Holly-Ventura Apartments
Northwest Corner of Holly Ave. NE and Ventura St. NE
Albuquerque, NM

DRAFT
Traffic Impact Study

January 7, 2021

Presented to:

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City of Albuquerque
&
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New Mexico Department of Transportation

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Holly-Ventura Apartments - Albuquerque, NM
(Northwest Corner of Holly Ave. & Ventura St.)
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 Holly-Ventura Apartments development (111 units) to determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared voluntarily by the developer to be reviewed by the City of Albuquerque Transportation Development Section of the Planning Department and the New Mexico Department of Transportation. The volumes generated by the project do not meet the City of Albuquerque's warrant for a Traffic Impact Study. The developer agreed to prepare and submit one for review, nonetheless.

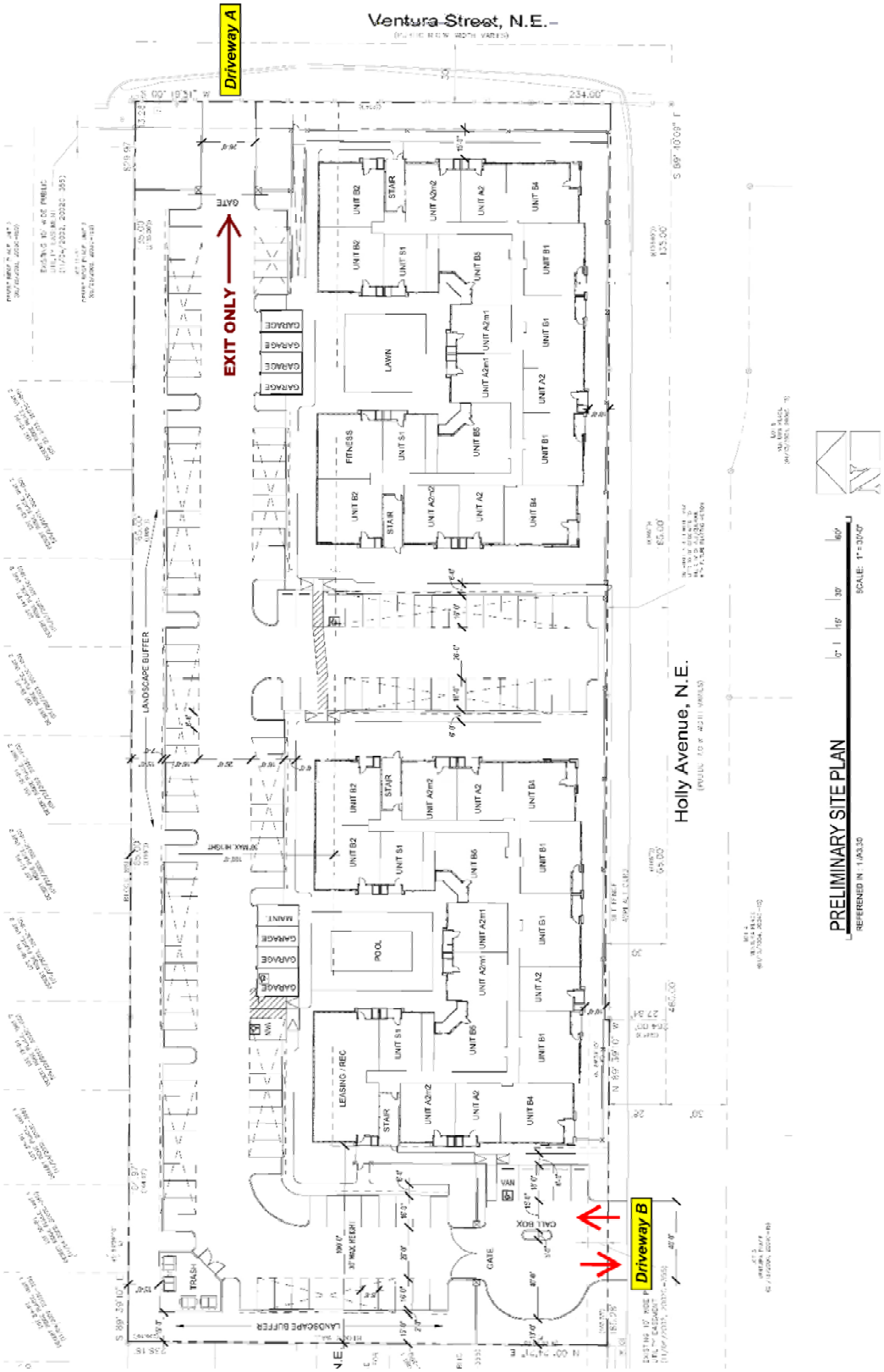
Project Description

- The new development will be located on 3.9 acres of undeveloped land located on the northwest corner of Holly Ave. N.E. and Ventura St. N.E.
- The site and the adjacent lands are zoned MX-L (Mixed-use, Low Density)
- Two driveways are proposed to access the new development. Driveway 'A' is an exit-only driveway located on the west leg of the E. Holly & Ventura St. intersection, 690-feet north of Paseo del Norte (centerline to centerline). Driveway 'B' is a full access driveway located on the north side of W. Holly Ave., 600-feet west of Ventura St. (centerline to centerline).
- No transportation projects and no other recent or planned developments were identified within the study area.
- The anticipated implementation year for this project is 2021. Since the project will generate less than 50 peak hour trips and will be constructed in one phase a year from now, a horizon year was not analyzed.
- According to the Institute of Traffic Engineers' (ITE) trip generation rates, the project is anticipated to generate 10 new entering trips and 28 new exiting trips during the weekday AM Peak Hour period and 30 new entering trips and 19 new exiting trips during the PM Peak Hour period. No pass-by trips are included in the trips generated.
- The study area includes five intersections as listed below and shown:
    1. Paseo del Norte & Ventura St. (Signalized)
    2. (West) Holly Ave/Albertsons Driveway & Ventura St. (Unsignalized)
    3. (East) Holly Ave./Driveway A & Ventura St. (Unsignalized)
    4. (West) Holly Ave. & Barstow St. (Signalized)
    5. (West) Holly Ave. & Driveway B (Unsignalized)

    Note: In this report, the West leg of Holly Ave. is identified as W. Holly Ave. and the East leg of Holly Ave. is identified as E. Holly Ave. even though these are not the legal names of these sections of Holly Ave.

The vicinity map and proposed site plan are shown below.

City of Albuquerque
Legend
Arterial Streets
Freeway
Principal Arterial
Minor Arterial
BN and SF Railroad
Municipal Limits
Corrales
Edgewood
Los Ranchos
Rio Rancho
Tijeras
UNINCORPORATED
World Street Map
Notes
UNINCORPORATED AREAS
SITE
ALAMEDA BLVD
PASEO DEL NORTE
WYOMING BLVD
VENTURA ST
HARPER RD
SAN ANTONIO DR
4,156
0
2,075
4,156
Feet
1: 24,988
WGS_1984_Web_Mercator_Auxiliary_Sphere
12/14/2023
©City of Albuquerque
THIS MAP IS NOT TO BE USED FOR NAVIGATION


Ventura Street, N.E.
Driveway A
EXIT ONLY
GATE
Holly Avenue, N.E.
Driveway B
LANDSCAPE BUFFER
PRELIMINARY SITE PLAN
SCALE: 1" = 30'-0"

Traffic Analysis Results

A summary of the Highway Capacity Manual (HCM) analysis results is included in the following table:

HCM Results Summary Table

Holly Ventura Apartments

Northwest Corner of Holly Ave. and Ventura St. - Albuquerque, NM

JAN. 2021

				Implementation Year (2021) Conditions	
Intersection No.	Intersection Name	Signalization	Case	AM Peak (LOS-delay)	PM Peak (LOS-delay)
1	Paseo del Norte & Ventura St.	Signalized	NO BUILD	D - 42.5	D - 39.3
			BUILD	D - 42.9	D - 39.5
2	W. Holly Ave./Albertsons & Ventura St.	Unsignalized [1]	NO BUILD	C - 18.1	D - 26.8
			MITIGATED[2]	C - 19.3	D - 30.6
		Roundabout w/ Single Lane Approaches	BUILD	A - 6.4	A - 7.9
		Roundabout w/ Double Lane Approaches	BUILD	A - 5.6	A - 6.5
3	E. Holly Ave./Driveway A & Ventura Street	Unsignalized [1]	NO BUILD	B -13.1	B - 13.7
			BUILD	B - 14.2	B - 14.9
4	W. Holly Ave. & Barstow St.	Signalized	NO BUILD	B - 11.4	B - 14.6
			BUILD	B - 11.6	B - 15.0
5	W. Holly Ave. & Driveway B	Unsignalized[1]	NO BUILD		
			BUILD	B - 10.0	B - 10.6

1. Worst LOS for Driveway Exit and Entrance Movements
2. Mitigated Geometry assumes two approach lanes southbound

- Level of Service (LOS) remains constant for all intersections for the NO BUILD and BUILD conditions and the intersections perform at LOS=D or better for all peak hour periods.
- Overall intersection delays are worse for the BUILD condition by less than a few seconds and Volume to Capacity Ratios are less than one for all approaches.

- As requested by the City of Albuquerque a roundabout alternative was analyzed for the W. Holly/Ventura intersection. A one- or a two-lane approach roundabout at this intersection improves the LOS from to "A" during the AM peak hour and from C to A during the PM peak hour.
- At the PdN & Ventura St. intersection, the eastbound and westbound, left-turn and right-turn lanes, have NO BUILD and BUILD LOS=E. However, these are existing problems, and the project does not make the delays significantly worse.
- Turn lane warrant analysis indicates that no turn lanes are warranted for this project.
- No significant vertical or horizontal curves exist along W. Holly Ave. or Ventura St. in the vicinity of the driveways and there are no structures blocking sight distances into and out of the entrances.

Conclusions

In summary, the proposed Holly-Ventura Apartments will have minimal adverse impact to the adjacent transportation system, therefore, no mitigation measures are proposed in this study. LOS at the intersections in the study area meet the Minimum Acceptable Level of Service Standards (LOS=D or better, City of Albuquerque Development Process Manual (DPM) for NO BUILD and BUILD conditions for all intersections in the study area.

Recommendations

All site and offsite design and construction related to this development shall maintain adequate sight distances at driveways and intersections in the study area to the extent possible.

