

Sage / Unser Comm. Development
(Southeast Corner)

Traffic Impact Study

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Presented to:

City of Albuquerque
Transportation Development Section

Prepared for:

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Sage / Unser Commercial Center
(Sage Rd. / Unser Blvd. – Southeast Corner)
Traffic Impact Study

STUDY PURPOSE

The purpose of this study is to identify the impact of this new commercial development on the adjacent transportation system and to determine measures necessary to mitigate adverse impacts to the system. The study is being conducted as a condition of approval of a proposed site plan consisting 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 at the southeast corner of Sage Rd. / Unser Blvd. This study is being submitted to the City of Albuquerque Transportation Development Division to satisfy their requirements.

STUDY PROCEDURES

A scoping meeting was held with the City of Albuquerque Transportation Staff (Tony Loyd & John Hartmann) prior to the beginning of the study to discuss scope and methodology to be utilized within the report. In summary, this report is to define the newly generated trips from the proposed development, assign them into the existing adjacent street system, and analyze the impact of the newly generated traffic.

The basic procedure followed is described as follows:

- 1) Calculate the generated trips for the proposed development consisting 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 at the southeast corner of Sage Rd. / Unser Blvd. (See Pages A-6 thru A-11).
- 2) Calculate trip distribution for the newly generated trips by this development. The proposed commercial trips were distributed based on year 2014 population within a 2-mile radius of the project site as depicted on Page A-12 in the Appendix of this report.
- 3) Determine Trip Assignments for the newly generated trips based on the results of the Trip Distribution Analysis and logical routing to and from the site (See Pages A-13 thru A-20 in the Appendix of this report).
- 4) Perform an AM Peak Hour and PM Peak Hour turning movement traffic count at the intersections of Sage Rd. / Coors Blvd, Sage Rd / 86th St and Tower Rd. / Unser Blvd. Existing turning movement counts for the other intersections analyzed in this report were obtained from recent traffic count data supplied by the Mid-Region Council of Governments (MRCOG). (See Pages A-97 thru A-107).
- 5) Historic Growth Rates used in this report were calculated based on volumes obtained from the Mid-Region Council of Governments' Traffic Flow Maps for the years 2004 – 2008. (See Pages A-21 thru A-35)
- 6) Grow the existing traffic volumes (turning movement counts) at the designated growth rates to the implementation year to obtain the projected 2014 AM and PM Peak Hour NO BUILD turning movement volumes. (See Pages A-36 thru A-56).
- 7) Add in data from Trip Assignments Maps and Tables to the 2014 NO BUILD Volumes to obtain 2014 BUILD Volumes for this project. Additionally, there are several previously-approved developments which impact the intersections in this study. They include: the

SW & NE Corners Sage / Unser, Anderson Hills / Anderson Hts, and the Greg Sanchez Development. (See Pages A-36 thru A-56).

- 8) Provide signalized and unsignalized intersection analyses for the following intersections:

INTERSECTION	TYPE CONTROL	NO BUILD	BUILD
Sage Rd. / Coors Blvd.	Traffic Signal	2014	2014
Sage Rd. / Unser Blvd.	Traffic Signal	2014	2014
Sage Rd / 86 th St	Traffic Signal	2014	2014
Arenal Rd / Unser Blvd	Traffic Signal	2014	2014
Tower Rd / Unser Blvd	Traffic Signal	2014	2014
Sage Rd. / Driveway "A"	Stop Sign	N/A	2014
Sage Rd. / Driveway "B"	Stop Sign	N/A	2014
Arenal Rd. / Driveway "C"	Stop Sign	N/A	2014
Driveway "D" / Unser Blvd	Stop Sign	N/A	2014

(See Pages A-57 thru A-96).

GENERAL AREA CHARACTERISTICS

The proposed development is located at the southeast corner of Sage Rd. / Unser Blvd. The project is surrounded by land that is predominantly zoned for commercial and residential uses (See Zone Atlas on Page A-1 for zoning information). There is another commercial property directly north of this site across the street. There is also a proposed commercial development to the west of this project.

AREA STREET NETWORK

Unser Blvd. is classified as a Limited Access Arterial Roadway on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. Unser Blvd. is generally a four lane urban roadway facility from Gibson Blvd. north to Interstate 25. There is no approved access onto Unser Blvd. between Arenal Rd. and Sage Rd. at this time.

86th St. is classified as a Collector roadway on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. 86th St. is generally a two lane urban roadway from Gibson Blvd. north to Central Ave.

Coors Blvd. is classified as a Limited Access Principal Arterial Roadway on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area

Sage Rd & Tower Rd are classified as Minor Arterial roadways on the same map. Tower Rd is a four lane roadway with curb & gutter. Sage Rd is currently under construction to become a four lane paved municipal roadway with curb & gutter and raised medians.

Arenal Rd is classified as a Principal Arterial roadway on the Long Range Roadway System Map for the Albuquerque Metropolitan Planning Area. It is a four lane paved municipal roadway with curb & gutters and raised medians.

EXISTING TRAFFIC VOLUMES

2008 Average Weekday Traffic Volumes (AWDT) for major streets in the site plan area are shown in the Appendix on Page A-5.

Recent AM and PM Peak Hour Traffic Counts performed in conjunction with this report may be found at the end of the Appendix.

NETWORK IMPROVEMENTS

There are proposed Capital Improvements Program (CIP) projects planned for the street network on Unser Blvd. in the vicinity of this project. Improvements to the streets in the near future beyond the scope of those improvements will be by the developers of the properties adjacent to the streets.

EXISTING (2010) LEVELS OF SERVICE

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

LOS A	10.0" or less	Most Vehicles do not stop
LOS B	10.1 to 20.0"	Some Vehicles stop
LOS C	20.1 to 35.0"	Significant number of vehicles stop
LOS D	35.1 to 55.0"	Many vehicles stop.
LOS E	55.1 to 80.0"	Limit of acceptable delay.
LOS F	> 80.0"	Unacceptable delay.

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

Following are summary tables showing existing intersection geometry and existing levels-of-service of operation of existing signalized intersections:

Existing Geometry (Sage Rd. / Coors Blvd)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Sage Rd.	0	1	0	0	1
WB Sage Rd.	0	1	0	0	1
NB Coors Blvd	1	0	2	0	1
SB Coors Blvd	1	0	2	0	1

Sage Rd. / Coors Blvd	Existing Conditions (2010)	
	A.M.	P.M.
Existing Geometry	C – 31.1	C – 23.4

D - 39.7 - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

Existing Geometry (Sage Rd. / Unser Blvd.)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Sage Rd.	1	0	0	1	0
WB Sage Rd.	1	0	1	0	1
NB Unser Blvd.	1	0	1	0	1
SB Unser Blvd.	1	0	0	1	0

Arenal Rd. / Unser Blvd.	Existing Conditions (2010)	
	A.M.	P.M.
Existing Geometry	B – 17.9	B – 14.5

D - 39.7 - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

Existing Geometry (Sage / 86th St.)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Sage Rd.	1	0	1	1	0
WB Sage Rd.	1	0	1	1	0
NB 86 th St.	1	0	0	1	0
SB 86 th St.	1	0	0	1	0

Arenal Rd. / Unser Blvd.	Existing Conditions (2010)	
	A.M.	P.M.
Existing Geometry	A – 6.8	A – 9.2

D - 39.7 - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

Existing Geometry (Arenal Rd. / Unser Blvd.)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Arenal Rd.	1	0	2	0	1
WB Arenal Rd.	1	0	1	0	1
NB Unser Blvd.	1	0	2	0	1
SB Unser Blvd.	1	0	2	0	1

Arenal Rd. / Unser Blvd.	Existing Conditions (2010)	
	A.M.	P.M.
Existing Geometry	B – 11.3	B – 10.4

D - 39.7 - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

Existing Geometry (Tower Rd. / Unser Blvd.)

