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Terry O. Brown P.E.

Sage / Unser Comm. Development
(Southeast Corner)

Traffic Impact Study

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Presented to:

City of Albuquerque
Transportation Development Section

Prepared for:

Unser Sage Partnership
c/o George Rainhart
2325 San Pedro NE #2B
Albuquerque, NM 87110



Terry O. Brown

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

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
<u>Summary Sheet</u>		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		
Existing Lane Length		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		
Existing Lane Length		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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		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		
Existing Lane Length		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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		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		
Existing Lane Length		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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length		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		
Existing Lane Length		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		

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.

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	<i>Cont</i>	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	<i>Cont</i>	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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length	
<i>Existing Lane Length</i>		1	75	250	2	104	<i>Cont</i>	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	<i>Cont</i>	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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length	
<i>Existing Lane Length</i>		1	95	250	2	304	<i>Cont</i>	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	<i>Cont</i>	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		# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length	
<i>Existing Lane Length</i>		1	31	250	2	258	<i>Cont</i>	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	<i>Cont</i>	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	

AM PM
 Cycle Length: 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		
Existing Lane Length	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		
Existing Lane Length	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	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	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		
Existing Lane Length	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	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	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		
Existing Lane Length	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	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	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		
Existing Lane Length	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	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
Existing Lane Length	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
Existing Lane Length	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
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	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
Existing Lane Length	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
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	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
Existing Lane Length	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
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length
Existing Lane Length	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
Existing Lane Length	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
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
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
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

Cycle Length: AM 120 PM 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.

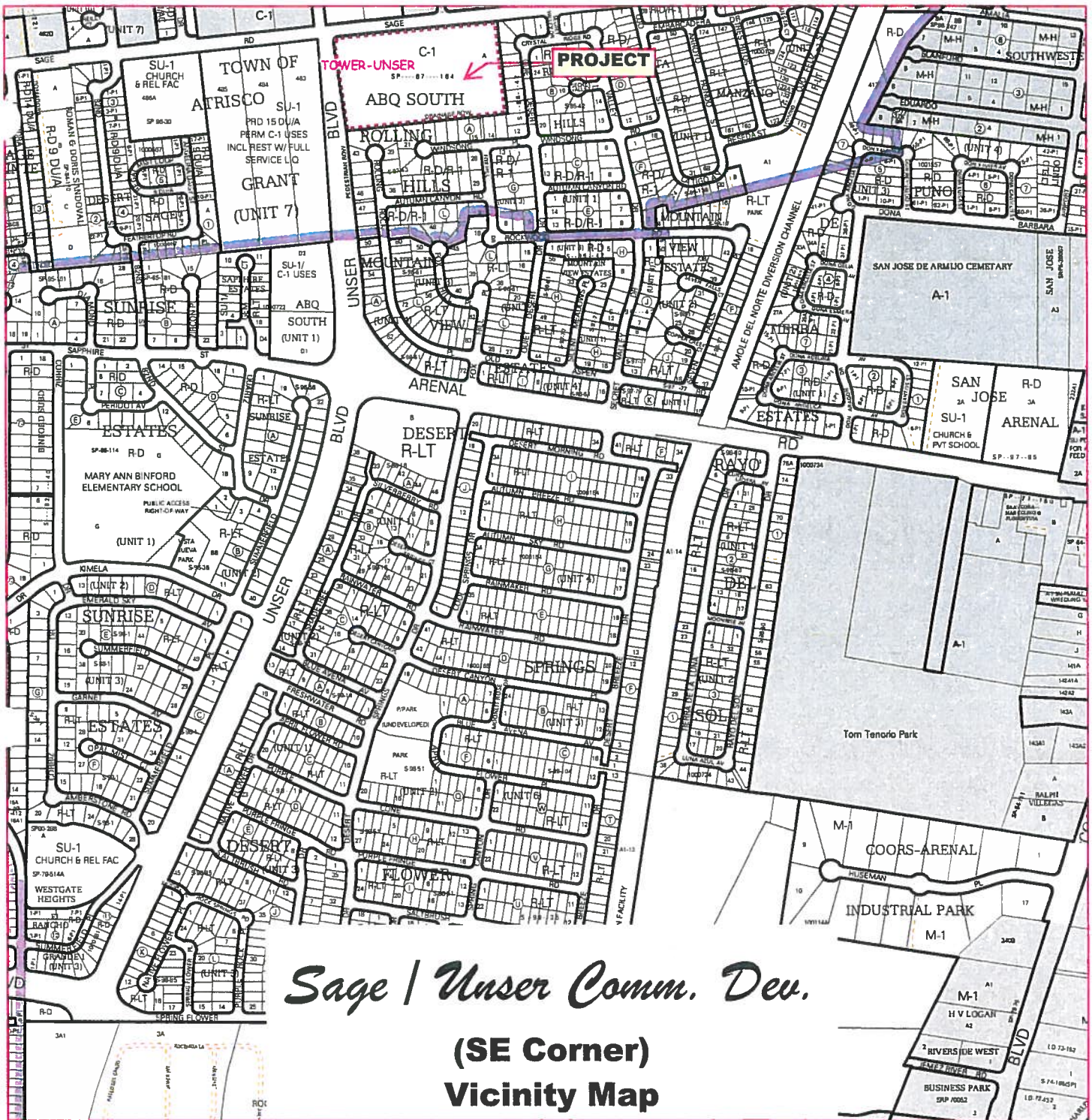
- A westbound left turn deceleration lane is warranted on Sage Rd. at Driveway "B". The westbound left turn deceleration lane should be constructed to a length of 150 feet plus transition to accommodate the projected 2014 volumes in this report.
- All driveways accessing the Sage / Unser Commercial Development 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.

Appendix

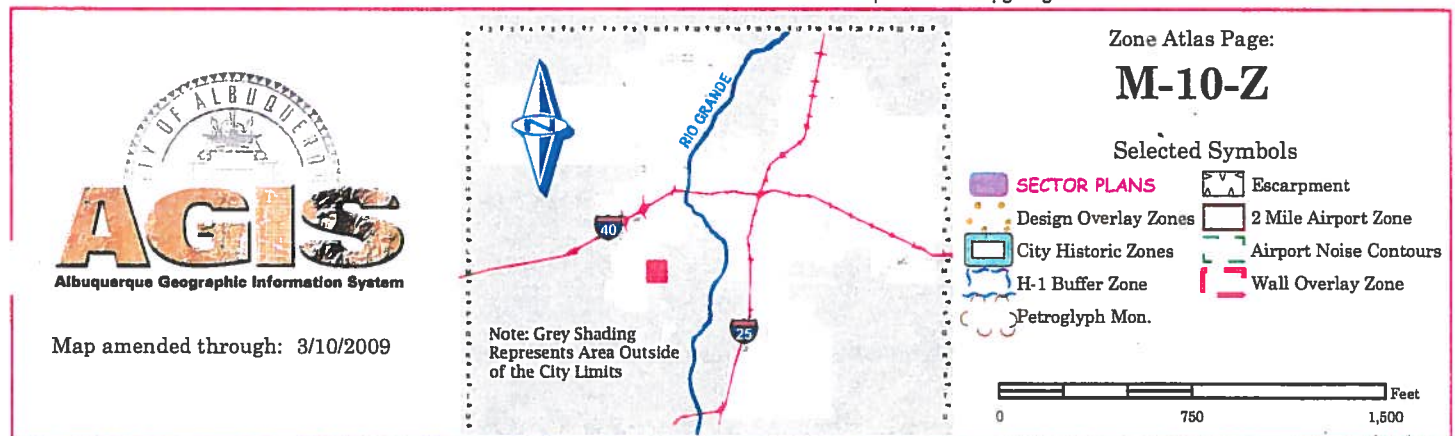
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<u>Traffic Count Data / Previous Development Trip Gen / ABQ Ride Map & Schedules</u>	A-97 thru A-113

APPENDIX

Sage / Unser Commercial Development (SE Corner)



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



Zone Atlas Page:

M-10-Z

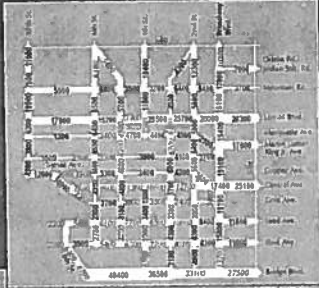
Selected Symbols

- SECTOR PLANS**
- Design Overlay Zones
- City Historic Zones
- H-1 Buffer Zone
- Petroglyph Mon.
- Escarpment
- 2 Mile Airport Zone
- Airport Noise Contours
- Wall Overlay Zone

0 750 1,500 Feet

A-1

Inset for Downtown



Inset for Uptown



Average Weekday Traffic Flows

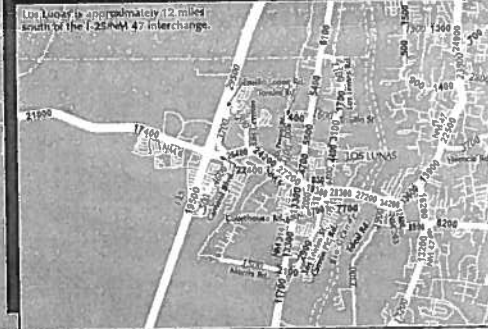


Standard Data
[9500]
Link Volume is based on traffic count data accepted by the New Mexico Department of Transportation. Traffic volume data is based on 15-minute intervals in accordance with the New Mexico State Traffic Monitoring Standards (NMSTMS).

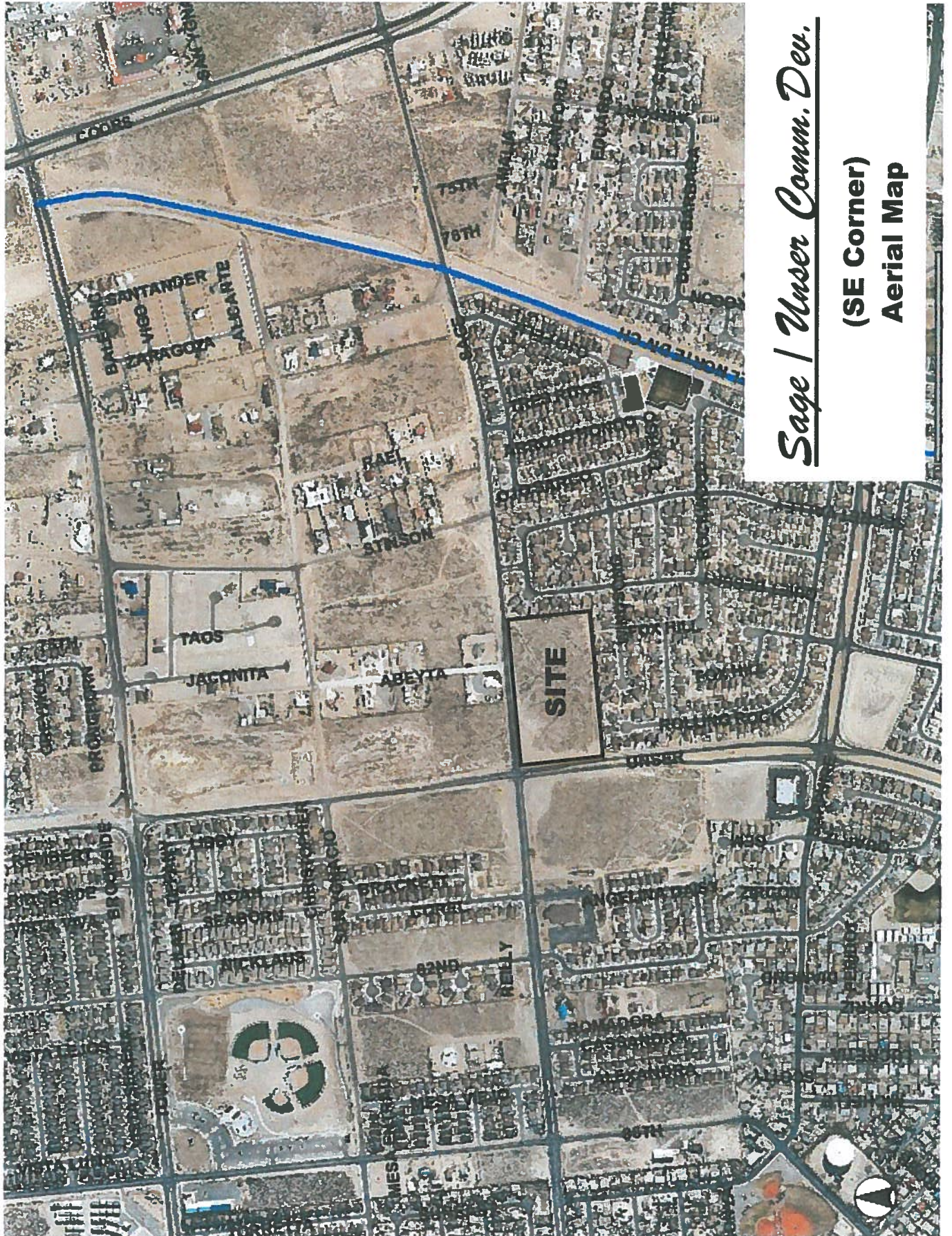
Non-Standard Data
[9500]
Link Volume is based on traffic count data not in compliance with the NMSTMS or on observational information. NMSTMS recommends that nonstandard data be used with caution.

Map prepared by the Mid-Region Council of Governments in cooperation with the New Mexico Department of Transportation, the local governments in the Albuquerque Metropolitan Planning Area, and the U.S. Department of Transportation, Federal Highway Administration.

Inset for Los Lunas, Valencia County

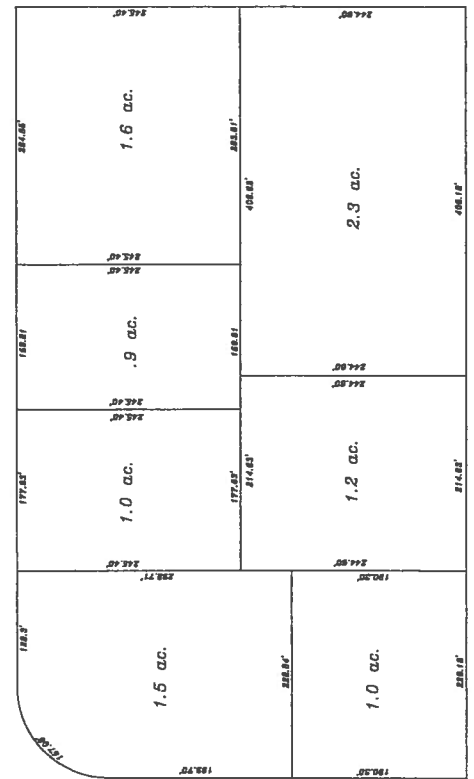
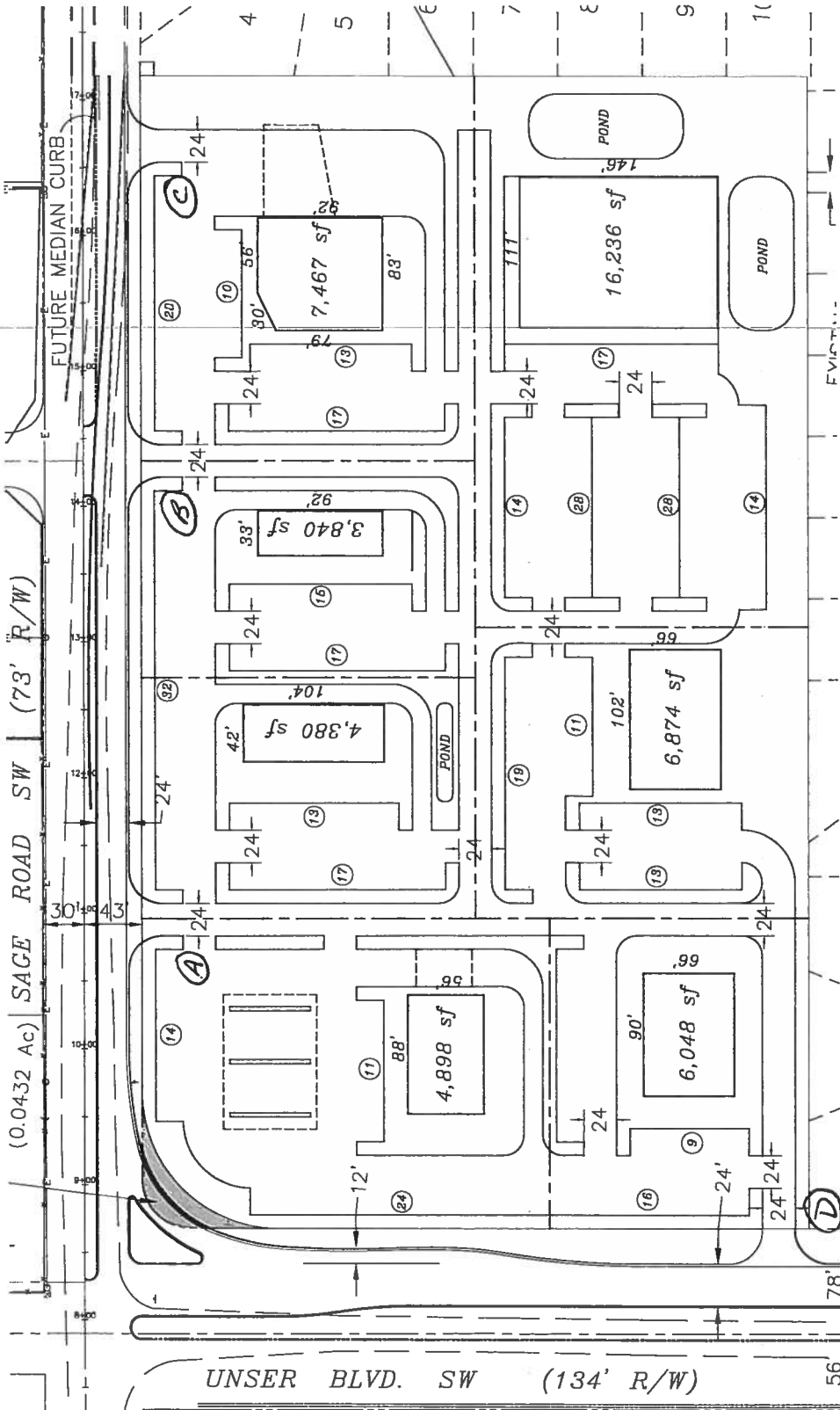


2008 Traffic Flows for the Greater Albuquerque Area



Sage / User Comm. Dev.

**(SE Corner)
Aerial Map**

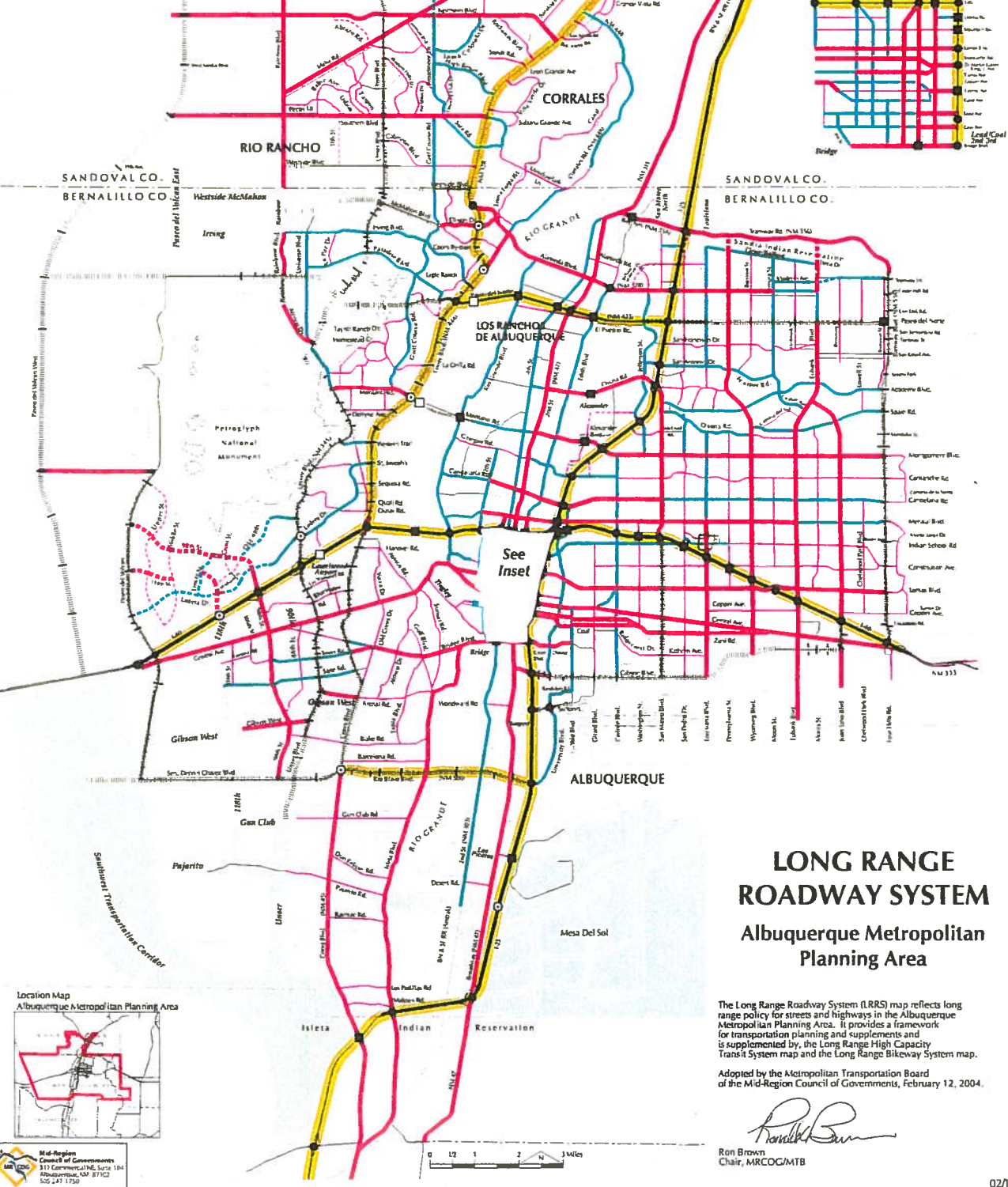


CONCEPT A

- Existing Proposed
- Facility with HOV Potential
 - Limited Access Roadway
 - Principal Arterial
 - Minor Arterial
 - Collector
- Dashed lines indicate proposed alignments
- Grade Separation
 - Interchange
- Rainbow
- Location Study Corridor
 - Subarea

Existing Freeway
Existing-Not to Freeway Standard

NOTE: Major streets are shown as existing to their existing condition unless otherwise noted. Major streets are shown as existing to their existing condition unless otherwise noted. Major streets are shown as existing to their existing condition unless otherwise noted.



LONG RANGE ROADWAY SYSTEM Albuquerque Metropolitan Planning Area

The Long Range Roadway System (LRRS) map reflects long range policy for streets and highways in the Albuquerque Metropolitan Planning Area. It provides a framework for transportation planning and supplements and is supplemented by the Long Range High Capacity Transit System map and the Long Range Bikeway System map.

Adopted by the Metropolitan Transportation Board of the Mid-Region Council of Governments, February 12, 2004.

Ron Brown
Ron Brown
Chair, MRCOG/MTB

02/13/04

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.		
	GROSS	ENTER	EXIT	ENTER	EXIT	
DESCRIPTION						
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

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

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
	GROSS	ENTER	EXIT	ENTER	EXIT
Gasoline / Service Station w/ Convenience Market (945)	12.00	1,953	61	61	80

Units
12.00
Fueling Positions

ITE Trip Generation Equations:

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

$$T = 162.78 (X) + 0$$

50% Enter, 50% Exit

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

$$T = 10.16 (X) + 0$$

50% Enter, 50% Exit

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

$$T = 13.38 (X) + 0$$

50% Enter, 50% Exit

Comments:

Tract No.

Based on ITE Trip Generation Manual - 8th Edition

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

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR		
		ENTER	EXIT	ENTER	EXIT	
Units						
Fast Food Restaurant w/ Drive-Thru Window (934)	4.38	2,173	110	106	77	71
1,000 S.F.						

ITE Trip Generation Equations:

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

$$T = \frac{496.12}{50\%} (X) + \frac{0}{50\% \text{ Exit}}$$

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

$$T = \frac{49.35}{51\% \text{ Enter,}} (X) + \frac{0}{49\% \text{ Exit}}$$

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

$$T = \frac{33.84}{52\% \text{ Enter,}} (X) + \frac{0}{48\% \text{ Exit}}$$

Comments:

Tract No.

Based on ITE Trip Generation Manual - 8th Edition

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

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
	GROSS	ENTER	EXIT	ENTER	EXIT

<i>Fast Food Restaurant w/ Drive-Thru Window (934)</i>	Units				
	3.84	1,905	97	93	68
	1,000 S.F.				62

ITE Trip Generation Equations:

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

$$T = 496.12 (X) + 0$$

50% Enter, 50% Exit

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

$$T = 49.35 (X) + 0$$

51% Enter, 49% Exit

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

$$T = 33.84 (X) + 0$$

52% Enter, 48% Exit

Comments:

Tract No.

Based on ITE Trip Generation Manual - 8th Edition

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

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR	
	GROSS	ENTER	EXIT	ENTER	EXIT

Units

Drive-In Bank (912)

4.00

557	22	16	54	56
-----	----	----	----	----

Drive-In Lanes

ITE Trip Generation Equations:

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

$$T = \frac{139.25}{50\%} (X) + \frac{0}{50\% \text{ Exit}}$$

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

$$T = \frac{9.44}{58\%} (X) + \frac{0}{42\% \text{ Exit}}$$

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

$$T = \frac{27.41}{49\%} (X) + \frac{0}{51\% \text{ Exit}}$$

Comments:

Tract No.

Based on ITE Trip Generation Manual - 8th Edition

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

USE (ITE CODE)	24 HOUR TWO-WAY VOLUME	A. M. PEAK HOUR		P. M. PEAK HOUR		
	GROSS	ENTER	EXIT	ENTER	EXIT	
Units						
Shopping Center (820)	29.17	3,049	45	29	137	142
1,000 S.F.						

ITE Trip Generation Equations:

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

$$\begin{array}{l} \text{Ln(T)} = 0.65 \text{ Ln(X)} + 5.83 \\ 50\% \text{ Enter, } 50\% \text{ Exit} \end{array}$$

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

$$\begin{array}{l} \text{Ln(T)} = 0.59 \text{ Ln(X)} + 2.32 \\ 61\% \text{ Enter, } 39\% \text{ Exit} \end{array}$$

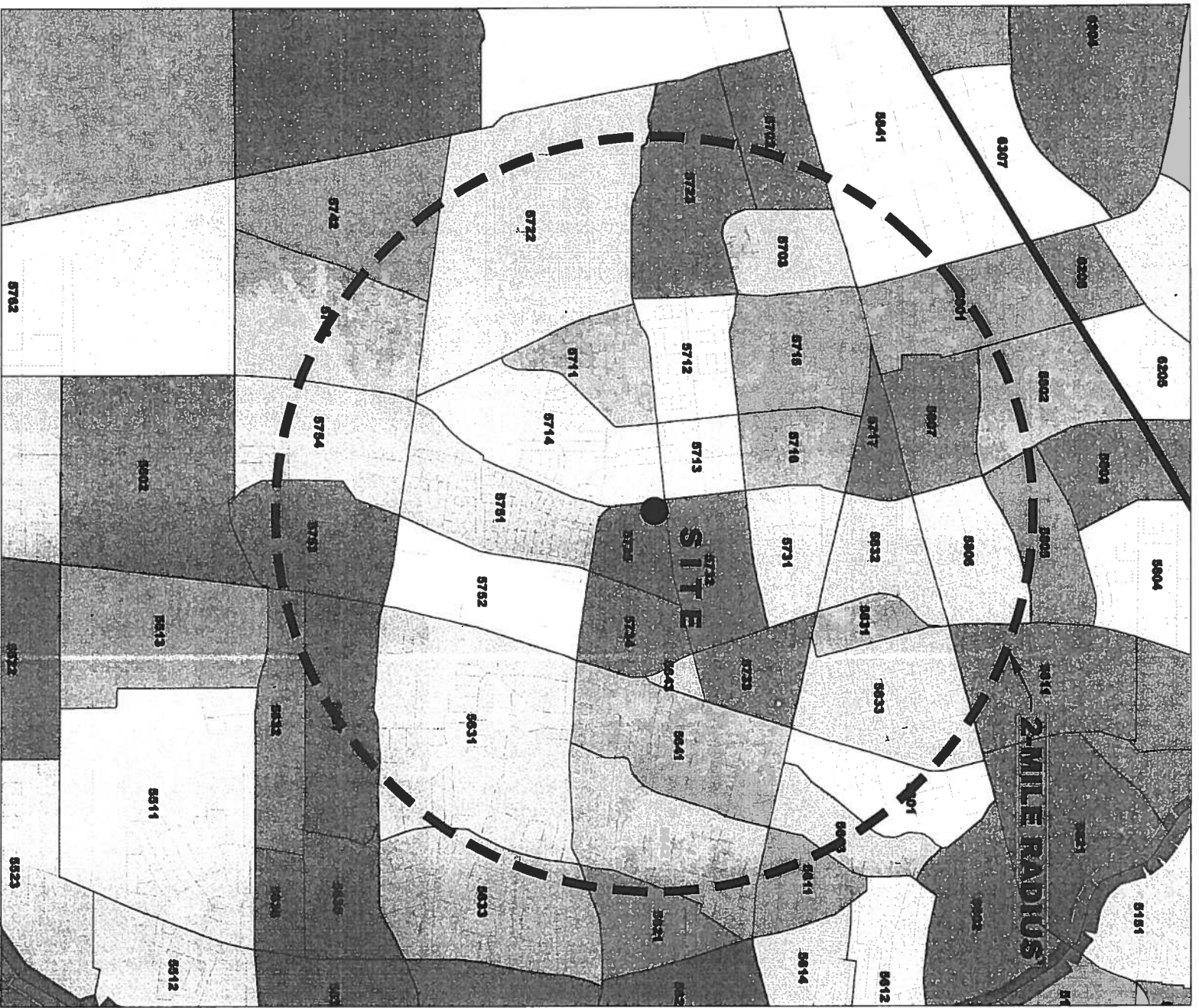
Average Vehicle Trip Ends on a Weekday, Peak Hour of Adjacent Street Traffic, One Hour Between 4pm and 6pm (P.M. PEAK HOUR)

$$\begin{array}{l} \text{Ln(T)} = 0.67 \text{ Ln(X)} + 3.37 \\ 49\% \text{ Enter, } 51\% \text{ Exit} \end{array}$$

Comments:

Tract No.

Based on ITE Trip Generation Manual - 8th Edition



DATA ANALYSIS SUBZONE (DASZ) MAP
Sage / Unser Commercial Development (SE Corner)

Trip Distribution Table **Sage / Unser Comm. Dev. (SE Corner)**

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

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic
 2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

							(UN)			(TE)			(CN)		
							Unser Blvd. North			Tower Rd East			Coors Blvd North		
DASZ #	% Sub Area In Study	2004 Population	2030 Population	Interpolated Population for the Year 2014	Population in Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030												
Boundary Specified on DASZ Map															
5806	35%	79	97	88	30	0.08%	50%	0.03%	15	0%	0.00%	0	50%	0.03%	15
5806	100%	809	835	819	619	1.22%	50%	0.81%	310	0%	0.00%	0	50%	0.81%	310
5811	25%	3959	3818	3,904	978	1.93%	50%	0.98%	488	0%	0.00%	0	50%	0.98%	488
5832	100%	1214	1283	1,241	1,241	2.45%	50%	1.22%	621	0%	0.00%	0	50%	1.22%	621
5831	100%	809	835	819	619	1.22%	0%	0.00%	0	0%	0.00%	0	100%	1.22%	819
5833	95%	3808	3385	3,522	3,348	8.80%	0%	0.00%	0	0%	0.00%	0	50%	3.30%	1,873
5801	80%	1335	1608	1,440	864	1.70%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5803	80%	810	822	815	489	0.98%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5811	40%	739	889	720	288	0.57%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1063	1,030	1,030	2.03%	50%	1.02%	515	50%	1.02%	515	0%	0.00%	0
5732	100%	127	758	370	370	0.73%	0%	0.00%	0	50%	0.38%	185	0%	0.00%	0
5733	100%	110	220	152	152	0.30%	0%	0.00%	0	0%	0.00%	0	50%	0.15%	78
5735	100%	1808	1491	1,583	1,583	3.08%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5734	100%	384	918	589	589	1.16%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	100%	1554	1592	1,589	1,589	3.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5843	100%	133	123	129	129	0.28%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5842	95%	1738	1694	1,720	1,634	3.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5821	25%	424	473	443	111	0.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5751	100%	3362	3151	3,281	3,281	6.47%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5752	100%	1313	2482	1,763	1,763	3.48%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	95%	2224	2115	2,182	2,073	4.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	15%	2571	2840	2,588	390	0.77%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5837	80%	873	809	848	509	1.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	20%	848	775	819	164	0.32%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5753	85%	1310	1224	1,277	1,085	2.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5754	25%	808	1397	911	228	0.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5743	55%	54	4901	1,918	1,055	2.08%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5742	20%	0	3765	1,448	290	0.67%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5722	75%	4878	9870	8,721	5,041	9.94%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5714	100%	3983	4284	4,079	4,079	8.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5711	100%	1703	1658	1,688	1,688	3.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5723	70%	3993	4118	4,040	2,828	5.88%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5712	100%	1881	1992	1,924	1,924	3.80%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5713	100%	409	733	534	534	1.05%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5716	100%	1795	2283	1,975	1,975	3.90%	50%	1.95%	988	0%	0.00%	0	0%	0.00%	0
5718	100%	2515	2774	2,615	2,615	5.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5703	100%	1890	1782	1,841	1,841	3.83%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5702	35%	49	58	52	18	0.04%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	10%	479	438	463	48	0.09%	50%	0.05%	23	0%	0.00%	0	0%	0.00%	0
5801	55%	542	928	690	380	0.75%	60%	0.45%	228	0%	0.00%	0	0%	0.00%	0
5802	30%	487	432	454	138	0.27%	100%	0.27%	138	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	1,001	1,001	1.97%	100%	1.97%	1,001	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	138	138	0.27%	70%	0.19%	95	0%	0.00%	0	0%	0.00%	0
				65,787	50,897	100.00%	4,419			700			3,801		
							8.72%			1.38%			7.50%		

Trip Distribution Table **Sage / Unser Comm. Dev. (SE Corner)**

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

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic
 2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

							(SE)			(CS)			(AE)		
							Sage Rd East			Coors Blvd South			Arenal Rd East		
DASZ #	% Sub Area In Study	2004 Population	2030 Population	Interpolated Population for the Year	Population In Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030	2014											
Boundary Specified on DASZ Map															
5805	35%	79	97	86	30	0.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5806	100%	809	835	819	619	1.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5811	25%	3959	3816	3,904	976	1.93%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,241	1,241	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	100%	809	835	819	619	1.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	95%	3808	3385	3,522	3,348	8.60%	50%	3.30%	1,873	0%	0.00%	0	0%	0.00%	0
5801	80%	1335	1608	1,440	864	1.70%	100%	1.70%	864	0%	0.00%	0	0%	0.00%	0
5803	80%	810	822	816	489	0.86%	100%	0.86%	489	0%	0.00%	0	0%	0.00%	0
5811	40%	739	689	720	288	0.57%	100%	0.57%	288	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1083	1,030	1,030	2.03%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5732	100%	127	758	370	370	0.73%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5733	100%	110	220	152	152	0.30%	50%	0.15%	76	0%	0.00%	0	0%	0.00%	0
5735	100%	1808	1491	1,583	1,583	3.08%	0%	0.00%	0	0%	0.00%	0	75%	2.31%	1,172
5734	100%	384	918	589	589	1.18%	0%	0.00%	0	50%	0.58%	295	50%	0.58%	295
5841	100%	1554	1592	1,589	1,589	3.09%	100%	3.09%	1,589	0%	0.00%	0	0%	0.00%	0
5843	100%	133	123	129	129	0.25%	60%	0.15%	77	40%	0.10%	52	0%	0.00%	0
5842	95%	1736	1894	1,720	1,834	3.22%	0%	0.00%	0	0%	0.00%	0	100%	3.22%	1,834
5821	25%	424	473	443	111	0.22%	0%	0.00%	0	0%	0.00%	0	100%	0.22%	111
5751	100%	3382	3151	3,281	3,281	8.47%	0%	0.00%	0	0%	0.00%	0	20%	1.29%	656
5752	100%	1313	2482	1,783	1,783	3.48%	0%	0.00%	0	25%	0.87%	441	75%	2.61%	1,322
5831	95%	2224	2115	2,182	2,073	4.09%	0%	0.00%	0	0%	0.00%	0	100%	4.09%	2,073
5833	15%	2571	2840	2,598	390	0.77%	0%	0.00%	0	0%	0.00%	0	100%	0.77%	390
5837	80%	873	809	848	509	1.00%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	20%	848	775	819	164	0.32%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5753	85%	1310	1224	1,277	1,085	2.14%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5754	25%	808	1397	911	228	0.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5743	55%	54	4901	1,918	1,055	2.08%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5742	20%	0	3785	1,448	290	0.57%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5722	75%	4878	9870	6,721	5,041	9.94%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5714	100%	3983	4264	4,079	4,079	8.05%	0%	0.00%	0	60%	4.83%	2,447	0%	0.00%	0
5711	100%	1703	1658	1,686	1,686	3.33%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5723	70%	3993	4116	4,040	2,828	5.58%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5712	100%	1881	1992	1,924	1,924	3.80%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5713	100%	409	733	534	534	1.08%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5716	100%	1795	2283	1,975	1,975	3.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5715	100%	2515	2774	2,615	2,615	5.16%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5703	100%	1890	1782	1,841	1,841	3.83%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5702	35%	49	58	52	18	0.04%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	10%	479	438	463	46	0.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5801	55%	542	928	690	380	0.75%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5802	30%	487	432	454	138	0.27%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	1,001	1,001	1.97%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	136	136	0.27%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0

Trip Distribution Table **Sage / Unser Comm. Dev. (SE Corner)**

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

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 *Socioeconomic*
 2030 *Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico*

							(US)			(AW)			(BS)		
							Unser Blvd. South			Arenal Rd West			86th St South		
DASZ #	% Sub Area In Study	2004 Population	2030 Population	Interpolated Population for the Year 2014	Population In Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030	2014											
Boundary Specified on DASZ Map															
5805	35%	79	97	88	30	0.06%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5806	100%	809	835	819	819	1.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5811	25%	3959	3816	3,904	978	1.93%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,241	1,241	2.45%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	100%	809	835	819	819	1.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	95%	3808	3385	3,522	3,348	8.60%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5801	80%	1335	1808	1,440	864	1.70%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5803	80%	810	822	815	489	0.98%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5811	40%	739	889	720	288	0.57%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1083	1,030	1,030	2.03%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5732	100%	127	758	370	370	0.73%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5733	100%	110	220	152	152	0.30%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5735	100%	1608	1491	1,583	1,583	3.08%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5734	100%	384	918	589	589	1.18%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5641	100%	1554	1592	1,589	1,589	3.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5643	100%	133	123	129	129	0.26%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5642	95%	1738	1694	1,720	1,834	3.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5821	25%	424	473	443	111	0.22%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5751	100%	3362	3151	3,281	3,281	6.47%	80%	5.18%	2,625	0%	0.00%	0	0%	0.00%	0
5752	100%	1313	2482	1,763	1,763	3.48%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5831	95%	2224	2115	2,182	2,073	4.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5833	15%	2571	2840	2,598	390	0.77%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5837	60%	873	809	848	509	1.00%	100%	1.00%	509	0%	0.00%	0	0%	0.00%	0
5832	20%	846	775	819	164	0.32%	100%	0.32%	164	0%	0.00%	0	0%	0.00%	0
5753	85%	1310	1224	1,277	1,085	2.14%	100%	2.14%	1,085	0%	0.00%	0	0%	0.00%	0
5754	25%	808	1397	911	228	0.45%	100%	0.45%	228	0%	0.00%	0	0%	0.00%	0
5743	55%	54	4901	1,918	1,055	2.08%	100%	2.08%	1,055	0%	0.00%	0	0%	0.00%	0
5742	20%	0	3785	1,448	290	0.57%	100%	0.57%	290	0%	0.00%	0	0%	0.00%	0
5722	75%	4878	9870	6,721	5,041	9.94%	0%	0.00%	0	25%	2.49%	1,280	25%	2.49%	1,280
5714	100%	3983	4284	4,079	4,079	8.05%	0%	0.00%	0	40%	3.22%	1,632	0%	0.00%	0
5711	100%	1703	1658	1,688	1,688	3.33%	0%	0.00%	0	25%	0.83%	422	25%	0.83%	422
5723	70%	3993	4116	4,040	2,828	5.68%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5712	100%	1881	1992	1,924	1,924	3.80%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5713	100%	409	733	534	534	1.05%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5718	100%	1795	2283	1,975	1,975	3.90%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5715	100%	2515	2774	2,615	2,615	5.16%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5703	100%	1890	1762	1,841	1,841	3.83%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5702	35%	49	58	52	18	0.04%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5841	10%	479	438	463	46	0.09%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5801	55%	542	926	690	380	0.75%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5802	30%	487	432	454	138	0.27%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	1,001	1,001	1.97%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	136	136	0.27%	0%	0.00%	0	0%	0.00%	0	0%	0.00%	0
									5,956			3,313			1,682
									11.75%			8.54%			3.32%

Trip Distribution Table **Sage / Unser Comm. Dev. (SE Corner)**

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

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 *Socioeconomic*
 2030 *Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico*

							(SW) Sage Rd West			(8N) 86th St North		
DASZ #	% Sub Area In Study	2004 Population	2030 Population	Interpolated Population for the Year 2014	Population In Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030									
Boundary Specified on DASZ Map												
5805	35%	79	97	86	30	0.06%	0%	0.00%	0	0%	0.00%	0
5806	100%	609	635	619	619	1.22%	0%	0.00%	0	0%	0.00%	0
5811	25%	3959	3816	3,904	976	1.93%	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,241	1,241	2.45%	0%	0.00%	0	0%	0.00%	0
5831	100%	609	635	619	619	1.22%	0%	0.00%	0	0%	0.00%	0
5833	95%	3608	3385	3,522	3,346	8.60%	0%	0.00%	0	0%	0.00%	0
5801	60%	1335	1608	1,440	664	1.70%	0%	0.00%	0	0%	0.00%	0
5803	60%	810	622	815	489	0.96%	0%	0.00%	0	0%	0.00%	0
5811	40%	739	889	720	288	0.57%	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1063	1,030	1,030	2.03%	0%	0.00%	0	0%	0.00%	0
5732	100%	127	758	370	370	0.73%	0%	0.00%	0	0%	0.00%	0
5733	100%	110	220	152	152	0.30%	0%	0.00%	0	0%	0.00%	0
5735	100%	1608	1491	1,563	1,563	3.08%	0%	0.00%	0	0%	0.00%	0
5734	100%	384	918	589	589	1.16%	0%	0.00%	0	0%	0.00%	0
5841	100%	1554	1592	1,569	1,569	3.09%	0%	0.00%	0	0%	0.00%	0
5843	100%	133	123	129	129	0.25%	0%	0.00%	0	0%	0.00%	0
5842	95%	1736	1694	1,720	1,634	3.22%	0%	0.00%	0	0%	0.00%	0
6821	25%	424	473	443	111	0.22%	0%	0.00%	0	0%	0.00%	0
5751	100%	3382	3151	3,261	3,261	6.47%	0%	0.00%	0	0%	0.00%	0
5752	100%	1313	2482	1,763	1,763	3.48%	0%	0.00%	0	0%	0.00%	0
5831	95%	2224	2115	2,162	2,073	4.09%	0%	0.00%	0	0%	0.00%	0
5833	15%	2571	2640	2,598	390	0.77%	0%	0.00%	0	0%	0.00%	0
5837	60%	673	809	848	509	1.00%	0%	0.00%	0	0%	0.00%	0
5832	20%	846	775	819	184	0.32%	0%	0.00%	0	0%	0.00%	0
5753	65%	1310	1224	1,277	1,085	2.14%	0%	0.00%	0	0%	0.00%	0
5754	25%	608	1397	911	228	0.45%	0%	0.00%	0	0%	0.00%	0
5743	55%	54	4901	1,918	1,055	2.08%	0%	0.00%	0	0%	0.00%	0
5742	20%	0	3765	1,448	290	0.57%	0%	0.00%	0	0%	0.00%	0
5722	75%	4878	9670	6,721	5,041	9.94%	50%	4.97%	2,521	0%	0.00%	0
5714	100%	3983	4264	4,079	4,079	8.05%	0%	0.00%	0	0%	0.00%	0
5711	100%	1703	1658	1,686	1,686	3.33%	50%	1.66%	843	0%	0.00%	0
5723	70%	3993	4116	4,040	2,628	5.58%	50%	2.79%	1,414	0%	0.00%	0
5712	100%	1881	1992	1,924	1,924	3.80%	35%	1.33%	673	30%	1.14%	577
5713	100%	409	733	534	534	1.05%	0%	0.00%	0	50%	0.53%	267
5716	100%	1795	2283	1,975	1,975	3.90%	0%	0.00%	0	0%	0.00%	0
5715	100%	2515	2774	2,615	2,615	5.16%	0%	0.00%	0	50%	2.58%	1,308
5703	100%	1690	1762	1,841	1,841	3.63%	50%	1.82%	921	0%	0.00%	0
5702	35%	49	58	52	16	0.04%	100%	0.04%	16	0%	0.00%	0
5841	10%	479	438	463	46	0.09%	50%	0.05%	23	0%	0.00%	0
5801	55%	542	926	690	380	0.75%	0%	0.00%	0	40%	0.30%	152
5802	30%	467	432	454	136	0.27%	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	1,001	1,001	1.97%	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	138	138	0.27%	0%	0.00%	0	30%	0.08%	41
					65,787	50,697	100.00%	6,412		2,345		
								12.65%		4.62%		

Trip Distribution Table **Sage / Unser Comm. Dev. (SE Corner)**

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

2004 and 2030 Data Taken from Mid-Region Council of Governments' 2030 Socioeconomic
 2030 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico

							(TW)			(SC)		
							Tower Rd West			Sage Rd Central		
DASZ #	% Sub Area In Study	2004 Population	2030 Population	Interpolated Population for the Year 2014	Population In Study	Percent Population	% Utilizing	% Population Utilizing	Population	% Utilizing	% Population Utilizing	Population
		2004	2030									
Boundary Specified on DASZ Map												
5806	35%	79	97	86	30	0.06%	0%	0.00%	0	0%	0.00%	0
5806	100%	609	635	619	619	1.22%	0%	0.00%	0	0%	0.00%	0
5811	25%	3959	3616	3,904	976	1.93%	0%	0.00%	0	0%	0.00%	0
5832	100%	1214	1283	1,241	1,241	2.45%	0%	0.00%	0	0%	0.00%	0
5831	100%	609	635	619	619	1.22%	0%	0.00%	0	0%	0.00%	0
5833	95%	3608	3385	3,522	3,346	6.60%	0%	0.00%	0	0%	0.00%	0
5801	80%	1335	1608	1,440	864	1.70%	0%	0.00%	0	0%	0.00%	0
5803	80%	810	622	615	489	0.96%	0%	0.00%	0	0%	0.00%	0
5811	40%	739	889	720	288	0.57%	0%	0.00%	0	0%	0.00%	0
5731	100%	1010	1083	1,030	1,030	2.03%	0%	0.00%	0	0%	0.00%	0
5732	100%	127	758	370	370	0.73%	0%	0.00%	0	50%	0.36%	165
5733	100%	110	220	152	152	0.30%	0%	0.00%	0	0%	0.00%	0
5735	100%	1608	1491	1,583	1,583	3.08%	0%	0.00%	0	25%	0.77%	391
5734	100%	384	918	589	589	1.16%	0%	0.00%	0	0%	0.00%	0
5641	100%	1554	1592	1,569	1,569	3.09%	0%	0.00%	0	0%	0.00%	0
5843	100%	133	123	129	129	0.25%	0%	0.00%	0	0%	0.00%	0
5842	95%	1736	1694	1,720	1,634	3.22%	0%	0.00%	0	0%	0.00%	0
6621	25%	424	473	443	111	0.22%	0%	0.00%	0	0%	0.00%	0
5751	100%	3362	3151	3,281	3,281	6.47%	0%	0.00%	0	0%	0.00%	0
5752	100%	1313	2482	1,763	1,763	3.48%	0%	0.00%	0	0%	0.00%	0
5631	95%	2224	2115	2,182	2,073	4.09%	0%	0.00%	0	0%	0.00%	0
5633	15%	2571	2640	2,598	390	0.77%	0%	0.00%	0	0%	0.00%	0
5837	80%	673	809	848	509	1.00%	0%	0.00%	0	0%	0.00%	0
5632	20%	846	775	819	164	0.32%	0%	0.00%	0	0%	0.00%	0
5753	85%	1310	1224	1,277	1,085	2.14%	0%	0.00%	0	0%	0.00%	0
5754	25%	608	1397	911	226	0.45%	0%	0.00%	0	0%	0.00%	0
5743	55%	54	4901	1,916	1,055	2.06%	0%	0.00%	0	0%	0.00%	0
5742	20%	0	3765	1,448	290	0.57%	0%	0.00%	0	0%	0.00%	0
5722	75%	4878	9870	6,721	5,041	9.94%	0%	0.00%	0	0%	0.00%	0
5714	100%	3983	4264	4,079	4,079	8.05%	0%	0.00%	0	0%	0.00%	0
5711	100%	1703	1658	1,688	1,688	3.33%	0%	0.00%	0	0%	0.00%	0
5723	70%	3993	4116	4,040	2,826	6.58%	50%	2.79%	1,414	0%	0.00%	0
5712	100%	1881	1992	1,924	1,924	3.80%	35%	1.33%	673	0%	0.00%	0
5713	100%	409	733	534	534	1.05%	50%	0.53%	267	0%	0.00%	0
5716	100%	1795	2263	1,975	1,975	3.90%	50%	1.95%	988	0%	0.00%	0
5715	100%	2515	2774	2,615	2,615	5.16%	50%	2.58%	1,308	0%	0.00%	0
5703	100%	1890	1762	1,841	1,841	3.63%	50%	1.82%	921	0%	0.00%	0
5702	35%	49	58	52	18	0.04%	0%	0.00%	0	0%	0.00%	0
5841	10%	479	438	463	46	0.09%	0%	0.00%	0	0%	0.00%	0
5801	55%	542	926	690	380	0.75%	0%	0.00%	0	0%	0.00%	0
5802	30%	467	432	454	136	0.27%	0%	0.00%	0	0%	0.00%	0
5807	100%	737	1424	1,001	1,001	1.97%	0%	0.00%	0	0%	0.00%	0
5717	100%	3	350	136	136	0.27%	0%	0.00%	0	0%	0.00%	0
						65,767	50,697	100.00%	5,570	576		
									10.99%	1.14%		

(SE) Sage / Unser Comm. Dev.