Access – Driveway "A" should be designated as an EXIT ONLY driveway (unsignalized). The eastbound lane of Driveway "A" should align with the eastbound lane of E. Holly Ave. to the east of Ventura St. Driveway "B" should be a full access unsignalized driveway (unsignalized) possessing at least one entering lane and one exiting lane.

Holly-Ventura Apartments - Albuquerque, NM
(Northwest Corner of Holly Ave. & Ventura St.)
Traffic Impact Study

Contents

Holly-Ventura Apartments - Albuquerque, NM
(Northwest Corner of Holly Ave. & Ventura St.)
Traffic Impact Study

Introduction

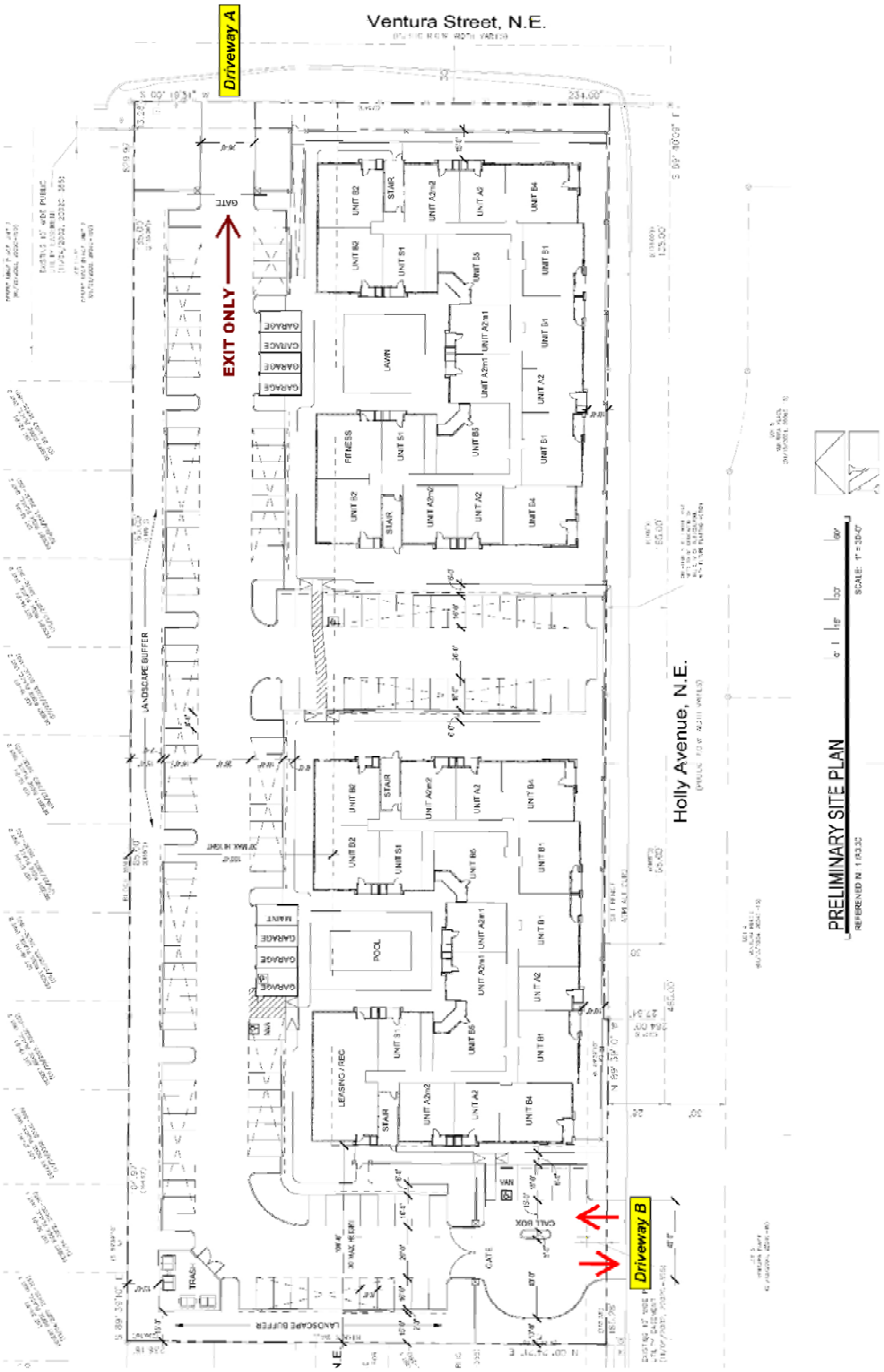
The purpose of this Traffic Impact Study (TIS) is to evaluate the transportation conditions before and after implementation of the proposed the Holly-Ventura Apartments development to determine the impact of the development on the adjacent transportation system and recommend mitigation measures where necessary. This study is prepared voluntarily by the developer to be reviewed by the City of Albuquerque Transportation Development Section of the Planning Department and the New Mexico Department of Transportation. The volumes generated by the project do not meet the City of Albuquerque's warrant for a Traffic Impact Study. The developer agreed to prepare and submit one for review, nonetheless.

Description of Proposed Development

The proposed development is to be located at the Northwest Corner of Holly Ave. & Ventura St., within the City of Albuquerque, New Mexico. Two driveways are proposed to access the new development. Driveway 'A' is an out-only driveway located on the west leg of the E. Holly & Ventura St. intersection, 690-feet north of Paseo del Norte (centerline to centerline). Driveway 'B' is a full access driveway located on the north side of W. Holly Ave., 600-feet west of Ventura St. (centerline to centerline). No transportation projects and no other recent or planned developments were identified within the study area. The anticipated implementation year for this project is 2021. Since the project will generate less than 50 peak hour trips and will be constructed in one phase, a horizon year was not analyzed.

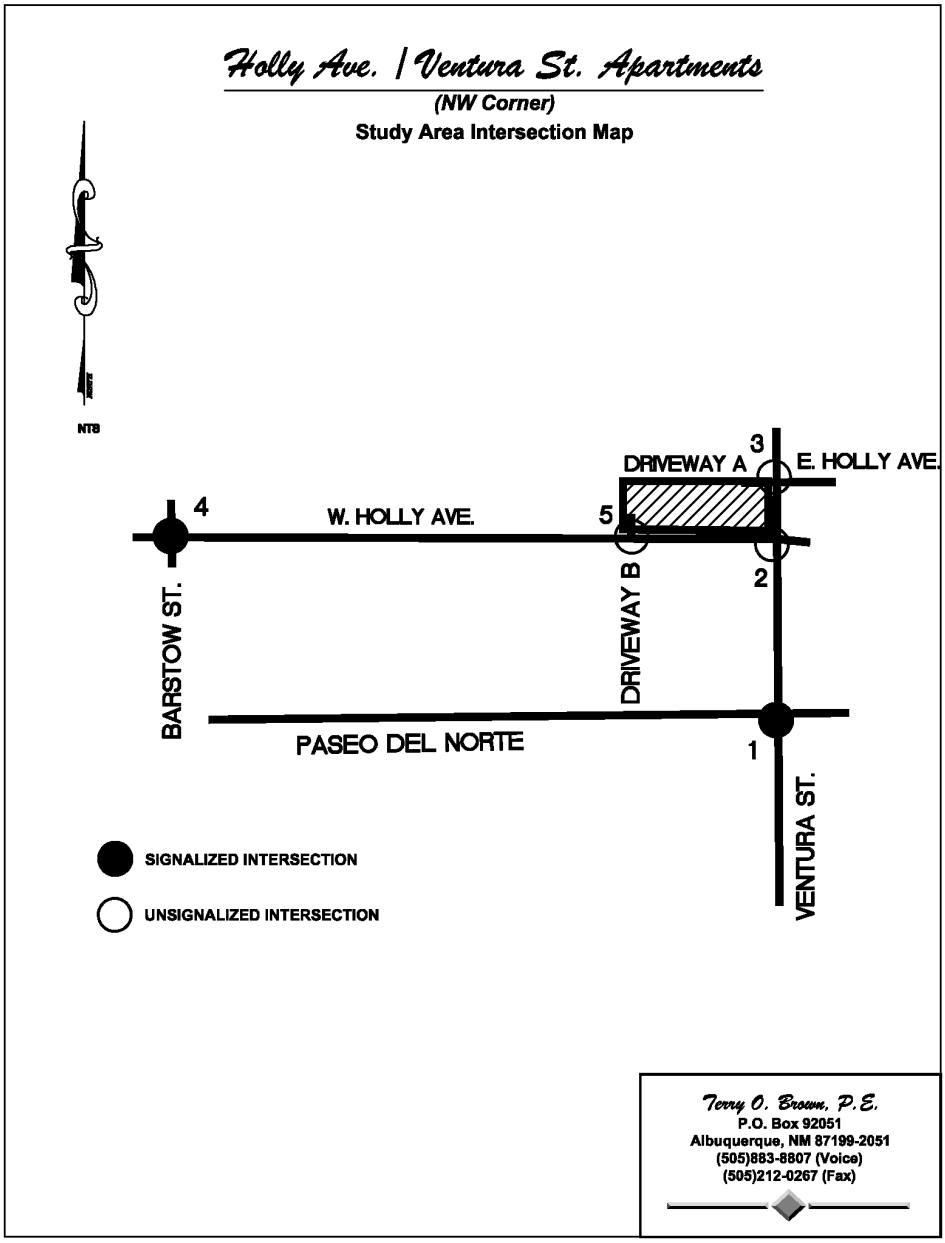
The vicinity map and proposed site plan are shown below.