Approach	Left Turn Lanes	Thru/Lefts	Thru Lanes	Thru/Rights	Right Turn Lanes
EB Tower Rd.	1	0	2	0	1
WB Tower Rd.	1	0	2	0	1
NB Unser Blvd.	1	0	2	0	1
SB Unser Blvd.	1	0	2	0	1

Tower Rd. / Unser Blvd.	Existing Conditions (2010)	
	A.M.	P.M.
Existing Geometry	B – 13.7	B – 12.5

D - 39.7 - Bold Italicized Level-of-Service indicates that one or more individual turning movements is Level-of-Service E or worse.

EXISTING TRANSIT SERVICE

This area currently is serviced by City Bus Route 54 (Bridge / Westgate) operating weekdays and Saturdays. Weekday service is at approximately 40 minute intervals from 6:00 am to 9:00 pm. Saturday service is at about 1 hour and 15 minute intervals from 11:00 am to 5:30 pm. Bus Route Maps and Schedules are included at the end of the Appendix.

PROPOSED DEVELOPMENT

The subject area of land targeted for the commercial development plan totals approximately 10 acres. The associated trip generation rates as summarized in the following table:

Sage / Unser Commercial Development (SE Corner)

Trip Generation Data (ITE Trip Generation Manual - 8th Edition)

USE (ITE CODE)	DESCRIPTION	24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.		
			GROSS	ENTER	EXIT	ENTER	EXIT
Summary Sheet		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
	Subtotal		9,637	335	305	416	411

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 is proposed as full access unsignalized driveway. The western & eastern driveways are proposed to be right-turn-in, right-turn-out only unsignalized driveways. The fourth access point is a proposed driveway accessing Unser Blvd. It is proposed as a right-in only driveway due to the length of the northbound right turn lane currently designed at Sage Rd / Unser Blvd.

TRIP GENERATION

Projected trips were calculated from data in the Institute of Transportation Engineers Trip Generation report (8th Edition, 2007). Trips for the development were determined based on land uses defined on the Conceptual Site Development Plan on Page A-2 in the Appendix of this report. The Trip Generation Summary can be seen on the preceding section or the Trip Generation Summary Table and Trip Generation Worksheets can be reviewed in the Appendix of this study.

TRIP DISTRIBUTION

Primary and Diverted Linked Trips:

Trips were distributed as follows:

Commercial Land Use

Primary and diverted linked trips for the commercial land use development were distributed proportionally to the 2014 projected population of Data Analysis Subzones within a two mile radius of the proposed development. Population data for the years 2000 and 2025 were taken from the 2025 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico, S-03-01 (2000), Appendix B and Appendix C, supplied by the Mid-Region Council of Governments (MRCOG). Population data from the years 2000 and 2025 was interpolated linearly to obtain 2014 population data to utilize for this analysis. Population Subzones were grouped based on the most likely major street(s) or route(s) to the subject development. The trip distribution worksheets and associated map of data analysis subzones is shown in the Appendix. The Trip Distribution map can be found in the Appendix on Page A-10.

TRIP ASSIGNMENTS

Trips were assigned to the transportation network in accordance with the results of the trip distribution analysis above and logical routing. Trip assignments utilized in this study are displayed on the Trip Assignments Maps on Pages A-19 and A-20 in the Appendix.

BACKGROUND TRAFFIC GROWTH

Background traffic growth rates were considered for each individual approach to an intersection that was targeted for analysis based on data from the 2004, 2005, 2006, 2007 and 2008 Traffic Flow maps prepared by the Mid-Region Council of Governments (MRCOG). Almost all of the Traffic Flow Data for those years taken from the MRCOG Traffic Flow Maps were Standard Data. The data from those years for each approach was

plotted on a graph and a linear “regression trend line” calculated using the equation format $y=mx+b$. The growth rate was determined by calculating the average volume increase per year during the time period considered and dividing that volume into the most recent AWDT used in the analysis from which future volumes will be calculated. The rate of growth of that trend line was utilized as the growth rate for each approach if that calculated rate appeared feasible. However, there were some instances where the rate indicated a negative growth trend. In those cases, an appropriate growth rate from an adjacent segment of the same roadway was considered. Due to the potential for growth in the area, it was believed that a zero percent growth rate was inappropriate for this study. Additionally, if the R^2 value of the trend line was low, other means of establishing a probable growth rate from the data accumulated was considered. Historical Growth Rate Graphs with linear regression trendlines are shown in the the Appendix D. A Historic Growth Map can be found in the Appendix, pg. A-35. The growth rate utilized for each approach to an intersection is printed at the top of the Turning Movement sheets for each intersection (pp. A-39 thru A-56 in the Appendix).

PREVIOUSLY PROPOSED PROJECTS

In addition to the annual background traffic growth rate, trips from other recently proposed projects were manually added to specifically account for those projects. Therefore, the annual growth rate utilized will be effectively higher than the percentage reported on the turning movements volumes worksheets in the Appendix of this report. The other proposed projects that were manually added in to the background traffic volumes in this study include the following projects:

- 1) SW Corner of Sage / 98th St. Commercial Development (formerly Walmart Neighborhood Center)
- 2) NE Corner of Sage / 98th St.
- 3) Southwest Mesa Subdivisions (including Ceja Vista) – 30% development level
- 4) Anderson Heights Subdivision
- 5) Anderson Hills Subdivision
- 6) Greg Sanchez Development (NW Corner of Sage / Unser Blvd.)

PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2014 BUILDOUT

The calculated annual growth rates were applied to the recent peak hour traffic counts to establish the 2014 background traffic volumes. To these volumes, the generated trips based on implementation of the proposed Preliminary Site Development Plan were added to obtain BUILD volumes for the intersection analyses. See Appendix Pages A-36 thru A-57 for further information regarding turning movement counts.

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.

Capacity analyses were performed for the following traffic conditions.

- 2014 without development of Proposed SE Corner Sage / Unser Development (No Build)
- 2014 with development of Proposed SE Corner Sage / Unser Development (Build)

RESULTS AND DISCUSSION OF INTERSECTION CAPACITY ANALYSES

Signalized Intersection Capacity Analysis

IMPLEMENTATION YEAR (2014)

1 - Sage Rd. / Coors Blvd. - Pages A-57 thru A-62

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

Intersection: #1 - Sage Rd. / Coors Blvd.

2014 AM Peak Hour				2014 PM Peak Hour		
BASE GEOMETRY				BASE GEOMETRY		
NO BUILD		BUILD		NO BUILD		BUILD
Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	LOS-Delay	
Eastbound - Sage Rd.						
L	>	E - 59.8	E - 73.1	>	D - 51.4	E - 64.2
T	1	E - 59.8	E - 73.1	1	D - 51.4	E - 64.2
R	1	B - 11.2	B - 10.3	1	B - 18.8	B - 16.4
Westbound - Sage Rd.						
L	>	B - 14.8	B - 14.0	>	C - 32.5	C - 26.9
T	1	B - 14.8	B - 14.0	1	C - 32.5	C - 26.9
R	1	B - 10.9	A - 10.0	1	B - 18.6	B - 15.9
Northbound - Coors Blvd.						
L	1	C - 26.1	C - 30.7	1	C - 26.1	D - 44.4
T	2	D - 43.3	E - 56.1	2	C - 20.7	C - 26.5
R	1	B - 17.5	B - 18.8	1	A - 9.2	B - 12.2
Southbound - Coors Blvd.						
L	1	C - 28.6	C - 30.1	1	B - 14.3	B - 18.8
T	2	D - 48.8	E - 68.3	2	C - 26.5	D - 39.1
R	1	B - 18.3	B - 19.8	1	B - 11.8	B - 16.1
Intersection:		D - 43.7	D - 55.0		C - 25.8	C - 33.6

NOTE: > denotes a shared thru/right and / or thru/left turn lane.

The analysis of the intersection of Sage Rd. / 86th St. demonstrates that the signalized intersection will operate at acceptable levels-of-service and delays for all conditions analyzed in this study. No recommendations are made.