(SE) 9.93

(SE Corner)

Trip Distribution Map (%)

COORS BLVD NW
(CN)

7.50

(CS)

6.38



SAGE RD

(SC)

1.14

(TE)

1.38

TOWER RD

(UN)

8.72

UNSER BLVD

(TW)

10.99

86th ST
(8N)

4.62

(SW)

12.65

(8S)

3.32

(AW)

6.54

ARENAL RD

(AE)

15.10

(US)

11.75

Tony O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

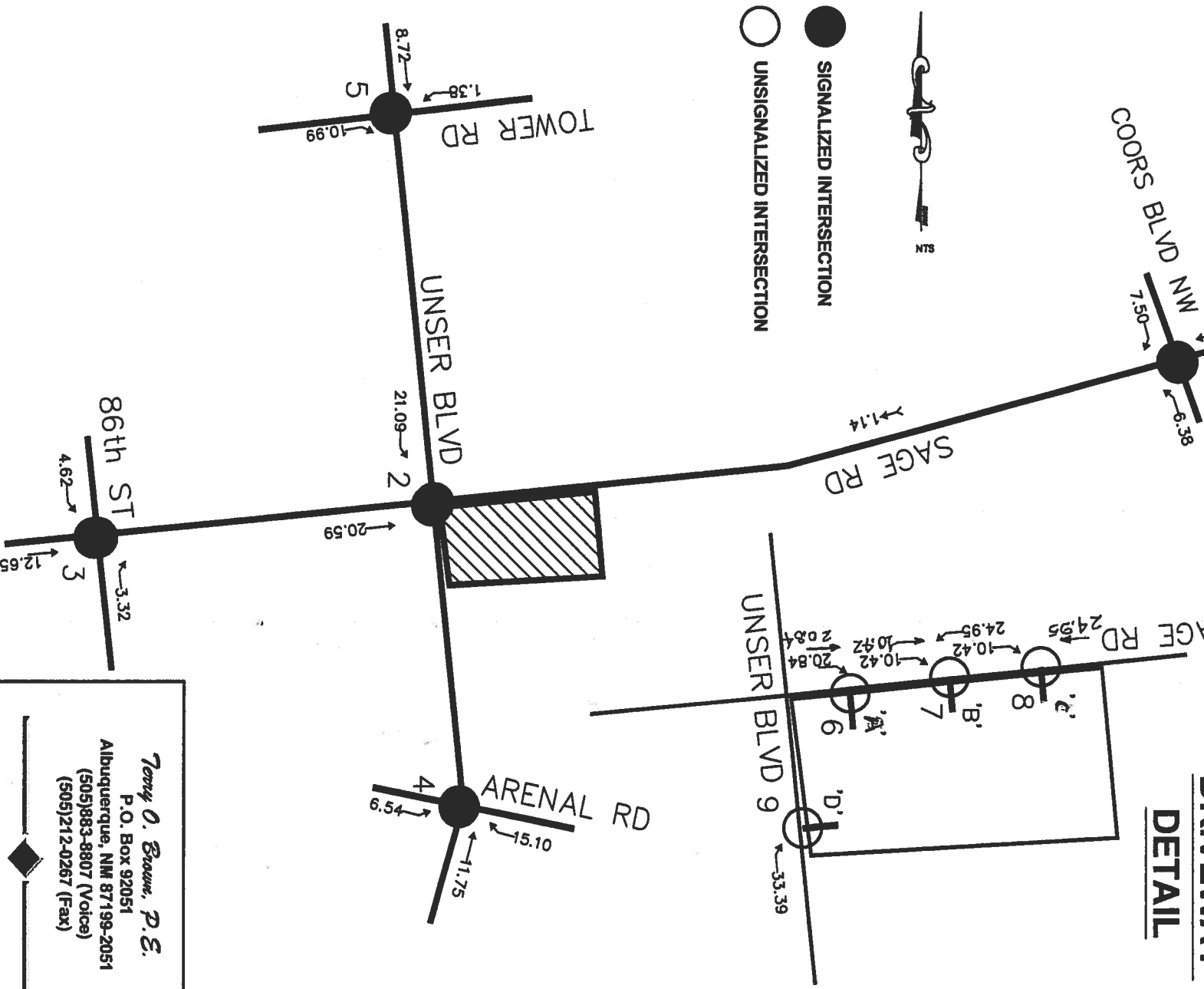


Sage / Unser Comm. Dev.

(SE Corner)

° Trip Assignments (% Entering)

DRIVEWAY DETAIL



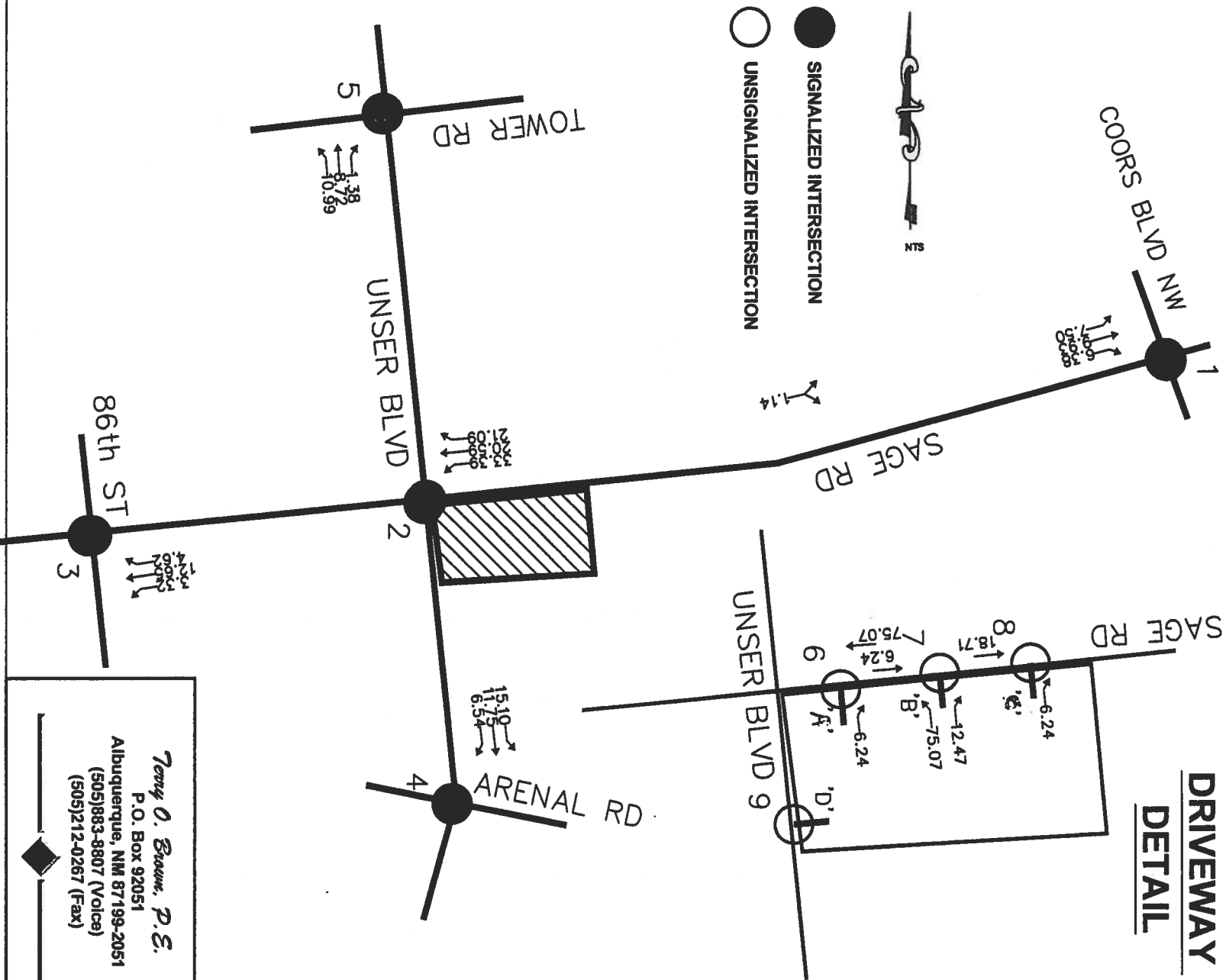
Terry O. Braun, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

Sage / Unser Comm. Dev.

(SE Corner)

Trip Assignments (% Exiting)

DRIVEWAY DETAIL



Teeny O. Braun, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

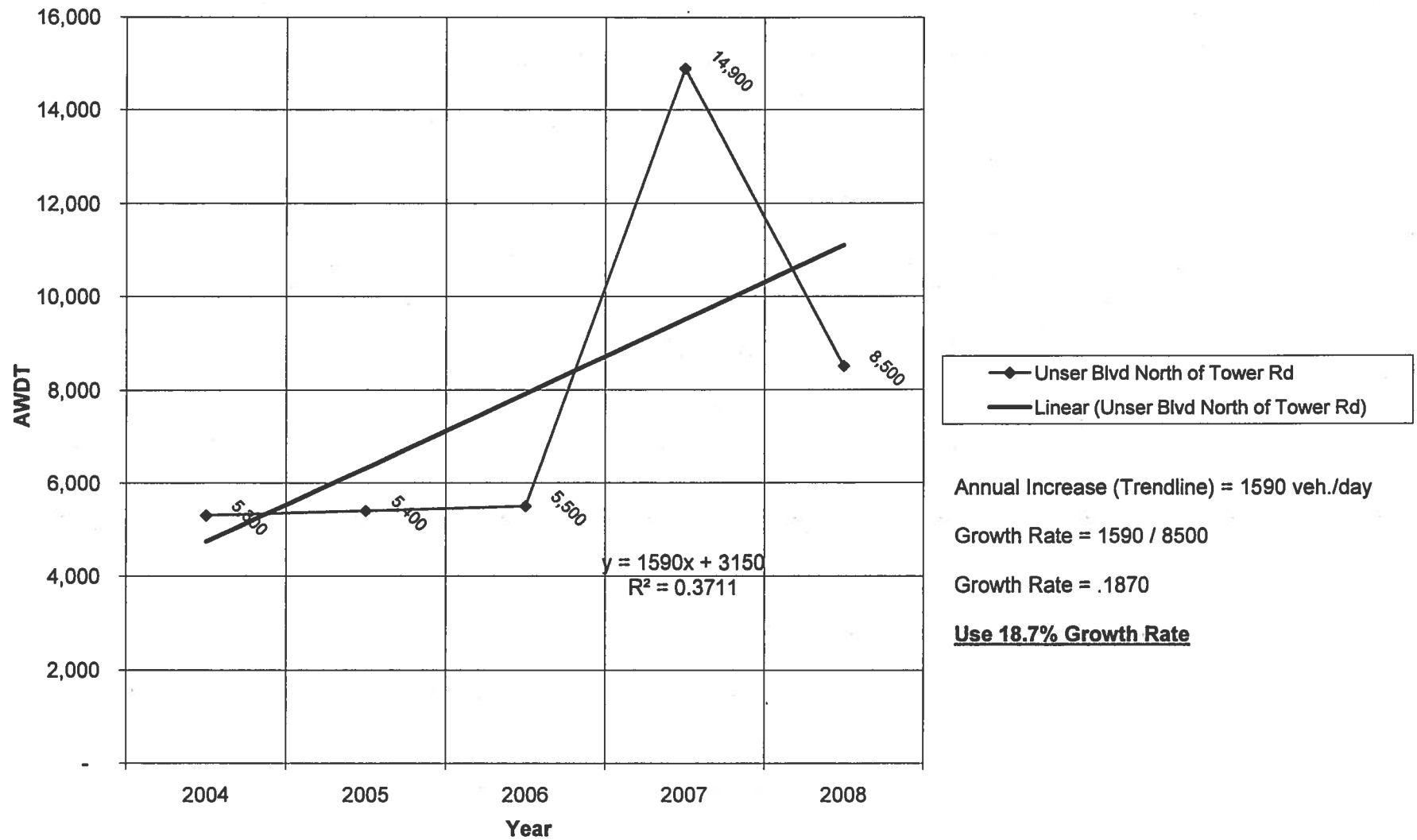


Sage / Unser Commercial Development (SE Corner)
Historic Growth Rate Table

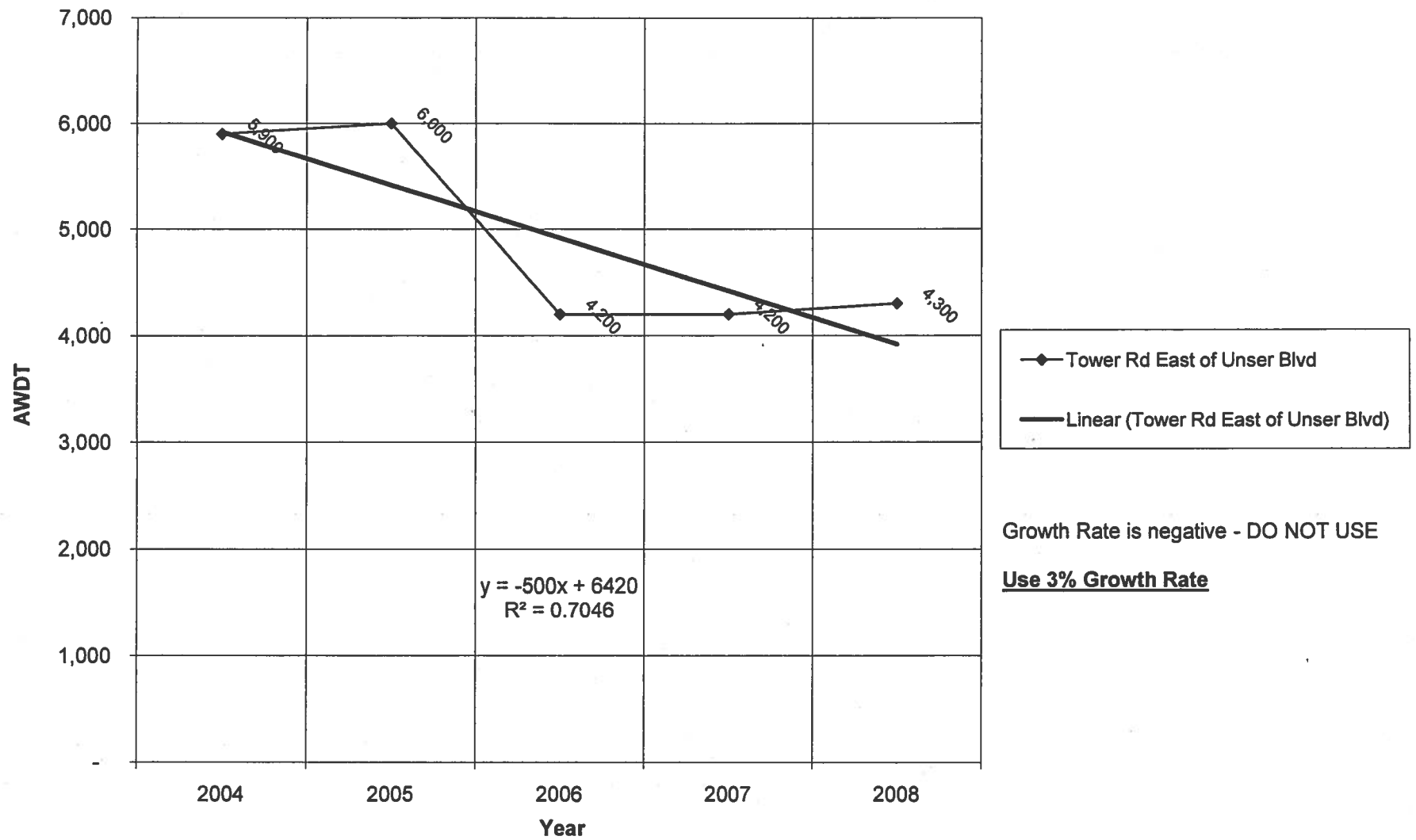
Traffic Flows from MRCOG Map

	2004	2005	2006	2007	2008
Unser Blvd North of Tower Rd	5,300	5,400	5,500	14,900	8,500
Tower Rd East of Unser Blvd	5,900	6,000	4,200	4,200	4,300
Sage Rd between Unser & Coors	8,800	8,900	9,000	9,100	5,000
Coors Blvd North of Sage Rd	22,900	23,600	23,900	24,200	54,300
Sage Rd East of Coors Blvd	3,900	4,800	4,900	5,000	6,100
Arenal Rd East of Unser Blvd	11,200	11,500	11,700	12,600	10,300
Unser Blvd South of Arenal Rd	6,400	6,500	6,600	6,700	5,000
Unser between Arenal & Sage	7,600	10,700	10,900	11,000	10,200
Sage Rd between Unser & 86th St	6,700	6,900	7,000	7,100	8,000
Sage Rd West of 86th St	5,600	5,800	4,200	4,700	4,700
86th St North of Sage Rd	6,300	6,500	6,600	3,700	3,700
Unser Blvd between Sage & Tower	2,200	2,300	2,300	6,700	6,700
Tower Rd West of Unser Blvd	6,900	7,100	3,600	3,600	3,700

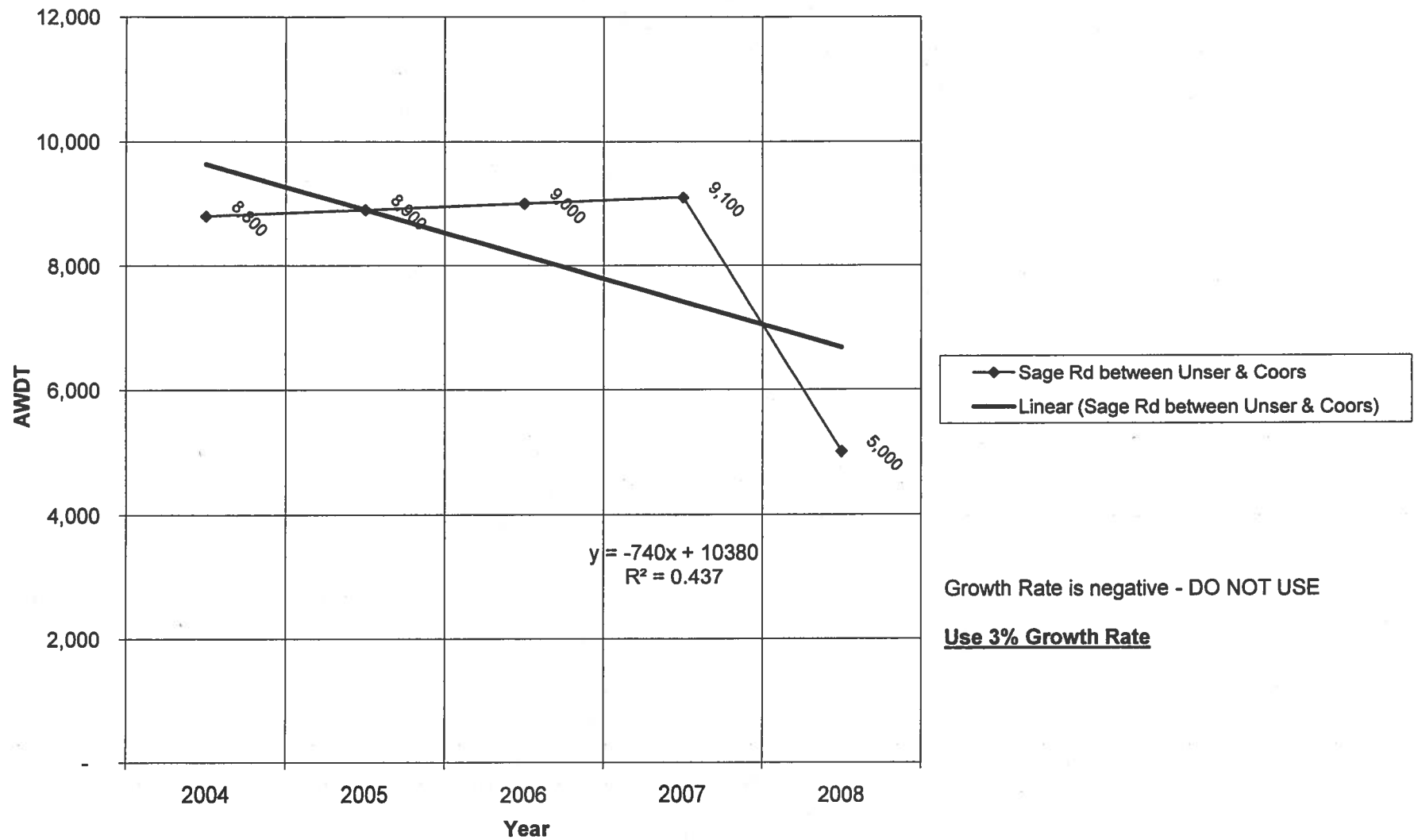
Historic Growth Chart Unser Blvd North of Tower Rd (2004-2008)



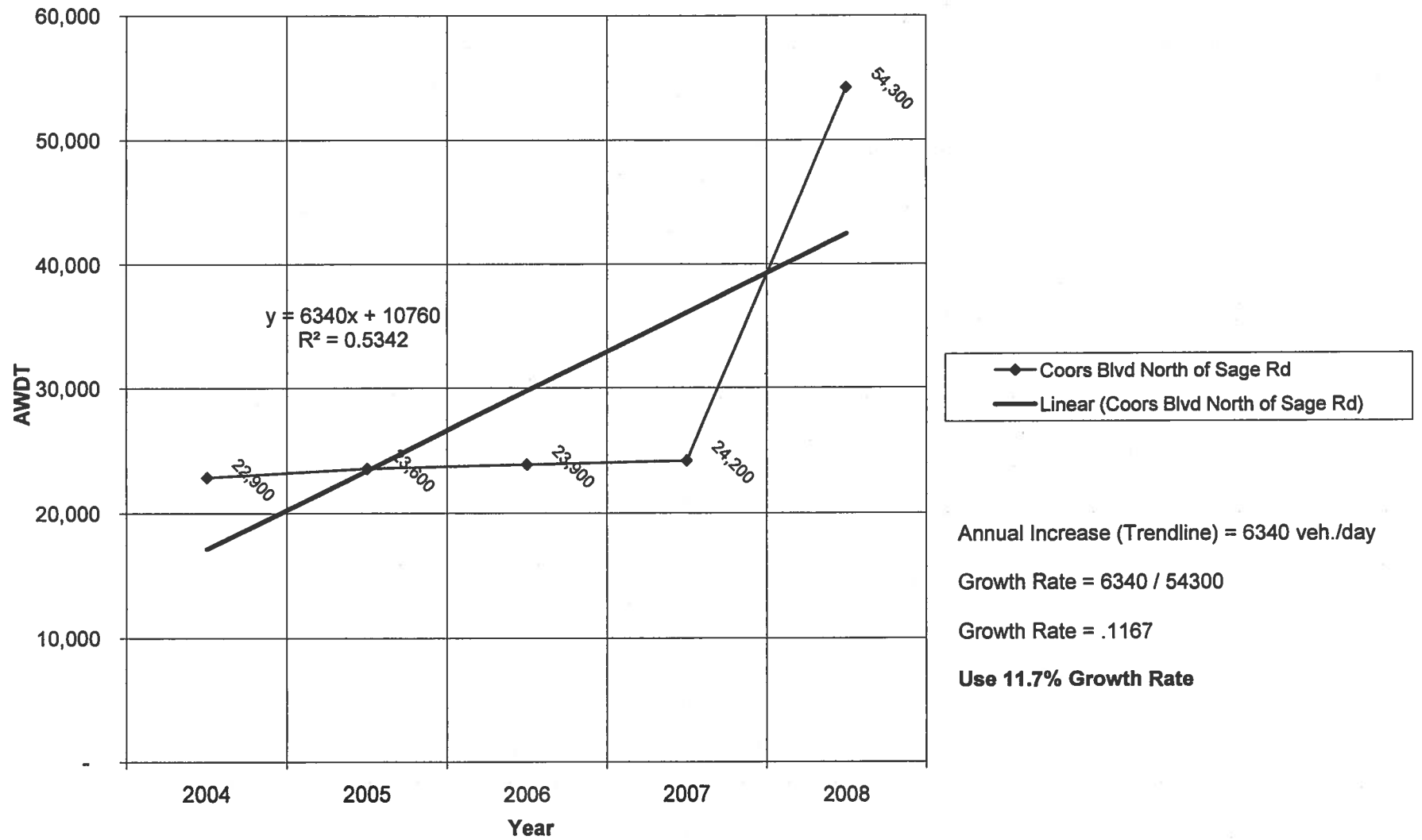
Historic Growth Chart Tower Rd East of Unser Blvd (2004-2008)



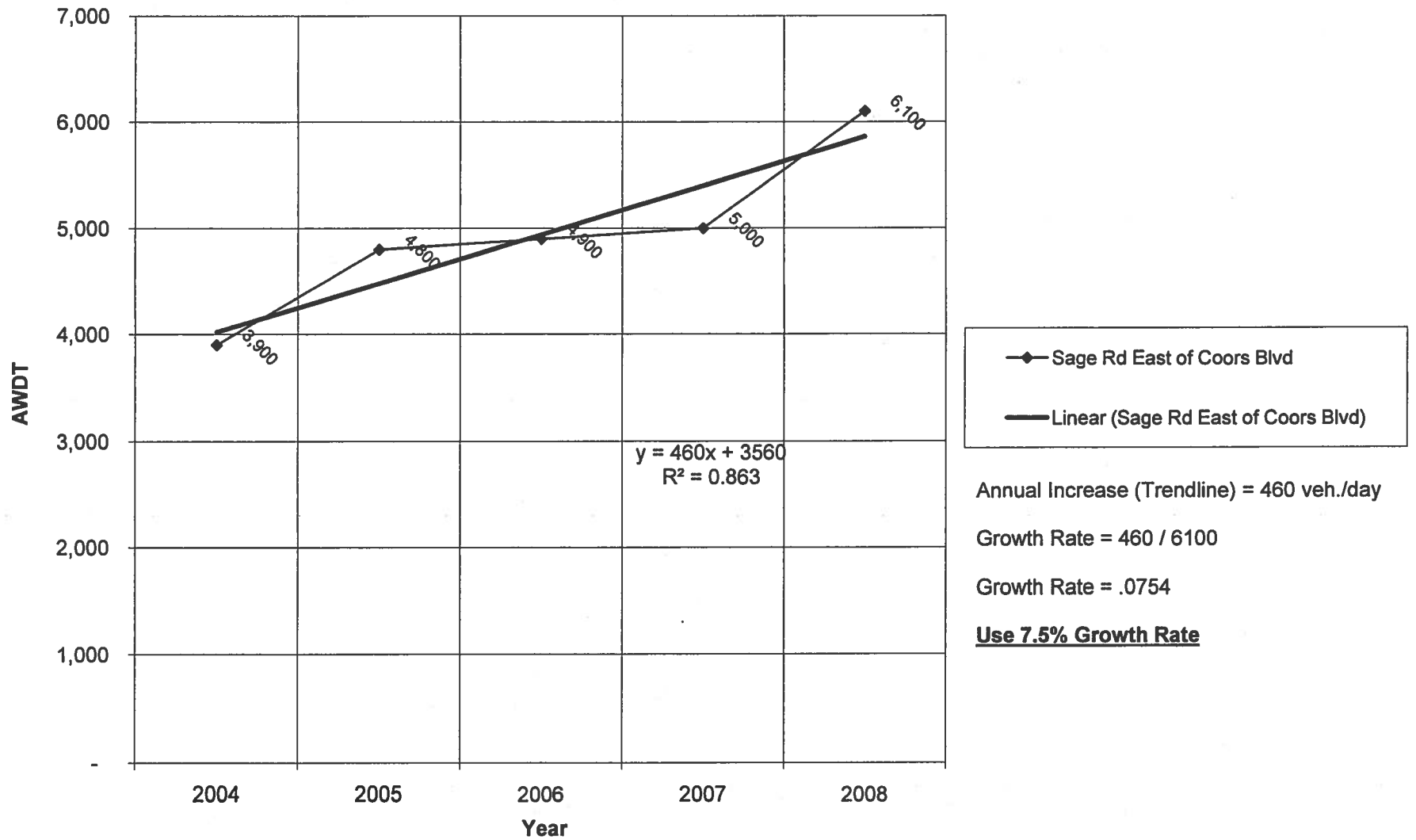
Historic Growth Chart Sage Rd between Unser & Coors (2004-2008)



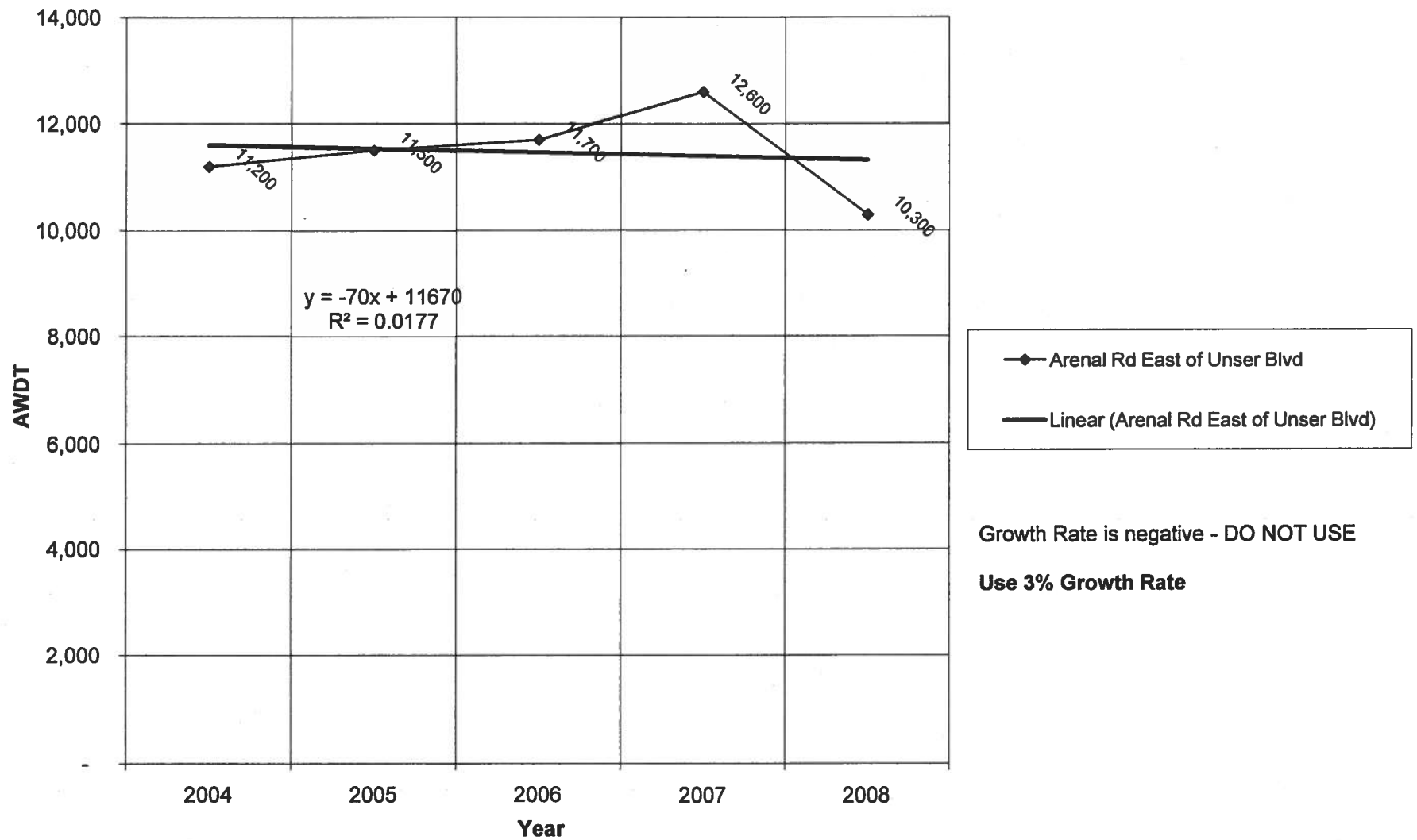
Historic Growth Chart Coors Blvd North of Sage Rd (2004-2008)



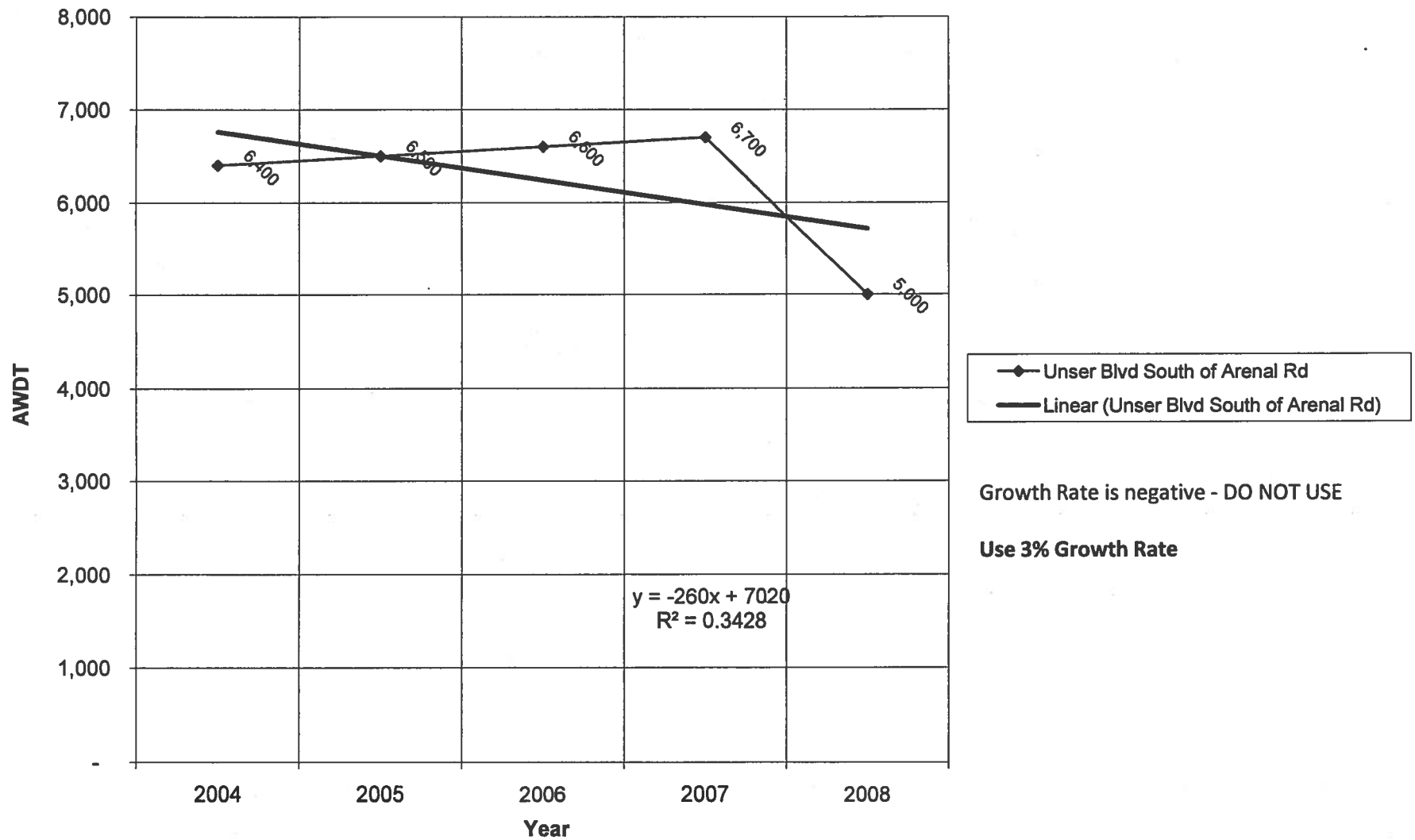
Historic Growth Chart Sage Rd East of Coors Blvd (2004-2008)



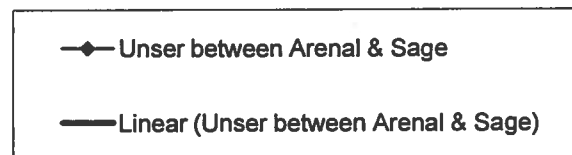
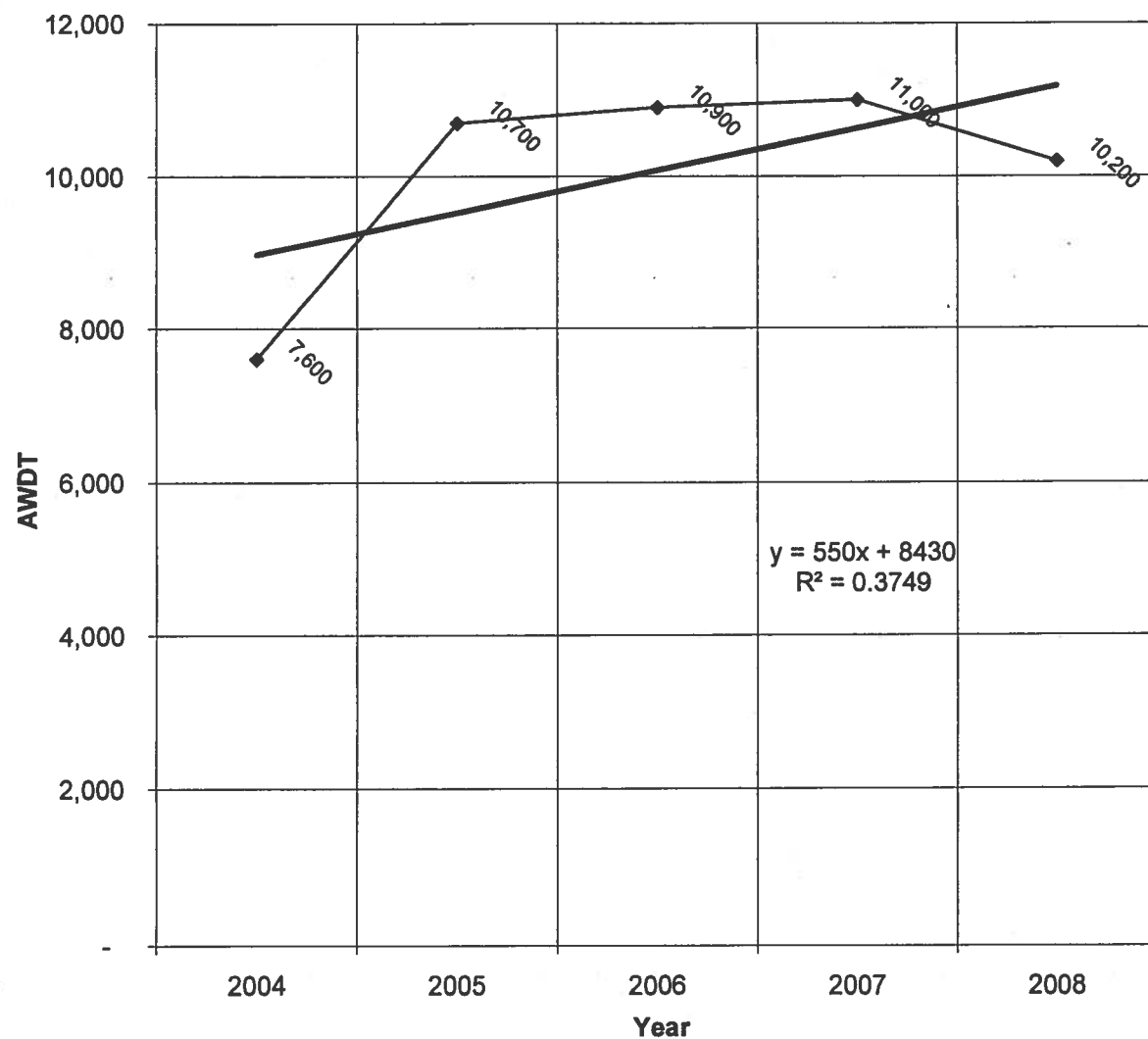
Historic Growth Chart Arenal Rd East of Unser Blvd (2004-2008)



Historic Growth Chart Unser Blvd South of Arenal Rd (2004-2008)



Historic Growth Chart Unser between Arenal & Sage (2004-2008)



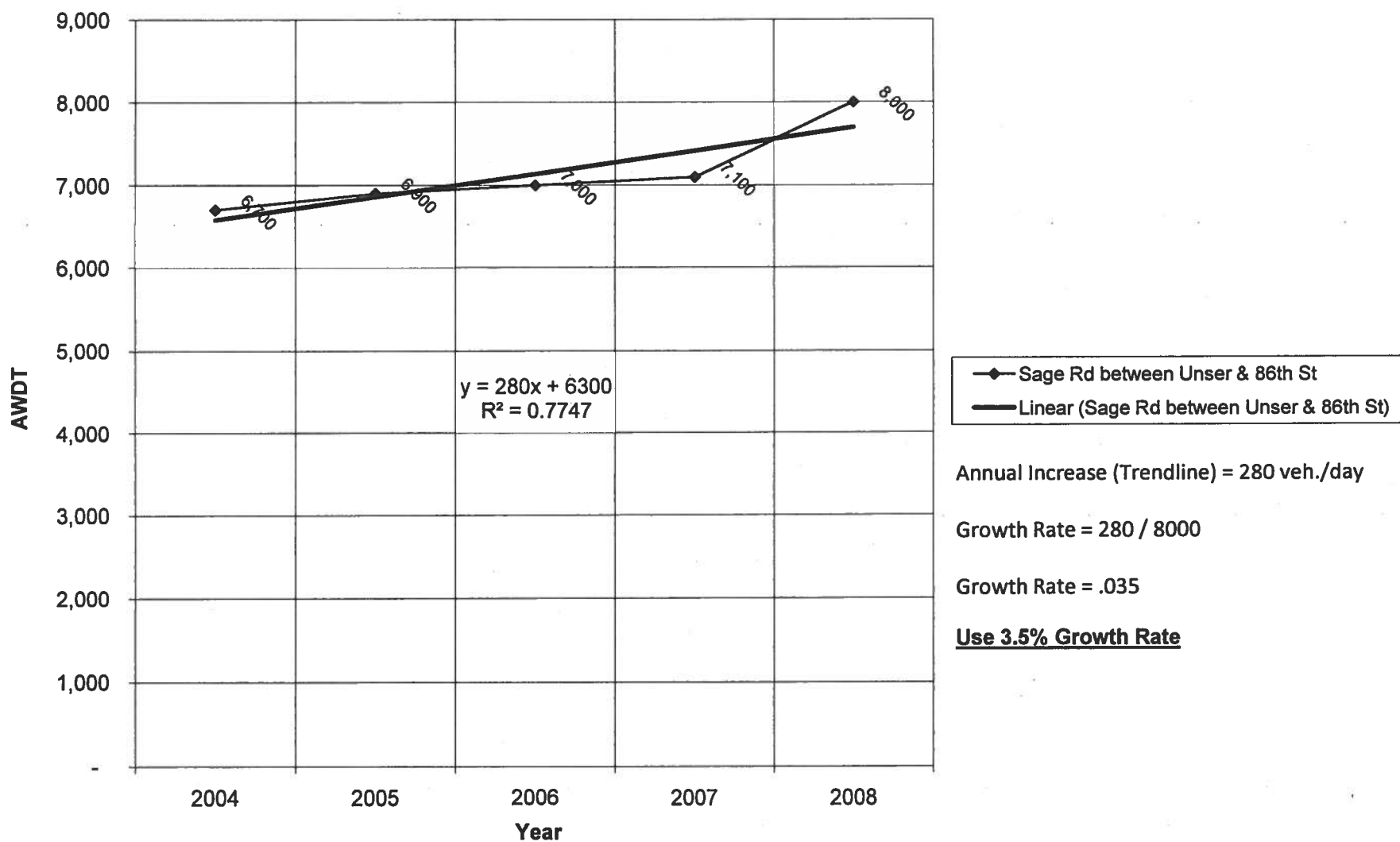
Annual Increase (Trendline) = 550 veh./day

