UNM Student Housing Access Study

DRAFT

November 6, 2009

Prepared for:
American Campus Communities
805 Las Cimas Parkway
Suite 400
Austin, TX, 78746

Prepared by:

Bohannan ▲ Huston INC.

ENGINEERING ▲
SPATIAL DATA ▲
ADVANCED TECHNOLOGIES ▲

UNM STUDENT HOUSING
ACCESS STUDY

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_____

ERIC J. WRAGE, P.E., PTOE DATE

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I. INTRODUCTION

The UNM Student Housing site is located on the south side of Avenida Cesar Chavez, east of I-25 and the AMAFCA South Diversion Channel, and west of the Pit. The general site location and site map is illustrated in Figure 1 and Figure 2 on pages 2 and 3. The site will developed entirely as student housing for UNM, with a population of approximately 900 students. As the residents will be entirely UNM students, and parking is extremely limited on campus, the vast majority of the trips are expected to be UNM shuttle trips to campus. The student housing will be served directly by the UNM shuttle bus system. This study will consider that 60% of the peak hour trips to and from the site will be captured by the UNM shuttle system.

A. Study Purpose

This access study is being prepared in support of identifying the requirements at the access and driveway locations. The build conditions will be evaluated for the need for traffic control (stop control or traffic signal) and the requirement for turn lanes at the entrances.

B. Study Procedure

A meeting was held on September 24, 2009, with the City of Albuquerque Transportation Development staff prior to beginning the study to define scope and methodology. Specific items included were the intersections to be studied, the trip distribution to be utilized, and implementation year definitions.

The study was requested to consider the following intersections:

- Avenida Cesar Chavez and Langham Street
- I-25 north bound ramp onto Avenida Cesar Chavez
- All site driveways onto Avenida Cesar Chavez

The intersection evaluations include analysis for the AM and PM peak hours for the following traffic conditions:

Existing (2009) traffic
2011 - Completion Year without proposed development (No Build)
2011 - Completion Year with Development Complete (Build)

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FIGURE 1
VICINITY MAP

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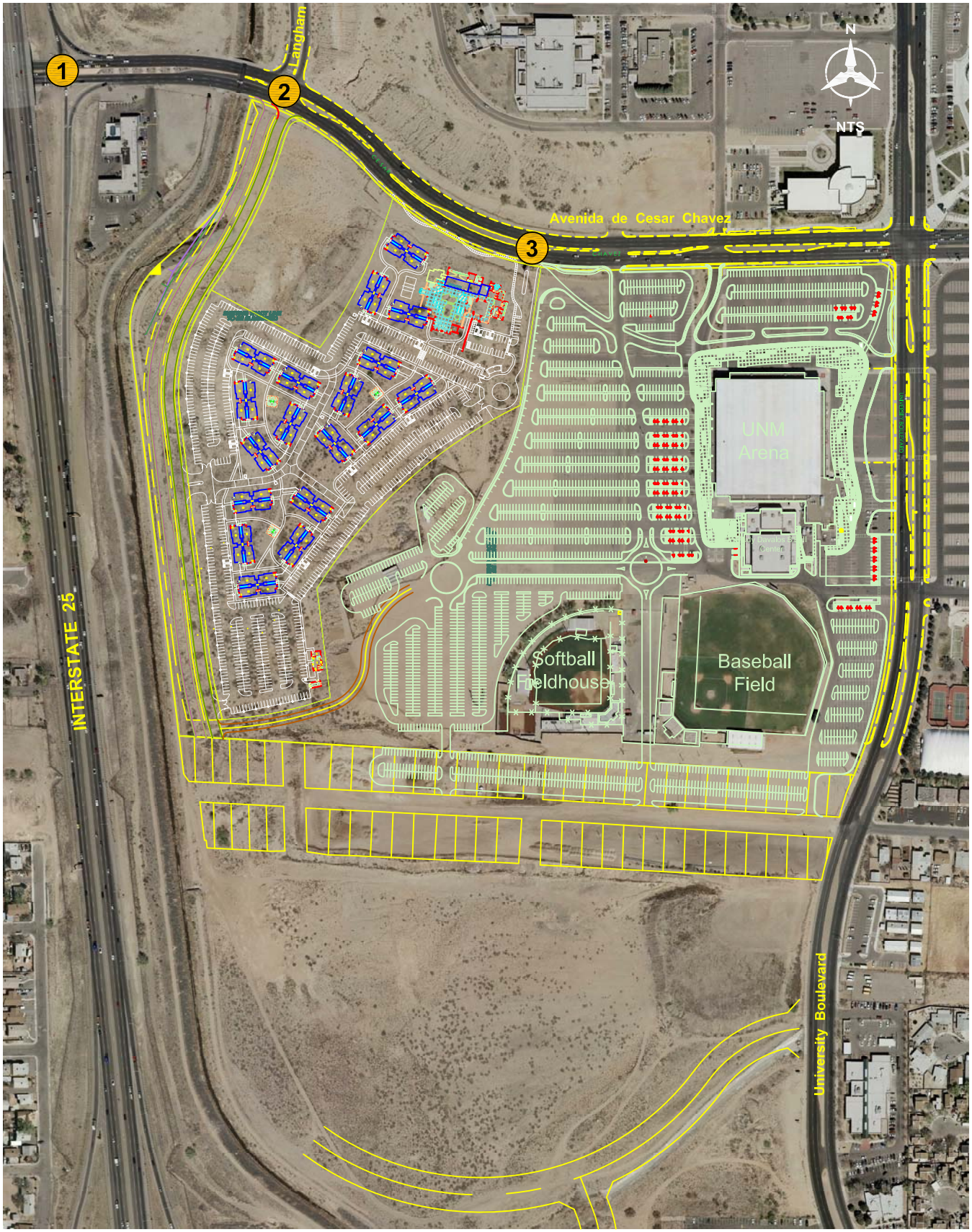

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FIGURE 2
CONCEPTUAL SITE PLAN

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II. EXISTING AREA CHARACTERISTICS

A. General Area Characteristics

The site is located on University of New Mexico (UNM) property. The site is bounded on the south by an undeveloped Clayton Heights-Lomas Del Cielo parcel, on the east by the University of New Mexico Sports Complex, on the west by I-25, and on the north by Avenida Cesar Chavez.

The site is currently undeveloped. At full build out, the development will provide access to Avenida Cesar Chavez via a full access entrance between Langham Street and Bradbury Drive intersections. There will also be an exit only access from the student housing that exits onto Avenida Cesar Chavez at the existing Langham Street intersection. This is referred to as West Road. These are shown on the site plan in Figure 2 on page 3.

Existing development in the vicinity of the proposed development includes UNM athletic complex (the Pit, University Stadium, etc.), Isotopes Park, as well as additional UNM and Central New Mexico Community College facilities.

B. Area Street Network

Avenida Cesar Chavez, University Boulevard and I-25, are the primary access to the site. I-25 provides major access via the diamond interchange with Avenida Cesar Chavez.

Avenida Cesar Chavez from I-25 to University Boulevard is a six-lane street with left turn lanes at intersections and median cuts.

University Boulevard is a four-lane facility north of Gibson Avenue to Avenida Cesar Chavez. It then turns into a six-lane facility with median cuts to Lomas Boulevard.

Langham Street is a two-lane local street with left turn median and left turn lanes at intersections.

I-25 is a six-lane freeway with interchanges at Gibson Boulevard, Avenida Cesar Chavez and Coal Avenue.

The future UNM Student Housing road is anticipated to be a two-lane street.

C. Existing Traffic Volumes

Bohannan Huston, Inc. sub-consultant, Mike Henderson Consulting, LLC collected traffic counts for the intersections of interest. Figure 3 on page 6 is a summary of the 2009 peak hour traffic volumes, laneage, and level of service. Existing traffic counts are included in Appendix A.

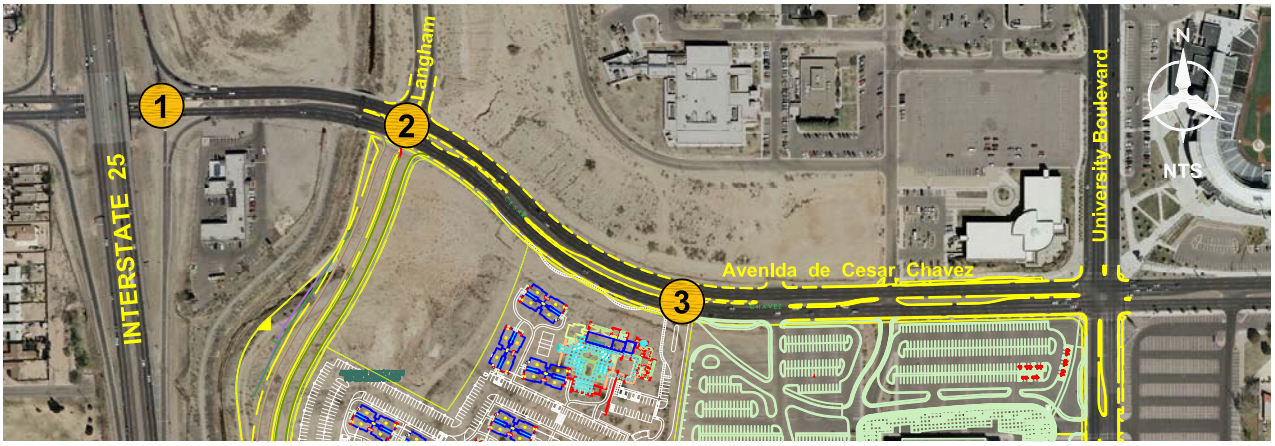
D. Existing Intersection Capacity Analysis

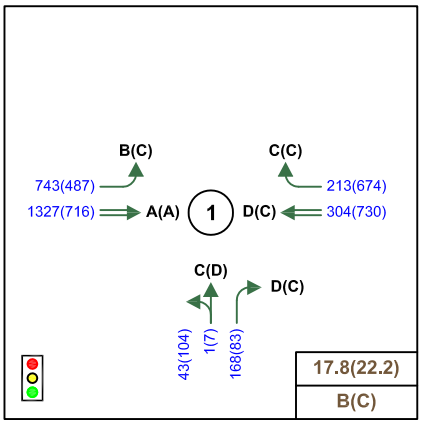
The 2000 Highway Capacity Manual (HCM) defines Level of Service (LOS) for signalized and unsignalized intersections as follows:

TABLE 1 – LEVEL OF SERVICE DEFINITIONS			
Level of Service	Signalized Delay (sec/veh)	Definition	Unsignalized Delay (sec/veh)
A	≤10	Most vehicles do not stop.	≤10
B	>10 and ≤20	Some vehicles stop.	>10 and ≤15
C	>20 and ≤35	Significant numbers of vehicles stop.	>15 and ≤25
D	>35 and ≤55	Many vehicles stop.	>25 and ≤35
E	>55 and ≤80	Limit of acceptable delay.	>35 and ≤50
F	>80	Unacceptable delay.	>50

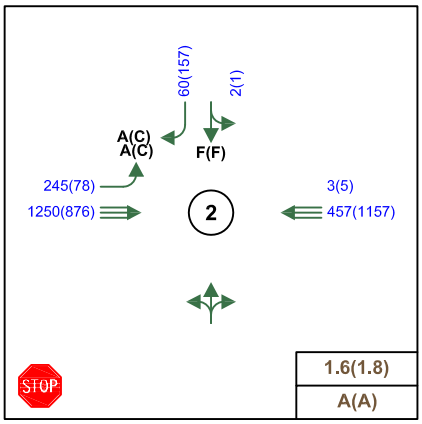
LOS D is generally considered acceptable in urban areas and is the desirable base condition for analysis in a traffic study.

Existing intersection traffic volumes were analyzed using signalized intersection methodology from the 2000 Highway Capacity Manual (HCM). Version 7 of Synchro was utilized to perform the analysis. Individual intersection output is included in Appendix B. The results are summarized in the following tables.

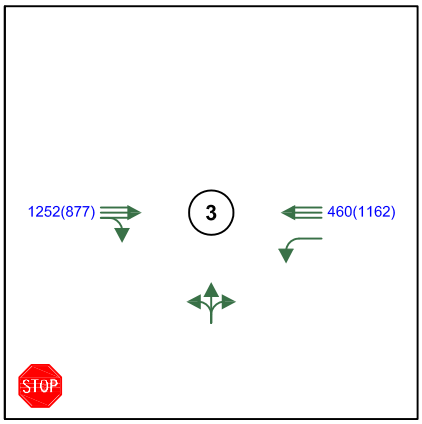




Avenue Cesar Chavez/I-25 NB On Ramp



Avenida Cesar Chavez/Langham



Avenida Cesar Chavez/Entrance

LEGEND

	Thru Lanes (# as indicated)
	Turning Lanes (# as indicated)
1234(1234)	AM(PM) Traffic Counts
X(X)	AM(PM) Level of Service (LOS)
N	Entering
X	Exiting

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FIGURE 3
2009 PEAK HOUR
TRAFFIC VOLUMES - AM(PM)

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TABLE 2 - 2009 CAPACITY ANALYSIS RESULTS						
	2009 AM Peak			2009 PM Peak		
Intersection	Delay	V/C	LOS	Delay	V/C	LOS
I-25 NB Ramp & Avenida Cesar Chavez	17.8	0.72	B	22.2	0.73	C

The I-25 NB Ramp and Avenida Cesar Chavez intersection operates at an acceptable level of service under current traffic conditions.

TABLE 3 – 2009 UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Un-signalized Intersections	2009 AM Peak				2009 PM Peak			
Movement	Delay (sec.)	v/c	Queue (ft.)	LOS	Delay (sec.)	v/c	Queue (ft.)	LOS
Avenida Cesar Chavez & Langham								
EB Left	9.6	0.25	25	A	15.1	0.21	25	C
SB Left (1-stage maneuver)	63.2	0.04	25	F	136.4	0.05	25	F
SB Right	9.8	0.09	25	A	16.6	0.40	50	C

The existing performance at the Avenida Cesar Chavez and Langham intersection shows that the southbound left turn operates at poor level of service. This movement has very low volume (1 or 2 vehicles) indicating that drivers avoid this maneuver. The internal street network of this development also provides direct access to University Boulevard to the east for motorists desiring this maneuver. This movement will be discussed in more detail in a later section.

E. Existing Queuing Analysis

A queuing analysis of the I-25 NB Ramp and Avenida Cesar Chavez intersection was conducted and the results are shown in Table 4 on page 7. This analysis is included in Appendix B.

TABLE 4 - EXISTING QUEUE DISTANCES (VEH*)		
Intersection & Movement	AM Peak Hour	PM Peak Hour
I-25 NB Ramp and Avenida Cesar Chavez**		
WB Through	136	250
WB Right	60	300
* - rounded to nearest 25 foot vehicle length ** - Synchro Queue (estimated 95th percentile) Queues for all movements included in Appendix B		

Table 4 shows that the maximum westbound through movement at Avenida Cesar Chavez and I-25 is approximately 250 feet in length during the PM peak hour. The maximum westbound right queue is 300 feet. The westbound right queue is likely overstated as the analysis assumed that the right turn movement is controlled by the traffic signal. The right turn is a yielded free right turn onto the I-25 NB on-ramp. There is an excess of 450 feet between Langham Street and the I-25 NB ramp.