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

Queueing Analysis Summary Sheet

Project: Sage / Unser Commercial Development (SE Corner)

Intersection: Sage Rd / Coors Blvd NW

2014

Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	0	173	0	1	402	Cont	1	49	50
AM NO BUILD Queue	0	200	275	1	458	550	1	71	125
AM BUILD Queue	0	223	300	1	488	575	1	90	150
<i>Existing Lane Length</i>	0	85	0	1	146	Cont	1	35	50
PM NO BUILD Queue	0	116	200	1	193	300	1	100	175
PM BUILD Queue	0	147	225	1	234	325	1	126	200
Westbound									
<i>Existing Lane Length</i>	0	5	0	1	97	Cont	1	31	50
AM NO BUILD Queue	0	7	25	1	136	200	1	40	75
AM BUILD Queue	0	7	25	1	169	250	1	40	75
<i>Existing Lane Length</i>	0	8	0	1	242	Cont	1	38	50
PM NO BUILD Queue	0	10	50	1	343	450	1	49	100
PM BUILD Queue	0	10	50	1	384	500	1	49	100
Northbound									
<i>Existing Lane Length</i>	1	23	250	2	639	Cont	1	13	250
AM NO BUILD Queue	1	37	75	2	716	475	1	15	50
AM BUILD Queue	1	58	100	2	716	475	1	15	50
<i>Existing Lane Length</i>	1	45	250	2	608	Cont	1	0	250
PM NO BUILD Queue	1	80	150	2	681	500	1	0	0
PM BUILD Queue	1	107	175	2	681	500	1	0	0
Southbound									
<i>Existing Lane Length</i>	1	34	250	2	456	Cont	1	92	250
AM NO BUILD Queue	1	50	100	2	669	450	1	142	225
AM BUILD Queue	1	50	100	2	669	450	1	167	250
<i>Existing Lane Length</i>	1	33	250	2	773	Cont	1	267	250
PM NO BUILD Queue	1	48	100	2	1,135	775	1	412	525
PM BUILD Queue	1	48	100	2	1,135	775	1	443	575

Cycle Length: AM PM
120 130

NOTE: Queue lengths are in feet.

The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

2 - Sage Rd. / Unser Blvd. - Pages A-63 thru A-70

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

Intersection: #2 - Sage Rd. / Unser Blvd.

2014 AM Peak Hour					2014 PM Peak Hour					
BASE GEOMETRY			MIT. GEOM.		BASE GEOMETRY			MIT. GEOM.		
NO BUILD		BUILD	BUILD		NO BUILD		BUILD	BUILD		
Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	
Eastbound - Sage Rd.										
L	1	B - 13.7	A - 9.8	2	D - 37.8	1	B - 19.1	C - 21.2	2	D - 49.5
T	2	B - 15.9	B - 11.4	2	D - 35.6	2	B - 14.5	B - 17.4	2	E - 59.4
R	1	B - 14.1	B - 10.4	1	C - 20.6	1	B - 13.6	B - 16.2	1	C - 28.1
Westbound - Sage Rd.										
L	1	D - 42.1	E - 64.2	2	D - 40.2	1	F - 145	F - 307	2	D - 53.7
T	2	B - 13.5	A - 9.9	2	C - 21.6	2	B - 16.3	B - 18.7	2	D - 35.7
R	1	B - 12.6	A - 9.4	1	B - 15.4	1	B - 13.4	B - 15.6	1	C - 21.2
Northbound - Unser Blvd.										
L	1	B - 16.2	F - 82.4	1	C - 23.6	1	F - 142	F - 264	1	D - 38.1
T	2	A - 8.0	B - 11.3	2	C - 26.6	2	A - 7.5	B - 12.7	2	C - 23.9
R	1	A - 8.2	A - 8.6	1	B - 15.9	1	A - 4.3	A - 5.3	1	C - 21.1
Southbound - Unser Blvd.										
L	1	A - 9.4	D - 51.0	1	C - 22.9	1	A - 2.4	B - 14.6	1	B - 16.4
T	2	A - 8.9	B - 12.9	2	C - 30.9	2	A - 3.6	B - 10.9	2	C - 28.3
R	1	A - 6.1	A - 2.7	1	B - 16.3	1	A - 0.5	A - 3.6	1	A - 4.4
Intersection:		B - 12.4	B - 20.0	C - 28.0		C - 33.0		E - 66.8	D - 35.6	

NOTE: > denotes a shared thru/right and / or thru/left turn lane.

The City of Albuquerque is currently in the process of designing the intersection of Sage Rd. / Unser Blvd. as a part of the Unser Blvd. Improvement Project targeted for construction in 2010. The preceding 2014 NO BUILD and BUILD analysis assumes that the City geometry is in place. Applying the projected 2014 NO BUILD and BUILD Volumes to the new design of Sage Rd. / Unser Blvd. results in less than acceptable levels-of-service for some of the turning movements during the PM Peak Hour period. Mitigation of the long delays for those turning movements consists of constructing dual eastbound and westbound left turn lanes and designating those left turning movements as protected only. The Traffic Impact Study for the Sage / Unser Commercial Development at the southwest corner of the intersection made the same recommendation. Additional access approval to the project on the southwest corner stipulated that the developer would construct dual eastbound and westbound left turn lanes on Sage Rd. at Unser Blvd.

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

Queueing Analysis Summary Sheet

Project: Sage / Unser Commercial Development (SE Corner)
 Intersection: Sage Rd / Unser Blvd

2014									
Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	17	250	2	337	Cont	1	127	250
AM NO BUILD Queue	1	53	100	2	459	325	1	160	225
AM BUILD Queue	1	53	100	2	528	375	1	160	225
<i>Existing Lane Length</i>	1	21	250	2	170	Cont	1	116	250
PM NO BUILD Queue	1	123	200	2	376	300	1	171	275
PM BUILD Queue	1	123	200	2	462	350	1	171	275
Westbound									
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	75	250	2	104	Cont	1	11	250
AM NO BUILD Queue	1	134	200	2	168	150	1	13	50
AM BUILD Queue	1	236	325	2	231	200	1	77	125
<i>Existing Lane Length</i>	1	201	250	2	364	Cont	1	20	250
PM NO BUILD Queue	1	361	475	2	542	400	1	24	75
PM BUILD Queue	1	498	625	2	627	475	1	111	200
Northbound									
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	95	250	2	304	Cont	1	200	250
AM NO BUILD Queue	1	140	200	2	602	425	1	286	375
AM BUILD Queue	1	140	200	2	602	425	1	286	375
<i>Existing Lane Length</i>	1	164	250	2	225	Cont	1	50	250
PM NO BUILD Queue	1	257	375	2	561	425	1	86	150
PM BUILD Queue	1	257	375	2	561	425	1	86	150
Southbound									
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	31	250	2	258	Cont	1	6	250
AM NO BUILD Queue	1	81	150	2	651	450	1	27	75
AM BUILD Queue	1	152	225	2	651	450	1	27	75
<i>Existing Lane Length</i>	1	32	250	2	304	Cont	1	18	250
PM NO BUILD Queue	1	72	125	2	868	600	1	79	150
PM BUILD Queue	1	160	250	2	868	600	1	79	150

Cycle Length: AM PM
120 130

NOTE: Queue lengths are in feet.

Critical to this analysis is the fact that the eastbound design queue length for the 2014 analysis should be 325 feet. The proposed driveway on Sage Rd. accessing the project at the southwest corner of the intersection should consider the length of the eastbound queuing on Sage Rd. at Unser Blvd. The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

3 - Sage Rd. / 86th St. - Pages A-71 thru A-76

The results of the implementation year analysis of the signalized intersection of Sage Rd. / 86th St. are summarized in the following table:

Intersection: #3 - Sage Rd. / 86th St.

