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Montgomery / Wyoming Restaurants

Traffic Impact Study

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FINAL

Presented to:

City of Albuquerque Transportation Development Section

Prepared for:

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Montgomery / Wyoming Restaurants (NW Corner) TRAFFIC IMPACT STUDY

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Montgomery / Wyoming Restaurants (NW Corner) TRAFFIC IMPACT STUDY

STUDY PURPOSE

This study is being conducted in conjunction with a request for approval of a commercial development plan for the property located on the north side of Montgomery Blvd. west of Wyoming Blvd. The purpose of this study is to identify the impact of the Development on the adjacent transportation system, and to make recommendations to mitigate any significant adverse impact on the adjacent transportation system resulting from the implementation of the project. This report is being prepared to meet the requirements of the City of Albuquerque Transportation Development Section in association with the development of the proposed project associated with this site plan.

STUDY PROCEDURES

A scoping meeting was held with City of Albuquerque staff on June 23, 2015 (Jeanne Wolfenbarger and Racquel Michel) prior to beginning the Montgomery / Wyoming Restaurants study to discuss scope and methodology to be utilized within that report.

The resulting basic procedure followed in this study is described as follows:

- Calculate the generated trips for the proposed commercial development consisting of the following proposed restaurants: 2 ea. 6,000 SF High Turnover (Sitdown) restaurants, 2 ea. 3,500 SF Fast-food Restaurants w/ drive-thru window, and a 2,000 SF Coffee/donut Shop w/ drive-thru window.
- Calculate trip distribution for the newly generated trips by this development. The commercial trips shall be distributed based on 2035 DASZ population data within a two-mile radius of the proposed site.
- 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.
- 4) Obtain AM Peak Hour and PM Peak Hour turning movement traffic counts at the intersections of Montgomery Blvd. / Pennsylvania St., Montgomery Blvd. / Wyoming Blvd., Osuna Rd. / Wyoming Blvd., Gutierrez St. / Wyoming Blvd., Driveway "A" / Wyoming Blvd. and Montgomery Blvd. / Driveway "B".
- 5) Calculate Historic Growth Rates for each of the approaches to the intersections targeted for analysis where the historic data was available. Historic Growth Rates were calculated using Mid-Region Council of Governments Traffic Flow Maps for the years 2004 thru 2013.
- 6) Determine 2017 NO BUILD intersection volumes by growing the data from the existing traffic counts at the calculated historic growth rate to the analysis year. There are no recently approved projects to be added to these volumes.
- Add in data from Trip Assignments Maps and Tables to the 2017 NO BUILD Volumes to obtain 2017 BUILD Volumes for this project.

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

INTERSECTION	TYPE CONTROL	NO BUILD	BUILD
Montgomery Blvd. / Pennsylvania St. (1)	Traffic Signal	2017	2017
Montgomery Blvd. / Wyoming Blvd. (2)	Traffic Signal	2017	2017
Osuna Rd. / Wyoming Blvd. (3)	Traffic Signal	2017	2017
Gutierrez St. / Wyoming Blvd. (4)	Stop Sign	2017	2017
Driveway "A" / Wyoming Blvd. (5)	Stop Sign	2017	2017
Montgomery Blvd / Driveway "B" (6)	Stop Sign	2017	2017

PREVIOUS RELATED TRAFFIC IMPACT STUDIES

There were no previously approved Traffic Impact Studies to be added to this study.

GENERAL AREA CHARACTERISTICS

Surrounding land uses include commercial along Montgomery Blvd. and residential uses to the north and south. A McDonald's and a Wells Fargo Bank are located to the south of the site on Montgomery Blvd. The project is at the northwest corner of Montgomery Blvd. / Wyoming Blvd. All of the driveways for this site are existing, shared driveways.

AREA STREET NETWORK

Montgomery Blvd. and Wyoming Blvd. are classified as an Urban Principal Arterial roadways on the for the Albuquerque Metropolitan Planning Area. They are currently paved urban sixlane facilities with raised medians and curbs and gutters on both sides of the street. The posted speed limit on both is 40 M.P.H.

Pennsylvania St. is classified as an Urban Collector roadway on the Current Roadway Functional Classification System for the Albuquerque Metropolitan Planning Area. It is currently a paved urban two-lane facility with curbs and gutters and bicycle lanes on both sides of the street. The posted speed limit on Pennsylvania St. is 30 M.P.H.

Osuna Rd. is classified as an Existing Urban Minor Arterial roadway on the Current Roadway Functional Classification System for the Albuquerque Metropolitan Planning Area. It is currently paved urban two-lane facility with curbs and gutters and bicycle lanes on both sides of the street. The posted speed limit on Osuna Rd. is 30 M.P.H.

Gutierrez St. is not classified on the Current Roadway Functional Classification System for the Albuquerque Metropolitan Planning Area.

There are three Suntran bus routes in the area, specifically Routes # 5, 31 and 98. Route 5 runs east / west on Montgomery Blvd. and north / south on Carlisle Blvd. to downtown. Route 31 runs north / south on Wyoming Blvd. between Alameda Blvd. and Kirtland Air Force Base (KAFB). Route 98 runs from Ellison / Alameda east to Wyoming and south to KAFB. See the complete route information in the Appendix, Pages A-76 thru A-80.

There are bike routes on Pennsylvania St. and Comanche Rd., and bike lanes and multi-use trails in the area, as shown on the following map.



EXISTING TRAFFIC VOLUMES

2013 Average Weekday Traffic Volumes (AWDT) for major streets in the site plan area are shown on Page A-4 in the Appendix.

Existing AM and PM peak hour turning movement counts for the year 2015 were provided by the consulting engineer for the following intersections:

Montgomery Blvd. / Pennsylvania St. Montgomery Blvd. / Wyoming Blvd. Osuna Rd. / Wyoming Blvd. Gutierrez St. / Wyoming Blvd. Driveway "A" / Wyoming Blvd. Montgomery Blvd. / Driveway "B"

The existing traffic counts are included at the end of the Appendix.

EXISTING LEVELS OF SERVICE

The <u>Highway Capacity Manual</u> 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.

