



## **Natural Grocer's Supermarket**

Albuquerque, New Mexico | 4625 Wyoming Boulevard

### Traffic Impact Study

January 2, 2024

FINAL

HT#F19D013E  
Received 1/2/2024



Presented to:  
Matt Grush, P.E.  
City of Albuquerque  
P.O. Box 1293  
One Civic Plaza  
Albuquerque, NM 87502

Terry O. Brown, P.E.  
5571 Midway Park Pl. NE  
Albuquerque, NM. 87109  
(505) 883-8807



Ronald R. Bohannon, P.E.  
5571 Midway Park Pl. NE  
Albuquerque, NM. 87109  
(505) 858-3100

Prepared for:  
Kemper Isely  
Vitamin Cottage Natural Food Markets, Inc  
12612 W. Alameda Parkway  
Lakewood, CO 80228

**Natural Grocer's  
4625 Wyoming Blvd., NE - Albuquerque, NM  
Traffic Impact Study**

## **Executive Summary**

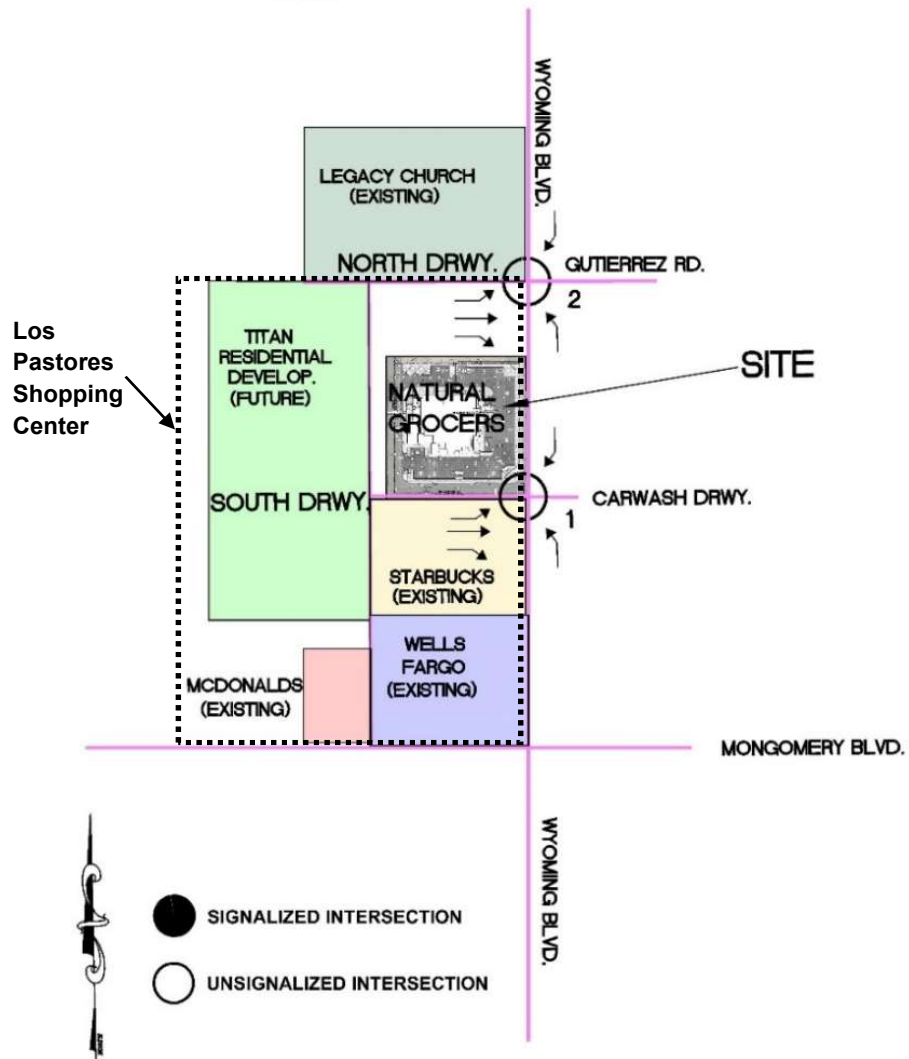
The purpose of this Traffic Impact Study (TIS) is to evaluate the transportation conditions before and after implementation of the proposed Natural Grocer's to determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared in accordance with the requirements of the City of Albuquerque (COA). The COA Scoping Form for this TIS is in Appendix pages A-85 thru A-87.

Preliminary capacity analysis presented in the DRAFT TIS for Natural Grocer's (May, 2023) demonstrated that Level of Service (LOS) and delays at the development's driveways for vehicles turning left from the driveways onto Wyoming are unacceptable (LOS=F). Signalizing one of the driveways or restricting access from the side streets are the only practical solutions. Restricting access at both driveways to right-in/right-out/left-out-only significantly impedes access not only for Natural Grocer's but all developments in the Los Pastores Shopping Center and causes all eastbound left-turning vehicles to make U-turns at other intersections in the roadway system which is already congested. Signalizing the North Driveway is expensive but is more likely to improve safety, access, and performance of the Wyoming Corridor between Montgomery and Osuna, so this is the option that was selected to be analyzed for the Mitigated Case.

## **Project Description**

The proposed Natural Grocer's retail store is to be in the northwest quadrant of Montgomery Blvd. & Wyoming Blvd. in the City of Albuquerque, NM at 4625 Wyoming Blvd. The site is a part of a partially developed mixed-use development, the Los Pastores Shopping Center. The shopping center has five existing unsignalized driveways (two on Montgomery Blvd. and three on Wyoming Blvd). The study area includes only the two full-access driveways on the west side of Wyoming Blvd. between Montgomery Blvd. and Osuna Rd. (Intersections 1 & 2). See the map on the following page.

**STUDY AREA INTERSECTIONS**  
 NO BUILD & BUILD CASES  
 SOUTH + NORTH DRWYS. FULL ACCESS, UNSIGNALIZED



## Summary of Impacts

- 2023 Capacity and Queueing Analysis** of Intersection 1 (South Driveway & Wyoming Blvd.) and Intersection 2 (North Driveway/Gutierrez Rd. & Wyoming Blvd.) demonstrates that the proposed Natural Grocer's will have minimal impact on the LOS and delays. LOS remains the same for all movements from the NO BUILD to the BUILD condition. However, for traffic turning left from the driveways/side streets, LOS=E or F for both the NO BUILD and BUILD conditions. Since the intersection is not controlled by a signal, the high volume of traffic on Wyoming Blvd. causes insufficient gaps in traffic flows for vehicles exiting the driveway to enter the flow of traffic in an acceptable amount of time. Mitigation on the part of the development is recommended. Restricting access at the driveways to right-in/right-out/left-in, significantly improves traffic conditions (Interim Case). Adding a signal to the North Driveway further improves LOS and delays at both driveways (Mitigated Case).

**HCM Results Summary Table**  
Natural Grocer's - Wyoming Blvd. - Albuquerque, NM

12/18/2023					2023 Capacity Analysis		Queueing
					LOS, Delay (s/veh) <sup>1</sup>		2023
Intersect.							Lane/Additional Queue length Required (ft)
No.	Intersection	Signalization/Control	Access Geometry	Case	AM Peak <sup>2</sup>	PM Peak <sup>2</sup>	
1: Wyoming Blvd. & South Driveway/Car Wash Driveway	Unsignalized/ 2-way Stop Control		Full Access	NO BUILD	F - 999 (EBL)	F-293 (EBL)	0
			Full Access	BUILD	F - 999 (EBL)	F-434 (EBL)	0
			RI/RO/LI Only	BUILD Interim	F-56.8 (NBL)	E-35.9 (NBL)	0
			RI/RO/LI Only	BUILD Mitigated	B-14.4 (EBR)	B-13.4 (EBR)	0
2: Wyoming Blvd. & North Driveway/Gutierrez Rd.	Unsignalized/ 2-way Stop Control		Full Access	NO BUILD	E-39.3 (NBL)	E-48.3 (WBL)	0
			Full Access	BUILD	F-148 (EBL)	F-207 (EBL)	0
			RI/RO/LI Only	BUILD Interim	E-39.9 (NBL)	F-61 (NBL)	0
	Signalized		Full Access	BUILD Mitigated	A - 4.2	A-3.2	0

1 - LOS = Level of Service as defined in the STATE ACCESS MANAGEMENT MANUAL, New Mexico State Highway and Transportation Department

2 - For unsignalized intersections, LOS is for movement with worst LOS & Delay

3 - HCM Multiple Period Analysis

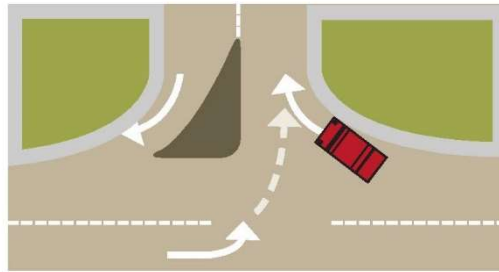
- Deceleration Lane Warrant Analysis** shows that only a southbound right-turn deceleration lane is warranted at the South Driveway, however, the existing deceleration lane is sufficient. No deceleration lanes are warranted at the North Driveway. Northbound and southbound left-turn deceleration lanes exist at both driveways.
- The Manual on Uniform Traffic Control Devices (MUTCD) Signal Warrant Analysis** was conducted using the HCS 2023 MUTCD Warrants software. The analysis determined that a traffic signal is warranted at the North Driveway/Gutierrez Rd. & Wyoming Blvd. Intersection (Intersection 2).
- Progression analysis** of the proposed signal and the signalized intersections north and south of the proposed signal, Osuna Rd./Wyoming Blvd., and Montgomery Blvd./Wyoming Blvd., demonstrates that the proposed signal will have minimal adverse impact to the progression of traffic along the corridor and significantly improves performance index of the corridor (a factor of total delays and vehicle stops).

## Recommendations

Based on the LOS, queuing, and progression analysis the following mitigations are recommended:

1. The Natural Grocer's project shall use only existing driveways to access the Natural Grocer's site from Wyoming Blvd. and Montgomery Blvd.
2. **Intersection 1 (South Driveway & Wyoming Blvd.)** – The eastbound approach should be re-marked, and a raised median should be constructed at the driveway entrance to restrict access to right-in/right-out/left-in only, like Figure 7.4.103 from the City of Albuquerque 2020 Design Process Manual shown below.

FIGURE 7.4.103 Right-in / Right-out and Left-in



3. **Intersection 2 (North Driveway/Gutierrez & Wyoming Blvd.)** –
  - a. The eastbound approach shall be re-marked to indicate one dedicated eastbound left-turn lane and one eastbound thru/right lane.
    - a. Install a new traffic signal. The timing/phasing of the new signal should be coordinated with the existing signals at Montgomery Blvd./Wyoming Blvd. and Osuna Rd./Wyoming Blvd. Only one single phase should be included to service the side street (North Driveway). See AM & PM signal timing and phasing recommendations in Appendix pages A-88 and A-89.
  - b. In the interim period, until the new signal can be constructed, it is recommended that the North Driveway be reconfigured as restricted access driveway (Right-in/Right-out/Left-in Only), like Figure 7.4.103 above.
4. Site distances, queue storage capacity, and lane geometries shall be maintained at all access driveways for the project.
5. Maintain pedestrian sidewalk along property's frontage with Wyoming Blvd. and Montgomery Blvd.

Natural Grocer's  
4625 Wyoming Blvd., NE - Albuquerque, NM  
Traffic Impact Study

## Contents

<b>Executive Summary</b> .....	<b>i</b>
Project Description.....	i
Summary of Impacts.....	iii
Recommendations .....	iv
<b>Introduction</b> .....	<b>1</b>
<b>Scope of Work</b> .....	<b>1</b>
<b>Site Location</b> .....	<b>1</b>
<b>Study Area</b> .....	<b>3</b>
Existing Land Use .....	3
Other Planned or Approved Development and Transportation Improvements .....	3
Study Area Intersections.....	3
Existing and Future Area Roadways and Bikeways.....	5
<b>Development Description</b> .....	<b>7</b>
<b>Trip Distribution</b> .....	<b>8</b>
<b>Trip Assignments</b> .....	<b>9</b>
<b>Traffic Volumes</b> .....	<b>12</b>
Existing Traffic Volumes .....	12
NO BUILD Traffic Volumes .....	13
BUILD Traffic Volumes .....	14
BUILD Interim Volumes .....	14
BUILD Mitigated Volumes.....	14
<b>Level of Service (LOS) Standards</b> .....	<b>14</b>
<b>Traffic Analysis</b> .....	<b>15</b>
Intersection 1 – South Driveway/Car Wash Driveway & Wyoming Blvd.....	15
Intersection 2 – North Driveway/Gutierrez Rd. & Wyoming Blvd. ....	18
<b>Determination of Warrants for Deceleration Lanes</b> .....	<b>21</b>
<b>Signal Warrant Analysis</b> .....	<b>21</b>
<b>Progression Analysis</b> .....	<b>23</b>
<b>Access Design Specifications</b> .....	<b>26</b>
Sight Distance .....	26
Access Spacing .....	27
Signalized Intersection Spacing .....	27
<b>Summary of Impacts</b> .....	<b>28</b>
<b>Recommendations</b> .....	<b>30</b>
<b>Appendix</b> .....	<b>31</b>

## Introduction

The purpose of this Traffic Impact Study (TIS) is to evaluate the transportation conditions before and after implementation of the proposed Natural Grocer's to determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared in accordance with the requirements of the City of Albuquerque (COA). The COA Scoping Form for this TIS is in Appendix pages A-85 thru A-87.

Preliminary capacity analysis presented in the DRAFT TIS for Natural Grocer's (May, 2023) demonstrated that Level of Service (LOS) and delays at the development's driveways for vehicles turning left from the driveways onto Wyoming are unacceptable (LOS=F). Signalizing one of the driveways or restricting access from the side streets are the only practical solutions. Restricting access at both driveways to right-in/right-out/left-out-only significantly impedes access not only for Natural Grocer's but all developments in the Los Pastores Shopping Center and causes all eastbound left-turning vehicles to make U-turns at other intersections in the roadway system which is already congested. Signalizing the North Driveway is expensive but is more likely to improve safety, access, and performance of the Wyoming Corridor between Montgomery and Osuna, so this is the option that was selected to be analyzed for the Mitigated Case.