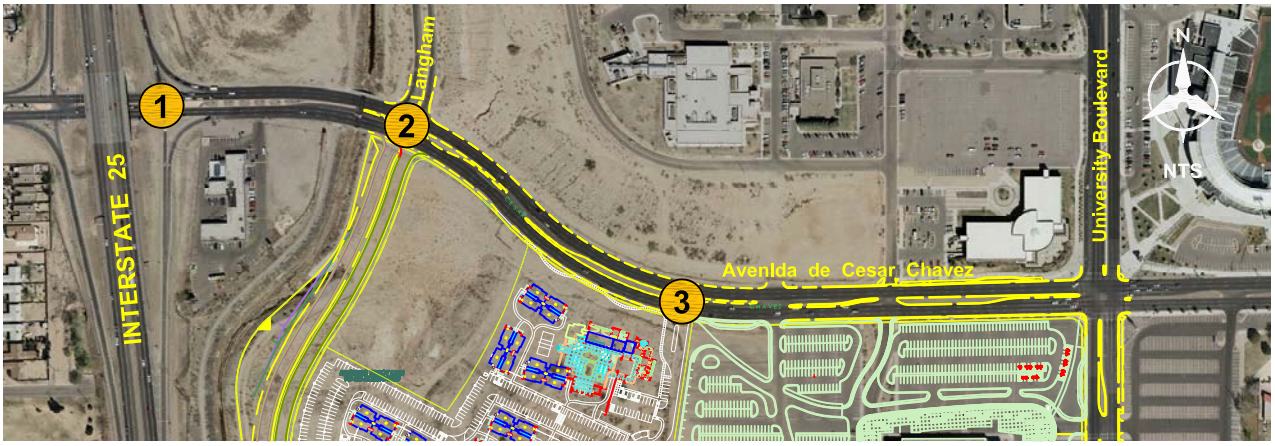
III. BACKGROUND TRAFFIC PROJECTIONS

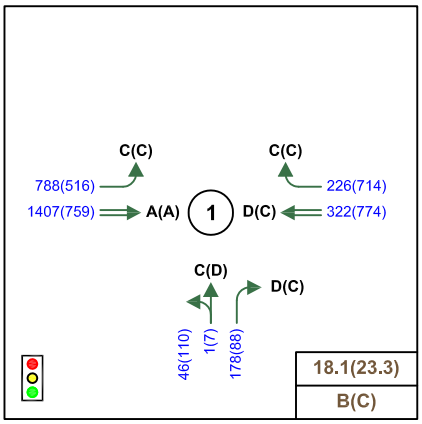
The existing 2009 traffic counts were projected to the build year 2011 using a straight line growth rate.

A. No-Build Traffic Projections

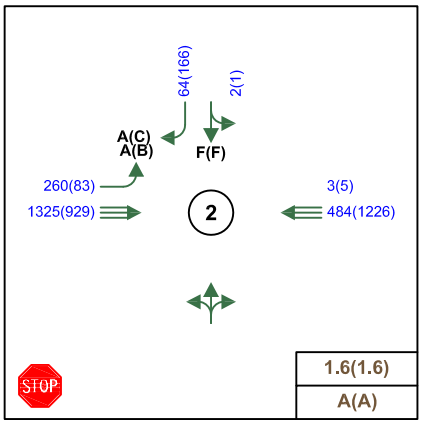
Traffic data from the 2004 through 2008 Mid-Region Council of Governments (MRCOG) traffic flow maps were used to estimate the background traffic growth rate. The area of the study has experienced flat traffic growth in the past few years. Due to this relatively flow background traffic growth rate a 2% annual growth rate was used to project future traffic levels. Transportation links used to determine this rate and details of the analysis is included in Appendix C.

The 2011 No-Build background traffic volumes and level of service are summarized in Figure 4 page 9.

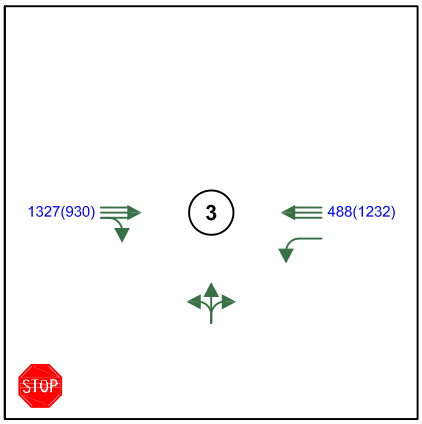




Avenue Cesar Chavez/I-25 NB On Ramp



Avenida Cesar Chavez/Langham



Avenida Cesar Chavez/Entrance

LEGEND

	Thru Lanes (# as indicated)
	Turning Lanes (# as indicated)
1234(1234)	AM(PM) Traffic Counts
X(X)	AM(PM) Level of Service (LOS)
N	Entering
X	Exiting

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FIGURE 4
2011 NO BUILD PEAK HOUR
TRAFFIC VOLUMES - AM(PM)

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B. 2011 No Build Intersection Capacity Analysis

The intersections within the study area were analyzed using Synchro to perform the capacity analysis. Table 5 on page 10 is a summary of the 2002 No-Build results. Synchro output is included in Appendix D.

TABLE 5 - 2011 NO-BUILD CAPACITY ANALYSIS RESULTS						
Intersection	2011 AM Peak No Build			2011 PM Peak No Build		
	Delay	V/C	LOS	Delay	V/C	LOS
I-25 NB Ramp & Avenida Cesar Chavez	18.1	0.76	B	23.3	0.75	C

As with the existing conditions analysis, the I-25 NB Ramp and Avenida Cesar Chavez intersection is anticipated to operate satisfactorily in the 2011 No Build condition.

TABLE 6 – 2011 NO BUILD UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Un-signalized Intersections	2011 No Build AM Peak				2011 No Build PM Peak			
Movement	Delay (sec.)	v/c	Queue (ft.)	LOS	Delay (sec.)	v/c	Queue (ft.)	LOS
Avenida Cesar Chavez & Langham								
EB Left	9.3	0.28	50	A	13.9	0.19	25	B
SB Left (1-stage maneuver)	78.3	0.05	25	F	108.1	0.03	25	F
SB Left (2-stage maneuver)	33.8	0.02	25	D	36.8	0.01	25	E
SB Right	9.9	0.09	25	A	15.2	0.36	50	C

The Langham Street intersection again has poor level of service for the southbound left turn movement. As stated previously, this movement has low volume. As the HCM unsignalized procedures are considered to overestimate delay and that there is a median for motorists to perform a 2-stage left turn, the movement was also evaluated as a 2-stage maneuver. This improves the level of service for this movement.

C. 2011 No Build Queuing Analysis

A queuing analysis of the I-25 NB Ramp and Avenida Cesar Chavez intersection was conducted and the results are shown in Table 7 below. This analysis is included Appendix D.

TABLE 7 – 2011 NO BUILD QUEUE DISTANCES (FT*)		
Intersection & Movement	AM Peak Hour	PM Peak Hour
I-25 NB Ramp and Avenida Cesar Chavez**		
WB Through	142	197
WB Right	62	144
* - rounded to nearest 25 foot ** - Synchro Queue (estimated 95th percentile) Queues for all movements included in Appendix D		

Table 7 shows that the expected queues will not back-up into the Langham Street intersection

IV. PROPOSED SITE CHARACTERISTICS

A. Proposed Development

The proposed development is to be developed as an approximately 900 student housing complex. For the purposes of this study the site is anticipated to be complete by 2011.

B. Trip Generation

Generated trips are broken down into three types; 1) primary, 2) pass-by trips, and 3) diverted link. The *Trip Generation* report defines these trips as follows:

- Primary Trips - These trips are made for the specific purpose of visiting the generator. The stop at that generator is the primary reason for the trip. For example, a home to shopping to home combination of trips is a primary trip set.
- Pass-by Trips - These trips are made as intermediate stops on the way from an origin to a primary trip generation. Pass-by trips are attracted from the traffic passing the site on an adjacent street that contains direct access to the generator site. These trips do not require a diversion from another roadway. For example, stopping at the store on the way home from work.
- Diverted Linked Trips - These trips are attracted from the traffic volume on the roadway within the vicinity of the generator, but which require a diversion from that roadway to another roadway to gain access to the site. The roadways could include streets or freeways adjacent to the generator, but without access to the generator such as I-40. For this study, the diverted link trips have been included in with the primary trips.

Projected trips for the proposed development were calculated from data in the Institute of Transportation Engineers (ITE) *Trip Generation, 6th Edition*, 2000. Trips generated by the proposed development were calculated as Apartments, ITE trip generation code 220.

No pass-by or diverted link trips are included in this analysis. As mentioned previously, as the residents will consist of entirely UNM students, it is expected that a large percentage of the trips from the site will utilize the UNM shuttle that will service the site directly. To that end, 60% of the peak hour trips were assumed to utilize the UNM shuttle. The balance of the trips was assumed to be trips to employment throughout the City.

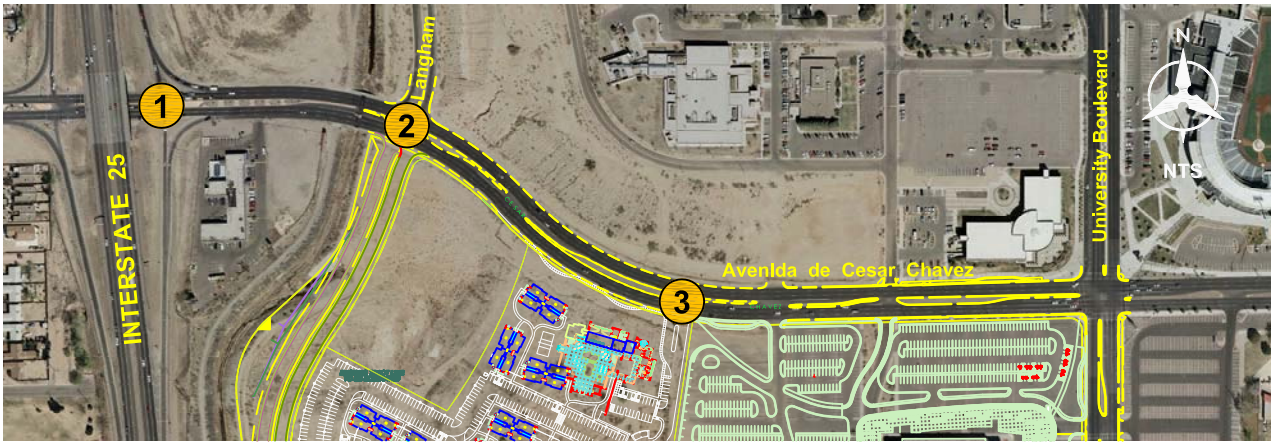
Trips generated by the proposed development are summarized as follows:

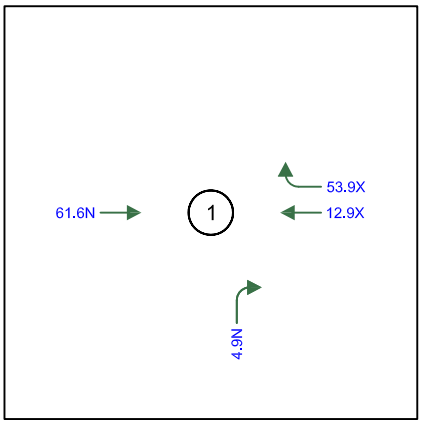
TABLE 8 - TRIP GENERATION							
Land Use	ITE Land Use Code	Size	24 Hour Two-Way Volume	AM Peak Hour		PM Peak Hour	
				Enter	Exit	Enter	Exit
Apartments	220	900	3,059	49	196	229	124
Shuttle Use in Peak Hour (60%)				29	117	137	74
Peak Hour Trips Used In Analysis			3,059	20	79	92	50

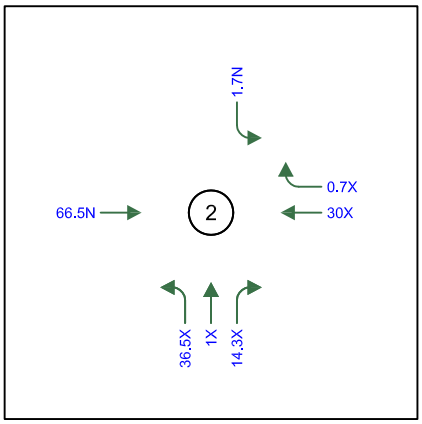
A detailed breakdown of the trips generated is included in Appendix E.

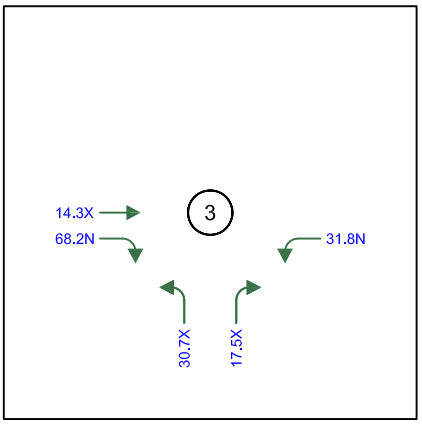
C. Trip Distribution and Assignment

As mentioned, the off-site, non-UNM shuttle trips were assumed to be employment trips. These trips were distributed throughout the entire City using standard City of Albuquerque trip distribution methodology. The trip distribution spreadsheet is included in Appendix F. Trip assignment percentages to individual intersections are shown in Figure 5 on page 13. The peak hour volumes that result from these trip assignment percentages is shown in Figure 6 on page 14.









LEGEND

	Thru Lanes (# as indicated)
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1234(1234)	AM(PM) Traffic Counts
X(X)	AM(PM) Level of Service (LOS)
N	Entering
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FIGURE 5
TRIP DISTRIBUTION PERCENTAGES

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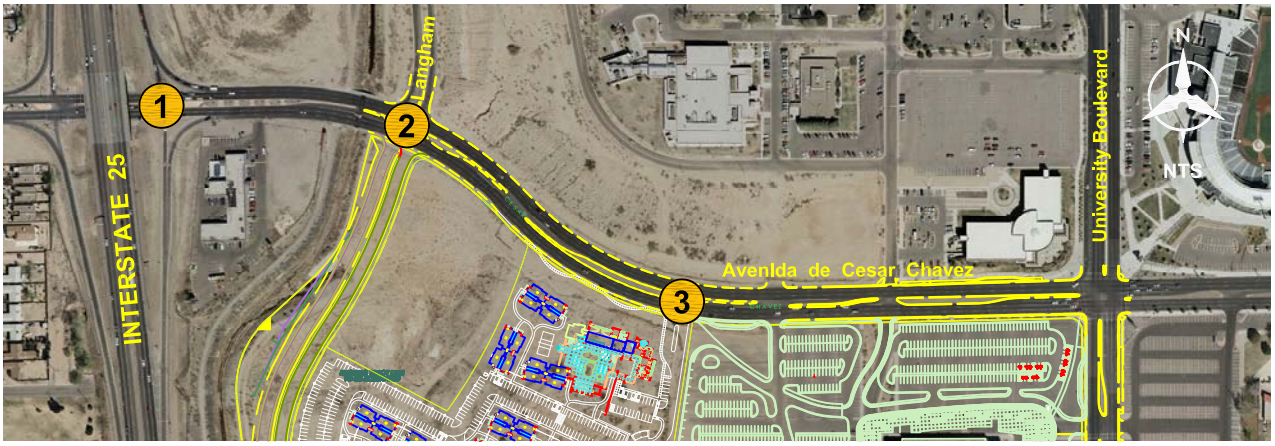

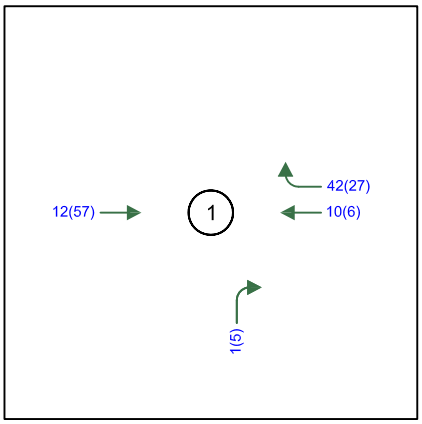

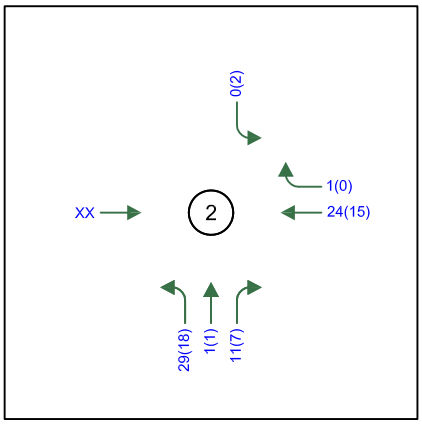

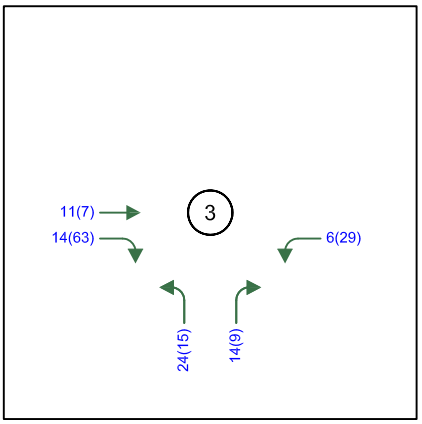

LEGEND

	Thru Lanes (# as indicated)
	Turning Lanes (# as indicated)
1234(1234)	AM(PM) Traffic Counts
X(X)	AM(PM) Level of Service (LOS)
N	Entering
X	Exiting

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FIGURE 6
TRIP DISTRIBUTION VOLUMES
AM(PM)

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V. BUILD TRAFFIC ANALYSES

A. 2011 Build Traffic Volumes

Based on the trip distribution and assignments, the estimated traffic generated by the proposed development (Figure 6) was then added to the 20114 No-Build traffic projections (Figure 4). Details of the 2011 Build traffic volume computations are included in Appendix G. Figure 7, page 16 is a summary of the 2011 Build Peak hour traffic projections.

