

Monday, February 22, 2010

**Tony J. Loyd**  
Traffic Engineer, City of Albuquerque  
Transportation Development Section  
600 2nd St. NW  
Albuquerque, NM 87102

**Re: Sage / Unser Commercial Development (SE Corner)**

Dear Tony:

Attached are two copies of the DRAFT Traffic Impact Study for the referenced proposed project for your review and comment.

Please call me if you have questions or if you need additional information.

Best Regards,



Terry O. Brown, P.E.

cc: George Rainhart w/2 copies of report

attachments as noted

# **Sage / Unser Commercial Development (SE Corner) ACCESS STUDY**

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## **Sage / Unser Commercial Development (SE Corner) ACCESS STUDY**

### **STUDY PURPOSE**

The study is being conducted in conjunction with a request for approval from the City of Albuquerque to install a right-turn-in, right-turn-out unsignalized access along the east side of Unser Blvd. approximately 500 feet south of Sage Rd. (centerline to centerline). The purpose of this study is to provide sufficient analysis for evaluation by the City of Albuquerque so that determination can be made regarding whether or not it is feasible and beneficial to apply for approval of the new access point on Unser Blvd. as previously described and as shown graphically in this study. Since Unser Blvd. is a Limited Access Arterial Roadway in the City of Albuquerque on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area, then approval of the new access point by the Transportation Coordinating Committee (T.C.C.) will be required.

### **STUDY PROCEDURES**

The scope of this study is described as follows:

- 1) The following data from the Sage / Unser Commercial Development (SE Corner) Traffic Impact Study will be utilized in this Access Study:
  - a) Trip Generation Rates for the proposed Sage / Unser Commercial Development (SE Corner)
  - b) Trip Distribution Model for the proposed Sage / Unser Commercial Development (SE Corner)
  - c) Projected AM and PM Peak Hour 2014 volumes and 2030 volumes associated with the Sage / Unser BUILD Conditions.
- 2) The Mid-Region Council of Governments' (MRCOG) 2030 transportation model was used as a basis to forecast 2030 turning movements volumes at the intersections analyzed in this study using the Fratar method.
- 3) Analysis of three conditions are presented in this study to quantify the impact of implementation of a new right-turn-in, right-turn-out driveway on the east side of Unser Blvd. between Arenal Rd. and Sage Rd. The impact is quantified by calculating the levels-of-service and delays at Sage Rd. / Coors Blvd., Sage Rd. / Driveway "B", Sage Rd. / Driveway "C", and Unser Blvd. / Driveway "D" for Case "N" (without the proposed right-turn-in, right-turn-out Driveway "D"), Case "Y1" (with the proposed right-turn-in only Driveway "D"), and Case Y2 (with the proposed right-turn-in, right-turn-out Driveway "D"). The comparison of the three Cases will be the basis upon which the impact of the new right-turn-in, right-turn-out driveway is determined.

## **GENERAL AREA CHARACTERISTICS**

The proposed development plan is located along the east side of Unser Blvd. south of Sage Rd. as shown on the Vicinity Map on Page A-1 of the Appendix of this report. The property in the vicinity of this site is a mix of residential with some commercial along Unser Blvd. especially near major intersections. This project is located in the midst of a relatively active development area.

## **AREA STREET NETWORK**

The entire length of Unser Blvd. is classified as a Limited Access Principal Arterial Roadway on the Long Range Roadway System Plan for the Albuquerque Urban Area (See Page A-3 in the Appendix). There are existing approved access points on Unser Blvd. at Arenal Rd. and at Sage Rd. Arenal Rd. / Unser Blvd. and Sage Rd. / Unser Blvd. are currently signalized intersections. There is one other approved access break between Arenal Rd. and Sage Rd. on the west side of Unser Blvd. for the Sage / Unser Commercial Development (SW Corner). The proposed new access will be approximately 500 feet south of Sage Rd. (centerline to centerline) The east side of Unser Blvd. between Arenal Rd. and Sage Rd. is largely developed as a residential subdivision. The subject tract is a vacant 10-acre tract on the southeast corner of Sage / Unser zoned C-1 in the City of Albuquerque city limits. The 10-acre tract has a frontage along Sage Rd. of approximately 900 feet and a frontage along Unser Blvd. of approximately 500 feet.

Sage Rd. is classified as a Minor Arterial Street on the Long Range Roadway Plan for the Albuquerque Urban Area. Currently, Sage Rd. is a two lane rural type of roadway along the frontage of this project. Sage Rd. will ultimately be a four-lane urban roadway with raised medians.

The existing Sage Rd. / Unser Blvd intersection is signalized.

## **PROPOSED DEVELOPMENT**

The subject commercial development plan consists of approximately 8,220 S.F. of fast food restaurants in 2 locations, approximately 29,170 S.F. of shopping center, a 12 position gas station w/market, and a drive-in bank w/4 lanes. The associated trip generation rates are summarized in the following table:

*Sage / Unser Commercial Development (SE Corner)*  
**Trip Generation Data (ITE Trip Generation Manual - 8th Edition)**

USE (ITE CODE)		24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
DESCRIPTION		GROSS	ENTER	EXIT	ENTER	EXIT
<b>Summary Sheet</b>		Units				
Gasoline / Service Station w/ Convenience Market (945)	12	1,953	61	61	80	80
Fast Food Restaurant w/ Drive-Thru Window (934)	4.38	2,173	110	106	77	71
Fast Food Restaurant w/ Drive-Thru Window (934)	3.84	1,905	97	93	68	62
Drive-In Bank (912)	4	557	22	16	54	56
Shopping Center (820)	29.17	3,049	45	29	137	142
<b>Subtotal</b>		<b>9,637</b>	<b>335</b>	<b>305</b>	<b>416</b>	<b>411</b>

See the conceptual site development plan on Page A-2 in the Appendix of this report to acquire more detailed information about the proposed development. This site plan is somewhat preliminary at this point in time and is subject to some changes as progress takes place in the design process. The plan should, however, provide a reliable basis upon which to analyze the impact of the development on the adjacent transportation system and provide guidelines for mitigating the impact and establishing access criteria. The conceptual site plan as it is shown in this report proposes four (4) access points into the site. Three access driveways are off of Sage Rd. The middle access (Driveway "B") is proposed as a full access unsignalized driveway. The eastern driveway (Driveway "A") is proposed to be a right-turn-in, right-turn-out only unsignalized driveway. The western driveway (Driveway "C") is proposed to be a right-turn-in, right-turn-out only unsignalized driveway. The fourth access point (Driveway "D") is off of Unser Blvd. and is proposed to be a right-turn-in, right-turn-out only unsignalized driveway.