City of Albuquerque
UNINCORPORATED AREAS
SITE
VENTURA ST
HARPER RD
WYOMING BLVD
PASEO DEL NORTE
SAN ANTONIO DR
ALAMEDA BLVD
Legend
Arterial Streets
Freeway
Principal Arterial
Minor Arterial
BN and SF Railroad
Municipal Limits
Corrales
Edgewood
Los Ranchos
Rio Rancho
Tijeras
UNINCORPORATED
World Street Map
Notes
THIS MAP IS NOT TO BE USED FOR NAVIGATION
4,156
0
2,078
4,156 Feet
1: 24,688
WGS_1984_Web_Mercator_Auxiliary_Sphere
12/14/2020
©City of Albuquerque


Ventura Street, N.E.
Driveway A
EXIT ONLY
Holly Avenue, N.E.
Driveway B
PRELIMINARY SITE PLAN

The study area includes five intersections as listed below and shown on the following map:

1. Paseo del Norte & Ventura St. (Signalized)
2. (West) Holly Ave/Albertsons Driveway & Ventura St. (Unsignalized)
3. (East) Holly Ave./Driveway A & Ventura St. (Unsignalized)
4. (West) Holly Ave. & Barstow St. (Signalized)
5. (West) Holly Ave. & Driveway B (Unsignalized)



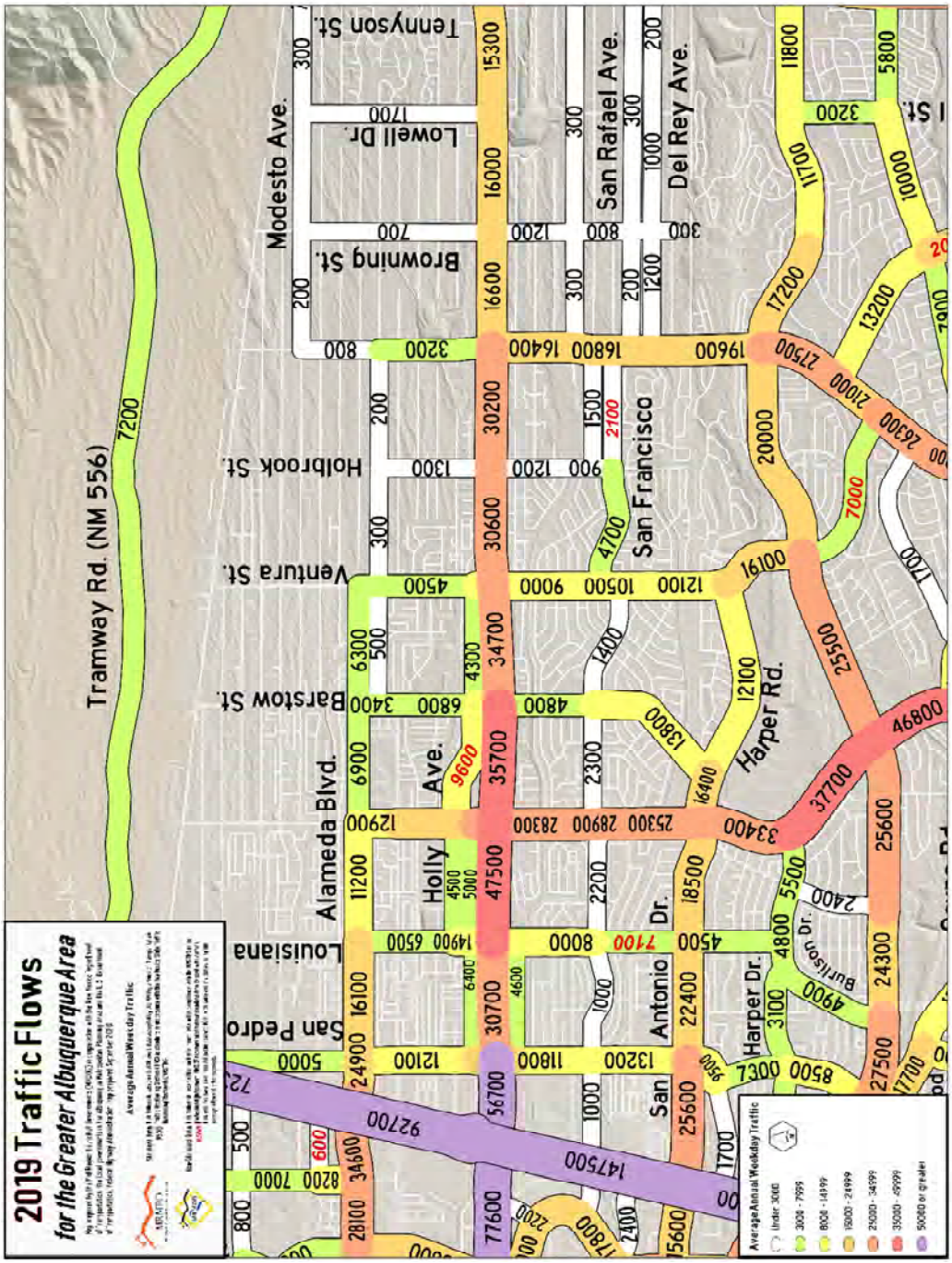
Study Area Conditions

The characteristics of the study area used in the analysis are as follows:

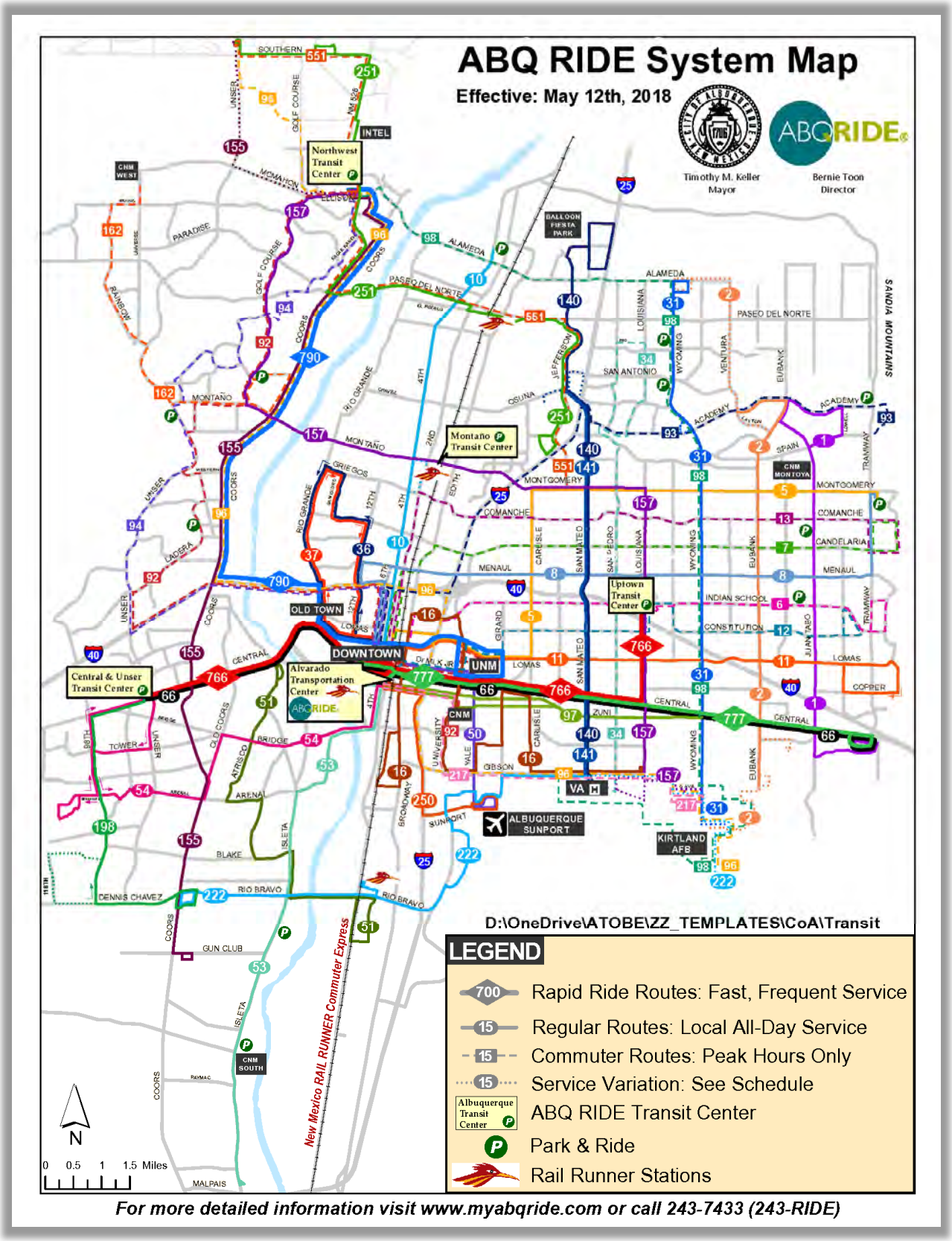
- The new development will be located on 3.9 acres of vacant undeveloped land located on the northwest corner of Holly Ave. N.E. and Ventura St. N.E.
- The site and the adjacent lands are zoned MX-L (Mixed-use, Low Density)
- No other known planned or approved developments in the influence area
- There are existing pedestrian facilities in the project area sidewalks, trails, or paths.
- There are no existing bike lanes/shoulders along Paseo del Norte or Ventura St. in the vicinity of the project. There is a bike lane planned along Ventura St.
- Paseo del Norte is classified as urban principal arterial roadway on the NMDOT Regional Roadway Functional Class Map. It is a six-lane roadway with raised divided medians, curbs and gutters and posted speed limits of 55-mph.
- Holly Ave. (East and West of Ventura St.) is classified as a major collector roadway on the NMDOT Regional Roadway Functional Class Map. It has 2-lanes, curbs and gutters, no median, no bike lane, and a 30-mph speed limit.
- Ventura St. and Barstow St. are major collectors with curbs and gutters. Ventura St. is a two-lane roadway north of W. Holly Ave. and a four-lane roadway south of W. Holly Ave with a raised median north and south of the project but no median along the frontage of the project. Barstow is a two-lane roadway with curb and gutter, a stripped median and 35 mph speed limit.
- All existing signalized intersections have lighting.

Ventura St. north of the west leg of Holly Ave. is currently constructed with one driving lane southbound. The Holly / Ventura Apartments project will construct a second southbound thru lane on Ventura St. along its frontage. Therefore, the BUILD Mitigated analysis for the intersection of the west leg of Holly at Ventura St. will analyze two southbound approach lanes on Ventura St.