B. 2011 Build Intersection Capacity Analysis

The results for the 2011 build for Phase 1 are summarized in Table 9. Synchro output is included in Appendix H.

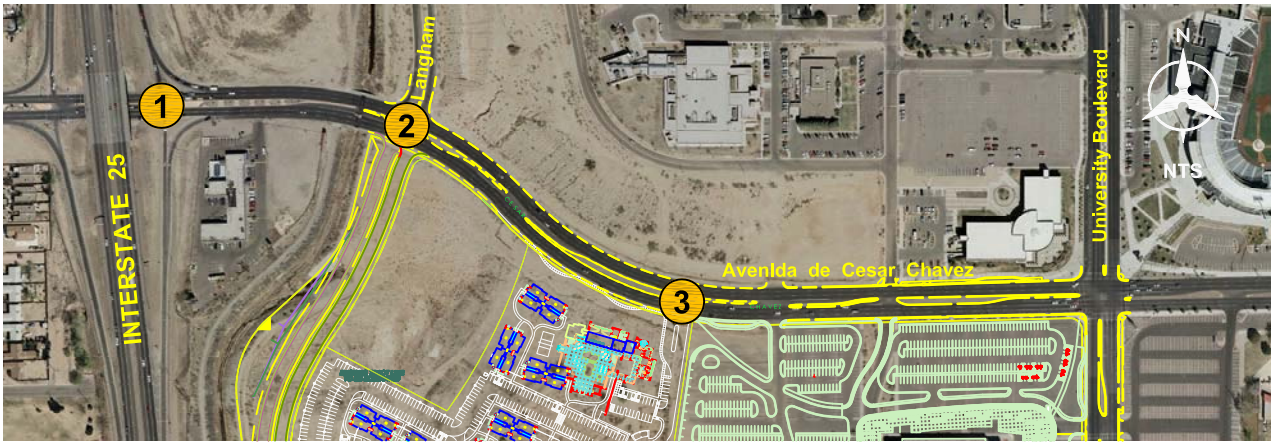
The signalized intersection again operates at an acceptable level of service in the peak hours.

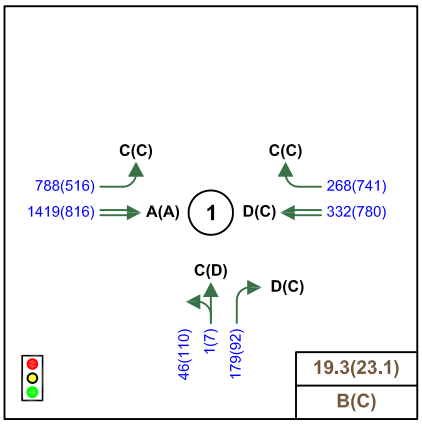
TABLE 9 - 2011 BUILD CAPACITY ANALYSIS RESULTS

Intersection	2011 AM Peak Build			2011 PM Peak Build		
	Delay	V/C	LOS	Delay	V/C	LOS
I-25 NB Ramp and Avenida Cesar Chavez	19.3	0.77	B	23.1	0.75	C

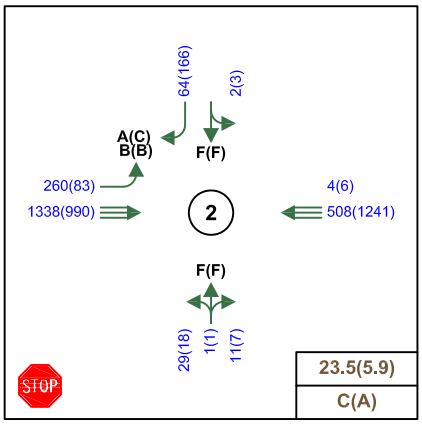
The unsignalized intersections were again analyzed. The results are shown in Table 10 with HCS summaries included in Appendix H. It can be seen from the table that the minor street left turns at both Langham and the proposed entrance will operate with poor levels of service. Even if the intersections are evaluated as a 2-stage maneuver there is still high delay.

The intersections were evaluated to determine if the Peak Hour Traffic Signal Volume Warrant was satisfied. The Langham Street intersection has a relatively high amou8nt of southbound right turn traffic. This volume would be sufficient to warrant a traffic signal, however as right turning traffic is allowed to turn right of red, the operation of that movement is comparable to a Stop controlled intersection. Table 10 indicates that this movement operates an acceptable delay as an unsignalized intersection. Therefore a traffic signal is not considered warranted at the Langham intersection.

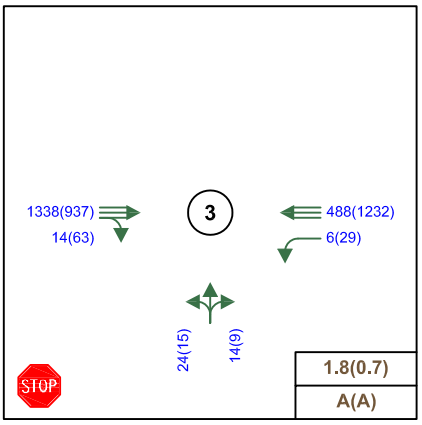




Avenue Cesar Chavez/I-25 NB On Ramp



Avenida Cesar Chavez/Langham



Avenida Cesar Chavez/Entrance

LEGEND

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FIGURE 7
2001 BUILD PEAK HOUR
TRAFFIC VOLUMES - AM(PM)

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TABLE 10 – 2011 BUILD UNSIGNALIZED INTERSECTION CAPACITY ANALYSIS RESULTS								
Un-signalized Intersections	2011 Build AM Peak				2011 Build PM Peak			
Movement	Delay (sec.)	v/c	Queue (ft.)	LOS	Delay (sec.)	v/c	Queue (ft.)	LOS
Avenida Cesar Chavez & Langham								
EB Left	10.1	0.29	50	B	14.0	0.19	25	B
NB Left/Thru/Rt (1-stage maneuver)	1,125	2.5	175	F	389	1.06	100	F
NB Left/Thru/Rt (2-stage maneuver)	278	1.03	125	F	52.2	0.29	50	F
SB Left (1-stage maneuver)	92.2	0.05	25	F	135	0.11	25	F
SB Left (2-stage maneuver)	36.2	0.02	25	E	38.9	0.03	25	E
SB Right	10.	0.09	25	A	15.3	0.36	50	C
Avenida Cesar Chavez & Entrance								
WB Left	13.3	0.02	25	B	11.1	0.05	25	B
NB Left/Right (1-stage maneuver)	80.5	0.50	75	F	52.8	0.27	50	F
NB Left/Right (2-stage maneuver)	36.7	0.28	50	E	225.	0.12	25	C

The volume at the entrance is not sufficient to warrant a traffic signal. The signal warrant analysis is included in Appendix H.

C. 2011 Build Queuing Analysis

A queuing analysis of the I-25 NB Ramp and Avenida Cesar Chavez intersection was conducted and the results shown in the table below. Synchro queue analysis summary sheets are included in Appendix H.

TABLE 11 - 2011 BUILD QUEUE DISTANCES (FT)		
Intersection & Movement	AM Peak Hour	PM Peak Hour
I-25 NB Ramp and Avenida Cesar Chavez**		
WB Through	145	275
WB Right	67	450
* - rounded to nearest 25 foot ** - Synchro Queue (estimated 95th percentile) Queues for all movements included in Appendix H		

Table 11 shows that the westbound through queue will extend approximately 275 feet from the I-25 NB Ramp. The westbound right turn queue is considered to be overstated as it assumes signal control of the movement, when in reality it is a yield controlled free right turn onto the NB on-ramp. As there is more than 450 feet between the NB on-ramp and the proposed West Road/Langham Street intersection, the queue will not spillover into the intersection.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

The results indicate that the proposed development will have negligible impact on the operation of the I-25 NB ramp and Avenida Cesar Chavez intersection.

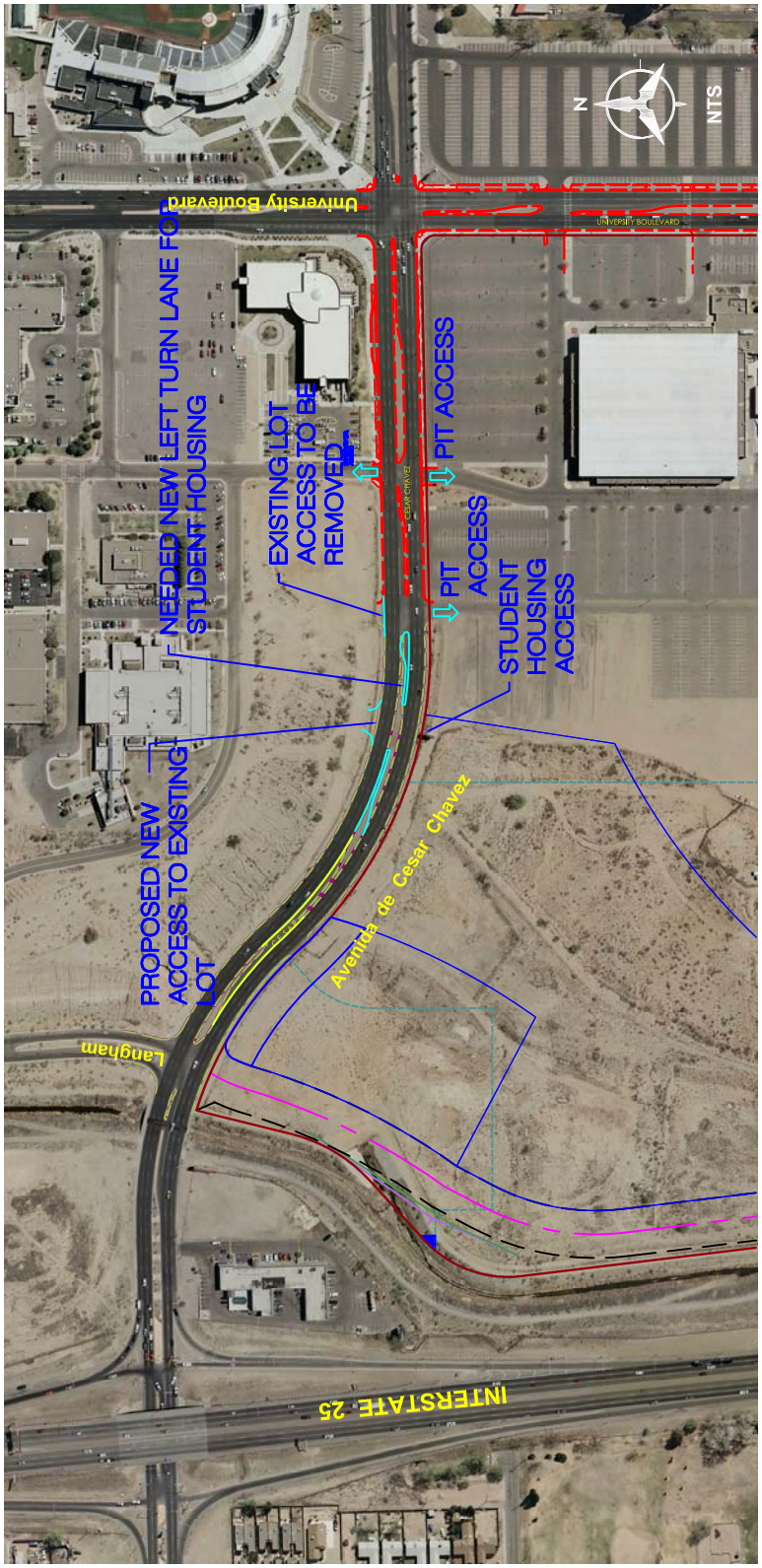
The results do indicate that the minor street left and through movements will experience high delay in the peak hour periods due to the volume of traffic on Avenida Cesar Chavez, particularly during the AM peak. For AM peak hour vehicles leaving the site at either location (West Road/Langham or the Main Entrance) delays will likely be high even when performing 2-stage maneuver. However these locations do not meet the peak hour volume requirements for a traffic signal.

B. Recommendations

The site plan indicates that the Main Entrance is approximately 250 feet from an existing parking entrance to the Pit. An eastbound left turn lane currently serves a vacant parcel. In order to provide a westbound left turn lane for the site, the access to the vacant parcel will need to be relocated as shown in Figure 8.

The following recommendations are for the site driveways/entrances:

- Provide a minimum of 50-feet for a westbound left turn lane into the site per the DPM. This will likely require a variance from the standard 150/150-foot reverse curve. Initial layouts indicate this will likely require 50/50-foot reverse curves to reach 50 feet.
- Re-align access to the vacant parcel to the north of the Pit parking entrance as shown in Figure 8.
- Construct a 150-foot eastbound right turn lane into the main entrance per City of Albuquerque DPM standards. The transition for the proposed right turn lanes should be designed with the 300/150-foot reverse curve transition required by the DPM.
- The Main Entrance onto Avenida Cesar Chavez should be designed to accommodate one entry lane and two exit lanes with a minimum of 200-feet of storage for queued vehicles.
- The driveways should be designed and constructed to ensure adequate sight distances.



P:\20100122\TRANS\Study\Graphics\Report Figures\20100122-Rec.dwg Nov 02, 2009 - 4:08pm

Bohannan Huston

Courtyard I 7500 Jefferson St. NE Albuquerque, NM 87109-4335

ENGINEERING ▲ SPATIAL DATA ▲ ADVANCED TECHNOLOGIES

UNM STUDENT HOUSING

FIGURE 8
RECOMMENDED IMPROVEMENTS

APPENDIX A

EXISTING TURNING MOVEMENT COUNTS

Mike Henderson Consulting, LLC

5301 Camino Sandia NE
Albuquerque, NM 87111
(505) 275-5706

Collected by: MH

File Name : AVC@I-25 East Ramps
Site Code : 00000025
Start Date : 10/8/2009

Groups Printed- Cars - Trucks

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				I-25 NB Off Ramp Northbound				On Ramp Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:45	216	220	0	436	0	52	31	83	5	0	33	38	0	0	0	0	557
Total	216	220	0	436	0	52	31	83	5	0	33	38	0	0	0	0	557
07:00	163	289	0	452	0	44	53	97	10	0	35	45	0	0	0	0	594
07:15	207	349	0	556	0	86	50	136	6	0	54	60	0	0	0	0	752
07:30	190	320	0	510	0	92	47	139	13	1	55	69	0	0	0	0	718
07:45	183	369	0	552	0	82	63	145	14	0	24	38	0	0	0	0	735
Total	743	1327	0	2070	0	304	213	517	43	1	168	212	0	0	0	0	2799
08:00	135	247	0	382	0	68	60	128	11	0	22	33	0	0	0	0	543
08:15	135	270	0	405	0	78	49	127	16	1	14	31	0	0	0	0	563
08:30	142	321	0	463	0	78	67	145	11	1	25	37	0	0	0	0	645
08:45	126	316	0	442	0	102	52	154	12	0	42	54	0	0	0	0	650
Total	538	1154	0	1692	0	326	228	554	50	2	103	155	0	0	0	0	2401
09:00	113	312	0	425	0	93	59	152	13	1	42	56	0	0	0	0	633
09:15	105	294	0	399	0	85	73	158	8	0	23	31	0	0	0	0	588
09:30	107	185	0	292	0	97	71	168	19	1	19	39	0	0	0	0	499
*** BLANK ***																	
Total	325	791	0	1116	0	275	203	478	40	2	84	126	0	0	0	0	1720
*** BLANK ***																	
11:00	95	167	5	267	0	123	129	252	12	0	11	23	0	0	0	0	542
11:15	109	173	0	282	0	126	115	241	17	0	11	28	0	0	0	0	551
11:30	106	187	0	293	0	117	111	228	18	1	16	35	0	0	0	0	556
11:45	109	222	0	331	0	144	107	251	14	0	20	34	0	0	0	0	616
Total	419	749	5	1173	0	510	462	972	61	1	58	120	0	0	0	0	2265
12:00	93	184	0	277	0	133	118	251	12	0	17	29	0	0	0	0	557
12:15	114	155	1	270	0	96	88	184	18	0	16	34	0	0	0	0	488
12:30	95	123	0	218	0	137	114	251	14	0	5	19	0	0	0	0	488
12:45	124	172	0	296	0	130	124	254	15	1	13	29	0	0	0	0	579
Total	426	634	1	1061	0	496	444	940	59	1	51	111	0	0	0	0	2112
13:00	118	176	0	294	0	111	108	219	19	1	16	36	0	0	0	0	549
13:15	130	214	0	344	0	143	139	282	12	0	25	37	0	0	0	0	663
13:30	109	219	0	328	0	136	111	247	13	0	16	29	0	0	0	0	604
13:45	106	190	0	296	0	173	168	341	9	1	8	18	0	0	0	0	655
Total	463	799	0	1262	0	563	526	1089	53	2	65	120	0	0	0	0	2471
*** BLANK ***																	
15:00	122	180	0	302	0	172	158	330	23	1	12	36	0	0	0	0	668
15:15	129	198	0	327	0	160	162	322	18	0	21	39	0	0	0	0	688
15:30	104	173	0	277	0	191	202	393	35	2	17	54	0	0	0	0	724
15:45	132	165	0	297	0	207	152	359	28	4	33	65	0	0	0	0	721
Total	487	716	0	1203	0	730	674	1404	104	7	83	194	0	0	0	0	2801
16:00	120	182	0	302	0	149	129	278	27	0	20	47	0	0	0	0	627
16:15	111	179	0	290	0	159	131	290	23	2	10	35	0	0	0	0	615
16:30	121	179	0	300	0	166	143	309	18	0	8	26	0	0	0	0	635
16:45	107	221	0	328	0	147	125	272	20	0	14	34	0	0	0	0	634
Total	459	761	0	1220	0	621	528	1149	88	2	52	142	0	0	0	0	2511
17:00	105	224	0	329	0	186	239	425	19	0	26	45	0	0	0	0	799
17:15	114	259	0	373	0	154	154	308	19	0	23	42	0	0	0	0	723
17:30	95	186	0	281	0	125	114	239	21	0	13	34	0	0	0	0	554
17:45	106	184	0	290	0	120	117	237	18	3	14	35	0	0	0	0	562
Total	420	853	0	1273	0	585	624	1209	77	3	76	156	0	0	0	0	2638