## Scope of Work

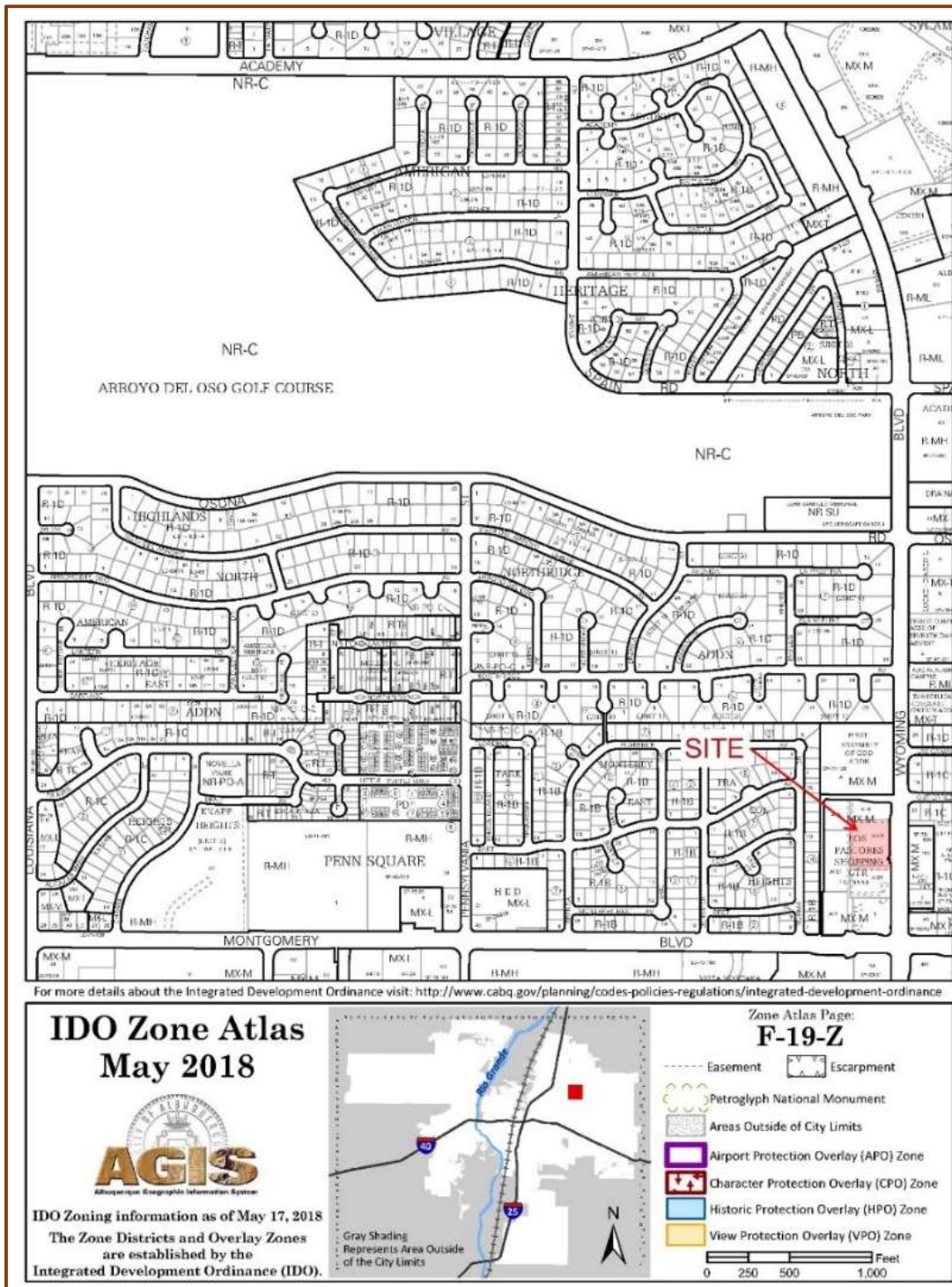
The primary scope of work for this TIS includes:

1. 2023 capacity and queueing analysis of the proposed development's two existing driveway intersections on Wyoming Blvd., the South Driveway/Car Wash, and the North Driveway/Gutierrez Rd. in accordance with the Highway Capacity Manual, 6<sup>th</sup> Edition.
2. Deceleration Lane Warrant Analysis of the South and North Driveway Intersections in accordance with the City of Albuquerque Development Process Manual.
3. Signal Warrant Analysis of the North Driveway intersection in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), 2009 Edition.
4. Progression Analysis of the Wyoming Corridor from Osuna Rd. to Montgomery Blvd. in accordance with the Highway Capacity Manual, 6<sup>th</sup> Edition.

The original scoping summary for this TIS was expanded to include items 3 and 4 above because of the findings in the DRAFT TIS.

## Site Location

The proposed Natural Grocer's is to be in the northwest quadrant of Montgomery Blvd. & Wyoming Blvd. in the City of Albuquerque, NM at 4625 Wyoming Blvd. See the IDO Zone Atlas map on the following page for the site location.



## Study Area

### *Existing Land Use*

The land for the project is undeveloped and the larger development ( Los Pastores Shopping Center) is approximately 75% developed with commercial retail businesses. All land parcels adjacent to the development are zoned mixed use and are fully developed. The influence area is a 2-mile radius from the development.

### *Other Planned or Approved Development and Transportation Improvements*

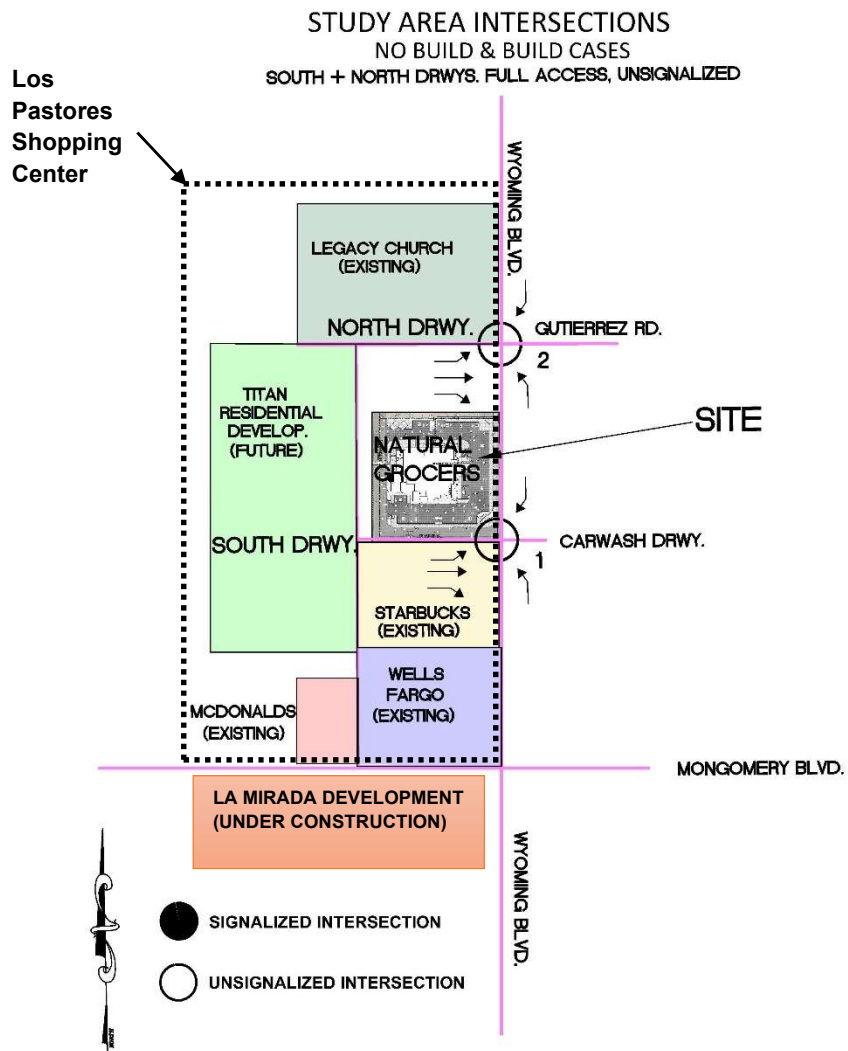
There are two major developments in the influence area that may affect the results of the analysis in this TIS; La Mirada Commercial Development in the southwest quadrant of Montgomery Blvd./Wyoming Blvd. and Titan Residential Development within the Los Pastores Shopping Center (see below). Trips generated by the developments are included in the NO BUILD volumes. There are no major planned transportation projects in the study area.

### *Study Area Intersections*

The study area for the 2023 **NO BUILD and BUILD** conditions includes the two existing full access, unsignalized driveway intersections on the west side of Wyoming Blvd. north of the Montgomery Bld./ Wyoming Blvd. intersection. See the map below.

1. South Driveway/Carwash Driveway & Wyoming Blvd. (Unsignalized, Full-access, Existing)
2. North Driveway/Gutierrez Rd. & Wyoming Blvd. (Unsignalized, Full-access, Existing)

These are two of five driveways that provide private access to the Los Pastores Shopping Center. Natural Grocer's is to share the driveways with an existing church, three existing commercial developments, and one future residential development also shown on the map.



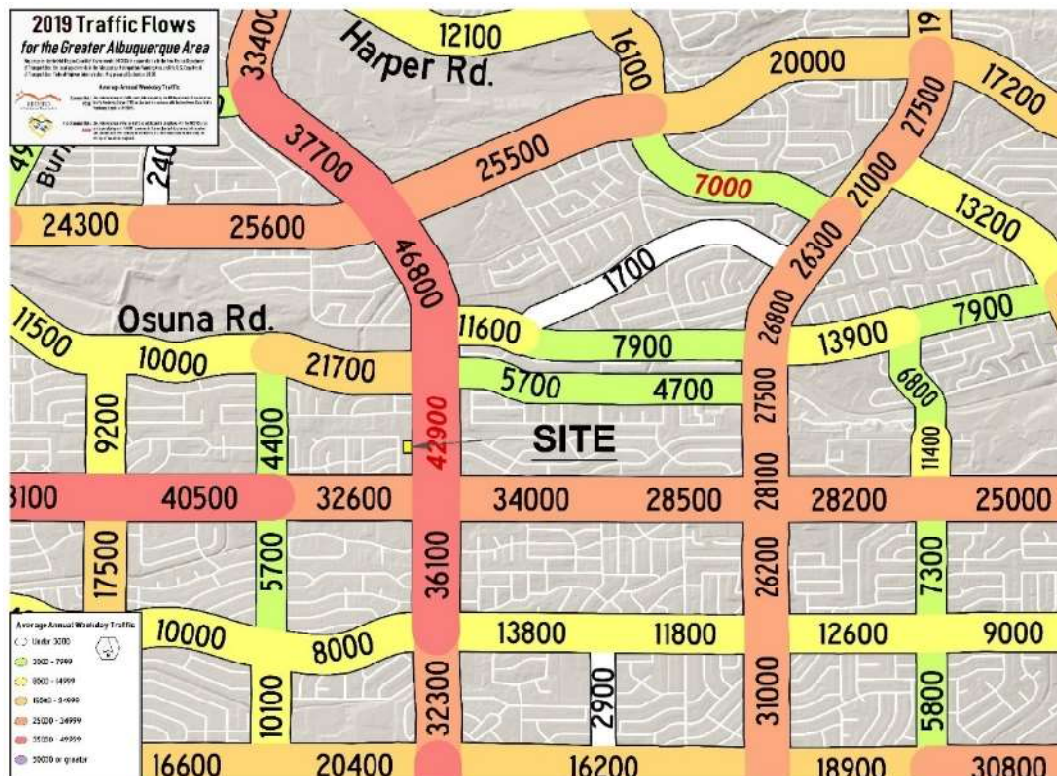
### Existing and Future Area Roadways and Bikeways

Wyoming Blvd. is classified as a **Principal Arterial** roadway on the Mid-Region Council of Governments Long Range Roadway System map. It is a six-lane roadway with a raised divided median, curbs, and gutters. The posted speed limit is 40-mph. There are existing pedestrian facilities (sidewalks) on both sides of Wyoming Blvd. There are no existing or planned bike lanes fronting the project. It has a traffic flow of 42,900 Average Annual Weekday Traffic (AAWT).

