	0	0	0	80	194	49
5:00 PM	5:15 PM	0	108	138	0	227	0	1	0	0	87	205	34
5:15 PM	5:30 PM	0	425	403	0	409	0	0	0	0	90	243	40
5:30 PM	5:45 PM	0	00	402	4	222	0	0	0	0	70	234	30
5:45 PM	6:00 PM	0	84	97	6	480	5	0	0	0	73	465	27
PM Peak Hour Volumes		0	494	532	2	858	0	1	0	0	331	774	158
% of Total Traffic		0.0%	13.8%	14.8%		23.9%	0.0%	0.0%	0.0%	0.0%	9.2%	21.6%	4.4%
% Directional			28.6%			36.2%		0.0%	0.0%			35.2%	
PM Peak Hour Factor			0.93			0.91		Intersection	0.96	#DIV/0!		0.95	

SCOPE OF TRAFFIC IMPACT STUDY (TIS)

TO: Terry Brown

MEETING DATE: July 26, 2018

ATTENDEES: Consultant Team; COA Transportation Development Review; NMDOT

PROJECT: C-Store Comanche Rd. & Princeton, Zone Atlas # G-16

REQUESTED CITY ACTION: ☐ Zone Change ☐ Site Development Plan

☐ Subdivision ☒ Building Permit ☐ Sector Plan ☐ Sector Plan Amendment

☐ Curb Cut Permit ☐ Conditional Use ☐ Annexation ☐ Site Plan Amendment

ASSOCIATED APPLICATION: New 20 pump gas convenience market at SW corner of Comanche Rd. and Princeton Dr. 1.56 acre site.

SCOPE OF REPORT:

The Traffic Impact Study should follow the standard report format, which is outlined in the DPM. The following supplemental information is provided for the preparation of this specific study.

1. Trip Generation - Use Trip Generation Manual, 10th Edition.
Local data may be used for certain land use types as determined by staff.
Consultant to provide.

2. Appropriate study area:
Signalized Intersections;
 - a. I-25 and Comanche ramps (both sides)
 - b. Princeton and Comanche
 - c. Comanche and Carlisle
 - d. Princeton and Candelaria
 - e. Candelaria and University

Unsignalized Intersections;

- a. None

Driveway Intersections: all site drives.

3. Intersection turning movement counts
Study Time – 7-9 a.m. peak hour, 4-6 p.m. peak hour
Consultant to provide for all intersections listed above.

4. Type of intersection progression and factors to be used.
Type III arrival type (see "2016 Highway Capacity Manual" or equivalent as approved by staff). Unless otherwise justified, peak hour factors and % heavy commercial should be taken directly from the MRCOG turning movement data provided or as calculated from current count data by consultant.

5. Boundaries of area to be used for trip distribution,
1.5 mile radius – commercial;

6. Basis for trip distribution.

Residential – Use inverse relationship based upon distance and employment. Use employment data from 2040 Socioeconomic Forecasts, MRCOG – See MRCOG website for most current data.

Office/Industrial - Use inverse relationship based upon distance and population. Use population data from 2040 Socioeconomic Forecasts, MRCOG – See MRCOG website for most current data.

Commercial - Use relationship based upon population. Use population data from 2040 Socioeconomic Forecasts, MRCOG – See MRCOG website for most current data.

Residential - $T_s = (T_t) (S_e / D) / (S_e / D)$
 T_s = Development to Individual Subarea Trips
 T_t = Total Trips
 S_e = Subarea Employment
 D = Distance from Development to Subarea

Office/Industrial - $T_s = (T_t) (S_p / D) / (S_p / D)$
 T_s = Development to Individual Subarea Trips
 T_t = Total Trips
 S_p = Subarea Population
 D = Distance from Development to Subarea

Commercial -
 $T_s = (T_t) (S_p) / (S_p)$
 T_s = Development to Individual Subarea Trips
 T_t = Total Trips
 S_p = Subarea Population

7. Traffic Assignment. Logical routing on the major street system.
8. Method of intersection capacity analysis - planning or operational (see "2016 Highway Capacity Manual" or equivalent [i.e. HCS, Synchro, Teapac, etc.] as approved by staff). Must use latest version of design software and/or current edition of design manual.
Implementation Year:
9. Traffic conditions for analysis:
- Existing analysis __ yes X no - year ();
 - Phase implementation year(s) without proposed development – 2019
 - Phase implementation year(s) with proposed development – 2019
 - Project completion year without proposed development – 2029
 - Project completion year with proposed development – 2029

f. Other –

10. Background traffic growth.

Method: use 10-year historical growth based on standard data from the MRCOG Traffic Flow Maps. Minimum growth rate to be used is 1/2%.

11. Items to be included in the study:

- a. Intersection analysis.
- b. Signal progression - An analysis is required if the driveway analysis indicates a traffic signal is possibly warranted. Analysis Method:
- c. Arterial LOS analysis;
- d. Recommended street, intersection and signal improvements.
- e. Site design features such as turning lanes, median cuts, queuing requirements and site circulation, including driveway signalization and visibility.
- f. Transportation system impacts.
- g. Other mitigating measures.
- h. Accident analyses ☐ yes ☒ no; Location(s):
- i. Weaving analyses ☐ yes ☒ no; Location(s):

12. Other:

SUBMITTAL REQUIREMENTS:

- 1. Number of copies of report required
 - a. 1 paper copy
 - b. 1 digital copy
- 2. Submittal Fee – \$1300 for up to 3 reviews

The Traffic Impact Study for this development proposal, project name, shall be performed in accordance with the above criteria. If there are any questions regarding the above items, please contact me at 924-3633.

Ernest Armijo, P.E.
Senior Engineer for
Transportation Development Section

8/23/18
Date

via: email
C: TIS Task Force Attendees, file