Mike Henderson Consulting, LLC

5301 Camino Sandia NE
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Collected by: MH

File Name : AVC@I-25 East Ramps
Site Code : 00000025
Start Date : 10/8/2009

Groups Printed- Cars - Trucks

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				I-25 NB Off Ramp Northbound				On Ramp Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	4496	8004	6	12506	0	4462	3933	8395	580	21	773	1374	0	0	0	0	22275
Apprch %	36	64	0		0	53.2	46.8		42.2	1.5	56.3		0	0	0		
Total %	20.2	35.9	0	56.1	0	20	17.7	37.7	2.6	0.1	3.5	6.2	0	0	0	0	
Cars	4374	7876	5	12255	0	4382	3852	8234	558	20	757	1335	0	0	0	0	21824
% Cars	97.3	98.4	83.3	98	0	98.2	97.9	98.1	96.2	95.2	97.9	97.2	0	0	0	0	98
Trucks	122	128	1	251	0	80	81	161	22	1	16	39	0	0	0	0	451
% Trucks	2.7	1.6	16.7	2	0	1.8	2.1	1.9	3.8	4.8	2.1	2.8	0	0	0	0	2

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				I-25 NB Off Ramp Northbound				On Ramp Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:45 to 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	163	289	0	452	0	44	53	97	10	0	35	45	0	0	0	0	594
07:15	207	349	0	556	0	86	50	136	6	0	54	60	0	0	0	0	752
07:30	190	320	0	510	0	92	47	139	13	1	55	69	0	0	0	0	718
07:45	183	369	0	552	0	82	63	145	14	0	24	38	0	0	0	0	735
Total Volume	743	1327	0	2070	0	304	213	517	43	1	168	212	0	0	0	0	2799
% App. Total	35.9	64.1	0		0	58.8	41.2		20.3	0.5	79.2		0	0	0		
PHF	.897	.899	.000	.931	.000	.826	.845	.891	.768	.250	.764	.768	.000	.000	.000	.000	.931
Cars	722	1311	0	2033	0	296	208	504	41	1	167	209	0	0	0	0	2746
% Cars	97.2	98.8	0	98.2	0	97.4	97.7	97.5	95.3	100	99.4	98.6	0	0	0	0	98.1
Trucks	21	16	0	37	0	8	5	13	2	0	1	3	0	0	0	0	53
% Trucks	2.8	1.2	0	1.8	0	2.6	2.3	2.5	4.7	0	0.6	1.4	0	0	0	0	1.9
Peak Hour Analysis From 10:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 13:00																	
13:00	118	176	0	294	0	111	108	219	19	1	16	36	0	0	0	0	549
13:15	130	214	0	344	0	143	139	282	12	0	25	37	0	0	0	0	663
13:30	109	219	0	328	0	136	111	247	13	0	16	29	0	0	0	0	604
13:45	106	190	0	296	0	173	168	341	9	1	8	18	0	0	0	0	655
Total Volume	463	799	0	1262	0	563	526	1089	53	2	65	120	0	0	0	0	2471
% App. Total	36.7	63.3	0		0	51.7	48.3		44.2	1.7	54.2		0	0	0		
PHF	.890	.912	.000	.917	.000	.814	.783	.798	.697	.500	.650	.811	.000	.000	.000	.000	.932
Cars	454	788	0	1242	0	558	516	1074	50	2	63	115	0	0	0	0	2431
% Cars	98.1	98.6	0	98.4	0	99.1	98.1	98.6	94.3	100	96.9	95.8	0	0	0	0	98.4
Trucks	9	11	0	20	0	5	10	15	3	0	2	5	0	0	0	0	40
% Trucks	1.9	1.4	0	1.6	0	0.9	1.9	1.4	5.7	0	3.1	4.2	0	0	0	0	1.6
Peak Hour Analysis From 14:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 15:00																	
15:00	122	180	0	302	0	172	158	330	23	1	12	36	0	0	0	0	668
15:15	129	198	0	327	0	160	162	322	18	0	21	39	0	0	0	0	688
15:30	104	173	0	277	0	191	202	393	35	2	17	54	0	0	0	0	724
15:45	132	165	0	297	0	207	152	359	28	4	33	65	0	0	0	0	721
Total Volume	487	716	0	1203	0	730	674	1404	104	7	83	194	0	0	0	0	2801
% App. Total	40.5	59.5	0		0	52	48		53.6	3.6	42.8		0	0	0		
PHF	.922	.904	.000	.920	.000	.882	.834	.893	.743	.438	.629	.746	.000	.000	.000	.000	.967
Cars	468	701	0	1169	0	721	662	1383	99	7	81	187	0	0	0	0	2739
% Cars	96.1	97.9	0	97.2	0	98.8	98.2	98.5	95.2	100	97.6	96.4	0	0	0	0	97.8
Trucks	19	15	0	34	0	9	12	21	5	0	2	7	0	0	0	0	62
% Trucks	3.9	2.1	0	2.8	0	1.2	1.8	1.5	4.8	0	2.4	3.6	0	0	0	0	2.2

Mike Henderson Consulting, LLC

5301 Camino Sandia NE
Albuquerque, NM 87111
(505) 275-5706

Collected by: CB

File Name : AVC@Langham
Site Code : 00045362
Start Date : 10/8/2009
Page No : 1

Groups Printed- Cars - Trucks

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				Northbound				Langham Ave Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
06:45	48	205	0	253	0	77	0	77	0	0	0	0	0	0	6	6	336
Total	48	205	0	253	0	77	0	77	0	0	0	0	0	0	6	6	336
07:00	51	273	0	324	0	86	0	86	0	0	0	0	0	0	11	11	421
07:15	72	331	0	403	0	117	1	118	0	0	0	0	1	0	19	20	541
07:30	54	321	0	375	0	123	2	125	0	0	0	0	1	0	16	17	517
07:45	68	325	0	393	0	131	0	131	0	0	0	0	0	0	14	14	538
Total	245	1250	0	1495	0	457	3	460	0	0	0	0	2	0	60	62	2017
08:00	43	226	0	269	0	111	0	111	0	0	0	0	0	0	17	17	397
08:15	39	245	0	284	0	113	1	114	0	0	0	0	0	0	14	14	412
08:30	44	302	0	346	0	127	3	130	0	0	0	0	1	0	18	19	495
08:45	65	293	0	358	0	132	1	133	0	0	0	0	0	0	22	22	513
Total	191	1066	0	1257	0	483	5	488	0	0	0	0	1	0	71	72	1817
09:00	37	317	0	354	0	135	1	136	0	0	0	0	1	0	17	18	508
09:15	41	276	0	317	0	126	1	127	0	0	0	0	0	0	32	32	476
09:30	27	177	0	204	0	144	0	144	0	0	0	0	0	0	24	24	372
*** BLANK ***																	
Total	105	770	0	875	0	405	2	407	0	0	0	0	1	0	73	74	1356
*** BLANK ***																	
11:00	16	162	0	178	0	223	3	226	0	0	0	0	1	0	29	30	434
11:15	19	165	0	184	0	194	1	195	0	0	0	0	0	0	47	47	426
11:30	23	180	0	203	0	182	0	182	0	0	0	0	0	0	46	46	431
11:45	41	201	0	242	0	213	0	213	0	0	0	0	1	0	38	39	494
Total	99	708	0	807	0	812	4	816	0	0	0	0	2	0	160	162	1785
12:00	22	179	0	201	0	213	0	213	0	0	0	0	0	0	38	38	452
12:15	20	151	0	171	0	146	1	147	0	0	0	0	0	0	38	38	356
12:30	16	112	0	128	0	216	1	217	0	0	0	0	2	0	35	37	382
12:45	22	163	0	185	0	217	1	218	0	0	0	0	0	0	37	37	440
Total	80	605	0	685	0	792	3	795	0	0	0	0	2	0	148	150	1630
13:00	31	161	0	192	0	183	4	187	0	0	0	0	0	0	36	36	415
13:15	27	212	0	239	0	230	3	233	0	0	0	0	0	0	51	51	523
13:30	27	208	0	235	0	222	1	223	0	0	0	0	0	0	25	25	483
13:45	21	177	0	198	0	288	1	289	0	0	0	0	0	0	53	53	540
Total	106	758	0	864	0	923	9	932	0	0	0	0	0	0	165	165	1961
*** BLANK ***																	
15:00	16	176	0	192	0	285	1	286	0	0	0	0	0	0	45	45	523
15:15	17	202	0	219	0	270	1	271	0	0	0	0	0	0	52	52	542
15:30	16	174	0	190	0	325	1	326	0	0	0	0	0	0	68	68	584
15:45	13	185	0	198	0	307	1	308	0	0	0	0	0	0	52	52	558
Total	62	737	0	799	0	1187	4	1191	0	0	0	0	0	0	217	217	2207
16:00	15	187	0	202	0	245	2	247	0	0	0	0	0	0	33	33	482
16:15	5	184	0	189	0	250	1	251	0	0	0	0	0	0	40	40	480
16:30	12	175	0	187	0	269	1	270	0	0	0	0	0	0	40	40	497
16:45	20	215	0	235	0	244	0	244	0	0	0	0	1	0	28	29	508
Total	52	761	0	813	0	1008	4	1012	0	0	0	0	1	0	141	142	1967
17:00	20	230	0	250	0	373	2	375	0	0	0	0	0	0	52	52	677
17:15	26	256	0	282	0	271	2	273	0	0	0	0	0	0	37	37	592
17:30	23	176	0	199	0	209	4	213	0	0	0	0	1	0	30	31	443
17:45	28	170	0	198	0	203	5	208	0	0	0	0	0	0	34	34	440
Total	97	832	0	929	0	1056	13	1069	0	0	0	0	1	0	153	154	2152

Mike Henderson Consulting, LLC

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File Name : AVC@Langham
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Start Date : 10/8/2009
Page No : 2

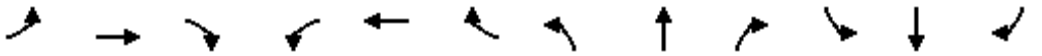
Groups Printed- Cars - Trucks

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				Northbound				Langham Ave Southbound				
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Grand Total	1085	7692	0	8777	0	7200	47	7247	0	0	0	0	10	0	1194	1204	17228
Apprch %	12.4	87.6	0		0	99.4	0.6		0	0	0		0.8	0	99.2		
Total %	6.3	44.6	0	50.9	0	41.8	0.3	42.1	0	0	0	0	0.1	0	6.9	7	
Cars	1075	7558	0	8633	0	7076	46	7122	0	0	0	0	10	0	1158	1168	16923
% Cars	99.1	98.3	0	98.4	0	98.3	97.9	98.3	0	0	0	0	100	0	97	97	98.2
Trucks	10	134	0	144	0	124	1	125	0	0	0	0	0	0	36	36	305
% Trucks	0.9	1.7	0	1.6	0	1.7	2.1	1.7	0	0	0	0	0	0	3	3	1.8

	Avenida Cesar Chavez Eastbound				Avenida Cesar Chavez Westbound				Northbound				Langham Ave Southbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 06:45 to 09:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00																	
07:00	51	273	0	324	0	86	0	86	0	0	0	0	0	0	11	11	421
07:15	72	331	0	403	0	117	1	118	0	0	0	0	1	0	19	20	541
07:30	54	321	0	375	0	123	2	125	0	0	0	0	1	0	16	17	517
07:45	68	325	0	393	0	131	0	131	0	0	0	0	0	0	14	14	538
Total Volume	245	1250	0	1495	0	457	3	460	0	0	0	0	2	0	60	62	2017
% App. Total	16.4	83.6	0		0	99.3	0.7		0	0	0		3.2	0	96.8		
PHF	.851	.944	.000	.927	.000	.872	.375	.878	.000	.000	.000	.000	.500	.000	.789	.775	.932
Cars	244	1234	0	1478	0	449	3	452	0	0	0	0	2	0	55	57	1987
% Cars	99.6	98.7	0	98.9	0	98.2	100	98.3	0	0	0	0	100	0	91.7	91.9	98.5
Trucks	1	16	0	17	0	8	0	8	0	0	0	0	0	0	5	5	30
% Trucks	0.4	1.3	0	1.1	0	1.8	0	1.7	0	0	0	0	0	0	8.3	8.1	1.5
Peak Hour Analysis From 10:00 to 13:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 13:00																	
13:00	31	161	0	192	0	183	4	187	0	0	0	0	0	0	36	36	415
13:15	27	212	0	239	0	230	3	233	0	0	0	0	0	0	51	51	523
13:30	27	208	0	235	0	222	1	223	0	0	0	0	0	0	25	25	483
13:45	21	177	0	198	0	288	1	289	0	0	0	0	0	0	53	53	540
Total Volume	106	758	0	864	0	923	9	932	0	0	0	0	0	0	165	165	1961
% App. Total	12.3	87.7	0		0	99	1		0	0	0		0	0	100		
PHF	.855	.894	.000	.904	.000	.801	.563	.806	.000	.000	.000	.000	.000	.000	.778	.778	.908
Cars	105	746	0	851	0	910	9	919	0	0	0	0	0	0	164	164	1934
% Cars	99.1	98.4	0	98.5	0	98.6	100	98.6	0	0	0	0	0	0	99.4	99.4	98.6
Trucks	1	12	0	13	0	13	0	13	0	0	0	0	0	0	1	1	27
% Trucks	0.9	1.6	0	1.5	0	1.4	0	1.4	0	0	0	0	0	0	0.6	0.6	1.4
Peak Hour Analysis From 14:00 to 17:45 - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 16:30																	
16:30	12	175	0	187	0	269	1	270	0	0	0	0	0	0	40	40	497
16:45	20	215	0	235	0	244	0	244	0	0	0	0	1	0	28	29	508
17:00	20	230	0	250	0	373	2	375	0	0	0	0	0	0	52	52	677
17:15	26	256	0	282	0	271	2	273	0	0	0	0	0	0	37	37	592
Total Volume	78	876	0	954	0	1157	5	1162	0	0	0	0	1	0	157	158	2274
% App. Total	8.2	91.8	0		0	99.6	0.4		0	0	0		0.6	0	99.4		
PHF	.750	.855	.000	.846	.000	.775	.625	.775	.000	.000	.000	.000	.250	.000	.755	.760	.840
Cars	77	867	0	944	0	1142	5	1147	0	0	0	0	1	0	153	154	2245
% Cars	98.7	99.0	0	99.0	0	98.7	100	98.7	0	0	0	0	100	0	97.5	97.5	98.7
Trucks	1	9	0	10	0	15	0	15	0	0	0	0	0	0	4	4	29
% Trucks	1.3	1.0	0	1.0	0	1.3	0	1.3	0	0	0	0	0	0	2.5	2.5	1.3