Growth Rate = $550 / 10200$

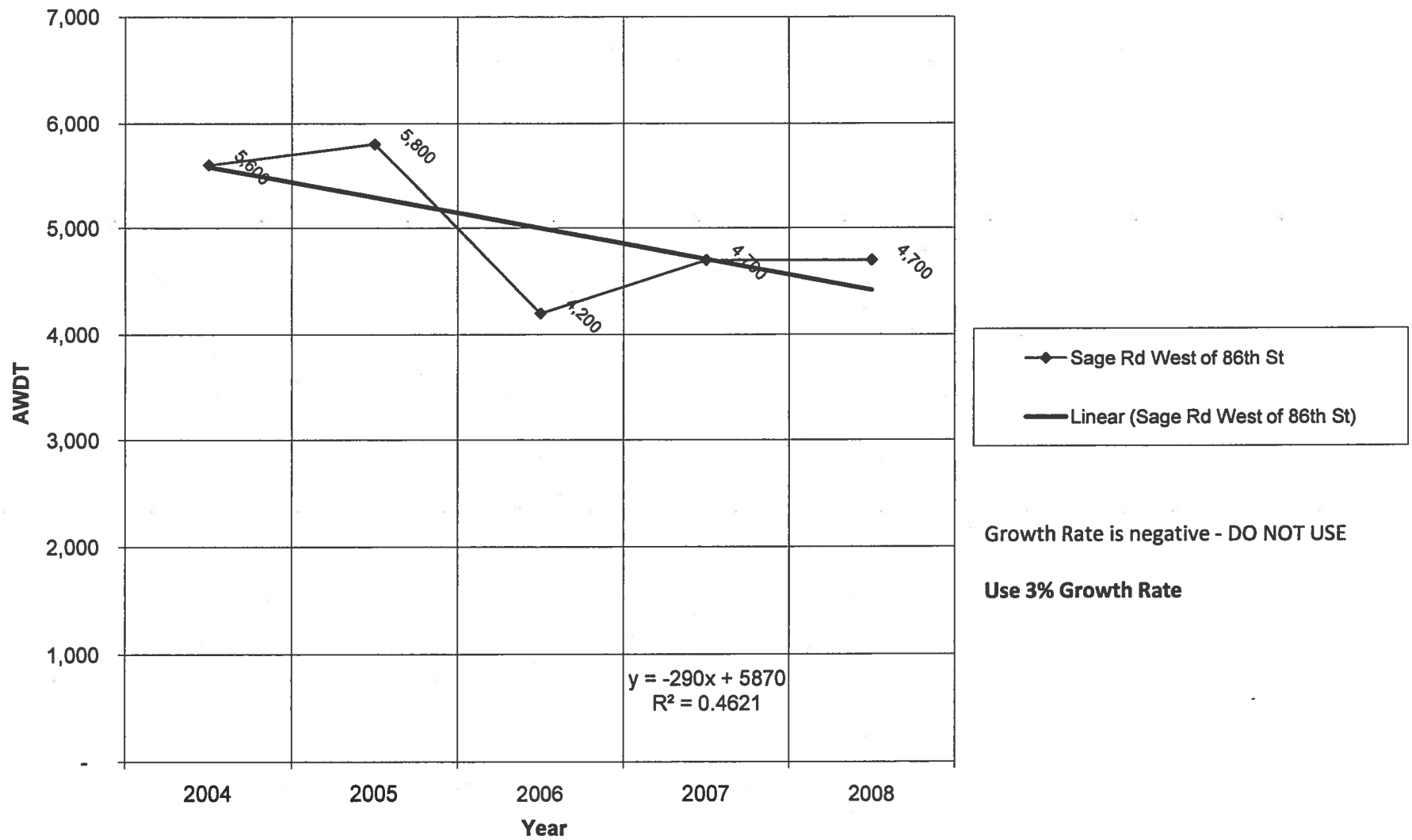
Growth Rate = .0539

Use 5.4% Growth Rate

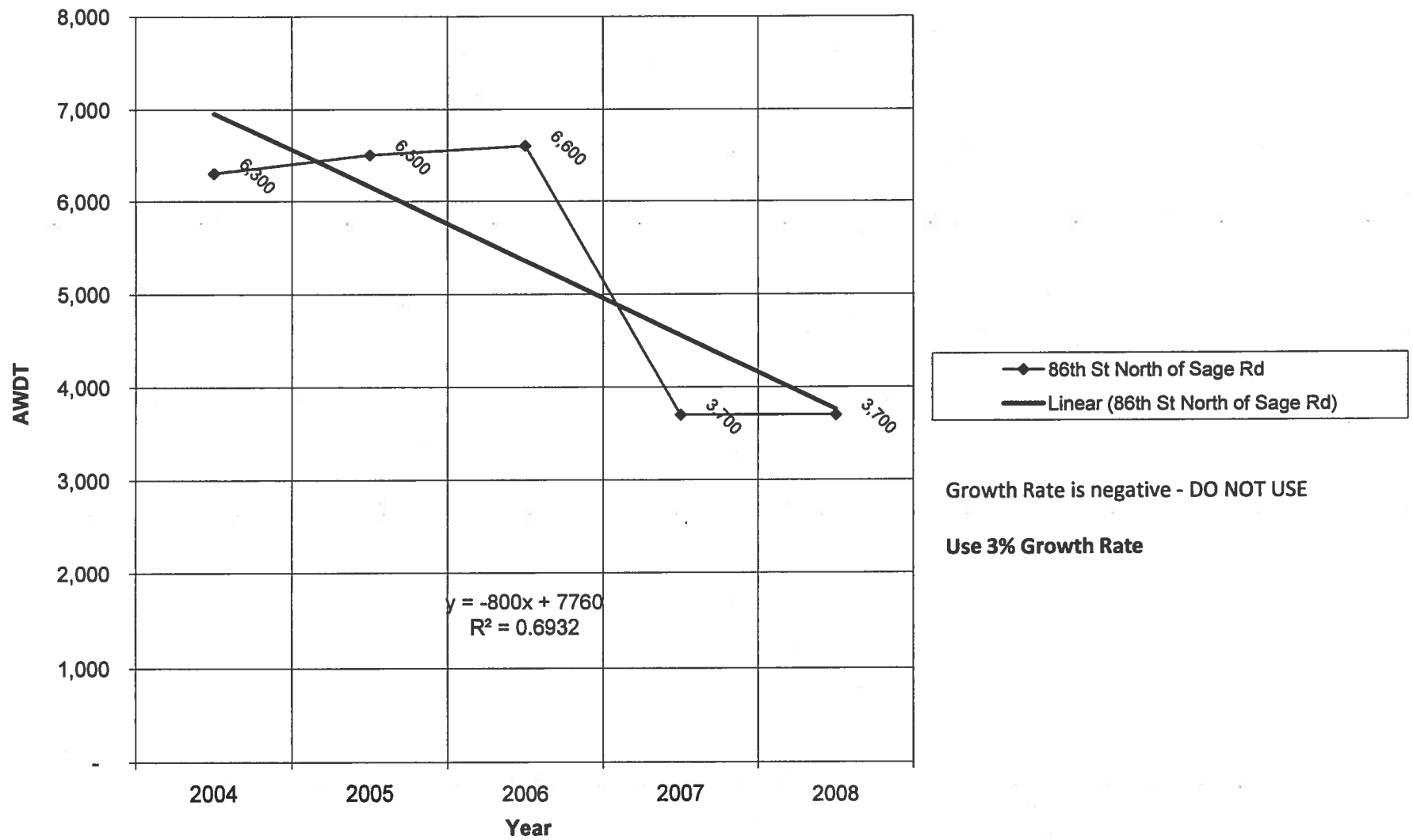
Historic Growth Chart Sage Rd between Unser & 86th St (2004-2008)



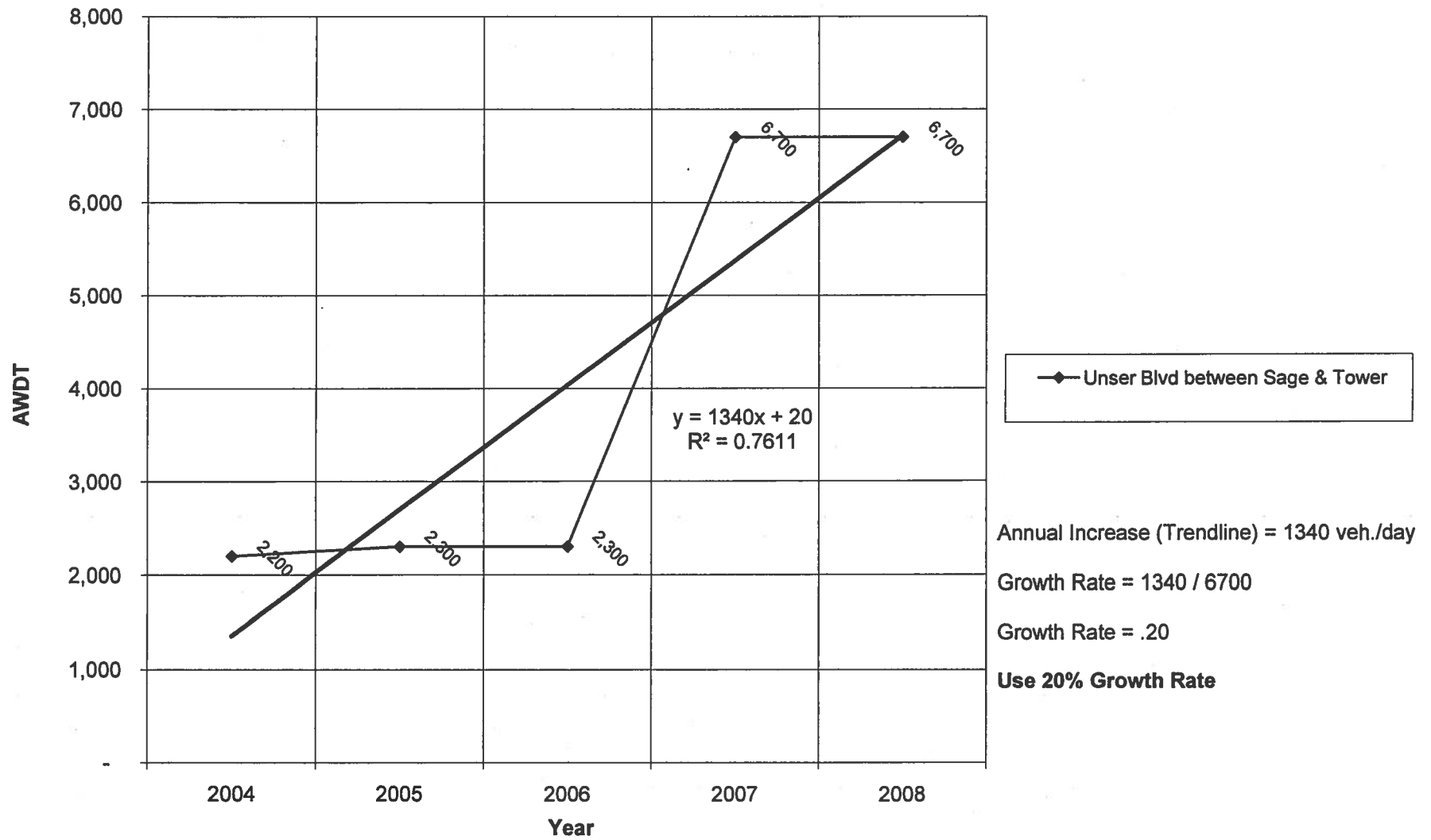
Historic Growth Chart Sage Rd West of 86th St (2004-2008)



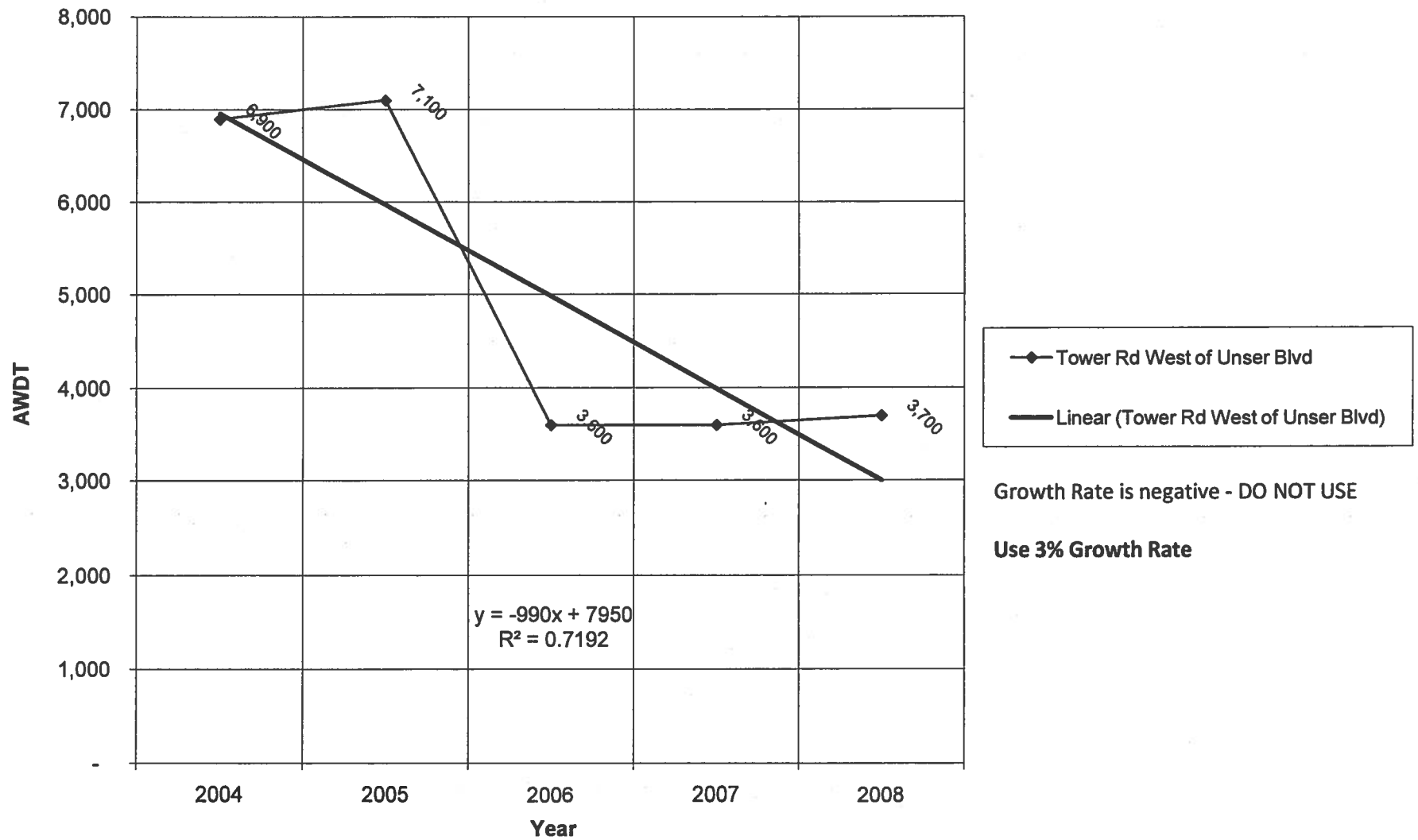
Historic Growth Chart 86th St North of Sage Rd (2004-2008)



Historic Growth Chart Unser Blvd between Sage & Tower (2004-2008)



Historic Growth Chart Tower Rd West of Unser Blvd (2004-2008)



Sage / Unser Comm. Dev.

7.5 (SE Corner)

Growth Rate Map (%)

COORS BLVD NW

11.7

3*



SAGE RD

3*

* Generic growth rate of 3% used where rate is negative or unavailable

3*

18.7

TOWER RD

UNSER BLVD

20.0

3.5

5.4

ARENAL RD

3*

3*

3*

3*

3*

86th ST

3*

3*

Tony O. Baum, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)



Sage / Unser Commercial Development (SEE Corner)
 Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2014 - 100% Development)

INTERSECTION:**Summary**

Sage Rd / Coors Blvd NW		0.91		0.65		0.87		0.77		PHF			
(1)	3.0% Truck	Eastbound (Sage Rd)		Westbound (Sage Rd)		Northbound (Coors Blvd NW)		Southbound (Coors Blvd NW)					
Existing (2010)		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
		173	402	49	5	97	31	23	639	13	34	456	92
2014 (NO BUILD - A.M.)		200	458	71	7	136	40	37	716	15	50	689	142
2014 (BUILD - A.M.)		223	488	90	7	169	40	58	716	15	50	669	167

		0.89			0.92			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
Existing (2010) 2014 (NO BUILD - P.M.) 2014 (BUILD - P.M.)		85	146	35	8	242	38	45	608	0	33	773	287
		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

Sage Rd / Unser Blvd		0.78			0.83			0.87			0.76			PHF
(2)	3.7% Truck	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)			
Existing (2010)		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
2014 (NO BUILD - A.M.)		18	381	136	80	110	12	105	337	222	43	361	8	
2014 (BUILD - A.M.)		53	459	160	134	168	13	140	602	286	81	651	27	
		53	528	160	236	231	77	140	602	286	152	651	27	

		0.93			0.95			0.91			0.85			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		
Existing (2010)	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			
2014 (NO BUILD - P.M.)															
2014 (BUILD - P.M.)															

Sage Rd / 98th St		0.84		0.80		0.90		0.75		PHF			
(3)	3.0% Truck	Eastbound (Sage Rd)		Westbound (Sage Rd)		Northbound (98th St)		Southbound (98th St)					
Existing (2010)		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
		72	407	20	18	193	39	15	79	47	39	45	48
2014 (NO BUILD - A.M.)		81	456	22	21	220	44	17	88	53	44	50	54
2014 (BUILD - A.M.)		81	498	22	31	259	58	17	88	64	59	50	54

		0.89		0.84		0.85		0.88		PHF			
		Eastbound (Sage Rd)		Westbound (Sage Rd)		Northbound (98th St)		Southbound (98th St)					
		Left	Thru	Right	Left	Thru	Right	Left	Thru	Right			
Existing (2010)		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
2014 (NO BUILD - P.M.)													
2014 (BUILD - P.M.)													

Sage / Unser Commercial Development (SE Corner)
 Projected Turning Movements SUMMARY
PROPOSED DEVELOPMENT (2014) - 100% Development

INTERSECTION:**Summary**

Arsenal Rd / Unser Blvd		0.74		0.78		0.67		0.92		PHF	
(4)		3.4% Truck									
Existing (2010)											
2014 (NO BUILD - A.M.)											
2014 (BUILD - A.M.)											
Eastbound (Arsenal Rd)		Westbound (Arsenal 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

Eastbound (Arsenal Rd)		Westbound (Arsenal 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	398	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

Tower Rd / Unser Blvd		0.85		0.90		0.89		0.95		PHF	
(5)		3.0% Truck									
Existing (2010)											
2014 (NO BUILD - A.M.)											
2014 (BUILD - A.M.)											
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	1,163	103	65	651	66

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

Sage Rd / Driveway 'A'		0.83		0.83		0.85		0.85		PHF	
(6)		3.7% Truck									
Existing (2010)											
2014 (NO BUILD - A.M.)											
2014 (BUILD - A.M.)											
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	19	0	0	0	0

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 (SEE Corner)
 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 - P.M.)

0.63			0.63			0.65			0.65		
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	755	0	0	314	0	0	0	0	0	0	0
0	809	35	84	314	0	229	0	38	0	0	0

3.0% Truck
 2014 (NO BUILD - P.M.)
 2014 (BUILD - P.M.)

0.95			0.95			0.95			0.95		
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	489	0	0	926	0	0	0	0	0	0	0
0	558	43	104	926	0	309	0	51	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			0.86			0.85		
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	755	0	0	314	0	0	0	0	0	0	0
0	812	35	0	398	0	0	0	19	0	0	0

Existing (2010)
 2014 (NO BUILD - P.M.)
 2014 (BUILD - P.M.)

0.95			0.95			0.95			0.85		
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	489	0	0	926	0	0	0	0	0	0	0
0	566	43	0	1,030	0	0	0	26	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		
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	1,028	0	0	743	0
0	0	0	0	0	0	0	1,028	112	0	743	0

Existing (2010)
 2014 (NO BUILD - P.M.)
 2014 (BUILD - P.M.)

0.85			0.85			0.91			0.91		
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	904	0	0	1,176	0
0	0	0	0	0	0	0	904	139	0	1,176	0

Sage / Unser Commercial Development (SE Corner)
Projected Turning Movements Worksheet
Sage Rd / Coors Blvd NW

INTERSECTION:

E-W Street: Sage Rd
N-S Street: Coors Blvd NW

(1)

Year of Existing Counts
Implementation Year

2010
2014

Growth Rates

	3.00%			7.50%			3.00%			11.70%		
	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
Existing Volumes	173	402	49	5	97	31	23	639	13	34	456	92
Background Traffic Growth	21	48	6	2	29	9	3	77	2	16	213	43
Subtotal	194	450	55	7	126	40	26	716	15	50	669	135
SW Corner Sage / Unser	6	8	16	0	10	0	11	0	0	0	0	7
Subtotal (NO BUILD - A.M.)	200	458	71	7	136	40	37	716	15	50	669	142
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	9.93%	0.00%	6.38%	0.00%	0.00%	0.00%	0.00%	0.00%	7.50%
Percent Commercial Trips Generated(Exiting)	7.50%	9.93%	6.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	23	30	19	0	33	0	21	0	0	0	0	25
Total AM Peak Hour BUILD Volumes	223	488	90	7	169	40	58	716	15	50	669	167

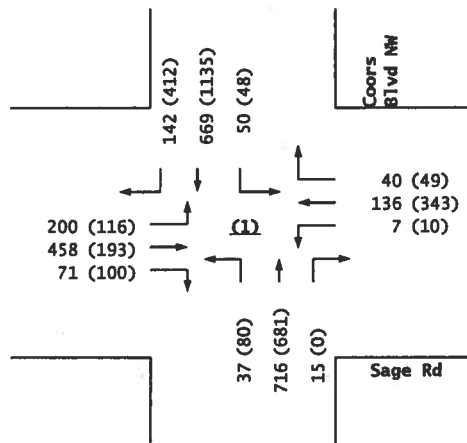
	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Coors Blvd NW)			Southbound (Coors Blvd NW)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	85	146	35	8	242	38	45	608	0	33	773	267
Background Traffic Growth	10	18	4	2	73	11	5	73	0	15	362	125
Subtotal	95	164	39	10	315	49	50	681	0	48	1,135	392
SW Corner Sage / Unser	21	29	61	0	28	0	30	0	0	0	0	20
Subtotal (NO BUILD - P.M.)	116	193	100	10	343	49	80	681	0	48	1,135	412
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	9.93%	0.00%	6.38%	0.00%	0.00%	0.00%	0.00%	7.50%
Percent Commercial Trips Generated(Exiting)	7.50%	9.93%	6.38%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	31	41	26	0	41	0	27	0	0	0	0	31
Total PM Peak Hour BUILD Volumes	147	234	126	10	384	49	107	681	0	48	1,135	443

Number of Commercial Trips Generated

Entering Exiting
335 305 A.M.
416 411 P.M.

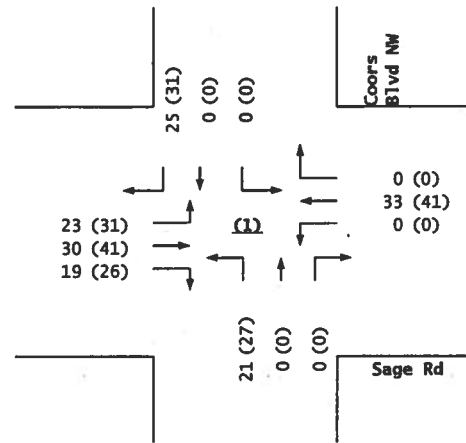
100% Commercial Development

2014
NO BUILD

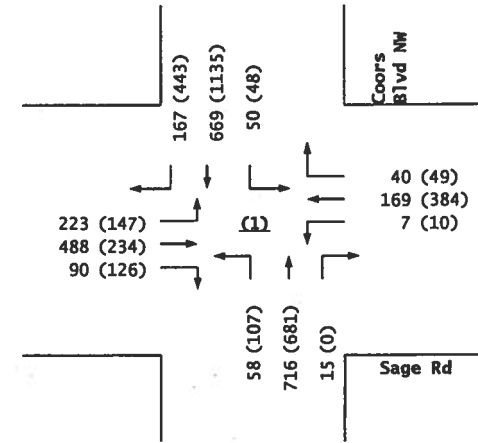


Trips

2014
BUILD



Sage Rd / Coors Blvd NW



Sage / Unser Commercial Development (SEE Corner)
Projected Turning Movements Worksheet
Sage Rd / Unser Blvd

INTERSECTION :

E-W Street: Sage Rd
N-S Street: Unser Blvd

(2)

Year of Existing Counts
Implementation Year

2008
2014

Growth Rates

	3.50%			3.00%			5.40%			20.00%		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	17	337	127	75	104	11	95	304	200	31	258	6
Background Traffic Growth	4	71	27	14	19	2	31	98	65	37	310	7
Subtotal	21	408	154	89	123	13	126	402	265	68	568	13
Anderson Hills / Anderson Heights	0	0	0	3	0	0	0	155	17	0	71	0
Greg Sanchez Development	5	5	5	0	9	0	8	0	0	0	0	8
Previous development from below	22	45	1	42	35	0	5	45	4	13	12	5
Subtotal (NO BUILD - A.M.)	53	459	160	134	168	13	140	602	286	81	651	27
Percent Commercial Trips Generated(Entering)	0.00%	20.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.09%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	33.39%	20.59%	21.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	69	0	102	63	64	0	0	0	71	0	0
Total AM Peak Hour BUILD Volumes	53	528	160	236	231	77	140	602	286	152	651	27

	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	21	170	116	201	364	20	164	225	50	32	304	18
Background Traffic Growth	4	36	24	36	66	4	53	73	16	38	355	22
Subtotal	25	206	140	237	430	24	217	298	66	70	659	40
Anderson Hills / Anderson Heights	0	0	0	16	0	0	0	198	19	0	166	0
Greg Sanchez Development	25	23	26	0	22	0	24	0	0	0	0	23
Previous development from below	73	147	5	108	90	0	16	65	1	2	33	16
Subtotal (NO BUILD - P.M.)	123	376	171	361	542	24	257	561	86	72	858	79
Percent Commercial Trips Generated(Entering)	0.00%	20.59%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	21.09%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	33.39%	20.59%	21.09%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	86	0	137	85	87	0	0	0	88	0	0
Total PM Peak Hour BUILD Volumes	123	462	171	498	627	111	257	561	86	160	858	79

Number of Commercial Trips Generated

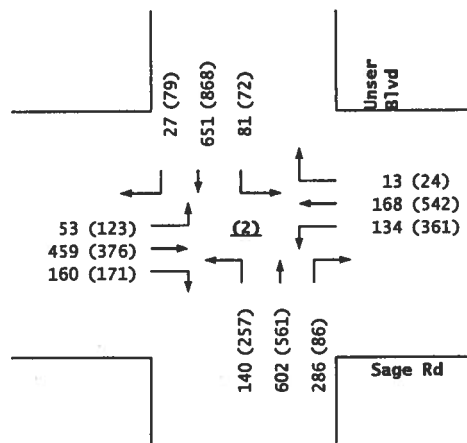
Entering
335
416

Exiting
306
411

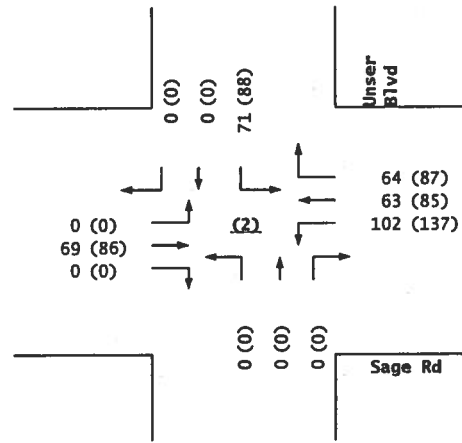
A.M.
P.M.

100% Commercial Development

2014
NO BUILD

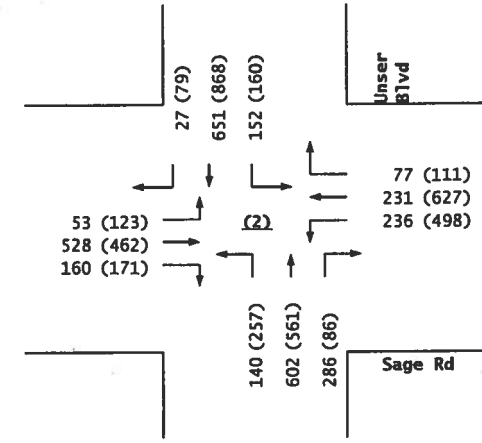


Trips



Sage Rd / Unser Blvd

2014
BUILD



Sage / User Commercial Development (SEE Corner)
Projected Turning Movements Worksheet
Sage Rd / 86th St

INTERSECTION: E-W Street: Sage Rd
N-S Street: 86th St
Year of Existing Counts: 2010
Implementation Year: 2014

(3)

Growth Rates

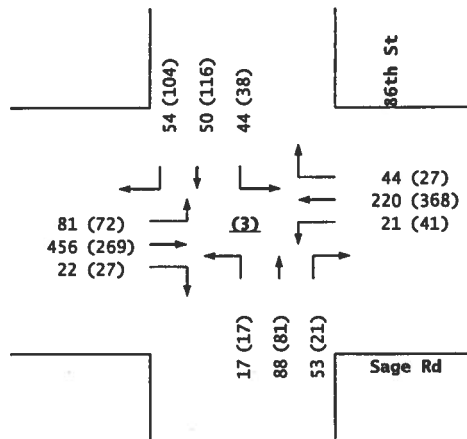
		3.00%		3.50%		3.00%		3.00%	
		Eastbound (Sage Rd)		Westbound (Sage Rd)		Northbound (86th St)		Southbound (86th St)	
Left	Thru	Left	Right	Left	Thru	Left	Thru	Left	Thru
72	407	20	18	193	39	15	79	47	39
9	49	2	3	27	5	2	9	9	5
81	456	22	21	220	44	17	88	53	44
0.00%	12.65%	0.00%	0.00%	0.00%	0.00%	0.00%	3.32%	4.62%	0.00%
0.00%	0.00%	0.00%	3.32%	12.65%	4.62%	0.00%	0.00%	0.00%	0.00%
0	42	0	10	39	14	0	0	11	15
0	42	0	10	39	14	0	0	11	15
Total AM Peak Hour BUILD Volumes	81	498	22	31	259	17	88	64	59
									50
									54

		3.00%		3.50%		3.00%		3.00%	
		Eastbound (Sage Rd)		Westbound (Sage Rd)		Northbound (86th St)		Southbound (86th St)	
Left	Thru	Left	Right	Left	Thru	Left	Thru	Left	Thru
64	240	24	36	323	24	15	72	19	34
8	29	3	5	45	3	2	9	2	4
72	269	27	41	368	27	17	81	21	38
0.00%	12.65%	0.00%	0.00%	0.00%	0.00%	0.00%	3.32%	4.62%	0.00%
0.00%	0.00%	0.00%	3.32%	12.65%	4.62%	0.00%	0.00%	0.00%	0.00%
0	53	0	14	52	19	0	0	14	19
0	53	0	14	52	19	0	0	14	19
Total PM Peak Hour BUILD Volumes	72	322	27	55	420	17	81	35	57
									116
									104

Number of Commercial Trips Generated

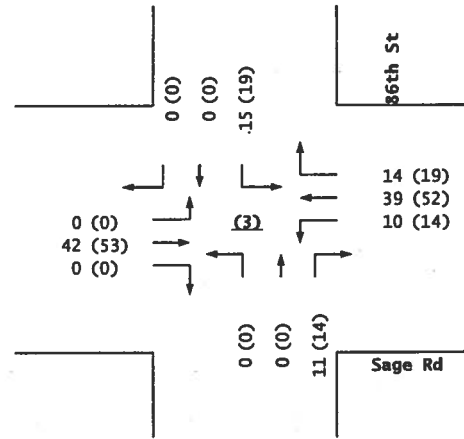
Entering Exiting
335 305 A.M. 100% Commercial Development
416 411 P.M.

2014
NO BUILD

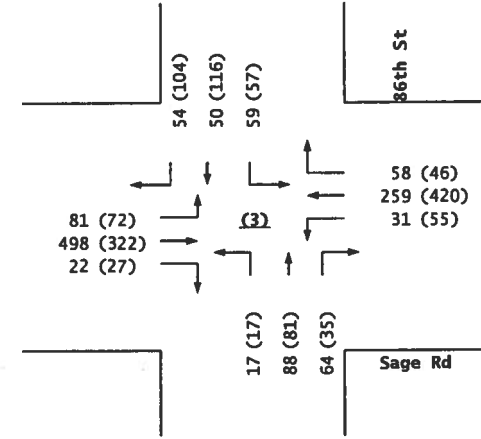


Trips

2014
BUILD



Sage Rd / 86th St



Sage / Unser Commercial Development (SEE Corner)
Projected Turning Movements Worksheet
Arenal Rd / Unser Blvd

INTERSECTION: E-W Street: Arenal Rd
N-S Street: Unser Blvd
Year of Existing Counts 2008
Implementation Year 2014

(4)

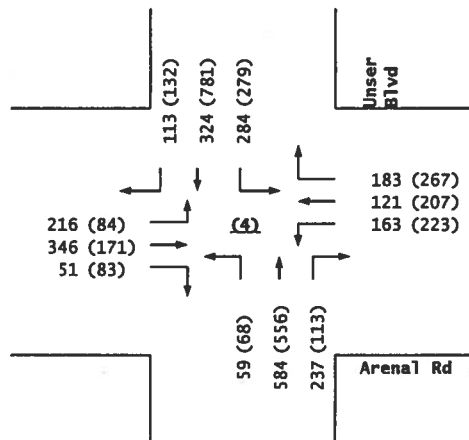
	Growth Rates											
	3.00%			3.00%			3.00%			5.40%		
	Eastbound (Arenal Rd)			Westbound (Arenal Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	183	293	30	136	101	128	27	308	176	209	193	85
Background Traffic Growth	33	53	5	24	18	23	5	55	32	68	63	28
Subtotal	216	346	35	160	119	151	32	363	208	277	256	113
NE Corner Sage / Unser	0	0	0	0	0	15	0	34	0	1	24	0
Anderson Hills / Anderson Heights	0	0	15	3	0	0	26	162	29	0	25	0
SW Corner Sage / Unser	0	0	1	0	2	17	1	25	0	5	19	0
Subtotal (NO BUILD - A.M.)	216	346	51	163	121	183	59	584	237	284	324	113
Percent Commercial Trips Generated(Entering)	6.54%	0.00%	0.00%	0.00%	0.00%	15.10%	0.00%	11.75%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.10%	11.75%	6.54%	6.54%
Total Trips Generated	22	0	0	0	0	51	0	39	0	46	36	20
Total AM Peak Hour BUILD Volumes	238	346	51	163	121	234	59	623	237	330	360	133

	Eastbound (Arenal Rd)			Westbound (Arenal Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	71	144	44	152	171	174	36	187	80	185	357	100
Background Traffic Growth	13	26	8	27	31	31	6	34	16	63	116	32
Subtotal	84	170	52	179	202	205	42	221	106	258	473	132
NE Corner Sage / Unser	0	0	0	0	0	15	0	50	0	0	56	0
Anderson Hills / Anderson Heights	0	0	27	44	0	0	23	217	7	0	182	0
SW Corner Sage / Unser	0	1	4	0	5	47	3	68	0	21	70	0
Subtotal (NO BUILD - P.M.)	84	171	83	223	207	267	68	556	113	279	781	132
Percent Commercial Trips Generated(Entering)	6.54%	0.00%	0.00%	0.00%	15.10%	0.00%	11.75%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	15.10%	11.75%	6.54%	6.54%
Total Trips Generated	27	0	0	0	0	63	0	49	0	62	48	27
Total PM Peak Hour BUILD Volumes	111	171	83	223	207	330	68	605	113	341	829	159

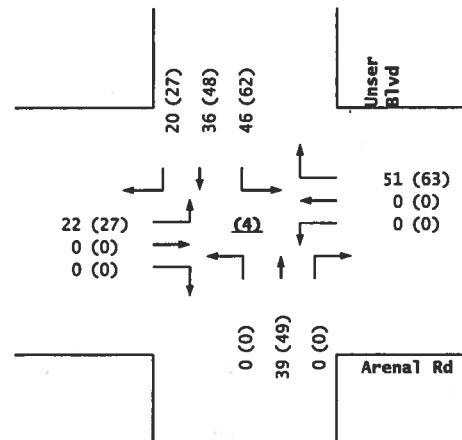
Number of Commercial Trips Generated

Entering	335	Exiting	305	A.M.	100% Commercial Development
	416		411	P.M.	

2014
NO BUILD

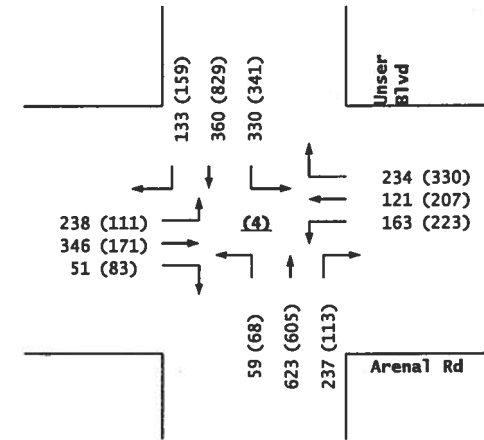


Trips



Arenal Rd / Unser Blvd

2014
BUILD



Sage / Unser Commercial Development (SE Corner)
Projected Turning Movements Worksheet
Tower Rd / Unser Blvd

INTERSECTION:

E-W Street: Tower Rd
N-S Street: Unser Blvd

(5)

Year of Existing Counts
Implementation Year

2010
2014

Growth Rates

	3.00%			3.00%			20.00%			18.70%		
	Eastbound (Tower Rd)	Thru	Right	Westbound (Tower Rd)	Thru	Right	Northbound (Unser Blvd)	Thru	Right	Southbound (Unser Blvd)	Thru	Right
Existing Volumes	134	208	18	17	94	17	51	626	46	37	325	38
Background Traffic Growth	16	25	2	2	11	2	41	501	37	28	243	28
Subtotal	150	233	20	19	105	19	92	1,127	83	65	568	66
NE Corner Sage / Unser	0	0	33	0	0	0	23	29	16	0	54	0
Subtotal (NO BUILD - A.M.)	150	233	53	19	105	19	115	1,156	99	65	622	66
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	10.99%	1.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.72%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.99%	8.72%	1.98%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	37	5	0	0	34	27	4	0	29	0
Total AM Peak Hour BUILD Volumes	150	233	90	24	105	19	149	1,183	103	65	651	66

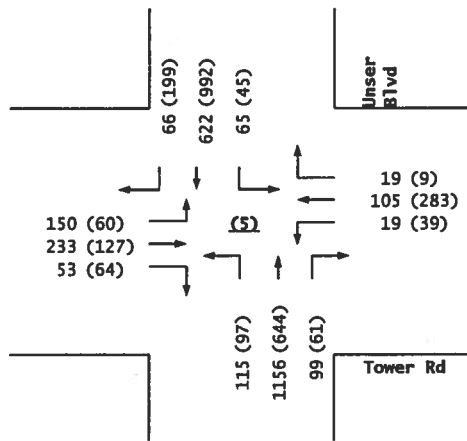
	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	54	113	15	35	253	8	25	315	12	26	534	114
Background Traffic Growth	6	14	2	4	30	1	20	252	10	19	399	85
Subtotal	60	127	17	39	283	9	45	567	22	45	933	199
NE Corner Sage / Unser	0	0	47	0	0	0	52	77	39	0	59	0
Subtotal (NO BUILD - P.M.)	60	127	64	39	283	9	97	644	61	45	992	199
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	10.99%	1.98%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	8.72%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	10.99%	8.72%	1.98%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	46	6	0	0	45	36	6	0	36	0
Total PM Peak Hour BUILD Volumes	60	127	110	45	283	9	142	680	67	45	1,028	199

Number of Commercial Trips Generated

Entering Exiting
335 305 A.M.
418 411 P.M.

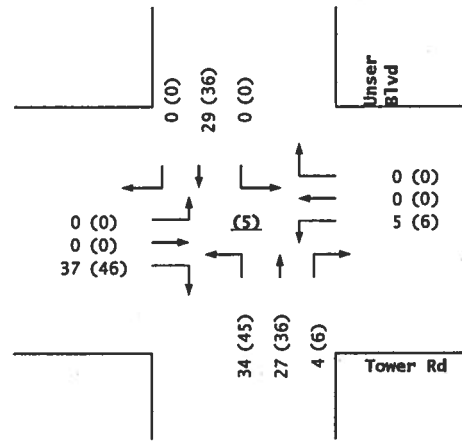
100% Commercial Development

2014
NO BUILD

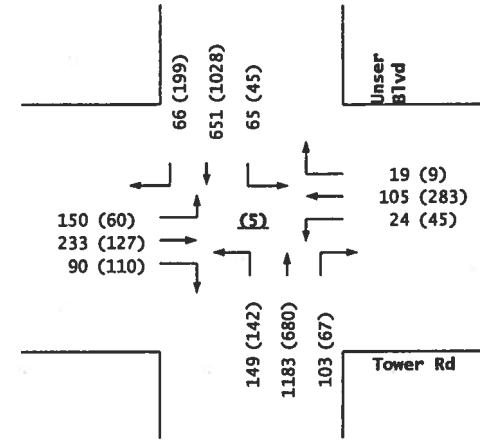


Trips

2014
BUILD



Tower Rd / Unser Blvd



Sage / Unser Commercial Development (SEE Corner)
Projected Turning Movements Worksheet
Sage Rd / Driveway 'A'

INTERSECTION: E-W Street: Sage Rd
N-S Street: Driveway 'A'
Year of Existing Counts 2008
Implementation Year 2014

(6)

Growth Rates

3.00%			3.00%			3.00%			3.00%		
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	568	0	0	180	0	0	0	0	0	0	0
0	102	0	0	34	0	0	0	0	0	0	0
0	670	0	0	224	0	0	0	0	0	0	0
0	17	0	0	3	0	0	0	0	0	0	0
0	5	0	0	9	0	0	0	0	0	0	0
0	63	0	0	78	0	0	0	0	0	0	0
0	755	0	0	314	0	0	0	0	0	0	0
0.00%	20.84%	20.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	75.07%	0.00%	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%
0	70	0	0	229	0	0	0	0	0	0	0
0	825	70	0	543	0	0	19	0	0	0	0
Total AM Peak Hour BUILD Volumes											

3.00%			3.00%			3.00%			3.00%		
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	252	0	0	585	0	0	0	0	0	0	0
0	45	0	0	105	0	0	0	0	0	0	0
0	297	0	0	690	0	0	0	0	0	0	0
0	19	0	0	16	0	0	0	0	0	0	0
0	23	0	0	22	0	0	0	0	0	0	0
0	150	0	0	198	0	0	0	0	0	0	0
0	489	0	0	926	0	0	0	0	0	0	0
0.00%	20.84%	20.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
0.00%	0.00%	0.00%	0.00%	75.07%	0.00%	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%
0	87	0	0	309	0	0	0	0	0	0	0
0	576	87	0	1,235	0	0	26	0	0	0	0
Total PM Peak Hour BUILD Volumes											

Percent Commercial Trips Generated(Entering)
Percent Commercial Trips Generated(Exiting)
Total Trips Generated

Subtotal (NO BUILD - P.M.)