### **BACKGROUND TRAFFIC GROWTH**

Background traffic growth rates utilized in this study for the short term analysis (2014) were those from the Traffic Impact Study for the proposed Sage / Unser Commercial Development (SE Corner) prepared in February, 2010. It utilized annual growth rates derived from the Mid-Region Council of Governments' (MRCOG) regional model based on the 2030 data set. The 2030 analysis utilized growth rates consistent with the MRCOG's 2030 data set forecast link volumes for the AM and PM Peak Hours. AM and PM Peak Hour Link Volumes were taken from the current MRCOG data set for the years 2004 and 2030 to determine the growth rate used to project the 2030 AM and PM Peak Hour NO BUILD Volume utilized in this access study.

## **PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2014 and 2030 BUILDOUT**

The calculated growth rates from the Traffic Impact Study were applied to the recent AM and PM Peak Hour Volumes acquired for the Sage / Unser Commercial Development Traffic Impact Study to establish the 2014 background traffic volumes. Additionally, adjustments were made to the background volumes to account for trips generated by the Commercial Development located at the southwest corner of Sage Rd. / Unser Blvd. To these volumes, the generated trips based on implementation of the proposed Sage / Unser Commercial Development (SE Corner) were added to obtain 2014 BUILD volumes for the intersection analyses.

The calculated growth rates from the MRCOG model were applied to the recent AM and PM Peak Hour Volumes acquired for the Sage / Unser Commercial Development (SE Corner) TIS to establish the forecast 2030 background traffic volumes. Additionally, adjustments were made to the background volumes to account for the trips generated by the other proposed development mentioned above to obtain 2030 BUILD volumes for the intersection analysis.

## **INTERSECTION CAPACITY ANALYSIS**

Signalized and unsignalized intersection capacity analyses were conducted utilizing Synchro, version 7 (Build 763) computer modeling software. Synchro software deviates from the 2000 Highway Capacity Manual methods in several areas. The results obtained using Synchro software are generally deemed by the State to be close to those based on the 2000 Highway Capacity Manual in most cases.

All analyses performed in this study utilized the 2014 and the 2030 BUILD Volumes.

The results of the 2014 and 2030 BUILD analyses are summarized in the following sections - *Results and Discussion of Analyses*.

## **RESULTS AND DISCUSSION OF ANALYSES**

### **Level-of-Service Analysis**

There were three Cases analyzed in this study to provide a comparison upon which to evaluate the impact of implementing a right-turn-in, right-turn-out driveway on the east side of Unser Blvd. approximately 500 feet south of Sage Rd. Case "N" is the evaluation of the conditions if no access was permitted on Unser Blvd. between Sage Rd. and Arenal Rd. Case "Y1" is the evaluation of the conditions if a new right-turn-in only unsignalized driveway was implemented approximately 500 feet south of Sage Rd. on the west side of Unser Blvd. only. Case "Y2" is the evaluation of the conditions if a new right-turn-in, right-turn-out unsignalized driveway was implemented approximately 500 feet south of Sage Rd. on the west side of Unser Blvd.

In these Cases, the analysis of the intersections of Sage Rd. / Unser Blvd., Sage Rd. / "Driveway A", Sage Rd. / Driveway "B", and Driveway "D" / Unser Blvd. are provided and the results compared to measure the impact of the new access.

This report analyzed Sage Rd. / Unser Blvd. as a signalized intersection, and the driveways as unsignalized intersections.

Following is a summary of the conditions associated with each of the three Cases analyzed in this study:

<b>Sage Rd. / Unser Blvd.</b>	<b>2014 Conditions</b>			<b>2030 Conditions</b>		
	<b>Case "N"</b>	<b>Case "Y1"</b>	<b>Case "Y2"</b>	<b>Case "N"</b>	<b>Case "Y1"</b>	<b>Case "Y2"</b>
AM Peak Hour	C – 31.6	C – 31.8	C – 32.7	D – 38.3	D – 38.5	D – 41.9
PM Peak Hour	D – 37.3	D – 38.1	D – 41.3	F – 90.8	F – 92.9	F – 103.9

The impact of the proposed new access on Unser Blvd. to the intersection of Sage Rd. / Unser Blvd. is insignificant. The levels-of-service are the same for all three cases for the AM and PM Peak Hour 2014 and 2030 BUILD conditions. The change is in the delay, which increases at the intersection with Case "N", Case "Y1", and Case "Y2", respectively. The Case "Y2" 2030 AM and PM Peak Hour Conditions experience the highest delays at the intersection.

By implementing dual northbound and southbound lefts at the intersection, both the delays and the levels-of-service at the intersection are improved for all cases and specifically for the proposed Case "Y2" as demonstrated in the table below.

<b>Sage Rd. / Unser Blvd.</b>	<b>2030 Conditions (Mitigated) w/Dual NB/SB Left Turn Lanes</b>		
	<b>Case "N"</b>	<b>Case "Y1"</b>	<b>Case "Y2"</b>
AM Peak Hour	D – 38.7	D – 38.9	D – 40.4
PM Peak Hour	E – 70.1	E – 71.6	E – 77.6

The preceding tables demonstrate that the implementation of the proposed new driveway (whether right-in only or right-turn-in, right-turn-out) provides a minor impact to the performance of Unser Blvd. by slightly increasing the average intersection delays at Sage Rd.

/ Unser Blvd. The magnitude of the increase in average delay is insignificant with the exception of the 6 second delay realized during the 2030 PM Peak Hour period.

Consideration of average delays alone does not accurately represent the conditions at the signalized intersection. The HCM 2000 methodology calculates the average delay as the weighted average of the calculated delay of each turning movement at the intersection. Therefore, by removing or significantly reducing a low-delay turning movement, the average delay will be increased while the total intersection delay is decreased. That is the case concerning the intersection of Sage Rd. / Unser Blvd. Implementation of the right-in only driveway on Unser Blvd. south of Sage Rd. will significantly reduce the volume of northbound right turn traffic at Sage Rd. / Unser Blvd. The preceding tables indicate that the average delay at the intersection will be marginally increased. However, the tables on the following pages demonstrate that the total intersection delay (vehicle-seconds) will actually be reduced as a result of the approval of a right-in only driveway at the southwest corner of this project.