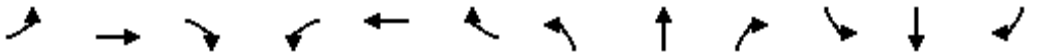
APPENDIX B

2009 INTERSECTION CAPACITY ANALYSIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	743	1327	0	0	304	213	43	1	168	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3505	1568		1776	1583			
Flt Permitted	0.32	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	599	3539			3505	1568		1776	1583			
Peak-hour factor, PHF	0.93	0.93	0.93	0.89	0.89	0.89	0.77	0.77	0.77	0.92	0.92	0.92
Adj. Flow (vph)	799	1427	0	0	342	239	56	1	218	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	197	0	0	60	0	0	0
Lane Group Flow (vph)	799	1427	0	0	342	42	0	57	158	0	0	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	64.0	64.0			16.0	16.0		18.0	18.0			
Effective Green, g (s)	64.0	64.0			16.0	16.0		18.0	18.0			
Actuated g/C Ratio	0.71	0.71			0.18	0.18		0.20	0.20			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	998	2517			623	279		355	317			
v/s Ratio Prot	c0.39	0.40			0.10							
v/s Ratio Perm	c0.18					0.03		0.03	c0.10			
v/c Ratio	0.80	0.57			0.55	0.15		0.16	0.50			
Uniform Delay, d1	10.8	6.3			33.7	31.3		29.8	32.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	6.7	0.9			3.5	1.2		1.0	5.5			
Delay (s)	17.6	7.2			37.2	32.4		30.7	37.5			
Level of Service	B	A			D	C		C	D			
Approach Delay (s)		10.9			35.2			36.1			0.0	
Approach LOS		B			D			D			A	

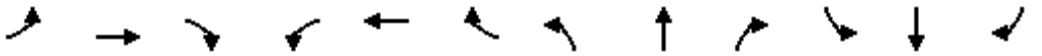
Intersection Summary			
HCM Average Control Delay	17.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	67.7%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	245	1250	0	0	457	3	0	0	0	2	0	60
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.93	0.93	0.93	0.88	0.88	0.88	0.92	0.92	0.92	0.78	0.78	0.78
Hourly flow rate (vph)	263	1344	0	0	519	3	0	0	0	3	0	77
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	523			1344			2121	2394	448	1496	2392	175
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	523			1344			2121	2394	448	1496	2392	175
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	75			100			100	100	100	96	100	91
cM capacity (veh/h)	1040			508			21	25	558	64	23	820

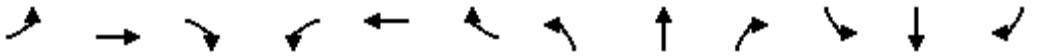
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	263	448	448	448	208	208	107	0	3	77
Volume Left	263	0	0	0	0	0	0	0	3	0
Volume Right	0	0	0	0	0	0	3	0	0	77
cSH	1040	1700	1700	1700	1700	1700	1700	1700	64	820
Volume to Capacity	0.25	0.26	0.26	0.26	0.12	0.12	0.06	0.00	0.04	0.09
Queue Length 95th (ft)	25	0	0	0	0	0	0	0	3	8
Control Delay (s)	9.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	63.2	9.8
Lane LOS	A							A	F	A
Approach Delay (s)	1.6				0.0			0.0	11.6	
Approach LOS								A	B	

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	35.8%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	487	716	0	0	730	674	104	7	83	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	1752	3505			3539	1583		1745	1553			
Flt Permitted	0.19	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	351	3505			3539	1583		1745	1553			
Peak-hour factor, PHF	0.92	0.92	0.92	0.89	0.89	0.89	0.75	0.75	0.75	0.92	0.92	0.92
Adj. Flow (vph)	529	778	0	0	820	757	139	9	111	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	321	0	0	89	0	0	0
Lane Group Flow (vph)	529	778	0	0	820	436	0	148	22	0	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	64.0	64.0			35.0	35.0		18.0	18.0			
Effective Green, g (s)	64.0	64.0			35.0	35.0		18.0	18.0			
Actuated g/C Ratio	0.71	0.71			0.39	0.39		0.20	0.20			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	639	2492			1376	616		349	311			
v/s Ratio Prot	c0.23	0.22			0.23							
v/s Ratio Perm	c0.36					0.28		0.08	0.01			
v/c Ratio	0.83	0.31			0.60	0.71		0.42	0.07			
Uniform Delay, d1	16.6	4.8			21.9	23.2		31.5	29.2			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	11.8	0.3			1.9	6.7		3.7	0.4			
Delay (s)	28.3	5.2			23.8	29.9		35.2	29.7			
Level of Service	C	A			C	C		D	C			
Approach Delay (s)		14.5			26.7			32.8			0.0	
Approach LOS		B			C			C			A	

Intersection Summary			
HCM Average Control Delay	22.2	HCM Level of Service	C
HCM Volume to Capacity ratio	0.73		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	84.8%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	78	876	0	0	1157	5	0	0	0	1	0	157
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.85	0.85	0.85	0.78	0.78	0.78	0.92	0.92	0.92	0.76	0.76	0.76
Hourly flow rate (vph)	92	1031	0	0	1483	6	0	0	0	1	0	207
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	1490			1031			1915	2704	344	2014	2701	498
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1490			1031			1915	2704	344	2014	2701	498
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	79			100			100	100	100	95	100	60
cM capacity (veh/h)	447			670			21	17	652	29	16	515

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	92	344	344	344	593	593	303	0	1	207
Volume Left	92	0	0	0	0	0	0	0	1	0
Volume Right	0	0	0	0	0	0	6	0	0	207
cSH	447	1700	1700	1700	1700	1700	1700	1700	29	515
Volume to Capacity	0.21	0.20	0.20	0.20	0.35	0.35	0.18	0.00	0.05	0.40
Queue Length 95th (ft)	19	0	0	0	0	0	0	0	3	48
Control Delay (s)	15.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	136.4	16.6
Lane LOS	C							A	F	C
Approach Delay (s)	1.2				0.0			0.0	17.3	
Approach LOS								A	C	

Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	40.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	799	1427	342	239	57	218
v/c Ratio	0.80	0.57	0.55	0.50	0.16	0.58
Control Delay	17.9	7.4	37.5	8.6	31.2	28.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	17.9	7.4	37.5	8.6	31.2	28.0
Queue Length 50th (ft)	253	175	94	0	27	73
Queue Length 95th (ft)	428	223	136	60	51	114
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	999	2517	623	475	355	377
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	0.80	0.57	0.55	0.50	0.16	0.58

Intersection Summary

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	529	778	820	757	148	111
v/c Ratio	0.83	0.31	0.60	0.81	0.42	0.28
Control Delay	27.3	5.2	24.1	15.3	35.8	8.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	27.3	5.2	24.1	15.3	35.8	8.3
Queue Length 50th (ft)	175	73	191	110	74	0
Queue Length 95th (ft)	#351	97	248	279	107	26
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	638	2492	1376	936	349	399
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	0.83	0.31	0.60	0.81	0.42	0.28

Intersection Summary

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

APPENDIX C

BACKGROUND TRAFFIC GROWTH

UNM Housing
Growth Rate Determination

AWDT on ACC
(West of I-25)

Year	AWDT
2004	28,200
2005	28,000
2006	27,800
2007	27,600
2008	27,500

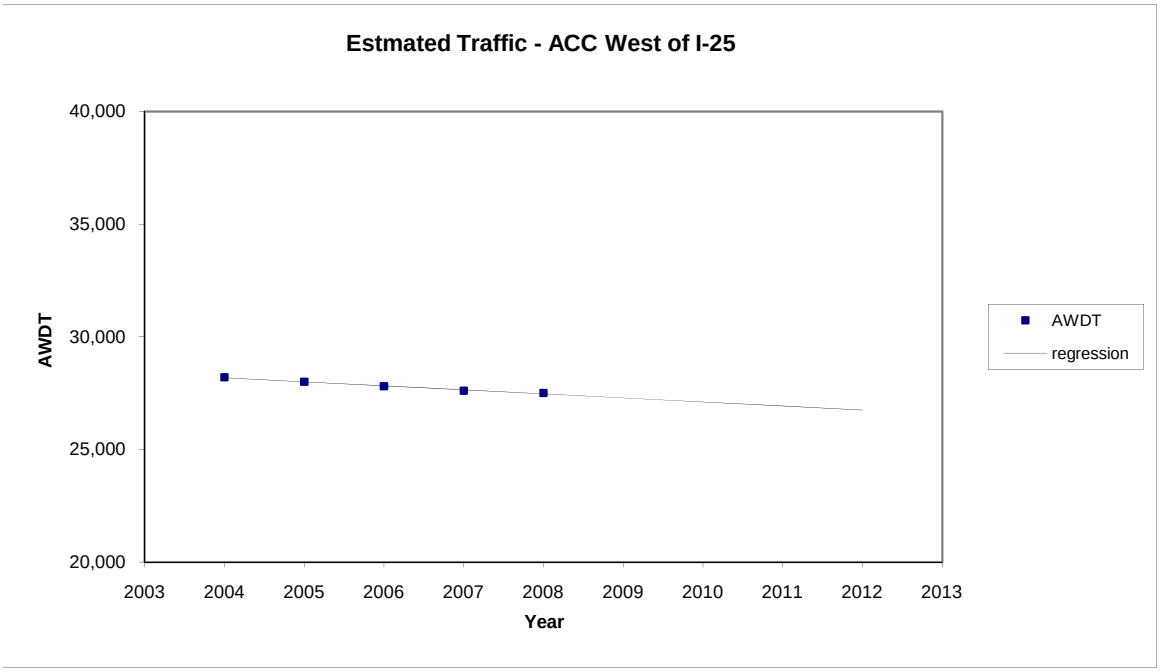
Linear Growth Rate = {[(27,500-28,200)/2]/27,500}x100= -0.64%

Projected AWDT	
2004	28,180
2005	28,000
2006	27,820
2007	27,640
2008	27,460
2009	27,280
2010	27,100
2011	26,920
2012	26,740

Regression Output	
R Square	0.99
Standard Error	3.65E+01
Observations	5
Intercept	388,900
Std Err of Intercept	2.E+04
Coefficient	-180.00
Std Err of Coefficient	12

Regression Equation
AWDT = 709 x Year - 1,376,076

Estimated Annual Growth Rate
[(26,740-27,500)/27,500) x 100% = -2.76%
-2.76%/4 = -0.69%



UNM Housing
Growth Rate Determination

AWDT on I25 S
(South of ACC)

Year	AWDT
2004	109,000
2005	101,600
2006	107,100
2007	110,100
2008	110,400

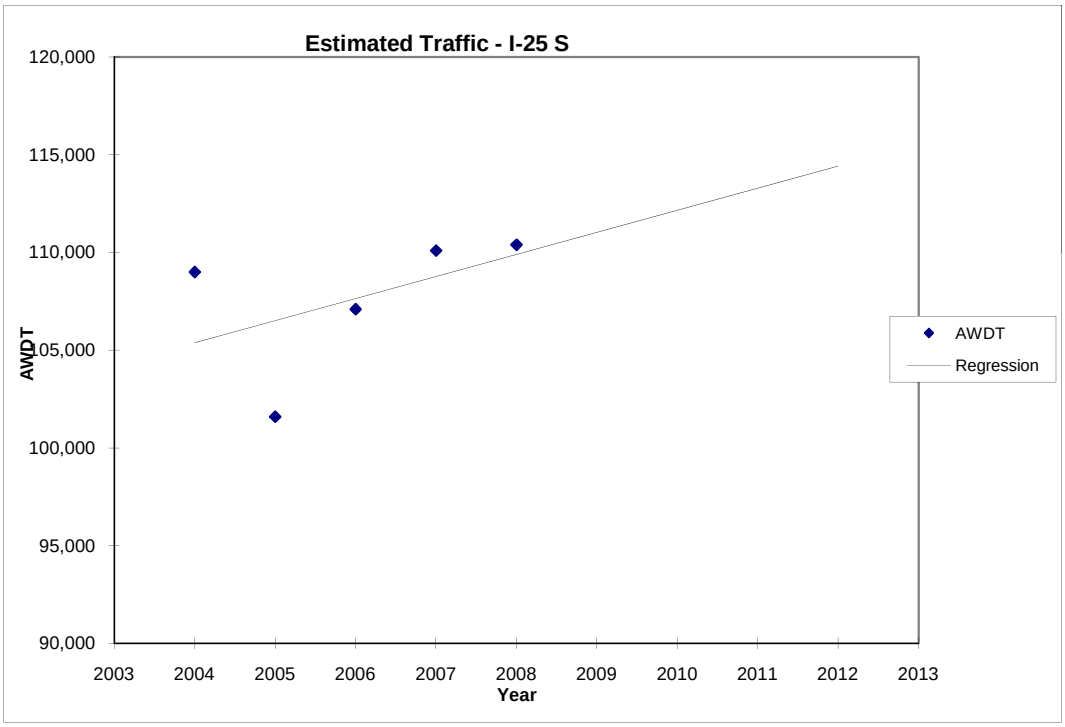
Linear Growth Rate = {[(110,400-109,000)/2]/110,400}x100= 0.32%

Projected AWDT	
2004	105,380
2005	106,510
2006	107,640
2007	108,770
2008	109,900
2009	111,030
2010	112,160
2011	113,290
2012	114,420

Regression Output	
R Square	0.24
Standard Error	3.63E+03
Observations	5
Intercept	-2,159,140
Std Err of Intercept	2.E+06
Coefficient	1,130.00
Std Err of Coefficient	1148

Regression Equation
AWDT = 700 x Year + -1,381,900

Estimated Annual Growth Rate
((93,000-90,500))/90,500) x 100% = 3.64%
14.89%/4 = 0.91%



UNM Housing
Growth Rate Determination

AWDT on I25 N
(North of ACC)

Year	AWDT
2004	117,600
2005	121,000
2006	128,700
2007	129,400
2008	129,500

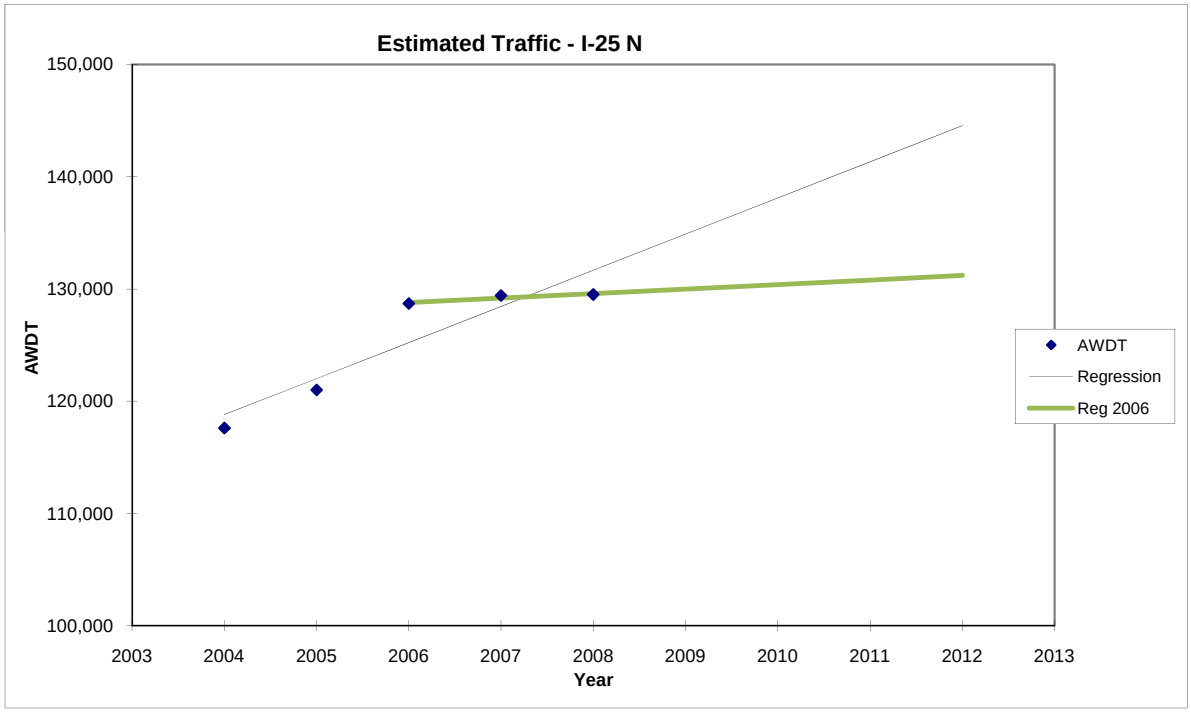
Linear Growth Rate = {[(129,500-117,600)/2]/129,500}x100= 2.30%