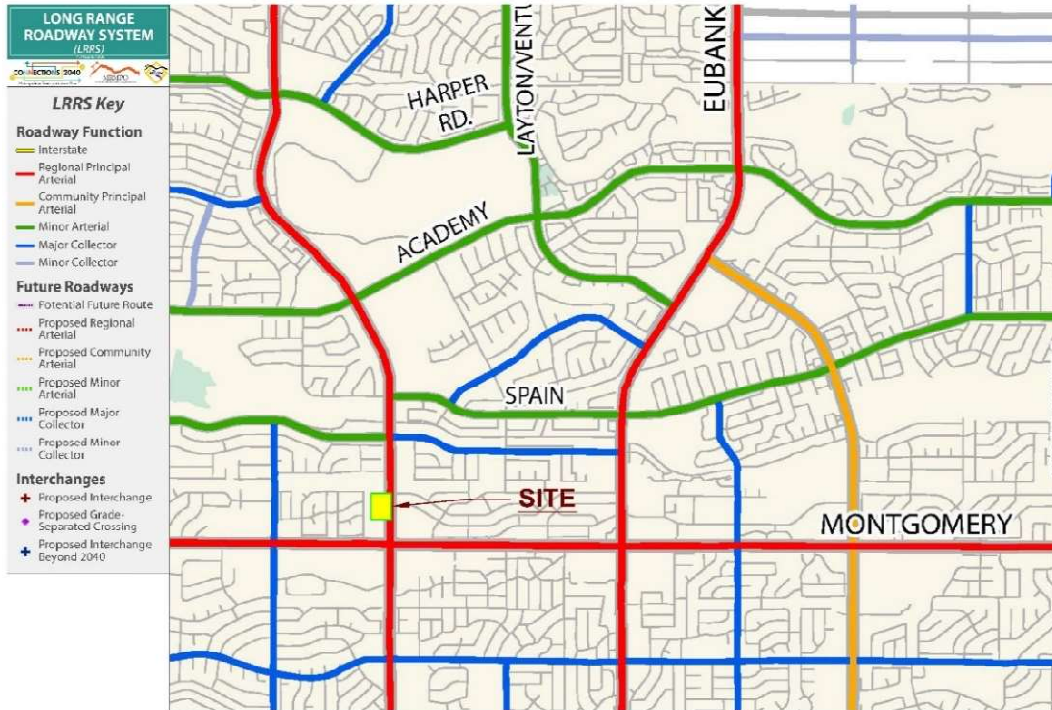
Gutierrez Rd. is classified as a **local roadway** on the Mid-Region Council of Governments Long Range Roadway System map. It is a two-lane residential roadway with curbs and gutters but no median. The posted speed limit is 35-mph. There are pedestrian facilities along both sides of the road but no bike facilities.

All existing intersections in the study area have adequate **lighting**.

The following are portions of the following regional transportation maps for more information. These include the 2019 Traffic Flow Map, Futures 2040 Long Range Roadway System, and Futures 2040 Long Range Bikeway System Map.



Portion of 2019 Traffic Flow Map  
(from Mid-Region Council of Governments)



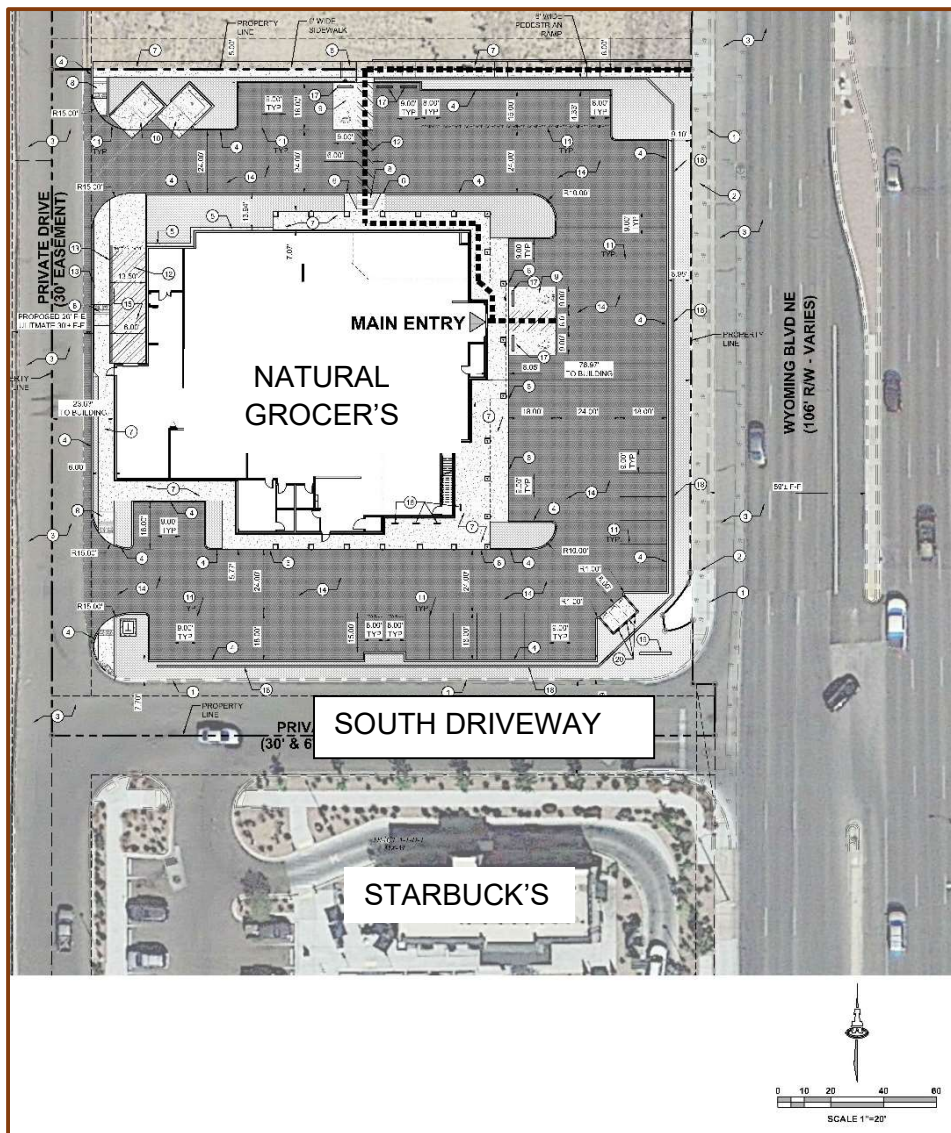
Portion of Futures 2040 Long Range Roadway System  
(from Mid-Region Council of Governments)



Portion of Futures 2040 Long Range Bikeway System  
(from Mid-Region Council of Governments)

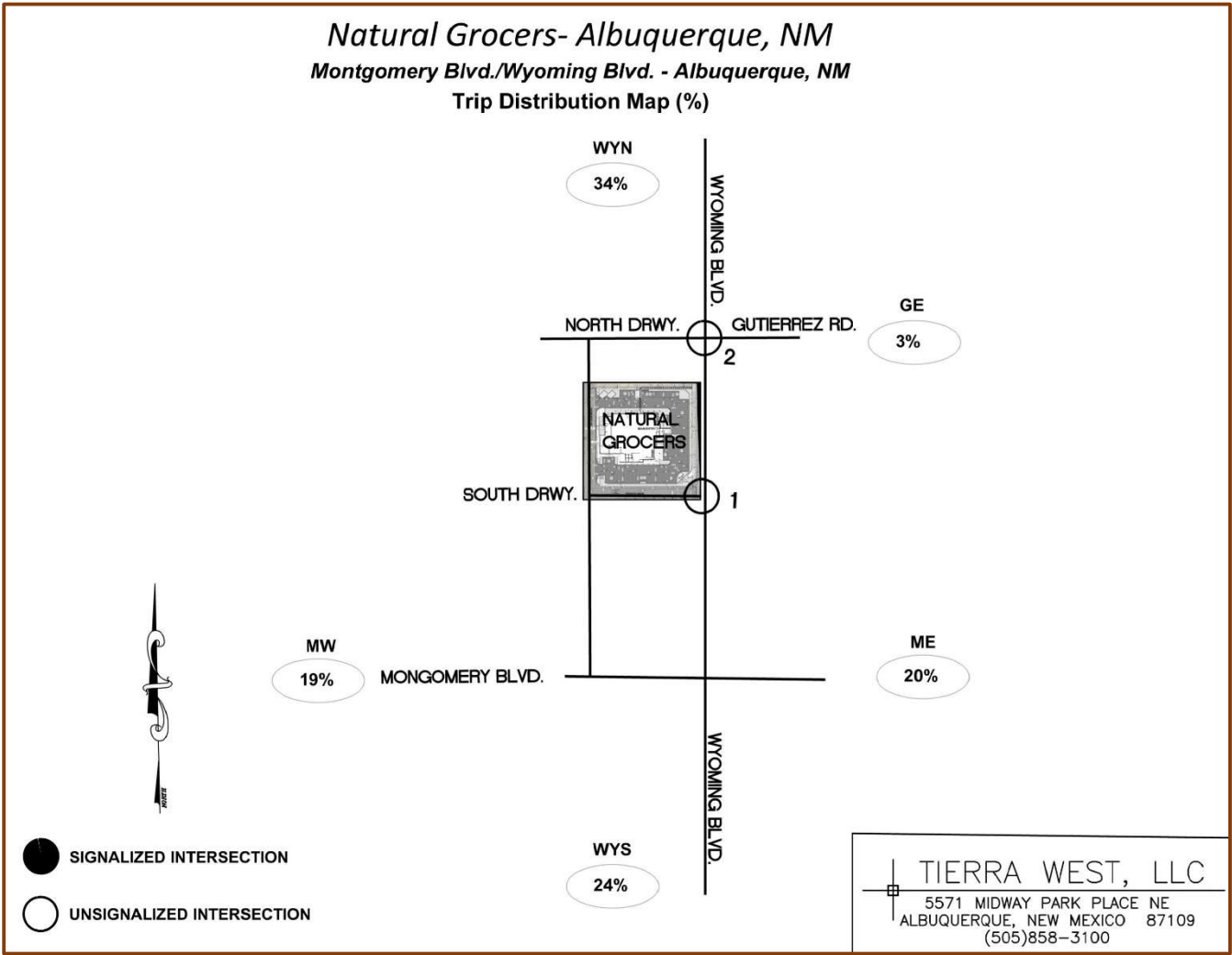
## Development Description

The proposed project is to be developed as a Supermarket (ITE Land Use 850) with 14,000 square feet of floor area on 1.4 acres of land. The tract of land (TR A-1-C-1A) to be used for the development is currently undeveloped and is part of a larger development, Los Pastores Shopping Center, which is approximately 50% developed. The shopping center has four existing driveways, however, since the Natural Grocer's store will primarily use the two driveways on Wyoming Blvd. (South Driveway and North Driveway) only those driveways are analyzed in this study, as agreed to with the City of Albuquerque during the scoping process. See the map above for the driveway locations. The South Driveway is 470-ft north of Montgomery Blvd. on the west side of Wyoming Blvd. laterally across from a car wash driveway on the east side of Wyoming Blvd. The North Driveway is 890-ft north of Montgomery Blvd. on the west side of Wyoming Blvd. in line with Gutierrez Rd. on the west side. The proposed site plan is shown below and in Appendix pg. A-2. The anticipated implementation year for this project is 2023. It will be built in one phase.



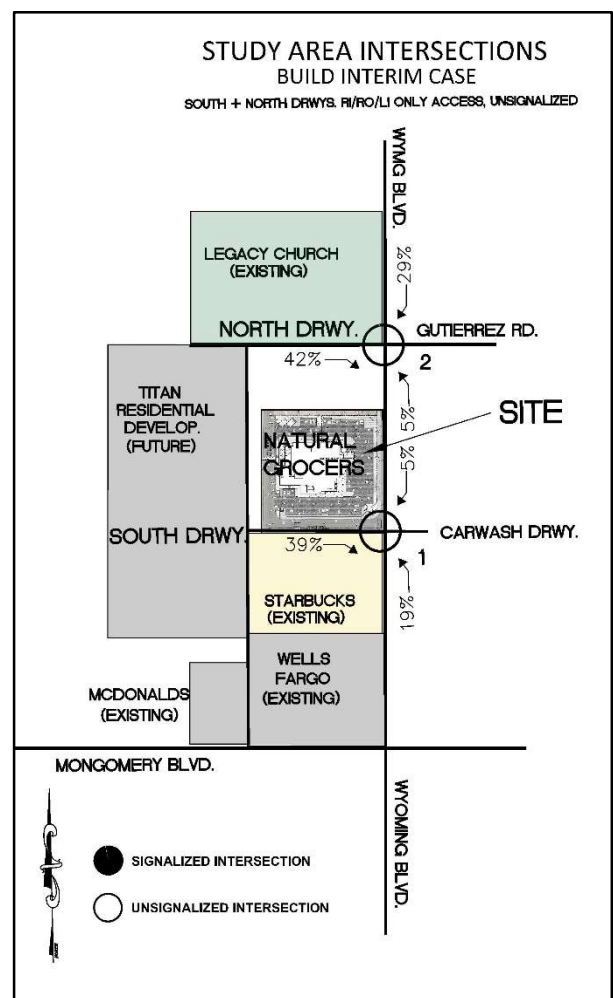
# Trip Distribution

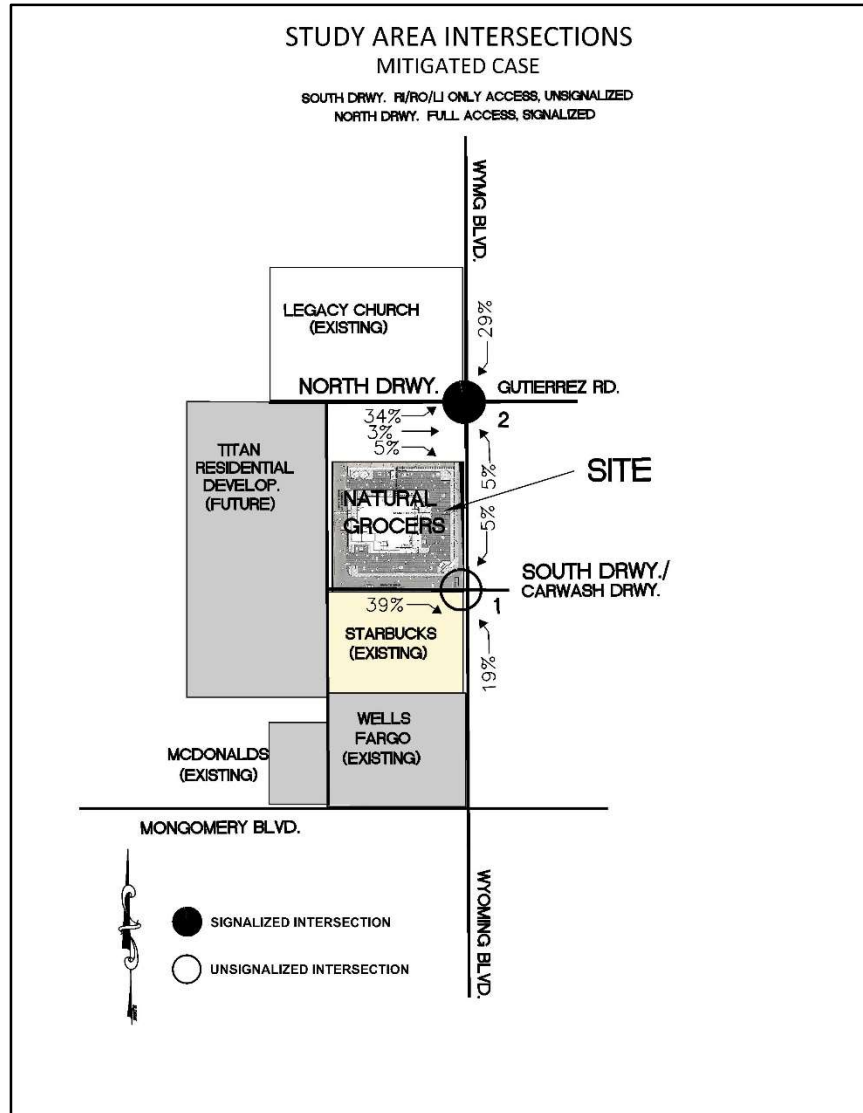
Trip Distribution and Trip Assignments of the newly generated traffic are based on interpolated 2016 and 2040 Socioeconomic Forecasts by Data Analysis Subzones (DASZ) for the Mid-Region of New Mexico as published by the Mid-Region Council of Governments (MRCOG). New Trips were distributed proportionally based on distribution of population withing a two-mile radius of the project.  
(See Appendix page A-5 thru A-7).