While it is usually important to stress the calculated average signalized intersection delays when evaluating the viability of a new access, in this case it is important to consider the total intersection delay (in vehicle-seconds) to realize that the requested new access does provide a definable benefit to the intersection of Sage Rd. / Unser Blvd., and thus, to the Unser Blvd. corridor.

The following tables summarize the resulting total delay at the intersection of Sage Rd. / Unser Blvd. (in vehicle-seconds of delay) for each Case considered:

<b>Cummulative Delay Worksheet (Sage / Unser - BUILD Condition)</b>									
<b>Sage / Unser</b>	<b>2014 AM Peak Hour (Existing Geometry)</b>								
	<b>Case "N"</b>			<b>Case "Y1"</b>			<b>Case "Y2"</b>		
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay
<b>Eastbound</b>									
Left	53	43.4	2,300	53	43.4	2,300	53	42.1	2,231
Thru	528	37.1	19,589	528	37.1	19,589	528	46.2	24,394
Right	160	22.6	3,616	160	22.2	3,552	160	23	3,680
<b>Westbound</b>									
Left	236	43.6	10,290	236	43.6	10,290	236	47.5	11,210
Thru	231	23.1	5,336	231	23.1	5,336	181	25.5	4,616
Right	77	15.9	1,224	77	15.6	1,201	26	18.6	484
<b>Northbound</b>									
Left	140	26.6	3,724	140	24.1	3,374	190	28	5,320
Thru	602	31.8	19,144	602	32.2	19,384	653	30.9	20,178
Right	398	33.8	13,452	286	35.7	10,210	286	26.3	7,522
<b>Southbound</b>									
Left	152	21.9	3,329	152	21.5	3,268	152	21.3	3,238
Thru	651	31.5	20,507	651	32.5	21,158	651	29.4	19,139
Right	27	17.8	481	27	18.1	489	27	16.5	446
Vehicle Seconds of delay			102,991			100,151			102,456



Sage / Unser	2014 PM Peak Hour (Existing Geometry)									
	Case "N"			Case "Y1"			Case "Y2"			
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	
Eastbound										
Left	123	41.5	5,105	123	41.5	5,105	123	44.5	5,474	
Thru	462	44.2	20,420	462	44.2	20,420	462	55.7	25,733	
Right	171	24.5	4,190	171	24.5	4,190	171	23	3,933	
Westbound										
Left	498	57.9	28,834	498	57.9	28,834	498	49.9	24,850	
Thru	627	32.7	20,503	627	32.7	20,503	559	30.6	17,105	
Right	111	19.1	2,120	111	19.1	2,120	41	18.5	759	
Northbound										
Left	257	52.3	13,441	257	52.5	13,493	325	53.7	17,453	
Thru	561	31.9	17,896	561	32.9	18,457	630	31.1	19,593	
Right	225	24.3	5,468	76	35	2,660	86	36	3,096	
Southbound										
Left	160	18.7	2,992	160	18.7	2,992	160	20.8	3,328	
Thru	868	36.9	32,029	868	36.9	32,029	868	49.1	42,619	
Right	79	17.4	1,375	79	17.4	1,375	79	19.7	1,556	
Vehicle Seconds of delay			154,372				152,177			165,499

Cummulative Delay Worksheet (Sage / Unser - BUILD Condition)									
2030 AM Peak Hour (w/Single NB / SB Left Turn Lanes)									
Sage / Unser	Case "N"			Case "Y1"			Case "Y2"		
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay
Eastbound									
Left	55	52.7	2,899	55	52.7	2,899	55	52.7	2,899
Thru	576	56.5	32,544	576	56.5	32,544	576	68.4	39,398
Right	178	28.9	5,144	178	28.9	5,144	178	28.2	5,020
Westbound									
Left	415	56.1	23,282	415	57.3	23,780	415	70.9	29,424
Thru	480	30.4	14,592	480	30.6	14,688	430	32.4	13,932
Right	103	20.3	2,091	103	20.4	2,101	52	21.4	1,113
Northbound									
Left	209	49.6	10,366	209	49.6	10,366	259	63.9	16,550
Thru	824	33.1	27,274	824	32.8	27,027	875	30.7	26,863
Right	544	19.8	10,771	432	17.1	7,387	432	16.2	6,998
Southbound									
Left	183	33.8	6,185	183	33.4	6,112	183	31.6	5,783
Thru	909	40.1	36,451	909	39.7	36,087	909	38.6	35,087
Right	33	20.9	690	33	20.8	686	33	20.5	677
Vehicle Seconds of delay			172,289	168,822			183,743		
2030 AM Peak Hour (w/Dual NB / SB Left Turn Lanes)									
Sage / Unser	Case "N"			Case "Y1"			Case "Y2"		
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay
Eastbound									
Left	55	52.7	2,899	55	52.7	2,899	55	52.7	2,899
Thru	576	56.5	32,544	576	56.5	32,544	576	60.8	35,021
Right	178	31.5	5,607	178	28.9	5,144	178	30.5	5,429
Westbound									
Left	415	56.1	23,282	415	57.3	23,780	415	57.3	23,780
Thru	480	30.4	14,592	480	30.6	14,688	430	30.4	13,072
Right	103	20.8	2,142	103	20.9	2,153	52	20.6	1,071
Northbound									
Left	209	65.1	13,606	209	58.1	12,143	259	63.9	16,550
Thru	824	32	26,368	824	31.8	26,203	875	32.3	28,263
Right	544	19.6	10,662	432	16.8	7,258	432	16.4	7,085
Southbound									
Left	183	58.4	10,687	183	58.4	10,687	183	58.4	10,687
Thru	909	34.5	31,361	909	35.4	32,179	909	36.1	32,815
Right	33	18.9	624	33	19.3	637	33	19.6	647
Vehicle Seconds of delay			174,373	170,313			177,317		