2014 AM Peak Hour				2014 PM Peak Hour		
BASE GEOMETRY				BASE GEOMETRY		
NO BUILD		BUILD		NO BUILD		BUILD
Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	LOS-Delay	
Eastbound - Sage Rd.						
L	1	A - 6.1	A - 6.2	1	A - 5.1	A - 5.4
T	2	A - 6.4	A - 6.6	2	A - 4.8	A - 5.0
R	>	A - 6.4	A - 6.6	>	A - 4.8	A - 5.0
Westbound - Sage Rd.						
L	1	A - 5.5	A - 5.8	1	A - 2.4	A - 3.2
T	2	A - 5.8	A - 6.0	2	A - 2.6	A - 3.2
R	>	A - 5.8	A - 6.0	>	A - 2.6	A - 3.2
Northbound - 86th St.						
L	1	A - 8.2	A - 8.4	1	B - 19.5	B - 14.5
T	1	A - 8.9	A - 9.1	1	C - 20.3	B - 15.3
R	>	A - 8.9	A - 9.1	>	C - 20.3	B - 15.3
Southbound - 86th St.						
L	1	A - 8.7	A - 9.2	1	B - 19.8	B - 15.3
T	1	A - 8.6	A - 8.8	1	C - 22.0	B - 16.3
R	>	A - 8.6	A - 8.8	>	C - 22.0	B - 16.3
Intersection:		A - 6.9	A - 7.0		A - 9.4	A - 7.7

NOTE: > denotes a shared thru/right and / or thru/left turn lane.

The analysis of the intersection of Sage Rd. / 86th St. demonstrates that the signalized intersection will operate at acceptable levels-of-service and delays for all conditions analyzed in this study. No recommendations are made.

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

Queueing Analysis Summary Sheet

Project: Sage / Unser Commercial Development (SE Corner)
 Intersection: Sage Rd / 86th St

2014											
Approach	Left Turns			Thru Movements			Right Turns				
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
<i>Existing Lane Length</i>	1	72	225	2	407	Cont	0	20	0		
AM NO BUILD Queue	1	81	150	2	456	325	0	22	50		
AM BUILD Queue	1	81	150	2	498	350	0	22	50		
<i>Existing Lane Length</i>	1	64	225	2	240	Cont	0	24	0		
PM NO BUILD Queue	1	72	125	2	269	225	0	27	75		
PM BUILD Queue	1	72	125	2	322	275	0	27	75		
Westbound											
<i>Existing Lane Length</i>	1	18	190	2	193	Cont	0	39	0		
AM NO BUILD Queue	1	21	50	2	220	200	0	44	100		
AM BUILD Queue	1	31	75	2	259	225	0	58	100		
<i>Existing Lane Length</i>	1	36	190	2	323	Cont	0	24	0		
PM NO BUILD Queue	1	41	100	2	368	300	0	27	75		
PM BUILD Queue	1	55	125	2	420	325	0	46	100		
Northbound											
<i>Existing Lane Length</i>	1	15	50	1	79	Cont	0	47	0		
AM NO BUILD Queue	1	17	50	1	88	150	0	53	100		
AM BUILD Queue	1	17	50	1	88	150	0	64	125		
<i>Existing Lane Length</i>	1	15	50	1	72	Cont	0	19	0		
PM NO BUILD Queue	1	17	50	1	81	150	0	21	50		
PM BUILD Queue	1	17	50	1	81	150	0	35	75		
Southbound											
<i>Existing Lane Length</i>	1	39	75	1	45	Cont	0	48	0		
AM NO BUILD Queue	1	44	100	1	50	100	0	54	100		
AM BUILD Queue	1	59	100	1	50	100	0	54	100		
<i>Existing Lane Length</i>	1	34	75	1	104	Cont	0	93	0		
PM NO BUILD Queue	1	38	100	1	116	200	0	104	175		
PM BUILD Queue	1	57	125	1	116	200	0	104	175		

AM
PM
 Cycle Length: 120 130

NOTE: Queue lengths are in feet.

The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

4 - Arenal Rd. / Unser Blvd. - Pages A-77 thru A-82

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

Intersection: #4 - Arenal Rd. / Unser Blvd.

2014 AM Peak Hour					2014 PM Peak Hour					
BASE GEOMETRY			MIT. GEOM.		BASE GEOMETRY			MIT. GEOM.		
NO BUILD		BUILD	BUILD		NO BUILD		BUILD	BUILD		
Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	
Eastbound - Arenal Rd.										
L	1	C - 28.8	E - 65.5	1	E - 63.9	1	B - 19.4	D - 46.2	1	D - 50.6
T	2	B - 14.7	B - 19.0	2	C - 27.3	2	B - 17.9	C - 29.8	2	C - 34.7
R	1	B - 12.7	B - 16.4	1	C - 23.7	1	B - 17.1	C - 28.4	1	C - 32.8
Westbound - Arenal Rd.										
L	1	C - 34.6	E - 79.2	1	C - 30.1	1	D - 39.6	F - 91.4	1	C - 31.8
T	1	B - 13.9	B - 18.0	1	B - 18.4	1	B - 20.0	C - 34.1	1	C - 25.1
R	1	B - 13.7	B - 18.3	1	B - 10.7	1	B - 18.4	C - 31.6	1	B - 14.1
Northbound - Unser Blvd.										
L	1	A - 7.1	A - 6.5	1	C - 27.7	1	A - 8.7	A - 7.5	1	C - 31.4
T	2	A - 8.2	A - 7.6	2	C - 34.8	2	A - 6.8	A - 6.2	2	C - 27.2
R	1	A - 7.7	A - 7.3	1	C - 22.7	1	A - 5.7	A - 5.1	1	B - 14.9
Southbound - Unser Blvd.										
L	1	C - 30.5	D - 39.1	1	D - 46.8	1	B - 15.2	C - 30.1	1	C - 25.9
T	2	A - 5.4	A - 4.2	2	B - 13.0	2	A - 3.9	A - 7.7	2	B - 11.8
R	1	A - 4.8	A - 3.6	1	B - 12.1	1	A - 2.9	B - 10.8	1	A - 8.7
Intersection:		B - 15.1	C - 23.0		C - 29.9		B - 12.0	C - 22.2		C - 21.9

NOTE: > denotes a shared thru/right and / or thru/left turn lane.

The analysis of the intersection of Arenal Rd. / Unser Blvd. demonstrates that the signalized intersection will operate at acceptable levels-of-service and delays for all conditions analyzed in this study with the exception of the westbound left turn movement during the PM Peak Hour period. Mitigation of the long delays consists of constructing new left turn arrows for the westbound left turn movement and the southbound left turn movement along with the right turn overlap arrows for the westbound right turn movement and the northbound right turn movement. Geometric improvements to the intersection will not be required.

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

Queueing Analysis Summary Sheet

Project: Sage / Unser Commercial Development (SE Corner)
 Intersection: Arenal Rd / Unser Blvd

2014											
Approach	Left Turns			Thru Movements			Right Turns				
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
<i>Existing Lane Length</i>	1	183	120	2	293	Cont	1	30	50		
AM NO BUILD Queue	1	216	300	2	346	275	1	51	100		
AM BUILD Queue	1	238	325	2	346	275	1	51	100		
<i>Existing Lane Length</i>	1	71	120	2	144	Cont	1	44	50		
PM NO BUILD Queue	1	84	150	2	171	175	1	83	150		
PM BUILD Queue	1	111	200	2	171	175	1	83	150		
<hr/>											
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
<i>Existing Lane Length</i>	1	136	200	1	101	Cont	1	128	50		
AM NO BUILD Queue	1	163	250	1	121	200	1	183	250		
AM BUILD Queue	1	163	250	1	121	200	1	234	325		
<i>Existing Lane Length</i>	1	152	200	1	171	Cont	1	174	50		
PM NO BUILD Queue	1	223	325	1	207	300	1	267	375		
PM BUILD Queue	1	223	325	1	207	300	1	330	450		
<hr/>											
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
<i>Existing Lane Length</i>	1	27	140	2	308	Cont	1	176	130		
AM NO BUILD Queue	1	59	100	2	584	400	1	237	325		
AM BUILD Queue	1	59	100	2	623	425	1	237	325		
<i>Existing Lane Length</i>	1	36	140	2	187	Cont	1	90	130		
PM NO BUILD Queue	1	68	125	2	556	425	1	113	200		
PM BUILD Queue	1	68	125	2	605	450	1	113	200		
<hr/>											
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
<i>Existing Lane Length</i>	1	209	140	2	193	Cont	1	85	130		
AM NO BUILD Queue	1	284	375	2	324	250	1	113	175		
AM BUILD Queue	1	330	425	2	360	275	1	133	200		
<i>Existing Lane Length</i>	1	195	140	2	357	Cont	1	100	130		
PM NO BUILD Queue	1	279	400	2	781	550	1	132	225		
PM BUILD Queue	1	341	450	2	829	575	1	159	250		

AM
PM
 Cycle Length: 120 130

NOTE: Queue lengths are in feet.