Previous development from below

Greg Sanchez Development

Anderson Hills / Anderson Heights

Subtotal

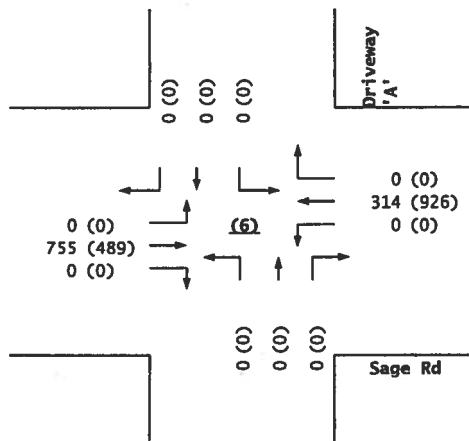
Background Traffic Growth

Existing Volumes

Number of Commercial Trips Generated

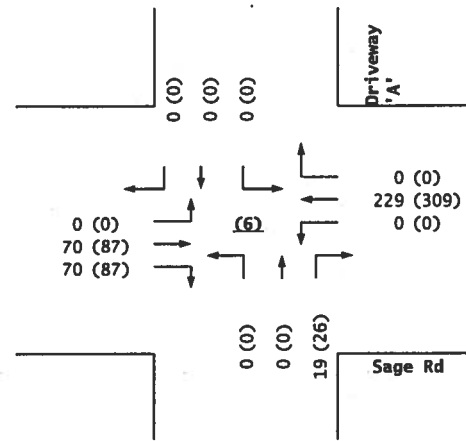
Entering Exiting
335 305 A.M.
416 411 P.M.
100% Commercial Development

2014
NO BUILD

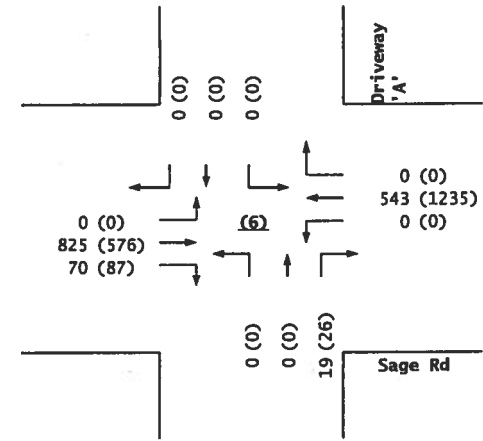


Trips

2014
BUILD



Sage Rd / Driveway 'A'



Sage / User Commercial Development (SEE Corner)
Projected Turning Movements Worksheet
Sage Rd / Driveway 'B'

INTERSECTION:

E-W Street: Sage Rd
N-S Street: Driveway 'B'

(7)

Year of Existing Counts
Implementation Year

2008
2014

Growth Rates

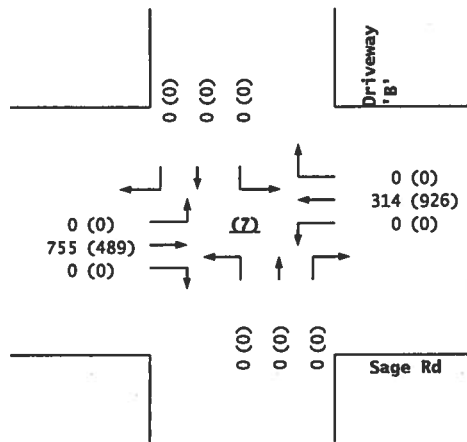
	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'B')			Southbound (Driveway 'B')		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	568	0	0	190	0	0	0	0	0	0	0
Background Traffic Growth	0	102	0	0	34	0	0	0	0	0	0	0
Subtotal	0	670	0	0	224	0	0	0	0	0	0	0
Anderson Hills / Anderson Heights	0	17	0	0	3	0	0	0	0	0	0	0
Greg Sanchez Development	0	5	0	0	9	0	0	0	0	0	0	0
Previous development from below	0	63	0	0	78	0	0	0	0	0	0	0
Subtotal (NO BUILD - A.M.)	0	755	0	0	314	0	0	0	0	0	0	0
Percent Commercial Trips Generated(Entering)	0.00%	10.42%	0.00%	24.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%	75.07%	0.00%	12.47%	0.00%	0.00%	0.00%
Total Trips Generated	0	54	35	84	0	0	229	0	38	0	0	0
Total AM Peak Hour BUILD Volumes	0	809	35	84	314	0	229	0	38	0	0	0

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'B')			Southbound (Driveway 'B')		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	252	0	0	585	0	0	0	0	0	0	0
Background Traffic Growth	0	45	0	0	105	0	0	0	0	0	0	0
Subtotal	0	297	0	0	690	0	0	0	0	0	0	0
Anderson Hills / Anderson Heights	0	19	0	0	16	0	0	0	0	0	0	0
Greg Sanchez Development	0	23	0	0	22	0	0	0	0	0	0	0
Previous development from below	0	150	0	0	198	0	0	0	0	0	0	0
Subtotal (NO BUILD - P.M.)	0	489	0	0	926	0	0	0	0	0	0	0
Percent Commercial Trips Generated(Entering)	0.00%	10.42%	0.00%	24.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%	75.07%	0.00%	12.47%	0.00%	0.00%	0.00%
Total Trips Generated	0	69	43	104	926	0	309	0	51	0	0	0
Total PM Peak Hour BUILD Volumes	0	558	43	104	926	0	309	0	51	0	0	0

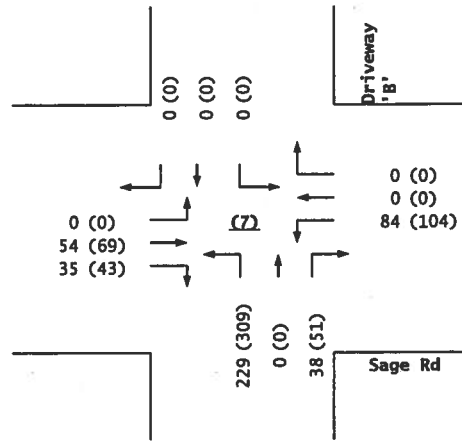
Number of Commercial Trips Generated

Entering	Exiting		
335	305	A.M.	100% Commercial Development
416	411	P.M.	

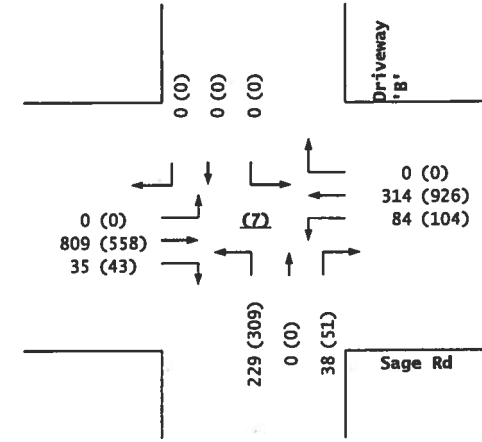
2014
NO BUILD



Trips



2014
BUILD



Sage Rd / Driveway 'B'

Sage / Unser Commercial Development (SE Corner)
Projected Turning Movements Worksheet
Sage Rd / Driveway 'C'

INTERSECTION :

E-W Street: Sage Rd
N-S Street: Driveway 'C'

(8)

Year of Existing Counts
Implementation Year

2008
2014

Growth Rates

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'C')			Southbound (Driveway 'C')		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	568	0	0	190	0	0	0	0	0	0	0
Background Traffic Growth	0	102	0	0	34	0	0	0	0	0	0	0
	0	670	0	0	224	0	0	0	0	0	0	0
<i>Subtotal</i>	0	17	0	0	3	0	0	0	0	0	0	0
Anderson Hills / Anderson Heights	0	5	0	0	9	0	0	0	0	0	0	0
Greg Sanchez Development	0	63	0	0	78	0	0	0	0	0	0	0
Previous development from below	0	755	0	0	314	0	0	0	0	0	0	0
<i>Subtotal (NO BUILD - A.M.)</i>	0.00%	0.00%	10.42%	0.00%	24.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Entering)	0.00%	18.71%	0.00%	0.00%	0.00%	0.00%	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0	57	35	0	84	0	0	0	19	0	0	0
Total Trips Generated	0	812	35	0	398	0	0	0	19	0	0	0
Total AM Peak Hour BUILD Volumes	0	812	35	0	398	0	0	0	19	0	0	0

	3.00%			3.00%			3.00%			3.00%		
	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Driveway 'C')			Southbound (Driveway 'C')		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing Volumes	0	252	0	0	595	0	0	0	0	0	0	0
Background Traffic Growth	0	45	0	0	105	0	0	0	0	0	0	0
	0	297	0	0	690	0	0	0	0	0	0	0
<i>Subtotal</i>	0	19	0	0	16	0	0	0	0	0	0	0
Anderson Hills / Anderson Heights	0	23	0	0	22	0	0	0	0	0	0	0
Greg Sanchez Development	0	150	0	0	198	0	0	0	0	0	0	0
Previous development from below	0	489	0	0	926	0	0	0	0	0	0	0
<i>Subtotal (NO BUILD - P.M.)</i>	0.00%	0.00%	10.42%	0.00%	24.95%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Entering)	0.00%	18.71%	0.00%	0.00%	0.00%	0.00%	0.00%	6.24%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0	77	43	0	104	0	0	0	26	0	0	0
Total Trips Generated	0	566	43	0	1,030	0	0	0	26	0	0	0
Total PM Peak Hour BUILD Volumes	0	566	43	0	1,030	0	0	0	26	0	0	0

Number of Commercial Trips Generated

Entering Exiting
335 305 A.M.
416 411 P.M.

100% Commercial Development

Sage / Unser Commercial Development (SE Corner)
Projected Turning Movements Worksheet
Driveway 'D' / Unser Blvd

INTERSECTION:

E-W Street: Driveway 'D'

(9)

N-S Street: Unser Blvd

NO EXITING TRAFFIC BECAUSE DRIVE IS RIGHT-IN ONLYYear of Existing Counts
Implementation Year

2008

2014

Growth Rates

	3.00%		3.00%		5.40%		5.40%	
	Eastbound (Driveway 'D')	Westbound (Driveway 'D')	Northbound (Unser Blvd)	Southbound (Unser Blvd)	Eastbound (Driveway 'D')	Westbound (Driveway 'D')	Northbound (Unser Blvd)	Southbound (Unser Blvd)
Existing Volumes	0	0	0	0	599	0	0	460
Background Traffic Growth	0	0	0	0	194	0	0	149
Subtotal	0	0	0	0	793	0	0	609
Anderson Hills / Anderson Heights	0	0	0	0	172	0	0	74
Greg Sanchez Development	0	0	0	0	8	0	0	5
Previous development from below	0	0	0	0	55	0	0	55
Subtotal (NO BUILD - A.M.)	0	0	0	0	1,028	0	0	743
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	0	0	112	0	0	0
Total AM Peak Hour BUILD Volumes	0	0	0	0	1,028	112	0	743

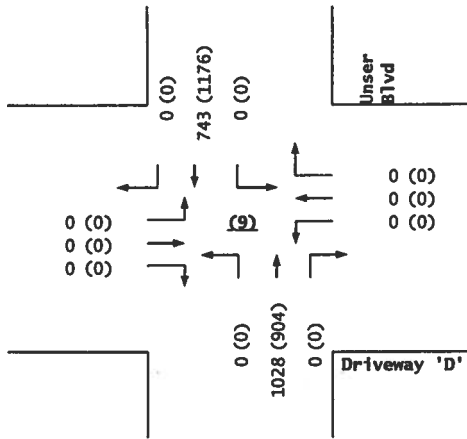
	3.00%		3.00%		5.40%		5.40%	
	Eastbound (Driveway 'D')	Westbound (Driveway 'D')	Northbound (Unser Blvd)	Southbound (Unser Blvd)	Eastbound (Driveway 'D')	Westbound (Driveway 'D')	Northbound (Unser Blvd)	Southbound (Unser Blvd)
Existing Volumes	0	0	0	0	439	0	0	621
Background Traffic Growth	0	0	0	0	142	0	0	201
Subtotal	0	0	0	0	581	0	0	822
Anderson Hills / Anderson Heights	0	0	0	0	217	0	0	182
Greg Sanchez Development	0	0	0	0	24	0	0	26
Previous development from below	0	0	0	0	82	0	0	146
Subtotal (NO BUILD - P.M.)	0	0	0	0	904	0	0	1,176
Percent Commercial Trips Generated(Entering)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Percent Commercial Trips Generated(Exiting)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Total Trips Generated	0	0	0	0	139	0	0	0
Total PM Peak Hour BUILD Volumes	0	0	0	0	904	139	0	1,176

Number of Commercial Trips Generated

Entering	Exiting	
335	305	A.M.
416	411	P.M.

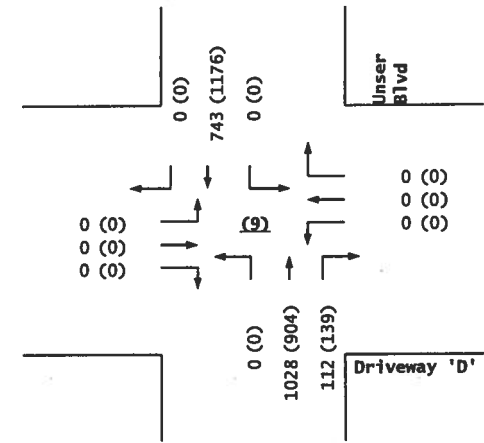
100% Commercial Development

2014
NO BUILD

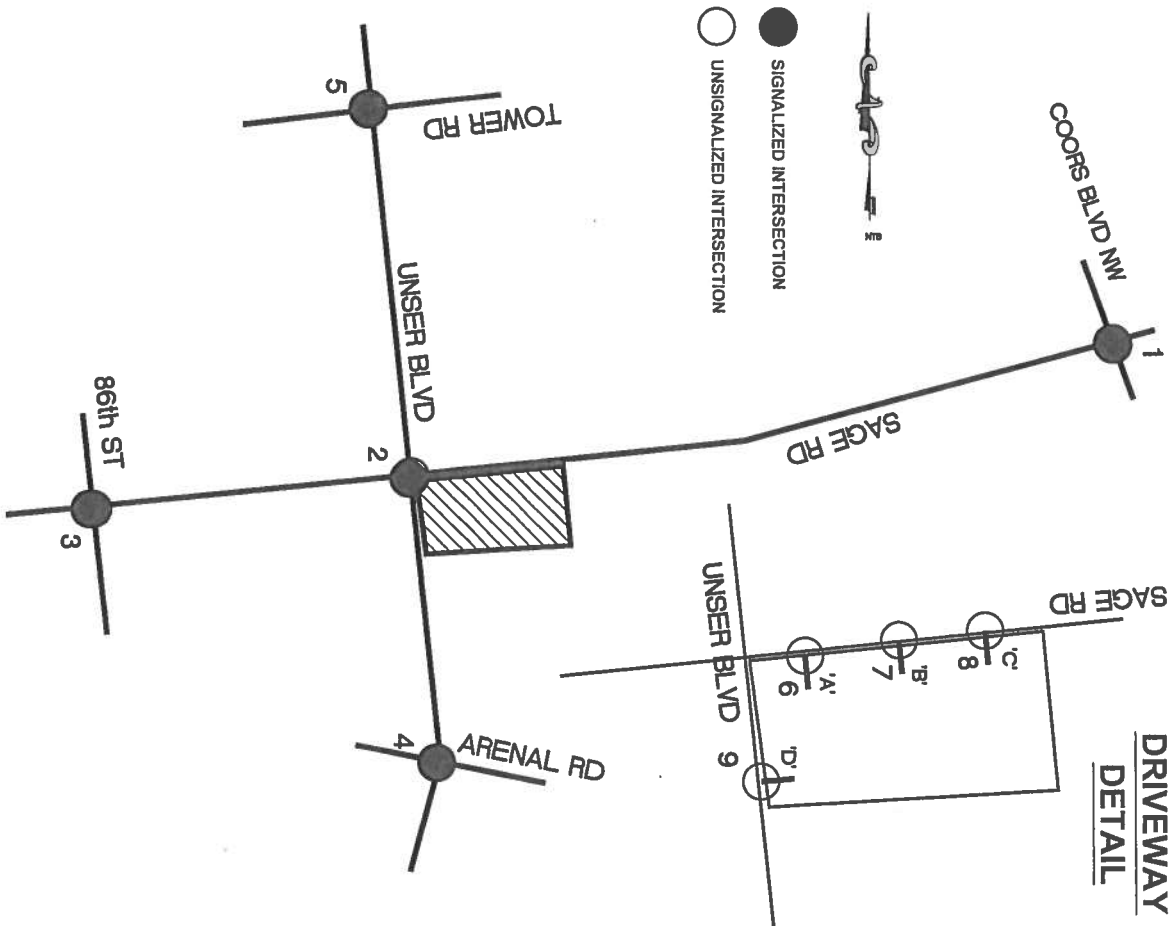


Trips

2014
BUILD



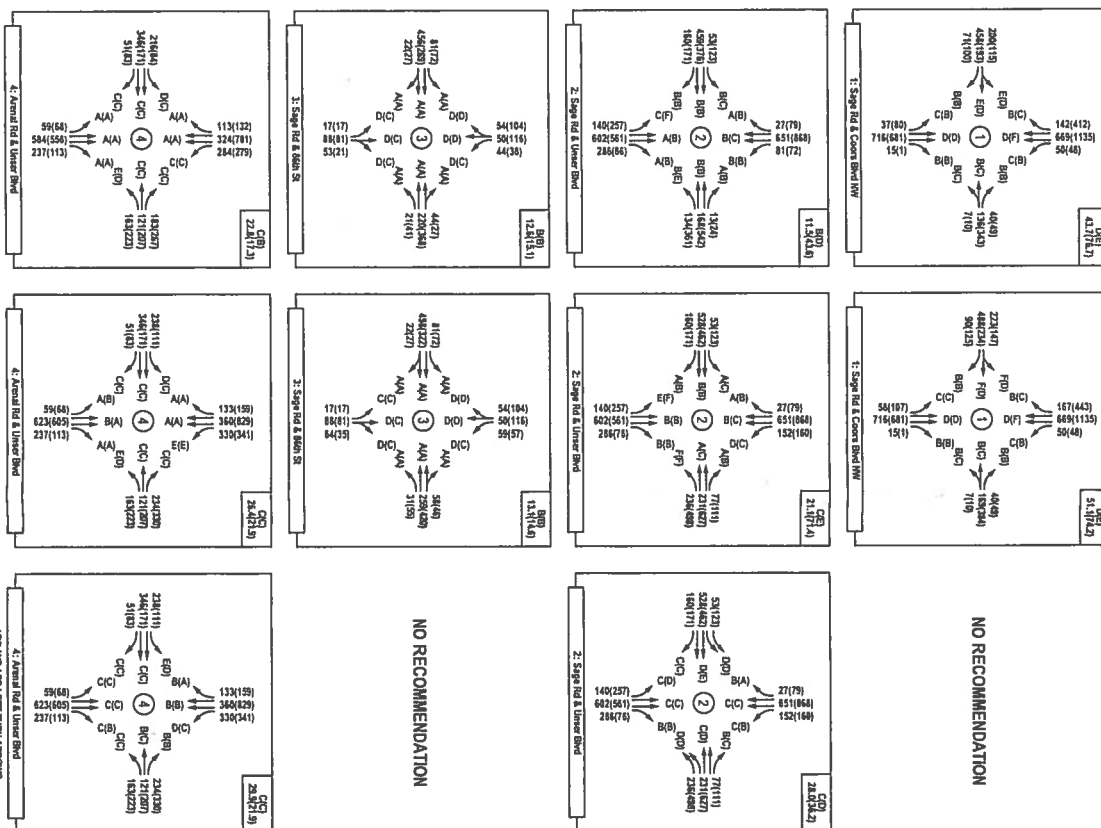
Driveway 'D' / Unser Blvd



2014 NO BUILD (Exist. Geom.)

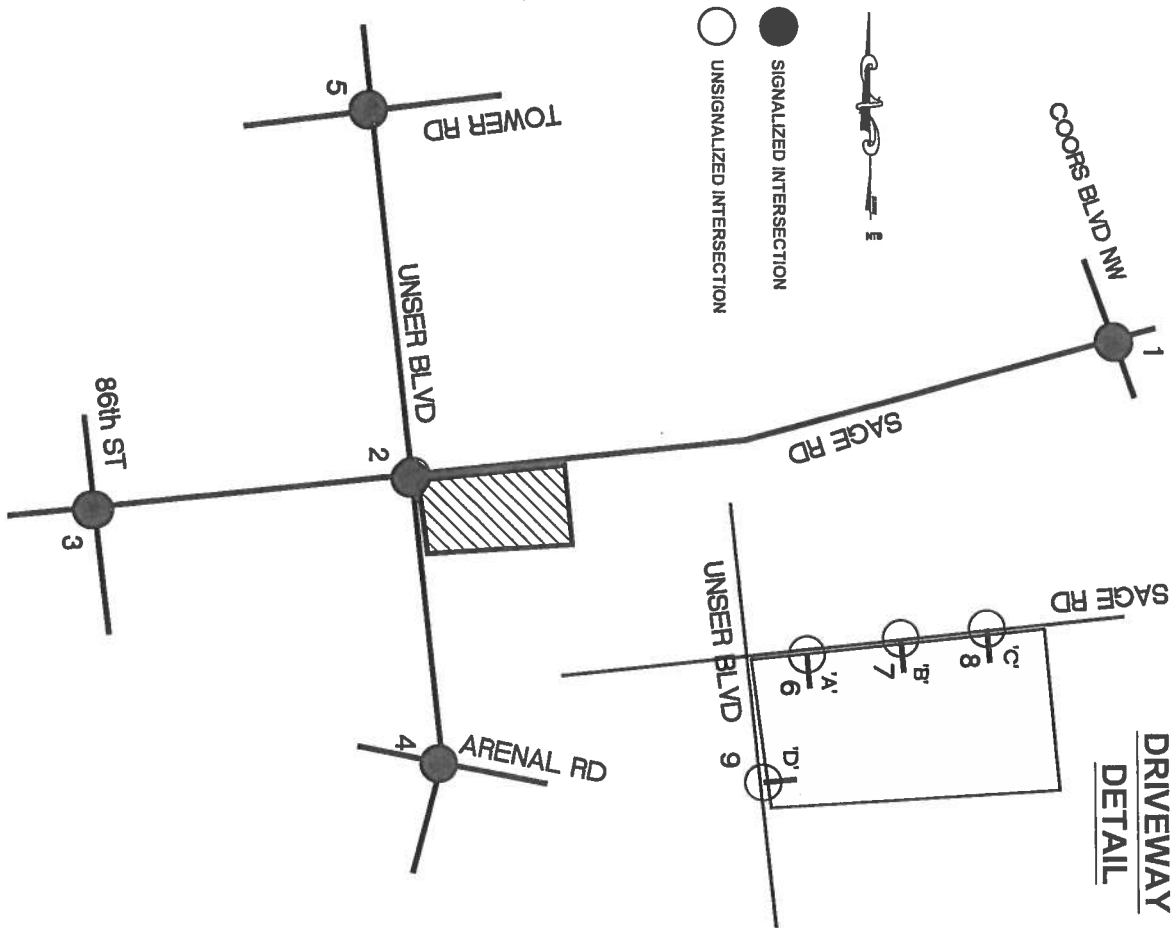
2014 BUILD (Existing Geom.)

2014 BUILD (MITIGATED Geom.)

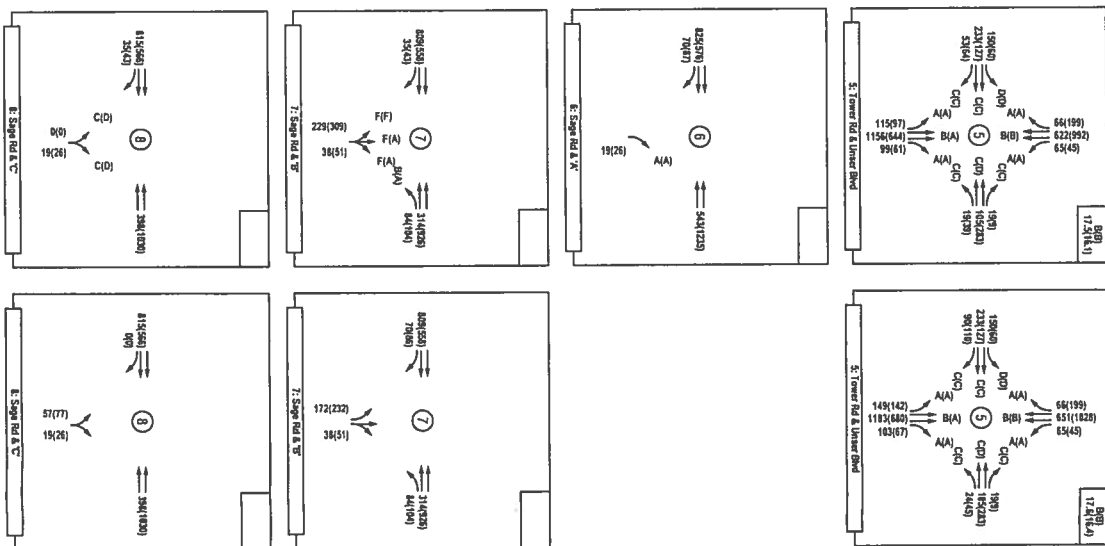


Sage / Unser Commercial Development
SE Corner
LOS / Volume Analysis Map

A-56 i



DRIVEWAY DETAIL



Sage / Unser Commercial Development
SE Corner
LOS / Volume Analysis Map

Line Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Line Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	173	402	49	5	97	31	23	639	13	34	465	44
Turn Type	pm+pt			pm+pt			pm+pt		pt+ov	pm+pt		pt+ov
Protected Phases	7	4	4, 5	3	8	6, 1	6	2	2, 3	1	6	6, 7
Permitted Phases	4						2				6	
Dilemma Phase	7	4	4, 5	3	8	6, 1	5	2	2, 3	1	6	6, 7
Switch Phase												
Minimum Initial (%)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (%)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Minimum Split (s)	10.0	41.0	51.0	10.0	41.0	51.0	10.0	29.0	39.0	10.0	29.0	39.0
Total Split (%)	11.1%	45.6%	56.7%	11.1%	45.6%	56.7%	11.1%	32.2%	43.3%	11.1%	32.2%	43.3%
Total Split (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
All-Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lost Time Adjustment (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Max	Max	Max	Max	Max	Max
Accel Effect Green (s)	36.8	41.6		36.8	41.6	28.1	24.1	34.2	28.1	24.1	34.2	34.2
Accel Effect Red (s)	0.43	0.48		0.43	0.48	0.34	0.28	0.40	0.34	0.28	0.40	0.40
Acceluated APC Ratio	0.92	0.07		0.16	0.05	0.10	0.75	0.02	0.22	0.60	0.17	0.17
Control Delay	42.6	5.5		12.6	4.1	16.7	34.5	6.6	20.5	30.8	4.4	4.4
Queue Delay	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	42.6	5.5		12.6	4.1	16.7	34.5	6.6	20.5	30.8	4.4	4.4
LOS	D	A		B	A	B	C	A	C	A	C	A
Approach Delay	38.7			10.6			33.5		26.9			
Approach LOS	D			B			C					C
Intersection Summary												
Cycle Length: 90												
Actualized Cycle Length: 85.8												
Natural Cycle: 80												
Control Type: Semi Act-Uncoordinated												
Maximum v/c Ratio: 0.92												
Intersection Signal Delay: 31.4												
Intersection Capacity Utilization: 70.9%												
Analysis Period (min): 15												
Spots and Phases: 1: Sags Rd & Coors Blvd NW												
	e1	e2	e3	e4	e5	e6	e7	e8				

[illegible]

Timings

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	200	455	71	7	136	40	37	716	15	50	659	142
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Permitted Phases	7	4	4.5	3	8	8.1	5	2	2.3	1	6	6.7
Detector Phases	4			8			2			6		
Switch Phase	7	4	4.5	3	8	8.1	5	2	2.3	1	6	6.7
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	41.0	61.0	10.0	41.0	61.0	10.0	29.0	39.0	10.0	29.0	39.0
Total Split (%)	11.1%	45.6%	56.7%	11.1%	45.6%	56.7%	11.1%	32.2%	43.3%	11.1%	32.2%	43.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	41.0	48.0	41.0	48.0	41.0	48.0	41.0	29.0	34.0	41.0	29.0	34.0
ACTUAL G/C Ratio	0.46	0.51	0.46	0.51	0.46	0.51	0.46	0.32	0.27	0.38	0.32	0.27
vic Ratio	1.01	0.09	0.20	0.06	0.24	0.08	0.03	0.36	0.93	0.26	0.36	0.26
Control Delay	60.7	6.8	13.2	3.7	21.5	44.1	8.3	24.2	49.9	4.0	49.9	4.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.7	6.8	13.2	3.7	21.5	44.1	8.3	24.2	49.9	4.0	49.9	4.0
LOS	E	A	B	A	C	D	A	C	D	A	C	D
Approach Delay	55.3			11.1			42.3			40.8		
Approach LOS	E			B			D			D		
Intersection Summary												
Cycle Length: 90												
ACTUAL Cycle Length: 90												
Natural Cycle: 90												
Control Type: Semi Act/Uncoord												
Maximum v/c Ratio: 1.01												
Intersection Signal Delay: 43.0												
Intersection Capacity Utilization: 82.5%												
Analysis Period (min): 15												

Splits and Phases: 1: Sage Rd & Coors Blvd NW



HCM Signalized Intersection Capacity Analysis

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	200	455	71	7	136	40	37	716	15	50	659	142
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.99	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd Flow (prot)	1817	1568	1840	1568	1840	1568	1840	1568	1840	1568	1840	1568
Flt Permitted	0.84	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00	0.98	1.00	1.00
Satd Flow (perm)	1543	1568	1799	1568	1799	1568	1799	1568	1799	1568	1799	1568
Peak-hour factor, PHF	0.91	0.91	0.85	0.85	0.85	0.85	0.87	0.87	0.87	0.77	0.77	0.77
Adj. Flow (vph)	220	503	78	8	160	47	43	823	17	65	869	184
RTOR Reduction (vph)	0	0	23	0	0	23	0	0	11	0	0	11
Lane Group Flow (vph)	0	723	65	0	168	24	43	823	8	65	869	70
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Permitted Phases	7	4	4.5	3	8	8.1	5	2	2.3	1	6	6.7
ACTUAL Green, G (s)	41.0	48.0	41.0	48.0	41.0	48.0	41.0	29.0	34.0	41.0	29.0	34.0
Effective Green, g (s)	41.0	46.0	41.0	46.0	41.0	46.0	41.0	28.0	33.0	41.0	28.0	33.0
ACTUAL g/C Ratio	0.46	0.51	0.46	0.51	0.46	0.51	0.46	0.32	0.27	0.38	0.32	0.27
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	718	801	822	801	822	801	822	801	822	801	822	801
v/c Ratio Prot	0.06	0.03	0.01	0.02	0.01	0.02	0.01	0.23	0.00	0.02	0.25	0.04
v/c Ratio Perm	0.40			0.08			0.06			0.10		
v/c Ratio	1.01	0.07	0.20	0.03	0.24	0.08	0.01	0.36	0.03	0.12	0.36	0.12
Uniform Delay, d1	24.5	11.1	14.7	10.9	23.0	31.6	17.5	23.0	32.2	18.2	23.0	32.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.3	0.0	0.1	0.0	3.2	11.6	0.0	5.6	16.6	0.1	5.6	16.6
Delay (s)	59.8	11.2	14.9	10.9	26.1	43.3	17.5	28.6	48.8	18.3	28.6	48.8
Level of Service	E	B	B	B	C	D	B	C	D	B	C	D
Approach Delay (s)	55.1			14.0			41.9			42.6		
Approach LOS	E			B			D			D		
Intersection Summary												
HCM Average Control Delay												
HCM Volume to Capacity ratio												
ACTUAL Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
Critical Lane Group												

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
DATA06PROJECTS\Sage_Unser_SE\Synchro2014ANX.syn

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
DATA06PROJECTS\Sage_Unser_SE\Synchro2014ANX.syn

Timings

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volumes (vph)	223	488	90	7	189	40	58	716	15	60	669	167
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Permitted Phases	7	4	4.5	3	8	8.1	5	2	2.3	1	6	8.7
Detector Phases	4			8			2			6		
Switch Phase	7	4	4.5	3	8	8.1	5	2	2.3	1	6	8.7
Minimum Inter (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0
Total Split (s)	10.0	43.0	53.0	10.0	43.0	53.0	10.0	27.0	37.0	10.0	27.0	37.0
Total Split (%)	11.1%	47.8%	58.9%	11.1%	47.8%	58.9%	11.1%	30.9%	41.1%	11.1%	30.9%	41.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimizer?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Effect Green (s)	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0
Act Effect Green Ratio	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53
Act Effect Green Ratio	1.05	0.11	0.24	0.05	0.37	0.06	0.03	0.36	1.01	0.31	0.24	0.06
Control Delay	74.0	6.3	12.7	3.4	25.9	57.3	8.9	25.6	66.4	4.3	74.0	6.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.0	6.3	12.7	3.4	25.9	57.3	8.9	25.6	66.4	4.3	74.0	6.3
LOS	E	A	B	A	C	E	A	C	E	A	E	A
Approach Delay	66.1			11.0			54.1				54.7	
Approach LOS	E			B			D				D	
Intersection Summary												
Cycle Length: 90												
Actuated Cycle Length: 90												
Natural Cycle: 90												
Control Type: Semi-Actuated												
Maximum v/c Ratio: 1.08												
Intersection Signal Delay: 54.2												
Intersection Capacity Utilization 87.1%												
Analysis Period (min) 15												
Spills and Phases:												
1: Sage Rd & Coors Blvd NW												
	e1	e2	e3	e4	e5	e6	e7	e8	e9	e10	e11	e12
	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Sage / User Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
D:\AT08\PROJECTS\Sage_Unser_SE\Synchro2014\ABX.syn

HCM Signalized Intersection Capacity Analysis

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	4	4	4	4	4	4	4	4	4	4	4	4
Volumes (vph)	223	488	90	7	189	40	58	716	15	60	669	167
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Permitted	0.82	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Satd. Flow (pc/h)	1816	1816	1816	1816	1816	1816	1816	1816	1816	1816	1816	1816
Satd. Flow (pc/h)	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908	1908
Peak-hour factor, PHF	0.91	0.91	0.91	0.85	0.85	0.85	0.87	0.87	0.87	0.77	0.77	0.77
Adj. Flow (vph)	245	536	99	8	199	47	67	823	17	65	869	217
RTOR Reduction (vph)	0	0	28	0	0	22	0	0	11	0	0	140
Lane Group Flow (vph)	0	781	71	0	207	25	67	823	18	66	869	77
Turn Type	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt	pm+pt
Permitted Phases	7	4	4.5	3	8	8.1	5	2	2.3	1	6	8.7
Prohibited Phases	4			8			2			6		
Actuated Green, G (s)	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0
Effective Green, g (s)	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0	43.0	48.0
Actuated g/C Ratio	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53	0.48	0.53
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	738	838	864	838	738	838	738	838	738	838	738	838
v/c Ratio Pct	60.06	0.05	0.01	0.02	60.02	0.23	0.00	60.02	0.23	0.00	60.25	0.05
v/c Ratio Perm	60.45			0.10			0.09				0.09	
v/c Ratio	1.06	0.09	0.24	0.03	0.37	0.06	0.01	0.36	0.01	0.36	1.01	0.04
Uniform Delay, d1	23.5	10.3	13.9	10.0	24.8	33.8	18.8	24.5	34.0	19.7	23.5	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	49.6	0.0	0.1	0.0	5.9	22.5	0.0	5.6	34.3	0.1	49.6	0.0
Delay (s)	73.1	10.3	14.0	10.0	30.7	56.1	18.8	30.1	68.3	19.8	73.1	10.3
Level of Service	E	B	B	A	C	E	B	C	E	B	E	B
Approach Delay (s)	66.1			13.3			53.5				57.0	
Approach LOS	E			B			D				E	
Intersection Summary												
HCM Average Control Delay	55.0											
HCM Volume to Capacity Ratio	1.00											
Actuated Cycle Length (s)	90.0											
Intersection Capacity Utilization	87.1%											
Analysis Period (min)	15											
Official Lane Group												

Sage / User Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Timings Terry O. Brown, P.E.
21/2/2010 - Synchro 7

1: Sage Rd & Coors Blvd NW

EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SSR
85	146	35	8	242	38	46	608	1	33
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1611	1688	1642	1688	1752	3505	1608	1752	3505	1588
0.77	1.00	0.99	1.00	0.21	1.00	1.00	0.22	1.00	1.00
1412	1558	1424	1558	358	3505	1588	3505	1588	1588
0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
96	164	39	9	253	41	56	760	1	34
0	0	24	0	0	15	0	0	1	0
0	280	16	0	272	26	60	760	0	34
Perm	4	4.5	Perm	8	8.1	6	2	2.3	1
4	4	4.5	6	8	8.1	6	2	2.3	1
14.8	24.6	24.6	24.6	34.8	24.0	19.0	28.0	24.0	18.0
14.8	24.6	24.6	24.6	34.8	24.0	19.0	28.0	24.0	18.0
0.23	0.39	0.39	0.39	0.54	0.38	0.30	0.46	0.38	0.30
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
324	808	706	853	254	1047	715	258	1047	468
0.16	0.51	0.51	0.51	0.62	0.52	0.22	0.50	0.51	0.23
0.80	0.02	0.39	0.03	0.22	0.73	0.00	0.13	0.04	0.05
23.1	12.1	14.1	6.7	13.4	20.0	9.4	13.1	20.3	16.5
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13.3	0.0	0.4	0.0	2.0	4.4	0.0	1.1	5.4	0.8
36.5	12.1	14.4	6.7	15.4	24.4	9.4	14.1	25.7	17.3
D	B	B	A	B	C	A	B	C	B
33.3	13.4	13.4	13.4	23.7	23.7	23.7	23.7	23.7	23.7
23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6
15	15	15	15	15	15	15	15	15	15

Splits and Phases: 1: Sage Rd & Coors Blvd NW

HCM Signalized Intersection Capacity Analysis Terry O. Brown, P.E.
21/2/2010 - Synchro 7

1: Sage Rd & Coors Blvd NW

EBL	EBT	EBR	WBL	WBT	NBL	NBT	SBL	SBT	SSR
85	146	35	8	242	38	46	608	1	33
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.98	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1611	1688	1642	1688	1752	3505	1608	1752	3505	1588
0.77	1.00	0.99	1.00	0.21	1.00	1.00	0.22	1.00	1.00
1412	1558	1424	1558	358	3505	1588	3505	1588	1588
0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
96	164	39	9	253	41	56	760	1	34
0	0	24	0	0	15	0	0	1	0
0	280	16	0	272	26	60	760	0	34
Perm	4	4.5	Perm	8	8.1	6	2	2.3	1
4	4	4.5	6	8	8.1	6	2	2.3	1
14.8	24.6	24.6	24.6	34.8	24.0	19.0	28.0	24.0	18.0
14.8	24.6	24.6	24.6	34.8	24.0	19.0	28.0	24.0	18.0
0.23	0.39	0.39	0.39	0.54	0.38	0.30	0.46	0.38	0.30
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
324	808	706	853	254	1047	715	258	1047	468
0.16	0.51	0.51	0.51	0.62	0.52	0.22	0.50	0.51	0.23
0.80	0.02	0.39	0.03	0.22	0.73	0.00	0.13	0.04	0.05
23.1	12.1	14.1	6.7	13.4	20.0	9.4	13.1	20.3	16.5
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13.3	0.0	0.4	0.0	2.0	4.4	0.0	1.1	5.4	0.8
36.5	12.1	14.4	6.7	15.4	24.4	9.4	14.1	25.7	17.3
D	B	B	A	B	C	A	B	C	B
33.3	13.4	13.4	13.4	23.7	23.7	23.7	23.7	23.7	23.7
23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4	23.4
0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70
63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6	63.6
15	15	15	15	15	15	15	15	15	15

Splits and Phases: 1: Sage Rd & Coors Blvd NW

Sage / User Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ SageUser
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Sage / User Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ SageUser
D:\ATOBEP\PROJECTS\Sage_User_SE\Synchro2010P\X.syn

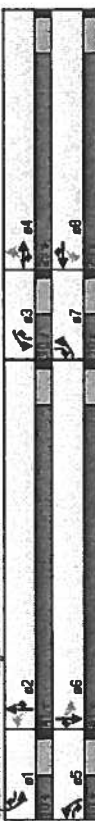
Timings

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBR
115	193	100	10	343	49	80	681	1
1900	1900	1900	1900	1900	1900	1900	1900	1900
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
1811	1558	1842	1688	1752	3505	1658	1762	3505
0.86	1.00	0.99	1.00	0.11	1.00	1.00	0.23	1.00
1221	1558	1825	1688	204	3505	1688	418	3505
0.89	0.89	0.92	0.92	0.92	0.80	0.80	0.98	0.96
129	217	112	11	373	53	100	851	1
0	0	73	0	35	0	0	0	0
0	346	39	0	384	18	100	851	1
7	4	4.5	3	8	5.1	5	2	2.3
4	4	4.5	3	8	5.1	5	2	2.3
24.8	29.8	24.8	29.8	41.1	38.1	46.1	41.1	38.1
24.8	29.8	24.8	29.8	41.1	38.1	46.1	41.1	38.1
0.29	0.35	0.29	0.35	0.48	0.42	0.54	0.48	0.42
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
387	544	528	544	188	1473	841	278	1473
50.05	0.02	0.04	0.01	0.03	0.24	0.00	0.01	0.34
0.21	0.07	0.73	0.03	0.53	0.58	0.00	0.16	0.30
0.86	0.07	0.73	0.03	0.53	0.58	0.00	0.16	0.30
29.3	18.6	27.5	18.5	15.7	19.1	9.2	12.9	21.8
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22.1	0.1	5.0	0.0	10.4	1.7	0.0	1.4	4.7
51.4	18.8	32.5	18.8	25.1	20.7	9.2	14.3	26.5
D	B	C	B	C	C	A	B	C
43.4	30.3	30.3	30.3	21.3	21.3	22.3	22.3	22.3
D	C	C	C	C	C	C	C	C
25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8
0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
15	15	15	15	15	15	15	15	15
15	15	15	15	15	15	15	15	15

Splits and Phases: 1: Sage Rd & Coors Blvd NW



HCM Signalized Intersection Capacity Analysis

1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBR
115	193	100	10	343	49	80	681	1
1900	1900	1900	1900	1900	1900	1900	1900	1900
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
1811	1558	1842	1688	1752	3505	1658	1762	3505
0.86	1.00	0.99	1.00	0.11	1.00	1.00	0.23	1.00
1221	1558	1825	1688	204	3505	1688	418	3505
0.89	0.89	0.92	0.92	0.92	0.80	0.80	0.98	0.96
129	217	112	11	373	53	100	851	1
0	0	73	0	35	0	0	0	0
0	346	39	0	384	18	100	851	1
7	4	4.5	3	8	5.1	5	2	2.3
4	4	4.5	3	8	5.1	5	2	2.3
24.8	29.8	24.8	29.8	41.1	38.1	46.1	41.1	38.1
24.8	29.8	24.8	29.8	41.1	38.1	46.1	41.1	38.1
0.29	0.35	0.29	0.35	0.48	0.42	0.54	0.48	0.42
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
387	544	528	544	188	1473	841	278	1473
50.05	0.02	0.04	0.01	0.03	0.24	0.00	0.01	0.34
0.21	0.07	0.73	0.03	0.53	0.58	0.00	0.16	0.30
0.86	0.07	0.73	0.03	0.53	0.58	0.00	0.16	0.30
29.3	18.6	27.5	18.5	15.7	19.1	9.2	12.9	21.8
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22.1	0.1	5.0	0.0	10.4	1.7	0.0	1.4	4.7
51.4	18.8	32.5	18.8	25.1	20.7	9.2	14.3	26.5
D	B	C	B	C	C	A	B	C
43.4	30.3	30.3	30.3	21.3	21.3	22.3	22.3	22.3
D	C	C	C	C	C	C	C	C
25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8	25.8
0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9	85.9
15	15	15	15	15	15	15	15	15
15	15	15	15	15	15	15	15	15

Intersection Summary

ICU Level of Service E

Intersection Capacity Utilization 87.8%

Analysis Period (min) / 15

Sage / Unser Comm. Dev. (SE Corner)

2014 PM NOBUILD Conditions - New Geom @ Sage/Unser
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Timings
1: Sage Rd & Coors Blvd NW

Terry O. Brown, P.E.
2/12/2010 - Synchro 7[illegible]

Solids and Phases: 1: Sage Rd & Coors Blvd NW



Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom. @ Sage-Unser
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HCM Signalized Intersection Capacity Analysis

HCM Signalized Intersection Capacity Analysis
1: Sage Rd & Coors Blvd NW

	EBL	EBI	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SEB
Movement												
Lane Configurations												
Volume (vph)	147	234	126	10	384	49	107	881	1	48	1135	443
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1988 Loss Fnc (g)	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
PFI	1.00	0.95			1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
FRT Protected	0.98	1.00			1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd Flow (prot)	1810	1698			1842	1688	1762	3505	1668	1752	3505	1658
FRT Permitted	0.91	1.00			0.99	1.00	0.12	1.00	1.00	0.19	1.00	1.00
Satd Flow (perm)	1134	1568			1825	1588	224	3505	1584	350	3505	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.92	0.92	0.92	0.80	0.80	0.80	0.96	0.96	0.96
Left Turn Flow (vph)	165	263	140	11	417	53	134	851	1	50	1182	451
RTOR Reduction (vph)	0	0	0	0	0	0	31	0	0	0	0	121
Left Group Flow (vph)	0	426	69	0	426	22	134	851	0	60	1182	340
Turn Type												
Protected Phases	7	4	4, 6	3	6	8, 1	5	2	2, 3	1	6	6, 7
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.9	36.9			31.9	36.9	36.0	33.0	43.0	36.0	33.0	43.0
Effective Green, g (s)	31.9	36.9			31.9	36.9	36.0	33.0	43.0	36.0	33.0	43.0
Actuated g/C Ratio	0.35	0.41			0.35	0.41	0.42	0.37	0.48	0.42	0.37	0.48
Clearance Time (s)	5.0				5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0				3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	440	644			649	844	180	1287	750	228	1287	750
Grp Ratio Prot	61.85	61.84			61.84	61.84	61.84	61.84	61.84	61.84	61.84	61.84
Grp Ratio Perm	61.85	61.84			61.84	61.84	61.84	61.84	61.84	61.84	61.84	61.84
W/O Ratio	0.97	0.11			0.86	0.03	0.74	0.66	0.00	0.22	0.92	0.45
Uniform Delay, d1	28.6	18.3			24.4	15.8	20.3	23.8	12.2	16.6	27.2	15.6
Progression Factor	1.00	1.00			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	35.6	0.1			2.4	0.0	24.1	2.7	0.0	2.2	11.9	0.4
Delay (s)	64.2	18.4			26.9	15.9	44.4	26.5	12.2	18.8	39.1	16.1
Level of Service	E	B			C	B	D	C	B	B	D	B
Approach Delay (s)	62.4				25.6		28.9			32.2		
Approach LOS	D				C		C			C		

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HCM Average Control Delay	HCM Level of Service	C
33.6		

Item	Value
Item Average Cost of Delay	\$5.0
HCM Volume to Capacity Ratio	0.83

Activated Cycle Length (s)	89.9	Sum of lost time (s)	20.0
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Intersection	Capacity	Utilization	100 Level of Service
F	95.2%		

Analysis Period (min)	15
Calculated Peak Count	

6 Critical Line Group

100

Sage / Unser Comm. Dev. (SE Corner)