Cummulative Delay Worksheet (Sage / Unser - BUILD Condition)									
Sage / Unser	2030 PM Peak Hour (w/Single NB / SB Left Turn Lanes)								
	Case "N"			Case "Y1"			Case "Y2"		
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay
Eastbound									
Left	129	108.2	13,958	129	108.2	13,958	129	79.9	10,307
Thru	505	175.9	88,830	505	175.9	88,830	505	175.9	88,830
Right	201	35.3	7,095	201	35.3	7,095	201	33	6,633
Westbound									
Left	474	160.2	75,935	474	160.2	75,935	474	192.4	91,198
Thru	583	58.6	34,164	583	58.6	34,164	515	57	29,355
Right	108	31.8	3,434	108	31.8	3,434	38	31.8	1,208
Northbound									
Left	457	212.1	96,930	457	212.1	96,930	525	230.3	120,908
Thru	835	24.9	20,792	835	24.9	20,792	904	25.5	23,052
Right	286	11.6	3,318	147	10.4	1,529	147	10.5	1,544
Southbound									
Left	217	23.1	5,013	217	23.1	5,013	217	25.7	5,577
Thru	1409	92.5	130,333	1409	92.5	130,333	1409	111	156,399
Right	111	21.3	2,364	111	21.3	2,364	111	21.9	2,431
Vehicle Seconds of delay			482,164	480,375			537,440		
Sage / Unser	2030 PM Peak Hour w/Dual NB / SB Left Turn Lanes)								
	Case "N"			Case "Y1"			Case "Y2"		
	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay	Volume	Delay (Sec)	Vol x Delay
Eastbound									
Left	129	78.9	10,178	129	79.9	10,307	129	79.9	10,307
Thru	505	123.9	62,570	505	123.9	62,570	505	147.6	74,538
Right	201	38.5	7,739	201	38.5	7,739	201	37.7	7,578
Westbound									
Left	474	112.8	53,467	474	112.8	53,467	474	134.1	63,563
Thru	583	50.8	29,616	583	50.8	29,616	515	50.4	25,956
Right	108	29.6	3,197	108	29.6	3,197	38	29.7	1,129
Northbound									
Left	457	120.2	54,931	457	120.2	54,931	525	129.7	68,093
Thru	835	28.4	23,714	835	28.4	23,714	904	27.8	25,131
Right	286	13.1	3,747	147	11.7	1,720	147	11.3	1,661
Southbound									
Left	217	60.8	13,194	217	60.8	13,194	217	60.8	13,194
Thru	1409	76.6	107,929	1409	76.6	107,929	1409	76.6	107,929
Right	111	19.7	2,187	111	19.7	2,187	111	19.6	2,176
Vehicle Seconds of delay			372,468	370,571			401,254		

Generally speaking, there is a two thousand to four thousand vehicle-second reduction in total delay at the intersection of Sage Rd. / Unser Blvd. realized by implementation of a new right-turn-in only driveway on the east side of Unser Blvd. south of Sage Rd.

Justification for the right-out movement at the subject driveway cannot be based on either calculated average delay or calculated total delay at the intersection of Sage Rd. / Unser Blvd. Permitting the right turn out movement at the Unser driveway will result in increased northbound thru traffic and left turn traffic.

The recommendation for approval for the right-turn-out movement at the proposed driveway on the east side of Unser south of Sage is based on the findings, conclusions, and recommendations of the Traffic Impact Study for the Sage / Unser Commercial Development prepared in February, 2010 and approved by the City of Albuquerque. The recommendation to approve the right-turn-out at the new Unser driveway is based on operational and safety issues on Sage Rd. east of Unser. Development of the Sage / Unser Commercial Development absent the right turn out on Unser Blvd. will result in excessively long queues and long delays at the primary full access driveway on Sage Rd. located approximately 650

feet east of Unser Blvd. (centerline to centerline). As a result, a large volume of traffic exiting the site desiring the travel west on Sage Rd. or north on Unser Blvd. will probably end up turning right (east) on Sage Rd. and then executing a U-Turn to achieve their route. The primary concern with this issue is the safety conditions associated with a large volume of U-Turning traffic on Sage Rd. as well as impatient drivers executing other risky maneuvers to enter onto westbound Sage Rd. or northbound Unser Blvd.

The recommendation for approval of the right-out movement at the new Unser driveway is based on the aforementioned safety and operational (delay) concerns. Approval of a new right-in, right-out driveway will relieve these safety and operational concerns on Sage Rd. east of Unser Blvd.

The operation of the proposed unsignalized intersection (Driveway "A") in this study is summarized in the following table:

	2014 BUILD			2030 BUILD		
	Case "N"	Case "Y1"	Case "Y2"	Case "N"	Case "Y1"	Case "Y2"
<b>Sage Rd. / Driveway "A"</b>						
<b>Minor Street (Driveway "A")</b>						
NB Right – AM Peak Hour	A – 9.3	A – 9.1	A – 9.1	A – 9.4	A – 9.3	A – 9.3
NB Right – PM Peak Hour	A – 8.9	A – 9.0	A – 9.0	A – 9.0	A – 8.9	A – 8.9

Evaluation of the right-turn-in, right-turn-out tee intersection indicates that the intersection will operate at an acceptable level-of-service for all conditions analyzed. The comparison between the three cases demonstrates that Case "Y1" and Case "Y2" will experience lower delays than Case "N".