The Highway Capacity Manual defines Level of Service (LOS) for unsignalized intersections in terms of average controlled delay per vehicle also. However, the thresholds for the various

levels of service for unsignalized intersections varies from that of signalized intersections. The following table summarizes the thresholds for various levels of service at unsignalized intersections:

LOS A	0 to10.0"
LOS B	10 to 15"
LOS C	15 to 25"
LOS D	25 to 35"
LOS E	35 to 50"
LOS F	> 50"

Level of Service D is generally considered acceptable in urban areas and is the desirable base condition for analysis in a traffic study. In addition to consideration of the overall level-of-service of the signalized intersection, the levels-of-service of each individual movement should be considered also. There are cases in large cities where achieving LOS "D" or better at an intersection (signalized or unsignalized) is not possible, especially on heavily travelled arterial roadways in urbanized areas.

Existing Levels-of-Service were not calculated for this study. Instead, the 2017 NO BUILD and the 2017 BUILD Conditions were evaluated.

PROPOSED DEVELOPMENT

The development plan is comprised of proposed commercial uses consisting of the following proposed restaurants: two (2) 6,000 SF High Turnover (Sitdown) restaurants, two (2) 3,500 SF Fast-food Restaurants w/ drive-thru, and a 2,000 SF Coffee/donut Shop w/ drive-thru. The land uses utilized for this analysis should be representative of the type of uses that will result from the proposed development. Should the development occur in such a manner that the actual number of trips generated significantly exceed that projected in this study, the City of Albuquerque may require an updated Traffic Impact Study.

Access is provided into the proposed facility via one driveway accessing Montgomery Blvd. and two accessing Wyoming Blvd. The overall access to the project is as depicted on the Conceptual Site Development Plan on Page A-2 of this study. The first access to the site is Gutierrez St. / Wyoming Blvd, which also serves a church access west of Wyoming Blvd. The second access on Wyoming Blvd. (Driveway "A") is south of Gutierrez and currently serves as access to the McDonald's. The access onto Montgomery Blvd. (Driveway "B") is an existing right-in, right-out, left-in unsignalized intersection to the west of Wyoming Blvd.

TRIP GENERATION

Projected trips were calculated from data in the Institute of Transportation Engineers <u>Trip Generation</u> report (9th Edition, 2012). Trips for the development were determined based on land uses projected to be associated with the site plan for this property.

The resulting number of trips generated for the proposed development is summarized in the following table:

Montgomery / Wyoming Restaurant Project

Trip Generation Data (ITE Trip Generation Manual - 9th Edition)

	USE (ITE CODE)		24 HR VOL	A. M. PE	AK HR.	P. M. PE	AK HR.
COMMENT	DESCRIPTION		GROSS	ENTER	EXIT	ENTER	EXIT
	Summary Sheet	Units					
2 Restaurants	High Turnover (Sit-Down) Restaurant (932)	12.00	1,526	71	58	71	47
2 Restaurants	Fast Food Restaurant w/ Drive-Thru Window (934)	7.00	3,473	162	156	119	110
1 Restaurant	Coffee/Donut Shop w/ Drive Thru Window (937)	2.00	1,637	103	99	43	43
	Subtotal		6,636	336	313	233	200
	Pass-By Trips	45%		-151	-141	-105	-90
	Total Primary Trips			185	172	128	110

(Also, see Pages A-6 thru A-9 in the Appendix of this report for Trip Generation Summary Table and Worksheets.)

TRIP DISTRIBUTION

Primary and Diverted Linked Trips:

Trips were distributed as follows:

Commercial Land Uses

Primary and diverted linked trips for the commercial land use development were distributed proportionally to the 2017 projected population of Data Analysis Subzones within a two mile radius of the proposed development. Population data for the years 2015 and 2025 were taken from the 2035 Socioeconomic Forecasts by Data Analysis Subzones for the Mid-Region of New Mexico supplied by the Mid-Region Council of Governments (MRCOG). Population data from the years 2015 and 2025 was interpolated linearly to obtain 2017 population data to utilize for this analysis. Population Subzones were grouped based on the most likely major street(s) or route(s) to the subject development. The trip distribution worksheets and associated map of data analysis subzones are shown in the Appendix. The commercial Trip Distribution map can be found in the Appendix on Page A-19.

TRIP ASSIGNMENT

Trip assignments are first made on a percentage basis derived from data established in the trip distribution determination process and logical routing. Those percentages are then applied to the projected trips to determine individual traffic movements. Percentage trip assignments for commercial trips are shown in the Appendix on Pages A-20 thru A-21. An adjustment for Passby Trips of 30% was applied to this project.

BACKGROUND TRAFFIC GROWTH

Implementation year (2017) background annual traffic growth rates for the project were considered for each individual approach to an intersection that was targeted for analysis based on data from the 2004 thru 2013 Traffic Flow maps prepared by the Mid-Region Council of Governments. Most of the Traffic Flow Data for those years taken from the MRCOG Traffic Flow Maps were Standard Data. The data from those years for each approach was plotted on a graph and a linear "regression trend line" calculated using the equation format y=mx+b. The growth rate was determined by calculating the average volume increase per year during the time period considered and dividing that volume into the most recent AWDT used in the analysis from which future volumes will be calculated. The rate of growth of that trend line was utilized as the annual growth rate for each approach if that calculated rate appeared feasible. However, there were some instances where the rate indicated a negative growth trend or appeared to be unreasonably high or low. In those cases, an appropriate growth rate from an adjacent segment of the same roadway was used, a shorter time span was used to determine the growth rate, or the growth rate was considered to be a generic 1% if appropriate. Additionally, if the R² 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 Appendix on Pages A-22 thru A-32. The growth rate utilized for each approach to an intersection is printed at the top of the Turning Movement sheets for each intersection (Appendix Pages A-35 thru A-48).

PROJECTED PEAK HOUR TURNING MOVEMENTS FOR 2017 BUILDOUT

The calculated annual growth rates were applied to the existing (2015) peak hour traffic counts furnished by the consultant to establish the 2017 background traffic volumes. To these volumes, the generated trips based on implementation of the proposed land uses for this project were added to obtain the 2017 BUILD volumes for the intersection analyses. See Appendix Pages A-36 thru A-47 for further information regarding turning movement counts. 2017 NO BUILD and 2017 BUILD Volumes Maps and LOS are at the beginning of the Appendix of this report.

INTERSECTION CAPACITY ANALYSIS

Intersection capacity analyses were performed in accordance with the procedures for signalized and unsignalized intersections in the <u>Highway Capacity Manual</u>, Special Report 209, Transportation Research Board, 2010, using Synchro Version 8 Software (Build 803) for signalized and unsignalized intersections. For signalized intersections, the operational method of analysis was used for 2017 conditions (NO BUILD and BUILD). In addition to utilizing the operational analysis for the intersections, the 1985 planning method may also be used to provide additional information at the intersection to help define critical lane volumes and to help analyze a solution.