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Thimings

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
18	361	80	110	12	105	337	222
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	8	8	2	2	2	2
4	4	8	8	2	2	2	2
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
27.0	27.0	27.0	27.0	23.0	23.0	23.0	23.0
54.0%	54.0%	54.0%	54.0%	46.0%	46.0%	46.0%	46.0%
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
None	None	None	None	None	None	None	None
20.3	20.3	20.3	20.3	19.7	19.7	19.7	19.7
0.41	0.41	0.41	0.41	0.39	0.39	0.39	0.39
0.85	0.85	0.85	0.85	0.83	0.83	0.83	0.83
8.4	26.6	36.8	3.4	4.7	22.4	15.5	5.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.4	26.6	36.8	3.4	4.7	22.4	15.5	5.1
A	C	D	A	A	C	B	A
25.0	C	26.0	B	13.2	B	18.9	B
C	C	B	B	B	B	B	B
Intersection Signal Delay: 18.9	Intersection LOS: B	Intersection LOS: B	Intersection LOS: B	Intersection LOS: B	Intersection LOS: B	Intersection LOS: B	Intersection LOS: B
Intersection Capacity Utilization: 73.7%	ICU Level of Service: D	ICU Level of Service: D	ICU Level of Service: D	ICU Level of Service: D	ICU Level of Service: D	ICU Level of Service: D	ICU Level of Service: D
Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15	Analysis Period (min): 15
Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd	Split and Phases: 2: Sage Rd & Unser Blvd

Sage / Unser Comm. Dev. (SE Corner)

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
D:\AT08\PROJECTS\Sage_Unser_SE\Synchro2010\AX.syn

HCM Signalized Intersection Capacity Analysis

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
18	361	136	110	12	105	337	222
1900	1900	1900	1900	1900	1900	1900	1900
6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
1.00	0.96	1.00	1.00	0.85	1.00	0.85	1.00
0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
1762	1769	1762	1645	1668	1762	1645	1668
0.87	1.00	0.20	1.00	0.33	1.00	0.44	1.00
1239	1769	343	1645	1668	615	1645	1668
0.78	0.78	0.83	0.83	0.83	0.87	0.87	0.78
23	493	174	96	133	14	121	367
0	29	0	0	0	0	0	165
23	808	0	96	133	6	121	387
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	8	8	2	2	2	2
20.3	20.3	20.3	20.3	19.7	19.7	19.7	19.7
0.41	0.41	0.41	0.41	0.39	0.39	0.39	0.39
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
503	718	147	749	637	242	727	618
0.02	0.02	0.26	0.00	0.20	0.20	0.06	0.07
0.05	0.85	0.85	0.18	0.01	0.50	0.53	0.18
9.0	13.4	12.0	9.5	8.9	11.4	11.6	9.8
1.00	1.00	1.00	1.00	0.99	0.99	0.99	1.00
0.0	9.1	10.0	0.1	0.0	6.9	2.7	0.5
9.0	22.6	22.0	9.8	8.9	18.3	14.2	18.5
A	C	C	A	A	B	B	B
22.1	C	14.5	B	16.3	B	18.7	B
C	C	B	B	B	B	B	B
17.9	HCM Level of Service	HCM Level of Service	HCM Level of Service	HCM Level of Service	HCM Level of Service	HCM Level of Service	HCM Level of Service
0.76	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio	HCM Volume to Capacity ratio
50.0	Sum of lost time (s)	Sum of lost time (s)	Sum of lost time (s)	Sum of lost time (s)	Sum of lost time (s)	Sum of lost time (s)	Sum of lost time (s)
73.7%	ICU Level of Service	ICU Level of Service	ICU Level of Service	ICU Level of Service	ICU Level of Service	ICU Level of Service	ICU Level of Service
15	Analysis Period (min)	Analysis Period (min)	Analysis Period (min)	Analysis Period (min)	Analysis Period (min)	Analysis Period (min)	Analysis Period (min)
6	Critical Lane Group	Critical Lane Group	Critical Lane Group	Critical Lane Group	Critical Lane Group	Critical Lane Group	Critical Lane Group

Sage / Unser Comm. Dev. (SE Corner)

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
D:\AT08\PROJECTS\Sage_Unser_SE\Synchro2010\AX.syn

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
24122010 - Synchro 7

[illegible]

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
D:\ATOB\PROJECTS\Sage_Unser_SEISynchro\2014ANX.syn

HCM Signalized Intersection Capacity Analysis

Terry O. Brown, P.E.
21122010 - Synchro 7

Movement	EBL	EBT	EBR	NBL	NBT	NBR	NBL	NBT	NBR	SBL	SBT	SBL	SBT
Lane Configurations	63	469	160	134	168	13	140	602	268	81	651	27	681
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Flow Lost Time (s)	6.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Flow Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
RTI	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85
RTI Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95
RTI Flow (vph)	1762	3605	1558	1762	3605	1684	1762	3605	1684	1762	3605	1684	1762
RTI Permitted	0.62	1.00	1.00	0.36	1.00	1.00	0.29	1.00	1.00	0.37	1.00	1.00	0.37
RTI Flow (vph)	1153	3505	1558	884	3505	1684	884	3505	1684	884	3505	1684	884
Peak-hour factor, PHF	0.78	0.78	0.83	0.83	0.83	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
RTOR Reduction (vph)	68	583	205	161	202	16	161	682	329	107	657	38	657
RTOR Flow (vph)	0	0	72	0	0	11	0	0	0	47	0	0	18
Lane Group Flow (vph)	68	688	133	161	202	5	161	682	262	107	657	18	657
Permitted Phases	4	4	4	6	6	6	2	2	2	6	6	6	6
Permitted Phases	14.5	14.5	14.5	14.5	14.5	14.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
Actuated Green, G (s)	14.5	14.5	14.5	14.5	14.5	14.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5
Effective Green, g (s)	0.29	0.29	0.29	0.29	0.29	0.29	0.61	0.61	0.61	0.61	0.61	0.61	0.61
Actuated G Ratio	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Clearance Time (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	334	1016	455	193	1016	455	272	1788	800	348	1788	800	1788
Lane Grp Cap (vph)	0.17	0.08	0.24	0.06	0.06	0.06	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Ratio Perm	0.05	0.20	0.68	0.29	0.63	0.20	0.97	0.59	0.39	0.35	0.31	0.48	0.01
Ratio	13.4	15.1	13.8	16.6	13.4	12.6	6.6	7.5	7.3	7.1	7.9	6.1	0.02
Uniform Delay, d1	1.00	1.00	1.00	1.00	1.00	1.00	0.82	1.00	0.97	1.00	1.00	1.00	1.00
Progression Factor	0.3	0.6	0.4	25.5	0.1	0.0	8.3	0.6	1.1	2.3	0.9	0.1	0.1
Incremental Delay, d2	13.7	15.9	14.1	42.1	13.5	12.6	16.2	8.0	8.2	9.4	8.9	8.1	8.1
Delay (s)	B	B	B	D	B	B	B	A	A	A	A	A	A
Level of Service	B	B	B	D	B	B	B	A	A	A	A	A	A

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
D:\ATOBELPROJECTS\Sage_Unser_SEISynchro\2014ANX.syn

Timings

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA
Volume (vph)	63	628	180	236	231	77	140	602	286	152	651	27
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	6	6	6
Detection Phases	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum SPRT (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Act Effect Green (s)	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Total Spk (s)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%	46.7%	46.7%
Total Spk (%)	53.3%	53.3%	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjct (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimizer?	None	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	None	None	None	None	None	None	None	None	None	None	None	None
Act Effect Green (s)	27.0	27.0	27.0	27.0	27.0	27.0	23.0	23.0	23.0	23.0	23.0	23.0
Act Effect Green Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38	0.38	0.38
Act Effect Green Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38	0.38	0.38
Act Effect Green Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38	0.38	0.38
Control Delay	10.7	12.3	8.7	71.2	10.2	3.1	94.2	11.5	5.9	68.1	13.1	1.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.7	12.3	8.7	71.2	10.2	3.1	94.2	11.5	5.9	68.1	13.1	1.3
LOS	B	B	A	E	B	A	F	B	A	E	B	A
Approach Delay	11.4	11.4	11.4	35.7	11.4	11.4	21.2	11.4	11.4	11.4	11.4	11.4
Approach LOS	B	B	A	D	B	A	C	B	A	D	B	A
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 60												
Offset: 9 (15%), Referenced to phase 2-NBTL and 8-SBTL, Start of Green												
Relative Cycle: 45												
Control Type: Actuated-Coordinated												
Maximum V/R Ratio: 1.02												
Intersection Signal Delay: 21.2												
Intersection Capacity Utilization: 76.1%												
Analysis Period (min): 15												
Splits and Phases: 2: Sage Rd & Unser Blvd												

HCM Signalized Intersection Capacity Analysis

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA
Volume (vph)	63	628	180	236	231	77	140	602	286	152	651	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Friction	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Friction Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd Flow (prot)	1752	3505	1588	1752	3505	1588	1752	3505	1588	1752	3505	1588
Friction Permitted	0.98	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd Flow (perm)	1072	3505	1588	1072	3505	1588	1072	3505	1588	1072	3505	1588
Peak-hour factor, PHF	0.78	0.78	0.78	0.83	0.83	0.83	0.87	0.87	0.87	0.87	0.87	0.87
Act Flow (vph)	58	677	205	264	278	93	161	682	329	200	557	38
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	68	677	175	284	278	42	161	682	329	200	557	38
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Permitted Phases	4	4	4	6	6	6	2	2	2	6	6	6
Actuated Green, G (s)	27.0	27.0	27.0	27.0	27.0	27.0	23.0	23.0	23.0	23.0	23.0	23.0
Effective Green, g (s)	27.0	27.0	27.0	27.0	27.0	27.0	23.0	23.0	23.0	23.0	23.0	23.0
Actuated g/C Ratio	0.45	0.45	0.45	0.45	0.45	0.45	0.38	0.38	0.38	0.38	0.38	0.38
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	482	1577	705	289	1577	705	159	1344	601	222	1344	601
V/R Ratio	0.19	0.19	0.11	0.44	0.08	0.08	0.20	0.20	0.20	0.24	0.24	0.24
V/R Ratio Perm	0.05	0.14	0.43	0.25	0.06	0.18	0.06	0.51	0.39	0.90	0.64	0.02
Uniform Delay, d1	9.7	11.2	10.2	16.3	9.9	9.3	18.5	14.2	13.4	17.4	15.1	11.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.72	0.71	0.82	0.73	0.71	0.73
Incremental Delay, d2	0.1	0.2	0.2	47.9	0.1	0.0	69.0	1.2	1.6	38.3	2.2	0.1
Delay (s)	9.8	11.4	10.4	64.2	9.9	9.4	82.4	11.3	8.8	61.0	12.9	2.7
Level of Service	A	B	B	E	A	A	F	B	A	D	B	A
Approach Delay (s)	11.1	11.1	11.1	33.4	11.1	11.1	20.2	11.1	11.1	16.5	11.1	11.1
Approach LOS	B	B	B	C	B	B	C	B	B	C	B	B
Intersection Summary												
HCM Average Control Delay	20.0											
HCM Volume to Capacity ratio	1.00											
Actuated Cycle Length (s)	60.0											
Intersection Capacity Utilization	76.1%											
Analysis Period (min)	15											
Critical Lane Group	C											

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
D:\AT08\PROJECTS\Sage_Unser_SE\Synchro2014ABX.syn

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
D:\AT08\PROJECTS\Sage_Unser_SE\Synchro2014ABX.syn

Timings 2: Sage Rd & Unser Blvd

HCM Signalized Intersection Capacity Analysis
2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	53	528	160	238	231	77	140	602	288	182	851
Volume (vph)	53	528	160	238	231	77	140	602	288	182	851
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Turn Type	Prot	pm-ov	Prot	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov
Permitted Phases	7	4	5	3	8	6	2	2	3	1	6
Permitted Phases	7	4	5	3	8	6	2	2	3	1	6
Switch Phase	7	4	5	3	8	6	2	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	21.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	23.0	12.0	14.0	27.0	12.0	12.0	31.0	14.0	12.0	10.0
Total Split (%)	12.5%	28.8%	15.0%	17.5%	33.8%	15.0%	15.0%	38.8%	17.5%	15.0%	12.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	5.4	17.7	29.7	9.3	23.8	35.9	32.6	25.8	40.2	33.1	26.0
Act Effd Green (s)	0.07	0.22	0.37	0.32	0.30	0.45	0.41	0.32	0.60	0.41	0.32
Adjusted g/C Ratio	0.30	0.67	0.34	0.72	0.27	0.12	0.65	0.61	0.40	0.66	0.75
vc Ratio	38.4	43.9	16.9	46.7	23.0	3.8	26.5	25.7	10.9	25.6	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	43.9	16.9	46.7	23.0	3.8	26.5	25.7	10.9	25.6	29.3
LOS	D	D	B	D	C	A	C	C	B	C	A
Approach Delay	37.7										
Approach LOS	D										
Flashback Summary											
Cycle Length: 80											
Adjusted Cycle Length (s)											
Offset: 79 (99%), Referenced to phase 2-NBTL and 6-SBTL Start of Green											
Maximum v/c Ratio: 0.87											
Control Type: Actuated-Coordinated											
Intersection Signal Delay: 28.6											
Intersection Capacity Utilization (63.7%)											
Analysis Period (min) 15											
Splits and Phases: 2: Sage Rd & Unser Blvd											

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	53	528	160	238	231	77	140	602	288	182	851
Volume (vph)	53	528	160	238	231	77	140	602	288	182	851
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Turn Type	Prot	pm-ov	Prot	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov	pm-ov
Permitted Phases	7	4	5	3	8	6	2	2	3	1	6
Permitted Phases	7	4	5	3	8	6	2	2	3	1	6
Switch Phase	7	4	5	3	8	6	2	2	3	1	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	10.0	21.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Total Split (s)	10.0	23.0	12.0	14.0	27.0	12.0	12.0	31.0	14.0	12.0	10.0
Total Split (%)	12.5%	28.8%	15.0%	17.5%	33.8%	15.0%	15.0%	38.8%	17.5%	15.0%	12.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag	Lead	Lag	Lead	Lead	Lag	Lead	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	None	None	None	None	None	None	None	None	None	None	None
Recall Mode	5.4	17.7	29.7	9.3	23.8	35.9	32.6	25.8	40.2	33.1	26.0
Act Effd Green (s)	0.07	0.22	0.37	0.32	0.30	0.45	0.41	0.32	0.60	0.41	0.32
Adjusted g/C Ratio	0.30	0.67	0.34	0.72	0.27	0.12	0.65	0.61	0.40	0.66	0.75
vc Ratio	38.4	43.9	16.9	46.7	23.0	3.8	26.5	25.7	10.9	25.6	29.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	38.4	43.9	16.9	46.7	23.0	3.8	26.5	25.7	10.9	25.6	29.3
LOS	D	D	B	D	C	A	C	C	B	C	A
Approach Delay	37.7										
Approach LOS	D										
Flashback Summary											
Cycle Length: 80											
Adjusted Cycle Length (s)											
Offset: 79 (99%), Referenced to phase 2-NBTL and 6-SBTL Start of Green											
Maximum v/c Ratio: 0.87											
Control Type: Actuated-Coordinated											
Intersection Signal Delay: 28.6											
Intersection Capacity Utilization (63.7%)											
Analysis Period (min) 15											
Splits and Phases: 2: Sage Rd & Unser Blvd											

Sage / Unser Comm. Dev. (SE Corner)
2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Sage / Unser Comm. Dev. (SE Corner)
2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Timings

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	22	182	213	386	21	182	249	55
Volume (vph)	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Turn Type	4	4	8	8	2	2	2	8
Protected Phases								
Permitted Phases								
Detected Phase								
Switch Phase								
Minimum Interval (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spill (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
TRB Spill (s)	25.0	25.0	25.0	25.0	30.0	30.0	30.0	30.0
Total Spill (%)	45.5%	45.5%	45.5%	45.5%	54.5%	54.5%	54.5%	54.5%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimize?								
Recall Mode	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max
Act Eff Green (s)	17.4	17.4	17.4	17.4	27.8	27.8	27.8	27.8
Act Eff Green Ratio	0.32	0.32	0.32	0.32	0.50	0.50	0.50	0.50
v/c Ratio	0.12	0.55	0.85	0.70	0.04	0.53	0.30	0.07
Control Delay	11.3	13.7	47.3	22.9	5.9	15.2	8.3	1.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	11.3	13.7	47.3	22.9	5.9	15.2	8.3	1.8
LOS	B	B	D	C	A	B	A	A
Approach Delay	13.5	30.7			10.2			5.4
Approach LOS	B	C			B			A
Intersection Summary								
Cycle Length: 55								
Actuated Cycle Length: 55								
Offset: 2 (4%), Referenced to phase 2/NBTL and 6/SBTL Start of Green								
Natural Cycle: 45								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.85								
Intersection Signal Delay: 16.3								
Intersection Capacity Utilization 79.6%								
Analysis Period (min): 15								
Splits and Phases: 2: Sage Rd & Unser Blvd								

Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	22	182	213	386	21	182	249	55
Volume (vph)	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (vphpl)	1752	1733	1752	1845	1752	1845	1752	1829
Flt Permitted	0.34	1.00	0.45	1.00	0.41	1.00	0.59	1.00
Satd Flow (vphpl)	536	1733	833	1845	1668	1845	1668	1829
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.91	0.91	0.95
Adj. Flow (vph)	24	196	133	224	406	22	200	274
RTOR Reduction (vph)	0	48	0	0	15	0	30	0
Lane Group Flow (vph)	24	281	0	224	406	7	200	274
Turn Type	Perm	4	Perm	8	Perm	2	Perm	6
Protected Phases								
Permitted Phases								
Actuated Green, G (s)	17.4	17.4	17.4	17.4	27.8	27.8	27.8	27.8
Effective Green, g (s)	17.4	17.4	17.4	17.4	27.8	27.8	27.8	27.8
Actuated g/C Ratio	0.32	0.32	0.32	0.32	0.50	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	201	548	264	584	496	376	928	547
v/c Ratio	0.16	0.16	0.22	0.22	0.15	0.15	0.15	0.15
v/c Ratio Perm	0.04	0.12	0.51	0.51	0.01	0.53	0.30	0.04
Uniform Delay, d1	13.4	15.3	17.6	18.5	12.9	9.3	8.0	7.1
Progression Factor	0.82	0.82	1.00	1.00	0.80	0.81	0.84	0.23
Incremental Delay, d2	0.3	0.8	21.8	3.6	0.0	5.3	0.8	0.1
Delay (s)	11.2	14.1	39.1	22.1	12.9	12.7	7.3	3.9
Level of Service	B	B	D	C	B	B	A	A
Approach Delay (s)	13.9		28.4		8.9			5.8
Approach LOS	B		C		A			A
Intersection Summary								
HCM Average Control Delay	14.5							
HCM Volume to Capacity ratio	0.55							
Actuated Cycle Length (s)	55.0							
Intersection Capacity Utilization	79.6%							
Analysis Period (min)	15							
Critical Lane Group								

Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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Timings
2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA
Volume (vph)	123	376	171	381	642	24	257	561	88	72	858	79
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	8	6	6
Detector Phase	4	4	4	8	8	8	2	2	2	8	6	6
Switch Phase	4	4	4	8	8	8	2	2	2	8	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Total Spk (%)	41.7%	41.7%	41.7%	41.7%	41.7%	41.7%	58.3%	58.3%	58.3%	58.3%	58.3%	58.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimizer?												
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Eff Green (s)	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0
Activated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.50	0.50	0.50	0.50	0.50	0.50
v/c Ratio	0.58	0.35	0.31	1.22	0.49	0.05	1.22	0.35	0.11	0.21	0.52	0.10
Control Delay	28.3	15.3	8.7	149.6	17.7	8.5	150.4	7.5	1.5	2.5	3.8	0.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.3	15.3	8.7	149.6	17.7	8.5	150.4	7.5	1.5	2.5	3.8	0.3
LOS	C	B	A	F	B	A	F	A	A	A	A	A
Approach Delay	16.0			66.7			47.5				3.3	
Approach LOS	B			E			D				A	
Intersection Summary												
Cycle Length: 80												
Minimum Cycle Length: 80												
Offset: 51 (05%), Referenced to phase 2/NBTL and 6/SBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 1.22												
Intersection Signal Delay: 34.4												
Intersection Capacity Utilization: 85.3%												
Analysis Period (min): 15												
Spills and Phases: 2: Sage Rd & Unser Blvd												
	a2						a4					
	a5						a6					

Sage / Unser Comm. Dev. (SE Corner)
2014 PM NOBUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA	AA
Volume (vph)	123	376	171	381	642	24	257	561	88	72	858	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Sat'd Flow (prot)	1762	2505	1568	1762	2505	1568	1762	2505	1568	1762	2505	1568
Flt Permitted	0.37	1.00	1.00	0.51	1.00	1.00	0.25	1.00	1.00	0.40	1.00	1.00
Sat'd Flow (perm)	585	2505	1568	532	3505	1568	462	3505	1568	731	3505	1568
Peak-hour factor, PHF	0.93	0.93	0.93	0.95	0.95	0.95	0.91	0.91	0.91	0.95	0.95	0.95
Adj. Flow (vph)	132	404	184	380	571	25	282	616	95	76	914	83
RTOR Reduction (vph)	0	0	65	0	0	17	0	0	48	0	0	42
Lane Group Flow (vph)	132	404	119	380	571	8	282	616	48	76	914	42
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6	6
Activated Green, G (s)	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0
Effective Green, g (s)	20.0	20.0	20.0	20.0	20.0	20.0	30.0	30.0	30.0	30.0	30.0	30.0
Activated g/C Ratio	0.33	0.33	0.33	0.33	0.33	0.33	0.50	0.50	0.50	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	228	1168	523	311	1168	523	231	1753	784	366	1753	784
v/c Ratio Prot	0.19	0.12	0.08	0.41	0.16	0.01	0.81	0.03	0.10	0.26	0.03	0.03
v/c Ratio Perm	0.58	0.35	0.23	1.22	0.49	0.02	1.22	0.35	0.08	0.21	0.52	0.05
Uniform Delay, d1	16.5	15.1	14.4	20.0	15.9	13.4	15.0	9.1	7.7	8.4	10.1	7.7
Progression Factor	0.94	0.95	0.92	1.00	1.00	1.00	0.78	0.77	0.64	0.17	0.27	0.05
Incremental Delay, d2	3.5	0.2	0.2	125.2	0.3	0.0	130.4	0.5	0.1	1.0	0.9	0.1
Delay (s)	19.1	14.6	13.5	145.2	16.3	13.4	141.9	7.5	4.3	2.4	3.6	0.5
Level of Service	B	B	B	F	B	B	F	A	A	A	A	A
Approach Delay (s)	15.1			66.4			46.4				3.2	
Approach LOS	B			E			D				A	
Intersection Summary												
HCM Average Control Delay	33.0											
HCM Volume to Capacity ratio	1.22											
Actuated Cycle Length (s)	80.0											
Intersection Capacity Utilization	85.3%											
Analysis Period (min)	15											
Critical Lane Group												

Sage / Unser Comm. Dev. (SE Corner)
2014 PM NOBUILD Conditions - New Geom. @ Sage/Unser
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Timings
2: Sage Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
123	462	171	498	627	111	267	561	76	160	868	79
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0	43.0
47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%	47.8%
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimizer?											
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min	Min
Act Eff Green (s)	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
Actuated g/c Ratio	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
v/c Ratio	0.53	0.34	0.26	1.60	0.45	0.16	1.49	0.38	0.11	0.54	0.56
Control Delay	28.5	18.1	10.2	307.1	19.7	3.5	267.5	12.8	1.6	15.4	11.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.5	18.1	10.2	307.1	19.7	3.5	267.5	12.8	1.6	15.4	11.9
LOS	C	B	B	F	B	A	F	B	A	B	A
Approach Delay	18.0										
Approach LOS	B										
Intersection Summary											
Cycle Length: 90											
Actuated Cycle Length: 90											
Offset: 39 (43%), Referenced to phase 2:NBTTL and 6:SBTTL, Start of Green											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 1.60											
Intersection Signal Delay: 66.9											
Intersection Capacity Utilization: 95.3%											
Analysis Period (min): 15											
Shifts and Phases: 2: Sage Rd & Unser Blvd											
	a2										
	a4										
	a6										

Sage / Unser Comm. Dev. (SE Corner)
2014 PM BUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

2: Sage Rd & Unser Blvd

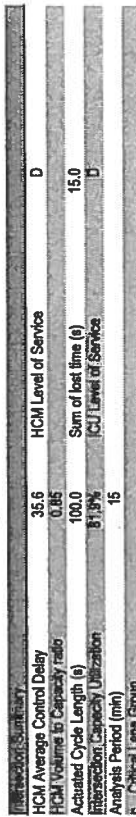
Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
123	462	171	498	627	111	267	561	76	160	868	79
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
1.00	0.95	1.00	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00
1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
1762	3666	1588	1762	3505	1588	1762	3505	1588	1762	3505	1588
0.32	1.00	1.00	0.42	1.00	0.22	1.00	1.00	0.36	1.00	1.00	1.00
595	3505	1588	779	3505	1588	404	3505	1588	670	3505	1588
0.93	0.93	0.93	0.95	0.95	0.95	0.91	0.91	0.91	0.95	0.95	0.95
132	497	184	524	660	117	262	616	84	168	914	83
0	0	47	0	0	88	0	0	45	0	0	44
132	497	137	524	660	49	262	616	84	168	914	83
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4
38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0	38.0
0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
251	1480	662	329	1480	662	189	1636	732	313	1836	732
0.14	0.14	0.14	0.19	0.19	0.19	0.18	0.18	0.18	0.26	0.26	0.26
0.22	0.34	0.21	1.59	0.45	0.37	1.49	0.38	0.05	0.54	0.56	0.56
19.3	17.5	16.5	26.0	18.5	15.5	24.0	15.5	13.1	17.1	17.3	13.1
0.98	0.99	0.97	1.00	1.00	0.79	0.79	0.78	0.39	0.52	0.50	0.27
2.0	0.1	0.2	280.7	0.2	0.0	245.1	0.6	0.1	5.7	1.2	0.1
21.2	17.4	16.2	305.7	18.7	15.8	264.9	12.7	5.3	14.5	10.9	3.8
C	B	B	F	B	B	F	B	A	B	B	A
17.8											
B											
Intersection Summary											
HCM Average Control Delay	66.8										
HCM Volume to Capacity ratio	1.84										
Actuated Cycle Length (s)	90.0										
Intersection Capacity Utilization	95.3%										
Analysis Period (min)	15										
Critical Lane Group											

Sage / Unser Comm. Dev. (SE Corner)
2014 PM BUILD Conditions - New Geom. @ Sage/Unser
D:\ATOBEP\PROJECTS\Sage_Unser_SE\Synchro2014\PRX.syn

[illegible]

Movement	EBL		EBT		ESR		HSL		HBT		HBR		NLL		NET		NBR		SBL		SBT		SBR	
	123	442	171	488	827	111	287	581	76	160	688	79	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Lane Configurations	123	442	171	488	827	111	287	581	76	160	688	79	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Volume (vph)	123	442	171	488	827	111	287	581	76	160	688	79	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Loss Ratio	0.87	0.95	1.00	0.97	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	
Lane Util. Factor	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	
FL	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	0.85	1.00	
FL Protected	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (prot)	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	
FL Permitted	0.95	1.00	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	
Satd. Flow (perm)	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	1558	3400	3505	
Peak-hour factor, PHF	0.93	0.93	0.93	0.85	0.95	0.95	0.85	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	
Adm. Flow (vph)	132	497	184	524	860	117	282	618	84	168	618	84	168	618	84	168	618	84	168	618	84	168	618	
RTOR Reduction (vph)	0	0	14	0	0	70	0	0	38	0	47	0	38	0	47	0	38	0	47	0	38	0	47	
RTOR Reduction (vphpl)	132	497	170	524	860	47	282	618	48	168	618	48	168	618	48	168	618	48	168	618	48	168	618	
Lane Group Flow (vph)	132	497	170	524	860	47	282	618	48	168	618	48	168	618	48	168	618	48	168	618	48	168	618	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6	7	2	
Prod	7	4	5	3	8	1	5	2	3	1	6	7	2	3	1	6	7	2	3	1	6			



Timings
3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	72	407	18	153	15	78	39	45
Volume (vph)	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Turn Type	4	4	8	8	2	2	8	6
Protected Phases	4	4	8	8	2	2	8	6
Permitted Phases	4	4	8	8	2	2	8	6
Detector Phase	4	4	8	8	2	2	8	6
Switch Phase	4	4	8	8	2	2	8	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag								
Lead-Lag Optimize?	None	None	None	None	Min	Min	Min	Min
Recall Mode	None	None	None	None	7.3	7.3	7.3	7.3
Act Effect Green (s)	10.2	10.2	10.2	10.2	7.3	7.3	7.3	7.3
Act Effect Green Ratio	0.37	0.37	0.37	0.37	0.28	0.28	0.28	0.28
Actual g/c Ratio	0.22	0.40	0.07	0.23	0.05	0.28	0.16	0.25
v/c Ratio	7.7	7.3	6.4	6.5	9.3	8.0	10.3	8.8
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Initial Delay	7.7	7.3	6.4	6.5	9.3	8.0	10.3	8.8
LOS	A	A	A	A	A	A	B	A
Approach Delay	7.4	7.4	6.5	6.5	8.2	8.2	7.8	7.8
Approach LOS	A	A	A	A	A	A	A	A
Intersection Summary								
Cycle Length: 45								
Actual Cycle Length: 27.3								
Natural Cycle: 45								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.40								
Intersection Signal Delay: 7.1								
Intersection Capacity Utilization 42.2%								
Analysis Period (min) 15								
Spills and Phases: 3: Sage Rd & 86th St								

HCM Signalized Intersection Capacity Analysis
3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	72	407	18	153	15	78	39	45
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	1.00	0.95	1.00	0.95	1.00	0.94	1.00	0.92
Lane Util. Factor	1.00	0.99	1.00	0.97	1.00	0.94	1.00	0.92
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Flt Permitted	0.57	1.00	0.46	1.00	0.68	1.00	0.67	1.00
Satd Flow (perm)	1059	3480	857	3416	1250	1742	1232	1702
Peak-hour factor, PHF	0.84	0.84	0.84	0.80	0.80	0.90	0.80	0.75
Adj. Flow (vph)	85	485	24	22	24	48	52	60
RTOR Reduction (vph)	0	9	0	0	31	0	0	47
Lane Group Flow (vph)	85	500	0	22	259	0	17	102
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Permitted Phases	4	4	8	8	2	2	6	6
Adjusted Green, G (s)	10.2	10.2	10.2	10.2	7.3	7.3	7.3	7.3
Effective Green, g (s)	10.2	10.2	10.2	10.2	7.3	7.3	7.3	7.3
Adjusted g/c Ratio	0.37	0.37	0.37	0.37	0.27	0.27	0.27	0.27
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	393	1291	318	1287	332	462	327	452
v/c Ratio PHF	0.22	0.39	0.07	0.20	0.05	0.22	0.16	0.15
g/c Ratio	0.08	0.33	0.03	0.03	0.01	0.04	0.04	0.05
Uniform Delay, d1	5.9	6.4	5.6	5.9	7.5	7.9	7.7	7.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2
Delay (s)	6.2	6.5	5.7	6.0	7.6	8.1	8.0	8.0
Level of Service	A	A	A	A	A	A	A	A
Approach Delay (s)	6.5	6.5	5.9	5.9	8.1	8.1	8.0	8.0
Approach LOS	A	A	A	A	A	A	A	A
Intersection Summary								
HCM Average Control Delay	6.8	6.8	6.8	6.8	6.8	6.8	6.8	6.8
HCM Volume to Capacity ratio	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Adjusted Cycle Length (s)	27.5	27.5	27.5	27.5	27.5	27.5	27.5	27.5
Intersection Capacity Utilization	42.2%	42.2%	42.2%	42.2%	42.2%	42.2%	42.2%	42.2%
Analysis Period (min)	15	15	15	15	15	15	15	15
Critical Lane Group								

Sage / Unser Comm. Dev. (SE Corner)
2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
D:\ATOBPROJECTS\Sage_Unser_SE\Synchro2010\AX.syn

Sage / Unser Comm. Dev. (SE Corner)
2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
D:\ATOBPROJECTS\Sage_Unser_SE\Synchro2010\AX.syn

Timings 3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	1	1	1	1	1	1	1	1
Volume (vph)	81	498	31	259	17	88	58	50
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	8	2	2	6	6
Permitted Phases	4	4	8	8	2	2	6	6
Deflector Phase	4	4	8	8	2	2	6	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Minimum Split (s)	24.0	24.0	24.0	24.0	21.0	21.0	21.0	21.0
Total Split (s)	53.3%	53.3%	53.3%	53.3%	46.7%	46.7%	46.7%	46.7%
Total Split (%)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Yellow Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
ALL Red Time (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lead Time Adjust (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimize?	None	None	None	None	Min	Min	Min	Min
Recess Mode	12.1	12.1	12.1	12.1	7.8	7.8	7.8	7.8
Red Eff Green (s)	0.40	0.40	0.40	0.40	0.26	0.26	0.26	0.26
Actuated G/C Ratio	0.25	0.44	0.13	0.28	0.06	0.34	0.25	0.28
v/c Ratio	8.2	7.8	7.1	5.8	10.4	8.7	12.5	7.5
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	8.2	7.8	7.1	5.8	10.4	8.7	12.5	7.5
Total Delay	A	A	A	A	B	A	B	A
LOS	A	A	A	A	B	A	B	A
Approach Delay	7.7	7.7	6.7	6.7	8.9	8.9	8.4	A
Approach LOS	A	A	A	A	A	A	A	A
Intersection Summary								
Cycle Length: 45								
Calculated Cycle Length: 30.3								
Natural Cycle: 45								
Control Type: Actuated-Uncoordinated								
Maximum v/c Ratio: 0.44								
Intersection Signal Delay: 7.5								
Intersection Capacity Utilization 46.3%								
Analysis Period (min): 15								
Splits and Phases: 3: Segn Rd & 86th St								

Splits and Phases: 3: Sage Rd & 86th St



Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	8	1	8	1	8	1	8	1
Volume (vph)	81	498	31	259	58	17	88	50
Ideal Flow (vphpl)	1800	1900	1800	1900	1800	1900	1800	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	0.97	1.00	1.00	1.00	1.00
Flt Protected	1.00	0.99	1.00	0.97	1.00	0.94	1.00	0.92
Flt Permitted	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1752	3483	1752	3409	1752	1728	1752	1701
Flt Permitted	0.52	1.00	0.42	1.00	0.67	1.00	0.65	1.00
Satd. Flow (perm)	355	3483	770	3409	1233	1728	1200	1701
Peak-hour factor, PHF	0.84	0.84	0.80	0.80	0.80	0.90	0.90	0.75
Adj. Flow (vph)	96	593	26	39	324	72	19	67
RTOR Reduction (vph)	0	7	0	0	43	0	52	0
Lane Group Flow (vph)	96	612	0	39	353	0	19	117
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	8	2	2	6	6
Permitted Phases	4	4	8	8	2	2	6	6
Actuated Green, G (s)	12.1	12.1	12.1	12.1	7.8	7.8	7.8	7.8
Effective Green, g (s)	12.1	12.1	12.1	12.1	7.8	7.8	7.8	7.8
Actuated G/C Ratio	0.40	0.40	0.40	0.40	0.26	0.26	0.26	0.26
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	387	1410	312	1380	322	451	313	444
v/c Ratio	0.10	0.25	0.10	0.10	0.02	0.02	0.07	0.05
Uniform Delay, d1	5.9	8.4	5.6	5.9	8.3	8.8	8.7	8.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2	0.1	0.1	0.3	0.4	0.2
Delay (s)	6.2	8.6	5.8	6.0	8.4	9.1	9.2	8.8
Level of Service	A	A	A	A	A	A	A	A
Approach Delay (s)	6.5	8.0	6.0	6.0	9.0	9.0	8.9	8.9
Approach LOS	A	A	A	A	A	A	A	A
Intersection Summary								
HCM Average Control Delay	7.0				HCM Level of Service			
HCM Volume to Capacity ratio	0.37				A			
Actuated Cycle Length (s)	29.9				Sum of lost time (s)			
Intersection Capacity Utilization	46.3%				10.0			
Analysis Period (min)	15				A			
Critical Lane Group								

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Timings 3: Sage Rd & 86th St

Terry O. Brown, P.E.
21/2/2010 - Synchro 7

Move	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4
Volume (vph)	64	240	36	323	15	72	34	104
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	8	8	2	2	6	6
Detected Phase	4	4	8	8	2	2	6	6
Switch Phase	4	4	8	8	2	2	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Spk (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Spk (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Spk (%)	50.9%	50.9%	50.9%	50.9%	49.1%	49.1%	49.1%	49.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effect Green (s)	35.0	35.0	35.0	35.0	10.0	10.0	10.0	10.0
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.18	0.18	0.18	0.18
v/c Ratio	0.12	0.13	0.06	0.17	0.10	0.31	0.17	0.57
Control Delay	5.9	4.5	4.2	3.5	17.5	17.2	16.7	16.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	4.5	4.2	3.5	17.5	17.2	16.7	16.9
LOS	A	A	A	A	B	B	B	B
Approach Delay	4.3	4.3	3.5	3.5	17.2	17.2	17.2	17.2
Approach LOS	A	A	A	A	B	B	B	B
Intersection Summary								
Cycle Length: 55								
Offset: 42 (76%), Referenced to phase 4:EBTL and 8:WBT, Start of Green								
Natural Cycle: 45								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.57								
Intersection Signal Delay: 8.5								
Intersection Capacity Utilization 33.2%								
Analysis Period (min) 15								

Splits and Phases: 3: Sage Rd & 86th St



HCM Signalized Intersection Capacity Analysis 3: Sage Rd & 86th St

Terry O. Brown, P.E.
21/2/2010 - Synchro 7

Move	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	4	4	4	4	4	4	4	4
Volume (vph)	64	240	36	323	15	72	34	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	0.95	1.00	1.00	1.00	1.00
PH	1.00	0.99	1.00	0.99	1.00	0.97	1.00	0.93
PH Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Base Flow (vphpl)	1762	3457	1762	3488	1762	1768	1762	1714
PH Permitted	0.53	1.00	0.57	1.00	0.53	1.00	0.69	1.00
Satd Flow (vphpl)	981	3457	1052	3488	982	1788	1268	1714
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.85	0.85	0.88	0.88
Adj. Flow (vphpl)	72	270	27	28	18	86	22	36
RTOR Reduction (vph)	0	9	0	0	0	18	0	0
Link Group Flow (vph)	72	286	0	38	384	0	18	89
Turn Type	Perm	4	Perm	8	Perm	2	Perm	6
Protected Phases	4	4	8	8	2	2	6	6
Permitted Phases	4	4	8	8	2	2	6	6
Actuated Green, G (s)	35.0	35.0	35.0	35.0	10.0	10.0	10.0	10.0
Effective Green, g (s)	35.0	35.0	35.0	35.0	10.0	10.0	10.0	10.0
Actuated g/C Ratio	0.84	0.84	0.84	0.84	0.18	0.18	0.18	0.18
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	624	2200	669	2207	179	325	231	312
PH Ratio Pct	0.07	0.08	0.04	0.04	0.02	0.05	0.03	0.06
v/c Ratio Perm	0.12	0.13	0.06	0.16	0.10	0.27	0.17	0.46
y/c Ratio	3.9	4.0	3.8	4.1	18.8	19.4	19.0	20.1
Uniform Delay, d1	1.00	1.00	0.77	0.74	1.00	1.00	1.00	1.00
Progression Factor	0.4	0.1	0.1	0.1	0.2	0.5	0.3	1.1
Incremental Delay, d2	4.3	4.1	3.0	3.1	19.0	19.8	19.3	21.2
Delay (s)	A	A	A	A	B	B	B	C
Level of Service	A	A	A	A	B	B	B	C
Approach Delay (s)	4.1	4.1	3.1	3.1	19.7	19.7	20.9	20.9
Approach LOS	A	A	A	A	B	B	C	C
Intersection Summary								
HCM Average Control Delay	9.2							
HCM Level of Service	A							
HCM Volume to Capacity ratio	0.23							
Actuated Cycle Length (s)	55.0							
Intersection Capacity Utilization	33.2%							
Analysis Period (min)	15							
g. Critical Lane Group								

Sage / Unser Comm. Dev. (SE Corner)
2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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Timings 3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
72	259	41	308	17	81	38	116
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	8	8	2	2	8	8
4	4	8	8	2	2	8	8
4.0	3.0	4.0	4.0	4.0	4.0	4.0	4.0
21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
29.0	29.0	29.0	29.0	31.0	31.0	31.0	31.0
48.3%	48.3%	48.3%	48.3%	51.7%	51.7%	51.7%	51.7%
4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
37.5	37.5	37.5	37.5	12.5	12.5	12.5	12.5
0.62	0.62	0.62	0.62	0.21	0.21	0.21	0.21
0.14	0.15	0.07	0.19	0.11	0.31	0.16	0.58
6.9	6.4	3.3	2.9	18.0	16.7	18.7	17.6
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8.9	6.4	3.3	2.9	18.0	16.7	18.7	17.6
A	A	A	A	B	B	B	B
5.7	3.0	A	A	16.9	17.7	B	B
A	A	A	A	B	B	B	B
Cycle Length: 80							
Activated Cycle Length: 60							
Offset: 2 (3%), Referenced to phase 4EBTL and 6WBTL, Start of Green							
Natural Cycle: 45							
Control Type: Actuated-Coordinated							
Maximum v/c Ratio: 0.56							
Intersection Signal Delay: 8.8							
Intersection Capacity Utilization 41.6%							
Analysis Period (min) 15							
Splits and Phases: 3: Sage Rd & 86th St							

Sage / User Comm. Dev. (SE Corner)
2014 PM NOBUILD Conditions - New Geom. @ Sage\user
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HCM Signalized Intersection Capacity Analysis 3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
72	259	41	308	17	81	38	116
Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
4	4	8	8	2	2	8	8
4	4	8	8	2	2	8	8
37.5	37.5	37.5	37.5	12.5	12.5	12.5	12.5
0.62	0.62	0.62	0.62	0.21	0.21	0.21	0.21
5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
584	2161	636	2168	183	372	261	357
0.09	0.09	0.04	0.04	0.02	0.02	0.03	0.03
0.14	0.15	0.07	0.19	0.11	0.27	0.16	0.49
4.8	4.7	4.4	4.8	19.2	19.9	19.5	20.9
1.00	1.00	0.82	0.61	1.00	1.00	1.00	1.00
0.5	0.1	0.2	0.1	0.3	0.4	0.3	1.1
5.1	4.8	2.4	2.6	19.6	20.3	19.8	22.0
A	A	A	A	B	C	B	C
A	A	A	A	20.2	21.7	C	C
A	A	A	A	C	C	C	C
HCM Average Control Delay	9.4	HCM Level of Service	A				
HCM Volume to Capacity Ratio	0.27						
Activated Cycle Length (s)	60.0	Sum of lost time (s)	10.0				
Intersection Capacity Utilization	41.6%	ICU Level of Service	A				
Analysis Period (min)	15						
Critical Lane Group							

Sage / User Comm. Dev. (SE Corner)
2014 PM NOBUILD Conditions - New Geom. @ Sage\user
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Timings 3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Sage / Unsr Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom @ Sage\Unsr
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Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations	72	322	55	420	17	81	57	116
Volume (vph)	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Turn Type	4	4	8	8	2	2	8	8
Protected Phases	4	4	8	8	2	2	8	8
Permitted Phases	4	4	8	8	2	2	8	8
Switch Phase	4	4	8	8	2	2	8	8
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Minimum Split (%)	23.0	23.0	23.0	23.0	22.0	22.0	22.0	22.0
Total Split (%)	51.1%	51.1%	51.1%	51.1%	48.9%	48.9%	48.9%	48.9%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane-Lag Optimize?								
Recall Mode	C-Max	C-Max	C-Max	C-Max	Min	Min	Min	Min
Act Effect Green (s)	25.5	25.5	25.5	25.5	9.5	9.5	9.5	9.5
Adjusted G/C Ratio	0.57	0.57	0.57	0.57	0.21	0.21	0.21	0.21
v/c Ratio	0.18	0.20	0.11	0.25	0.09	0.34	0.25	0.55
Control Delay	7.2	6.6	4.1	3.4	13.1	12.4	15.5	13.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	7.2	6.6	4.1	3.4	13.1	12.4	15.5	13.0
LOS	A	A	A	A	B	B	B	B
Approach Delay	5.9	5.9	3.4	3.4	12.4	12.4	13.5	13.5
Approach LOS	A	A	A	A	B	B	B	B
Intersection Summary								
Cycle Length: 45								
Offset: 4 (9%), Referenced to phase 4:EBTL and 8:WBT, Start of Green								
Natural Cycle: 45								
Control Type: Actuated-Coordinated								
Maximum v/c Ratio: 0.35								
Intersection Signal Delay: 7.3								
Intersection Capacity Utilization 43.7%								
Analysis Period (min) 15								
Splits and Phases: 3: Sage Rd & 86th St								

HCM Signalized Intersection Capacity Analysis 3: Sage Rd & 86th St

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Sage / Unsr Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom @ Sage\Unsr
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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	72	322	27	55	420	46	17	81	35	57	116	104
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95
Lane Util. Factor	1.00	0.98	1.00	0.98	1.00	0.98	1.00	0.95	1.00	0.95	1.00	0.93
Flt Protected	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00	0.95	1.00
Satd Flow (prot)	1762	3465	1762	3465	1762	3465	1762	1761	1762	1761	1762	1714
Flt Permitted	0.47	1.00	0.52	1.00	0.52	1.00	0.58	1.00	0.67	1.00	0.67	1.00
Satd Flow (perm)	853	3465	853	3465	853	3465	1029	1761	1236	1714	1236	1714
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.85	0.85	0.85	0.88	0.88	0.88
Adj. Flow (vph)	91	392	30	59	447	49	20	95	41	65	132	118
RTOR Reduction (vph)	0	10	0	0	13	0	0	32	0	0	91	0
Lane Group Flow (vph)	81	392	0	69	483	0	20	104	0	65	159	0
Turn Type	Perm	4	Perm	Perm	8	Perm	2	Perm	2	Perm	6	Perm
Permitted Phases	4	4	4	4	8	4	4	4	4	4	8	4
Actuated Green, G (s)	25.5	25.5	25.5	25.5	25.5	25.5	9.5	9.5	9.5	9.5	9.5	9.5
Effective Green, g (s)	25.5	25.5	25.5	25.5	25.5	25.5	9.5	9.5	9.5	9.5	9.5	9.5
Adjusted G/C Ratio	0.57	0.57	0.57	0.57	0.57	0.57	0.21	0.21	0.21	0.21	0.21	0.21
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	492	1984	544	1957	217	372	261	362	261	362	6109	544
V/C Ratio	0.09	0.11	0.06	0.09	0.11	0.06	0.02	0.06	0.02	0.06	0.09	0.06
v/c Ratio Perm	0.16	0.19	0.11	0.25	0.25	0.25	0.09	0.28	0.09	0.25	0.44	0.25
Uniform Delay, d1	4.7	4.7	4.5	4.5	4.5	4.5	14.3	14.9	14.3	14.8	15.4	14.8
Progression Factor	1.00	1.00	0.84	0.84	0.84	0.84	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.7	0.2	0.3	0.2	0.2	0.2	0.2	0.4	0.2	0.4	0.5	0.9
Delay (s)	5.4	5.0	3.2	3.2	3.2	3.2	14.5	15.3	14.5	15.3	16.3	15.3
Level of Service	A	A	A	A	A	A	B	B	B	B	B	B
Approach Delay (s)	5.0	5.0	3.2	3.2	3.2	3.2	15.2	16.1	15.2	16.1	16.1	16.1
Approach LOS	A	A	A	A	A	A	B	B	B	B	B	B
Intersection Summary												
HCM Average Control Delay	7.7	7.7	7.7	7.7	7.7	7.7	10.0	10.0	10.0	10.0	10.0	10.0
HCM Volume to Capacity ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Actuated Cycle Length (s)	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0	45.0
Intersection Capacity Utilization	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%	43.7%
Analysis Period (min)	15	15	15	15	15	15	15	15	15	15	15	15
Critical Lane Group												