The operation of the proposed unsignalized intersection (Driveway "B") in this study is summarized in the following table:

	2014 BUILD			2030 BUILD		
	Case "N"	Case "Y1"	Case "Y2"	Case "N"	Case "Y1"	Case "Y2"
<b>Sage Rd. / Driveway "B"</b>						
<b>Major Street (Sage Rd.)</b>						
WB Left – AM Peak Hour	B – 10.5	B – 10.4	B – 10.3	B – 10.6	B – 10.5	B – 10.5
WB Left – PM Peak Hour	A – 9.2	A – 8.8	A – 8.9	A – 9.3	A – 9.2	A – 9.2
<b>Minor Street (Driveway "B")</b>						
NB Left – AM Peak Hour	F – 93.8	F – 84.1	F – 80.9	F – 171	F – 161	E – 41.7
NB Left – PM Peak Hour	F – 209	F – 175	F – 176	F – 246	F – 234	F – 50.2
NB Right – AM Peak Hour	F – 93.8	F – 84.1	F – 80.9	F – 171	F – 161	E – 41.7
NB Right – PM Peak Hour	B – 10.1	A – 9.1	A – 9.1	F – 246	F – 234	F – 50.2

Evaluation of the full access tee intersection indicates that the intersection will operate at an acceptable level-of-service for the westbound left during the 2014 and 2030 AM and PM Peak Hour BUILD Conditions for all cases; however, the northbound left and right turns will experience excessive delays for all conditions and cases analyzed. The comparison between the three cases demonstrates that Case "Y2" will experience lower delays than the other two cases. This intersection will experience general operational issues, such as lengthened queues, excessive delays, and safety issues (northbound left-turn conflicting movements); however, Case "Y2" improves all of these issues over the other two cases. The northbound queue lengths, the number of northbound left turns, and the number of conflicting movements

are all reduced by allowing right turns out of Driveway "D" onto Unser Blvd. for vehicles traveling north or west of the site.

The operation of the proposed unsignalized intersection being requested (Driveway "D") in this study is summarized in the following table:

	2014 BUILD			2030 BUILD		
	Case "N"	Case "Y1"	Case "Y2"	Case "N"	Case "Y1"	Case "Y2"
<b>Sage Rd. / Driveway "D"</b>						
<b>Minor Street (Driveway "D")</b>						
WB Right – AM Peak Hour	N/A	N/A	C – 17.5	N/A	N/A	D – 25.7
WB Right – PM Peak Hour	N/A	N/A	C – 17.0	N/A	N/A	C – 24.8

Evaluation of the proposed right-turn-in, right-turn-out tee intersection indicates that the intersection will operate at an acceptable level-of-service for Case "Y2". Case "N" could not be analyzed because in this case Driveway "D" does not exist. Case "Y1" did not yield level-of-service results because the only movement at Driveway "D" would be right turns into the site.

## **CONCLUSIONS**

This analysis was conducted using the following methodology: Trip Generation was established using the Institute of Transportation Engineers' (ITE's) Trip Generation Manual (7th Edition). Generated Trips were distributed proportionately based on the Population Data Analysis Subzones within a two-mile radius of the proposed development for commercial properties; growth rates of background traffic volumes were established from MRCOG model data (2030 data set); and the intersection analyses were performed in accordance with the 2000 Highway Capacity Manual, Special Report 209. The Access Study showed that a decrease in total intersection delay (vehicle-seconds) can be realized by permitting an unsignalized right-turn-in driveway along the east side of Unser Blvd. approximately 510 feet south of Sage Rd. The benefits are realized as a reduction in the operational delays at the Sage Rd. / Unser Blvd. Approval of a westbound right turn out at the new driveway will provide safety benefits consistent with the findings, conclusions, and recommendations of the Traffic Impact Study for this project. Therefore, this study concludes that there are operational benefits to the intersection of Sage Rd. / Unser Blvd. as a direct result of approval of a right-in only driveway on the east side of Unser Blvd. south of Sage Rd. and a safety related operational benefit to the Sage Rd. corridor as a direct result of approval of a westbound right-out only movement at the same location.

## **RECOMMENDATIONS**

This study finds that the implementation of the new right-turn-in unsignalized access driveway (Driveway "D") located along the east side of Unser Blvd. approximately 510 feet south of Sage Rd. will provide a benefit to the adjacent transportation system by reducing the projected total intersection delay at the intersection of Sage Rd. / Unser Blvd. for the 2030 PM Peak Hour BUILD Conditions associated with the development of the Sage / Unser Commercial Development. Also, implementation of a right-out turning movement at the new driveway (Driveway "D") will provide safety-related operational benefits on the Sage Rd. corridor east of Unser Blvd. Upon that basis, the following recommendations are made:

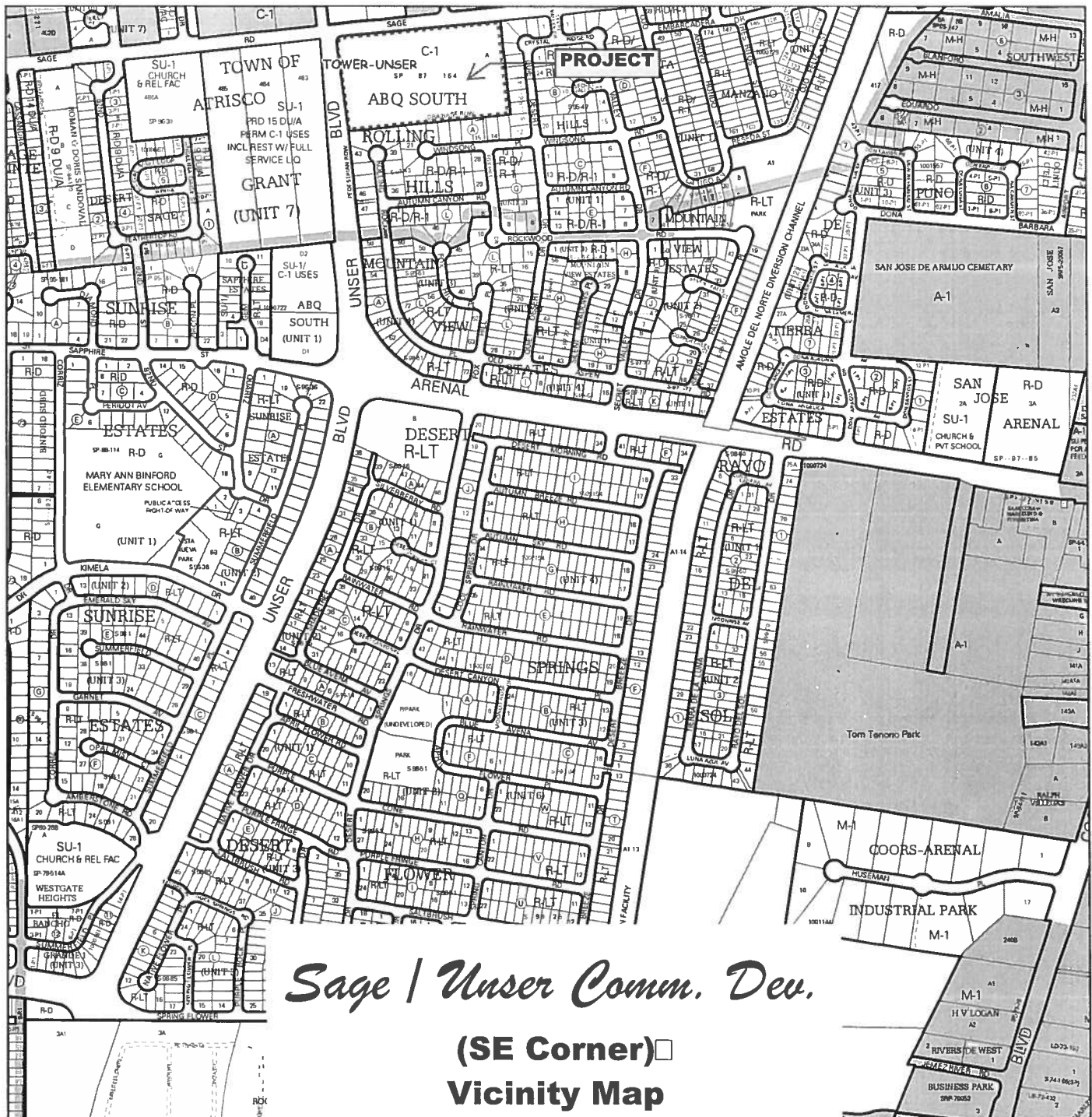
- This Access Study recommends that a new unsignalized right-turn-in, right-turn-out unsignalized access (Driveway "D") be implemented along the east side of Unser Blvd. approximately 510 feet south of Sage Rd for the purpose of providing access to the currently proposed Sage / Unser Commercial Development (SE Corner).
- The new access intersection should be constructed using 25 feet radius curb returns or greater.
- If it is found by reviewing agencies that the proposed right-in, right-out driveway is not acceptable, then this study recommends approval of a right-in-only driveway along the east side of Unser Blvd. approximately 510 feet south of Sage Rd. for the purpose of providing access to the currently proposed Sage / Unser Commercial Development (SE Corner).
- In either case (right-in, right-out or right-in only), a northbound right turn taper lane is recommended at the new Driveway "D". There is not sufficient right-of-way available to construct a full deceleration lane.