Capacity analyses were performed for the following traffic conditions.

- ⇒ 2017 without development of the subject property (NO BUILD)
- \Rightarrow 2017 with development as per the assumed land uses considering total implementation of the plan.

The results of the 2017 NO BUILD and the 2017 BUILD capacity analyses are summarized in the following sections – Results and Discussion of Intersection Capacity Analyses.

RESULTS OF SIGNALIZED INTERSECTION CAPACITY ANALYSES

IMPLEMENTATION YEAR (2017)

Intersection #1 - Montgomery Blvd. / Pennsylvania St. - Page A-49 thru A-72

The results of the 2017 implementation year analysis of the signalized intersection of Montgomery Blvd. / Pennsylvania St. are summarized in the following table:

Intersection: 1 - Montgomery Blvd. / Pennsylvania St.

				(EXIST	. GEON	1.)					((EXIST	GEON	1.)	
		NO) BU	ILD		BUII	LD	1		N) BU	ILD		BUIL	D
		Lanes	LOS	-Delay	Lanes	LO	S-I	Delay		Lanes	LOS	-Delay	Lanes	LOS	-Delay
	L	1	Α.	- 6.9	1	Α	-	7.4	L	1	В -	10.9	1	В -	11.4
B	Т	3	В	- 11.0	3	В	-	11.9	Т	3	Ċ	21.9	3	C -	23.0
	R	>	В	- 11.4	>	В	-	12.3	R	>	Ċ	23.9	>	C -	25.2
	L	1	Α .	- 7.3	1	Α	-	8.1	L	1	В -	17.9	1	В -	20.0
WB	Τ	3	A ·	- 1.0	3	Α	-	1.1	Т	3	Α -	0.8	3	Α -	0.9
	R	>	A	- 1.9	>	Α	-	2.1	R	>	Α -	1.6	>	Α -	1.7
	L	1	D ·	- 38.1	1	D	-	36.6	L	1	D -	37.7	1	D -	36.8
NB	Τ	1	D ·	- 49.1	1	D	-	49.6	Т	1	E	61.8	1	Ε.	63.3
Ш	R	>	Д	- 49.1	>	ם	-	49.6	R	>	Ė	61.8	>	E ·	63.3
	L	1	D ·	- 37.8	1	D	-	36.7	L	1	D -	42.4	1	D -	41.8
SB	Т	1	D ·	- 47.4	1	D	-	44.4	Т	1	D -	48.4	1	D -	47.1
	R	>	D ·	- 47.4	>	D	-	44.4	R	>	D -	48.4	>	D ·	47.1
Inte	Intersection: <i>B - 10.2 B - 10.7</i>										C -	20.2		<i>C</i> -	20.9

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

The projected operation of the signalized intersection of Montgomery Blvd. / Wyoming Blvd. is acceptable for all conditions analyzed in this report. The projected increase in delay at the intersection resulting from implementation of the Montgomery / Wyoming Restaurants is 0.5 seconds during the 2017 AM Peak Hour and 0.7 seconds during the 2017 PM Peak Hour. Therefore, no recommendation is made for the signalized intersection of Montgomery Blvd. / Pennsylvania St.

The Queuing Analysis for this intersection results in the lanes length changes summarized in the following table:

Queueing Analysis Summary Sheet

Project: Montgomery / Wyoming Restaurants (NW Corner)

Intersection: Montgomery Blvd. / Pensylvania St.

•	^	4	-
Z	u	7	•

2017	_					 ,					
Approach	<u>L</u> (eft Tur	<u>'ns</u>	<u>Thru</u>	Move	<u>nents</u>	Right Turns				
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	22	125	3	815	Cont	0	48	0		
AM NO BUILD Queue	1	22	50	3	823	350	0	48	75		
AM BUILD Queue	1	22	50	3	848	350	0	48	75		
Existing Lane Length	1	74	125	3	1,648	Cont	0	155	0		
PM NO BUILD Queue	1	75	125	3	1,664	725	0	157	225		
PM BUILD Queue	1	75	125	3	1,681	725	0	157	225		
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	73	125	3	1,364	Cont	0	72	0		
AM NO BUILD Queue	1	74	125	3	1,378	525	0	73	125		
AM BUILD Queue	1	93	125	3	1,401	550	0	75	125		
Existing Lane Length	1	70	125	3	1,174	Cont	0	48	0		
PM NO BUILD Queue	1	71	125	3	1,186	550	0	48	100		
PM BUILD Queue	1	83	150	3	1,201	550	0	49	100		
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	89	120	1	65	Cont	0	72	0		
AM NO BUILD Queue	1	90	125	1	66	100	0	73	125		
AM BUILD Queue	1	90	125	1	66	100	0	94	125		
Existing Lane Length	1	139	120	1	188	Cont	0	100	0		
PM NO BUILD Queue	1	140	200	1	190	275	0	101	175		
PM BUILD Queue	1	140	200	1	190	275	0	115	175		
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	32	110	1	51	Cont	0	44	0		
AM NO BUILD Queue	1	32	75	1	52	100	0	44	75		
AM BUILD Queue	1	34	75	1	52	100	0	44	75		
Existing Lane Length	1	60	110	1	110	Cont	0	39	0		
PM NO BUILD Queue	1	61	125	1	111	175	0	39	75		
PM BUILD Queue	1	63	125	1	111	175	0	39	75		

Cycle Length: 100 PM NOTE: Queue lengths are in feet.

Cycle Length: 120 Calculated Right Turn Queue Ler

Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

The northbound and southbound left turn lanes can be extended to approximately the recommended lengths in the table above by re-striping the approaches on Pennsylvania St.

Intersection #2 - Montgomery Blvd. / Wyoming Blvd. - Page A-49 thru A-72

The results of the 2017 implementation year analysis of the signalized intersection of Montgomery Blvd. / Wyoming Blvd. are summarized in the following table:

Intersection: 2 - Montgomery Blvd. / Wyoming Blvd.