Trip assignments percentages for vehicles entering and exiting the North and South Driveways are derived from the trip distribution percentages and logical routing. There are four cases (NO BUILD, BUILD, BUILD Interim, and BUILD Mitigated) analyzed in this TIS. Each case has an associated set of access geometries and traffic controls which affects the trip assignment percentages of each movement at the driveways (see the table and the maps below).

\*Right-in/Right-out/Left-in Only

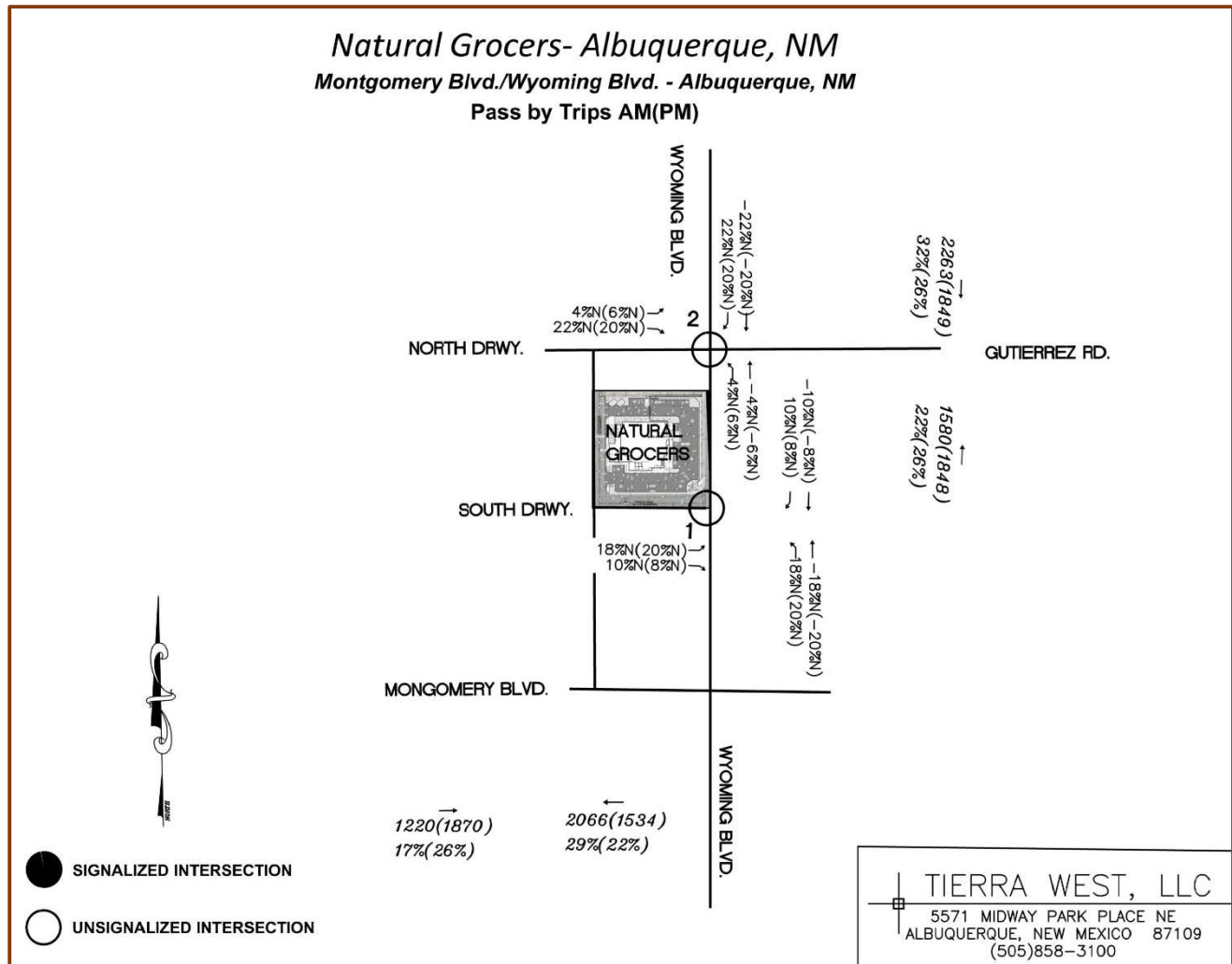




### Interim and Mitigated Cases

Because preliminary analysis indicates that the LOS at the driveway intersections is F for the NO BUILD and BUILD conditions, a traffic signal at the Northern Driveway is proposed to mitigate the problem. However, since the project is scheduled to be complete by the end of 2023, in just a couple weeks, an interim solution to restrict access at both driveways to right-in/right-out/left-in only, is proposed until the traffic signal can be constructed. Northbound traffic exiting the two driveways will turn right instead of left and make a U-Turn at the next accessible median opening. This interim geometry improves delays for traffic exiting the site as compared to the NO BUILD and BUILD conditions, however, the LOS remains F so further mitigation (i.e. installing a traffic signal at the North Driveway) is recommended.

Pass-by trip percentage distributions are shown below.



## Traffic Volumes

A summary of the turning movement traffic counts for each driveway intersection for Existing, NO BUILD, BUILD, BUILD Interim, and BUILD Mitigated conditions are provided below. See Appendix A-16 thru A-54 for the detailed turning movement count spreadsheets.

<i>Natural Grocers</i>												
Projected Turning Movements SUMMARY												
<u>PROPOSED DEVELOPMENT (2023) - 100% Development</u>												
INTERSECTION:												
<b>Summary</b>												
<u>South Driveway / Wyoming Blvd.</u>												
(1)	0.10			0.10			0.10			0.10		
	<b>Eastbound (South Driveway)</b>			<b>Westbound (South Driveway)</b>			<b>Northbound (Wyoming Blvd.)</b>			<b>Southbound (Wyoming Blvd.)</b>		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
<b>SCENARIO Access/Traffic Control</b>												
Existing (2021) Full/Unsignalized	46	0	82	0	0	5	33	1,532	3	2	1,992	62
2023 (NO BUILD - A.M.) Full/Unsignalized	46	0	91	0	0	5	34	1,625	3	2	2,081	62
2023 (BUILD - A.M.) Full/Unsignalized	47	0	97	0	0	5	38	1,625	3	2	2,080	64
2023 (BUILD Interim- A.M.) RI-RO-LI only/Unsignalized	0	0	97	0	0	5	38	1,625	3	2	2,080	64
2023 (BUILD Mitigated- A.M.) RI-RO-LI only/Unsignalized	0	0	60	0	0	5	23	1,640	3	2	2,080	69
	0.10			0.10			0.10			0.10		
	<b>Eastbound (South Driveway)</b>			<b>Westbound (South Driveway)</b>			<b>Northbound (Wyoming Blvd.)</b>			<b>Southbound (Wyoming Blvd.)</b>		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2021) Full/Unsignalized	38	0	38	0	0	39	15	1,635	26	13	1,744	34
2023 (NO BUILD - P.M.) Full/Unsignalized	38	0	44	0	0	39	19	1,698	26	13	1,807	35
2023 (BUILD - P.M.) Full/Unsignalized	44	0	71	0	0	39	34	1,698	26	13	1,806	39
2023 (BUILD Interim- P.M.) RI-RO-LI only/Unsignalized	0	0	71	0	0	39	34	1,698	26	13	1,806	39
2023 (BUILD Mitigated- P.M.) RI-RO-LI only/Unsignalized	0	0	76	0	0	39	27	1,705	26	13	1,806	35
<u>North Driveway / Wyoming Blvd.</u>												
(2)	0.10			0.10			0.10			0.10		
	<b>Eastbound (North Driveway)</b>			<b>Westbound (North Driveway)</b>			<b>Northbound (Wyoming Blvd.)</b>			<b>Southbound (Wyoming Blvd.)</b>		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
<b>SCENARIO Access/Traffic Control</b>												
Existing (2021) Full/Unsignalized	0	0	32	0	0	28	12	1,520	16	0	1,956	8
2023 (NO BUILD - A.M.) Full/Unsignalized	0	0	37	0	0	28	12	1,605	16	0	2,045	10
2023 (BUILD - A.M.) Full/Unsignalized	3	0	38	0	1	28	13	1,605	16	0	2,046	15
2023 (BUILD Interim- A.M.) RI-RO-LI only/Unsignalized	0	0	86	0	1	28	13	1,605	16	0	2,045	16
2023 (BUILD Mitigated- A.M.) Full/Signalized	195	8	52	12	10	4	31	1,605	16	7	2,045	47
	0.10			0.10			0.10			0.10		
	<b>Eastbound (North Driveway)</b>			<b>Westbound (North Driveway)</b>			<b>Northbound (Wyoming Blvd.)</b>			<b>Southbound (Wyoming Blvd.)</b>		
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Existing (2021) Full/Unsignalized	0	0	16	0	4	8	8	1,728	16	36	1,840	0
2023 (NO BUILD - P.M.) Full/Unsignalized	0	0	19	0	4	8	8	1,786	16	36	1,904	6
2023 (BUILD - P.M.) Full/Unsignalized	15	2	22	0	6	8	11	1,786	16	36	1,907	24
2023 (BUILD Interim- P.M.) RI-RO-LI only/Unsignalized	0	0	88	0	6	8	12	1,785	16	36	1,904	27
2023 (BUILD Mitigated- P.M.) Full/Signalized	97	8	37	19	8	8	44	1,785	27	12	1,904	49

## Existing Traffic Volumes

As agreed with the City of Albuquerque, existing thru traffic volumes (northbound and southbound) along Wyoming Blvd. are extrapolated from the **2021 traffic counts** collected in the field for the La Mirada project at the Montgomery Blvd. & Wyoming Blvd. intersection (Appendix pages A-79 thru A-84). The traffic counts were adjusted for COVID-19 traffic conditions. The adjusted counts are shown in the turning movement count spreadsheet for the La Mirada project on Appendix page A-80 thru A-81.

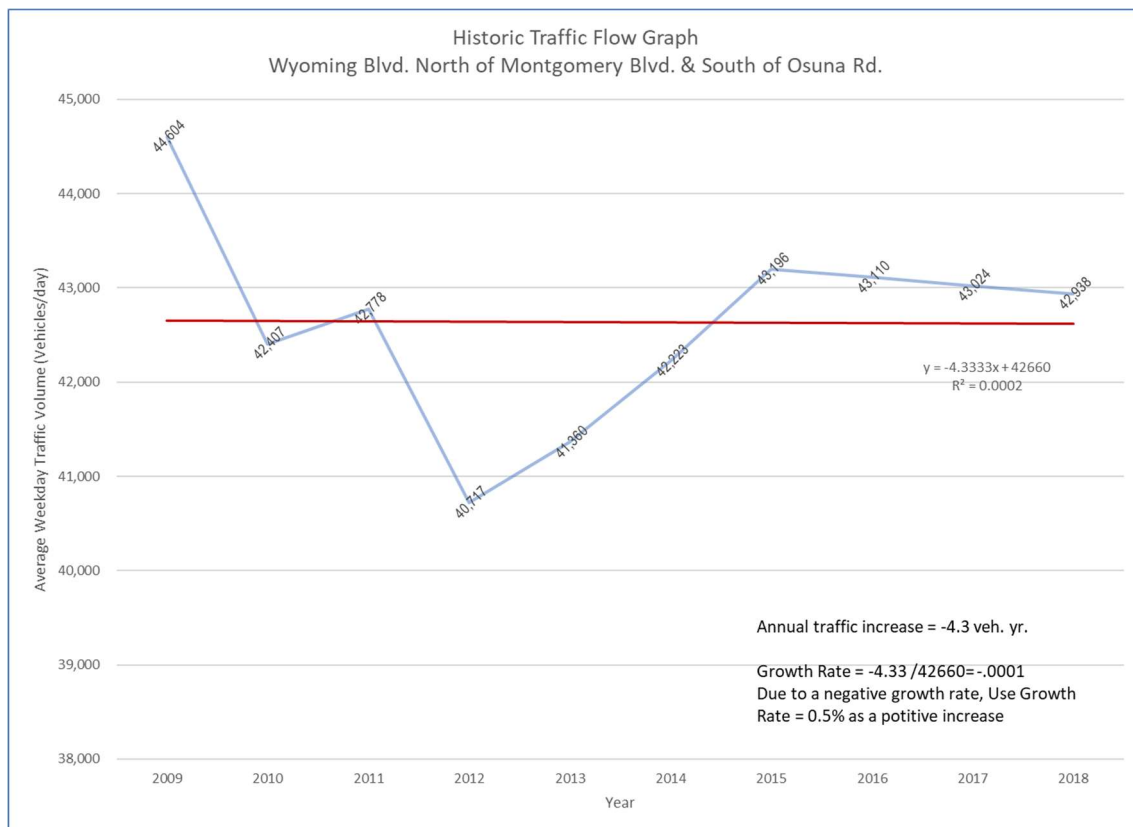
Existing traffic volumes entering and exiting the two driveway intersections (Intersection 1 and Intersection 2) are generated from ITE trip generation data (11<sup>th</sup> Edition) for each of the existing developments that share the driveways. See Appendix pages A-17 thru A-40 for the trip generation data tables and trip distribution maps for the existing developments.