The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

5 - Tower Rd. / Unser Blvd. - Pages A-83 thru A-88

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

Intersection: #5 - Tower Rd. / Unser Blvd.

2014 AM Peak Hour				2014 PM Peak Hour		
BASE GEOMETRY				BASE GEOMETRY		
NO BUILD		BUILD		NO BUILD		BUILD
Lanes	LOS-Delay	LOS-Delay	Lanes	LOS-Delay	LOS-Delay	
Eastbound - Tower Rd.						
L	>	C - 25.4	C - 27.7	>	C - 22.8	D - 42.7
T	1	B - 19.0	C - 20.4	1	C - 20.9	C - 33.6
R	>	B - 13.1	B - 13.8	>	B - 15.4	C - 27.1
Westbound - Tower Rd.						
L	>	B - 17.8	B - 19.3	>	C - 21.0	C - 34.1
T	1	B - 18.0	B - 19.3	1	C - 22.5	D - 37.1
R	>	B - 13.6	B - 14.5	>	B - 15.2	C - 27.2
Northbound - Unser Blvd.						
L	>	A - 7.2	A - 5.1	>	A - 6.3	B - 11.3
T	1	C - 21.9	B - 17.9	1	B - 10.5	A - 5.2
R	>	A - 9.9	A - 3.6	>	A - 8.0	A - 2.1
Southbound - Unser Blvd.						
L	>	A - 9.7	A - 9.9	>	A - 6.3	A - 5.8
T	1	B - 13.1	B - 13.6	1	B - 15.6	B - 12.5
R	>	B - 10.1	B - 10.4	>	A - 10.0	A - 8.8
Intersection:		B - 17.9	B - 16.1		B - 14.6	B - 15.6

NOTE: > denotes a shared thru/right and / or thru/left turn lane.

The analysis of the intersection of Tower Rd. / Unser Blvd. demonstrates that the signalized intersection will operate at acceptable levels-of-service and delays for all conditions analyzed in this study. No recommendations are made.

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

Queueing Analysis Summary Sheet

Project: Sage / Unser Commercial Development (SE Corner)
 Intersection: Tower Rd / Unser Blvd

2014									
Approach	Left Turns			Thru Movements			Right Turns		
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	134	110	2	208	Cont	1	18	180
AM NO BUILD Queue	1	150	225	2	233	200	1	53	100
AM BUILD Queue	1	150	225	2	233	200	1	90	150
<i>Existing Lane Length</i>	1	54	110	2	113	Cont	1	15	180
PM NO BUILD Queue	1	60	125	2	127	125	1	64	125
PM BUILD Queue	1	60	125	2	127	125	1	110	175
<hr/>									
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	17	150	2	94	Cont	1	17	90
AM NO BUILD Queue	1	19	50	2	105	100	1	19	50
AM BUILD Queue	1	24	50	2	105	100	1	19	50
<i>Existing Lane Length</i>	1	35	150	2	253	Cont	1	8	90
PM NO BUILD Queue	1	39	100	2	283	250	1	9	25
PM BUILD Queue	1	45	100	2	283	250	1	9	25
<hr/>									
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	51	290	2	626	Cont	1	46	60
AM NO BUILD Queue	1	115	175	2	1,156	725	1	99	175
AM BUILD Queue	1	149	225	2	1,183	750	1	103	175
<i>Existing Lane Length</i>	1	25	290	2	315	Cont	1	12	60
PM NO BUILD Queue	1	97	175	2	644	475	1	61	125
PM BUILD Queue	1	142	225	2	680	500	1	67	125
<hr/>									
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
<i>Existing Lane Length</i>	1	37	150	2	325	Cont	1	38	170
AM NO BUILD Queue	1	65	125	2	622	425	1	66	125
AM BUILD Queue	1	65	125	2	651	450	1	66	125
<i>Existing Lane Length</i>	1	26	150	2	534	Cont	1	114	170
PM NO BUILD Queue	1	45	100	2	992	675	1	199	300
PM BUILD Queue	1	45	100	2	1,028	700	1	199	300

AM
PM
 Cycle Length: 120 130

NOTE: Queue lengths are in feet.

The calculated right turn queue lengths can be reduced by 50% to account for right turns on red and overlap phases.

Unsignalized Intersection Capacity Analysis

IMPLEMENTATION YEAR (2014)

6 - Sage Rd. / Driveway "A" – Pages A-89 thru A-90

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

	2014 BUILD	
	AM	PM
Sage Rd. / Driveway "A"		
Minor Street (Driveway "A")		
NB Right	A – 9.1	A – 8.9
Major Street (Sage Rd.)		
WB Left	N/A	N/A

Driveway "A" is proposed as a right-turn-in, right-turn-out only unsignalized driveway located approximately 300 feet east of Unser Blvd. (centerline to centerline).

7 - Sage Rd. / Driveway "B" - Pages A-91 thru A-92

The results of the implementation year analysis of the unsignalized intersection of Sage Rd. / Driveway "B" are summarized in the following table:

	2014 BUILD	
	AM	PM
Sage Rd. / Driveway "B"		
Minor Street (Driveway "B")		
NB Left	F – 85.4	F – 189
NB Right	F – 85.4	F – 189
Major Street (Sage Rd.)		
WB Left	B – 10.4	A – 8.8

Driveway "B" is proposed as a full access unsignalized driveway located directly across from the existing driveway on the north side of the street. Synchro reports indicate that the northbound queue length (95th percentile) will be more than 500 feet long (see page A-92). The long queue length is due primarily to the fact that exiting traffic desiring to travel north or south on Unser Blvd. or west on Sage Rd. will be required to negotiate a northbound left turn from Driveway "B" on Unser Blvd. Thus the projected northbound left turn volume at Driveway "B" is 309 vph during the PM Peak Hour. The calculated queue length is reduced by about 100 feet by constructing Driveway "B" with a dedicated left turn lane plus a thru / right turn lane. This study recommends that Driveway "C" also be designated as a right-out, left-out driveway to provide some relief for Driveway "B". Also, a permitted right-turn-out movement at Driveway "D" will provide relief to Driveway "B", but the design length of the northbound right turn deceleration lane on Unser Blvd. at Sage Rd. will need to be reduced somewhat to allow the exiting westbound right turn movement at Driveway "D".

8 - Sage Rd. / Driveway "C" - Pages A-93 thru A-94

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

	2014 BUILD	
	AM	PM
Sage Rd. / Driveway "C"		
Minor Street (Driveway "C")		
NB Right	C – 24.8	D – 25.4
Major Street (Sage Rd.)		
WB Left	N/A	N/A

Driveway "C" is proposed as a right-turn-in, right-turn-out only unsignalized driveway located at the east end of the property. However, due to the calculated long delays and excessive queuing of exiting traffic at Driveway "B" (especially the northbound left turn movement), this report recommends that Driveway "C" be approved as right-out, left-out driveway to relieve exiting traffic at Driveway "B".

9 - Driveway "D" / Unser Blvd - Pages A-95 thru A-96

Driveway "D" is proposed to be built as a right-in only unsignalized driveway because the proposed northbound right turn lane extends south past the site property line. As a right-in only driveway, Driveway "D" requires no level-of-service / delay analysis since there are no conflicting movements or calculatable delays associated with a right-in only driveway. However, due to the projected delays and queue lengths at Driveway "B", this report recommends that consideration be given to approving Driveway "D" as a right-in, right-out driveway. Permitting a right-out at Driveway "D" will allow traffic desiring to travel north on Unser Blvd. and west on Sage Rd. the option to exit this development at Driveway "D", thus relieving the northbound left turn movement at Driveway "B". Regardless, access at Driveway "D" will require approval of the Transportation Coordinating Committee of the Mid-Region Council of Governments.