2017 AM Peak Hour BUILD

2017 PM Peak Hour BUILD

			(EXIST.	GEOM	l.)		(MI	Γ. GE	OM.)				(EXIST.	GEOM	.)		(MI	Γ. GE	OM.)
		NO) BUI	LD		BUIL	D		BUIL	.D		NO) BL	JILD	1	BUILI	כ		BUILI	D
		Lanes	LOS	-Delay	Lanes	LOS	-Delay	Lanes	LOS	3-Delay		Lanes	LOS	S-Delay	Lanes	LOS-	-Delay	Lanes	LOS	-Delay
	L	2	Е-	70.1	2	Ε -	70.1	2	Ε	- 70.1	L	2	F	- 93.5	2	F -	93.5	2	F-	93.5
EB	Т	3	C -	23.2	3	С -	22.9	3	В	- 17.3	Т	3	Е	- 70.6	3	E -	67.6	3	E -	75.6
	R	>	С -	26.3	>	С -	25.9	^	В	- 19.2	R	>	F	- 81.8	>	E -	78.7	>	F	87.0
Г	L	2	D -	51.4	2	D -	51.4	2	D	- 51.4	L	2	F	- 98.4	2	F -	98.4	2	F-	98.4
WB	Т	3	D -	53.9	3	Ε -	60.0	3	D	- 40.3	Т	3	Е	- 61.1	3	E -	64.5	3	E -	71.8
	R	>	Ε-	65.0	>	Ε -	71.8	>	D	- 47.4	R	>	Е	- 73.3	>	E -	77.5	>	F-	86.0
Г	L	2	Е -	71.6	2	F-	86.9	2	F	- 86.9	L	2	Е	- 64.7	2	E -	65.8	2	E -	61.7
NB	Т	3	C -	28.1	3	С -	30.3	3	D	- 36.3	Т	3	Е	- 69.1	3	E -	70.7	3	E -	70.7
	R	>	С -	29.5	>	С -	32.2	>	D	- 40.3	R	>	Е	- 80.9	>	F -	82.5	>	F-	82.5
Г	L	2	D -	50.7	2	D -	51.4	2	Е	- 56.3	L	2	F	- 84.3	2	F -	116	2	F-	89.8
SB	Т	3	D -	51.9	3	D -	49.7	3	D	- 41.7	Т	3	В	- 13.2	3	В -	14.0	3	В -	10.2
L	R	>	Е-	63.4	>	Е-	61.6	1	В	- 18.3	R	>	В	- 15.8	>	В -	17.0	1	Α -	5.4
Int	erse	ection:	D -	47.0		D -	49.0		D	- 40.4			Ε	- 61.7		E -	63.9		E -	64.3

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

Mitigation includes a southbound right turn lane.

This report demonstrates that the operation of the signalized intersection of Montgomery Blvd. / Wyoming Blvd. has some long delays associated with certain turning movements for the projected 2017 AM and PM Peak Hour NO BUILD and BUILD Conditions analyzed. There is limited possibility of providing additional lanes at any of the approaches to the intersection. The right turn volumes during the PM Peak Hour period seem to show a possibility that future right turn lanes will improve the operation of the signalized intersection. However, there is no available right-of-way for any right turn lanes. In the case of future redevelopment of any of the four corners of the intersection of Montgomery Blvd. / Wyoming Blvd., the City of Albuquerque should consider acquiring additional right-of-way for construction of right turn lanes at the intersection. The analysis demonstrates that trying to mitigate the intersection with a separate southbound right turn lane would slightly decrease the delay during the AM Peak Hour and slightly increase the delay during the PM Peak Hour. Therefore, no recommendation is made for the signalized intersection of Montgomery Blvd. / Wyoming Blvd. Implementation of the Montgomery / Wyoming Restaurants project is calculated to result in a 2 second increase in average delay during the AM Peak Hour and a 2.2 second increase in average delay of the intersection during the PM Peak Hour.

The Queuing Analysis for this intersection results in the lanes length changes summarized in the following table:

Queueing Analysis Summary Sheet

Project: Montgomery / Wyoming Restaurants (NW Corner)

Intersection: Montgomery Blvd. / Wyoming Blvd.

2	0	1	7

Approach	14	eft Tui	ns	Thru	Move	nents	Right Turns				
Eastbound		# Lanes Vol. Length			Vol.	Length	# Lanes Vol. Leng				
Existing Lane Length	2	150	250	# Lanes	554	Cont	0	89	0		
AM NO BUILD Queue	2	152	125	3	643	275	0	90	125		
AM BUILD Queue	2	152	125	3	627	275	0	90	125		
Existing Lane Length	2	383	250	3	1.296	Cont	0	200	0		
PM NO BUILD Queue	2	387	300	3	1,309	600	0	202	275		
PM BUILD Queue	2	387	300	3	1,290	575	0	202	275		
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	2	193	200	3	988	Cont	0	222	0		
AM NO BUILD Queue	2	195	150	3	998	400	0	224	275		
AM BUILD Queue	2	195	150	3	1,017	400	0	243	275		
Existing Lane Length	2	209	200	3	881	Cont	0	252	0		
PM NO BUILD Queue	2	211	175	3	890	425	0	255	350		
PM BUILD Queue	2	211	175	3	903	425	0	268	350		
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	2	176	180	3	971	Cont	0	122	0		
AM NO BUILD Queue	2	180	150	3	992	400	0	125	175		
AM BUILD Queue	2	196	150	3	1,008	400	0	125	175		
Existing Lane Length	2	198	180	3	1,603	Cont	0	244	0		
PM NO BUILD Queue	2	202	175	3	1,638	725	0	249	325		
PM BUILD Queue	2	213	175	3	1,649	725	0	249	325		
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	2	185	220	3	1,416	Cont	0	240	0		
AM NO BUILD Queue	2	187	150	3	1,430	550	0	242	275		
AM BUILD Queue	2	237	175	3	1,458	550	0	242	275		
Existing Lane Length	2	319	220	3	1,317	Cont	0	190	0		
PM NO BUILD Queue	2	322	250	3	1,330	600	0	192	275		
PM BUILD Queue	2	360	275	3	1,346	600	0	192	275		

AM PM NOTE: Queue lengths are in feet.

Cycle Length: 100 120 Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

None of the existing left turn lanes can be lengthened without adversely affecting the complementary left turn lanes at nearby driveways. Therefore, no recommendation is made.

The southbound queue lengths for the intersection of Montgomery Blvd. / Wyoming Blvd. were calculated using three different methods – Poisson's Arrival Method (above), SimTraffic and HCM 2010. The following table demonstrates the results.