### NO BUILD Traffic Volumes

NO BUILD Traffic Volumes are a sum of existing volumes, background growth volumes, and trips generated by other projects in the study area that have been recently approved or are under construction.

Background growth volumes are traffic volumes generated by applying expected background growth rates to the existing traffic volumes. Background growth rates are calculated using 2009 -2018 Average Weekday Traffic Flows (AWDT) published by the Mid-Region Council of Governments (MRCoG). A graph of the AWDT values and the linear regression line shows a -0.01% growth rate so the standard minimum growth rate of +0.5% was used to calculate the background growth traffic volumes.

There are two other planned developments in the study area, the La Mirada Development in the southwest corner of Montgomery Blvd. & Wyoming Blvd. and the Titan Residential Development within the Los Pastores Shopping Center. Trips generated by these developments and the associated trip distribution maps are provided in Appendix pages A-41 thru A-45.



## BUILD Traffic Volumes

BUILD Traffic Volumes are a sum of the NO BUILD Traffic Volumes and the trips generated by the project for each turning movement. According to the Institute of Traffic Engineers Trip Generation Manual, 11<sup>th</sup> Edition, the project is anticipated to generate 18 new entering trips and 62 new exiting trips during the weekday AM Peak Hour period and 13 new entering trips and 62 new exiting trips during the PM Peak Hour period. A 20% pass-by trip rate reduction is included in the trips generated. These trips and pass-by rates were agreed to in the scoping meeting for the project.

## BUILD Interim Volumes

BUILD Interim Volumes are the BUILD volumes redistributed according to the proposed interim geometry of the North and South Driveways (see map on Page 9). The BUILD Interim geometry restricts access at both driveways to Right-in/Right-out/Left-in to temporarily improve traffic conditions until a new signal can be constructed at the North Driveway.

## BUILD Mitigated Volumes

BUILD Mitigated volumes are the Existing and BUILD volumes redistributed according to the proposed mitigated geometry of the South Driveway and signalization of the North Driveway. For the mitigated case is assumed that a portion of the existing trips originating from the Los Pastores Shopping Center will prefer to use the proposed signalized intersection at the North Driveway so some of the existing trips are redistributed to the North Driveway under the mitigated condition.

## Level of Service (LOS) Standards

According to the City of Albuquerque, Design Process Manual (DPM), LOS standards are defined by Access Category. Table 7.5.88 identifies the minimum acceptable LOS standards according to Functional Classification & Roadway Type and City of Albuquerque's ABC Comprehensive Plan Type (see below). Because the site is outside of a defined center but within a Major Transit Corridor (outlined in green on



TABLE 7.5.88 Desired LOS by Location and Corridor Type

Functional Classification & Roadway Type	ABC Comp Plan Center Type						
	Transit Station Area	Downtown	Urban Center	Activity Center	Village Center	Employment Center	Outside Center
Premium Transit	E-F	E-F	E-F	E-F	E-F	E-F	E-F
Major Transit	E	E-F	E	E	D-E	D-E	D-E
Multi-modal	E	E	E	E	D-E	D-E	D-E
Commuter	E	E	D-E	D-E	D-E	D-E	D
Other Arterial	E	E	E	D-E	D-E	D-E	D
Minor Arterial	E	E	D-E	D-E	D-E	D	D
Collector	E	D-E	D	D	C-D	C-D	C-D

the following map, intersections within these corridors must have a LOS=E or better or mitigated to maintain the LOS at base (NO BUILD) condition levels.

### Traffic Analysis

**A capacity analysis of the study area intersections** was conducted in accordance with the Highway Capacity Manual (HCM6) V.6. A single period analysis was conducted on the two driveway intersections using Synchro 11 (Build 11.1.2.9) modeling software. See Appendix pages A-44 thru A-52 for detailed results of the analysis. Summaries of the analysis results for the 2023 Implementation Year are presented in the following tables:

#### *Intersection 1 – South Driveway/Car Wash Driveway & Wyoming Blvd.*

##### **Unsignalized, Existing**

**2023 LOS Analysis** of Intersection 1 demonstrates that traffic generated by the proposed Natural Grocer’s will have minimal impact on LOS and delays. LOS remains the same for all movements from the NO BUILD to the BUILD condition except the NBL turn movement which degrades from LOS=D to LOS=E. However, even for the NO BUILD condition, LOS is not acceptable (LOS =F) for the EBL, EBR, and NBL turn movements during the AM peak hour and for the EBL during the PM peak hour. Since the intersection is not controlled by a signal and the nearest signal for the southbound traffic is at Osuna Rd., 1/3-mile north, the high volume of traffic on Wyoming Blvd. causes insufficient gaps in traffic flows for vehicles exiting the driveway to enter the flow of traffic in an acceptable amount of time.

Even though this is an existing problem not made significantly worse by traffic from the development, mitigation on the part of the development is recommended. Restricting access at the South Driveway to right-in/right-out/left-in only significantly improves delay times as demonstrated by the interim case in the data tables on the following pages. Adding a signal to the North Driveway further improves LOS and delays at the South Driveway by creating larger gaps in the southbound traffic flows and encouraging traffic away from the South Driveway, as shown by analysis results for the mitigated case, LOS=B or better.

**2023 Queueing Analysis** demonstrates that no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than one for all movements for all conditions and lane capacities are greater than calculated queues, so no additional queue capacity is required.

2: Wyoming Blvd. & North Driveway/Gutierrez Rd.

2023 Implementation Year

North Driveway/Gutierrez Rd.

Wyoming Blvd.

Unsignalized

AM Peak Hour												
North Driveway/Gutierrez Rd. Wyoming Blvd.	EB (North Driveway/Gutierrez Rd.)			WB (North Driveway/Gutierrez Rd.)			NB (Wyoming Blvd.)			SB (Wyoming Blvd.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	0	<1	1	0	<1>	0	1	3>	0	1	3>	0
2023 AM NO BUILD Volumes	0	0	37	0	0	28	12	1,605	16	0	2,045	10
V/C Ratio			0.19		0.10		0.10					
Level-of-Service		A	D		C		E			A		
Control Delay (Seconds)		0.0	27.2		19.5		39.3			0.0		
Intersection LOS*	E-39.3 (NBL)											
95th Percentile Queue (veh)			0.7		0.3		0.3			0.0		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 AM BUILD Volumes	3	0	38	0	1	28	13	1,605	16	0	2,045	16
V/C Ratio		0.11	0.19		0.12		0.11					
Level-of-Service		F	D		C		E			A		
Control Delay (Seconds)		148.0	27.5		22.1		39.9			0.0		
Intersection LOS*	F-148 (EBL)											
95th Percentile Queue (veh)		5.7	0.7		0.4		0.4			0.0		
Additional Lane Capacity Required		0.3	0.7		0.4		0.4			0.0		
2023 AM BUILD Interim Volumes	0	0	86	0	1	28	13	1,605	16	16	2,045	16
Interim Lane Geometry	0	0	1	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio			0.43		0.12		0.11			0.08		
Level-of-Service			E		C		E			D		
Control Delay (Seconds)			36.5		22.5		39.9			25.2		
Intersection LOS*	E-39.9 (NBL)											
95th Percentile Queue (veh)			2.5		0.1	1.4				0.0		
Additional Lane Capacity Required			0.0		0.0	0.0				0.0		
2023 AM BUILD Mitigated Volumes	194	0	52	12	10	4	31	1,605	16	7	2,046	50
Interim and Mitigated Lane Geometry	1	1>	0	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio	0.69	0.00	0.22	0.10	0.00	0.00	0.07	0.43	0.43	0.03	0.71	0.71
Level-of-Service	D	A	D	D	A	A	A	A	A	B	A	A
Control Delay (Seconds)	52.0	0.0	41.9	40.8	0.0	0.0	6.2	0.5	1.0	11.4	0.8	1.5
Intersection LOS*	A - 4.2											
95th Percentile Queue (veh)	9.6	0.0	2.3	1.1	0.0	0.0	0.4	0.3	0.7	0.1	0.4	0.8
Additional Lane Capacity Required	0.0		0.0			0.0	0.0			0.0		

PM Peak Hour												
North Driveway/Gutierrez Rd. Wyoming Blvd.	EB (North Driveway/Gutierrez Rd.)			WB (North Driveway/Gutierrez Rd.)			NB (Wyoming Blvd.)			SB (Wyoming Blvd.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	1	0	1	0	0	1	1	3>	0	1	3	1
2023 PM NO BUILD Volumes	0	0	19	0	4	8	8	1,786	16	36	1,904	6
V/C Ratio			0.09		0.13		0.06			0.23		
Level-of-Service		A	C		E		D			D		
Control Delay (Seconds)		0.0	22.7		48.3		32.5			34.6		
Intersection LOS*	E-48.3 (WBL)											
95th Percentile Queue (veh)			0.3		0.4		0.2			0.8		
Queue Storage Ratio			0.0		0.1		0.1			0.2		
Existing Lane Capacity (ft)			250.0		100.0		100.0			100.0		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 PM BUILD Volumes	15	2	22	0	6	8	11	1,786	16	36	1,907	24
V/C Ratio		0.53	0.10		0.18		0.08			0.23		
Level-of-Service		F	C		F		D			D		
Control Delay (Seconds)		207.0	23.3		61.0		33.8			34.6		
Intersection LOS*	F-207 (EBL)											
95th Percentile Queue (veh)		1.8	0.3		0.6		0.3			0.8		
Additional Lane Capacity Required		0.0	0.0		0.0		0.0			0.0		
2023 PM BUILD Interim Volumes	0	0	88	0	6	8	12	1,785	16	36	1,904	27
Interim Lane Geometry	0	0	1	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio			0.40		0.18		0.09			0.23		
Level-of-Service			D		F		D			D		
Control Delay (Seconds)			32.1		61.0		34.0			34.4		
Intersection LOS*	F-61 (NBL)											
95th Percentile Queue (veh)			1.8		0.6		0.3			0.8		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 PM BUILD Mitigated Volumes	93	8	36	19	8	8	43	1,786	27	12	1,907	51
Interim and Mitigated Lane Geometry	1	1>	0	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio	0.52	0.00	0.35	0.24	0.00	0.00	0.19	0.54	0.54	0.02	0.47	0.47
Level-of-Service	E	A	D	D	A	A	A	A	A	A	A	A
Control Delay (Seconds)	56.5	0.0	54.3	53.4	0.0	0.0	9.3	1.0	1.8	3.7	0.2	0.3
Intersection LOS*	A-3.2											
95th Percentile Queue (veh)	5.2	0.0	2.4	1.9	0.0	0.0	0.8	0.5	1.1	0.1	0.1	0.3
Additional Lane Capacity Required	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0

## ***Intersection 2 – North Driveway/Gutierrez Rd. & Wyoming Blvd.***

### **Unsignalized, Existing**

**2023 LOS Analysis** of Intersection 2 demonstrates that the proposed Natural Grocer's will have moderate impact on the LOS and delays for the 2023 AM and PM BUILD conditions. LOS to the EBL degrades from LOS=A for the NO BUILD condition to LOS=F the BUILD condition with a 148 seconds per vehicle delay during the AM peak period and a 207 seconds per vehicle delay during the PM peak period. Since the intersection is not controlled by a signal, the high volume of traffic on Wyoming Blvd. causes insufficient gaps in traffic flows for vehicles exiting the driveway and side street to enter the flow of traffic in an acceptable amount of time. Given that the development is the primary source of traffic at this intersection, mitigation on the part of the development by either restricting access from the driveway or adding a traffic signal is recommended. Analysis results in the following tables show that restricting access (interim case) improves the LOS of the EBL to LOS=E. Installing a traffic signal (mitigated case) restores the LOS of the entire intersection to LOS=A with no movement having less than LOS=D.

**2023 Queueing Analysis** demonstrates that no additional queueing capacity is required. V/C ratios (a measure of congestion) are less than 1 for all movements and lane capacities are greater than calculated queues, so no additional queue capacity is required.

## Synchro Results Summary Sheet

2: Wyoming Blvd. & North Driveway/Gutierrez Rd.

2023 Implementation Year

North Driveway/Gutierrez Rd.

Wyoming Blvd.