## **Appendix**

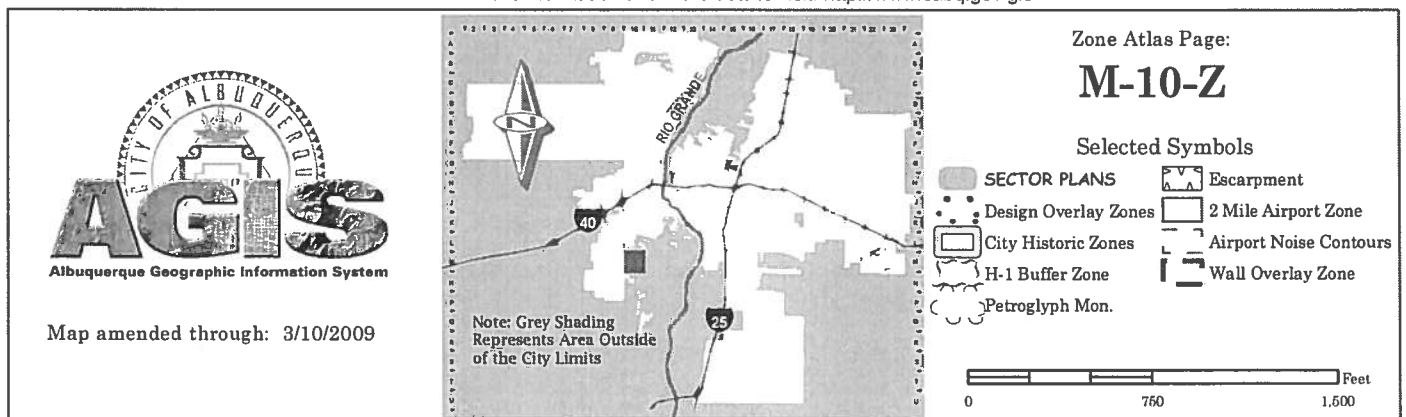
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## **APPENDIX**