Regression Output		2006-2008
R Square	0.84	0.84
Standard Error	2.59E+03	2.45E+02
Observations	5	3
Intercept	-6,334,080	-673,600
Std Err of Intercept	2.E+06	3.E+05
Coefficient	3,220.00	400.00
Std Err of Coefficient	818	173

Regression Equation
AWDT = 3,220 x Year - 6,334,080

Projected AWDT		
2004	118,800	
2005	122,020	
2006	125,240	128,800
2007	128,460	129,200
2008	131,680	129,600
2009	134,900	130,000
2010	138,120	130,400
2011	141,340	130,800
2012	144,560	131,200

Estimated Annual Growth Rate
[(144,560-129,500)/129,500) x 100% = 11.63%
11.63%/4 = 2.91%
[(131,200-129,500)/129,500) x 100% = 1.31% 2006-2008
11.63%/4 = 0.33%



UNM Housing
Growth Rate Determination

AWDT on ACC
(East of I-25)

Year	AWDT
2004	21,300
2005	21,100
2006	20,800
2007	28,880
2008	28,400

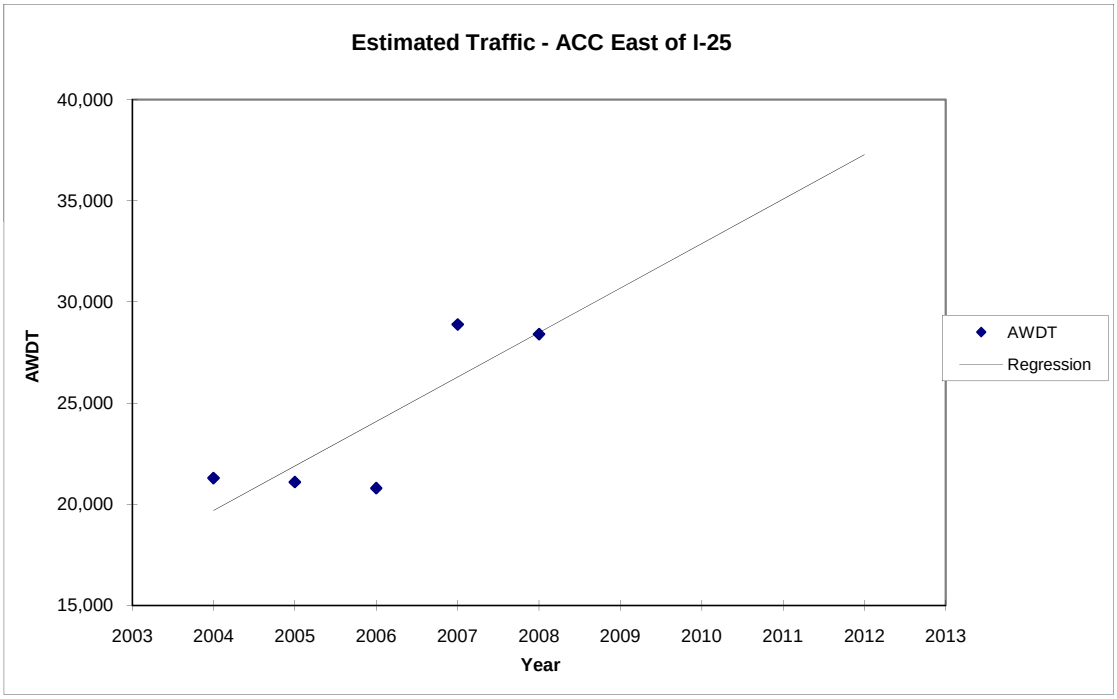
Linear Growth Rate = {[(28,400-21,300)/2]/28,400}x100= 6.25%

Projected AWDT	
2004	19,700
2005	21,898
2006	24,096
2007	26,294
2008	28,492
2009	30,690
2010	32,888
2011	35,086
2012	37,284

Regression Output	
R Square	0.70
Standard Error	2.63E+03
Observations	5
Intercept	-4,385,092
Std Err of Intercept	2.E+06
Coefficient	2,198.00
Std Err of Coefficient	832

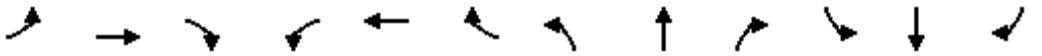
Regression Equation
AWDT = 2,198 x Year - 4,385,092

Estimated Annual Growth Rate
[(37,287-28,400)/28,400) x 100% = 31.28%
31.28%/4 = 7.82%



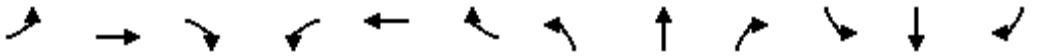
APPENDIX D

2011 NO BUILD INTERSECTION CAPACITY ANALYSIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	788	1407	0	0	322	226	46	1	178	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3505	1568		1776	1583			
Flt Permitted	0.31	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	584	3539			3505	1568		1776	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	857	1529	0	0	350	246	50	1	193	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	202	0	0	53	0	0	0
Lane Group Flow (vph)	857	1529	0	0	350	44	0	51	140	0	0	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	65.0	65.0			16.0	16.0		17.0	17.0			
Effective Green, g (s)	65.0	65.0			16.0	16.0		17.0	17.0			
Actuated g/C Ratio	0.72	0.72			0.18	0.18		0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	1015	2556			623	279		335	299			
v/s Ratio Prot	c0.42	0.43			0.10							
v/s Ratio Perm	c0.19					0.03		0.03	c0.09			
v/c Ratio	0.84	0.60			0.56	0.16		0.15	0.47			
Uniform Delay, d1	11.7	6.1			33.8	31.3		30.5	32.5			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	8.6	1.0			3.6	1.2		1.0	5.2			
Delay (s)	20.3	7.2			37.4	32.5		31.4	37.7			
Level of Service	C	A			D	C		C	D			
Approach Delay (s)		11.9			35.4			36.4			0.0	
Approach LOS		B			D			D			A	

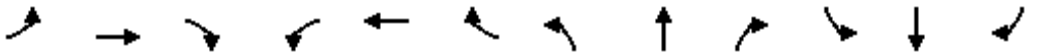
Intersection Summary			
HCM Average Control Delay	18.1	HCM Level of Service	B
HCM Volume to Capacity ratio	0.76		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	71.0%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	260	1325	0	0	484	3	0	0	0	2	0	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	289	1472	0	0	538	3	0	0	0	2	0	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	541			1472			2305	2591	491	1608	2589	181
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	541			1472			2305	2591	491	1608	2589	181
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	72			100			100	100	100	95	100	91
cM capacity (veh/h)	1024			454			15	18	523	51	16	812

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	289	491	491	491	215	215	111	0	2	75
Volume Left	289	0	0	0	0	0	0	0	2	0
Volume Right	0	0	0	0	0	0	3	0	0	75
cSH	1024	1700	1700	1700	1700	1700	1700	1700	51	812
Volume to Capacity	0.28	0.29	0.29	0.29	0.13	0.13	0.07	0.00	0.05	0.09
Queue Length 95th (ft)	29	0	0	0	0	0	0	0	4	8
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	78.3	9.9
Lane LOS	A							A	F	A
Approach Delay (s)	1.6				0.0			0.0	12.0	
Approach LOS								A	B	

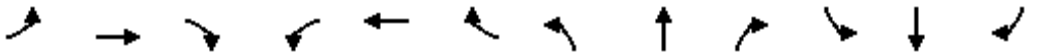
Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	37.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	260	1325	0	0	484	3	0	0	0	2	0	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	289	1472	0	0	538	3	0	0	0	2	0	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	541			1472			2305	2591	491	1608	2589	181
vC1, stage 1 conf vol							2050	2050		539	539	
vC2, stage 2 conf vol							255	541		1069	2050	
vCu, unblocked vol	541			1472			2305	2591	491	1608	2589	181
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.7	6.7	7.1
tC, 2 stage (s)							6.5	5.5		6.7	5.7	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	72			100			100	100	100	98	100	91
cM capacity (veh/h)	1024			454			36	54	523	127	55	812

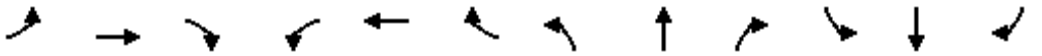
Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	289	491	491	491	215	215	111	0	2	75
Volume Left	289	0	0	0	0	0	0	0	2	0
Volume Right	0	0	0	0	0	0	3	0	0	75
cSH	1024	1700	1700	1700	1700	1700	1700	1700	127	812
Volume to Capacity	0.28	0.29	0.29	0.29	0.13	0.13	0.07	0.00	0.02	0.09
Queue Length 95th (ft)	29	0	0	0	0	0	0	0	1	8
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	33.8	9.9
Lane LOS	A							A	D	A
Approach Delay (s)	1.6				0.0			0.0	10.6	
Approach LOS								A	B	

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	37.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	759	0	0	774	714	110	7	88	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	1752	3505			3539	1583		1745	1553			
Flt Permitted	0.18	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	334	3505			3539	1583		1745	1553			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	825	0	0	841	776	120	8	96	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	305	0	0	78	0	0	0
Lane Group Flow (vph)	561	825	0	0	841	471	0	128	18	0	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	65.0	65.0			35.0	35.0		17.0	17.0			
Effective Green, g (s)	65.0	65.0			35.0	35.0		17.0	17.0			
Actuated g/C Ratio	0.72	0.72			0.39	0.39		0.19	0.19			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	651	2531			1376	616		330	293			
v/s Ratio Prot	c0.25	0.24			0.24							
v/s Ratio Perm	c0.37					0.30		0.07	0.01			
v/c Ratio	0.86	0.33			0.61	0.76		0.39	0.06			
Uniform Delay, d1	17.9	4.5			22.0	23.9		31.9	30.0			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	14.1	0.3			2.0	8.8		3.4	0.4			
Delay (s)	32.0	4.9			24.1	32.7		35.4	30.4			
Level of Service	C	A			C	C		D	C			
Approach Delay (s)		15.9			28.2			33.2			0.0	
Approach LOS		B			C			C			A	

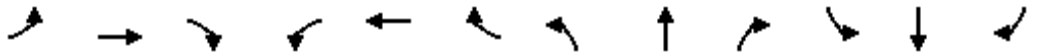
Intersection Summary			
HCM Average Control Delay	23.3	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	89.3%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	83	929	0	0	1226	5	0	0	0	1	0	166
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	92	1032	0	0	1362	6	0	0	0	1	0	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	1368			1032			1866	2584	344	1894	2582	457
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1368			1032			1866	2584	344	1894	2582	457
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			100	100	100	97	100	64
cM capacity (veh/h)	498			669			25	20	652	36	20	548

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	92	344	344	344	545	545	278	0	1	195
Volume Left	92	0	0	0	0	0	0	0	1	0
Volume Right	0	0	0	0	0	0	6	0	0	195
cSH	498	1700	1700	1700	1700	1700	1700	1700	36	548
Volume to Capacity	0.19	0.20	0.20	0.20	0.32	0.32	0.16	0.00	0.03	0.36
Queue Length 95th (ft)	17	0	0	0	0	0	0	0	2	40
Control Delay (s)	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	108.1	15.2
Lane LOS	B							A	F	C
Approach Delay (s)	1.1				0.0			0.0	15.7	
Approach LOS								A	C	

Intersection Summary				
Average Delay	1.6			
Intersection Capacity Utilization	41.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	83	929	0	0	1226	5	0	0	0	1	0	166
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	92	1032	0	0	1362	6	0	0	0	1	0	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	1368			1032			1866	2584	344	1894	2582	457
vC1, stage 1 conf vol							1217	1217		1365	1365	
vC2, stage 2 conf vol							649	1368		529	1217	
vCu, unblocked vol	1368			1032			1866	2584	344	1894	2582	457
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)							6.5	5.5		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			100	100	100	99	100	64
cM capacity (veh/h)	498			669			88	78	652	114	104	548

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	92	344	344	344	545	545	278	0	1	195
Volume Left	92	0	0	0	0	0	0	0	1	0
Volume Right	0	0	0	0	0	0	6	0	0	195
cSH	498	1700	1700	1700	1700	1700	1700	1700	114	548
Volume to Capacity	0.19	0.20	0.20	0.20	0.32	0.32	0.16	0.00	0.01	0.36
Queue Length 95th (ft)	17	0	0	0	0	0	0	0	1	40
Control Delay (s)	13.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	36.8	15.2
Lane LOS	B							A	E	C
Approach Delay (s)	1.1				0.0			0.0	15.3	
Approach LOS								A	C	

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	41.7%	ICU Level of Service	A
Analysis Period (min)	15		

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	857	1529	350	246	51	193
v/c Ratio	0.84	0.60	0.56	0.51	0.15	0.55
Control Delay	20.9	7.3	37.8	8.7	31.9	28.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	20.9	7.3	37.8	8.7	31.9	28.2
Queue Length 50th (ft)	293	187	96	0	24	65
Queue Length 95th (ft)	#564	238	142	62	56	134
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	1015	2556	623	481	335	352
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	0.84	0.60	0.56	0.51	0.15	0.55

Intersection Summary

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

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	561	825	841	776	128	96
v/c Ratio	0.86	0.33	0.61	0.84	0.39	0.26
Control Delay	31.1	4.9	24.4	18.7	36.0	8.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.1	4.9	24.4	18.7	36.0	8.9
Queue Length 50th (ft)	200	74	197	144	64	0
Queue Length 95th (ft)	#390	98	260	#407	118	40
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	651	2531	1376	921	330	371
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	0.86	0.33	0.61	0.84	0.39	0.26

Intersection Summary

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

APPENDIX E

TRIP GENERATION

UNM Off-Campus Student Housing
Summary of Multi-Use Trip Generation
Average Weekday Driveway Volumes
21-Sep-09

Land Use	Size	24 Hour Two-Way Volume	AM Pk Hour		PM Pk Hour	
			Enter	Exit	Enter	Exit
Apartments	900 Persons	3,059	49	196	229	124
Shuttle Use						
60%			20	79	92	50