Unsignalized

AM Peak Hour												
North Driveway/Gutierrez Rd. Wyoming Blvd.	EB (North Driveway/Gutierrez Rd.)			WB (North Driveway/Gutierrez Rd.)			NB (Wyoming Blvd.)			SB (Wyoming Blvd.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	0	<1	1	0	<1>	0	1	3>	0	1	3>	0
2023 AM NO BUILD Volumes	0	0	37	0	0	28	12	1,605	16	0	2,045	10
V/C Ratio			0.19		0.10		0.10					
Level-of-Service		A	D		C		E			A		
Control Delay (Seconds)		0.0	27.2		19.5		39.3			0.0		
Intersection LOS*	E-39.3 (NBL)											
95th Percentile Queue (veh)			0.7		0.3		0.3			0.0		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 AM BUILD Volumes	3	0	38	0	1	28	13	1,605	16	0	2,045	16
V/C Ratio		0.11	0.19		0.12		0.11					
Level-of-Service		F	D		C		E			A		
Control Delay (Seconds)		148.0	27.5		22.1		39.9			0.0		
Intersection LOS*	F-148 (EBL)											
95th Percentile Queue (veh)		5.7	0.7		0.4		0.4			0.0		
Additional Lane Capacity Required		0.3	0.7		0.4		0.4			0.0		
2023 AM BUILD Interim Volumes	0	0	86	0	1	28	13	1,605	16	16	2,045	16
Interim Lane Geometry	0	0	1	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio			0.43		0.12		0.11			0.08		
Level-of-Service			E		C		E			D		
Control Delay (Seconds)			36.5		22.5		39.9			25.2		
Intersection LOS*	E-39.9 (NBL)											
95th Percentile Queue (veh)			2.5		0.1	1.4				0.0		
Additional Lane Capacity Required			0.0		0.0	0.0				0.0		
2023 AM BUILD Mitigated Volumes	194	0	52	12	10	4	31	1,605	16	7	2,046	50
Interim and Mitigated Lane Geometry	1	1>	0	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio	0.69	0.00	0.22	0.10	0.00	0.00	0.07	0.43	0.43	0.03	0.71	0.71
Level-of-Service	D	A	D	D	A	A	A	A	A	B	A	A
Control Delay (Seconds)	52.0	0.0	41.9	40.8	0.0	0.0	6.2	0.5	1.0	11.4	0.8	1.5
Intersection LOS*	A - 4.2											
95th Percentile Queue (veh)	9.6	0.0	2.3	1.1	0.0	0.0	0.4	0.3	0.7	0.1	0.4	0.8
Additional Lane Capacity Required	0.0		0.0			0.0	0.0			0.0		

PM Peak Hour												
North Driveway/Gutierrez Rd. Wyoming Blvd.	EB (North Driveway/Gutierrez Rd.)			WB (North Driveway/Gutierrez Rd.)			NB (Wyoming Blvd.)			SB (Wyoming Blvd.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	0	<1	1	0	<1>	0	1	3>	0	1	3>	0
2023 PM NO BUILD Volumes	0	0	19	0	4	8	8	1,786	16	36	1,904	6
V/C Ratio			0.09		0.13		0.06			0.23		
Level-of-Service		A	C		E		D			D		
Control Delay (Seconds)		0.0	22.7		48.3		32.5			34.6		
<b>Intersection LOS*</b>	<b>E-48.3 (WBL)</b>											
95th Percentile Queue (veh)			0.3		0.4		0.2			0.8		
Queue Storage Ratio			0.0		0.1		0.1			0.2		
Existing Lane Capacity (ft)			250.0		100.0		100.0			100.0		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 PM BUILD Volumes	15	2	22	0	6	8	11	1,786	16	36	1,907	24
V/C Ratio		0.53	0.10		0.18		0.08			0.23		
Level-of-Service		F	C		F		D			D		
Control Delay (Seconds)		207.0	23.3		61.0		33.8			34.6		
<b>Intersection LOS*</b>	<b>F-207 (EBL)</b>											
95th Percentile Queue (veh)		1.8	0.3		0.6		0.3			0.8		
Additional Lane Capacity Required		0.0	0.0		0.0		0.0			0.0		
2023 PM BUILD Interim Volumes	0	0	88	0	6	8	12	1,785	16	36	1,904	27
Interim Lane Geometry	0	0	1	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio			0.40		0.18		0.09			0.23		
Level-of-Service			D		F		D			D		
Control Delay (Seconds)			32.1		61.0		34.0			34.4		
<b>Intersection LOS*</b>	<b>F-61 (NBL)</b>											
95th Percentile Queue (veh)			1.8		0.6		0.3			0.8		
Additional Lane Capacity Required			0.0		0.0		0.0			0.0		
2023 PM BUILD Mitigated Volumes	93	8	36	19	8	8	43	1,786	27	12	1,907	51
Interim and Mitigated Lane Geometry	1	1>	0	0	<1>	0	1	3>	0	1	3>	0
V/C Ratio	0.52	0.00	0.35	0.24	0.00	0.00	0.19	0.54	0.54	0.02	0.47	0.47
Level-of-Service	E	A	D	D	A	A	A	A	A	A	A	A
Control Delay (Seconds)	56.5	0.0	54.3	53.4	0.0	0.0	9.3	1.0	1.8	3.7	0.2	0.3
<b>Intersection LOS*</b>	<b>A-3.2</b>											
95th Percentile Queue (veh)	5.2	0.0	2.4	1.9	0.0	0.0	0.8	0.5	1.1	0.1	0.1	0.3
Additional Lane Capacity Required	0.0		0.0	0.0			0.0	0.0	0.0	0.0	0.0	0.0

## Determination of Warrants for Deceleration Lanes

Determination of Warrants for Deceleration Lanes for the South and North Driveways is conducted in accordance with the City of Albuquerque Development Process Manual (DPM) Criteria. The following tables define the City's warrant criteria for right and left turn lanes at driveways based on the right and left turn traffic volumes entering the site:



**Summary of Auxillary Lane Warrant Analysis**  
Natural Grocer's - Wyoming Blvd - Albuquerque, NM

			Left Turn Warrant					Right Turn Warrant				
Access	Major Street	Speed Limit (Mph)	Left Turn Warrant	Maximum Left Turn Volume	Left Turn Lane Warranted?	Minimum Storage Length (ft)4	Minimum Left-turn Transition Length (ft)2	Right Turn Warrant	Maximum Right Turn Volume	Right Turn Lane Warranted?	Minimum Storage Length (ft)3	Minimum Right-turn Transition Length (ft)2
			(veh/hr)1	(Veh/hr)4			(veh/hr)1	(Veh/hr)				
City of Albuquerque Auxillary Lane Warrant Analysis												
South Driveway	Wyoming Blvd	40	40	38	No	-	-	50	69	Yes	240	100
North Driveway	Wyoming Blvd	40	40	36	No	-	-	50	49	No	-	-

1. City of Albuquerque DPM, Table 7.4.67
2. City of Albuquerque DPM, Table 7.4.70
3. City of Albuquerque DPM, Table 7.4.68
4. Traffic Volumes from Mitigated Case

**TABLE 7.4.67 Turn Lane Warrants**

Left Turn		Right Turn	
Design Speed (MPH)	Turning Volume per Hour	Design Speed (MPH)	Turning Volume per Hour
25	50	25	60
30-40	40	30-40	50
45	30	45	45

**Determination of Warrants for Deceleration Lanes** for the South Driveway and the North Driveway indicate that only a right-turn deceleration lane is warranted at the South Driveway. No deceleration lanes are warranted at the North Driveway.

## Signal Warrant Analysis

The Manual on Uniform Traffic Control Devices (MUTCD) Signal Warrant Analysis was conducted using the HCS 2023 MUTCD Warrants software to determine whether installation of a traffic control signal is justified at the North Driveway/Gutierrez Rd. & Wyoming Blvd. intersection (Intersection 2). Twelve-hour (6am-6pm) weekday distribution of traffic volumes on Wyoming, the North Driveway, and Gutierrez Rd. were used as basis for the analysis. Hourly volumes on Wyoming Blvd. were determined from 2021 15-minute directional traffic volumes, "tube-counts", provided by Mid-Region Council of Governments. On the side streets hourly traffic volumes were generated using ITE Hourly distribution of existing and proposed developments based on ITE Land Use Code 821, Shopping Plaza. See Appendix pages A-75 thru A-78 for the hourly traffic volumes used in the analysis.

The report shows that four Warrants are satisfied, Warrant 1, Eight-hour Vehicular Volume; Warrant 2, Four Hour Vehicular Volume; Warrant 3, Peak-hour; and Warrant 6, Coordinated Signal System. Detailed descriptions of each Warrant are available in the MUTCD 2009 Edition, Chapter 4C, Sections 4C.01 thru 4C.07. See results report below.

Volume Summary														
Hour	Major Volume	Minor Volume	Total Volume	Peds/h	Gaps/h	1A (100%)	1A (80%)	1B (100%)	1B (80%)	2 (100%)	3A (100%)	3B (80%)	4A (70%)	4B (56%)
07 - 08	1253	36	1297	0	0	No	No	No	No	No	No	No	No	No
08 - 09	3328	69	3414	0	0	No	No	No	No	No	No	No	No	No
09 - 10	3220	103	3349	0	0	No	No	Yes	Yes	No	No	No	No	No
10 - 11	2664	145	2845	0	0	No	No	Yes	Yes	Yes	No	No	No	No
11 - 12	2867	199	3116	0	0	No	Yes	Yes	Yes	Yes	No	Yes	No	No
12 - 13	3104	238	3402	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
13 - 14	3265	242	3534	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
14 - 15	3264	219	3507	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
15 - 16	3835	214	4073	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
16 - 17	4039	221	4284	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
17 - 18	4114	243	4383	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
18 - 19	3628	258	3914	0	0	Yes	Yes	Yes	Yes	Yes	No	Yes	No	No
Total	38581	2187	41118	0	0	7	8	10	10	9	0	8	0	0
Warrants														
<b>Warrant 1: Eight-Hour Vehicular Volume</b>													✓	
A. Minimum Vehicular Volumes (Both major approaches --and-- higher minor approach) --or--														
B. Interruption of Continuous Traffic (Both major approaches --and-- higher minor approach) --or--													✓	
80% Vehicular --and-- Interruption Volumes (Both major approaches --and-- higher minor approach)													✓	
<b>Warrant 2: Four-Hour Vehicular Volume</b>													✓	
Four-Hour Vehicular Volume (Both major approaches --and-- higher minor approach)													✓	
<b>Warrant 3: Peak Hour</b>													✓	
A. Peak-Hour Conditions (Minor delay -- and-- minor volume --and-- total volume) --or--														
B. Peak-Hour Vehicular Volumes (Both major approaches --and-- higher minor approach)													✓	
<b>Warrant 4: Pedestrian Volume</b>														
A. Four Hour Volumes --or--														
B. One-Hour Volumes														
<b>Warrant 5: School Crossing</b>														
Gaps Same Period --and--														
Student Volumes														
Nearest Traffic Control Signal (optional)													✓	
<b>Warrant 6: Coordinated Signal System</b>													✓	
Degree of Platooning (Predominant direction or both directions)													✓	
<b>Warrant 7: Crash Experience</b>														
A. Adequate trials of alternatives, observance and enforcement failed --and--														
B. Reported crashes susceptible to correction by signal (12-month period) --and--														
C. 80% Volumes for Warrants 1A, 1B, --or-- 4 are satisfied													✓	
<b>Warrant 8: Roadway Network</b>														
A. Weekday Volume (Peak hour total --and-- projected warrants 1, 2, or 3) --or--														
B. Weekend Volume (Five hours total)														
<b>Warrant 9: Grade Crossing</b>														
A. Grade Crossing within 140 ft --and--														
B. Peak-Hour Vehicular Volumes														

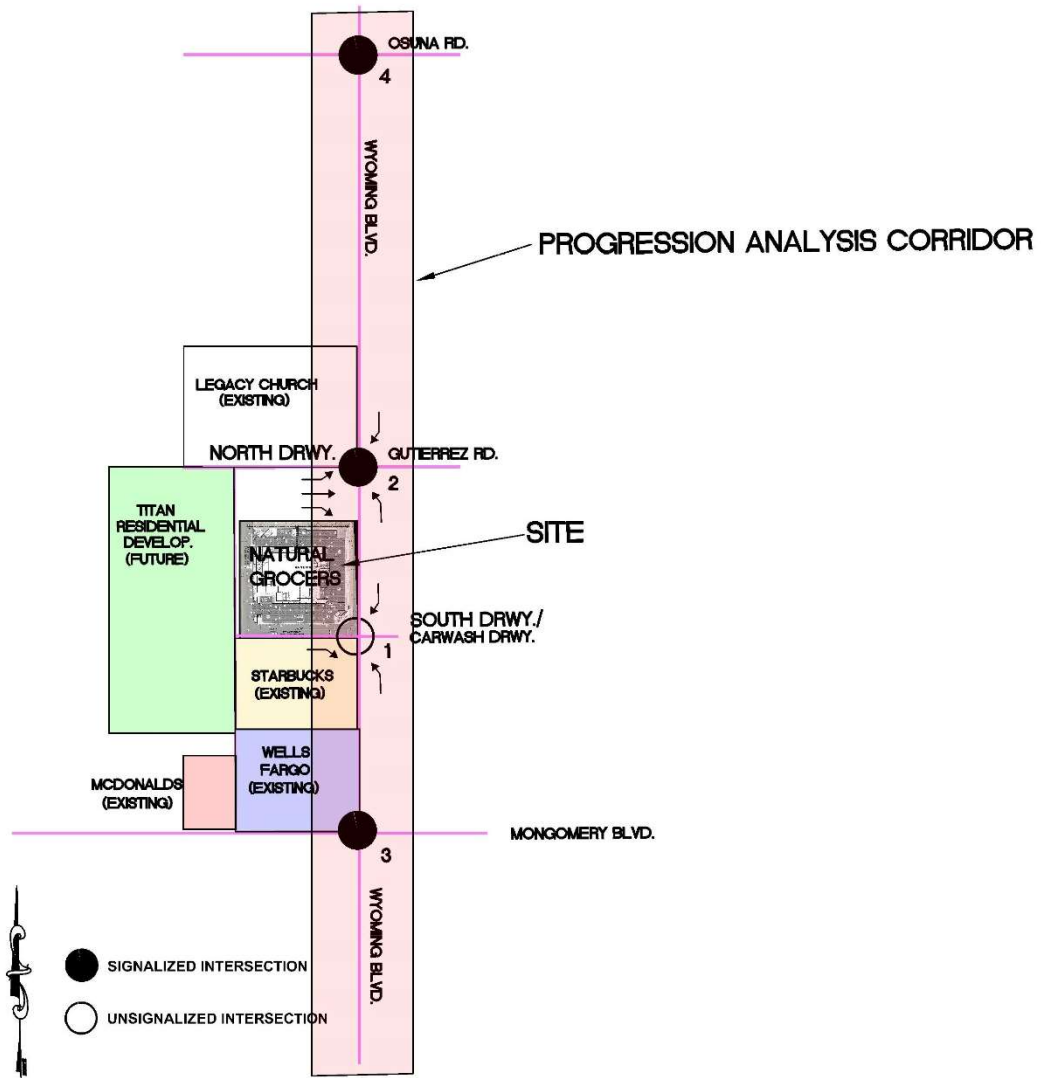
Copyright © 2023 University of Florida. All Rights Reserved.