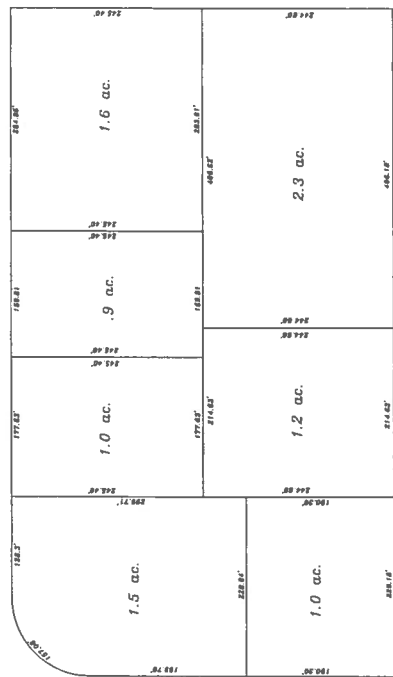
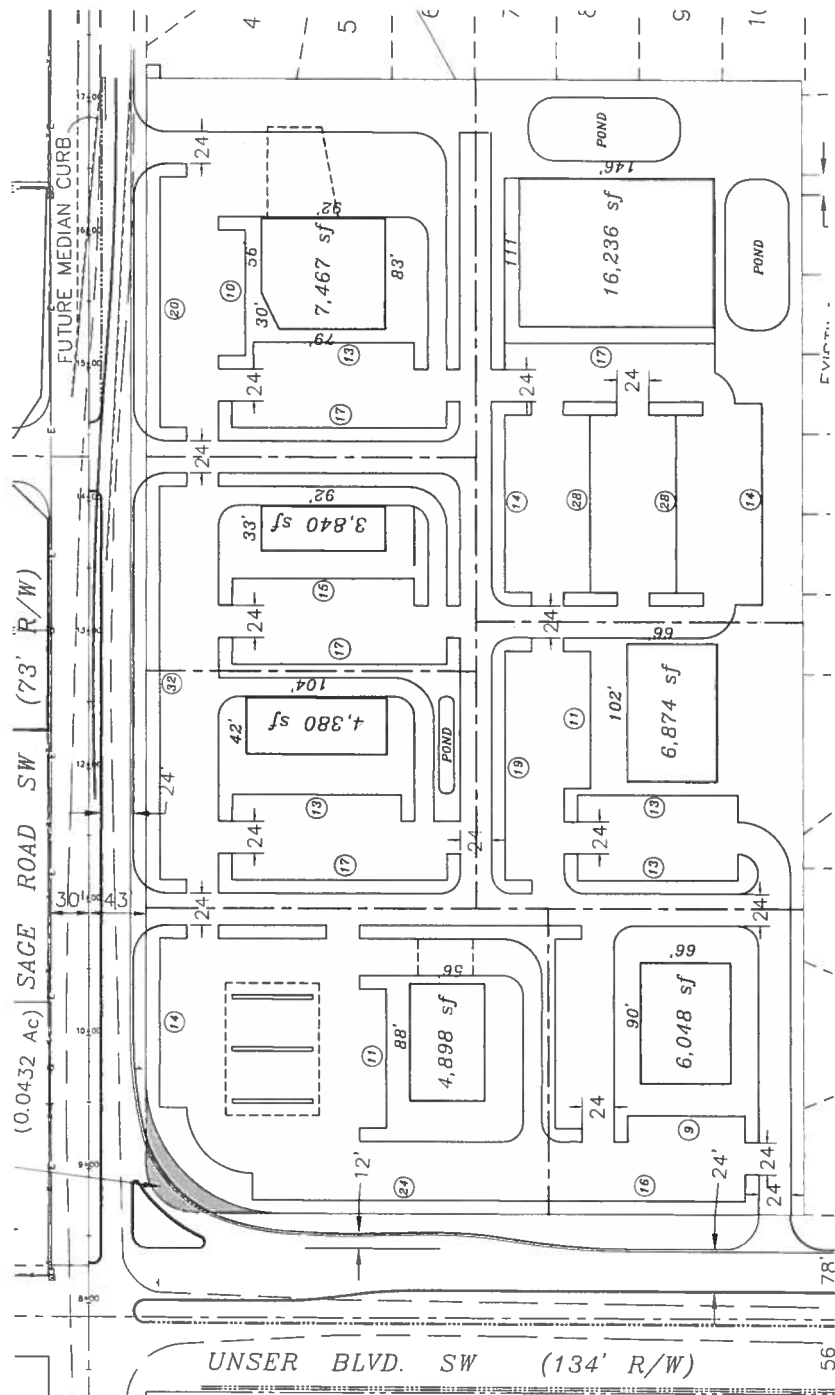
# Sage / Unser Commercial Development (SE Corner)



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







CONCEPT A

Terry O. Brown P.E.

**Sage / Unser Comm. Development**  
(Southeast Corner)

**Access Justification Study**

July 26, 2010

**Presented to:**

City of Albuquerque  
Transportation Development Section

**Prepared for:**

Unser Sage Partnership  
c/o George Rainhart  
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A handwritten signature in cursive script that reads "Terry O. Brown".

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# **Sage / Unser Commercial Development (SE Corner) - CASE Y1**

Projected Turning Movements SUMMARY

**PROPOSED DEVELOPMENT (2014) - 100% Development**

INTERSECTION:

## **Summary**

### **Sage Rd / Coors Blvd NW**

(1)

3.0% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.91			0.85			0.87			0.77			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Coors Blvd NW)			Southbound (Coors Blvd NW)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
173	402	49	5	97	31	23	639	13	34	456	92	
200	458	71	7	136	40	37	716	15	50	669	142	
223	488	90	7	169	40	58	716	15	50	669	167	
10.3%	6.1%	21.1%	0.0%	19.5%	0.0%	36.2%	0.0%	0.0%	0.0%	0.0%	15.0%	
	9.0%			15.3%			2.7%			2.8%		
						5.6%						

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.89			0.92			0.80			0.96			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Coors Blvd NW)			Southbound (Coors Blvd NW)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
85	146	35	8	242	38	45	608	0	33	773	267	
116	193	100	10	343	49	80	681	0	48	1,135	412	
147	234	126	10	384	49	107	681	0	48	1,135	443	
21.1%	17.5%	20.6%	0.0%	10.7%	0.0%	25.2%	0.0%	N/A	0.0%	0.0%	7.0%	
	19.3%			9.3%			3.4%			1.9%		
						5.9%						

### **Sage Rd / Unser Blvd**

(2)

3.7% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.78			0.83			0.87			0.76			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
18	361	136	80	110	12	105	337	222	43	361	8	
53	459	160	134	168	13	140	602	286	81	651	27	
53	528	160	236	231	77	140	602	286	152	651	27	
0.0%	13.1%	0.0%	43.2%	27.3%	83.1%	0.0%	0.0%	0.0%	46.7%	0.0%	0.0%	
	9.3%			42.1%			0.0%			8.6%		
						11.7%						

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.93			0.95			0.91			0.95			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
22	182	124	213	386	21	182	249	55	45	426	25	
123	376	171	361	542	24	257	561	86	72	868	79	
123	462	171	498	627	111	257	561	86	160	868	79	
0.0%	18.6%	0.0%	27.5%	13.6%	78.4%	0.0%	0.0%	0.0%	55.0%	0.0%	0.0%	
	11.4%			25.0%			0.0%			7.9%		
						12.1%						

### **Sage Rd / 86th St**

(3)

3.0% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.84			0.80			0.90			0.75			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (86th St)			Southbound (86th St)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
72	407	20	18	193	39	15	79	47	39	45	48	
81	456	22	21	220	44	17	88	53	44	50	54	
81	498	22	31	259	58	17	88	64	59	50	54	
0.0%	8.4%	0.0%	32.3%	15.1%	24.1%	0.0%	0.0%	17.2%	25.4%	0.0%	0.0%	
	7.0%			18.1%			6.5%			9.2%		
						10.2%						

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.89			0.94			0.85			0.88			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (86th St)			Southbound (86th St)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
64	240	24	36	323	24	15	72	19	34	104	93	
72	269	27	41	368	27	17	81	21	38	116	104	
72	322	27	55	420	46	17	81	35	57	116	104	
0.0%	16.5%	0.0%	25.5%	12.4%	41.3%	0.0%	0.0%	40.0%	33.3%	0.0%	0.0%	
	12.6%			16.3%			10.5%			6.9%		
						12.6%						