Timings

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	194	311	32	144	107	136	29	326	187	232	214
Volume (vph)	194	311	32	144	107	136	29	326	187	232	214
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	8	6
Permitted Phases	4	4	4	8	8	8	2	2	2	8	6
Detector Phase	4	4	4	8	8	8	2	2	2	8	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Yellow (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Minimum Split (s)	23.0	23.0	23.0	23.0	23.0	23.0	27.0	27.0	27.0	27.0	27.0
Total Split (%)	46.0%	46.0%	46.0%	46.0%	46.0%	46.0%	54.0%	54.0%	54.0%	54.0%	54.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag											
Lead-Lag Optimizer?											
Round Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max
Act Eff Green (s)	15.1	15.1	15.1	15.1	15.1	15.1	24.9	24.9	24.9	24.9	24.9
Act Eff Green Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.50	0.50	0.50	0.50	0.50
Actuated G/C Ratio	0.70	0.39	0.09	0.65	0.25	0.29	0.08	0.21	0.24	0.52	0.13
v/c Ratio	26.4	14.3	4.7	26.1	13.1	3.8	8.4	8.3	2.5	6.9	5.0
Control Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Queue Delay	25.4	14.3	4.7	26.1	13.1	3.8	8.4	8.3	2.5	6.9	5.0
Total Delay	25.4	14.3	4.7	26.1	13.1	3.8	8.4	8.3	2.5	6.9	5.0
LOS	C	B	A	C	B	A	A	A	A	A	A
Approach Delay	17.7			14.7			6.3			6.0	
Approach LOS	B			B			A			A	
Intersection Summary											
Cycle Length: 50											
Actuated Cycle Length: 50											
Offset: 48 (95%), Referenced to phase 2:NBT, Start of Green											
Natural Cycle: 45											
Control Type: Actuated-Coordinated											
Maximum v/c Ratio: 0.70											
Intersection Signal Delay: 11.3											
Intersection Capacity Utilization: 55.1%											
Analysis Period (min): 15											
Spills and Phases: 4: Arenal Rd & Unser Blvd											

Sage / Unser Comm. Dev. (SE Corner)

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Lane Configurations	194	311	32	144	107	136	29	326	187	232	214
Volume (vph)	194	311	32	144	107	136	29	326	187	232	214
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt Flow (vphpl)	1762	3505	1608	1762	1845	1608	1762	3505	1608	1762	3505
Flt Permitted	0.87	1.00	0.51	1.00	1.00	0.81	1.00	1.00	0.53	1.00	1.00
SSAT Flow (norm)	1235	3505	1558	1235	1345	1558	1235	3505	1558	1235	3505
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	209	415	415	185	137	174	33	375	215	252	233
RTOR Reduction (vph)	0	0	30	0	0	121	0	0	108	0	0
Line Group Flow (vph)	209	415	13	185	137	63	33	375	107	252	233
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Permitted Phases	4	4	4	8	8	8	2	2	2	8	6
Actuated Green, G (s)	15.1	15.1	15.1	15.1	15.1	15.1	24.9	24.9	24.9	24.9	24.9
Effective Green, g (s)	15.1	15.1	15.1	15.1	15.1	15.1	24.9	24.9	24.9	24.9	24.9
Actuated G/C Ratio	0.30	0.30	0.30	0.30	0.30	0.30	0.50	0.50	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	373	1059	474	284	557	474	557	1745	781	486	1745
v/c Ratio Pct	0.12			0.07			0.11			0.07	
v/c Ratio Perm	0.21	0.39	0.03	0.05	0.25	0.11	0.06	0.21	0.14	0.52	0.13
Uniform Delay, d1	15.4	13.8	12.3	15.2	13.2	12.6	6.5	7.1	6.8	6.5	6.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.57	0.62
Incremental Delay, d2	5.5	0.2	0.0	5.3	0.2	0.1	0.2	0.3	0.4	2.8	0.1
Delay (s)	20.9	14.1	12.3	20.4	13.4	12.7	6.7	7.3	7.1	9.3	6.8
Level of Service	C	B	B	C	B	B	A	A	A	A	A
Approach Delay (s)	18.4			15.3			7.2			5.5	
Approach LOS	B			B			A			A	
Intersection Summary											
HCM Average Control Delay	11.3										
HCM Volume to Capacity ratio	0.58										
Actuated Cycle Length (s)	50.0										
Intersection Capacity Utilization	55.1%										
Analysis Period (min)	15										
Critical Lane Group											

Sage / Unser Comm. Dev. (SE Corner)

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
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Timings
4: Arenal Rd & Unser Blvd

HCM Signalized Intersection Capacity Analysis
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Line Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	216	346	61	163	121	183	59	584	237	284	324	113
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Flt	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3505	1668	1752	1845	1668	1752	3505	1668	1752	3505	1668
Flt Permitted	0.66	1.00	1.00	0.47	1.00	1.00	0.54	1.00	1.00	0.39	1.00	1.00
SSBL Flow (perm)	1215	3505	1558	1617	1845	1668	988	3505	1588	1762	3505	1588
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	288	481	88	259	155	235	88	671	272	309	352	123
RTOR Reduction (vph)	0	0	48	0	0	123	0	82	0	0	0	81
Lane Group Flow (vph)	288	481	20	259	155	112	88	671	190	308	352	62
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	8	2	2	8	8	6
Permitted Phases	4	4	4	8	8	8	8	2	2	8	8	6
Actuated Green, G (s)	14.7	14.7	14.7	14.7	14.7	14.7	25.3	25.3	25.3	25.3	25.3	25.3
Effective Green, g (s)	14.7	14.7	14.7	14.7	14.7	14.7	25.3	25.3	25.3	25.3	25.3	25.3
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.51	0.51	0.51	0.51	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	357	1030	481	255	542	481	505	1774	783	355	1774	783
v/s Ratio Prot	0.13	0.13	0.13	0.06	0.06	0.06	0.19	0.19	0.19	0.19	0.19	0.19
v/s Ratio Perm	0.24	0.45	0.04	0.82	0.29	0.24	0.13	0.38	0.34	0.57	0.20	0.08
Uniform Delay, d1	16.3	14.3	12.8	16.4	13.6	13.4	6.5	7.5	6.9	10.9	8.8	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.5	0.3	0.0	18.2	0.3	0.3	0.6	0.6	0.7	21.8	0.2	0.2
Delay (s)	28.8	14.7	12.7	34.6	13.9	13.7	7.1	8.2	7.7	30.6	5.4	4.8
Level of Service	C	B	B	C	B	B	A	A	A	C	A	A
Approach Delay (s)	19.5	19.5	21.1	21.1	21.1	21.1	8.0	8.0	8.0	16.2	16.2	8.0
Approach LOS	B	B	C	C	C	C	A	A	A	B	B	B
Intersection Summary												
HCM Average Control Delay	15.1											
HCM Volume to Capacity Ratio	0.85											
Actuated Cycle Length (s)	50.0											
Intersection Capacity Utilization	85.1%											
Analysis Period (min)	15											
Chifford Lane Group												

Timings
4: Arenal Rd & Unser Blvd

HCM Signalized Intersection Capacity Analysis
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Line Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	216	346	61	163	121	183	59	584	237	284	324	113
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost Time (s)	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Lane Util. Factor	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00	0.95	1.00
Flt	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1752	3505	1668	1752	1845	1668	1752	3505	1668	1752	3505	1668
Flt Permitted	0.66	1.00	1.00	0.47	1.00	1.00	0.54	1.00	1.00	0.39	1.00	1.00
SSBL Flow (perm)	1215	3505	1558	1617	1845	1668	988	3505	1588	1762	3505	1588
Peak-hour factor, PHF	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Adj. Flow (vph)	288	481	88	259	155	235	88	671	272	309	352	123
RTOR Reduction (vph)	0	0	48	0	0	123	0	82	0	0	0	81
Lane Group Flow (vph)	288	481	20	259	155	112	88	671	190	308	352	62
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	8	2	2	8	8	6
Permitted Phases	4	4	4	8	8	8	8	2	2	8	8	6
Actuated Green, G (s)	14.7	14.7	14.7	14.7	14.7	14.7	25.3	25.3	25.3	25.3	25.3	25.3
Effective Green, g (s)	14.7	14.7	14.7	14.7	14.7	14.7	25.3	25.3	25.3	25.3	25.3	25.3
Actuated g/C Ratio	0.29	0.29	0.29	0.29	0.29	0.29	0.51	0.51	0.51	0.51	0.51	0.51
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	357	1030	481	255	542	481	505	1774	783	355	1774	783
v/s Ratio Prot	0.13	0.13	0.13	0.06	0.06	0.06	0.19	0.19	0.19	0.19	0.19	0.19
v/s Ratio Perm	0.24	0.45	0.04	0.82	0.29	0.24	0.13	0.38	0.34	0.57	0.20	0.08
Uniform Delay, d1	16.3	14.3	12.8	16.4	13.6	13.4	6.5	7.5	6.9	10.9	8.8	6.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	12.5	0.3	0.0	18.2	0.3	0.3	0.6	0.6	0.7	21.8	0.2	0.2
Delay (s)	28.8	14.7	12.7	34.6	13.9	13.7	7.1	8.2	7.7	30.6	5.4	4.8
Level of Service	C	B	B	C	B	B	A	A	A	C	A	A
Approach Delay (s)	19.5	19.5	21.1	21.1	21.1	21.1	8.0	8.0	8.0	16.2	16.2	8.0
Approach LOS	B	B	C	C	C	C	A	A	A	B	B	B
Intersection Summary												
HCM Average Control Delay	15.1											
HCM Volume to Capacity Ratio	0.85											
Actuated Cycle Length (s)	50.0											
Intersection Capacity Utilization	85.1%											
Analysis Period (min)	15											
Chifford Lane Group												

Sage / Unser Comm. Dev. (SE Corner)
2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
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Sage / Unser Comm. Dev. (SE Corner)
2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
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Timings

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro7

Line Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Line Configurations	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	238	346	51	163	121	234	59	623	237	330	360
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6
Detector Phases	4	4	4	8	8	8	2	2	2	6	6
Switch Phase	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Initial (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Total Split (%)	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Road Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag											
Lead-Lag Optimize?	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max
Recall Mode	18.0	18.0	18.0	18.0	18.0	18.0	34.0	34.0	34.0	34.0	34.0
Act Effct Green (s)	0.27	0.27	0.27	0.27	0.27	0.27	0.57	0.57	0.57	0.57	0.57
Adjusted G/C Ratio	0.98	0.49	0.15	0.99	0.32	0.53	0.12	0.36	0.29	0.96	0.20
Control Delay	71.8	20.7	6.2	88.2	19.8	10.2	6.9	7.7	4.8	46.2	4.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	71.8	20.7	6.2	88.2	19.8	10.2	6.9	7.7	4.8	46.2	4.3
LOS	E	C	A	F	B	B	A	A	A	D	A
Approach Delay	38.7			37.0			6.9			20.8	
Approach LOS	D			D			A			C	
Intersection Summary											
Cycle Length: 60											
Adjusted Cycle Length: 60											
Offset: 39 (65%), Referenced to phase 2/NBTL, Start of Green											
Natural Cycle: 55											
Control Type: Actuated-Coordinated											
Minimum Wt Ratio: 0.99											
Intersection Signal Delay: 24.0											
Intersection Capacity Utilization: 71.7%											
Analysis Period (min): 15											
Spots and Phases: 4: Arenal Rd & Unser Blvd											

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBR
Line Configurations	4	4	4	4	4	4	4	4	4	4	4
Volume (vph)	238	346	51	163	121	234	59	623	237	330	360
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Satd Flow (vph)	1752	3505	1598	1752	1845	1888	1752	3505	1598	1752	3505
Flt Permitted	0.66	1.00	1.00	0.43	1.00	1.00	0.52	1.00	1.00	0.38	1.00
Satd Flow (vph)	1215	3505	1598	794	1845	1598	861	3505	1598	861	3505
Peak-hour factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.87	0.87	0.87	0.92	0.92
Adj Flow (vph)	317	461	58	209	155	300	58	718	272	359	391
RTOR Reduction (vph)	0	0	50	0	0	153	0	0	46	0	0
Lane Group Flow (vph)	317	461	58	209	155	147	58	718	224	359	391
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	8	8	8	2	2	2	6	6
Permitted Phases	4	4	4	8	8	8	2	2	2	6	6
Actuated Green, G (s)	16.0	16.0	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0	34.0
Effective Green, g (s)	16.0	16.0	16.0	16.0	16.0	16.0	34.0	34.0	34.0	34.0	34.0
Adjusted G/C Ratio	0.27	0.27	0.27	0.27	0.27	0.27	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	324	935	416	212	492	418	545	1966	889	375	1988
Wt Ratio Prot	0.13			0.58			0.20			0.11	
Wt Ratio Perm	0.26	0.01	0.01	0.26	0.09	0.07	0.14	0.54	0.05	0.05	0.05
Wt Ratio	0.96	0.49	0.04	0.99	0.32	0.35	0.72	0.96	0.25	0.20	0.09
Uniform Delay, d1	21.8	18.6	16.3	21.9	17.6	17.8	6.1	7.1	6.8	12.3	5.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.84	0.58
Incremental Delay, d2	43.6	0.4	0.0	57.3	0.4	0.5	0.5	0.5	0.7	31.7	0.2
Delay (s)	65.8	19.0	16.4	79.2	18.0	18.3	6.6	7.6	7.3	39.1	4.2
Level of Service	E	B	B	E	B	B	A	A	A	D	A
Approach Delay (s)	36.2			37.4			7.4			18.1	
Approach LOS	D			D			A			B	
Intersection Summary											
HCM Average Control Delay	23.0										
HCM Volume to Capacity ratio	0.97										
Actuated Cycle Length (s)	60.0										
Intersection Capacity Utilization	71.7%										
Analysis Period (min)	15										
Critical Lane Group											

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom @ Sage/Unser
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Timings

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.

2/21/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	238	346	51	163	121	234	59	623	237	330	360	133
Volume (vph)	Perm	Perm	Perm	pm+pt	pm+ov	Perm	pm+ov	pm+pt	Perm	Perm	Perm	Perm
Turn Type	Perm	Perm	Perm	pm+pt	pm+ov	Perm	pm+ov	pm+pt	Perm	Perm	Perm	Perm
Protected Phases	4	4	4	3	8	1	2	3	1	6	6	6
Permitted Phases	4	4	4	3	8	1	2	3	1	6	6	6
Detector Phase	4	4	4	3	8	1	2	3	1	6	6	6
Switch Phase	4	4	4	3	8	1	2	3	1	6	6	6
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0	21.0	10.0
Total Split (s)	31.0	31.0	31.0	10.0	41.0	20.0	29.0	21.0	10.0	20.0	49.0	49.0
Total Split (%)	34.4%	34.4%	34.4%	11.1%	45.6%	22.2%	32.2%	11.1%	22.2%	54.4%	54.4%	54.4%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead	Lead	Lag	Lag	Lead	Lead	Lag	Lag	Lag
Lead-Lag Optimize?	Recall Mode	Min	Min	Min	None	Min	None	C-Max	C-Max	None	None	C-Max
Act. Effect Green (s)	25.1	25.1	25.1	35.1	35.1	55.2	24.8	34.8	44.9	44.9	44.9	44.9
Actuated g/C Ratio	0.28	0.28	0.28	0.39	0.39	0.61	0.28	0.39	0.50	0.50	0.50	0.50
v/c Ratio	0.94	0.47	0.14	0.70	0.22	0.31	0.26	0.74	0.40	0.92	0.22	0.17
Control Delay	68.1	28.5	7.1	34.8	18.9	8.2	29.3	35.5	12.2	50.7	13.4	2.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	28.5	7.1	34.8	18.9	8.2	29.3	35.5	12.2	50.7	13.4	2.8
LOS	E	C	A	C	B	A	C	D	B	D	B	A
Approach Delay	41.6				19.1			29.1			26.7	
Approach LOS	D				B			C			C	

Intersection Summary

Cycle Length: 90
 Actuated Cycle Length: 90
 Offset: 0 (0%), Referenced to phase 2:NBT and 6:SBTL, Start of Green
 Natural Cycle: 90
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.94
 Intersection Signal Delay: 29.6
 Intersection Capacity Utilization 71.7%
 Analysis Period (min) 15

Intersection LOS: C
 ICU Level of Service C

Splits and Phases: 4: Arenal Rd & Unser Blvd



HCM Signalized Intersection Capacity Analysis

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.

2/21/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	238	346	51	163	121	234	59	623	237	330	360	133
Volume (vph)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Ideal Flow (vphpl)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Total Lost time (s)	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Lane Util. Factor	0.95	1.00	0.85	1.00	1.00	0.85	1.00	0.95	1.00	0.85	1.00	0.85
Fit	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	1.00	0.85	1.00	0.85
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	1845	1568	1752	3505	1568	1752	3505	1568
Fit Permitted	0.66	1.00	1.00	0.32	1.00	1.00	0.52	1.00	1.00	0.16	1.00	1.00
Satd. Flow (perm)	1215	3505	1568	596	1845	1568	961	3505	1568	294	3505	1568
Peak-hour factor, PHF	0.75	0.75	0.75	0.78	0.78	0.78	0.87	0.87	0.87	0.92	0.92	0.92
Adj. Flow (vph)	317	461	68	209	155	300	68	716	272	359	391	145
RTOR Reduction (vph)	0	0	49	0	0	13	0	88	0	0	73	0
Lane Group Flow (vph)	317	461	19	209	155	287	68	716	184	359	391	72
Turn Type	Perm	Perm	pm+pt	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+ov	pm+pt	Perm	Perm
Protected Phases	4	4	8	8	2	2	6	6	6	6	6	6
Permitted Phases	4	4	8	8	2	2	6	6	6	6	6	6
Actuated Green, G (s)	25.1	25.1	25.1	35.1	35.1	50.2	24.8	24.8	29.8	44.9	44.9	44.9
Effective Green, g (s)	25.1	25.1	25.1	35.1	35.1	50.2	24.8	24.8	29.8	44.9	44.9	44.9
Actuated g/C Ratio	0.28	0.28	0.28	0.39	0.39	0.56	0.28	0.28	0.33	0.50	0.50	0.50
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	339	978	437	297	720	962	265	966	606	391	1749	782
v/c Ratio Prot	c0.26	0.13	c0.04	0.08	0.05	0.20	0.02	c0.15	0.11	0.05	0.09	0.05
v/c Ratio Perm	0.94	0.47	0.04	0.70	0.22	0.30	0.26	0.74	0.30	0.92	0.22	0.17
Uniform Delay, d1	31.7	26.9	23.7	22.7	18.3	10.6	25.4	29.7	22.4	20.9	12.7	11.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	32.3	0.4	0.0	7.4	0.2	2.3	5.1	0.3	25.9	0.3	0.2	0.2
Delay (s)	63.9	27.3	23.7	30.1	18.4	10.7	27.7	34.8	22.7	46.8	13.0	12.1
Level of Service	E	C	C	C	B	B	C	C	C	D	B	B
Approach Delay (s)	40.7				18.6			31.2			26.4	
Approach LOS	D				B			C			C	

Intersection Summary

HCM Average Control Delay 29.9
 HCM Volume to Capacity ratio 0.89
 Actuated Cycle Length (s) 90.0
 Intersection Capacity Utilization 71.7%
 Analysis Period (min) 15
 Critical Lane Group

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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A-79a

Timings
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	75	153	47	181	181	184	38	198	95	216	396	111
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	8		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	8
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
Total Split (%)	41.8%	41.8%	41.8%	41.8%	41.8%	41.8%	58.2%	58.2%	58.2%	58.2%	58.2%	58.2%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	13.5	13.5	13.5	13.5	13.5	13.5	31.5	31.5	31.5	31.5	31.5	31.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.57	0.57	0.57	0.57	0.57	0.57
v/c Ratio	0.30	0.20	0.12	0.61	0.44	0.38	0.09	0.11	0.12	0.40	0.24	0.14
Control Delay	18.0	15.6	6.5	28.5	19.5	4.8	7.6	6.8	2.3	7.3	4.9	1.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	18.0	15.6	6.5	28.5	19.5	4.8	7.6	6.8	2.3	7.3	4.9	1.7
LOS	B	B	A	C	B	A	A	A	A	A	A	A
Approach Delay		14.5			16.5			5.5			5.1	
Approach LOS		B			B			A			A	

Intersection Summary												
Cycle Length: 55												
Actuated Cycle Length: 55												
Offset: 33 (60%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 45												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.61												
Intersection Signal Delay: 9.6												
Intersection Capacity Utilization 47.8%												
Analysis Period (min) 15												

Splits and Phases: 4: Arenal Rd & Unser Blvd



Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔	↔
Volume (vph)	75	153	47	181	181	184	38	198	95	216	396	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1558	1752	1845	1558	1752	3505	1558	1752	3505	1558
Flt Permitted	0.83	1.00	1.00	0.84	1.00	1.00	0.48	1.00	1.00	0.61	1.00	1.00
Satd. Flow (perm)	1154	3505	1558	1185	1845	1558	884	3505	1558	1122	3505	1558
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	84	172	53	177	199	202	44	230	110	260	477	134
RTOR Reduction (vph)	0	0	40	0	0	152	0	47	0	0	0	57
Lane Group Flow (vph)	84	172	13	177	199	50	44	230	63	260	477	77
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	13.5	13.5	13.5	13.5	13.5	13.5	31.5	31.5	31.5	31.5	31.5	31.5
Effective Green, g (s)	13.5	13.5	13.5	13.5	13.5	13.5	31.5	31.5	31.5	31.5	31.5	31.5
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.57	0.57	0.57	0.57	0.57	0.57
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	283	880	385	291	453	385	508	2007	898	643	2007	898
v/s Ratio Prot		0.05			0.11			0.07			0.14	
v/s Ratio Perm	0.07		0.01	c0.15		0.03	0.05		0.04	c0.23		0.05
v/c Ratio	0.30	0.20	0.03	0.61	0.44	0.13	0.09	0.11	0.07	0.40	0.24	0.09
Uniform Delay, d1	16.9	16.5	15.8	18.4	17.5	16.2	5.3	5.4	5.2	8.5	5.8	5.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.88	0.75
Incremental Delay, d2	0.6	0.1	0.0	3.6	0.7	0.2	0.3	0.1	0.2	1.6	0.2	0.2
Delay (s)	17.5	16.6	15.8	22.0	18.2	16.3	5.6	5.5	5.4	6.0	4.2	4.1
Level of Service	B	B	B	C	B	B	A	A	A	A	A	A
Approach Delay (s)		18.7			18.7			5.5			4.7	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM Average Control Delay												
HCM Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
Critical Lane Group												

Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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Timings

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.

2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	84	171	83	223	207	267	68	558	113	279	781	132
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	39.0	39.0	39.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	39.0	39.0	39.0	39.0	39.0	39.0
Total Split (%)	35.0%	35.0%	35.0%	35.0%	35.0%	35.0%	65.0%	65.0%	65.0%	65.0%	65.0%	65.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Eff Green (s)	15.1	15.1	15.1	15.1	15.1	15.1	34.9	34.9	34.9	34.9	34.9	34.9
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.58	0.58	0.58	0.58	0.58	0.58
v/c Ratio	0.36	0.22	0.20	0.84	0.49	0.51	0.28	0.32	0.14	0.79	0.46	0.16
Control Delay	22.6	18.1	5.9	48.0	22.9	8.0	10.0	7.2	1.8	19.2	4.1	0.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.6	18.1	5.9	48.0	22.9	8.0	10.0	7.2	1.8	19.2	4.1	0.9
LOS	C	B	A	D	C	A	B	A	A	B	A	A
Approach Delay		16.2			25.2			6.6		7.3		
Approach LOS		B			C			A		A		

Intersection Summary

Cycle Length: 60

Actuated Cycle Length: 60

Offset: 21 (35%), Referenced to phase 2:NBT and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/c Ratio: 0.84

Intersection Signal Delay: 12.1

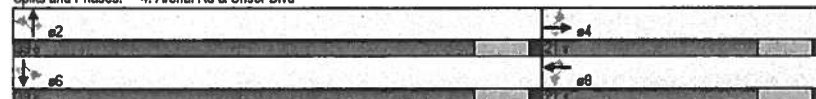
Intersection LOS: B

Intersection Capacity Utilization 84.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Arenal Rd & Unser Blvd



Sage / Unser Comm. Dev. (SE Corner)

2014 PM NOBUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis

4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.

2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Volume (vph)	84	171	83	223	207	267	68	558	113	279	781	132
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1762	3505	1568	1762	1845	1568	1762	3505	1568	1762	3505	1568
Flt Permitted	0.56	1.00	1.00	0.63	1.00	1.00	0.26	1.00	1.00	0.40	1.00	1.00
Satd. Flow (perm)	1028	3505	1568	1164	1845	1568	488	3505	1568	731	3505	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	94	192	93	245	227	293	79	647	131	336	941	159
RTOR Reduction (vph)	0	0	70	0	0	184	0	0	55	0	0	67
Lane Group Flow (vph)	94	192	23	245	227	109	79	647	76	336	941	92
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2		6		6
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	15.1	15.1	15.1	15.1	15.1	15.1	34.9	34.9	34.9	34.9	34.9	34.9
Effective Green, g (s)	15.1	15.1	15.1	15.1	15.1	15.1	34.9	34.9	34.9	34.9	34.9	34.9
Actuated g/C Ratio	0.25	0.25	0.25	0.25	0.25	0.25	0.58	0.58	0.58	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	258	882	395	293	464	395	284	2039	912	425	2039	912
v/c Ratio Prot		0.05			0.12			0.16		0.46		0.06
v/c Ratio Perm	0.09		0.01	0.21		0.07	0.16		0.05	0.46		0.06
v/c Ratio	0.36	0.22	0.06	0.34	0.49	0.28	0.28	0.32	0.08	0.79	0.46	0.10
Uniform Delay, d1	18.5	17.8	17.1	21.3	19.2	18.1	6.3	6.4	5.5	9.7	7.2	5.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.49	0.47	0.49
Incremental Delay, d2	0.9	0.1	0.1	18.3	0.8	0.4	2.4	0.4	0.2	10.5	0.5	0.2
Delay (s)	19.4	17.9	17.1	39.6	20.0	18.4	8.7	6.8	6.7	16.2	3.9	2.9
Level of Service	B	B	B	D	B	B	A	A	A	B	A	A
Approach Delay (s)		18.1			25.7			6.8		6.4		
Approach LOS		B			C			A		A		

Intersection Summary

HCM Average Control Delay

HCM Level of Service

B

HCM Volume to Capacity ratio

0.80

Actuated Cycle Length (s)

60.0

Sum of lost time (s)

10.0

Intersection Capacity Utilization

84.6%

ICU Level of Service

C

Analysis Period (min)

15

Critical Lane Group

Sage / Unser Comm. Dev. (SE Corner)

2014 PM NOBUILD Conditions - New Geom. @ Sage/Unser
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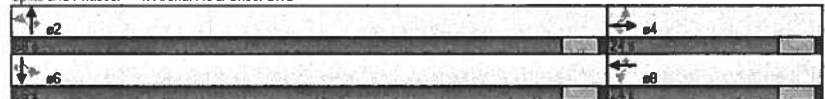
Timings
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑
Volume (vph)	111	171	83	223	207	330	68	605	113	341	829	159
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2		6		
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	8	8	8	2	2	2	6	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
Total Split (s)	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	26.7%	73.3%	73.3%	73.3%	73.3%	73.3%	73.3%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag												
Lead-Lag Optimize?												
Recess Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	C-Max	C-Max	C-Max	C-Max
Act Effct Green (s)	19.0	19.0	19.0	19.0	19.0	19.0	61.0	61.0	61.0	61.0	61.0	61.0
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.88	0.88	0.88	0.88	0.88	0.88
v/c Ratio	0.72	0.26	0.23	1.00	0.58	0.66	0.25	0.30	0.12	0.89	0.42	0.17
Control Delay	57.9	30.7	8.3	94.7	38.8	14.4	8.0	6.2	1.2	33.1	7.9	1.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	57.9	30.7	8.3	94.7	38.8	14.4	8.0	6.2	1.2	33.1	7.9	1.9
LOS	E	C	A	F	D	B	A	A	A	C	A	A
Approach Delay	33.9				44.8			5.7			13.6	
Approach LOS	C				D			A			B	

Intersection Summary												
Cycle Length: 90												
Actuated Cycle Length: 90												
Offset: 28 (31%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 70												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 1.00												
Intersection Signal Delay: 20.8												
Intersection Capacity Utilization 69.4%												
Analysis Period (min) 15												

Splits and Phases: 4: Arenal Rd & Unser Blvd



Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑	↑↑	↑↑	↑
Volume (vph)	111	171	83	223	207	330	68	605	113	341	829	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Fr	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Fr Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	1845	1568	1752	3505	1568	1752	3505	1568
Fr Permitted	0.45	1.00	1.00	0.83	1.00	1.00	0.25	1.00	1.00	0.37	1.00	1.00
Satd. Flow (perm)	824	3505	1568	1164	1845	1568	489	3505	1568	680	3505	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	125	192	93	245	227	363	79	703	131	411	999	192
RTOR Reduction (vph)	0	0	73	0	0	223	0	0	42	0	0	62
Lane Group Flow (vph)	125	192	20	245	227	145	79	703	89	411	999	130
Turn Type	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm	Perm
Protected Phases		4			8			2		6		
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	19.0	19.0	19.0	19.0	19.0	19.0	61.0	61.0	61.0	61.0	61.0	61.0
Effective Green, g (s)	19.0	19.0	19.0	19.0	19.0	19.0	61.0	61.0	61.0	61.0	61.0	61.0
Actuated g/C Ratio	0.21	0.21	0.21	0.21	0.21	0.21	0.88	0.88	0.88	0.88	0.88	0.88
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	174	740	331	246	390	331	318	2376	1063	461	2376	1063
v/s Ratio Prot		0.05			0.12			0.20			0.29	
v/s Ratio Perm	0.15		0.01	c0.21		0.09	0.17		0.06	c0.60		0.08
v/c Ratio	0.72	0.26	0.08	1.00	0.58	0.42	0.25	0.30	0.08	0.89	0.42	0.12
Uniform Delay, d1	33.0	29.6	28.4	35.5	31.9	30.7	5.6	5.8	5.0	11.8	6.5	5.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.12	1.12	2.08
Incremental Delay, d2	13.2	0.2	0.1	55.9	2.2	0.9	1.9	0.3	0.2	16.9	0.4	0.2
Delay (s)	46.2	29.8	28.4	91.4	34.1	31.6	7.5	6.2	6.1	30.1	7.7	10.8
Level of Service	D	C	C	F	C	C	A	A	A	C	A	B
Approach Delay (s)		34.5			49.8			6.1		13.8		
Approach LOS		C			D			A		B		

Intersection Summary		
HCM Average Control Delay	22.2	HCM Level of Service C
HCM Volume to Capacity ratio	0.92	
Actuated Cycle Length (s)	90.0	Sum of lost time (s) 10.0
Intersection Capacity Utilization	69.4%	ICU Level of Service C
Analysis Period (min)	15	
p Critical Lane Group		

Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom. @ Sage/Unser
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Timings 4: Arenal Rd & Unser Blvd

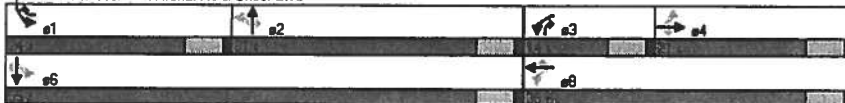
Terry O. Brown, P.E.
2/21/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	111	171	83	223	207	330	68	605	113	341	829	159
Volume (vph)	111	171	83	223	207	330	68	605	113	341	829	159
Turn Type	Perm		Perm	pm+pt		pm+ov	Perm		pm+ov	pm+pt		Perm
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	4	3	8	1	2	2	3	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	21.0	10.0	21.0	10.0	21.0	21.0	10.0	10.0	21.0	21.0
Total Split (s)	21.0	21.0	21.0	14.0	35.0	24.0	31.0	31.0	14.0	24.0	55.0	55.0
Total Split (%)	23.3%	23.3%	23.3%	15.6%	38.9%	26.7%	34.4%	34.4%	15.6%	26.7%	61.1%	61.1%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag	Lag	Lag	Lag	Lead		Lead	Lag	Lag	Lead	Lead		
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	None	Min	None	C-Max	C-Max	None	None	C-Max	C-Max
Act Effect Green (s)	13.6	13.6	13.6	27.6	27.6	50.0	30.0	30.0	44.0	52.4	52.4	52.4
Actuated g/C Ratio	0.15	0.15	0.15	0.31	0.31	0.56	0.33	0.33	0.49	0.58	0.58	0.58
v/c Ratio	0.73	0.36	0.29	0.70	0.40	0.41	0.45	0.60	0.16	0.84	0.49	0.19
Control Delay	60.0	35.5	9.9	36.6	26.4	10.9	36.2	28.8	3.3	30.3	12.4	2.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	35.5	9.9	36.6	26.4	10.9	36.2	28.8	3.3	30.3	12.4	2.0
LOS	E	D	A	D	C	B	D	C	A	C	B	A
Approach Delay		37.2			22.7			25.8			15.8	
Approach LOS		D			C			C			B	

Intersection Summary

Cycle Length: 90
Actuated Cycle Length: 90
Offset: 0 (0%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green
Natural Cycle: 70
Control Type: Actuated-Coordinated
Maximum v/c Ratio: 0.84
Intersection Signal Delay: 22.1
Intersection Capacity Utilization 69.4%
Analysis Period (min) 15

Splits and Phases: 4: Arenal Rd & Unser Blvd



Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Cond. - New Geom. @ Sage/Unser - MITIGATED
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HCM Signalized Intersection Capacity Analysis 4: Arenal Rd & Unser Blvd

Terry O. Brown, P.E.
2/21/2010 - Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	111	171	83	223	207	330	68	605	113	341	829	159
Volume (vph)	111	171	83	223	207	330	68	605	113	341	829	159
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	1.00	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.85	1.00	1.00	0.85	1.00
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	1845	1568	1752	3505	1568	1752	3505	1568
Fit Permitted	0.62	1.00	1.00	0.46	1.00	1.00	0.29	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1138	3505	1568	851	1845	1568	529	3505	1568	396	3505	1568
Peak-hour factor, PHF	0.89	0.89	0.89	0.91	0.91	0.91	0.86	0.86	0.86	0.83	0.83	0.83
Adj. Flow (vph)	125	192	93	245	227	363	79	703	131	411	999	192
RTOR Reduction (vph)	0	0	79	0	0	21	0	0	74	0	0	80
Lane Group Flow (vph)	125	192	14	245	227	342	79	703	57	411	999	112
Turn Type	Perm		Perm	pm+pt		pm+ov	Perm		pm+ov	pm+pt		Perm
Protected Phases		4		3	8	1		2	3	1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	13.6	13.6	13.6	27.6	27.6	44.9	30.1	30.1	39.1	52.4	52.4	52.4
Effective Green, g (s)	13.6	13.6	13.6	27.6	27.6	44.9	30.1	30.1	39.1	52.4	52.4	52.4
Actuated g/C Ratio	0.15	0.15	0.15	0.31	0.31	0.50	0.33	0.33	0.43	0.58	0.58	0.58
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	172	530	237	351	566	869	177	1172	768	491	2041	913
v/s Ratio Prot		0.05		c0.07	0.12	0.08		0.20	0.01	c0.16	0.29	
v/s Ratio Perm	0.11		0.01	c0.14		0.14	0.15		0.03	c0.33		0.07
v/c Ratio	0.73	0.36	0.06	0.70	0.40	0.39	0.45	0.60	0.07	0.84	0.49	0.12
Uniform Delay, d1	36.4	34.3	32.7	25.8	24.7	14.1	23.4	24.9	14.9	14.1	11.0	8.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	14.2	0.4	0.1	6.0	0.5	0.3	7.9	2.3	0.0	11.8	0.8	0.3
Delay (s)	50.6	34.7	32.8	31.8	25.1	14.4	31.4	27.2	14.9	25.9	11.8	8.7
Level of Service	D	C	C	C	C	B	C	C	B	C	B	A
Approach Delay (s)		39.1			22.4			25.8			15.1	
Approach LOS		D			C			C			B	

Intersection Summary

HCM Average Control Delay 21.9
HCM Volume to Capacity ratio 0.76
Actuated Cycle Length (s) 90.0
Intersection Capacity Utilization 69.4%
Analysis Period (min) 15
Critical Lane Group

HCM Level of Service C
Sum of lost time (s) 10.0
ICU Level of Service C

Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Cond. - New Geom. @ Sage/Unser - MITIGATED
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A-022

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Intersection Summary	
Cycle Length: 55	
Actuated Cycle Length: 50.6	
Natural Cycle: 55	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.56	
Intersection Signal Delay: 14.4	Intersection LOS: B
Intersection Capacity Utilization 47.3%	ICU Level of Service A
Analysis Period (min): 15	

 e1	 e2	 e4
 e3	 e5	 e6

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
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Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Intersection Summary			
HCM Average Control Delay	13.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	50.5	Sum of lost time (s)	15.0
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		
B Critical Lane Group			

2010 AM Existing Conditions - Exist. Geom. @ Sage/Unser
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Timings
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	←	→	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↓	↑↑	↑↑	↓	↑↑	↑↑	↓	↑↑	↑↑	↓
Volume (vph)	160	233	53	19	106	19	115	1158	99	65	622	66
Turn Type	Perm	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+ov	pm+pt	Perm	pm+pt	Perm	Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	6		8	2		2	6		6
Detector Phase	4	4	6	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	21.0	21.0	10.0	21.0	21.0	21.0
Total Split (s)	21.0	21.0	11.0	21.0	21.0	10.0	11.0	29.0	29.0	10.0	28.0	28.0
Total Split (%)	35.0%	35.0%	18.3%	35.0%	35.0%	16.7%	18.3%	48.3%	48.3%	16.7%	46.7%	46.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag		Lead			Lead	Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	Max	Max	Min	Max	Max
Act Effct Green (s)	12.4	12.4	23.4	12.4	12.4	22.5	30.0	24.1	24.1	28.2	23.2	23.2
Actuated g/C Ratio	0.22	0.22	0.41	0.22	0.22	0.40	0.53	0.43	0.43	0.50	0.41	0.41
v/c Ratio	0.65	0.36	0.09	0.10	0.17	0.04	0.29	0.87	0.15	0.24	0.46	0.10
Control Delay	31.8	19.7	3.5	18.0	17.9	7.2	7.6	24.5	4.8	8.1	14.1	4.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.8	19.7	3.5	18.0	17.9	7.2	7.6	24.5	4.8	8.1	14.1	4.2
LOS	C	B	A	B	B	A	A	C	A	A	B	A
Approach Delay		21.9			16.5			21.7			12.7	
Approach LOS		C			B			C			B	
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 58.6												
Natural Cycle: 60												
Control Type: Semi Act-Uncoord												
Maximum v/c Ratio: 0.87												
Intersection Signal Delay: 19.0												
Intersection Capacity Utilization 63.8%												
ICU Level of Service B												
Analysis Period (min) 15												
Splits and Phases: 5: Tower Rd & Unser Blvd												

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	←	→	↖	↗	↖	↗	↖	↗	↖	↗	↖	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↑↑	↑↑	↓	↑↑	↑↑	↓	↑↑	↑↑	↓	↑↑	↑↑	↓
Volume (vph)	160	233	53	19	106	19	115	1158	99	65	622	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	0.95	1.00	1.00
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1588	1752	3505	1588	1752	3505	1588	1752	3505	1588
Flt Permitted	0.87	1.00	1.00	0.58	1.00	1.00	0.34	1.00	1.00	0.17	1.00	1.00
Satd. Flow (perm)	1234	3505	1588	1076	3505	1588	828	3505	1588	318	3505	1588
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.89	0.89	0.89	0.85	0.85	0.85
Adj. Flow (vph)	176	274	62	24	131	24	129	1299	111	68	655	68
RTOR Reduction (vph)	0	0	42	0	0	9	0	0	54	0	0	41
Lane Group Flow (vph)	176	274	20	24	131	15	129	1299	67	68	655	28
Turn Type	Perm	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases	4	4	5	8	8	1	5	2	2	6	1	6
Permitted Phases	4		4	6		8	2		2	6		6
Actuated Green, G (s)	12.4	12.4	18.3	12.4	12.4	17.4	30.0	24.1	24.1	28.2	23.2	23.2
Effective Green, g (s)	12.4	12.4	18.3	12.4	12.4	17.4	30.0	24.1	24.1	28.2	23.2	23.2
Actuated g/C Ratio	0.22	0.22	0.32	0.22	0.22	0.31	0.63	0.43	0.43	0.50	0.41	0.41
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	271	789	647	236	769	622	450	1495	869	286	1439	644
v/s Ratio Prot	0.06	0.06	0.00	0.04	0.00	0.03	0.37	0.02	0.02	0.02	0.19	0.02
v/s Ratio Perm	c0.14		0.01	0.02		0.01	0.12		0.04	0.10		0.02
v/c Ratio	0.65	0.36	0.03	0.10	0.17	0.02	0.29	0.87	0.09	0.24	0.46	0.04
Uniform Delay, d1	20.1	18.7	13.0	17.6	17.9	13.6	6.9	14.8	9.6	9.3	12.1	10.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.3	0.3	0.0	0.2	0.1	0.0	0.4	7.1	0.3	0.4	1.0	0.1
Delay (s)	25.4	19.0	13.1	17.8	18.0	13.6	7.2	21.9	9.9	9.7	13.1	10.1
Level of Service	C	B	B	B	B	B	A	C	A	A	B	B
Approach Delay (s)		20.4			17.4			19.8			12.6	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM Average Control Delay 17.9 HCM Level of Service B												
HCM Volume to Capacity ratio 0.68												
Actuated Cycle Length (s) 58.5 Sum of lost time (s) 10.0												
Intersection Capacity Utilization 63.8% ICU Level of Service B												
Analysis Period (min) 15												
Critical Lane Group												

Sage / Unser Comm. Dev. (SE Corner)

2014 AM NOBUILD Conditions - New Geom. @ Sage/Unser
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Timings
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Volume (vph)	190	233	90	24	105	19	149	1183	103	65	651	66
Turn Type	Perm		pm+ov	Perm		pm+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	10.0	21.0	21.0	10.0	21.0	21.0
Total Split (s)	21.0	21.0	12.0	21.0	21.0	10.0	12.0	29.0	29.0	10.0	27.0	27.0
Total Split (%)	35.0%	35.0%	20.0%	35.0%	35.0%	16.7%	20.0%	48.3%	48.3%	16.7%	45.0%	45.0%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Max	C-Max	Min	C-Max	C-Max
Act Effect Green (s)	12.9	12.9	24.8	12.9	12.9	23.4	33.5	26.8	26.8	30.8	25.2	25.2
Actuated g/C Ratio	0.22	0.22	0.41	0.22	0.22	0.39	0.66	0.44	0.44	0.51	0.42	0.42
v/c Ratio	0.67	0.36	0.15	0.13	0.17	0.04	0.36	0.86	0.16	0.24	0.47	0.10
Control Delay	33.6	20.7	3.7	18.8	18.5	7.8	8.2	20.8	1.9	8.2	14.7	4.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	33.6	20.7	3.7	18.8	18.5	7.8	8.2	20.8	1.9	8.2	14.7	4.4
LOS	C	C	A	B	B	A	A	C	A	A	B	A
Approach Delay		21.5			17.1			17.7			13.3	
Approach LOS		C			B			B			B	
Intersection Summary												
Cycle Length: 60												
Actuated Cycle Length: 60												
Offset: 10 (17%), Referenced to phase 2:NBT and 6:SBTL, Start of Green												
Natural Cycle: 60												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.86												
Intersection Signal Delay: 17.2												
Intersection Capacity Utilization 64.6%												
Analysis Period (min) 15												
Splits and Phases: 5: Tower Rd & Unser Blvd												
	e1	e2						e4				
	e5	e6						e8				

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations	↖	↗	↘	↖	↗	↘	↖	↗	↘	↖	↗	↘	
Volume (vph)	150	233	90	24	105	19	149	1183	103	65	651	66	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Fit	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Fit Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1752	3505	1588	1752	3505	1588	1752	3505	1588	1752	3505	1588	
Fit Permitted	0.87	1.00	1.00	0.58	1.00	1.00	0.32	1.00	1.00	0.18	1.00	1.00	
Satd. Flow (perm)	1234	3505	1588	1076	3505	1588	585	3505	1588	283	3505	1588	
Peak-hour factor, PHF	0.85	0.85	0.85	0.80	0.80	0.80	0.89	0.89	0.89	0.95	0.95	0.95	
Adj. Flow (vph)	176	274	106	30	131	24	167	1329	116	68	685	69	
RTOR Reduction (vph)	0	0	81	0	0	6	0	0	54	0	0	40	
Lane Group Flow (vph)	176	274	45	30	131	16	167	1329	62	68	685	29	
Turn Type	Perm	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	
Protected Phases	4	4	5	8	8	1	5	2	2	1	6	6	
Permitted Phases	4	4	5	8	8	1	5	2	2	1	6	6	
Actuated Green, G (s)	12.9	12.9	19.8	12.9	12.9	18.5	33.4	26.5	26.5	30.8	25.2	25.2	
Effective Green, g (s)	12.9	12.9	19.8	12.9	12.9	18.5	33.4	26.5	26.5	30.8	25.2	25.2	
Actuated g/C Ratio	0.22	0.22	0.33	0.22	0.22	0.31	0.58	0.44	0.44	0.51	0.42	0.42	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	265	754	648	231	754	614	460	1548	693	287	1472	659	
v/c Ratio Prot	0.08	0.01	0.01	0.04	0.00	0.04	0.04	0.03	0.02	0.02	0.02	0.02	
v/c Ratio Perm	0.14	0.02	0.03	0.01	0.01	0.16	0.04	0.10	0.04	0.10	0.04	0.04	
W/C Ratio	0.66	0.36	0.07	0.13	0.17	0.33	0.38	0.88	0.09	0.24	0.47	0.10	
Uniform Delay, d1	21.6	20.1	13.8	19.0	19.2	14.5	6.8	15.1	9.7	9.5	12.5	10.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.77	0.35	1.00	1.00	1.00	
Incremental Delay, d2	6.1	0.3	0.0	0.3	0.1	0.0	0.5	6.3	0.3	0.4	1.1	0.1	
Delay (s)	27.7	20.4	13.8	19.3	19.3	14.5	6.1	17.8	3.6	9.9	13.8	10.4	
Level of Service	C	C	B	B	B	A	B	A	A	B	B	B	
Approach Delay (s)	21.4				18.7			15.5			13.0		
Approach LOS	C				B			B			B		
Intersection Summary													
HCM Average Control Delay	16.1						HCM Level of Service						B
HCM Volume to Capacity ratio	0.66												
Actuated Cycle Length (s)	60.0						Sum of lost time (s)						10.0
Intersection Capacity Utilization	64.6%						ICU Level of Service						C
Analysis Period (min)	15												
E Critical Lane Group													