APPENDIX F

TRIP DISTRIBUTION/TRIP ASSIGNMENT

UNM Housing (ACC) - Employment Trips
Employees by Subarea

Subarea	Employees 2004	Employees 2015	Employees* 2011	Distance	Employees / distance 2010	% Emp. / Dist	IN I-25 to/from North			IS I-25 to/from South			ACCW Avenue Cesar Chavez to/from West		
							% Utililizing	% Employees/ Dist. Utilizing	Employees	% Utililizing	% Employees/ Dist. Utilizing	Employees	% Utililizing	% Employees/ Dist. Utilizing	Employees
1	4,903	15,256	11,491	20.54	560	0.56%	100%	0.56%	11,491	0%	0.00%	0	0%	0.00%	0
2	16,736	21,605	19,834	13.17	1,505	1.52%	100%	1.52%	19,834	0%	0.00%	0	0%	0.00%	0
3	1,267	1,455	1,387	12.03	115	0.12%	100%	0.12%	1,387	0%	0.00%	0	0%	0.00%	0
4	2,392	3,797	3,286	17.77	185	0.19%	100%	0.19%	3,286	0%	0.00%	0	0%	0.00%	0
5	13,877	20,679	18,206	9.75	1,867	1.88%	100%	1.88%	18,206	0%	0.00%	0	0%	0.00%	0
6	712	4,140	2,893	12.51	231	0.23%	100%	0.23%	2,893	0%	0.00%	0	0%	0.00%	0
7	8,372	14,077	12,002	6.45	1,860	1.87%	80%	1.50%	9,602	0%	0.00%	0	20%	0.37%	2,400
8	8,058	12,809	11,081	4.50	2,462	2.48%	60%	1.49%	6,649	0%	0.00%	0	40%	0.99%	4,433
9	781	1,196	1,045	22.99	45	0.05%	100%	0.05%	1,045	0%	0.00%	0	0%	0.00%	0
10	3,246	5,693	4,803	7.63	629	0.63%	50%	0.32%	2,402	40%	0.25%	1,921	10%	0.06%	480
11	3,367	6,568	5,404	5.02	1,075	1.08%	0%	0.00%	0	40%	0.43%	2,162	60%	0.65%	3,242
12	6,929	6,964	6,951	7.41	939	0.94%	100%	0.94%	6,951	0%	0.00%	0	0%	0.00%	0
13	38,326	45,505	42,894	7.55	5,679	5.72%	100%	5.72%	42,894	0%	0.00%	0	0%	0.00%	0
14	35,837	41,610	39,511	10.42	3,791	3.82%	100%	3.82%	39,511	0%	0.00%	0	0%	0.00%	0
15	18,228	20,366	19,589	4.03	4,863	4.89%	90%	4.41%	17,630	0%	0.00%	0	10%	0.49%	1,959
16	56,556	62,473	60,321	6.27	9,617	9.68%	70%	6.78%	42,225	0%	0.00%	0	0%	0.00%	0
17	33,936	36,847	35,788	2.06	17,339	17.45%	70%	12.22%	25,052	0%	0.00%	0	30%	5.24%	10,737
18	43,756	49,618	47,486	1.40	33,868	34.09%	30%	10.23%	14,246	0%	0.00%	0	0%	0.00%	0
19	28,877	31,442	30,509	6.37	4,787	4.82%	25%	1.20%	7,627	0%	0.00%	0	0%	0.00%	0
20	7,090	10,342	9,159	4.40	2,082	2.10%	0%	0.00%	0	90%	1.89%	8,244	10%	0.21%	916
21	49	4,555	2,916	6.11	478	0.48%	0%	0.00%	0	90%	0.43%	2,625	0%	0.00%	0
22	29,284	29,470	29,402	7.29	4,032	4.06%	0%	0.00%	0	25%	1.01%	7,351	0%	0.00%	0
23	2,651	3,550	3,223	17.38	185	0.19%	100%	0.19%	3,223	0%	0.00%	0	0%	0.00%	0
24	1,727	1,902	1,838	13.41	137	0.14%	0%	0.00%	0	100%	0.14%	1,838	0%	0.00%	0
25	147	182	169	14.39	12	0.01%	0%	0.00%	0	100%	0.01%	169	0%	0.00%	0
26	17,290	22,645	20,698	27.82	744	0.75%	0%	0.00%	0	100%	0.75%	20,698	0%	0.00%	0
27	4,502	5,266	4,988	48.11	104	0.10%	100%	0.10%	4,988	0%	0.00%	0	0%	0.00%	0
28	4,545	5,371	5,071	53.47	95	0.10%	100%	0.10%	5,071	0%	0.00%	0	0%	0.00%	0
29	1,451	2,341	2,017	36.61	55	0.06%	100%	0.06%	2,017	0%	0.00%	0	0%	0.00%	0
Total			453,967		99,342	100.00%		53.59%			4.92%			8.01%	

* - Subarea Employment from MRCOG Socioeconomic Forecasts (from web)

UNM Housing (ACC) - Employment Trips
Employees by Subarea

Subarea	Employees 2004	Employees 2015	Employees* 2011	Distance	Employees / distance 2010	% Emp. / Dist	ACCE Avenue Cesar Chavez to/from East			LN Langham to/fron North		
							% Utililizing	% Employees/ Dist. Utilizing	Employees	% Utililizing	% Employees/ Dist. Utilizing	Employees
1	4,903	15,256	11,491	20.54	560	0.56%	0%	0.00%	0	0%	0.00%	0
2	16,736	21,605	19,834	13.17	1,505	1.52%	0%	0.00%	0	0%	0.00%	0
3	1,267	1,455	1,387	12.03	115	0.12%	0%	0.00%	0	0%	0.00%	0
4	2,392	3,797	3,286	17.77	185	0.19%	0%	0.00%	0	0%	0.00%	0
5	13,877	20,679	18,206	9.75	1,867	1.88%	0%	0.00%	0	0%	0.00%	0
6	712	4,140	2,893	12.51	231	0.23%	0%	0.00%	0	0%	0.00%	0
7	8,372	14,077	12,002	6.45	1,860	1.87%	0%	0.00%	0	0%	0.00%	0
8	8,058	12,809	11,081	4.50	2,462	2.48%	0%	0.00%	0	0%	0.00%	0
9	781	1,196	1,045	22.99	45	0.05%	0%	0.00%	0	0%	0.00%	0
10	3,246	5,693	4,803	7.63	629	0.63%	0%	0.00%	0	0%	0.00%	0
11	3,367	6,568	5,404	5.02	1,075	1.08%	0%	0.00%	0	0%	0.00%	0
12	6,929	6,964	6,951	7.41	939	0.94%	0%	0.00%	0	0%	0.00%	0
13	38,326	45,505	42,894	7.55	5,679	5.72%	0%	0.00%	0	0%	0.00%	0
14	35,837	41,610	39,511	10.42	3,791	3.82%	0%	0.00%	0	0%	0.00%	0
15	18,228	20,366	19,589	4.03	4,863	4.89%	0%	0.00%	0	0%	0.00%	0
16	56,556	62,473	60,321	6.27	9,617	9.68%	30%	2.90%	18,096	0%	0.00%	0
17	33,936	36,847	35,788	2.06	17,339	17.45%	0%	0.00%	0	0%	0.00%	0
18	43,756	49,618	47,486	1.40	33,868	34.09%	65%	22.16%	30,866	5%	1.70%	2,374
19	28,877	31,442	30,509	6.37	4,787	4.82%	75%	3.61%	22,882	0%	0.00%	0
20	7,090	10,342	9,159	4.40	2,082	2.10%	0%	0.00%	0	0%	0.00%	0
21	49	4,555	2,916	6.11	478	0.48%	10%	0.05%	292	0%	0.00%	0
22	29,284	29,470	29,402	7.29	4,032	4.06%	75%	3.04%	22,052	0%	0.00%	0
23	2,651	3,550	3,223	17.38	185	0.19%	0%	0.00%	0	0%	0.00%	0
24	1,727	1,902	1,838	13.41	137	0.14%	0%	0.00%	0	0%	0.00%	0
25	147	182	169	14.39	12	0.01%	0%	0.00%	0	0%	0.00%	0
26	17,290	22,645	20,698	27.82	744	0.75%	0%	0.00%	0	0%	0.00%	0
27	4,502	5,266	4,988	48.11	104	0.10%	0%	0.00%	0	0%	0.00%	0
28	4,545	5,371	5,071	53.47	95	0.10%	0%	0.00%	0	0%	0.00%	0
29	1,451	2,341	2,017	36.61	55	0.06%	0%	0.00%	0	0%	0.00%	0
Total			453,967		99,342	100.00%		31.77%			1.70%	

* - Subarea Employment from MRCOG Socioeconomic Forecasts (from web)

APPENDIX G

TURNING MOVEMENT TABULATION

UNM STUDENT HOUSING - LANDS WEST OF THE PIT
EXISTING & PROJECTED TURNING MOVEMENTS

INTERSECTION: Avenida Caeser Chavez and I-25 Northbound

AM Peak Hour

	Southbound I-25			Westbound Avenida Caeser Chavez			Northbound I-25			Eastbound Avenida Caeser Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	0	0	0	0	304	213	43	1	168	743	1,327	0
Background Growth (2009-2011)	0	0	0	0	18	13	3	0	10	45	80	0
Approved Development*												
2011 No Build	0	0	0	0	322	226	46	1	178	788	1,407	0
Apartment Enter									1		12	
Apartment Exit					10	42						
2010 Build	0	0	0	0	332	268	46	1	179	788	1,419	0
PHF	*0.920*			*0.891*			*0.768*			*0.931*		
HV %		*2*			*3*			*2*			*2*	

PM Peak Hour

	Southbound I-25			Westbound Avenida Caeser Chavez			Northbound I-25			Eastbound Avenida Caeser Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	0	0	0	0	730	674	104	7	83	487	716	0
Background Growth (2009-2011)	0	0	0	0	44	40	6	0	5	29	43	0
Approved Development*												
2011 No Build	0	0	0	0	774	714	110	7	88	516	759	0
Apartment Enter									5		57	
Apartment Exit					6	27						
2010 Build	0	0	0	0	780	741	110	7	92	516	816	0
PHF	*0.920*			*0.893*			*0.746*			*0.920*		
HV %		*2*			*2*			*4*			*3*	

growth rates	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
Trip Distribution % Enter									4.9%		61.6%		Apartments
Trip Distribution % Exit	0.0%	0.0%	0.0%	0.0%	12.9%	53.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	

UNM HOUSING - LANDS WEST OF THE PIT
EXISTING & PROJECTED TURNING MOVEMENTS

INTERSECTION: Avenida Caesar Chavez & Langham

AM Peak Hour

	Southbound Langham			Westbound Avenida Caesar Chavez			Northbound Langham			Eastbound Avenida Caesar Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	2	0	60	0	457	3	0	0	0	245	1,250	0
Background Growth (2009-2011)	0	0	4	0	27	0	0	0	0	15	75	0
Approved Development*												
2011 No Build	2	0	64	0	484	3	0	0	0	260	1,325	0
Apartment Enter	0										13	
Apartment Exit					24	1	29	1	11			
2010 Build	2	0	64	0	508	4	29	1	11	260	1,338	0
PHF	*0.775*			*0.878*			*0.920*			*0.927*		
HV %		*8*			*2*			*2*			*2*	

PM Peak Hour

	Southbound Langham			Westbound Avenida Caesar Chavez			Northbound Langham			Eastbound Avenida Caesar Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	1	0	157	0	1,157	5	0	0	0	78	876	0
Background Growth (2009-2011)	0	0	9	0	69	0	0	0	0	5	53	0
Approved Development*												
2011 No Build	1	0	166	0	1,226	5	0	0	0	83	929	0
Apartment Enter	2										61	
Apartment Exit					15	0	18	1	7			
2010 Build	3	0	166	0	1,241	6	18	1	7	83	990	0
PHF	*0.760*			*0.775*			*0.920*			*0.846*		
HV %		*3*			*2*			*2*			*2*	

growth rates	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
Trip Distribution % Enter	1.7%										66.5%		Apartments
Trip Distribution % Exit	0.0%	0.0%	0.0%	0.0%	30.0%	*0.7%*	36.5%	*1.0%*	14.3%	0.0%	0.0%	0.0%	

UNM HOUSING - LANDS WEST OF THE PIT
EXISTING & PROJECTED TURNING MOVEMENTS

INTERSECTION: Avenida Caesar Chavez and Site Entrance

AM Peak Hour

	Southbound Driveway			Westbound Avenida Caesar Chavez			Northbound Driveway			Eastbound Avenida Caesar Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	0	0	0	0	460	0	0	0	0	0	1,252	0
Background Growth (2009-2011)	0	0	0	0	28	0	0	0	0	0	75	0
Approved Development*												
2011 No Build	0	0	0	0	488	0	0	0	0	0	1,327	0
Apartment Enter				6								14
Apartment Exit							24		14		11	
2011 Build	0	0	0	6	488	0	24	0	14	0	1,338	14
PHF	*0.920*			*0.878*			*0.850*			*0.927*		
HV %		*2*			*2*			*2*			*2*	

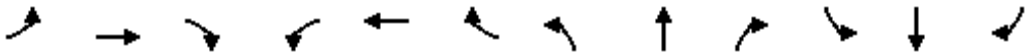
PM Peak Hour

	Southbound Driveway			Westbound Avenida Caesar Chavez			Northbound Driveway			Eastbound Avenida Caesar Chavez		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes (2009)	0	0	0	0	1,162	0	0	0	0	0	877	0
Background Growth (2009-2011)	0	0	0	0	70	0	0	0	0	0	53	0
Approved Development*												
2011 No Build	0	0	0	0	1,232	0	0	0	0	0	930	0
Apartment Enter				29								63
Apartment Exit							15		9		7	
2011 Build	0	0	0	29	1,232	0	15	0	9	0	937	63
PHF	*0.920*			*0.775*			*0.850*			*0.846*		
HV %		*2*			*2*			*2*			*2*	

growth rates	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	
Trip Distribution % Enter				31.8%								68.2%	Apartments
Trip Distribution % Exit	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	30.7%	0.0%	17.5%	0.0%	14.3%	0.0%	

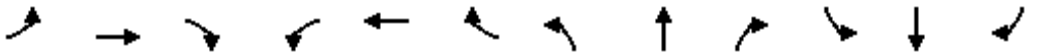
APPENDIX H

2011 BUILD INTERSECTION CAPACITY ANALYSIS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	788	1419	0	0	332	268	46	1	179	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (prot)	1770	3539			3505	1568		1776	1583			
Flt Permitted	0.30	1.00			1.00	1.00		0.95	1.00			
Satd. Flow (perm)	563	3539			3505	1568		1776	1583			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	857	1542	0	0	361	291	50	1	195	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	239	0	0	48	0	0	0
Lane Group Flow (vph)	857	1542	0	0	361	52	0	51	147	0	0	0
Heavy Vehicles (%)	2%	2%	2%	3%	3%	3%	2%	2%	2%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	64.0	64.0			16.0	16.0		18.0	18.0			
Effective Green, g (s)	64.0	64.0			16.0	16.0		18.0	18.0			
Actuated g/C Ratio	0.71	0.71			0.18	0.18		0.20	0.20			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	990	2517			623	279		355	317			
v/s Ratio Prot	c0.42	0.44			0.10							
v/s Ratio Perm	c0.19					0.03		0.03	c0.09			
v/c Ratio	0.87	0.61			0.58	0.19		0.14	0.46			
Uniform Delay, d1	12.8	6.7			33.9	31.5		29.7	31.7			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	10.0	1.1			3.9	1.5		0.8	4.8			
Delay (s)	22.8	7.8			37.8	32.9		30.5	36.6			
Level of Service	C	A			D	C		C	D			
Approach Delay (s)		13.2			35.6			35.3			0.0	
Approach LOS		B			D			D			A	

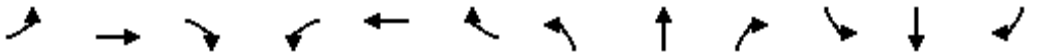
Intersection Summary			
HCM Average Control Delay	19.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	73.6%	ICU Level of Service	D
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	260	1338	0	0	508	4	29	1	11	2	0	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	289	1487	0	0	564	4	34	1	13	2	0	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	569			1487			2328	2633	496	1654	2631	190
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	569			1487			2328	2633	496	1654	2631	190
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.7	6.7	7.1
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	71			100			0	93	98	95	100	91
cM capacity (veh/h)	999			448			14	17	520	44	15	801

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	289	496	496	496	226	226	117	48	2	75
Volume Left	289	0	0	0	0	0	0	34	2	0
Volume Right	0	0	0	0	0	0	4	13	0	75
cSH	999	1700	1700	1700	1700	1700	1700	19	44	801
Volume to Capacity	0.29	0.29	0.29	0.29	0.13	0.13	0.07	2.55	0.05	0.09
Queue Length 95th (ft)	30	0	0	0	0	0	0	162	4	8
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0	1125.0	92.2	10.0
Lane LOS	B							F	F	A
Approach Delay (s)	1.6				0.0			1125.0	12.5	
Approach LOS								F	B	

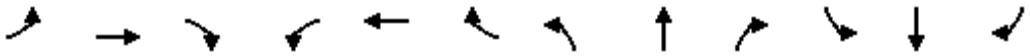
Intersection Summary				
Average Delay	23.5			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	260	1338	0	0	508	4	29	1	11	2	0	64
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	289	1487	0	0	564	4	34	1	13	2	0	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	569			1487			2328	2633	496	1654	2631	190
vC1, stage 1 conf vol							2064	2064		567	567	
vC2, stage 2 conf vol							263	569		1087	2064	
vCu, unblocked vol	569			1487			2328	2633	496	1654	2631	190
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.7	6.7	7.1
tC, 2 stage (s)							6.5	5.5		6.7	5.7	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.6	4.1	3.4
p0 queue free %	71			100			2	98	98	98	100	91
cM capacity (veh/h)	999			448			35	52	520	118	54	801

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	289	496	496	496	226	226	117	48	2	75
Volume Left	289	0	0	0	0	0	0	34	2	0
Volume Right	0	0	0	0	0	0	4	13	0	75
cSH	999	1700	1700	1700	1700	1700	1700	47	118	801
Volume to Capacity	0.29	0.29	0.29	0.29	0.13	0.13	0.07	1.03	0.02	0.09
Queue Length 95th (ft)	30	0	0	0	0	0	0	109	2	8
Control Delay (s)	10.1	0.0	0.0	0.0	0.0	0.0	0.0	277.9	36.2	10.0
Lane LOS	B							F	E	A
Approach Delay (s)	1.6				0.0			277.9	10.8	
Approach LOS								F	B	