	Queue Length (FT)								
Calculation Method	AM Peak Hour	PM Peak Hour							
Poisson's Method	550	600							
SimTraffic	390	450							
HCM 2010	391	391							

Poisson's Arrival method is the most conservative method, as the results clearly display. The proposed driveway will be located approximately 420 feet from the Montgomery Blvd. / Wyoming intersection. Therefore, the Poisson's Arrival Method shows that the driveway will be blocked during the AM and PM Peak Hour; the SimTraffic method shows that the driveway will not be blocked during the AM Peak Hour, but will be blocked during the PM Peak Hour; and the HCM 2010 method shows that the driveway will not be blocked during the AM or PM Peak Hours. The SimTraffic graphics are and HCM 2010 reports are included on Appendix Pages A-84 thru A-87.

Intersection #3 – Osuna Rd. / Wyoming Blvd. – Page A-49 thru A-72

The results of the 2017 implementation year analysis of the signalized intersection of Osuna Rd. / Wyoming Blvd. are summarized in the following table:

Intersection: 3 - Osuna Rd. / Wyoming Blvd.

	2017 AM Peak Hour BUILD	2017 PM Peak Hour BUILD
--	-------------------------	-------------------------

			(EXIST.	GEON	l.)		1	(EXIST. GEOM.)					
		N	O BUILD		BUILD)		N	O BUILD		BUILD		
		Lanes	LOS-Delay	Lanes	LOS-	Delay		Lanes	LOS-Delay	Lanes	LOS-Delay		
	L	1	D - 37.2	1	D -	37.2	L	1	D - 50.4	1	D - 50.2		
EB	Τ	1	D - 39.0	1	D -	39.0	Т	1	D - 44.1	1	D - 44.1		
	R	1	C - 34.1	1	C -	34.4	R	1	D - 36.2	1	D - 36.3		
	L	1	D - 35.2	1	D -	35.8	L	1	D - 44.8	1	D - 45.4		
WB	Т	1	E - 57.0	1	E -	56.9	Т	1	E - 68.0	1	E - 67.6		
	R	>	E - 57.0	۸	E -	56.9	R	>	E - 68.0	>	E - 67.6		
П	L	1	B - 14.9	1	В -	16.1	L	1	B - 19.0	1	B - 19.8		
NB	Т	3	B - 14.1	3	В -	14.4	Т	3	C - 25.3	3	C - 25.8		
	R	>	B - 14.9	^	В -	15.3	R	>	C - 28.3	>	C - 29.2		
П	L	1	A - 9.7	1	Α -	9.9	L	1	C - 29.3	1	C - 30.3		
SB	Т	3	B - 18.9	3	В -	19.3	Т	3	C - 22.8	3	C - 23.1		
	R	>	C - 21.7	>	C -	22.2	R	>	C - 25.3	>	C - 25.7		
Inte	erse	ection:	C - 20.3		<i>C</i> -	20.7			C - 28.6		C - 29.0		

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

This report demonstrates that the operation of the signalized intersection of Osuna Rd. / Wyoming Blvd. is acceptable for the projected 2017 AM and PM Peak Hour NO BUILD and BUILD Conditions analyzed. Note that the westbound thru / right turn movements are a LOS "E" for both the AM and PM Peak Hour periods, but the impact of this development on the delays for those movements are insignificant. Implementation of the Montgomery / Wyoming Restaurants project is calculated to result in a 0.4 second increase in average delay during the AM Peak Hour and a 0.4 second increase in average delay of the intersection during the PM Peak Hour.

The Queuing Analysis for this intersection results in the lanes length changes summarized in the following table:

Queueing Analysis Summary Sheet

Project: Montgomery / Wyoming Restaurants (NW Corner)

Intersection: Osuna Rd. / Wyoming Blvd.

2	0	1	7

2017											
Approach	<u>L</u>	eft Tur	<u>'ns</u>	<u>Thru</u>	Move	<u>ments</u>	ents Right Turns				
Eastbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	149	125	1	45	Cont	1	25	125		
AM NO BUILD Queue	1	150	200	1	45	75	1	25	50		
AM BUILD Queue	1	150	200	1	45	75	1	34	75		
Existing Lane Length	1	480	125	1	189	Cont	1	64	125		
PM NO BUILD Queue	1	485	575	1	191	275	1	65	125		
PM BUILD Queue	1	485	575	1	191	275	1	71	125		
Westbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	63	150	1	94	Cont	0	78	0		
AM NO BUILD Queue	1	64	100	1	95	150	0	79	125		
AM BUILD Queue	1	86	125	1	95	150	0	79	125		
Existing Lane Length	1	46	150	1	74	Cont	0	69	0		
PM NO BUILD Queue	1	46	100	1	75	125	0	70	125		
PM BUILD Queue	1	61	125	1	75	125	0	70	125		
Northbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	40	170	3	1,312	Cont	0	41	0		
AM NO BUILD Queue	1	40	75	3	1,325	525	0	41	75		
AM BUILD Queue	1	48	75	3	1,352	525	0	61	100		
Existing Lane Length	1	54	170	3	2,096	Cont	0	70	0		
PM NO BUILD Queue	1	55	100	3	2,117	900	0	71	125		
PM BUILD Queue	1	60	125	3	2,134	900	0	84	150		
Southbound	# Lanes	Vol.	Length	# Lanes	Vol.	Length	# Lanes	Vol.	Length		
Existing Lane Length	1	50	160	3	1,765	Cont	0	208	0		
AM NO BUILD Queue	1	51	100	3	1,783	650	0	210	250		
AM BUILD Queue	1	51	100	3	1,812	675	0	210	250		
Existing Lane Length	1	99	160	3	1,734	Cont	0	226	0		
PM NO BUILD Queue	1	100	175	3	1,751	750	0	228	300		

AM PM NOTE: Queue lengths are in feet.

Cycle Length: 100 120 Calculated Right Turn Queue Lengths can be reduced by 50% to account for right-turns-on-red and right turn overlaps.

The eastbound left turn lane on Osuna Rd. can be lengthened by re-striping the lane and sharpening the transition some. No other recommendation is made.

RESULTS OF UNSIGNALIZED INTERSECTION CAPACITY ANALYSES

IMPLEMENTATION YEAR (2017)

Intersection #4 - Gutierrez St. / Wyoming Blvd. - Page A-49 thru A-72

The results of the analysis of the full access unsignalized intersection of Gutierrez St. / Wyoming Blvd. are summarized in the following table:

Intersection: 4 - Guiterrez Rd. (Driveway) / Wyoming Blvd.