# *Sage / Unser Commercial Development (SE Corner) - CASE Y1*

## Projected Turning Movements SUMMARY **PROPOSED DEVELOPMENT (2014) - 100% Development**

### INTERSECTION:

### **Summary**

#### **Arenal Rd / Unser Blvd**

(4)

3.4% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.74			0.78			0.87			0.92			PHF
Eastbound (Arenal Rd)			Westbound (Arenal Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
194	311	32	144	107	136	29	326	187	232	214	94	
216	346	51	163	121	183	59	584	237	284	324	113	
238	346	51	163	121	234	59	623	237	330	360	133	
9.2%	0.0%	0.0%	0.0%	0.0%	21.8%	0.0%	6.3%	0.0%	13.9%	10.0%	15.0%	
	3.5%			9.8%	7.4%		4.2%			12.4%		

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.89			0.91			0.86			0.83			PHF
Eastbound (Arenal Rd)			Westbound (Arenal Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
75	153	47	161	181	184	38	198	95	216	396	111	
84	171	83	223	207	267	68	556	113	279	781	132	
111	171	83	223	207	330	68	605	113	341	829	159	
24.3%	0.0%	0.0%	0.0%	0.0%	19.1%	0.0%	8.1%	0.0%	18.2%	5.8%	17.0%	
	7.4%			8.3%	8.5%		6.2%			10.3%		

#### **Tower Rd / Unser Blvd**

(5)

3.0% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.85			0.80			0.89			0.95			PHF
Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
134	208	18	17	94	17	51	626	46	37	325	38	
150	233	53	19	105	19	115	1,156	99	65	622	66	
150	233	90	24	105	19	149	1,183	103	65	651	66	
0.0%	0.0%	41.1%	20.8%	0.0%	0.0%	22.8%	2.3%	3.9%	0.0%	4.5%	0.0%	
	7.8%			3.4%			4.5%			3.7%		
												4.8%

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

% Contribution by Movement

% Contribution by Approach

% Contribution - Intersection

0.81			0.84			0.92			0.90			PHF
Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
54	113	15	35	253	8	25	315	12	26	534	114	
60	127	64	39	283	9	97	644	61	45	992	199	
60	127	110	45	283	9	142	680	67	45	1,028	199	
0.0%	0.0%	41.8%	13.3%	0.0%	0.0%	31.7%	5.3%	9.0%	0.0%	3.5%	0.0%	
	15.5%			1.8%			9.8%			2.8%		
												6.3%

#### **Sage Rd / Driveway 'A'**

(6)

3.7% Truck

Existing (2010)

2014 (NO BUILD - A.M.)

2014 (BUILD - A.M.)

Existing (2010)

2014 (NO BUILD - P.M.)

2014 (BUILD - P.M.)

0.83			0.83			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'A')			Southbound (Driveway 'A')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	602	0	0	201	0	0	0	0	0	0	0	
0	755	0	0	314	0	0	0	0	0	0	0	
0	825	70	0	543	0	0	0	19	0	0	0	

0.95			0.95			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'A')			Southbound (Driveway 'A')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	267	0	0	620	0	0	0	0	0	0	0	
0	489	0	0	926	0	0	0	0	0	0	0	
0	576	87	0	1,235	0	0	0	26	0	0	0	

# *Sage / Unser Commercial Development (SE Corner) - CASE Y1*

Projected Turning Movements SUMMARY

**PROPOSED DEVELOPMENT (2014) - 100% Development**

INTERSECTION:

## **Summary**

### **Sage Rd / Driveway 'B'**

(7)

3.7% Truck  
3.0% Truck  
2014 (NO BUILD - A.M.)  
2014 (BUILD - A.M.)

0.83			0.83			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'B')			Southbound (Driveway 'B')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	602	0	0	201	0	0	0	0	0	0	0	0
0	755	0	0	314	0	0	0	0	0	0	0	0
0	809	35	84	314	0	229	0	38	0	0	0	0

3.0% Truck

2014 (NO BUILD - P.M.)  
2014 (BUILD - P.M.)

0.85			0.85			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'B')			Southbound (Driveway 'B')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	267	0	0	620	0	0	0	0	0	0	0	0
0	489	0	0	926	0	0	0	0	0	0	0	0
0	558	43	104	926	0	309	0	51	0	0	0	0

### **Sage Rd / Driveway 'C'**

(8)

3.7% Truck  
Existing (2010)  
2014 (NO BUILD - A.M.)  
2014 (BUILD - A.M.)

0.83			0.83			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'C')			Southbound (Driveway 'C')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	602	0	0	201	0	0	0	0	0	0	0	0
0	755	0	0	314	0	0	0	0	0	0	0	0
0	812	35	0	398	0	0	0	19	0	0	0	0

Existing (2010)

2014 (NO BUILD - P.M.)  
2014 (BUILD - P.M.)

0.95			0.95			0.85			0.85			PHF
Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'C')			Southbound (Driveway 'C')			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	267	0	0	620	0	0	0	0	0	0	0	0
0	489	0	0	926	0	0	0	0	0	0	0	0
0	566	43	0	1,030	0	0	0	26	0	0	0	0

### **Driveway 'D' / Unser Blvd**

(9)

3.7% Truck  
Existing (2010)  
2014 (NO BUILD - A.M.)  
2014 (BUILD - A.M.)

0.85			0.85			0.87			0.87			PHF
Eastbound (Driveway 'D')			Westbound (Driveway 'D')			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	664	0	0	510	0	0
0	0	0	0	0	0	0	1,028	0	0	743	0	0
0	0	0	0	0	0	0	1,028	112	0	743	0	0

Existing (2010)

2014 (NO BUILD - P.M.)  
2014 (BUILD - P.M.)

0.85			0.85			0.91			0.91			PHF
Eastbound (Driveway 'D')			Westbound (Driveway 'D')			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
0	0	0	0	0	0	0	486	0	0	688	0	0
0	0	0	0	0	0	0	904	0	0	1,176	0	0
0	0	0	0	0	0	0	904	139	0	1,176	0	0