It should be noted that Levels of Service (LOS) for unsignalized intersections cannot be compared directly with Levels of Service for signalized intersections. LOS for unsignalized intersections is based on reserve capacity, which is converted to generalized levels of delay; LOS for signalized intersections is based on actual delay in seconds.

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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

Generally speaking, a Level-of-Service D or better is an acceptable parameter for design purposes.

CONCLUSIONS

Based on projected traffic volumes for the year 2014, the proposed Commercial Development at the southeast corner of Sage Rd. / Unser Blvd. will have moderate impact to the adjacent transportation system. This report concludes that those impacts can be mitigated. Based on the results of the analysis contained in this study, the implementation of the proposed Sage / Unser Commercial Development at the southeast corner of Sage Rd. / Unser Blvd. will have no significant impact on the adjacent transportation system provided the following recommendations are followed:

RECOMMENDATIONS

- All design and construction of onsite and offsite improvements associated with this project shall take necessary precautions to preserve and maintain adequate sight distances at all intersections and driveways on which the improvements are constructed.
- **Sage Rd. / Unser Blvd.** – construct dual eastbound and dual westbound left turn lanes on Sage Rd. at Unser Blvd. (this was a requirement of the proposed commercial development at the southwest corner of Sage Rd. / Unser Blvd.).
- **Arenal Rd. / Unser Blvd.** – construct left turn arrows on signal for westbound left turn movement and southbound left turn movement. Also, construct corresponding right turn overlap phase arrows on traffic signal for northbound right turn movement and westbound right turn movement.
- The analysis of the transportation system in this report considered that there would be four access driveways into the site. Driveways “A”, “B”, and “C” are proposed unsignalized driveways on Sage Rd. east of Unser Blvd. Driveway “A” is a proposed right-in, right-out only driveway located approximately 300 feet east of Unser Blvd. (centerline to centerline). The primary access would be from a proposed full access driveway on Sage Rd. (Driveway “B”) It is the recommendation of this study that the full access driveway should align with the existing driveway on the north side of the street. Driveway “C” to the east of Driveway “B” should be designated as a right-out, left-out driveway to relieve Driveway “B”. Driveway “D” is a proposed right-in only driveway on Unser Blvd. at the south property line of this project. This report recommends, though, that Driveway “D” be approved as a right-in, right-out driveway in order to provide additional capacity for traffic exiting from this project. Permitting exiting right turns from Driveway “D” will require the northbound right turn lane on Unser Blvd. at Sage Rd. to be reduced somewhat.
- An eastbound right turn deceleration lane is warranted on Sage Rd. at Driveway “A”. The eastbound right turn deceleration lane should be constructed to a length of 150 feet plus transition if possible.
- An eastbound right turn deceleration lane is warranted on Sage Rd. at Driveway “B”. The eastbound right turn deceleration lane should be constructed to a length of 150 feet plus transition if possible. Driveway “B” should be constructed with two exiting lanes and one entering lane minimum. A northbound dedicated left turn lane should be provided in the driveway.

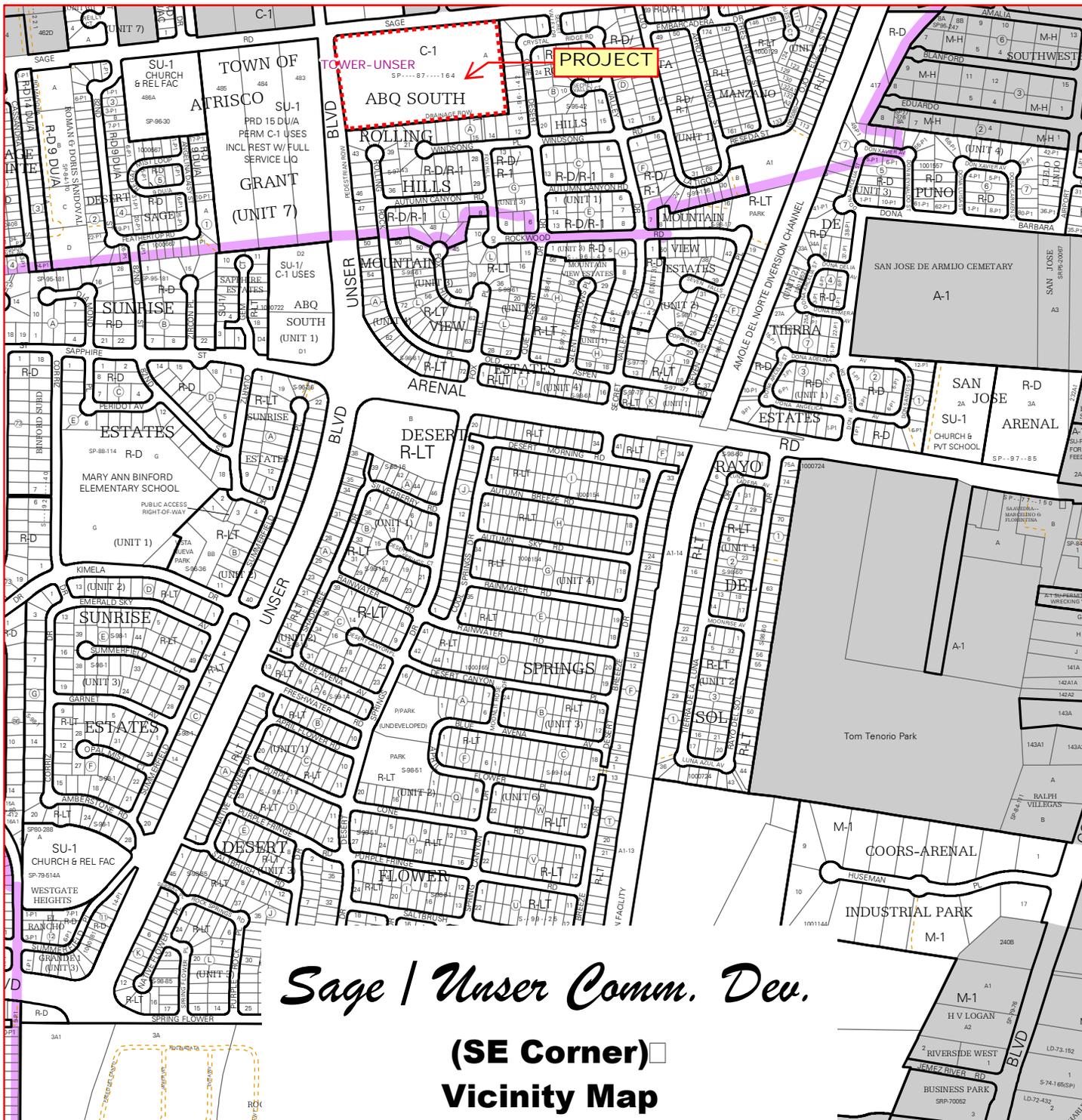
- A westbound left turn deceleration lane is warranted on Sage Rd. at Driveway “B”. The westbound left turn deceleration lane should be constructed to a length of 150 feet plus transition to accommodate the projected 2014 volumes in this report.
- All driveways accessing the Sage / Unser Commercial Development should be constructed utilizing 25 feet radius curb returns or larger if required to accommodate delivery trucks.
- Driveways should be located approximately as shown on the site plan on Page A-2 in Appendix “A” of this study.
- New driveways should be constructed as per DPM requirements.