		<u>2017</u>	AM Peak	Hou	r BUILD		<u>2017</u>	PM Peak	Hou	r BUILD
			(EXIST.	GEON	l.)			(EXIST.	GEOM	l.)
		N	O BUILD		BUILD		NO	O BUILD		BUILD
		Lanes	LOS-Delay	Lanes	LOS-Delay		Lanes	LOS-Delay	Lanes	LOS-Delay
	L	>	F - 262	>	F - 999	L	>	F - 720	>	F - 999
EB	Т	1	F - 262	1	F - 999	Т	1	F - 720	1	F - 999
Ш	R	>	F - 262	>	F - 999	R	>	F - 720	>	F - 999
	L	>	F - 196	>	F - 999	L	>	F - 734	>	F - 999
WB	Т	1	F - 196	1	F - 999	Т	1	F - 734	1	F - 999
	R	>	F - 196	^	F - 999	R	>	F - 734	>	F - 999
	L	1	E - 39.8	1	E - 43.2	L	1	D - 31.1	1	D - 32.5
NB	Т	3	A - 0.0	3	A - 0.0	Τ	3	A - 0.0	3	A - 0.0
Ш	R	>	A - 0.0	^	A - 0.0	R	>	A - 0.0	>	A - 0.0
П	L	1	C - 22.8	1	C - 23.2	L	1	E - 49.5	1	E - 50.0
SB	Т	3	A - 0.0	3	A - 0.0	Т	3	A - 0.0	3	A - 0.0
Ш	R	>	A - 0.0	>	A - 0.0	R	>	A - 0.0	>	A - 0.0
Inte	erse	ection:	on: u - 2.6 u - 65.4 u - 4.8				u - 0.1			

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

It should first be noted that the traffic utilizing the church driveway on the west side of Wyoming Blvd. (aligned with Guiterrez Rd.) is almost nil. The church will generate a significant volume of traffic on Tuesday evenings after 6:00 pm, on Saturday late afternoon beginning about 5:00 pm, and on Sunday mornings and noontime. The long delays reported from the calculated operational analysis of the unsignalized intersection of Guiterrez Rd. / Wyoming Blvd. is primarily due to the very high volume of traffic on Wyoming Blvd.

Most unsignalized driveways along major arterial streets in the Albuquerque metro area will have long calculated delays on the side street. The intersection of Guiterrez Rd. / Wyoming Blvd. is no different. The calculated delays are long. In almost every case, the left turn traffic turning from the side street (or driveway) onto the main street (Wyoming Blvd.) is the movement that creates the longest delays. Therefore, it is recommended for the driveway aligning with Guiterrez Rd. that the driveway be constructed with two exiting lanes (one for left turn movements and one for thru / right turn movements). This should allow thru and right turn movements to occur with reasonably moderate delay while the left turn traffic from the side street will have long delays. No other recommendation is made for this intersection.

Intersection #5 - Driveway "A" / Wyoming Blvd. - Page A-49 thru A-72

Driveway "A" is the full access driveway located midway between Gutierrez St. and Wyoming Blvd. The results of the analysis of the unsignalized intersection of Driveway "A" / Wyoming Blvd. are summarized in the following table:

Intersection: 5 - Driveway "A" / Wyoming Blvd.

		<u>2017</u>	AN	l Pe	ak	Hou	ır B	BU	<u>ILD</u>		<u>2017</u>	PM	Peak	(Hou	ır Bl	<u>JILD</u>	
				(EXI	ST.	GEON	l.)				(EXIST. GEOM.)						
		NO BUILD BUILD								NO) BU	ILD		BUIL)		
		Lanes	LOS	S-Del	ay	Lanes	LO	S-I	Delay		Lanes	LOS	-Delay	Lanes	LOS-	Delay	
	L	>	F	- 54	1.0	>	F	-	999	L	>	F	69.7	>	F-	291	
EB	Τ	1	F	- 54	1.0	1	F	-	999	Т	1	F	69.7	1	F-	291	
	R	>	F	- 54	1.0	>	F	-	999	R	>	F	69.7	>	F-	291	
	L	1	Е	- 35	5.6	1	F	-	66.0	L	1	D ·	31.9	1	E -	44.9	
NB	Т	3	Α	- (0.0	3	Α	-	0.0	Т	3	Α .	0.0	3	Α -	0.0	
	R	>	Α	- (0.0	>	Α	-	0.0	R	>	Α .	0.0	>	Α -	0.0	
Г	L	>	Α	- (0.0	>	Α	-	0.0	L	>	Α .	0.0	>	Α -	0.0	
SB	Т	3	Α	- (0.0	3	Α	-	0.0	Т	3	Α .	0.0	3	Α -	0.0	
	R	1	Α	- (0.0	1	Α	-	0.0	R	1	Α ·	0.0	1	Α -	0.0	
Intersection: <i>u</i> - 0.5						u ·	0.9		u -	9.5							

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

As discussed in the previous intersection analysis for Guiterrez Rd., the Driveway "A" analysis reports long delays for the eastbound traffic in the driveway desiring to turn onto Wyoming Blvd. Also, it is recommended that Driveway "A" should be constructed with two exiting lanes (one for left turns and one for right turns) and one entering lane.

Intersection #6 - Montgomery Blvd. / Driveway "B" - Page A-49 thru A-72

Driveway "B" is an existing right-in, right-out, left-in only driveway to the west of Wyoming Blvd. The results of the analysis of the unsignalized intersection of Montgomery Blvd. / Driveway "B" are summarized in the following table:

2017 DM Dook Hour BIIII D

Intersection: 6 - Montgomery Blvd. / Driveway "B"

2017 AM Dook Hour DIII D

		2017	AW	Peak	HOU	ır BU	<u>JILD</u>		2017	PM	Pear	Hou	Ir BU	<u>ILD</u>
			(E	XIST.	GEON	I.)			(EXIST. GEOM.)					
		N	O BUIL	_D		BUILI)		N	NO BUILD			BUILD)
		Lanes	LOS-I	Delay	Lanes	LOS-	Delay		Lanes	LOS-I	Delay	Lanes	LOS-	Delay
	L	1	C -	25.0	1	E -	35.9	L	1	C -	19.5	1	C -	23.3
EB	Τ	3	Α -	0.0	3	Α -	0.0	Т	3	Α -	0.0	3	Α -	0.0
	R	>	Α -	0.0	>	Α -	0.0	R	>	Α -	0.0	>	Α -	0.0
	L	>	Α -	0.0	>	Α -	0.0	L	>	Α -	0.0	>	Α -	0.0
WB	Τ	3	Α -	0.0	3	Α -	0.0	Т	3	Α -	0.0	3	Α -	0.0
	R	1	Α -	0.0	1	Α -	0.0	R	1	Α -	0.0	1	Α -	0.0
	L	>	Α -	0.0	^	Α -	0.0	L	^	Α -	0.0	>	Α -	0.0
SB	Τ	>	Α -	0.0	^	Α -	0.0	Т	>	Α -	0.0	>	Α -	0.0
	R	1	C -	18.7	1	С -	23.7	R	1	C -	16.1	1	C -	17.7
Int	erse	ection:	и -	0.7		и -	2.5			и -	0.3		и -	1.0