Sage / Unser Comm. Dev. (SE Corner)

2014 AM BUILD Conditions - New Geom. @ Sage/Unser
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Terry O. Brown, P.E.
2/12/2010 - Synchro 7

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Volume (vph)	54	113	15	35	253	8	25	315	12	28	534	18
Turn Type	Perm		pm+ov	Perm		pm+ov	pm+pt		Perm	pm+pt		Perm
Protected Phases		4	5		8	1	6	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Detector Phase	4	4	5	8	8	1	6	2	2	1	6	6
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	10.0	21.0	21.0	10.0	21.0	21.0
Total Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	10.0	24.0	24.0	10.0	24.0	24.0
Total Split (%)	38.2%	38.2%	16.2%	38.2%	38.2%	18.2%	18.2%	43.6%	43.6%	18.2%	43.6%	43.6%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead-Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Max	C-Max	Min	C-Max	C-Max
Act Effct Green (s)	10.2	10.2	21.1	10.2	10.2	21.1	29.8	23.9	23.9	29.8	23.9	23.9
Actuated g/C Ratio	0.19	0.19	0.38	0.19	0.19	0.38	0.54	0.43	0.43	0.54	0.43	0.43
v/c Ratio	0.35	0.22	0.03	0.19	0.47	0.02	0.05	0.22	0.02	0.05	0.39	0.17
Control Delay	23.9	19.0	4.7	19.9	21.9	5.4	2.8	5.4	1.6	5.0	12.2	3.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	19.0	4.7	19.9	21.9	5.4	2.8	5.4	1.6	5.0	12.2	3.5
LOS	C	B	A	B	C	A	A	A	A	B	B	A
Approach Delay	19.3				21.2			5.1			10.4	
Approach LOS	B				C			A			B	

Discussion Summary

Cycle Length: 55
 Actuated Cycle Length: 55
 Offset: 4 (7%), Referenced to phase 2:NBTL and 6:SRTL, Start of Green
 Natural Cycle: 55
 Control Type: Actuated-Coordinated
 Maximum v/c Ratio: 0.47
 Intersection Signal Delay: 12.6
 Intersection Capacity Utilization: 44.4%
 Analysis Period (min): 15

Splits and Phases: 5: Tower Rd & Unser Blvd

Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom. @ Sage/Unser
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Terry O. Brown, P.E.
2/12/2010 - Synchro 7

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑↑			↑↑			↑↑			↑↑	
Volume (vph)	64	113	16	36	253	8	25	316	12	26	534	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1568	1752	3505	1568	1752	3505	1568	1752	3505	1568
Flt Permitted	0.57	1.00	1.00	0.66	1.00	1.00	0.40	1.00	1.00	0.55	1.00	1.00
Satd. Flow (perm)	1048	3505	1568	1223	3505	1568	739	3505	1568	1008	3505	1568
Peak-hour factor, PHF	0.81	0.81	0.81	0.84	0.84	0.84	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	87	140	19	42	301	10	27	342	13	29	593	127
RTOR Reduction (vph)	0	0	13	0	0	7	0	0	7	0	0	72
Lane Group Flow (vph)	67	140	6	42	301	3	27	342	8	29	593	65
Turn Type	Perm		pm+ov	Perm		pm+ov	pm+pt		Perm		pm+pt	Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	10.2	10.2	16.1	10.2	10.2	16.1	29.8	23.9	23.9	29.8	23.9	23.9
Effective Green, g (s)	10.2	10.2	16.1	10.2	10.2	16.1	29.8	23.9	23.9	29.8	23.9	23.9
Actuated g/C Ratio	0.19	0.19	0.29	0.19	0.19	0.29	0.54	0.43	0.43	0.54	0.43	0.43
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	194	650	602	227	650	602	509	1523	681	626	1523	681
v/s Ratio Prot		0.04	0.00		0.09	0.00	0.01	0.10		0.00	0.17	
v/s Ratio Perm	0.06		0.00	0.03		0.00	0.02		0.00	0.02		0.04
v/c Ratio	0.35	0.22	0.01	0.19	0.46	0.06	0.05	0.22	0.01	0.05	0.39	0.08
Uniform Delay, d1	19.5	19.0	13.8	18.9	20.0	13.8	5.9	9.7	8.8	5.9	10.6	9.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.53	0.47	0.25	1.00	1.00	1.00
Incremental Delay, d2	1.1	0.2	0.0	0.4	0.5	0.0	0.0	0.3	0.0	0.0	0.8	0.2
Delay (s)	20.6	19.2	13.8	19.3	20.5	13.8	3.2	5.0	2.2	5.9	11.3	9.3
Level of Service	C	B	B	B	C	B	A	A	A	A	B	A
Approach Delay (s)		19.1			20.2			4.7			10.6	
Approach LOS		B			C			A			B	

Intersection Summary

HCM Average Control Delay	12.5	HCM Level of Service	B
HCM Volume to Capacity ratio	0.38		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	44.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Sage / Unser Comm. Dev. (SE Corner)

2010 PM Existing Conditions - Exist. Geom.@ Sage/Unser
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5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

													
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations		 			 		 	 		 	 		
Volume (Vph)	60	127	64	39	283	9	97	644	61	45	992	19	
Turn Type	Perm		pm+ov		Perm		pm+ov	pm+pt		Perm		pm+pt	Perm
Protected Phases		4	5		8	1	5	2		1	6		
Permitted Phases	4		4	8		8	2		2	8		6	
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	6	
Switch Phase													
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	10.0	21.0	21.0	10.0	21.0	21.0	
Total Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	10.0	29.0	29.0	10.0	29.0	29.0	
Total Split (%)	35.0%	35.0%	16.7%	35.0%	35.0%	16.7%	16.7%	48.3%	48.3%	16.7%	48.3%	48.3%	
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lead/Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag	
Lead-Lag Optimize?													
Recall Mode	Min	Min	Min	Min	Min	Min	Min	C-Max	C-Max	Min	C-Max	C-Max	
Act Effect Green (s)	11.3	11.3	22.8	11.3	11.3	22.3	34.1	27.7	27.7	33.2	27.2	27.2	
Actuated g/C Ratio	0.19	0.19	0.38	0.19	0.19	0.37	0.67	0.46	0.48	0.56	0.45	0.45	
v/c Ratio	0.40	0.24	0.13	0.20	0.51	0.02	0.33	0.43	0.09	0.11	0.69	0.27	
Control Delay	27.1	20.7	8.5	21.5	24.1	5.9	6.8	11.3	3.5	6.5	16.9	3.0	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	27.1	20.7	8.5	21.5	24.1	5.9	6.8	11.3	3.5	6.5	16.9	3.0	
LOS	C	C	A	C	C	A	A	B	A	A	B	A	
Approach Delay		19.1			23.3			10.2			14.2		
Approach LOS		B			C			B			B		

Intersection Summary

Cycle Length: 60

Adjusted Cycle Length: 60

Offset: 58 (97%), Referenced to phase 2:NBTL and 6:SBTL, Start of Green

Natural Cycle: 60

Control Type: Actuated-Coordinated

Maximum v/o Ratio: 0.69

Intersection Signal Delay: 14.8

Intersection Capacity Utilization 60.6%

Analysis Period (min) 15

Splits and Phases: 5: Tower Rd & Unser Blvd

Sage / Unser Comm. Dev. (SE Corner)

2014 PM NOBUILD Conditions - New Geom.@ Sage/Unser
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HCM Signalized Intersection Capacity Analysis 5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Volume (vph)	60	127	64	39	283	9	97	844	61	45	992	199	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Flt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	
Satd. Flow (prot)	1752	3505	1568	1762	3505	1568	1752	3505	1568	1752	3505	1568	
Flt Permitted	0.53	1.00	1.00	0.65	1.00	1.00	0.16	1.00	1.00	0.35	1.00	1.00	
Satd. Flow (perm)	953	3505	1568	1204	3505	1568	268	3505	1568	638	3505	1568	
Peak-hour factor, PHF	0.81	0.81	0.81	0.84	0.84	0.84	0.92	0.92	0.92	0.90	0.90	0.90	
Adj. Flow (vph)	74	157	79	46	337	11	105	700	68	50	1102	221	
RTOR Reduction (vph)	0	0	18	0	0	8	0	0	36	0	0	121	
Lane Group Flow (vph)	74	157	81	46	337	3	105	700	30	60	1102	100	
Turn Type	Perm	pm+ov		Perm	pm+ov		pm+pt	pm+pt		Perm	pm+pt		Perm
Protected Phases		4	5		8	1	5	2		2	6		
Permitted Phases	4		4	8		8	2		2	6		6	
Actuated Green, G (s)	11.3	11.3	17.8	11.3	11.3	17.3	34.2	27.7	27.7	33.2	27.2	27.2	
Effective Green, g (s)	11.3	11.3	17.8	11.3	11.3	17.3	34.2	27.7	27.7	33.2	27.2	27.2	
Actuated g/C Ratio	0.19	0.19	0.30	0.19	0.19	0.28	0.57	0.48	0.48	0.55	0.45	0.45	
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	185	680	598	227	660	583	322	1616	724	484	1589	711	
v/s Ratio Prot.		0.04	0.01		0.10	0.00	0.04	0.20		0.01	0.31		
v/s Ratio Perm	0.08		0.03	0.04		0.00	0.15		0.02	0.05		0.06	
Wt Ratio	0.40	0.24	0.10	0.20	0.51	0.01	0.33	0.43	0.04	0.11	0.89	0.74	
Uniform Delay, d1	21.4	20.7	15.3	20.5	21.9	15.2	7.2	10.9	8.9	6.2	13.1	9.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	0.79	0.88	0.88	1.00	1.00	1.00	
Incremental Delay, d2	1.4	0.2	0.1	0.4	0.7	0.0	0.6	0.8	0.1	0.1	2.5	0.4	
Delay (s)	22.8	20.9	15.4	21.0	22.5	15.2	6.3	10.6	8.0	6.3	15.6	10.0	
Level of Service	C	C	B	C	C	B	A	B	A	A	B	A	
Approach Delay (s)	19.9			22.2			9.8			14.4			
Approach LOS	B			C			A			B			

Intersection Summary

HCM Average Control Delay	14.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	60.0	Sum of lost time (s)	15.0
Intersection Capacity Utilization	60.6%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Sage / Unser Comm. Dev. (SE Corner)

2014 PM NOBUILD Conditions - New Geom. @ Sage/Unser
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Timings
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↑	→	←	↑	→	←	↑	→	←	↑	→
Volume (vph)	60	127	110	45	283	9	142	680	67	45	1028	199
Turn Type	Perm	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2		2	8		8
Detector Phase	4	4	5	8	8	1	5	2	2	1	6	8
Switch Phase												
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	21.0	21.0	10.0	21.0	21.0	10.0	21.0	21.0	10.0	21.0	21.0	21.0
Total Split (s)	24.0	24.0	15.0	24.0	24.0	10.0	15.0	58.0	58.0	10.0	51.0	51.0
Total Split (%)	26.7%	26.7%	16.7%	26.7%	26.7%	11.1%	16.7%	62.2%	62.2%	11.1%	56.7%	56.7%
Yellow Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lead/Lag			Lead			Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?												
Recall Mode	Min	Min	Min	Min	Min	Min	C-Max	C-Max	Min	C-Max	C-Max	C-Max
Act Effct Green (s)	14.3	14.3	27.3	14.3	14.3	25.2	82.8	54.8	54.8	58.8	52.7	52.7
Actuated g/C Ratio	0.16	0.16	0.30	0.16	0.16	0.28	0.70	0.81	0.61	0.65	0.59	0.59
v/c Ratio	0.60	0.28	0.27	0.28	0.60	0.02	0.44	0.35	0.07	0.10	0.56	0.22
Control Delay	64.1	33.7	14.5	36.8	39.4	11.4	10.5	5.5	0.8	5.0	13.6	2.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	64.1	33.7	14.5	36.8	39.4	11.4	10.5	5.5	0.8	5.0	13.6	2.9
LOS	D	C	B	D	D	B	B	A	A	A	B	A
Approach Delay		30.7			38.2			5.9			11.6	
Approach LOS		C			D			A			B	

Intersection Summary												
Cycle Length: 90												
Actuated Cycle Length: 90												
Offset: 88 (98%), Referenced to phase 2:NBT and 6:SRTL, Start of Green												
Natural Cycle: 80												
Control Type: Actuated-Coordinated												
Maximum v/c Ratio: 0.60												
Intersection Signal Delay: 15.5												
Intersection Capacity Utilization 84.1%												
Analysis Period (min) 15												

Splits and Phases: 5: Tower Rd & Unser Blvd



Sage / Unser Comm. Dev. (SE Corner)

2014 PM BUILD Conditions - New Geom. @ Sage/Unser
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HCM Signalized Intersection Capacity Analysis
5: Tower Rd & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	←	↑	→	←	↑	→	←	↑	→	←	↑	→
Volume (vph)	60	127	110	45	283	9	142	680	67	45	1028	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1752	3505	1658	1752	3505	1658	1752	3505	1658	1752	3505	1658
Flt Permitted	0.42	1.00	1.00	0.65	1.00	0.65	1.00	0.18	1.00	1.00	0.35	1.00
Satd. Flow (perm)	781	3505	1558	1204	3505	1558	327	3505	1558	651	3505	1558
Peak-hour factor, PHF	0.81	0.81	0.81	0.84	0.84	0.84	0.92	0.92	0.92	0.90	0.90	0.90
Adj. Flow (vph)	74	157	136	54	337	11	154	739	73	50	1142	221
RTOR Reduction (vph)	0	0	41	0	0	9	0	0	28	0	0	81
Lane Group Flow (vph)	74	157	95	54	337	2	154	739	45	50	1142	140
Turn Type	Perm	pm+ov	Perm	pm+ov	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm	pm+pt	Perm
Protected Phases		4	5		8	1	5	2		1	6	
Permitted Phases	4		4	8		8	2		2	6		6
Actuated Green, G (s)	14.3	14.3	22.2	14.3	14.3	20.1	62.8	54.9	54.9	58.8	52.8	52.8
Effective Green, g (s)	14.3	14.3	22.2	14.3	14.3	20.1	62.8	54.9	54.9	58.8	52.8	52.8
Actuated g/C Ratio	0.16	0.16	0.25	0.16	0.16	0.22	0.70	0.61	0.61	0.65	0.59	0.59
Clearance Time (s)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	124	557	474	191	557	437	353	2138	956	495	2056	920
v/s Ratio Prot		0.04	0.02		c0.10	0.00	c0.04	0.21		0.01	c0.33	
v/s Ratio Perm	0.09		0.04	0.04		0.00	0.27		0.03	0.06		0.09
v/c Ratio	0.60	0.28	0.20	0.28	0.61	0.01	0.44	0.35	0.05	0.10	0.56	0.15
Uniform Delay, d1	35.2	33.3	26.9	33.3	35.2	27.2	8.8	8.7	7.0	5.7	11.4	8.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.58	0.55	0.26	1.00	1.00	1.00
Incremental Delay, d2	7.5	0.3	0.2	0.8	1.9	0.0	0.8	0.4	0.1	0.1	1.1	0.4
Delay (s)	42.7	33.6	27.1	34.1	37.1	27.2	11.3	5.2	2.1	5.8	12.5	8.8
Level of Service	D	C	C	C	D	C	B	A	A	A	B	A
Approach Delay (s)		33.0			36.4			5.9			11.7	
Approach LOS		C			D			A			B	
Intersection Summary												
HCM Average Control Delay												
HCM Volume to Capacity ratio												
Actuated Cycle Length (s)												
Intersection Capacity Utilization												
Analysis Period (min)												
Critical Lane Group												

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 6: Sage Rd & 'A'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑		↑
Volume (veh/h)	825	70	0	543	0	19
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.85	0.85
Hourly flow rate (vph)	994	84	0	654	0	22
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	259					
PX, platoon unblocked			0.84		0.84	0.84
WC, conflicting volume			1078		1321	497
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCu, unblocked vol			700		990	4
TC, single (s)			4.2		6.9	7.0
TC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
P0 queue free %			100		100	98
cdL capacity (veh/h)			740		202	898
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	497	497	84	327	327	22
Volume Left	0	0	0	0	0	0
Volume Right	0	0	84	0	0	22
CSH	1700	1700	1700	1700	1700	898
Volume to Capacity	0.29	0.29	0.05	0.19	0.19	0.02
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	9.1
Lane LOS						A
Approach Delay (s)				0.0		9.1
Approach LOS						A
Intersection Summary						
Average Delay			0.1			
Intersection Capacity Utilization			32.8%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 6: Sage Rd & 'A'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	←←	↑	←	←←		↑
Volume (veh/h)	576	87	0	1235	0	26
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	606	92	0	1300	0	31
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (ft)	259					
PX, platoon unblocked			0.88		0.88	0.88
WC, conflicting volume			698		1256	303
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCu, unblocked vol			378		1014	0
IC, single (s)			4.2		6.9	7.0
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		100	97
pM capacity (veh/h)			1027		205	949
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	303	303	92	650	650	31
Volume Left	0	0	0	0	0	0
Volume Right	0	0	92	0	0	31
CSH	1700	1700	1700	1700	1700	949
Volume to Capacity	0.18	0.18	0.05	0.38	0.38	0.03
Queue Length 95th (ft)	0	0	0	0	0	2
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	8.9
Lane LOS						A
Approach Delay (s)	0.0			0.0		8.9
Approach LOS						A

Intersection Summary					
Average Delay	0.1				
Intersection Capacity Utilization	37.5%		ICU Level of Service	A	
Analysis Period (min)	15				

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 7: Sage Rd & 'B'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑	↑	↑↑	↑↑	
Volume (veh/h)	809	35	84	314	229	38
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.85	0.85
Hourly flow rate (vph)	975	42	101	378	269	45
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)	510					
PX, platoon unblocked			0.86		0.86	0.86
WC, conflicting volume			1017		1366	487
WC1, stage 1 conf vol					975	
WC2, stage 2 conf vol					392	
VCu, unblocked vol			682		1091	63
TC, single (s)			4.2		6.9	7.0
TC, 2 stage (s)					5.9	
IF (s)			2.2		3.5	3.3
P0 queue free %			87		6	95
cm capacity (veh/h)			770		287	842
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	487	487	42	101	189	189
Volume Left	0	0	0	101	0	0
Volume Right	0	0	42	0	0	0
CSH	1700	1700	1700	770	1700	1700
Volume to Capacity	0.29	0.29	0.02	0.13	0.11	0.11
Queue Length 95th (ft)	0	0	0	11	0	0
Control Delay (s)	0.0	0.0	0.0	10.4	0.0	0.0
Lane LOS				B		F
Approach Delay (s)				2.2		85.4
Approach LOS						F
Intersection Summary						
Average Delay			15.4			
Intersection Capacity Utilization			52.0%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 7: Sage Rd & 'B'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↕↕	↗	↘	↕↕	↕↕	↗
Volume (veh/h)	558	43	104	926	309	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	587	45	109	975	364	60
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)	510					
px, platoon unblocked			0.90		0.90	0.90
VC, conflicting volume			633		1294	294
VC1, stage 1 conf vol					587	
VC2, stage 2 conf vol					706	
vCu, unblocked vol			375		1108	0
IC, single (s)			4.2		6.9	7.0
IC, 2 stage (s)					5.9	
F (s)			2.2		3.5	3.3
p0 queue free %			90		0	94
CM capacity (veh/h)			1058		293	975
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	294	294	45	109	487	487
Volume Left	0	0	0	109	0	0
Volume Right	0	0	45	0	0	0
CSH	1700	1700	1700	1058	1700	1700
Volume to Capacity	0.17	0.17	0.03	0.10	0.29	0.29
Queue Length 95th (ft)	0	0	0	9	0	0
Control Delay (s)	0.0	0.0	0.0	8.8	0.0	0.0
Lane LOS				A		F
Approach Delay (s)	0.0			0.9		188.7
Approach LOS				F		F
Intersection Summary						
Average Delay			37.8			
Intersection Capacity Utilization			52.5%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 7: Sage Rd & 'B'

Terry O. Brown, P.E.
2/21/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔	↔	↔↔	↔ (1)	↔ (1)
Volume (veh/h)	558	43	104	926	309	51
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	587	45	109	975	364	60
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)	510					
pX, platoon unblocked			0.90		0.90	0.90
VC, conflicting volume			633		1294	294
VC1, stage 1 conf vol					587	
VC2, stage 2 conf vol					706	
VCu, unblocked vol			375		1108	0
IC, single (s)			4.2		6.9	7.0
IC, 2 stage (s)					5.9	
IF (s)			2.2		3.5	3.3
p0 queue free %			90		0	94
cM capacity (veh/h)			1058		293	975
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	WB 3
Volume Total	294	294	45	109	487	487
Volume Left	0	0	0	109	0	0
Volume Right	0	0	45	0	0	0
cSH	1700	1700	1700	1058	1700	1700
Volume to Capacity	0.7	0.17	0.03	0.10	0.29	0.29
Queue Length 95th (ft)	0	0	0	9	0	0
Con. d Delay (s)	0.0	0.0	0.0	8.8	0.0	0.0
Lane LOS				A		
Approach Delay (s)	0.0			0.9		
Approach LOS				F		

Intersection Summary					
Average Delay	29.5				
Intersection Capacity Utilization	49.4%				
Analysis Period (min)	15				
			ICU Level of Service		A

HCM Unsignalized Intersection Capacity Analysis 8: Sage Rd & 'C'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔↔	↔		↔↔	↔↔	
Volume (veh/h)	815	35	0	398	19	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.83	0.83	0.83	0.83	0.85	0.85
Hourly flow rate (vph)	982	42	0	480	22	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)	791					
PX, platoon unblocked			0.91		0.91	0.91
VC, conflicting volume			1024		1222	491
VC1, stage 1 conf vol						
VC2, stage 2 conf vol						
VCU, unblocked vol			820		1038	231
IC, single (s)			4.2		6.9	7.0
IC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		89	100
CM capacity (veh/h)			724		204	696
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	491	491	42	240	240	22
Volume Left	0	0	0	0	0	22
Volume Right	0	0	42	0	0	0
CSH	1700	1700	1700	1700	1700	204
Volume to Capacity	0.29	0.29	0.02	0.14	0.14	0.11
Queue Length 95th (ft)	0	0	0	0	0	9
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	24.8
Lane LOS						C
Approach Delay (s)	0.0			0.0		24.8
Approach LOS						C
Intersection Summary						
Average Delay			0.4			
Intersection Capacity Utilization			32.5%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 8: Sage Rd & 'C'

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑	↑		↑↑	↑↑	
Volume (veh/h)	566	43	0	1030	26	0
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.85	0.85
Hourly flow rate (vph)	596	45	0	1084	31	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)	791					
PX, platoon unblocked			0.97		0.97	0.97
WC, conflicting volume			641		1138	298
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCu, unblocked vol			557		1071	201
TC, single (s)			4.2		6.9	7.0
TC, 2 stage (s)						
IF (s)			2.2		3.5	3.3
p0 queue free %			100		85	100
sat capacity (veh/h)			968		207	775
Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	NB 1
Volume Total	298	298	45	542	542	31
Volume Left	0	0	0	0	0	31
Volume Right	0	0	45	0	0	0
CSH	1700	1700	1700	1700	1700	207
Volume to Capacity	0.18	0.18	0.03	0.32	0.32	0.15
Queue Length 95th (ft)	0	0	0	0	0	13
Control Delay (s)	0.0	0.0	0.0	0.0	0.0	25.4
Lane LOS						D
Approach Delay (s)	0.0			0.0		25.4
Approach LOS				D		D
Intersection Summary						
Average Delay	0.4					
Intersection Capacity Utilization	38.5%		ICU Level of Service		A	
Analysis Period (min)	15					

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 9: 'D' & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Volume (veh/h)	0	0	1028	112	0	743
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.87	0.87	0.87	0.87
Hourly flow rate (vph)	0	0	1182	129	0	854
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						467
PX, platoon unblocked	0.89					
WC, conflicting volume	1673	655			1310	
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCU, unblocked vol	1502	655			1310	
IC, single (s)	6.9	7.0			4.2	
IC, 2 stage (s)						
IF (s)	3.5	3.3			2.2	
P0 queue free %	100	100			100	
CM capacity (veh/h)	99	406			519	
Direction, Lane #						
	NB 1	NB 2	SB 1	SB 2		
Volume Total	788	523	427	427		
Volume Left	0	0	0	0		
Volume Right	0	129	0	0		
CSH	1700	1700	1700	1700		
Volume to Capacity	0.46	0.31	0.25	0.25		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			35.3%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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HCM Unsignalized Intersection Capacity Analysis 9: 'D' & Unser Blvd

Terry O. Brown, P.E.
2/12/2010 - Synchro 7



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations			↑↑			↑↑
Volume (veh/h)	0	0	904	139	0	1176
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.85	0.85	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	0	0	993	153	0	1292
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage (veh)						
Upstream signal (ft)						467
PX, platoon unblocked	0.79					
WC, conflicting volume	1716	573		1146		
WC1, stage 1 conf vol						
WC2, stage 2 conf vol						
VCu, unblocked vol	1379	573		1146		
IC, single (s)	6.9	7.0		4.2		
IC, 2 stage (s)						
IF (s)	3.5	3.3		2.2		
p0 queue free %	100	100		100		
CM capacity (veh/h)	106	480		600		
Direction, Lane #	NB 1	NB 2	SB 1	SB 2		
Volume Total	662	484	646	646		
Volume Left	0	0	0	0		
Volume Right	0	153	0	0		
CSH	1700	1700	1700	1700		
Volume to Capacity	0.39	0.28	0.38	0.38		
Queue Length 95th (ft)	0	0	0	0		
Control Delay (s)	0.0	0.0	0.0	0.0		
Lane LOS						
Approach Delay (s)	0.0		0.0			
Approach LOS						
Intersection Summary						
Average Delay			0.0			
Intersection Capacity Utilization			35.8%		ICU Level of Service	A
Analysis Period (min)			15			

Sage / Unser Comm. Dev. (SE Corner)

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Traffic Count Data Sheet

Year Counts Taken: 2010

E-W Street Sage Rd

N-S Street: Coors Blvd NW

Speed Limit (Sage Rd)= 35 MPH

Speed Limit (Coors Blvd NW)= 45 MPH

Date of Count: 1/14/10

Begin Time	End Time	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Coors Blvd NW)			Southbound (Coors Blvd NW)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	34	88	7	4	16	5	4	147	2	4	94	9
7:15 AM	7:30 AM	34	92	12	0	19	9	3	156	4	4	105	15
7:30 AM	7:45 AM	52	107	13	1	20	12	10	159	2	10	95	18
7:45 AM	8:00 AM	43	109	10	3	28	8	5	186	3	10	147	32
8:00 AM	8:15 AM	44	94	14	1	30	2	5	138	4	10	109	27
8:15 AM	8:30 AM	25	77	5	4	25	10	4	127	6	14	111	17
8:30 AM	8:45 AM	14	69	10	4	28	17	4	143	4	9	104	15
8:45 AM	9:00 AM	19	54	10	2	24	11	4	134	0	8	118	10

AM Peak Hour Volumes	173	402	49	5	97	31	23	639	13	34	456	92
% of Total Traffic	8.6%	20.0%	2.4%	0.2%	4.8%	1.5%	1.1%	31.7%	0.6%	1.7%	22.6%	4.6%
% Directional		31.0%			6.6%			33.5%			28.9%	
AM Peak Hour Factor		0.91			0.85			0.87			0.77	

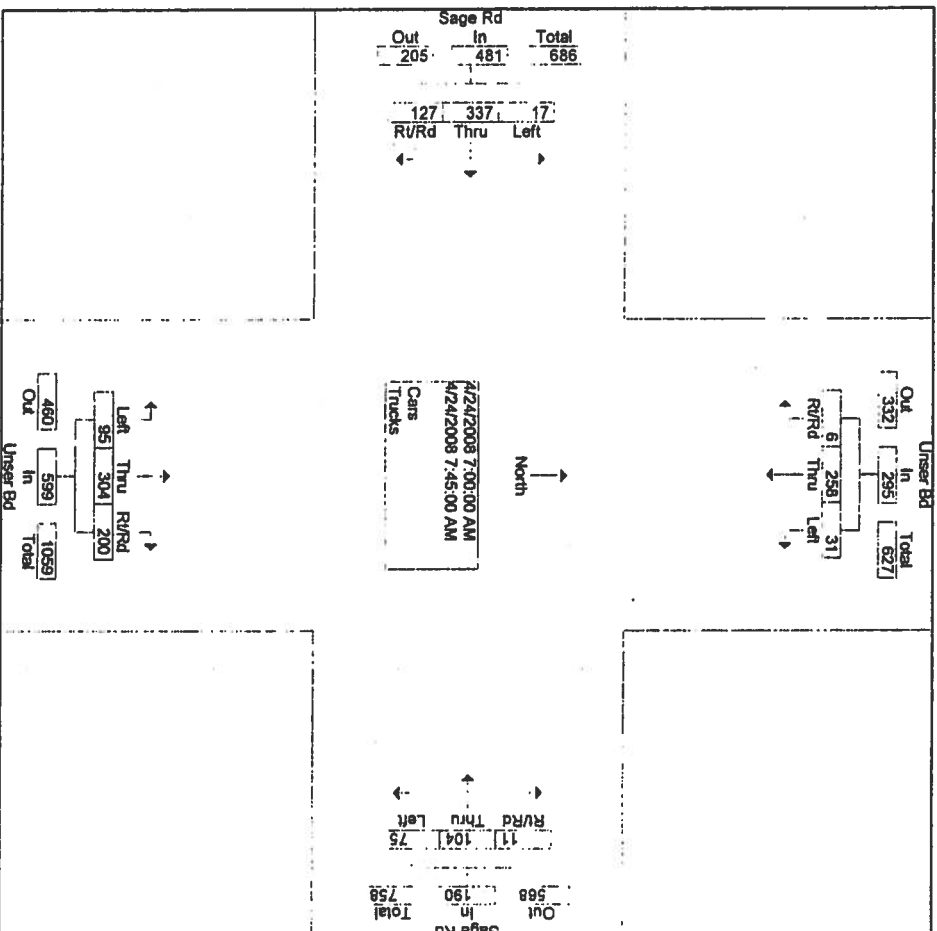
Begin Time	End Time	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (Coors Blvd NW)			Southbound (Coors Blvd NW)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	15	36	11	2	48	9	10	156	0	11	202	53
4:15 PM	4:30 PM	10	35	12	1	47	9	11	173	1	7	211	58
4:30 PM	4:45 PM	14	36	10	6	64	5	6	153	0	11	185	71
4:45 PM	5:00 PM	13	29	9	4	47	13	14	153	1	6	187	51
5:00 PM	5:15 PM	19	47	9	3	62	10	10	111	0	7	186	61
5:15 PM	5:30 PM	15	30	6	2	52	16	9	153	0	11	215	52
5:30 PM	5:45 PM	26	37	11	2	71	5	12	155	0	7	182	84
5:45 PM	6:00 PM	25	32	9	1	57	7	14	189	0	8	190	70

PM Peak Hour Volumes	85	146	35	8	242	38	45	608	0	33	773	267
% of Total Traffic	3.7%	6.4%	1.5%	0.4%	10.6%	1.7%	2.0%	26.7%	0.0%	1.4%	33.9%	11.7%
% Directional		11.7%			12.6%			28.6%			47.1%	
PM Peak Hour Factor		0.89			0.92			0.80			0.96	

Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Sage Rd and Unser Bd
Site Code : 00025518
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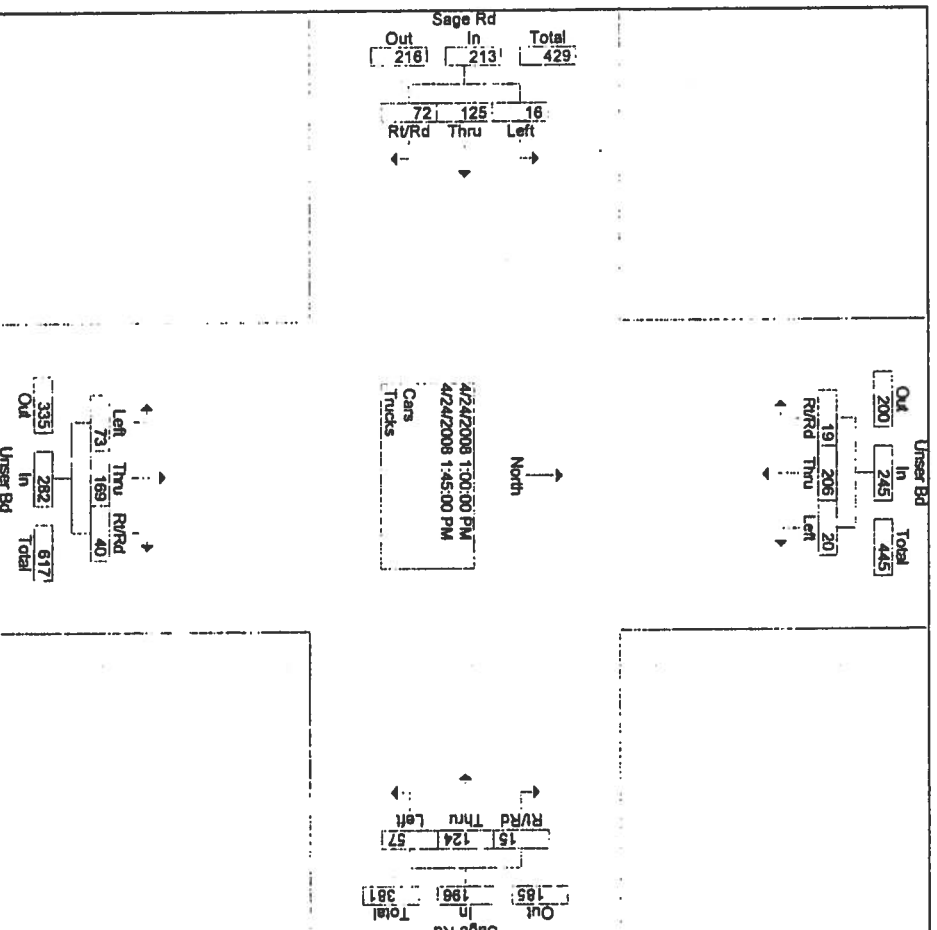
Start Time	Unser Bd From North					Sage Rd From East					Unser Bd From South					Sage Rd From West				
	Left	Thru	Right	RV	App. Total	Left	Thru	Right	RV	App. Total	Left	Thru	Right	RV	App. Total	Left	Thru	Right	RV	App. Total
Peak Hour From 06:45 to 09:30 - Peak 1 of 1																				
Intersection																				
on 07:00																				
Volume	31	258	6	0	295	75	104	10	1	190	95	304	141	59	599	17	337	109	18	481
Percent	10.	87.	2.0	0.0		39.	54.	7	0.5		15.	50.	23.	9.8		3.5	70.	22.	3.7	
Volume	31	258	6	0	295	75	104	10	1	190	95	304	141	59	599	17	337	109	18	481
Volume	5	80	4	0	89	28	23	5	1	57	27	76	54	16	173	6	97	48	3	154
Peak Factor																				
High Int. Volume	16	80	1	0	97	28	23	5	1	57	27	76	54	16	173	6	97	48	3	154
Peak Factor					0.76					0.83					0.86					0.78
					0					3					6					1



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Intersection Turning Movement Analysis

File Name : Sage Rd and Unser Bd
Site Code : 00025518
Start Date : 04/24/2008
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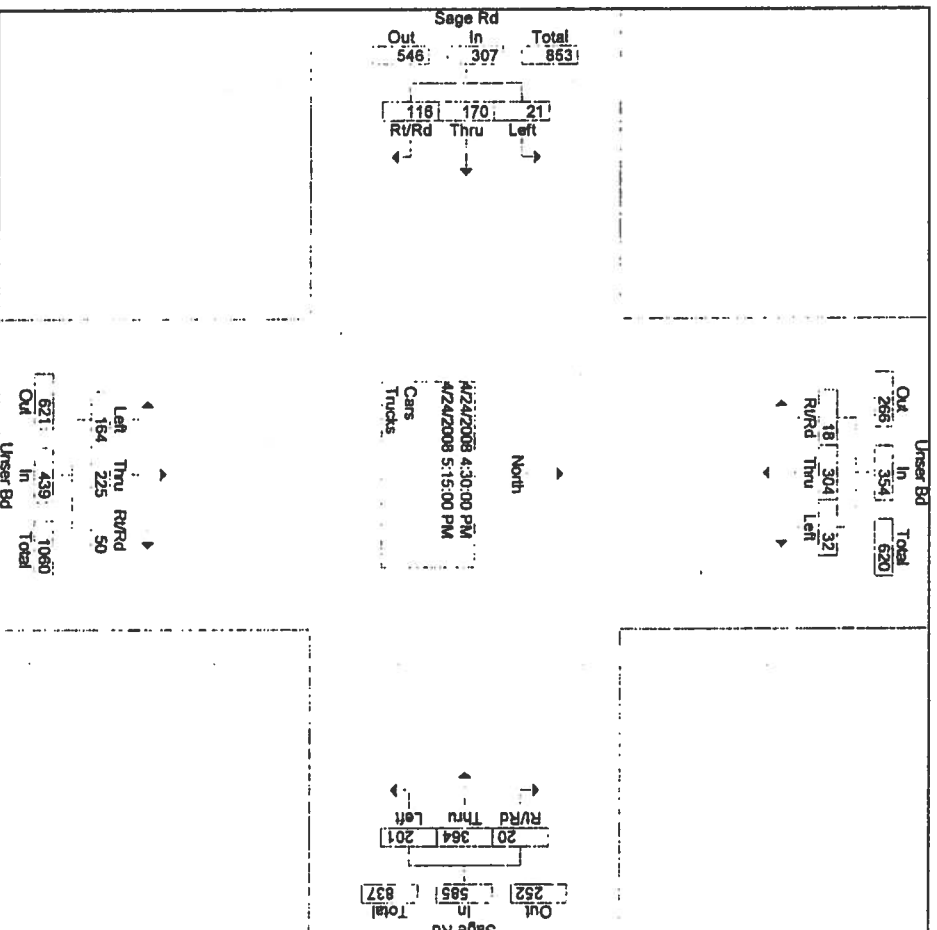
Unser Bd From North										Sage Rd From East										Unser Bd From South										Sage Rd From West									
Start Time	Left	Thru	Rig	Rv	App.	Left	Thru	Rig	Rv	App.	Left	Thru	Rig	Rv	App.	Left	Thru	Rig	Rv	App.	Left	Thru	Rig	Rv	App.	Int.													
Peak Hour From 11:00 to 13:45 - Peak 1 of 1																																							
Intersect on 13:00																																							
Volume	20	206	13	6	245	57	124	8	7	196	73	169	33	7	282	16	125	54	18	213	936																		
Percent	8.2	84.	5.3	2.4		29.	63.	4.1	3.6		25.	59.	11.	2.5		7.5	58.	25.	8.5																				
Volume	20	206	13	6	245	57	124	8	7	196	73	169	33	7	282	16	125	54	18	213	936																		
Volume	5	75	6	2	88	16	51	3	1	71	18	64	5	2	89	4	39	15	8	66	314																		
Peak																																							
Factor																																							
High Int.	13:45					13:45					13:45					13:45																							
Volume	5	75	6	2	88	16	51	3	1	71	18	64	5	2	89	4	39	15	8	66																			
Peak					0.69					0.69					0.79					0.80																			
Factor					6					0					2					7																			



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Intersection Turning Movement Analysis

File Name : Sage Rd and Unser Bd
Site Code : 00025518
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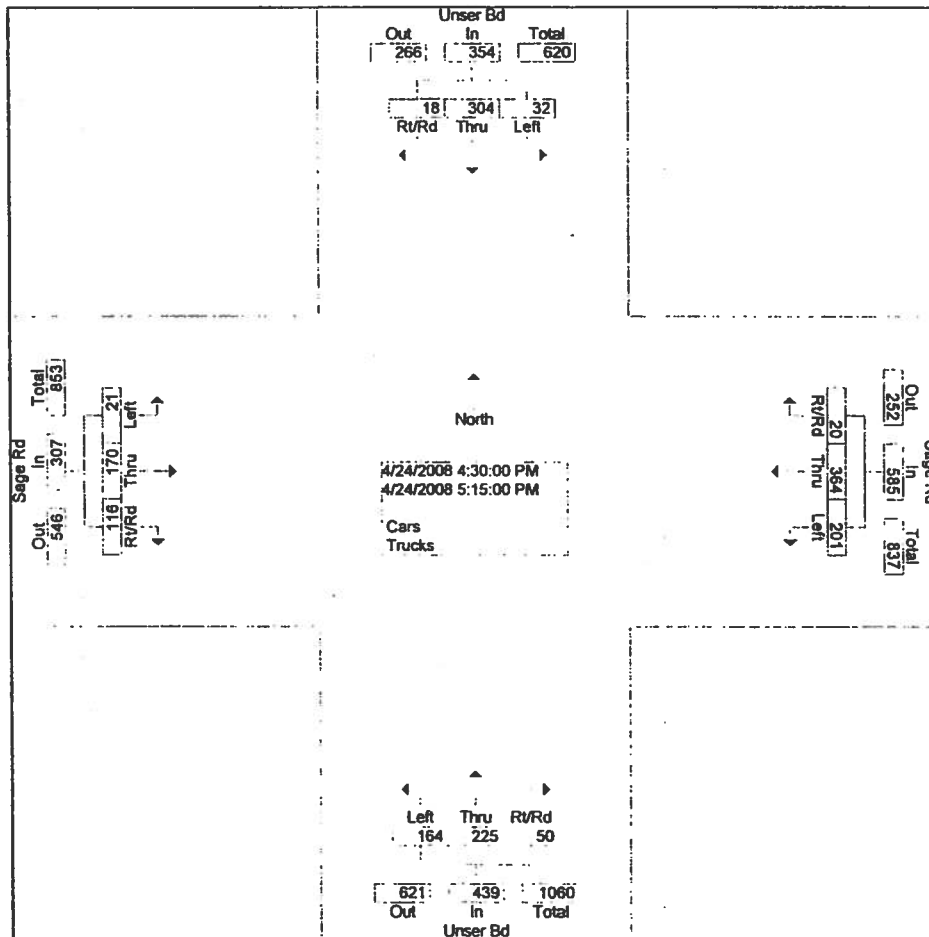
Start Time	Unser Bd From North					Sage Rd From East					Unser Bd From South					Sage Rd From West				
	Left	Thru	Rgt	Ru	App. Total	Left	Thru	Rgt	Ru	App. Total	Left	Thru	Rgt	Ru	App. Total	Left	Thru	Rgt	Ru	App. Total
Peak Hour From 15:00 to 17:30 - Peak 1 of 1																				
Intersect on																				
Volume	32	304	15	3	354	201	364	16	4	585	164	225	37	13	439	21	170	87	29	307
Percent	9.0	85.4	4.2	0.8		34.6	62.2	2.7	0.7		37.5	51.8	8.4	3.0		6.8	55.3	28.9	9.4	
Volume	32	304	15	3	354	201	364	16	4	585	164	225	37	13	439	21	170	87	29	307
Volume	7	72	3	1	83	52	100	2	0	154	48	50	4	2	104	5	40	28	10	83
Factor																				
High Int. Volume	16:30					17:00					17:15					17:00				
Peak Factor	10	81	1	1	93	52	100	2	0	154	43	63	14	1	121	5	40	28	10	83
					0.95					0.95					0.90					0.92
					2					0					7					5