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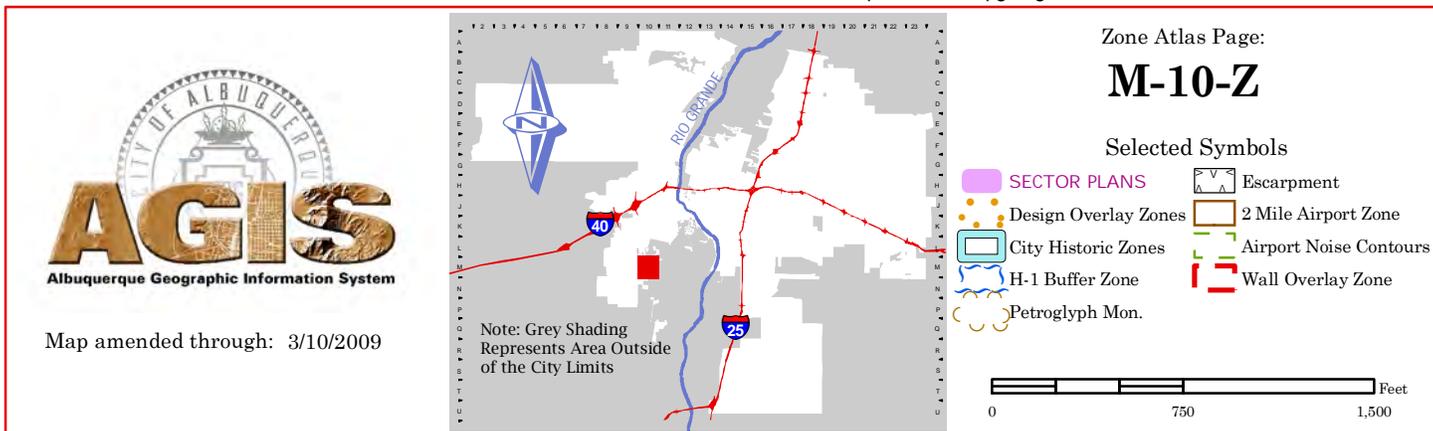
APPENDIX

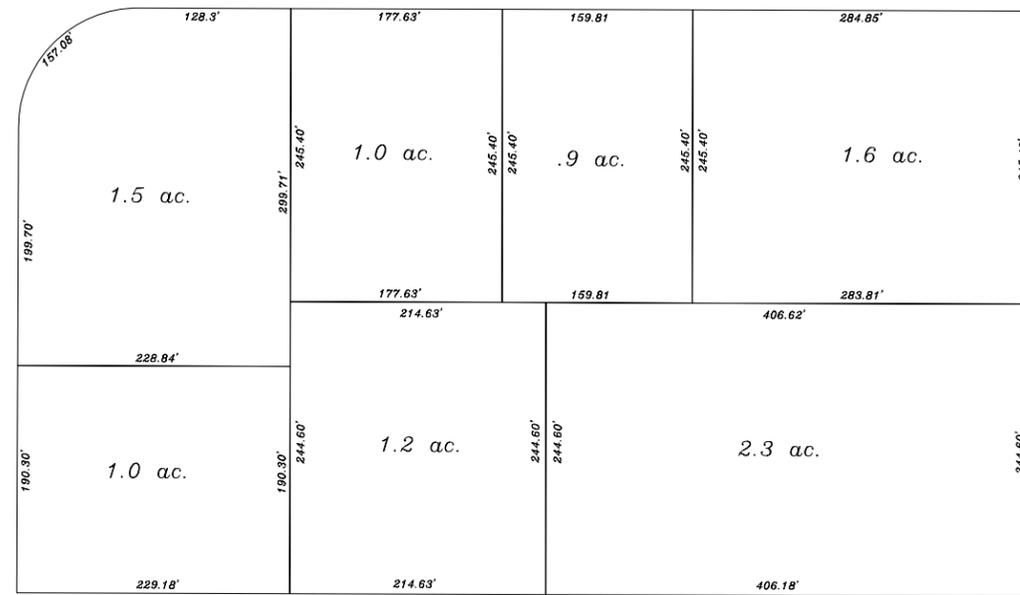
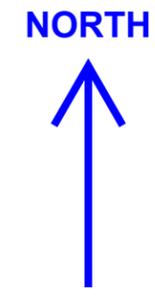
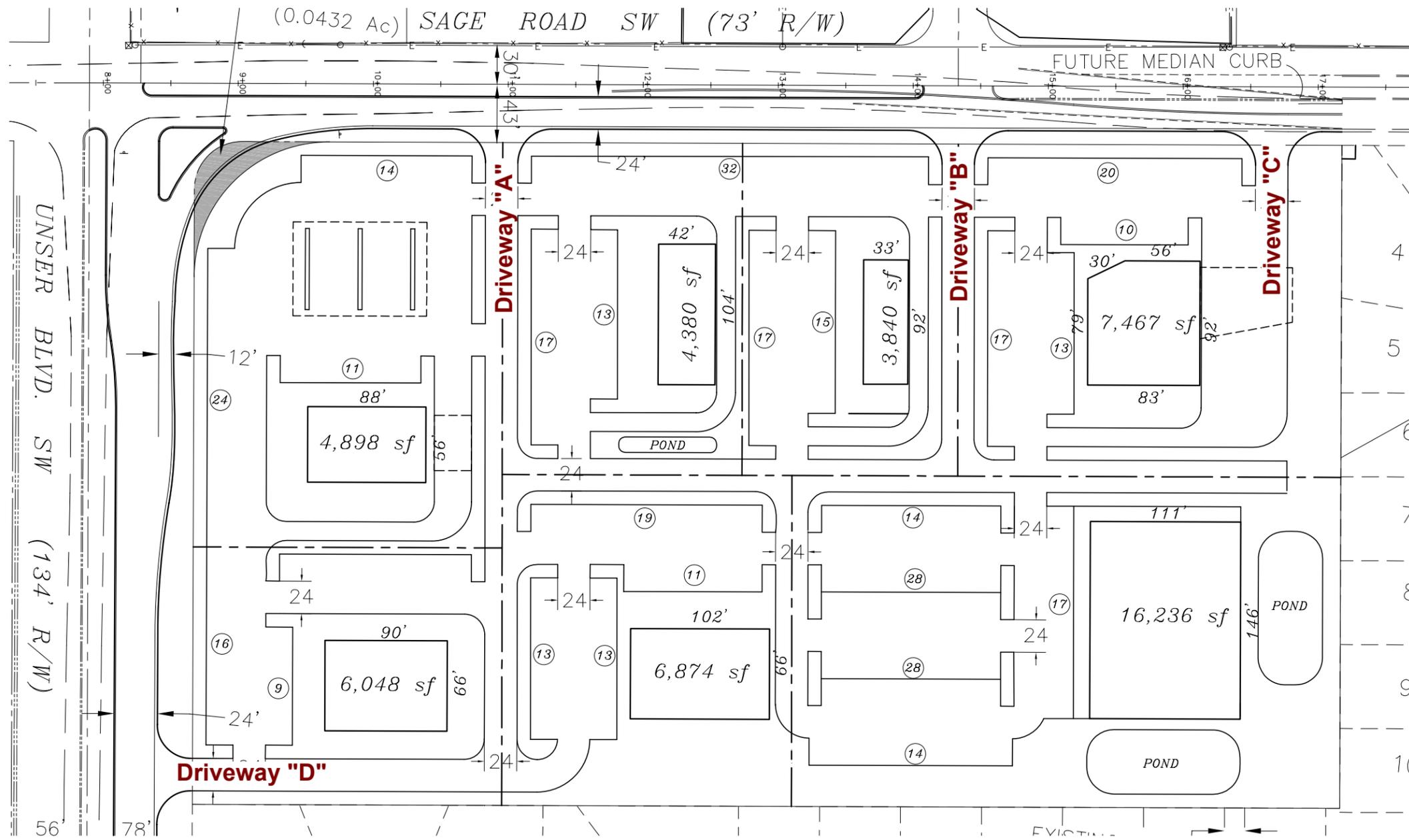
Sage / Unser Commercial Development (SE Corner)



Sage / Unser Comm. Dev.
(SE Corner)
Vicinity Map

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





CONCEPT A

(SE) *Sage / Unser Comm. Dev.*

(SE Corner)

9.93

Trip Distribution Map (%)

COORS BLVD NW
(CN)

7.50

(CS)

6.38



SAGE RD

(SC)

1.14

(TE)

1.38

(AE)

15.10

TOWER RD

(UN)