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

The operation of Driveway "B" based on projected 2017 AM and PM Peak Hour BUILD Volumes in this report is acceptable. Driveway "B" is an existing right-in, right-out, left-in only unsignalized driveway.

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

Average Delay	Level-of-Service
(secs)	
≤ 10	Α
$> 10 \text{ and } \le 15$	В
> 15 and ≤ 25	С
> 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

This analysis was conducted using the following methodology: Trip Generation was established using the Institute of Transportation Engineers' (ITE's) Trip Generation Manual (9th Edition). Generated Trips were distributed proportionately based on the Population Data Analysis Subzones within a 2-mile radius of the site; Growth rate of background traffic volumes was established from 2015 and 2025 COG Model Data from the 2035 data set; and the intersection analyses were performed in accordance with the 2010 Highway Capacity Manual, Special Report 209. The Traffic Impact Study showed a moderate increase in traffic congestion for the adjacent transportation network based on 100% buildout of the proposed project.

In summary, the proposed development of the Montgomery / Wyoming Restaurants project at the northwest corner of Montgomery Blvd. / Wyoming Blvd. will present no significant adverse impact to the adjacent transportation system provided that the following recommendations are followed:

RECOMMENDATIONS

FROM IMPLEMENTATION YEAR (2017) ANALYSIS

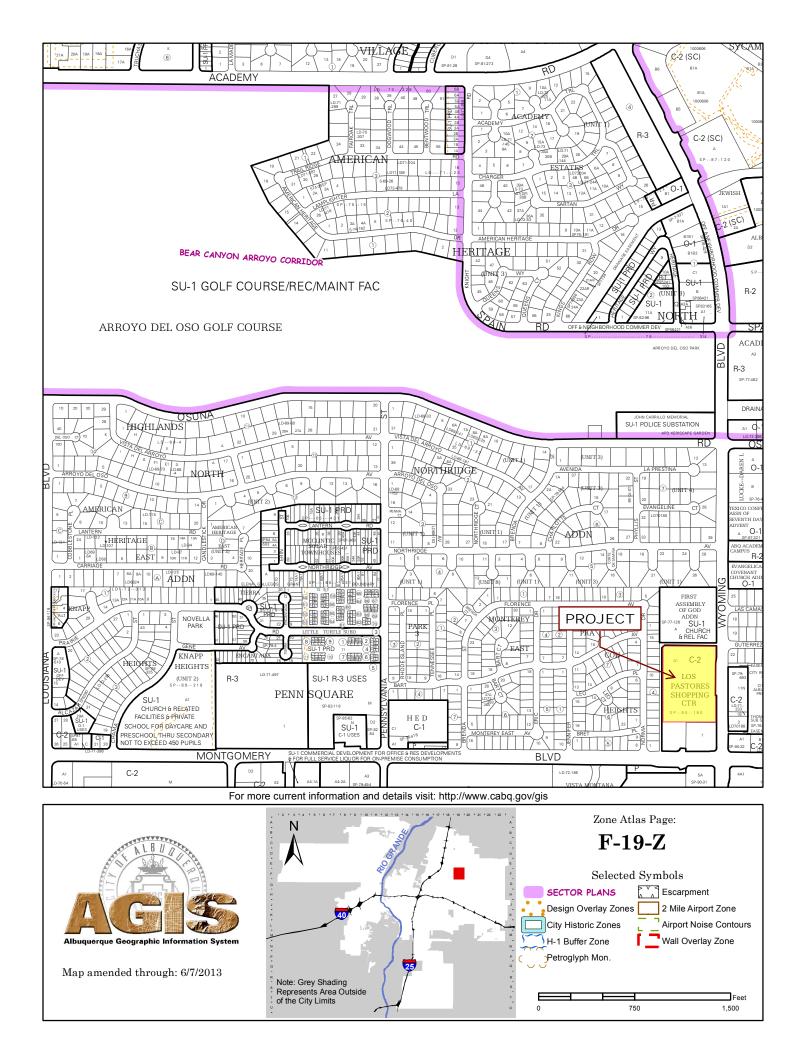
- Design and construction of the proposed development should be such that adequate site distances are maintained at all proposed driveways and intersections, and at existing intersections contingent to this site.
- Access to the project should be via two unsignalized driveways on Wyoming Blvd. and one right-in, right-out, left-in only driveway on Montgomery Blvd. as depicted on the preliminary site development plan on Page A-2 in the Appendix of this report. Driveway "A" and Gutierrez St. on Wyoming Blvd. are existing unsignalized intersections. Driveway "B" on Montgomery Blvd. is an existing right-in, right-out, left-in only unsignalized intersection. All driveways accessing this development should be constructed in compliance with City of Albuquerque D.P.M. requirements.
- ◆ The proposed north driveway (which aligns with Guiterrez Rd.) should be combined with the existing church driveway to operate as one driveway. This will require cooperation with the adjacent property owner (at this time it is a church facility). The new driveway should be constructed with two exiting lanes (one for left turn movements and one for thru / right turn movements) and one entering lane minimum. See Settlement Agreement on Appendix Pages A-89 thru A-95.
- Driveway "A" should be constructed as an unsignalized driveway with two exiting lanes (one for left turn movements and one for right turn movements) and one entering lane minimum.
- Montgomery Blvd. / Pennsylvania St. Extend the northbound and southbound left turn lanes (to approximately 200 feet and 125 feet, respectively) by re-striping the approaches on Pennsylvania St.
- ◆ Osuna Rd. / Wyoming Blvd. Lengthen the eastbound left turn lane on Osuna Rd. to the extent possible by re-striping the lane and sharpening the transition.