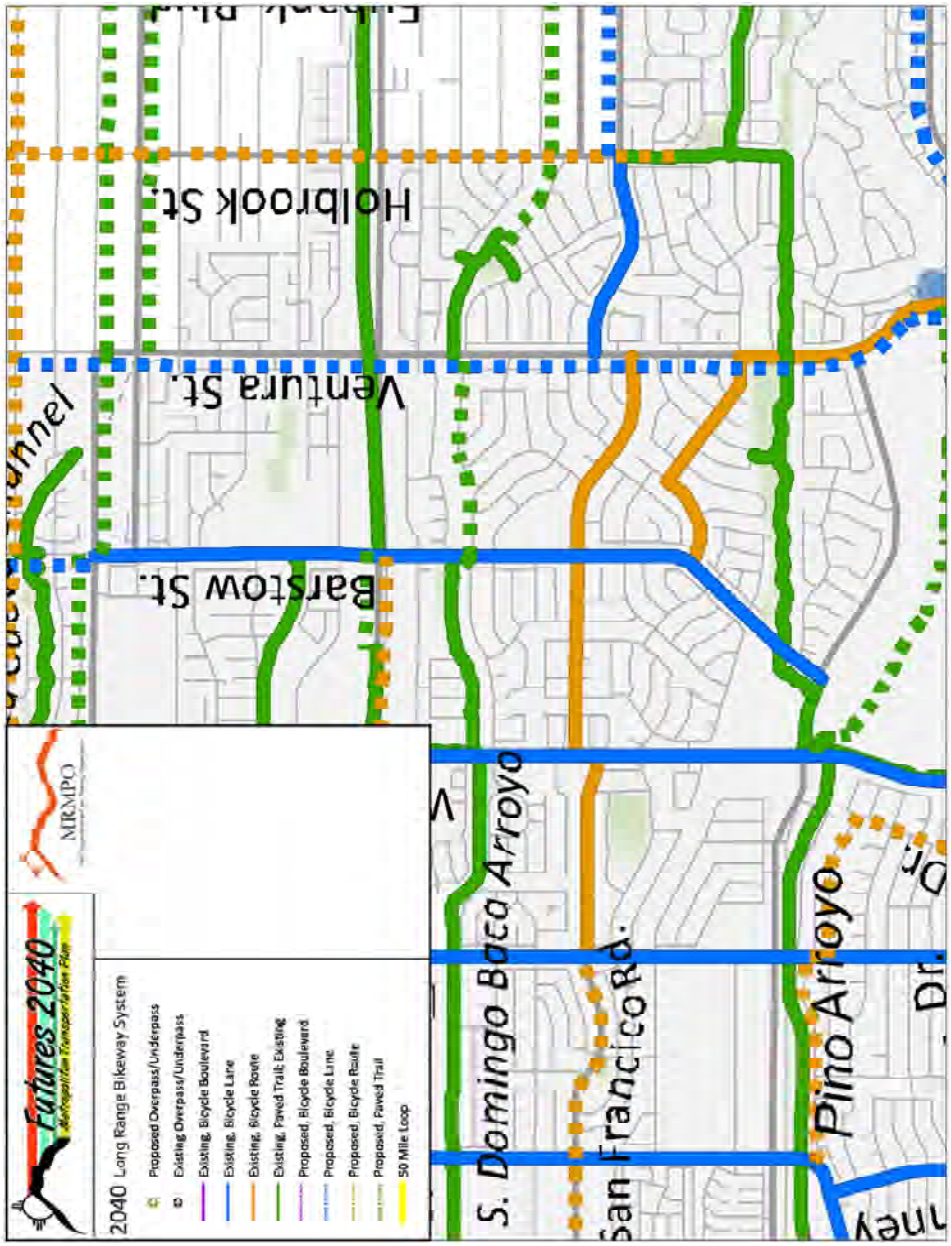
Following are portions of the following regional transportation maps for more information. These include the 2018 Traffic Flow Map, ABQ Ride (Bus) System Map, Futures 2040 Long Range Bikeway System Map.



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


ABQ RIDE System Map
Effective: May 12th, 2018
Timothy M. Keller
Mayor
Bernie Toon
Director
Northwest Transit Center
Montaño Transit Center
Uptown Transit Center
Central & Unser Transit Center
Alvarado Transportation Center
DOWNTOWN
OLD TOWN
UNM
CNM
VA
ALBUQUERQUE SUNPORT
KIRTLAND AFB
BALLOON FIESTA PARK
SANDIA MOUNTAINS
New Mexico RAIL RUNNER Commuter Express
D:\OneDrive\ATOBE\ZZ_TEMPLATES\CoA\Transit
LEGEND
Rapid Ride Routes: Fast, Frequent Service
Regular Routes: Local All-Day Service
Commuter Routes: Peak Hours Only
Service Variation: See Schedule
ABQ RIDE Transit Center
Park & Ride
Rail Runner Stations
0 0.5 1 1.5 Miles
For more detailed information visit www.myabqride.com or call 243-7433 (243-RIDE)

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)

Existing Traffic Volumes and Analysis

Existing Traffic Volumes

Starting in March of this year a shutdown of all non-essential businesses was ordered by the Governor of New Mexico due to the COVID-19 virus. It is estimated that traffic volumes in New Mexico are reduced from 20% to 40% on average due to the employment layoffs and furloughs and the high percentage of people working from their homes during this crisis period. Since normal traffic counts could not be obtained due the COVID-19 shutdown, existing traffic volumes (turning movement counts) used in this study were determined using the Data® Model and Transportation Analysis & Querying Application (TAQA) data provided by the Mid-Region Council of Governments (MRCOG). The methodology used for producing the existing traffic volume data is as follows.

1. The Streetlight Data® Model was used to generate 2019 (pre COVID-19) traffic volumes for each movement at each intersection for the AM and PM Peak Hours. Streetlight Data® does not generate 15-minute volumes, so the peak period volumes were approximated by simply dividing the peak hour volumes by four.
2. TAQA data was used to calibrate the Streetlight Data® volumes. TAQA data is generated by tube counts so it is considered more accurate than the Streetlight Data® model, but it only provides approach volumes, not volumes for each movement. So, the TAQA data was used to develop approach specific calibration factors.
3. For approaches where no TAQA data was available, the average of TAQA calibration factors for the other approaches was used. For example, if TAQA data was only available for the NB and SB movements, the average calibration factor from these movements was applied the WB and EB Streetlight Data® volumes.
4. The Streetlight Data® volumes were then multiplied by calibration factors to obtain the existing traffic volumes for each movement. See equations below.

$$\text{Existing Traffic Volume (per movement)} = \text{Streetlight Data® Traffic Volume (per movement)} \times \textit{TAQA Calibration Factor}$$

Where,

$$\textit{TAQA Calibration Factor} = \frac{\text{Total TAQA Approach Volume}}{\text{Total Streetlight Data® Approach Volume}}$$

The existing traffic volumes for each intersection in the study area based on this approach are in Appendix Pages A-3 thru A-6. These volumes are the basis of this Study.

Since no Streetlight Data® or TAQA traffic volume data exists for the Albertsons/Bank driveway on the east leg of the W. Holly Ave. and Ventura St intersection, base traffic volume data was determined using the Institute of Traffic Engineers (ITE) Trip Generation Manual (10th Edition) and Trip Distribution methodology. The number of trips generated by the Albertson's Grocery Store, Bank, Dental Office, and Swim facility during the AM and PM Peak Hours were approximated using ITE Codes 850 (Supermarket) and 912 (Drive-up Bank). See the trip generation table below.

Holly / Ventura Apartments (NW Corner)

Existing Deveolpment East of Ventura & Holly - Albertsons & Bank

Trip Generation Data (ITE Trip Generation Manual - 10th Edition)

USE (ITE CODE)		24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
DESCRIPTION		*GROSS*	*ENTER*	*EXIT*	*ENTER*	*EXIT*
Summary Sheet	Units					
Supermarket (850)	50	4,757	115	76	238	228
Drive-In Bank (912)	3.00	374	16	10	40	42
Medical-Dental Office Building (720)	4.33	79	11	3	5	12
Athletic Club (493)	10.00	-	19	12	39	24
Subtotal		**5,210**	**161**	**101**	**322**	**306**
Internal Capture			(1)	(1)	(3)	(3)
Adjusted Trips			**160**	**100**	**319**	**303**
Pass-By Trips	35%		(56)	(35)	(112)	(106)
Total Primary Trips			**104**	**65**	**207**	**197**

Analysis of Existing Conditions

An analysis of existing conditions was not conducted for this Study because the implementation year analysis is only an hour into the future.

Implementation Year and Horizon Year Volumes & Analysis

Project Generated Traffic Volumes and Growth Rates

The anticipated implementation year for this project is 2021. Since the project will generate less than 50 peak hour trips and will be constructed in one phase, a horizon year was not analyzed. The calculated **growth rates** at the intersections are 1.0 to 2.3%. See Appendix A-8 thru A-13.

Background traffic volumes were calculated by applying historical annual background traffic growth rates to the existing traffic volumes for the implementation year. The MRCOG Regional Transportation Model data from 2009 to 2018 was used to determine the historical growth rates.

Projected trips were calculated based on the Institute of Traffic Engineers (ITE) Trip Generation Manual (10th Edition). According to the Institute of Traffic Engineers' (ITE) trip generation rates, the project is anticipated to generate 10 new entering trips and 28 new exiting trips during the weekday AM Peak Hour period and 30 new entering trips and 19 new exiting trips during the PM Peak Hour period. No pass-by trips are included in the trips generated. See table below.