HCS™ Warrants Version 2023  
2023010 North Driveway & Wyoming Blvd. - Signal

Generated: 12/6/2023 2:50:10 PM

## Progression Analysis

Progression analysis was performed on the Wyoming Blvd. corridor from Osuna Rd. to Montgomery Blvd. in accordance with the HCM guidance to determine the progression of vehicles through the intersections and assess the effectiveness of the proposed traffic signal at North Driveway/Gutierrez Rd. See the map of the corridor below. A module in the Synchro 11 software was used to conduct the analysis. The HCM identifies several measures of effectiveness (MOEs) that can be used to evaluate the performance of signalized intersections, including travel time, speed, delay, queue, stops, density, and travel-time variance. Time-space Diagrams (TSD's) provide a graphical representation of the progression. The MOE's and TSD's for the AM and PM Peak Periods with and without the proposed signal are presented below. See Appendix pages A-72 thru A-74 for larger format.



## Unsignalized Northern Driveway

### AM PEAK PERIOD

#### Measures of Effectiveness

##### Network Totals

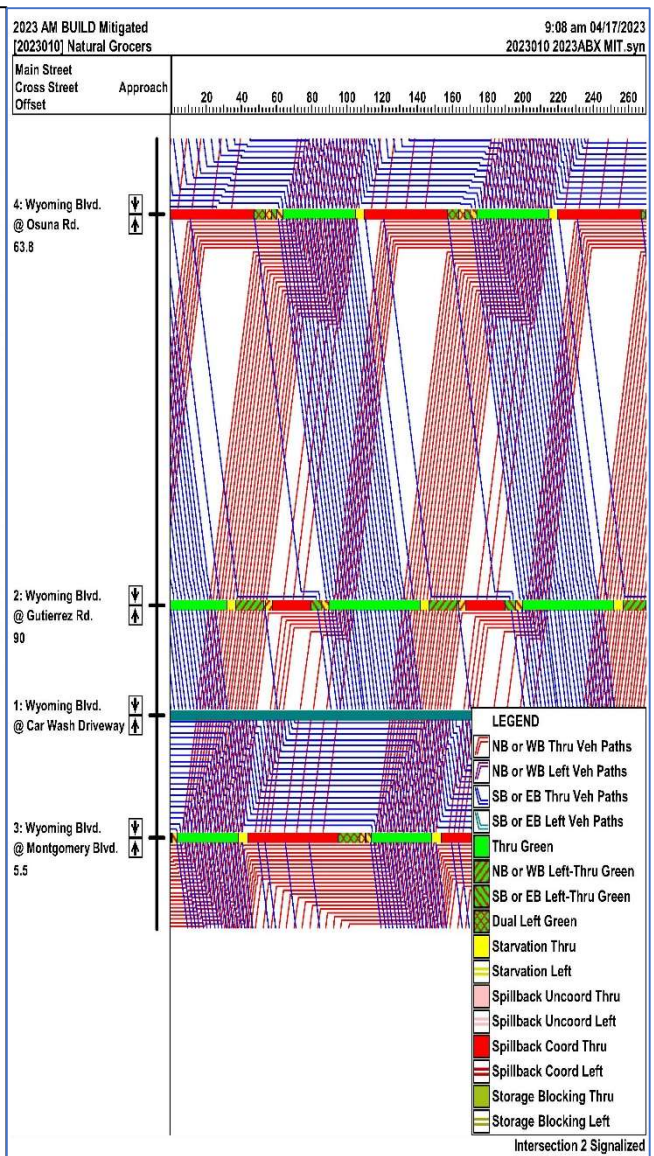
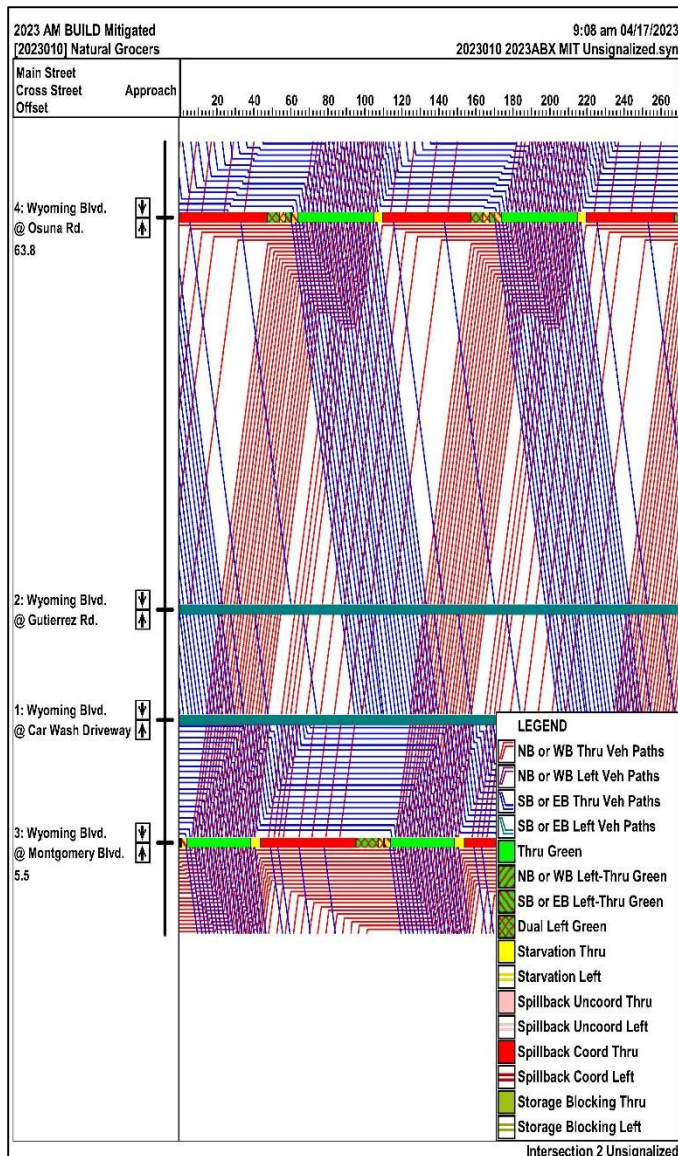
Number of Intersections	4
Total Delay (hr)	692
Stops (#)	9821
Average Speed (mph)	3
Total Travel Time (hr)	751
Distance Traveled (mi)	2342
Fuel Consumed (gal)	685
Fuel Economy (mpg)	3.4
Unserved Vehicles (#)	214
Vehicles in dilemma zone (#)	341
Performance Index	719.5

## Signalized Northern Driveway

#### Measures of Effectiveness

##### Network Totals

Number of Intersections	4
Total Delay (hr)	155
Stops (#)	10550
Average Speed (mph)	11
Total Travel Time (hr)	214
Distance Traveled (mi)	2342
Fuel Consumed (gal)	299
Fuel Economy (mpg)	7.8
Unserved Vehicles (#)	214
Vehicles in dilemma zone (#)	401
Performance Index	184.1



## Unsignalized Northern Driveway

### PM PEAK PERIOD

#### Measures of Effectiveness

##### Network Totals

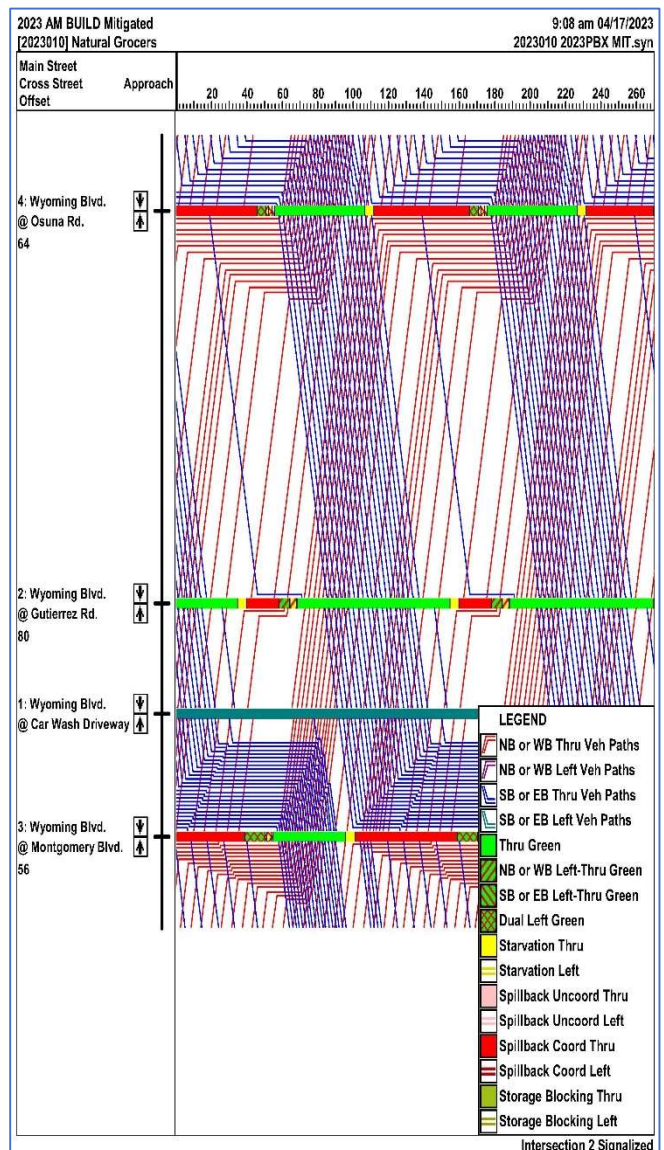
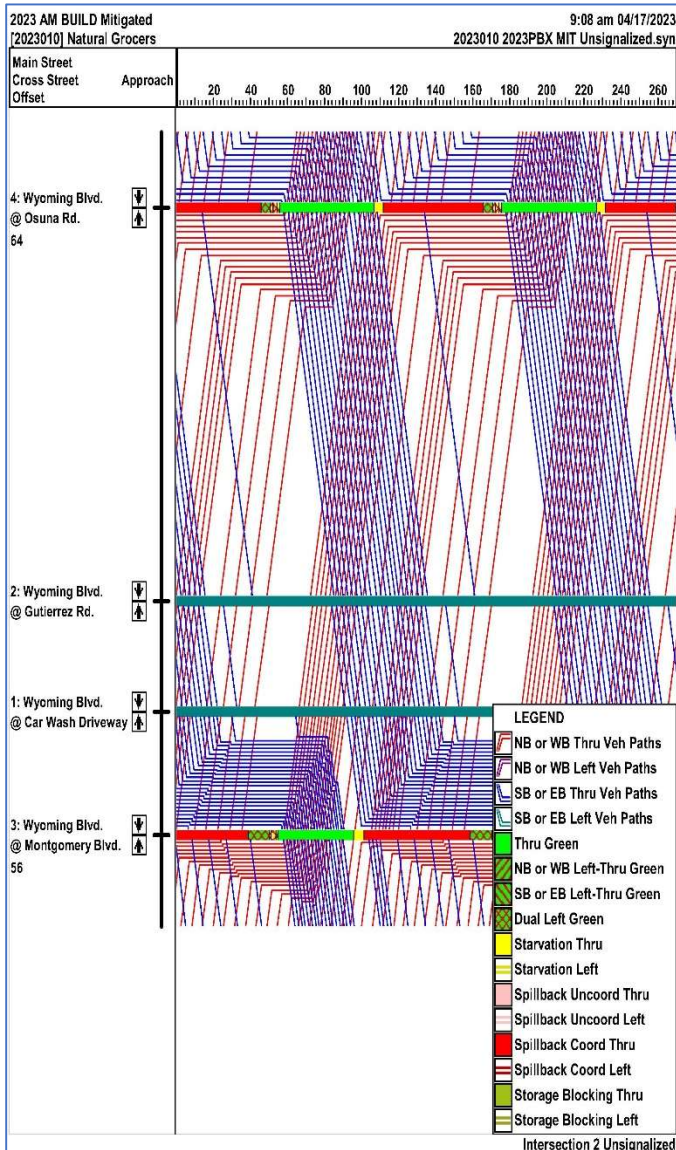
Number of Intersections	4
Total Delay (hr)	550
Stops (#)	10571
Average Speed (mph)	4
Total Travel Time (hr)	611
Distance Traveled (mi)	2427
Fuel Consumed (gal)	592
Fuel Economy (mpg)	4.1
Unserved Vehicles (#)	69
Vehicles in dilemma zone (#)	520
Performance Index	579.0

## Signalized Northern Driveway

#### Measures of Effectiveness

##### Network Totals

Number of Intersections	4
Total Delay (hr)	184
Stops (#)	10696
Average Speed (mph)	10
Total Travel Time (hr)	245
Distance Traveled (mi)	2427
Fuel Consumed (gal)	325
Fuel Economy (mpg)	7.5
Unserved Vehicles (#)	69
Vehicles in dilemma zone (#)	596
Performance Index	213.7



The MOEs show significant improvement in the performance of the corridor with the proposed traffic signal. Even though the number of stops increase slightly, delays and the performance index improve significantly with the proposed signal. The TSD’s demonstrate good progression in both directions with and without the signal.

## Access Design Specifications

### Sight Distance

Sight distances at the South Driveway and North Driveway are greater than 500-feet at each driveway in accordance with the COA Development Design Manual, Table 7.4.65 (see below). There are no vertical or horizontal curves that impede site distances along this portion of Wyoming Blvd. and there are no structures blocking sight distance into and out of the driveway.