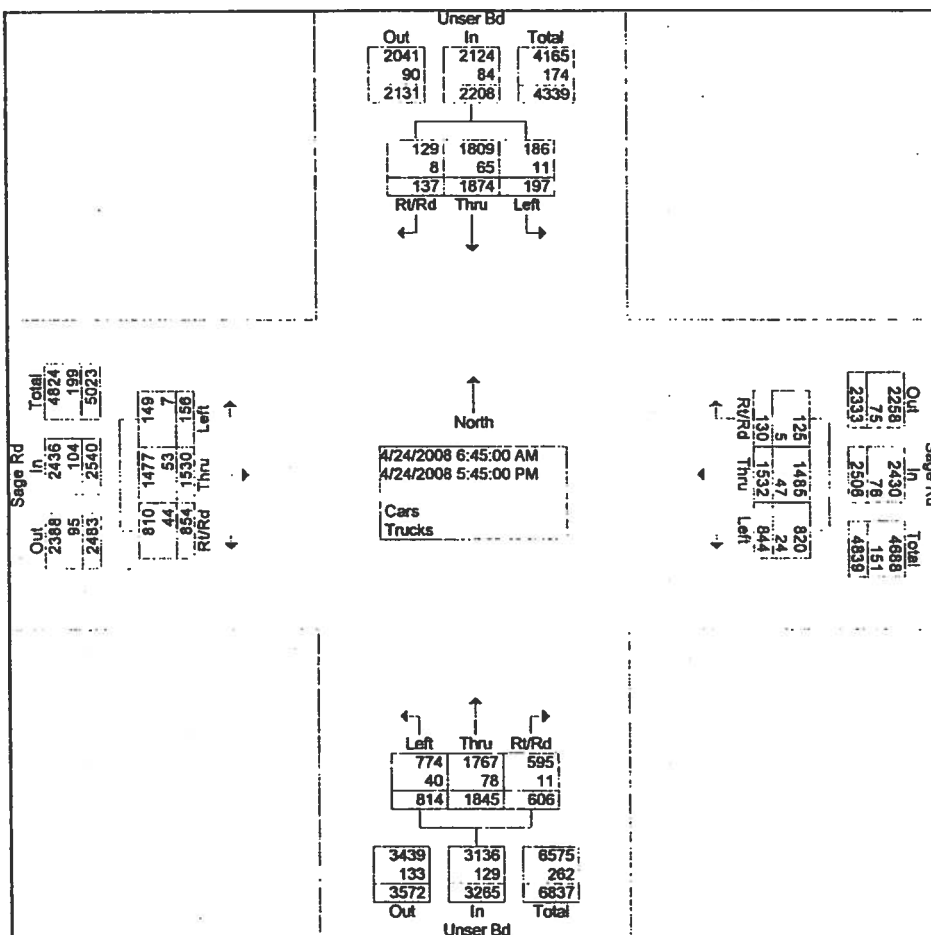
Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Sage Rd and Unser Bd
Site Code : 00025518
Start Date : 04/24/2008
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	Unser Bd From North					Sage Rd From East					Unser Bd From South					Sage Rd From West					
Start Time	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Int. Total
Peak Hour From 15:00 to 17:30 - Peak 1 of 1																					
Intersecti on	16:30																				
Volume	32	304	15	3	354	201	364	16	4	585	164	225	37	13	439	21	170	87	29	307	1685
Percent	9.0	85. 9	4.2	0.8		34. 4	62. 2	2.7	0.7		37. 4	51. 3	8.4	3.0		6.8	55. 4	28. 3	9.4		
Volume	32	304	15	3	354	201	364	16	4	585	164	225	37	13	439	21	170	87	29	307	1685
Volume	7	72	3	1	83	52	100	2	0	154	48	50	4	2	104	5	40	28	10	83	424
Peak Factor																					0.994
High Int.	16:30					17:00					17:15					17:00					
Volume	10	81	1	1	93	52	100	2	0	154	43	63	14	1	121	5	40	28	10	83	
Peak Factor	0.95					0.95					0.90					0.92					
	2					0					7					5					



17:00	7	72	3	1	83	52	100	2	0	154	48	50	4	2	104	5	40	28	10	83	424
17:15	7	77	4	1	89	49	82	5	2	138	43	63	14	1	121	4	38	18	8	68	416
17:30	11	77	3	0	91	62	71	3	0	136	28	54	7	7	96	6	42	34	6	88	411
17:45	6	71	4	1	82	51	87	4	5	147	23	50	10	3	86	8	54	23	8	93	408
Total	31	297	14	3	345	214	340	14	7	575	142	217	35	13	407	23	174	103	32	332	1659
Grand Total	197	1874	111	26	2208	844	1532	96	34	2506	814	1845	413	193	3265	1560	654	200	2540	10519	
Apprch %	8.9	84.9	5.0	1.2		33.7	61.1	3.8	1.4		24.9	56.5	12.6	5.9		6.1	60.2	25.7	7.9		
Total %	1.9	17.8	1.1	0.2	21.0	8.0	14.6	0.9	0.3	23.8	7.7	17.5	3.9	1.8	31.0	1.5	14.5	6.2	1.9	24.1	



Traffic Count Data Sheet

Year Counts Taken: 2010 E-W Street Sage Rd Speed Limit (Sage Rd)= 35 MPH
 N-S Street: 86th St Speed Limit (86th St)= 30 MPH
 Date of Count: 1/14/10

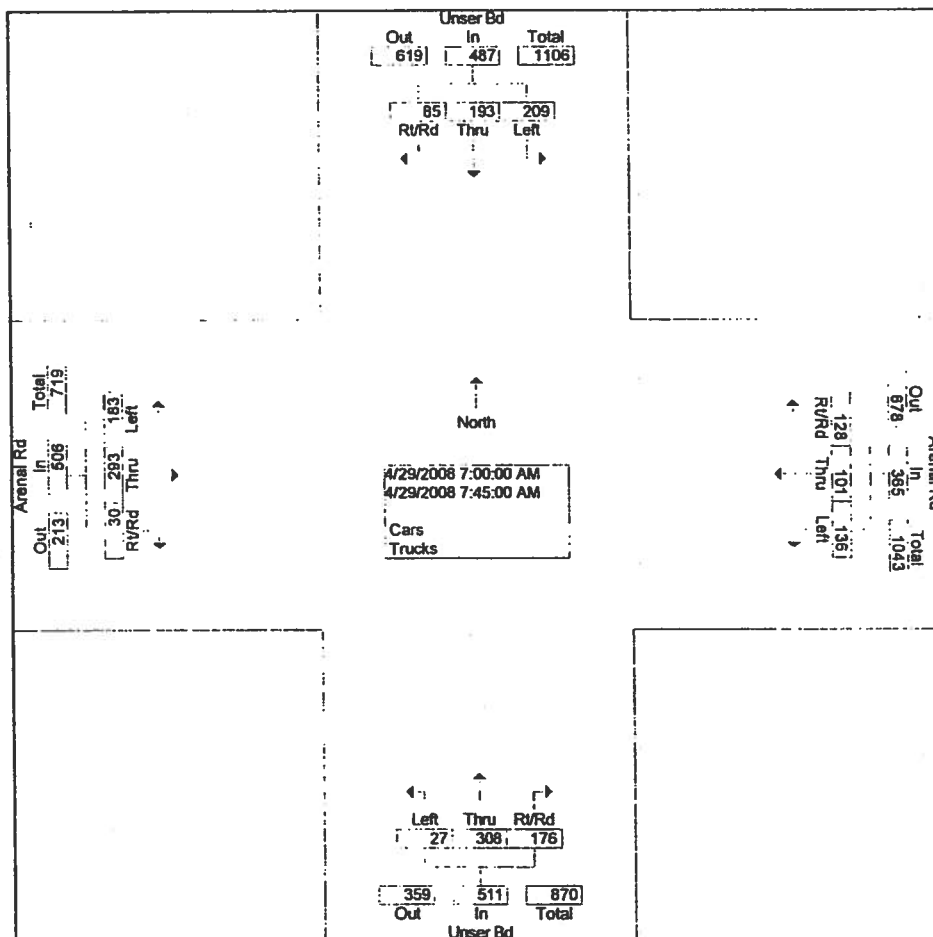
Begin Time	End Time	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (86th St)			Southbound (86th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	48	84	4	3	22	4	4	27	7	5	9	5
7:15 AM	7:30 AM	12	89	3	3	43	11	4	23	12	5	9	9
7:30 AM	7:45 AM	36	105	8	7	48	18	2	19	14	13	12	9
7:45 AM	8:00 AM	14	110	6	7	64	7	2	17	11	13	15	20
8:00 AM	8:15 AM	10	103	3	1	38	3	7	20	10	8	9	10
8:15 AM	8:30 AM	7	53	3	2	32	3	0	8	4	4	7	7
8:30 AM	8:45 AM	42	52	3	4	34	4	2	43	3	7	8	5
8:45 AM	9:00 AM	9	39	2	2	23	2	4	40	5	4	3	6
AM Peak Hour Volumes		72	407	20	18	193	39	15	79	47	39	45	48
% of Total Traffic		7.0%	39.8%	2.0%	1.8%	18.9%	3.8%	1.5%	7.7%	4.6%	3.8%	4.4%	4.7%
% Directional			48.8%			24.5%			13.8%			12.9%	
AM Peak Hour Factor			0.84			0.80			0.90			0.69	

Begin Time	End Time	Eastbound (Sage Rd)			Westbound (Sage Rd)			Northbound (86th St)			Southbound (86th St)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	46	48	2	6	75	5	0	44	3	8	22	20
4:15 PM	4:30 PM	9	55	3	6	93	7	4	43	3	42	22	33
4:30 PM	4:45 PM	45	57	4	6	64	4	3	47	6	5	45	45
4:45 PM	5:00 PM	42	68	9	8	83	40	5	49	5	4	28	47
5:00 PM	5:15 PM	12	54	9	5	86	4	4	19	7	8	30	25
5:15 PM	5:30 PM	19	58	4	9	75	7	3	22	1	9	23	21
5:30 PM	5:45 PM	15	59	6	9	78	8	4	10	5	10	29	27
5:45 PM	6:00 PM	18	69	5	13	84	5	4	21	6	7	22	20
PM Peak Hour Volumes		64	240	24	36	323	24	15	72	19	34	104	93
% of Total Traffic		6.1%	22.9%	2.3%	3.4%	30.8%	2.3%	1.4%	6.9%	1.8%	3.2%	9.9%	8.9%
% Directional			31.3%			36.5%			10.1%			22.0%	
PM Peak Hour Factor			0.89			0.94			0.85			0.88	

Mid-Region Council of Governments
Intersection Turning Movement Analysis

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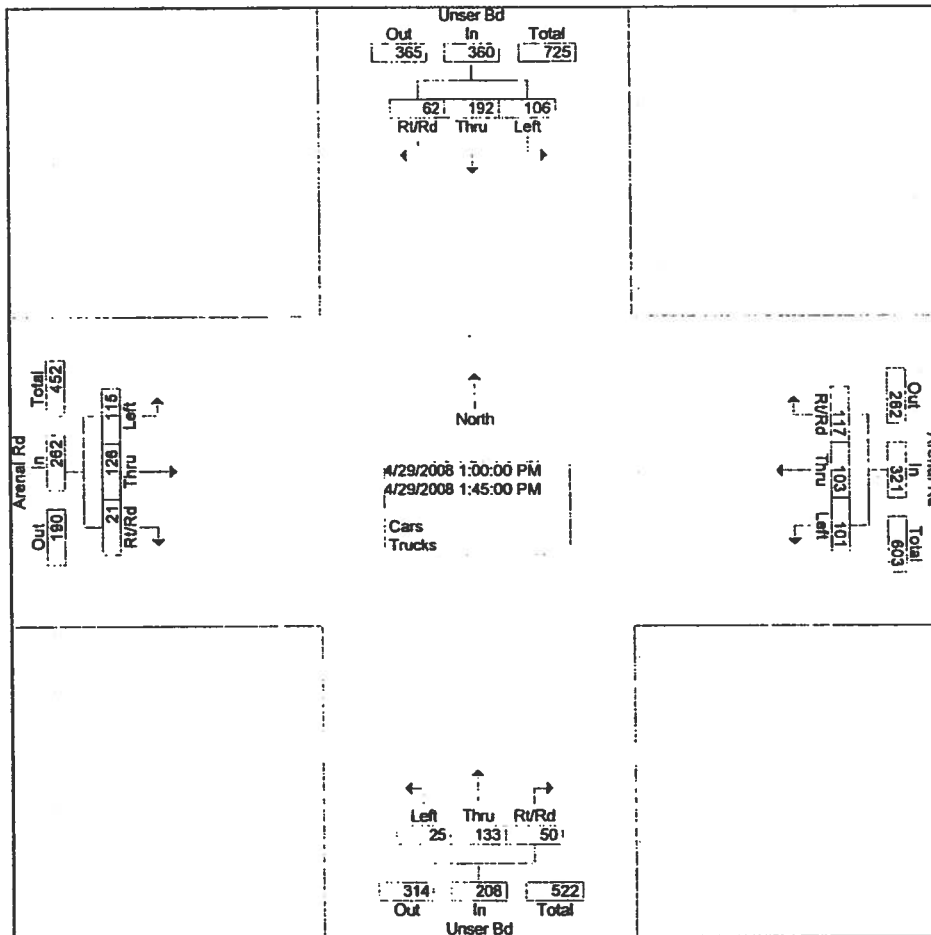
	Unser Bd From North					Arenal Rd From East					Unser Bd From South					Arenal Rd From West					
Start Time	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Int. Total
Peak Hour From 06:45 to 09:30 - Peak 1 of 1																					
Intersection on 07:00																					
Volume	209	193	67	18	487	136	101	128	0	365	27	308	176	0	511	183	293	23	7	506	1869
Percent	42.	39.	13.	3.7		37.	27.	35.	0.0		5.3	60.	34.	0.0		36.	57.	4.5	1.4		
	9	6	8			3	7	1				3	4			2	9				
Volume	209	193	67	18	487	136	101	128	0	365	27	308	176	0	511	183	293	23	7	506	1869
Volume	53	48	17	5	123	50	35	32	0	117	9	79	48	0	136	46	91	5	3	145	521
Peak Factor																					0.897
High Int. 07:15						07:30					07:15					07:45					
Volume	57	44	24	7	132	50	35	32	0	117	12	85	50	0	147	59	101	9	3	172	
Peak Factor					0.92					0.78					0.86						0.73
					2					0					9						5



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Intersection Turning Movement Analysis

File Name : Arenal Rd and Unser Bd
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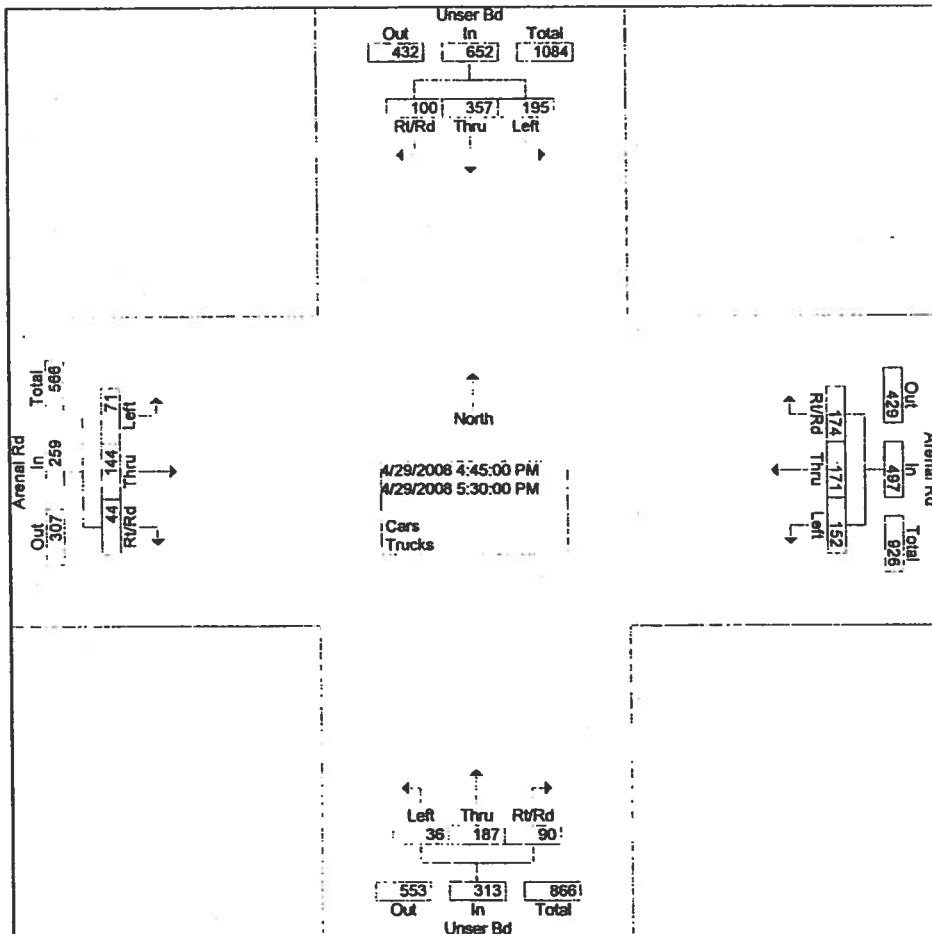
	Unser Bd From North					Arenal Rd From East					Unser Bd From South					Arenal Rd From West					
Start Time	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Int. Total
Peak Hour From 11:00 to 13:45 - Peak 1 of 1																					
Intersection on	13:00																				
Volume	106	192	45	17	360	101	103	117	0	321	25	133	50	0	208	115	126	19	2	262	1151
Percent	29.	53.	12.	4.7		31.	32.	36.	0.0		12.	63.	24.	0.0		43.	48.	7.3	0.8		
	4	3	5			5	1	4			0	9	0			9	1				
Volume	106	192	45	17	360	101	103	117	0	321	25	133	50	0	208	115	126	19	2	262	1151
Volume	21	67	13	1	102	32	27	28	0	87	9	39	14	0	62	31	54	6	1	92	343
Peak Factor																					0.839
High Int.	13:45					13:30					13:45					13:45					
Volume	21	67	13	1	102	35	33	30	0	98	9	39	14	0	62	31	54	6	1	92	
Peak Factor					0.88					0.81					0.83					0.71	
					2					9					9					2	



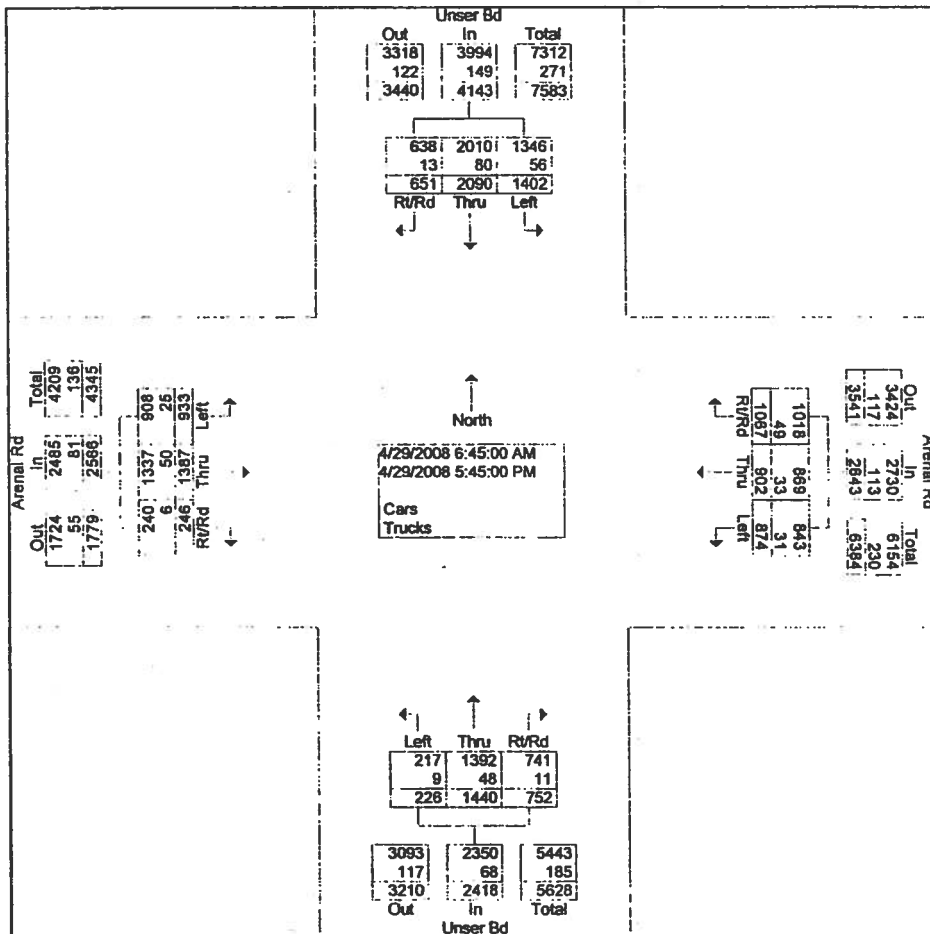
Mid-Region Council of Governments
Intersection Turning Movement Analysis

File Name : Arenal Rd and Unser Bd
Site Code : 00026882
Start Date : 04/29/2008
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	Unser Bd From North					Arenal Rd From East					Unser Bd From South					Arenal Rd From West					
Start Time	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Left	Thr u	Rig ht	Rt/ Rd	App. Total	Int. Total
Peak Hour From 15:00 to 17:30 - Peak 1 of 1																					
Intersecti on	16:45																				
Volume	195	357	72	28	652	152	171	174	0	497	36	187	90	0	313	71	144	27	17	259	1721
Percent	29	54	11	4.3		30	34	35	0.0		11	59	28	0.0		27	55	10	6.6		
	9	8	0			6	4	0			5	7	8			4	6	4			
Volume	195	357	72	28	652	152	171	174	0	497	36	187	90	0	313	71	144	27	17	259	1721
Volume	53	109	27	7	196	27	41	39	0	107	11	46	28	0	85	14	36	8	2	60	448
Peak Factor																					0.960
High Int.	17:30					17:00					17:15					17:00					
Volume	53	109	27	7	196	46	46	44	0	136	14	57	20	0	91	19	44	7	3	73	
Peak Factor	0.83					0.91					0.86					0.88					
	2					4					0					7					



17:00	32	92	9	5	138	46	46	44	0	136	5	37	24	0	66	19	44	7	3	73	413
17:15	59	81	26	7	173	51	33	35	0	119	14	57	20	0	91	22	24	6	7	59	442
17:30	53	109	27	7	196	27	41	39	0	107	11	46	28	0	85	14	36	8	2	60	448
17:45	42	88	15	17	162	36	40	37	0	113	15	45	18	0	78	21	29	10	4	64	417
Total	186	370	77	36	669	160	160	155	0	475	45	185	90	0	320	76	133	31	16	256	1720
Grand Total	140	209	469	182	4143	874	902	106	0	2843	226	144	752	0	2418	933	138	175	71	2566	1197
Total	2	0						7				0					7				0
Apprch %	33.	50.	11.	4.4		30.	31.	37.	0.0		9.3	59.	31.	0.0		36.	54.	6.8	2.8		
	8	4	3			7	7	5			6	1				4	1				
Total %	11.	17.	3.9	1.5	34.6	7.3	7.5	8.9	0.0	23.8	1.9	12.	6.3	0.0	20.2	7.8	11.	1.5	0.6	21.4	
	7	5									0	0				6	6				



Traffic Count Data Sheet

Year Counts Taken: 2010 E-W Street Tower Rd Speed Limit (Tower Rd)= ? MPH
 N-S Street: Unser Blvd Speed Limit (Unser Blvd)= ? MPH
 Date of Count: 1/12/10

Begin Time	End Time	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
		L	T	R	L	T	R	L	T	R	L	T	R
7:00 AM	7:15 AM	23	44	4	2	23	4	7	145	7	6	75	4
7:15 AM	7:30 AM	24	48	1	2	25	2	10	150	8	5	78	6
7:30 AM	7:45 AM	31	53	3	5	31	4	18	163	13	10	86	9
7:45 AM	8:00 AM	41	58	7	5	21	7	19	171	13	13	79	11
8:00 AM	8:15 AM	38	49	7	5	17	4	4	142	12	9	82	12
8:15 AM	8:30 AM	30	37	5	2	23	2	2	108	6	2	50	11
8:30 AM	8:45 AM	44	50	8	4	20	2	3	100	5	9	60	5
8:45 AM	9:00 AM	20	46	4	4	18	3	5	84	6	3	64	7
AM Peak Hour Volumes		134	208	18	17	94	17	51	626	46	37	325	38
% of Total Traffic		8.3%	12.9%	1.1%	1.1%	5.8%	1.1%	3.2%	38.9%	2.9%	2.3%	20.2%	2.4%
% Directional			22.3%			7.9%			44.9%			24.8%	
AM Peak Hour Factor			0.85			0.80			0.89			0.95	

Begin Time	End Time	Eastbound (Tower Rd)			Westbound (Tower Rd)			Northbound (Unser Blvd)			Southbound (Unser Blvd)		
		L	T	R	L	T	R	L	T	R	L	T	R
4:00 PM	4:15 PM	9	24	6	4	49	4	40	58	0	5	110	33
4:15 PM	4:30 PM	13	23	8	5	53	3	11	69	2	40	117	36
4:30 PM	4:45 PM	18	30	1	12	41	2	8	58	2	6	143	22
4:45 PM	5:00 PM	10	24	4	9	66	1	6	83	3	5	109	30
5:00 PM	5:15 PM	10	25	4	10	67	0	4	90	2	10	142	35
5:15 PM	5:30 PM	16	34	6	4	79	5	7	84	5	5	140	27
5:30 PM	5:45 PM	15	31	2	4	75	3	4	84	2	3	120	2
5:45 PM	6:00 PM	10	28	4	0	72	2	4	78	0	2	113	0
PM Peak Hour Volumes		54	113	15	35	253	8	25	315	12	26	534	114
% of Total Traffic		3.6%	7.5%	1.0%	2.3%	16.8%	0.5%	1.7%	20.9%	0.8%	1.7%	35.5%	7.6%
% Directional			12.1%			19.7%			23.4%			44.8%	
PM Peak Hour Factor			0.81			0.84			0.92			0.90	

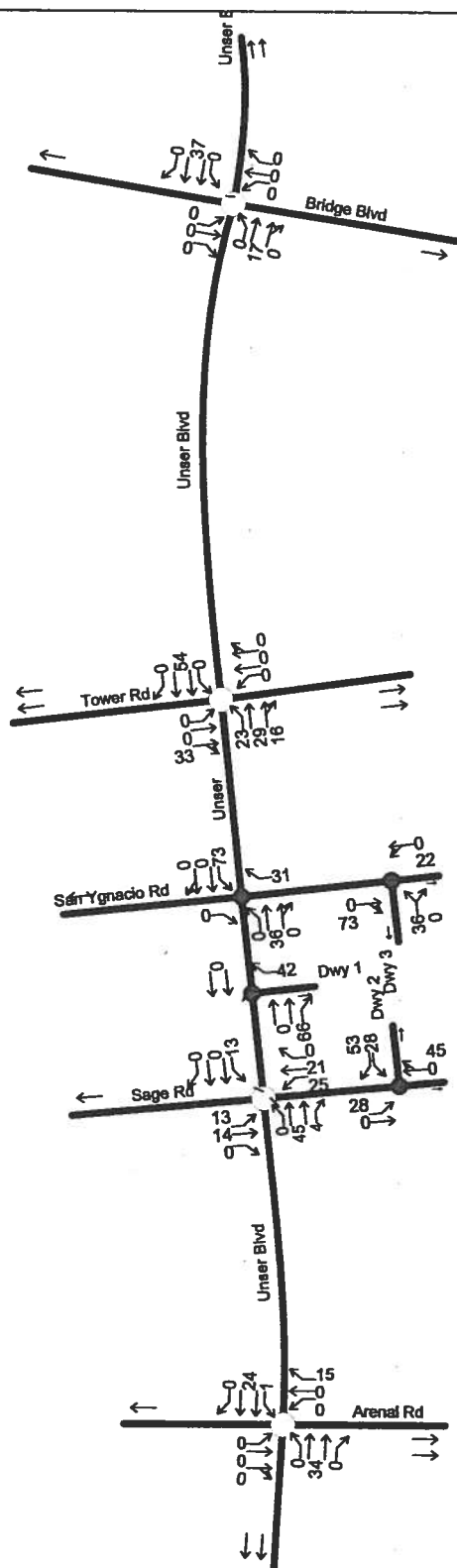
Sanchez Retail **Turning Movement Summary**

Intersection E-W Street: Sage Rd Existing Yr 2005
N-S Street: Unser Blvd Forecast Yr 2025

Approach Growth Rate 1.0% 1.0% 4.8% 9.0%												
AM Peak Hour	Eastbound			Westbound			Northbound			Southbound		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
Existing Counts (2005)	30	230	100	18	90	14	60	309	94	6	170	10
Base Year Count (2005)	30	230	100	18	90	14	60	309	94	6	170	10
Implementation Year (2025)	40	280	120	20	110	20	80	950	150	30	970	40
Site Generated Trips	5	5	5		9		8					8
Other Background Trips												
Implementation Yr No-Build	40	280	120	20	110	20	80	950	150	30	970	40
Implementation Yr Build	45	285	125	20	119	20	88	950	150	30	970	48

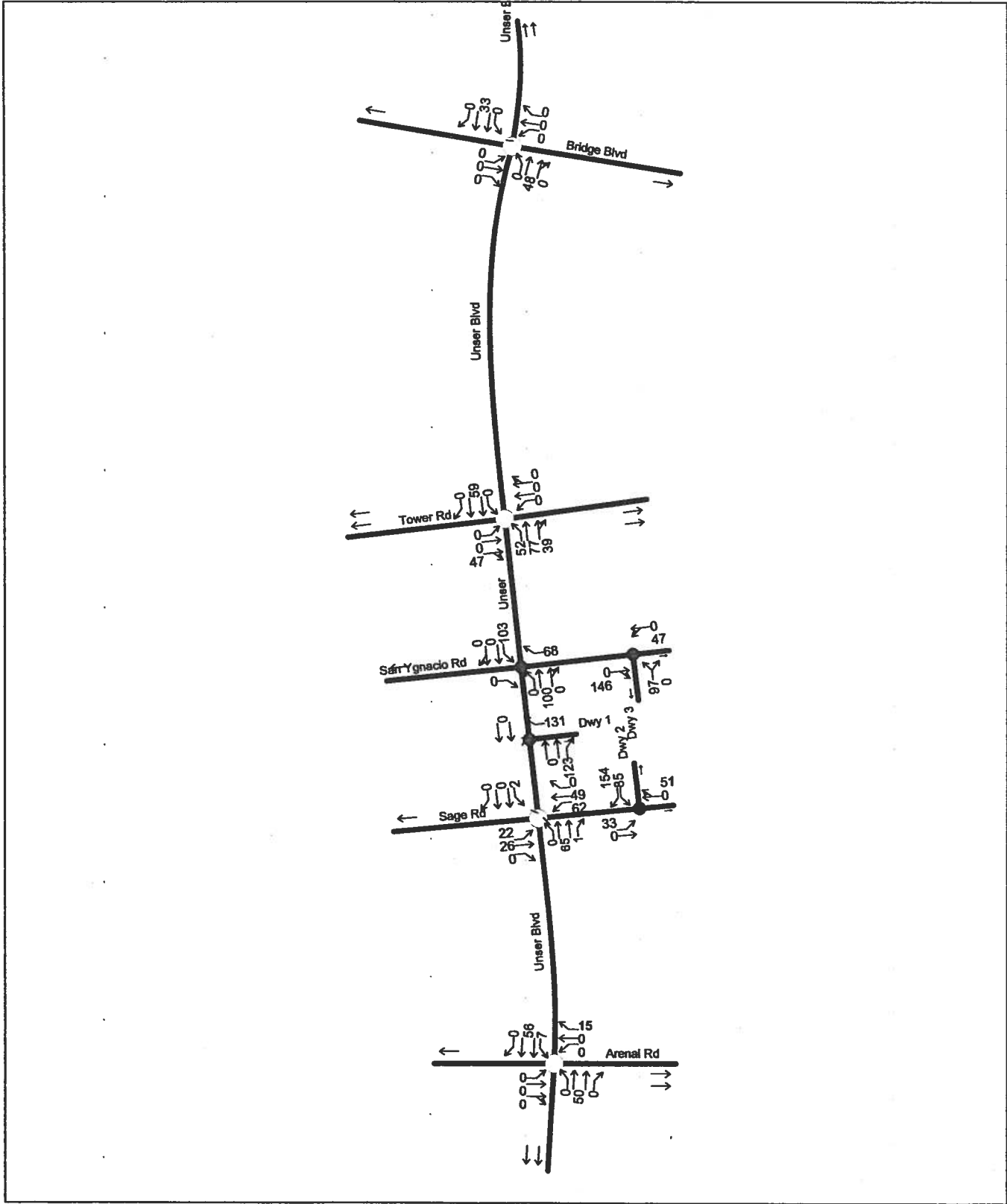
Approach Growth Rate 1.0% 2.7% 8.7% 5.9%												
PM Peak Hour	Eastbound			Westbound			Northbound			Southbound		
	LT	Th	RT	LT	Th	RT	LT	Th	RT	LT	Th	RT
Existing Counts (2005)	18	101	125	258	190	13	92	122	17	17	367	14
Base Year Count (2005)	18	101	125	258	190	13	92	122	17	17	367	14
Implementation Year (2025)	20	120	150	240	520	20	120	1050	60	50	1160	40
Site Generated Trips	25	23	26		22		24					23
Other Background Trips												
Implementation Yr No-Build	20	120	150	240	520	20	120	1050	60	50	1160	40
Implementation Yr Build	45	143	176	240	542	20	144	1050	60	50	1160	63

The applied growth rates were generalized from a comparison of the MRCOG link volumes with the existing (2005) counts. Volumes were then hand adjusted to reflect travel pattern shifts resulting from growth patterns and anticipated network changes between 2005 and 2025.



AM Peak Hour Trips

Figure C-3

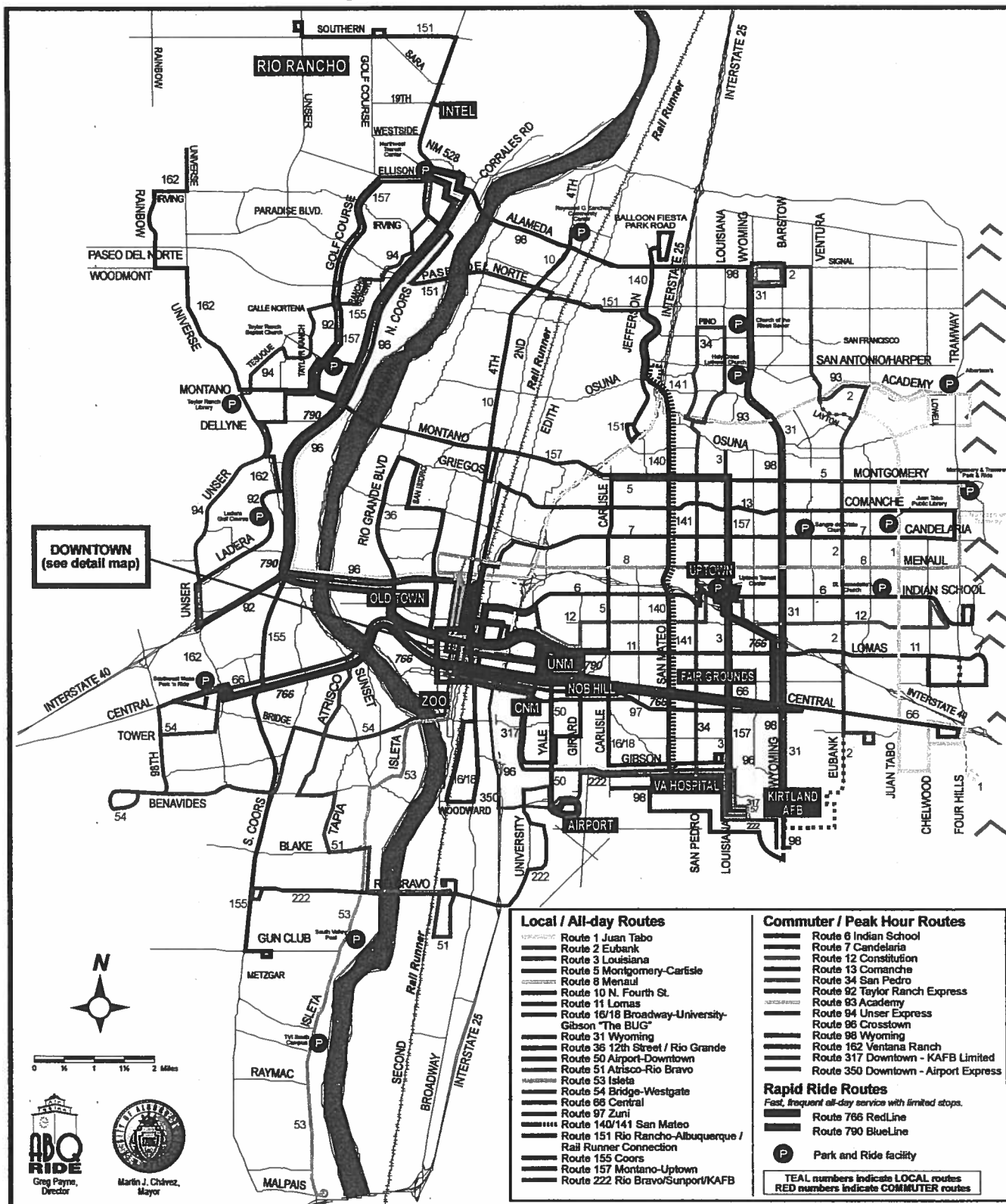


PM Peak Hour Trips

Figure C-4

ABQ Ride System Map

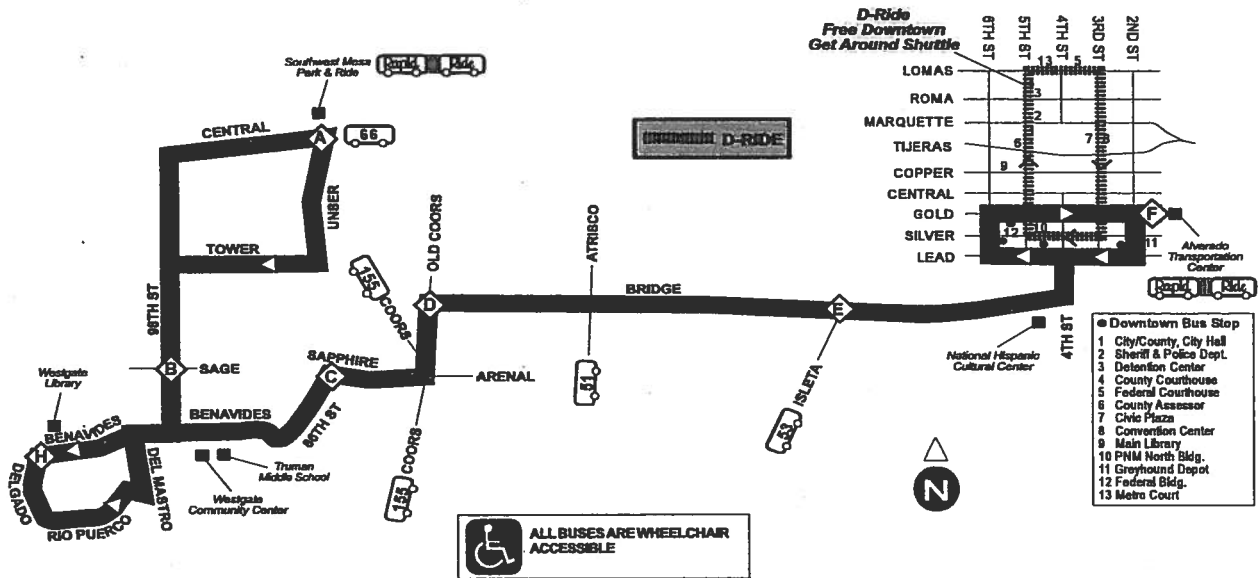
Effective
January 17, 2009



For trip planning assistance call 243-RIDE (-7433)
(724-3183 TTY) or visit www.cabq.gov/abqride

Route 54/Ruta 54 Bridge / Westgate

Eff. 12/19/2009



Route 54 - Weekday Eastbound

ALVARADO TRANSPORTATION CENTER	BRIDGE & ISLETA	BRIDGE & OLD COORS	BRIDGE & SAPHIRE	BRIDGE & SAGE	BRIDGE & BENAVIDES	BRIDGE & UNIBER
F	E	D	C	B	A	
545a	551a	555a	603a	609a	618a	
638a	644a	648a	656a	703a	713a	
724a	732a	737a	746a	754a	804a	
810a	818a	823a	832a	840a	850a	
902a	908a	912a	920a	926a	935a	
946a	952a	956a	1004a	1010a	1019a	
1031a	1037a	1041a	1049a	1055a	1104a	
1116a	1122a	1126a	1134a	1140a	1149a	
1201p	1207p	1211p	1219p	1225p	1234p	
1246p	1252p	1256p	104p	110p	119p	
131p	137p	141p	149p	156p	205p	
218p	224p	228p	236p	243p	252p	
307p	313p	317p	325p	332p	343p	
352p	400p	406p	414p	421p	432p	
433p	441p	448p	458p	505p	516p	
519p	527p	534p	544p	551p	602p	
604p	612p	619p	629p	636p	646p	
646p	652p	656p	704p	710p	718p	
733p	739p	743p	751p	757p	805p	
816p	822p	826p	834p	840p	848p	
900p	906p	910p	918p	924p	932p	

Route 54 - Weekday Westbound

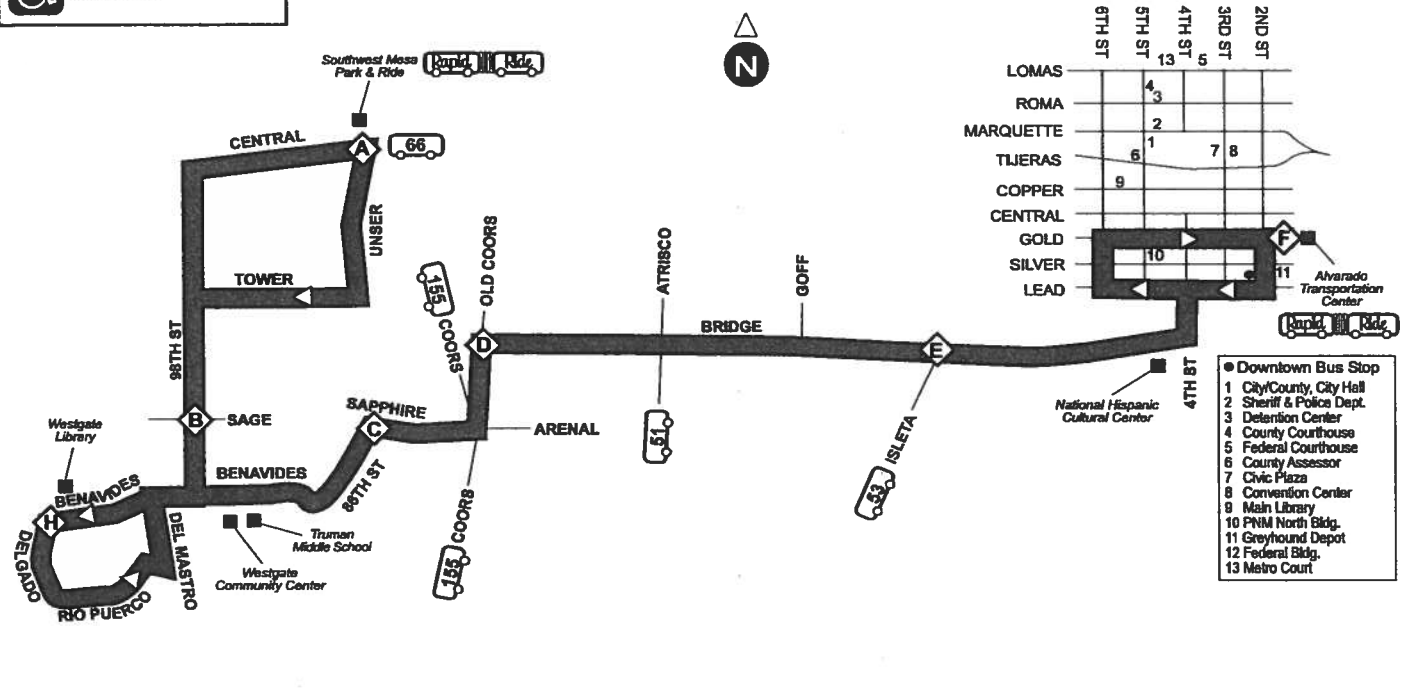
ALVARADO TRANSPORTATION CENTER	BRIDGE & ISLETA	BRIDGE & OLD COORS	BRIDGE & SAPHIRE	BRIDGE & SAGE	BRIDGE & BENAVIDES	BRIDGE & UNIBER
F	E	D	C	B	A	
553a	601a	607a	614a	622a	628a	634a
638a	646a	652a	659a	707a	713a	719a
723a	731a	738a	746a	754a	800a	806a
815a	823a	830a	838a	846a	852a	858a
900a	908a	914a	922a	930a	936a	942a
945a	953a	959a	1007a	1015a	1021a	1027a
1030a	1038a	1044a	1052a	1100a	1106a	1112a
1115a	1123a	1129a	1137a	1145a	1151a	1157a
1200p	1208p	1214p	1222p	1230p	1236p	1242p
1245p	1253p	1259p	107p	115p	121p	127p
130p	138p	144p	152p	200p	208p	214p
215p	223p	233p	241p	249p	257p	303p
300p	308p	318p	326p	334p	342p	348p
340p	348p	358p	406p	414p	423p	429p
420p	428p	439p	447p	455p	504p	510p
505p	513p	524p	532p	540p	549p	555p
550p	558p	609p	617p	625p	632p	638p
643p	651p	700p	708p	716p	723p	729p
725p	733p	739p	747p	755p	802p	808p
810p	818p	824p	831p	839p	845p	851p
907p	915p	921p	928p	936p	942p	948p

Route 54 | Ruta 54 Bridge/Westgate

Eff. 12/19/2009



ALL BUSES ARE WHEELCHAIR ACCESSIBLE



Route 54 - Saturday Eastbound

ALVARADO TRANSPORTATION CENTER	BRIDGE & ILETA	BRIDGE & OLD COORS	8TH STREET & SAPPHIRE	8TH STREET & SAGE	CENTRAL & UNSER
F	E	D	C	B	A
600a	608a	613a	618a	625a	640a
700a	708a	713a	718a	725a	740a
800a	808a	813a	818a	825a	840a
856a	904a	909a	914a	921a	938a
1000a	1008a	1013a	1018a	1025a	1040a
1100a	1108a	1113a	1118a	1125a	1140a
1200p	1208p	1213p	1218p	1225p	1240p
100p	108p	113p	118p	125p	140p
200p	208p	213p	218p	225p	240p
300p	308p	313p	318p	325p	340p
400p	408p	413p	418p	425p	440p
500p	508p	513p	518p	525p	540p
600p	608p	613p	618p	625p	640p
700p	708p	713p	718p	725p	740p
800p	808p	813p	818p	825p	840p
900p	908p	913p	918p	925p	940p

Route 54 - Saturday Westbound

ALVARADO TRANSPORTATION CENTER	BRIDGE & OLD COORS	BRIDGE & ILETA	8TH STREET & SAPPHIRE	8TH STREET & DELGADO	8TH STREET & SAGE	CENTRAL & UNSER
F	E	D	C	H	B	A
600a	609a	615a	621a	628a	634a	640a
700a	709a	715a	721a	728a	734a	740a
800a	809a	815a	821a	828a	834a	840a
900a	909a	915a	921a	928a	934a	940a
1000a	1009a	1015a	1021a	1028a	1034a	1040a
1100a	1109a	1115a	1121a	1128a	1134a	1140a
1200p	1209p	1215p	1221p	1228p	1234p	1240p
100p	109p	115p	121p	128p	134p	140p
200p	209p	215p	221p	228p	234p	240p
300p	309p	315p	321p	328p	334p	340p
400p	409p	415p	421p	428p	434p	440p
500p	509p	515p	521p	528p	534p	540p
600p	609p	615p	621p	628p	634p	640p
700p	709p	715p	721p	728p	734p	740p
800p	809p	815p	821p	828p	834p	840p
900p	909p	915p	921p	928p	934p	940p