Holly / Ventura Apartments (NW Corner)

Trip Generation Data (ITE Trip Generation Manual - 10th Edition)

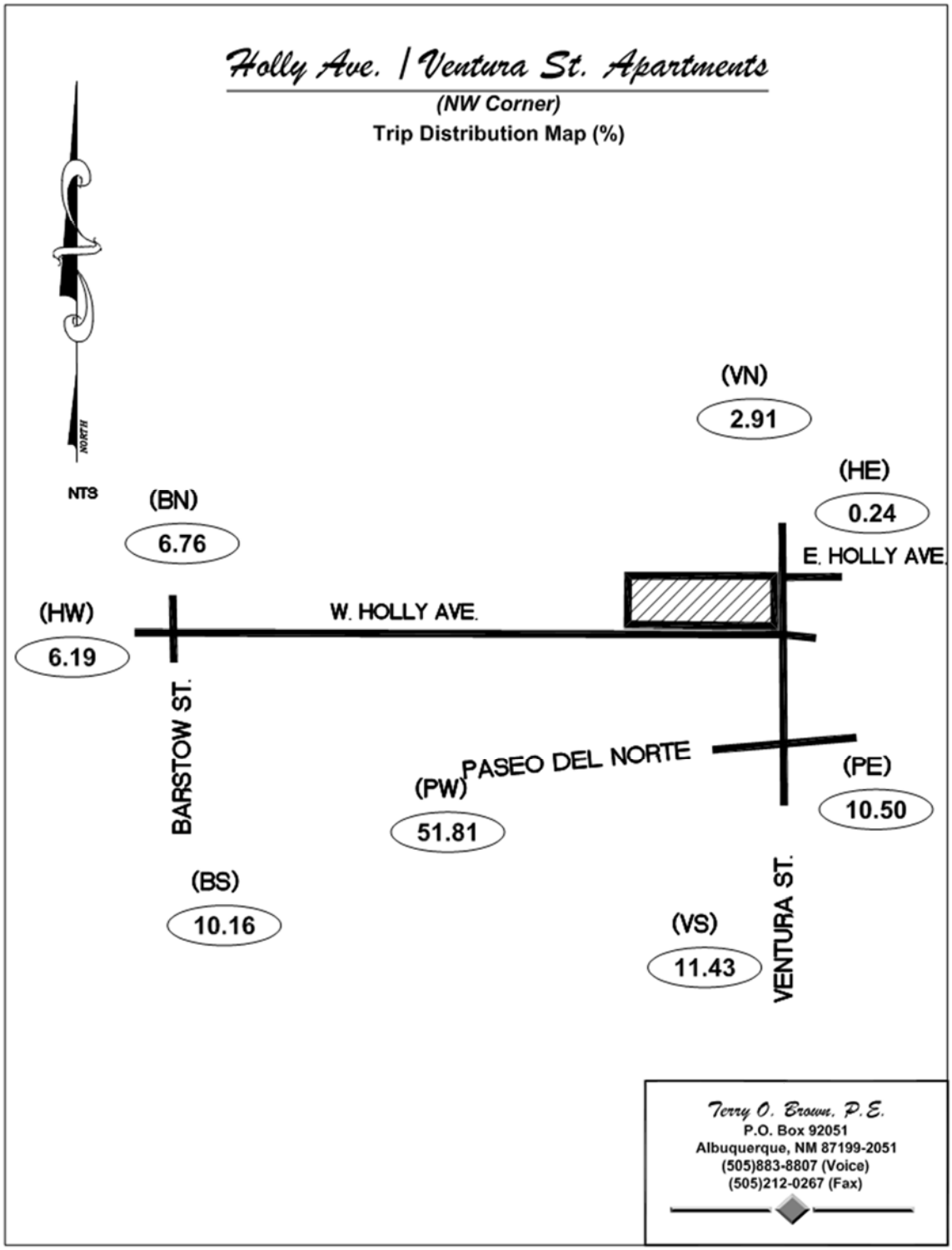
USE (ITE CODE)		24 HR VOL	A. M. PEAK HR.		P. M. PEAK HR.	
DESCRIPTION		*GROSS*	*ENTER*	*EXIT*	*ENTER*	*EXIT*
Summary Sheet	Units					
Multifamily Housing (Mid-Rise) (221)	111	602	10	28	30	19

Trip Distribution

The Gravity Model was used to determine trip distribution where primary trips for the residential land use development were distributed proportionally to the 2021 projected employment of Data Subareas regionally. Employment data for the years 2012 and 2040 were taken from the 2040 Socioeconomic Forecasts by Subareas for the Mid-Region of New Mexico supplied by the Mid-Region Council of Governments (MRCOG). Employment data from the years 2012 and 2040 was interpolated linearly to obtain 2021 employment data to utilize for this analysis. Employment Subareas were grouped based on the most likely major street(s) or route(s) to the subject development.

Due to the fact that there is neighborhood concern focused on Ventura St. from Paseo del Norte to Holly Ave., the trip assignments scenario derived from the trip distribution calculations was heavily weighted towards the Paseo del Norte / Holly Ave. along Ventura St. The reason for this is to demonstrate that even if most of the new trips from the Holly / Ventura Apartments did travel through Holly / Ventura and Paseo del Norte / Ventura, it would still only constitute only a very minor impact to the area. Thus, the trip assignments utilized for this project assumed that about 75 percent of the new trips would access the development via Ventura St. In reality, the percentage of new trips from the Holly / Ventura Apartment project that travel via Ventura St. should be 50% to 60%. This study makes a slightly conservative analysis to emphasize the minimal impact of the Holly / Ventura Apartments project on Ventura St. in the vicinity of Holly Ave. and Paseo del Norte.

The trip distribution worksheets and associated map of data Subareas are shown in the Appendix on Pages A-15 thru A-18. The residential Trip Distribution map can be found below and in the Appendix on Page A-19.


Holly Ave. / Ventura St. Apartments
(NW Corner)
Trip Distribution Map (%)
NORTH
NTS
(VN)
2.91
(HE)
0.24
E. HOLLY AVE.
(BN)
6.76
(HW)
6.19
W. HOLLY AVE.
BARSTOW ST.
PASEO DEL NORTE
(PW)
51.81
(PE)
10.50
(BS)
10.16
(VS)
11.43
VENTURA ST.
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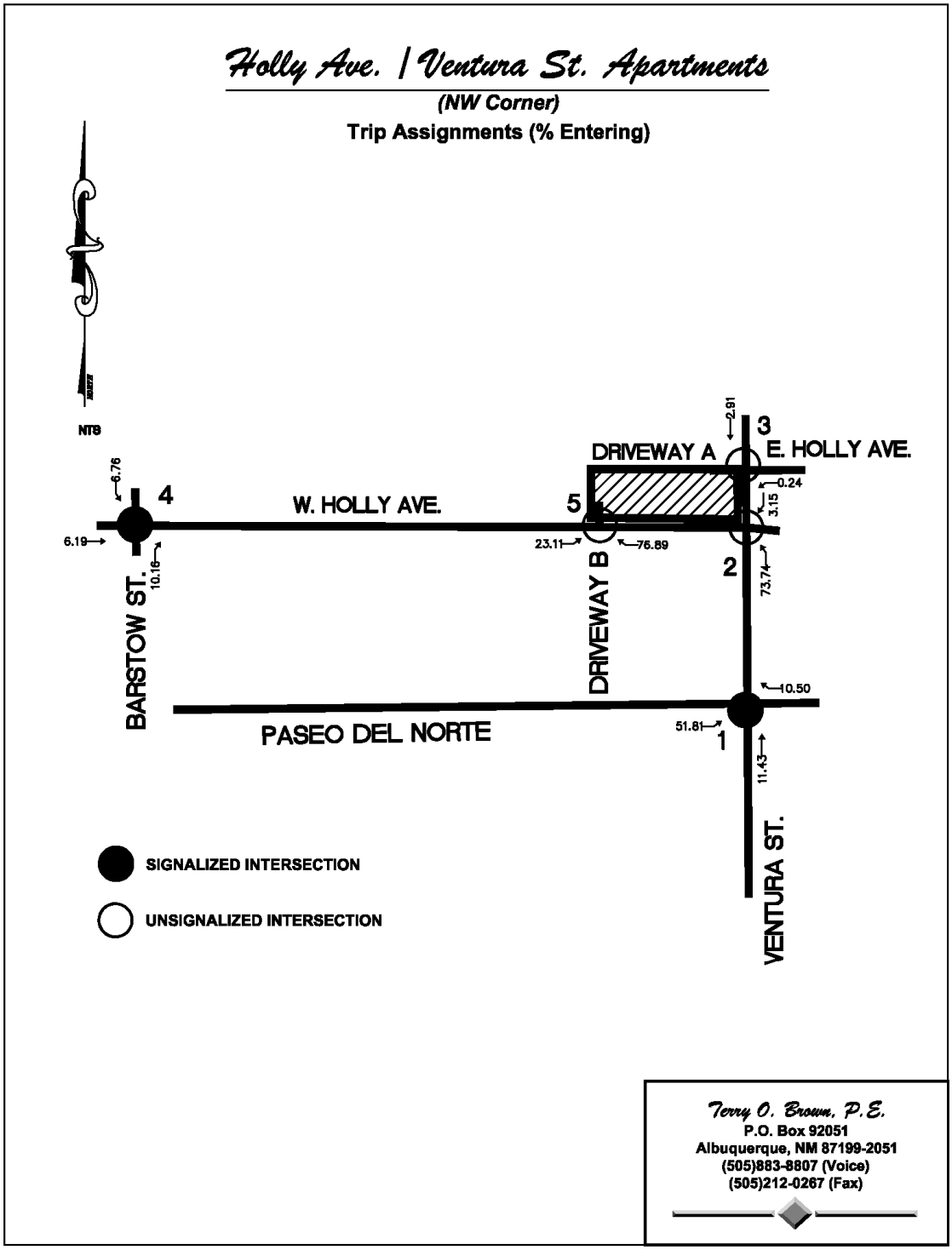
Trip assignments are first made on a percentage basis derived from data established in the trip distribution determination process and logical routing. Those percentages are then applied to the projected trips to determine individual traffic movements. Percentage trip assignments for residential trips are shown below and on Appendix on Pages A-20 thru A-21.