8.72

ARENAL RD

(US)

11.75

UNSER BLVD

(AW)

6.54

(TW)

10.99

(8S)

3.32

(8N)

86th ST

4.62

(SW)

2.65

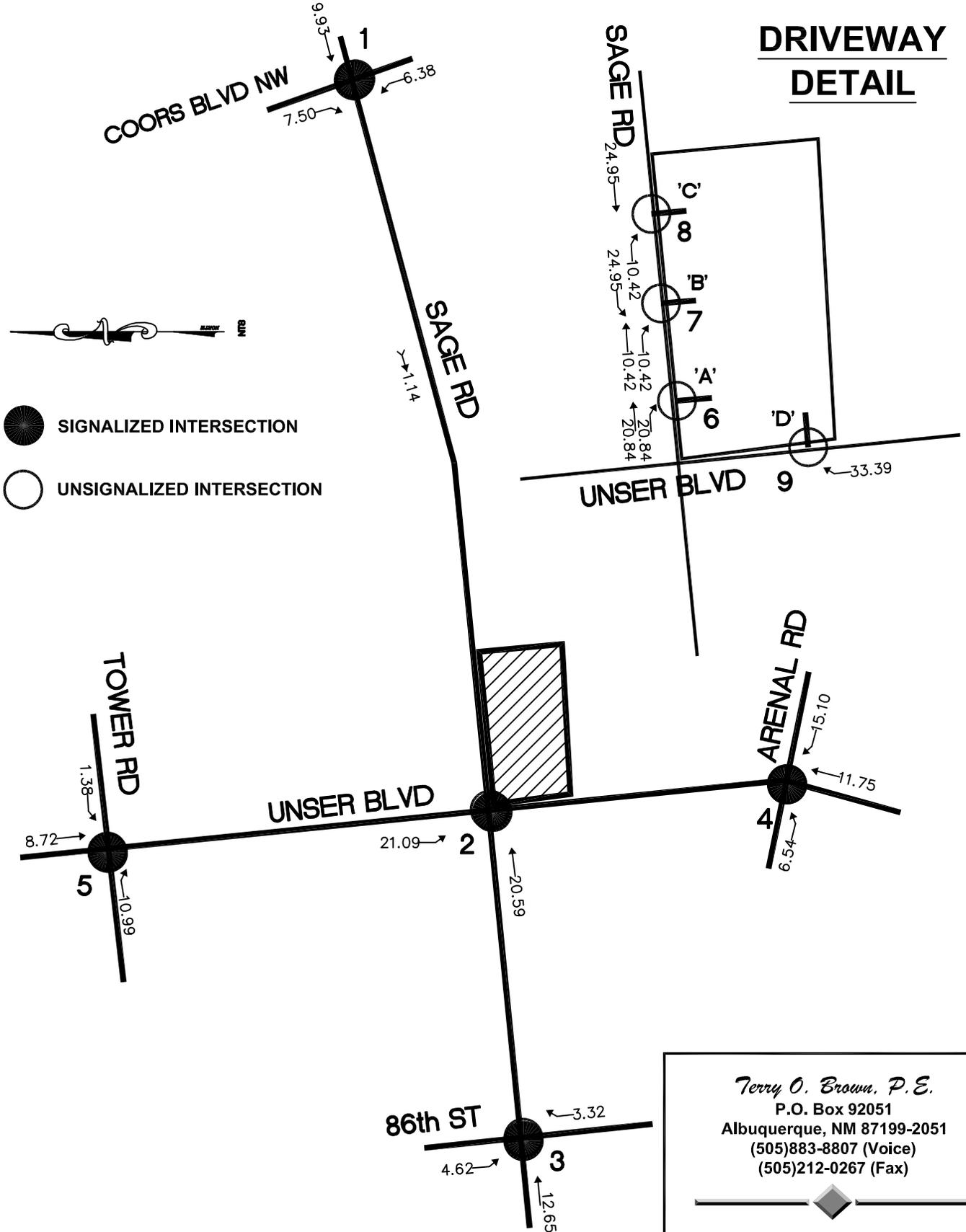
Terry O. Brown, P.E.
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Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)



Sage / Unser Comm. Dev.

(SE Corner)

Trip Assignments (% Entering)

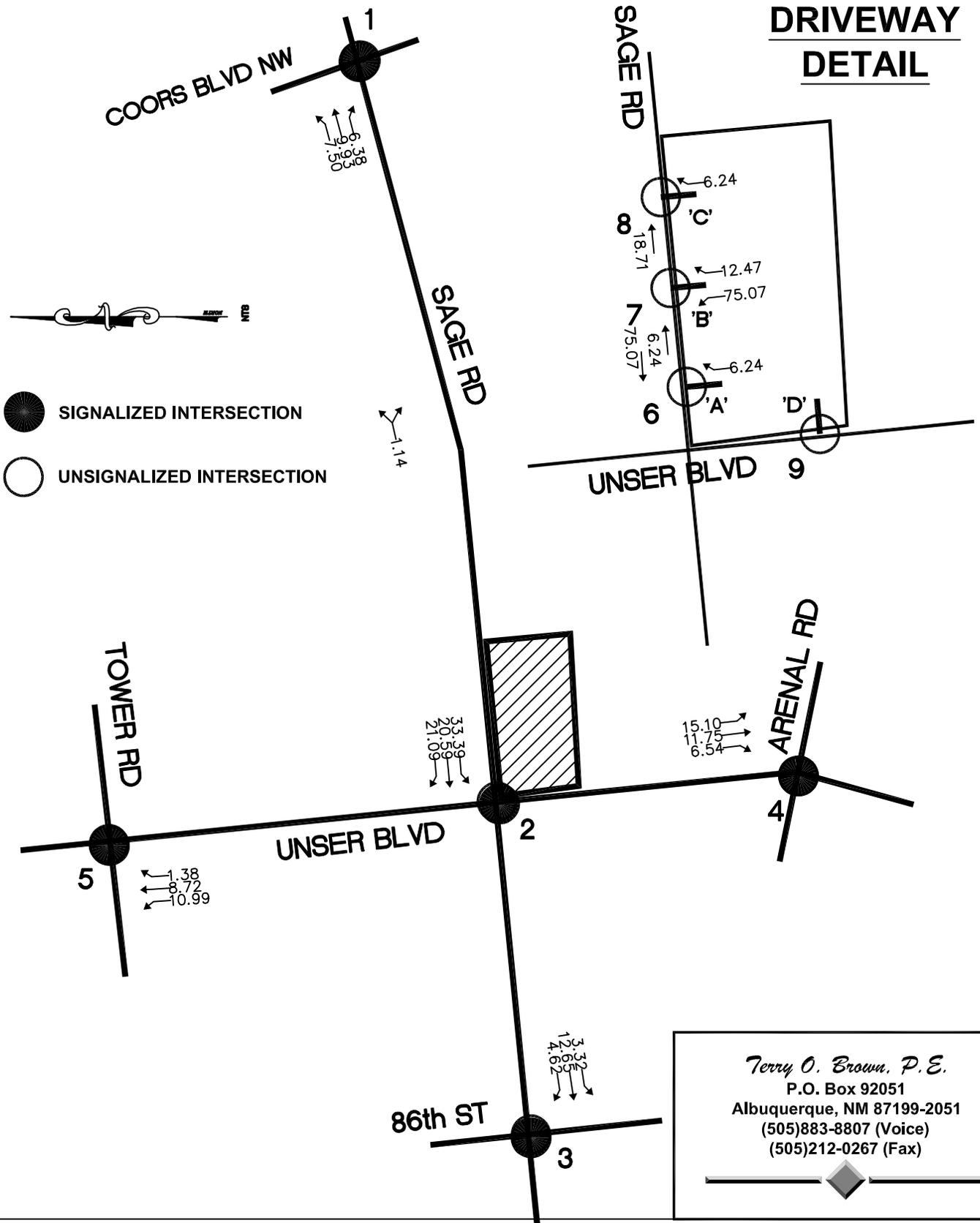


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Trip Assignments (% Exiting)



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