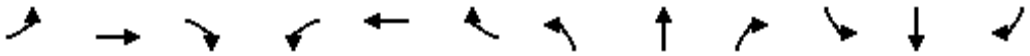
Intersection Summary				
Average Delay	6.9			
Intersection Capacity Utilization	43.3%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1338	14	6	488	0	24	0	14	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	0	1487	16	7	542	0	28	0	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		1281										
pX, platoon unblocked												
vC, conflicting volume	542			1502			1689	2050	503	1068	2058	181
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	542			1502			1689	2050	503	1068	2058	181
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			53	100	97	100	100	100
cM capacity (veh/h)	1023			442			60	54	514	169	54	831

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	595	595	313	7	181	181	181	45
Volume Left	0	0	0	7	0	0	0	28
Volume Right	0	0	16	0	0	0	0	16
cSH	1700	1700	1700	442	1700	1700	1700	89
Volume to Capacity	0.35	0.35	0.18	0.02	0.11	0.11	0.11	0.50
Queue Length 95th (ft)	0	0	0	1	0	0	0	54
Control Delay (s)	0.0	0.0	0.0	13.3	0.0	0.0	0.0	80.5
Lane LOS				B				F
Approach Delay (s)	0.0			0.2				80.5
Approach LOS								F

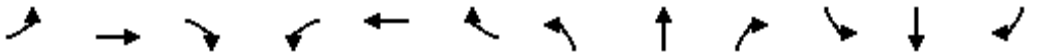
Intersection Summary				
Average Delay	1.8			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	1338	14	6	488	0	24	0	14	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	0	1487	16	7	542	0	28	0	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		1281										
pX, platoon unblocked												
vC, conflicting volume	542			1502			1689	2050	503	1068	2058	181
vC1, stage 1 conf vol							1494	1494		556	556	
vC2, stage 2 conf vol							194	556		512	1502	
vCu, unblocked vol	542			1502			1689	2050	503	1068	2058	181
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			75	100	97	100	100	100
cM capacity (veh/h)	1023			442			112	142	514	297	137	831

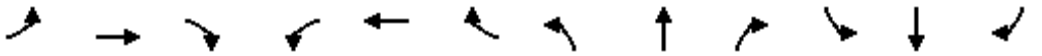
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	595	595	313	7	181	181	181	45
Volume Left	0	0	0	7	0	0	0	28
Volume Right	0	0	16	0	0	0	0	16
cSH	1700	1700	1700	442	1700	1700	1700	157
Volume to Capacity	0.35	0.35	0.18	0.02	0.11	0.11	0.11	0.28
Queue Length 95th (ft)	0	0	0	1	0	0	0	28
Control Delay (s)	0.0	0.0	0.0	13.3	0.0	0.0	0.0	36.7
Lane LOS				B				E
Approach Delay (s)	0.0			0.2				36.7
Approach LOS								E

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	36.2%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	516	816	0	0	780	741	110	7	92	0	0	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Util. Factor	1.00	0.95			0.95	1.00		1.00	1.00			
Frt	1.00	1.00			1.00	0.85		1.00	0.85			
Flt Protected	0.95	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (prot)	1752	3505			3539	1583		1745	1553			
Flt Permitted	0.18	1.00			1.00	1.00		0.96	1.00			
Satd. Flow (perm)	341	3505			3539	1583		1745	1553			
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	561	887	0	0	848	805	120	8	100	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	292	0	0	82	0	0	0
Lane Group Flow (vph)	561	887	0	0	848	513	0	128	18	0	0	0
Heavy Vehicles (%)	3%	3%	3%	2%	2%	2%	4%	4%	4%	2%	2%	2%
Turn Type	pm+pt					Perm	Perm		Perm			
Protected Phases	7	4			8			2				
Permitted Phases	4					8	2		2			
Actuated Green, G (s)	66.0	66.0			36.0	36.0		16.0	16.0			
Effective Green, g (s)	66.0	66.0			36.0	36.0		16.0	16.0			
Actuated g/C Ratio	0.73	0.73			0.40	0.40		0.18	0.18			
Clearance Time (s)	4.0	4.0			4.0	4.0		4.0	4.0			
Lane Grp Cap (vph)	658	2570			1416	633		310	276			
v/s Ratio Prot	c0.25	0.25			0.24							
v/s Ratio Perm	c0.38					0.32		0.07	0.01			
v/c Ratio	0.85	0.35			0.60	0.81		0.41	0.06			
Uniform Delay, d1	17.4	4.3			21.3	24.0		32.8	30.8			
Progression Factor	1.00	1.00			1.00	1.00		1.00	1.00			
Incremental Delay, d2	13.2	0.4			1.9	10.8		4.0	0.4			
Delay (s)	30.6	4.7			23.2	34.7		36.9	31.2			
Level of Service	C	A			C	C		D	C			
Approach Delay (s)		14.7			28.8			34.4			0.0	
Approach LOS		B			C			C			A	

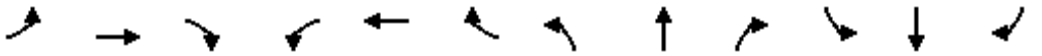
Intersection Summary			
HCM Average Control Delay	23.1	HCM Level of Service	C
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	90.9%	ICU Level of Service	E
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	83	990	0	0	1241	6	18	1	7	3	0	166
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	92	1100	0	0	1379	7	21	1	8	4	0	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	1386			1100			1939	2670	367	1942	2667	463
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1386			1100			1939	2670	367	1942	2667	463
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			2	93	99	89	100	64
cM capacity (veh/h)	490			630			22	18	630	31	18	543

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	92	367	367	367	552	552	282	31	4	195
Volume Left	92	0	0	0	0	0	0	21	4	0
Volume Right	0	0	0	0	0	0	7	8	0	195
cSH	490	1700	1700	1700	1700	1700	1700	29	31	543
Volume to Capacity	0.19	0.22	0.22	0.22	0.32	0.32	0.17	1.06	0.11	0.36
Queue Length 95th (ft)	17	0	0	0	0	0	0	88	9	41
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	0.0	0.0	389.3	135.4	15.3
Lane LOS	B							F	F	C
Approach Delay (s)	1.1				0.0			389.3	17.4	
Approach LOS								F	C	

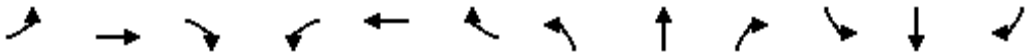
Intersection Summary				
Average Delay	5.9			
Intersection Capacity Utilization	47.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	83	990	0	0	1241	6	18	1	7	3	0	166
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.85	0.85	0.85
Hourly flow rate (vph)	92	1100	0	0	1379	7	21	1	8	4	0	195
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	1386			1100			1939	2670	367	1942	2667	463
vC1, stage 1 conf vol							1284	1284		1382	1382	
vC2, stage 2 conf vol							655	1386		560	1284	
vCu, unblocked vol	1386			1100			1939	2670	367	1942	2667	463
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.6	6.6	7.0
tC, 2 stage (s)							6.5	5.5		6.6	5.6	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	81			100			74	98	99	97	100	64
cM capacity (veh/h)	490			630			82	73	630	110	98	543

Direction, Lane #	EB 1	EB 2	EB 3	EB 4	WB 1	WB 2	WB 3	NB 1	SB 1	SB 2
Volume Total	92	367	367	367	552	552	282	31	4	195
Volume Left	92	0	0	0	0	0	0	21	4	0
Volume Right	0	0	0	0	0	0	7	8	0	195
cSH	490	1700	1700	1700	1700	1700	1700	106	110	543
Volume to Capacity	0.19	0.22	0.22	0.22	0.32	0.32	0.17	0.29	0.03	0.36
Queue Length 95th (ft)	17	0	0	0	0	0	0	27	2	41
Control Delay (s)	14.0	0.0	0.0	0.0	0.0	0.0	0.0	52.2	38.9	15.3
Lane LOS	B							F	E	C
Approach Delay (s)	1.1				0.0			52.2	15.7	
Approach LOS								F	C	

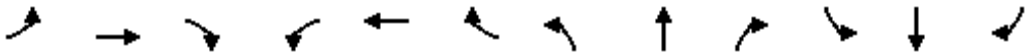
Intersection Summary				
Average Delay	2.1			
Intersection Capacity Utilization	47.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	937	63	29	1232	0	15	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	0	1041	70	32	1369	0	18	0	11	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)		1281										
pX, platoon unblocked												
vC, conflicting volume	1369			1111			1597	2509	382	1791	2544	456
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1369			1111			1597	2509	382	1791	2544	456
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			74	100	98	100	100	100
cM capacity (veh/h)	497			624			68	27	616	48	25	551

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	416	416	278	32	456	456	456	28
Volume Left	0	0	0	32	0	0	0	18
Volume Right	0	0	70	0	0	0	0	11
cSH	1700	1700	1700	624	1700	1700	1700	103
Volume to Capacity	0.24	0.24	0.16	0.05	0.27	0.27	0.27	0.27
Queue Length 95th (ft)	0	0	0	4	0	0	0	26
Control Delay (s)	0.0	0.0	0.0	11.1	0.0	0.0	0.0	52.8
Lane LOS				B				F
Approach Delay (s)	0.0			0.3				52.8
Approach LOS								F

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	34.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (veh/h)	0	937	63	29	1232	0	15	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90	0.85	0.85	0.85	0.90	0.90	0.90
Hourly flow rate (vph)	0	1041	70	32	1369	0	18	0	11	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		Raised			Raised							
Median storage veh)		1			1							
Upstream signal (ft)		1281										
pX, platoon unblocked												
vC, conflicting volume	1369			1111			1597	2509	382	1791	2544	456
vC1, stage 1 conf vol							1076	1076		1433	1433	
vC2, stage 2 conf vol							521	1433		358	1111	
vCu, unblocked vol	1369			1111			1597	2509	382	1791	2544	456
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)							6.5	5.5		6.5	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			95			90	100	98	100	100	100
cM capacity (veh/h)	497			624			170	116	616	111	109	551

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3	WB 4	NB 1
Volume Total	416	416	278	32	456	456	456	28
Volume Left	0	0	0	32	0	0	0	18
Volume Right	0	0	70	0	0	0	0	11
cSH	1700	1700	1700	624	1700	1700	1700	234
Volume to Capacity	0.24	0.24	0.16	0.05	0.27	0.27	0.27	0.12
Queue Length 95th (ft)	0	0	0	4	0	0	0	10
Control Delay (s)	0.0	0.0	0.0	11.1	0.0	0.0	0.0	22.5
Lane LOS				B				C
Approach Delay (s)	0.0			0.3				22.5
Approach LOS								C

Intersection Summary				
Average Delay	0.4			
Intersection Capacity Utilization	34.1%	ICU Level of Service		A
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	858	1542	361	291	51	193
v/c Ratio	0.85	0.60	0.58	0.56	0.15	0.55
Control Delay	21.6	7.4	38.2	8.8	31.9	28.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.6	7.4	38.2	8.8	31.9	28.7
Queue Length 50th (ft)	299	190	100	0	24	66
Queue Length 95th (ft)	#571	242	145	67	56	136
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	1010	2556	623	518	335	350
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	0.85	0.60	0.58	0.56	0.15	0.55

Intersection Summary

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

Lane Group	EBL	EBT	WBT	WBR	NBT	NBR
Lane Group Flow (vph)	566	887	848	805	128	96
v/c Ratio	0.86	0.35	0.60	0.87	0.41	0.27
Control Delay	30.4	4.7	23.5	21.6	37.5	9.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.4	4.7	23.5	21.6	37.5	9.3
Queue Length 50th (ft)	197	78	195	176	65	0
Queue Length 95th (ft)	#390	102	256	#450	120	41
Internal Link Dist (ft)		174	563		403	
Turn Bay Length (ft)						
Base Capacity (vph)	658	2570	1416	925	310	355
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	0.86	0.35	0.60	0.87	0.41	0.27

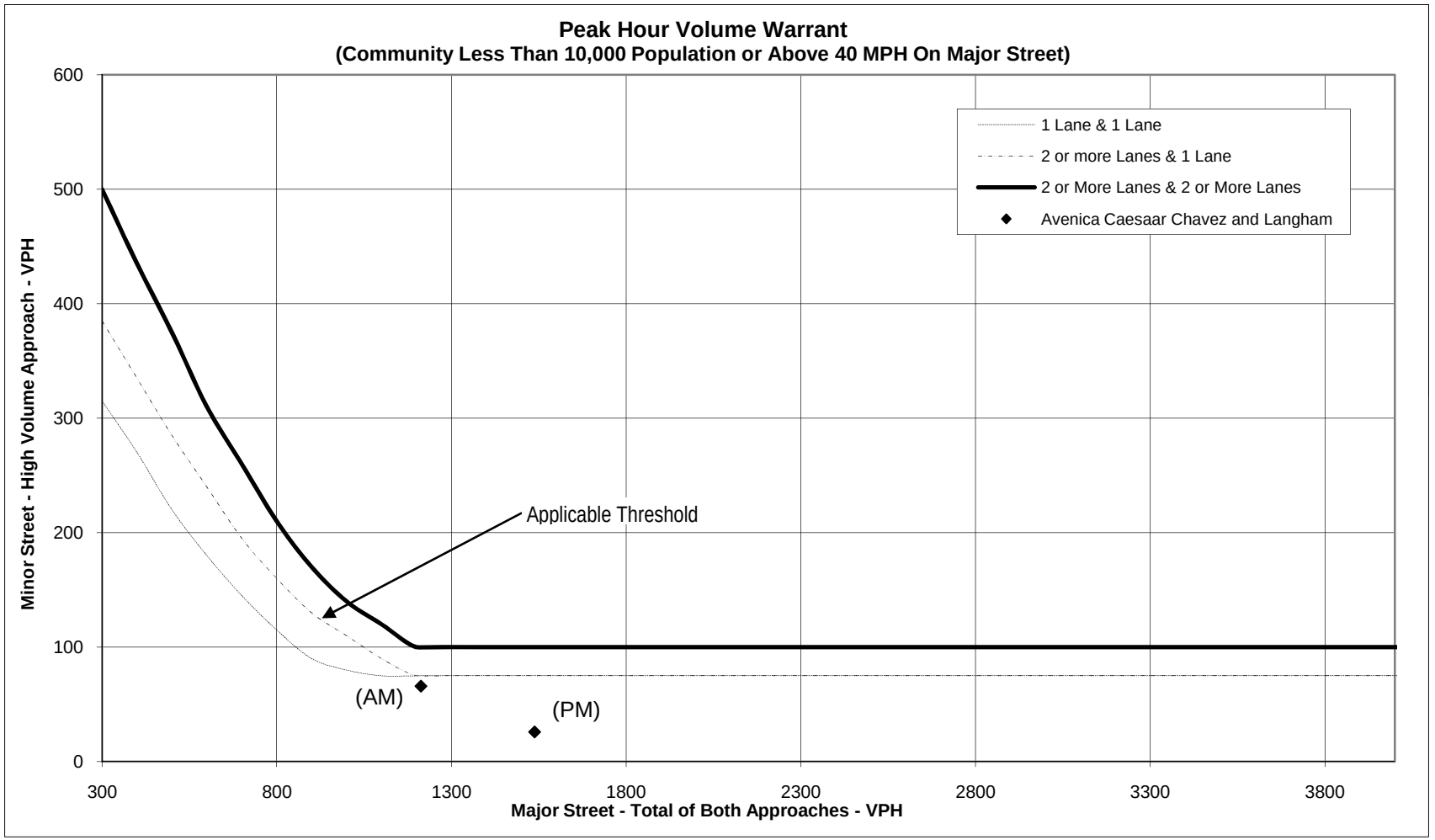
Intersection Summary

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

PEAK HOUR VOLUME SIGNAL WARRANT ANALYSIS

Scenario: Build - UNM Housing - Lands West of the Pit - No SB Rights included
Intersection: Avenica Caesaar Chavez and Langham
Type: 2 or more Lane/1 Lane
Major Street (Orientation): ACC (E/W)
Minor Street (Orientation): Langham

	Minor Street Approach Volume			Major Street Approach Volume			Satisfies
Time	NB	SB	High Vol Approach	EB	WB	EB + WB	Warrant 11?
AM Peak	41	66	66	416	797	1,213	NO
PM Peak	26	3	26	959	579	1,538	NO



Note: 100 VPH applies as the lower threshold for minor street approach with 2 or more lanes & 75 VPH as the threshold for a minor street approach with one lane