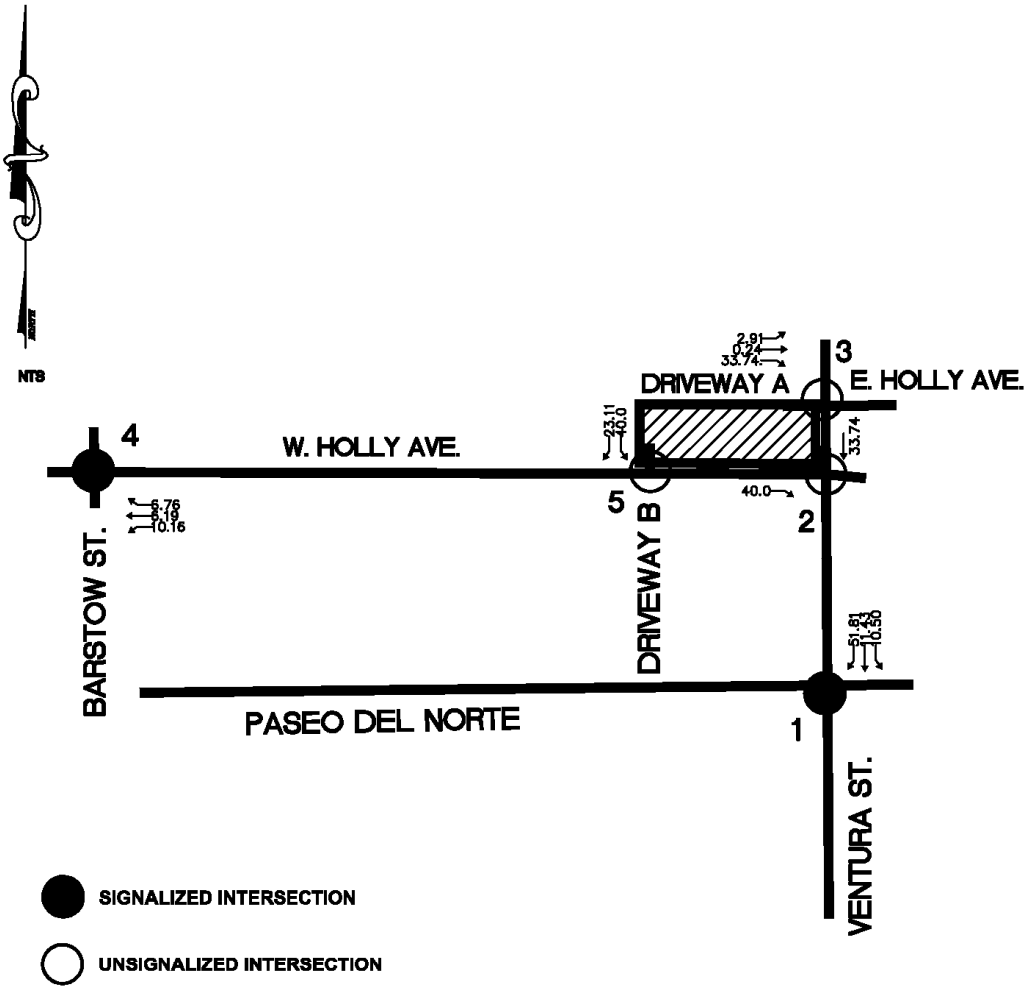
Peak hour volumes for BUILD, and NO BUILD conditions for the implementation year were calculated in accordance with the Highway Capacity Manual (HCM), 6th Edition by multiplying the peak 15-minute period turning movement counts for each condition by four. **Existing traffic volumes** were based on the analysis method described in the "Analysis of Existing Conditions" section above. **NO BUILD volumes** were generated by adjusting the demand volumes with the background traffic growth and adding the traffic volumes generated by the recent developments in the area BUILD **volumes** were calculated by adding the trips generated by the project to the NO BUIID volumes. The projected turning movement worksheets are provided in Appendix Pages A-22 thru A-26.


Holly Ave. / Ventura St. Apartments
(NW Corner)
Trip Assignments (% Entering)
NTS
W. HOLLY AVE.
E. HOLLY AVE.
DRIVEWAY A
DRIVEWAY B
BARSTOW ST.
PASEO DEL NORTE
VENTURA ST.
1
2
3
4
5
2.91
0.24
3.15
6.76
6.19
10.16
23.11
76.89
73.74
10.50
51.81
11.43
SIGNALIZED INTERSECTION
UNSIGNALIZED INTERSECTION
Terry O. Brown, P.E.
P.O. Box 92051
Albuquerque, NM 87199-2051
(505)883-8807 (Voice)
(505)212-0267 (Fax)

Holly Ave. / Ventura St. Apartments

(NW Corner)

Trip Assignments (% Exiting)



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Traffic Analysis

The Highway Capacity Manual, 6th Edition defines signalized and unsignalized intersection levels-of-service (LOS) based on the calculated average control delay of a turning movement, lane group, or overall intersection. The thresholds for various levels-of-service are summarized in the following tables:

LEVEL-OF-SERVICE CRITERIA FOR SIGNALIZED INTERSECTIONS

Average Delay (secs)	Level-of-Service
≤ 10	A
> 10 and ≤ 20	B
> 20 and ≤ 35	C
> 35 and ≤ 55	D
> 55 and ≤ 80	E
> 80	F

LEVEL-OF-SERVICE CRITERIA FOR UNSIGNALIZED INTERSECTIONS

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

A Level-of-Service D or better is an acceptable parameter in urban areas for design purposes.

A capacity analysis was conducted in accordance with the HCM6 for the signalized and unsignalized intersections using HCS7, Version 7.9, developed by McTrans Center, University of Florida.

The results of the analysis for the intersections in the study area are summarized in a table the Executive Summary and detailed in the following sections:

INTERSECTION 1 – Paseo del Norte & Ventura St. (Signalized, Existing)

The following table summarizes the 2021 Implementation Year analysis results for the signalized intersection of Paseo del Norte & Ventura St. See Appendix pages A-27 thru A-30 for analysis reports for all conditions.

Paseo del Norte/ Ventura St.
2021 Conditions
Paseo del Norte
Ventura St.
Signalized

Paseo del Norte / Ventura St. 2021 Conditions	EB (Paseo del Norte)			WB (Paseo del Norte)			NB (Ventura St.)			SB (Ventura St.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	2	3	1	2	3	>	2	1	1	1	2	1
AM Peak Hour												
NO BUILD Conditions Volumes	84	877	119	68	1,601	151	372	118	14	135	188	260
V/C Ratio	0.65	0.45	0.21	0.62	0.88	0.92	0.31	0.16	0.02	0.23	0.14	0.44
Level-of-Service	E	C	C	E	D	E	C	C	C	C	C	D
Control Delay (Seconds)	68.6	33.8	31.1	69.1	50.9	62.4	22.5	27.6	25.7	24.2	28.7	35.0
Intersection LOS	**D - 42.5**											
Queue Storage Ratio	0.1	0.0	0.3	0.1	0.0	0.0	0.3	0.0	0.1	0.9	0.0	1.3
BUILD Conditions Volumes	90	877	119	68	1,601	153	372	120	14	138	192	275
V/C Ratio	0.67	0.45	0.21	0.62	0.88	0.92	0.31	0.16	0.02	0.23	0.14	0.46
Level-of-Service	E	C	C	E	D	E	C	C	C	C	C	D
Control Delay (Seconds)	68.4	33.8	31.1	69.1	51.6	63.7	22.6	27.4	25.8	24.2	28.8	35.7
Intersection LOS	**D - 42.9**											
Queue Storage Ratio	0.1	0.0	0.3	0.1	0.0	0.0	0.3	0.0	0.1	0.9	0.0	1.3
PM Peak Hour												
NO BUILD Conditions Volumes	171	1,542	289	25	913	99	280	149	74	294	228	209
V/C Ratio	0.77	0.85	0.53	0.54	0.63	0.66	0.23	0.20	0.12	0.44	0.15	0.30
Level-of-Service	E	D	D	E	D	D	C	C	C	C	C	C
Control Delay (Seconds)	66.5	45.0	37.3	72.2	44.1	45.4	22.6	28.7	27.9	20.3	23.8	26.9
Intersection LOS	**D - 39.3**											
95th Percentile Queue (veh)	0.2	0.0	0.8	0.1	0.0	0.0	0.2	0.0	0.5	1.6	0.0	0.9
BUILD Conditions Volumes	187	1,542	289	25	913	103	280	153	74	296	231	219
V/C Ratio	0.78	0.85	0.53	0.54	0.64	0.65	0.23	0.21	0.12	0.45	0.15	0.32
Level-of-Service	E	D	D	E	D	D	C	C	C	C	C	C
Control Delay (Seconds)	66.2	45.0	37.9	72.2	44.8	45.4	22.7	28.9	27.9	20.3	23.9	27.2
Intersection LOS	**D - 39.5**											
95th Percentile Queue (veh)	0.2	0.0	0.8	0.1	0.0	0.0	0.2	0.0	0.5	1.6	0.0	1.0

Analysis of the intersection of Paseo del Norte & Ventura St. demonstrates that the proposed Holly-Ventura Apartments will have minimal adverse impact on the traffic movements at this intersection. LOS remains the same for the AM and PM Peak Hours, from the NO BUILD to the BUILD condition. The calculated intersection delays worsen by less than 0.5-second in the AM and PM Peak Hours for the BUILD Condition.

The significant delays and LOS=E in the EBL, WBL and WBR during the AM / PM peak hour may be alleviated by retiming the signal. Also, the Queue Storage Ratio exceeds 1.0 for the right and left-turn lanes on the southbound approach, for the NO BUILD and BUILD conditions indicating insufficient storage capacity in these lanes. The right-turn lane could be extended north to Holly Ave. or the righthand thru lane could be converted to a thru-right lane with a right-turn overlap to increase capacity for the right turning traffic. No additional room is available to expand the capacity of left-turn lane. However, since these are existing problems and the project does not

make the delays significantly worse, no mitigation measures are recommended as part of this project.

INTERSECTION 2 – W. Holly Ave. & Ventura St. (Unsignalized, Existing)

As shown in the aerial photograph above the WB approach (Albertsons/Bank Driveway) shows channelized right- and left-turns. According to the City of Albuquerque, the existing southbound left turn lane has recently been removed by City crews. Additionally, a second southbound thru lane along the frontage of the project will be constructed by this developer as a condition of approval. A second southbound thru lane would not be needed, though, if the City were to construct a single lane circulating roundabout at Holly Ave. / Ventura St.

The following table summarizes the 2021 Implementation Year analysis results for the unsignalized intersection of W. Holly Ave. & Ventura St. See Appendix pages A-31 thru A-38 for analysis reports for all conditions.

Holly Ave (W.)/ Ventura St.

2021 Conditions

Holly Ave (W.)

Ventura St.