FIGURE 7.4.93 Intersection Sight Distance

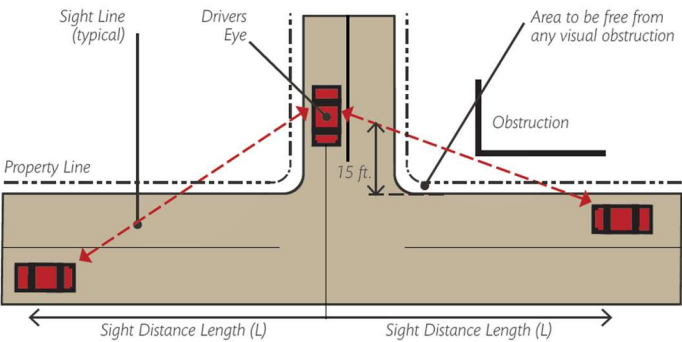


TABLE 7.4.65 Minimum Intersection Sight Distance						
Speed Limit (MPH)	Minimum Intersection Sight Distance					
	2 Lane Undivided		3 Lane Undivided or 2 Lane Divided w/ 12 ft. Median		4 Lane Undivided	
	Left Turn	Right Turn	Left Turn	Right Turn	Left Turn	Right Turn
20	230 ft.	200 ft.	240 ft.	200 ft.	250 ft.	200 ft.
25	280 ft.	240 ft.	300 ft.	240 ft.	320 ft.	240 ft.
30	340 ft.	290 ft.	360 ft.	290 ft.	380 ft.	290 ft.
35	390 ft.	340 ft.	420 ft.	340 ft.	440 ft.	340 ft.
40	450 ft.	390 ft.	480 ft.	390 ft.	500 ft.	390 ft.
45	500 ft.	430 ft.	530 ft.	430 ft.	570 ft.	430 ft.
50	560 ft.	480 ft.	590 ft.	480 ft.	630 ft.	480 ft.

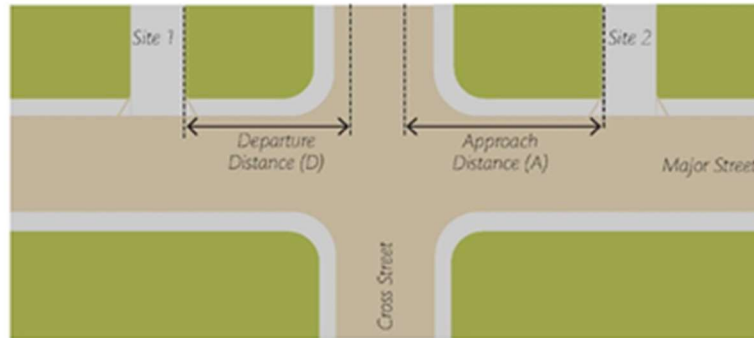
### 7-4(l)(5)(iv) Mini Clear Sight Triangle

Driveways need to maintain the mini clear sight triangle as shown in [FIGURE 7.4.94](#). This triangle starts at the sidewalk and measures 11 feet on a side.

### Access Spacing

The South and North Driveways meet the minimum access spacing requirements of the COA for a Principal Arterial. Montgomery Blvd. is a Principal Arterial, and the South Driveway is 400-ft north of Montgomery Blvd., 200-ft more than the minimum distance. See Table 7.4.45 below from the COA DPM.

City of Albuquerque Minimum Access Spacing Requirements  
COA DPM



**TABLE 7.4.45 Minimum Distance Between Commercial Site Access and Intersection**

Type of Street	Cross Street Classes					
	Arterial		Collector		Local	
	A	D	A	D	A	D
Principal Arterial	300 ft.	200 ft.	200 ft.	150 ft.	150 ft.	100 ft.
Minor Arterial	200 ft.	150 ft.	150 ft.	100 ft.	100 ft.	100 ft.
Major Collector	150 ft.	150 ft.	100 ft.	100 ft.	75 ft.	75 ft.
Minor Collector	150 ft.	150 ft.	100 ft.	100 ft.	75 ft.	75 ft.

### Signalized Intersection Spacing

Within a Major Transit Corridor, the COA recommended distance between signalized intersections is a minimum of 1320-feet. See Table 7.4.42 of the COA DPM below. The distance between nearest signalized intersection (Montgomery Blvd./Wyoming Blvd.) and the proposed signalized intersection (Intersection 2, North Driveway/Wyoming Blvd.) is 900-feet, centerline to centerline, 440-feet less than recommended. However a signal is still recommended because;

1. there is no reasonable access for northbound traffic from this development to Montgomery Blvd. and Wyoming Blvd., (either delays are extremely high or vehicles must make U-TURNS in an already congested area);
2. signalizing the North Driveway significantly improves the performance of the corridor as demonstrated by the progression analysis; and

3. signal warrant annalysis demonstrates that signal is justified.

**TABLE 7.4.42 Recommended Distance between Signalized Intersections by Corridor Type**

Corridor	Distance between Signalized Intersections	Distance between Signalized Pedestrian Crossings
Major Transit	1,320 ft. - 2,640 ft. ( $\frac{1}{4}$ - $\frac{1}{2}$ mile)	1,320 ft. ( $\frac{1}{4}$ mile)
Multi-modal	1,320 ft. - 2,640 ft. ( $\frac{1}{4}$ - $\frac{1}{2}$ mile)	1,320 ft. ( $\frac{1}{4}$ mile)
Main Street	1,320 ft. ( $\frac{1}{4}$ mile)	660 ft. ( $\frac{1}{8}$ mile)
Commuter	2,640 ft. - 5,280 ft. ( $\frac{1}{2}$ - 1 mile)	2,640 ft. ( $\frac{1}{2}$ mile)
Other Arterial	2,640 ft. ( $\frac{1}{2}$ mile)	2,640 ft. ( $\frac{1}{2}$ mile)
Minor Arterial	1,320 ft. - 2,640 ft. ( $\frac{1}{4}$ - $\frac{1}{2}$ mile)	1,320 ft. ( $\frac{1}{4}$ mile)
Collector	1,320 ft. - 2,640 ft. ( $\frac{1}{4}$ - $\frac{1}{2}$ mile)	1,320 ft. ( $\frac{1}{4}$ mile)

## Summary of Impacts

1. **2023 Capacity and Queueing Analysis** of Intersection 1 (South Driveway & Wyoming Blvd.) and Intersection 2 (North Driveway/Gutierrez Rd. & Wyoming Blvd.) demonstrates that the proposed Natural Grocer's will have minimal impact on the LOS and delays. LOS remains the same for all movements from the NO BUILD to the BUILD condition. However, for traffic turning left from the driveways/side streets, LOS=E or F for both the NO BUILD and BUILD conditions. Since the intersection is not controlled by a signal, the high volume of traffic on Wyoming Blvd. causes insufficient gaps in traffic flows for vehicles exiting the driveway to enter the flow of traffic in an acceptable amount of time. Mitigation on the part of the development is recommended. Restricting access at the driveways to right-in/right-out/left-in, significantly improves traffic conditions (Interim Case). Adding a signal to the North Driveway further improves LOS and delays at both driveways (Mitigated Case).

**HCM Results Summary Table**  
Natural Grocer's - Wyoming Blvd. - Albuquerque, NM

12/18/2023					2023 Capacity Analysis		Queueing
					LOS, Delay (s/veh) <sup>1</sup>		2023
							Lane/Additional Queue length Required (ft)
Intersect. No.	Intersection	Signalization/Control	Access Geometry	Case	AM Peak <sup>2</sup>	PM Peak <sup>2</sup>	
1: Wyoming Blvd. & South Driveway/Car Wash Driveway	Unsignalized/ 2-way Stop Control	Full Access	NO BUILD		F - 999 (EBL)	F-293 (EBL)	0
			BUILD		F - 999 (EBL)	F-434 (EBL)	0
			BUILD Interim		F-56.8 (NBL)	E-35.9 (NBL)	0
			BUILD Mitigated		B-14.4 (EBR)	B-13.4 (EBR)	0
2: Wyoming Blvd. & North Driveway/Gutierrez Rd.	Unsignalized/ 2-way Stop Control	Full Access	NO BUILD		E-39.3 (NBL)	E-48.3 (WBL)	0
			BUILD		F-148 (EBL)	F-207 (EBL)	0
			BUILD Interim		E-39.9 (NBL)	F-61 (NBL)	0
	Signalized	Full Access	BUILD Mitigated		A - 4.2	A-3.2	0

1 - LOS = Level of Service as defined in the STATE ACCESS MANAGEMENT MANUAL, New Mexico State Highway and Transportation Department

2 - For unsignalized intersections, LOS is for movement with worst LOS & Delay

3 - HCM Multiple Period Analysis

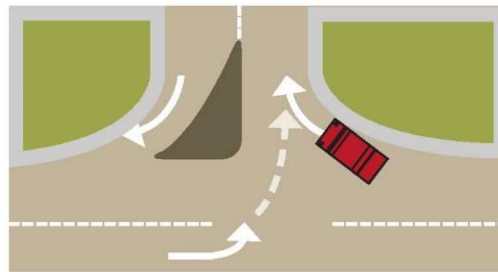
2. **Deceleration Lane Warrant Analysis** shows that only a southbound right-turn deceleration lane is warranted at the South Driveway, however, the existing deceleration lane is sufficient. No deceleration lanes are warranted at the North Driveway. Northbound and southbound left-turn deceleration lanes exist at both driveways.
3. **The Manual on Uniform Traffic Control Devices (MUTCD) Signal Warrant Analysis** was conducted using the HCS 2023 MUTCD Warrants software. The analysis determined that a traffic signal is warranted at the North Driveway/Gutierrez Rd. & Wyoming Blvd. Intersection (Intersection 2).
4. **Progression analysis** of the proposed signal and the signalized intersections north and south of the proposed signal, Osuna Rd./Wyoming Blvd., and Montgomery Blvd./Wyoming Blvd., demonstrates that the proposed signal will have minimal adverse impact to the progression of traffic along the corridor and significantly improves performance index of the corridor (a factor of total delays and vehicle stops).

## Recommendations

Based on the LOS, queuing, and progression analysis the following mitigations are recommended:

2. The Natural Grocer's project shall use only existing driveways to access the Natural Grocer's site from Wyoming Blvd. and Montgomery Blvd.
3. **Intersection 1 (South Driveway & Wyoming Blvd.)** – The eastbound approach should be re-marked, and a raised median should be constructed at the driveway entrance to restrict access to right-in/right-out/left-in only, like Figure 7.4.103 from the City of Albuquerque 2020 Design Process Manual shown below.

FIGURE 7.4.103 Right-in / Right-out and Left-in



4. **Intersection 2 (North Driveway/Gutierrez & Wyoming Blvd.)** –
  - a. The eastbound approach pavement markings shall be re-marked to indicate one dedicated eastbound left-turn lane and one eastbound thru/right lane.
  - b. Install a new traffic signal. The timing/phasing of the new signal should be coordinated with the existing signals at Montgomery Blvd./Wyoming Blvd. and Osuna Rd./Wyoming Blvd. Only one single phase should be included to service the side street (North Driveway). See AM & PM signal timing and phasing recommendations in Appendix pages A-88 and A-89.
  - c. In the interim period, until the new signal can be constructed, it is recommended that the North Driveway be reconfigured as restricted access driveway (Right-in/Right-out/Left-in Only), like Figure 7.4.103 above.
5. Site distances, queue storage capacity, and lane geometries shall be maintained at all access driveways for the project.
6. Maintain pedestrian sidewalk along property's frontage with Wyoming Blvd. and Montgomery Blvd.

## Appendix

<b><u>SITE INFORMATION</u></b>	
Zone Atlas Map/Vicinity Map	A-1
Proposed Site Plan	A-2
<b><u>HISTORIC GROWTH RATE</u></b>	
Historic Growth Rate Table and Graph	A-3 thru A-4
<b><u>SOCIOECONOMIC TRIP DISTRIBUTION</u></b>	
Socioeconomic Trip Distribution Data Table	A-5 thru A-6
DASZ Map – Bernalillo County	A-7
<b><u>TRIPS GENERATED BY EXISTING, FUTURE, &amp; PROPOSED DEVELOPMENTS</u></b>	A-8
Existing Developments	A-9 thru A-13
Titan Residential Development (Future)	A-14
Natural Grocer's (Proposed)	A-15
<b><u>TRIP DISTRIBUTION &amp; TURNING MOVEMENT COUNTS</u></b>	A-16
Existing Developments - NO BUILD & BUILD Cases	A-17 thru A-29
Existing Developments - Mitigated Case	A-30 thru A-40
Other Proposed and Recent Developments	A-41 thru A-45
Natural Grocer's – NO BUILD, BUILD, BUILD INTERIM Cases	A-46 thru A-50
Natural Grocer's – BUILD Mitigated Case	A-51 thru A-54
<b><u>2023 SYNCHRO HCM CAPACITY &amp; QUEUING ANALYSIS RESULTS</u></b>	A-55
Intersection 1 - South Driveway/Car Wash & Wyoming Blvd.	A-56 thru A-63
Intersection 2 - North Driveway/Car Wash & Wyoming Blvd.	A-64 thru A-71
<b><u>PROGRESSION ANALYSIS RESULTS</u></b>	A-72
AM Peak Period	A-73
PM Peak Period	A-74
<b><u>TRAFFIC VOLUME DATA FOR SIGNAL WARRANT AT NORTH DRWY/WYOMING BLVD.</u></b>	A-75
MRCOG 15-Min Tube-count Data for Wyoming Blvd.	A-76
Hourly Distribution of Vehicle Trips Generated by Existing and Proposed Developments	A-77
Hourly Distribution of All Trips for All Movements	A-78
<b><u>TRAFFIC COUNTS</u></b>	A-79
2021 Traffic Counts from La Mirada Development TIS	A-80 thru A-81
2023 Traffic Counts	A-82 thru A-84
<b><u>City of Albuquerque SCOPING FORM</u></b>	A-85 thru A-87
<b><u>Proposed Signal Timing and Phasing</u></b>	A-88 thru A-89

# APPENDIX