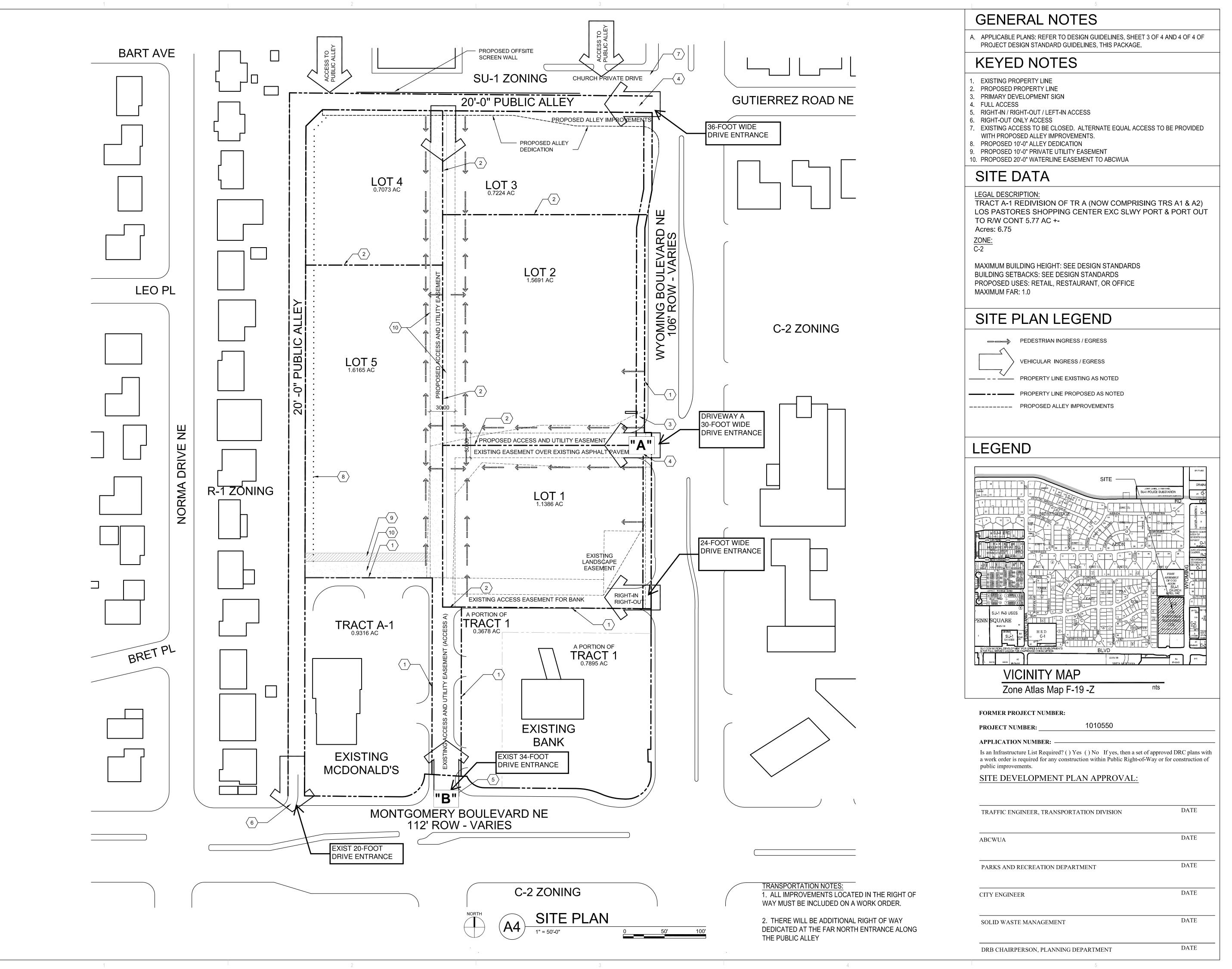
The recommended improvements are included on the Recommendations Exhibit on Appendix Page A-88.

Appendix

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APPENDIX





ARCHITECTURE / DESIGN / INSPIRATION

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PERICH
SABATINI

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CEAL

PROJECT

NW CORNER

10NTGOMERY & WYOMIN

ALBUQUERQUE, NM

Project 1 coation

REVISIONS

9/14/2015 PLANNING COMMENTS

DRAWN BY GG

REVIEWED BY CG

DATE 05/12/15

14-0077

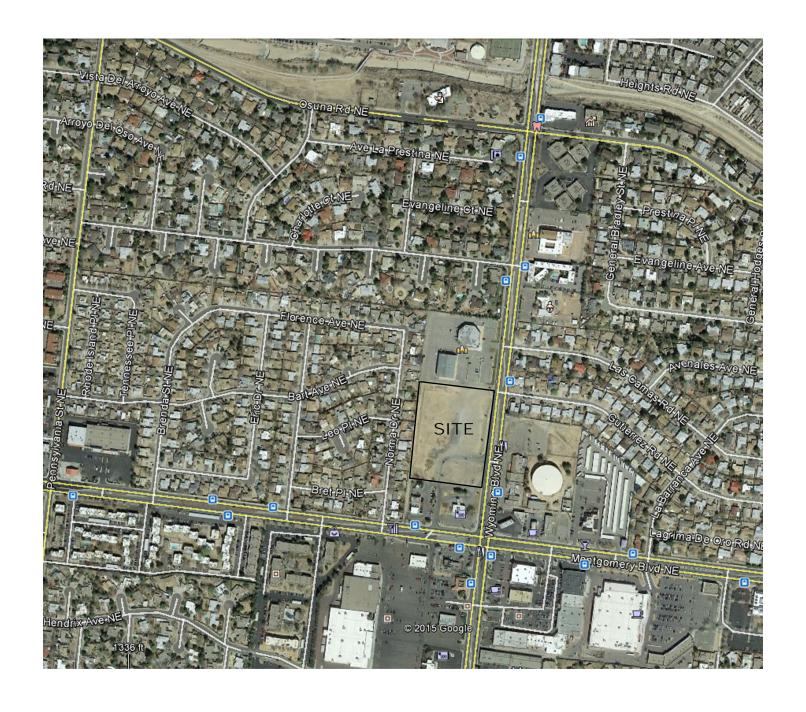
DRAWING NAME

PROJECT NO

AMENDED
SITE DEVELOPMENT
PLAN FOR
SUBDIVISION

SHEET NO

SPSD



Montgomery / Wyoming Restaurants

(NW Corner) Aerial Map