Signalized

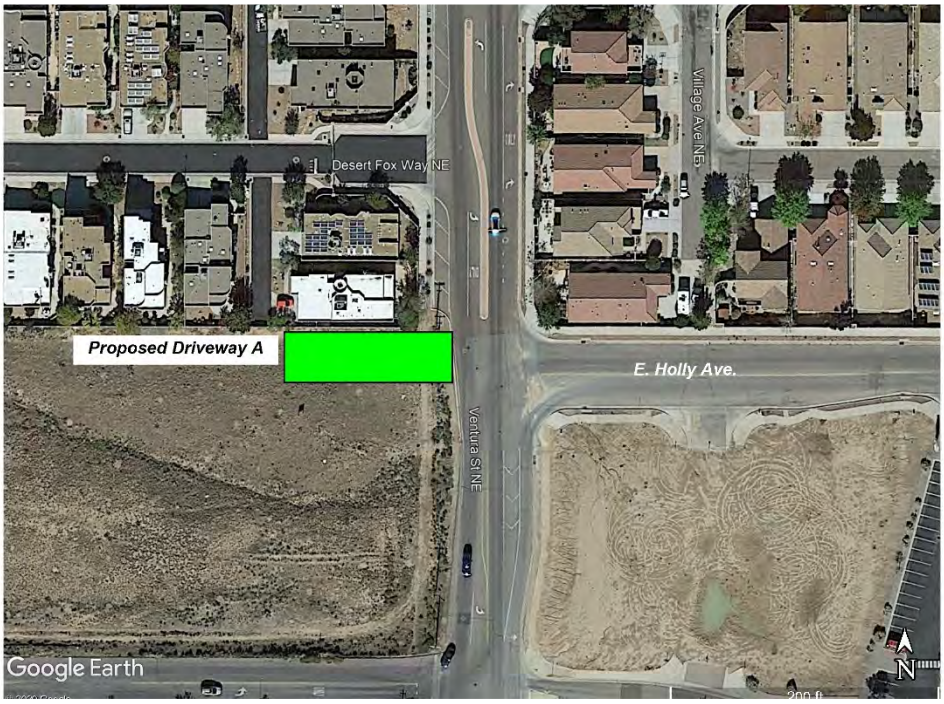
Holly Ave (W.) / Ventura St. 2021 Conditions	EB (Holly Ave (W.))			WB (Driveway)			NB (Ventura St.)			SB (Ventura St.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	1	0	1	0	0	1	1	1	1	0	1	>
AM Peak Hour												
2021 NO BUILD Conditions Volumes	52	0	103	0	0	48	91	316	45	0	388	52
V/C Ratio	0.16		0.16			0.07	0.08					
Level-of-Service	C		B			B	A					
Control Delay (Seconds)	18.1		11.7			10.3	8.5					
Intersection LOS	**TWCS**											
95th Percentile Queue (vehicles)	0.6		0.6			0.2	0.3					
Mitigated Lane Geometry	1	0	1	0	0	1	1	1	1	0	2	>
2021 BUILD Conditions Volumes	52	0	115	0	0	48	99	316	45	0	398	53
V/C Ratio	0.17		0.15			0.07	0.09					
Level-of-Service	C		B			B	A					
Control Delay (Seconds)	19.3		10.5			10.4	8.6					
Intersection LOS	**TWSC**											
95th Percentile Queue (vehicles)	0.6		0.5			0.2	0.3					
ROUNDABOUT Geometry	<	1	>	<	1	>	<	1	>	<	1	>
2021 BUILD Conditions Volumes	52	10	115	5	5	48	99	316	45	5	398	53
V/C Ratio		0.20			0.07			0.37			0.38	
Level-of-Service		A			A			A			A	
Control Delay (Seconds)		6.2			5.1			6.4			6.8	
Intersection LOS	**A - 6.4**											
95th Percentile Queue (vehicles)		0.8			0.2			1.7			1.8	

PM Peak Hour												
2021 NO BUILD Conditions Volumes	57	0	108	0	0	81	177	374	106	0	356	36
V/C Ratio	0.26		0.16			0.12	0.15					
Level-of-Service	D		B			B	A					
Control Delay (Seconds)	27.0		11.4			11.1	8.6					
Intersection LOS	**TWSC**											
95th Percentile Queue (vehicles)	1.0		0.6			0.4	0.5					
Mitigated Lane Geometry	1	0	1	0	0	1	1	1	1	0	2	>
2021 BUILD Conditions Volumes	57	0	116	0	0	81	200	374	106	0	363	37
V/C Ratio	0.29		0.14			0.12	0.17					
Level-of-Service	D		B			B	A					
Control Delay (Seconds)	30.6		10.2			11.1	8.8					
Intersection LOS	**TWSC**											
95th Percentile Queue (vehicles)	1.1		0.5			0.4	0.6					
ROUNDABOUT Geometry	<	1	>	<	1	>	<	1	>	<	o,l	>
2021 BUILD Conditions Volumes	57	5	116	5	5	81	200	374	106	5	363	37
V/C Ratio		0.20			0.13			0.54			0.38	
Level-of-Service		A			A			A			A	
Control Delay (Seconds)		5.9			6.7			3.4			1.8	
Intersection LOS	**A - 7.9**											
95th Percentile Queue (vehicles)		0.7			0.4			3.4			1.8	

LOS for the NO BUILD and BUILD conditions are C for the AM Peak Hour and D for the PM Peak Hour, therefore, no mitigation measures are recommended. However, as requested by the City of Albuquerque, a roundabout option was analyzed for this intersection. Roundabouts are often more efficient, less costly, more aesthetically appealing, and safer for all users than conventional intersection designs (https://safety.fhwa.dot.gov/intersection/innovative/roundabouts). Results of the analysis for a single lane approach, single lane circulating roundabout are provided in the Table. Results for a dual lane circulating roundabout are in the Appendix (Pages A-37 and A-39). As expected, the analysis results for a dual lane circulating roundabout are slightly better, but a single lane circulating roundabout will provide more than sufficient capacity for this intersection. Both scenarios would improve the LOS to A, significantly improve safety and increase the capacity of the intersection. Note that construction and implementation of the second southbound thru lane on Ventura St. north of Holly Ave. (west) will slightly increase average control delay for vehicles at the stop sign on Holly Ave. (eastbound). This was an unexpected increase in delay, although a minimally insignificant increase. The primary reason for the increase in delay is due to the fact that the eastbound left turn movement and the northbound left turn movement will need to cross two lanes of traffic to execute the turn instead of one. It will take slightly longer to cross two lanes, so they will need slightly longer gaps in conflicting traffic. Still, the operational characteristics of the unsignalized intersection of Holly Ave. (west) / Ventura St. are found to be acceptable.

The roundabout analysis is presented at the request of the City of Albuquerque for their own consideration and is not intended as a recommended mitigation measure for this developer. The developer of the Holly-Ventura Apartments agreed to provide the analysis of a roundabout in this Study, but not to construct the roundabout.

INTERSECTION 3 – W. Holly Ave./Driveway A & Ventura St.



The proposed Driveway "A" on Ventura St. is an exiting only driveway that should properly align with the existing east leg of Holly Ave. The following table summarizes the 2021 Implementation Year analysis results for the unsignalized intersection of E. Holly Ave. & Ventura St. See Appendix pages A-39 thru A-42 for analysis reports for all conditions.

Holly (East)/ Ventura St.
2021 Conditions
Holly (East)
Ventura St.
Signalized

Holly (East) / Ventura St. 2021 Conditions	EB (Holly (East))			WB (Holly (East))			NB (Ventura St.)			SB (Ventura St.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	0	0	0	1	0	1	0	1	1	1	1	0
AM Peak Hour												
NO BUILD Conditions Volumes	0	0	0	52	0	40	0	296	48	16	384	0
V/C Ratio				0.10		0.05				0.01		
Level-of-Service				B		B				A		
Control Delay (Seconds)				13.1		10.1				8.0		
Intersection LOS	**TWSC**											
Queue Storage Ratio				0.3		0.2				0.0		
Mitigated Lane Geometry	<	1	>	1	0	1	0	1	1	1	1	0
BUILD Conditions (Mitigated) Volumes	1	1	10	53		40	0	296	48	16	385	0
V/C Ratio		0.02		0.12		0.05				0.01		
Level-of-Service		B		B		B				A		
Control Delay (Seconds)		11.3		14.2		10.1				8.0		
Intersection LOS	**TWSC**											
95th Percentile Queue (veh)		0.1		0.4		0.2				0.0		
PM Peak Hour												
NO BUILD Conditions Volumes	0	0	0	60	0	28	0	340	92	52	300	0
V/C Ratio				0.13		0.04				0.05		
Level-of-Service				B		B				A		
Control Delay (Seconds)				13.7		10.4				8.4		
Intersection LOS	**TWSC**											
95th Percentile Queue (veh)		0.0		0.4		0.1				0.1		
Mitigated Lane Geometry	<	1	>	1	0	1	0	1	1	1	1	0
BUILD Conditions (Mitigated) Volumes	1	1	7	61	0	28	0	340	92	52	301	0
V/C Ratio		0.02		0.14		0.04				0.05		
Level-of-Service		B		B		B				A		
Control Delay (Seconds)		11.3		14.9		10.4				8.4		
Intersection LOS	**TWSC**											
95th Percentile Queue (veh)		0.0		0.5		0.1				0.1		

LOS for the BUILD condition is B for the AM and PM Peak Hour. Therefore, no mitigation measures are recommended.

INTERSECTION 4 – W. Holly Ave. & Barstow St.

The following table summarizes the 2021 Implementation Year analysis results for the unsignalized intersection of W. Holly Ave. & Barstow St. See Appendix pages A-43 thru A-46 for analysis reports for all conditions.

Holly Ave./ Barstow St.
2021 Conditions
Holly Ave.
Barstow St.
Signalized

Holly Ave. / Barstow St. 2021 Conditions	EB (Holly Ave.)			WB (Holly Ave.)			NB (Barstow St.)			SB (Barstow St.)		
	L	T	R	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	1	1	>	1	1	>	1	1	>	1	1	>
AM Peak Hour												
NO BUILD Conditions Volumes	150	40	103	36	44	84	62	406	23	41	442	53
V/C Ratio	0.46	0.38	0.00	0.12	0.34	0.00	0.11	0.38	0.00	0.07	0.44	0.00
Level-of-Service	C	B		C	B		A	A		A	A	
Control Delay (Seconds)	23.8	19.5		21.8	19.3		9.3	6.7		8.0	7.3	
Intersection LOS	**B - 11.4**											
Queue Storage Ratio	1.7	0.0		0.1	0.0		0.2	0.0		0.1	0.0	
BUILD Conditions Volumes	150	44	103	39	46	86	62	406	26	42	442	53
V/C Ratio	0.46	0.39	0.00	0.13	0.35	0.00	0.11	0.38	0.00	0.07	0.44	0.00
Level-of-Service	C	B		C	B		A	A		A	A	
Control Delay (Seconds)	23.8	19.5		21.9	19.3		9.4	6.8		8.2	7.4	
Intersection LOS	**B - 11.6**											
Queue Storage Ratio	1.7	0.0		0.2	0.0		0.2	0.0		0.1	0.0	
PM Peak Hour												
NO BUILD Conditions Volumes	75	174	198	72	1	85	101	221	97	66	323	56
V/C Ratio	0.17	0.75	0.00	0.35	0.18	0.00	0.18	0.32	0.00	0.11	0.37	0.00
Level-of-Service	B	C		C	B		B	A		B	A	
Control Delay (Seconds)	19.1	23.1		28.7	17.1		11.7	8.4		10.2	8.9	
Intersection LOS	**B - 14.6**											
95th Percentile Queue (veh)	0.8			0.3			0.3			0.3		
BUILD Conditions Volumes	75	174	198	72	1	85	101	221	97	66	323	56
V/C Ratio	0.17	0.75	0.00	0.35	0.19	0.00	0.18	0.33	0.00	0.12	0.38	0.00
Level-of-Service	B	C		C	B		B	A		B	A	
Control Delay (Seconds)	19.0	23.3		28.9	16.9		12.2	8.8		10.7	9.2	
Intersection LOS	**B - 15.0**											
95th Percentile Queue (veh)	0.8			0.4			0.3			0.3		

LOS is B for the NO BUILD and BUILD conditions for the AM and PM Peak Hours, therefore, no mitigation measures are recommended.

INTERSECTION 5 – W. Holly Ave. & Driveway B

The following table summarizes the 2021 Implementation Year analysis results for the signalized intersection of Paseo del Norte & General Chennault St. See Appendix pages A-47 thru A-48 for analysis reports for all conditions.

Holly Ave./ Driveway "B"
2021 Conditions
Holly Ave.
Driveway "B"
Signalized

Holly Ave. / Driveway "B" 2021 Conditions	EB (Holly Ave.)			WB (Driveway)			SB (Driveway "B")		
	L	T	R	L	T	R	L	T	R
Existing Lane Geometry	<	1			1	>	<	1	>
AM Peak Hour									
2021 BUILD Conditions Volumes	3	164			152	8	12		7
V/C Ratio	0.00						0.03		0.03
Level-of-Service	A						B		B
Control Delay (Seconds)	7.6						10.0		10.0
Intersection LOS	**TWSC**								
95th Percentile Queue (vehicles)	0.0						0.1		0.1
PM Peak Hour									
2021 BUILD Conditions Volumes	7	172			220	24	8		5
V/C Ratio	0.01						0.02		0.02
Level-of-Service	A						B		B
Control Delay (Seconds)	7.7						10.6		10.6
Intersection LOS	**TWSC**								
95th Percentile Queue (vehicles)	0.0						0.1		0.1

Analysis of the intersection of W. Holly Ave. and proposed Driveway B demonstrates that the proposed Holly-Ventura Apartments will have no significant adverse impact on the traffic movements at this intersection. LOS for the AM and PM Peak Hours are acceptable for the BUILD condition. The driveway shall be designed to ensure access for delivery vehicles and to maintain adequate site distances.

Impact Assessment

The proposed Holly-Ventura Apartments will have no significant adverse impacts on the adjacent transportation system; therefore, no mitigation measures are recommended for intersections in the study area.

Access Design Specifications

No significant vertical or horizontal curves exist along Holly Ave. or Ventura St. in the vicinity of the driveways and there are no structures blocking sight distances into and out of the entrances. Driveways should be designed to ensure access for fire trucks and delivery vehicles and to maintain adequate site distances.

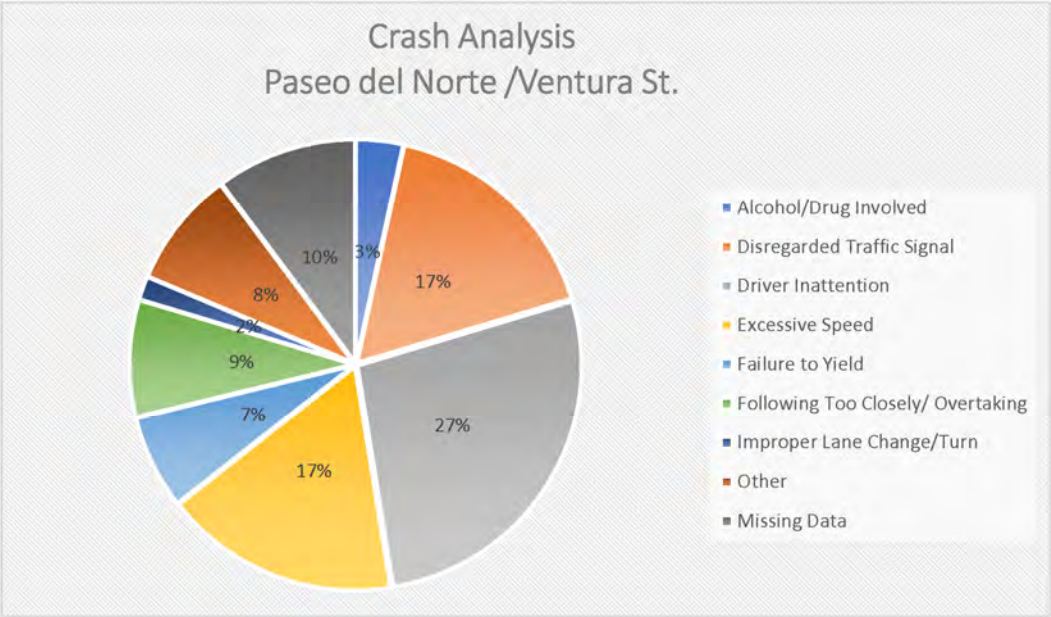
Crash Analysis

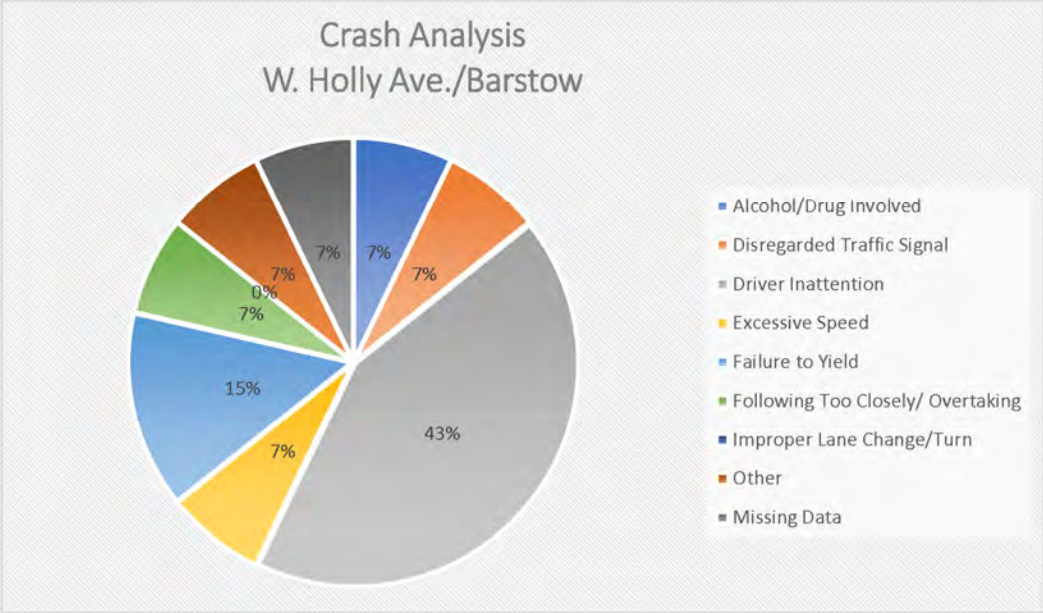
All the intersections in the study area have adequate lighting and a combination of permissive and protected/permissive left-turn phasing, and medium to low pedestrian activity level. The total number of observed crashes from 2016 through 2019 (inclusive) at each of the seven intersections in the study area was provided by the New Mexico Department of Transportation, Traffic Safety Division (Traffic Records). Data was sorted according to intersection, year, and "highest contributing factor to crash". The "highest contributing factor to crash" data was grouped into nine categories.

1. Alchohol/Drug Involved
2. Disregarded Traffic Signal
3. Driver Inattention
4. Excessive Speed
5. Failure to Yield
6. Following Too Closely/Overtaking
7. Improper Lane Change
8. Other (i.e vehicle malfunction, animal crossing, etc.)
9. Missing Data (no explanation for crash)

A summary of the crash rates (crashes per million vehicles entering) at each intersection is presented below. Only the signalized intersections, PdN & Ventura St. and W. Holly Ave. & Barstow St. had significant crash data. The other intersections had less than three total recorded crashes. The crash data tables are provided in Appendix pages A-57 thru A-58.

The average intersection Crash Rate for the Albuquerque Metropolitan Planning Area as published by the MRCOG in the "Safety Doesn't Happen by Accident, General Crash Data Trends, 2001-2010 for the Albuquerque Metropolitan Planning Area (AMPA) is 1.14 Crashes per million vehicles entering. The calculated crash rate at PdN & Ventura St. is 1.2 crashes per million vehicles, slightly above the average crash rate. The crash rate at W. Holly Ave. & Barstow St. is only 0.8 crashes per million vehicles, lower than the average crash rate. As shown in the pie charts below, over half of the crashes at PdN & Ventura St. are caused by driver inattention, disregarding the traffic signal, and excessive speed with driver inattention being the greatest cause of accidents. The crash distribution at W. Holly Ave. and Barstow St. is similar except the percentage of alcohol/drug involved crashes are double.





Sight Distance

The posted speed limit on Ventura St. north of Paseo del Norte is 35 M.P.H. The posted speed limit on Holly Ave. west of Ventura St. is 30 MPH. No significant vertical or horizontal curves exist along W. Holly Ave. or Ventura St. in the vicinity of the driveways and there are no structures blocking sight distances into and out of the entrances. Sight distances exceed 500-feet in each direction at both driveways.

Summary of Deficiencies, Anticipated Impacts, and Recommendations

In summary, the proposed Holly-Ventura Apartments will have minimal adverse impact to the adjacent transportation system, therefore, no mitigation measures are proposed in this study. Below is a summary of the findings and recommendations of the study.

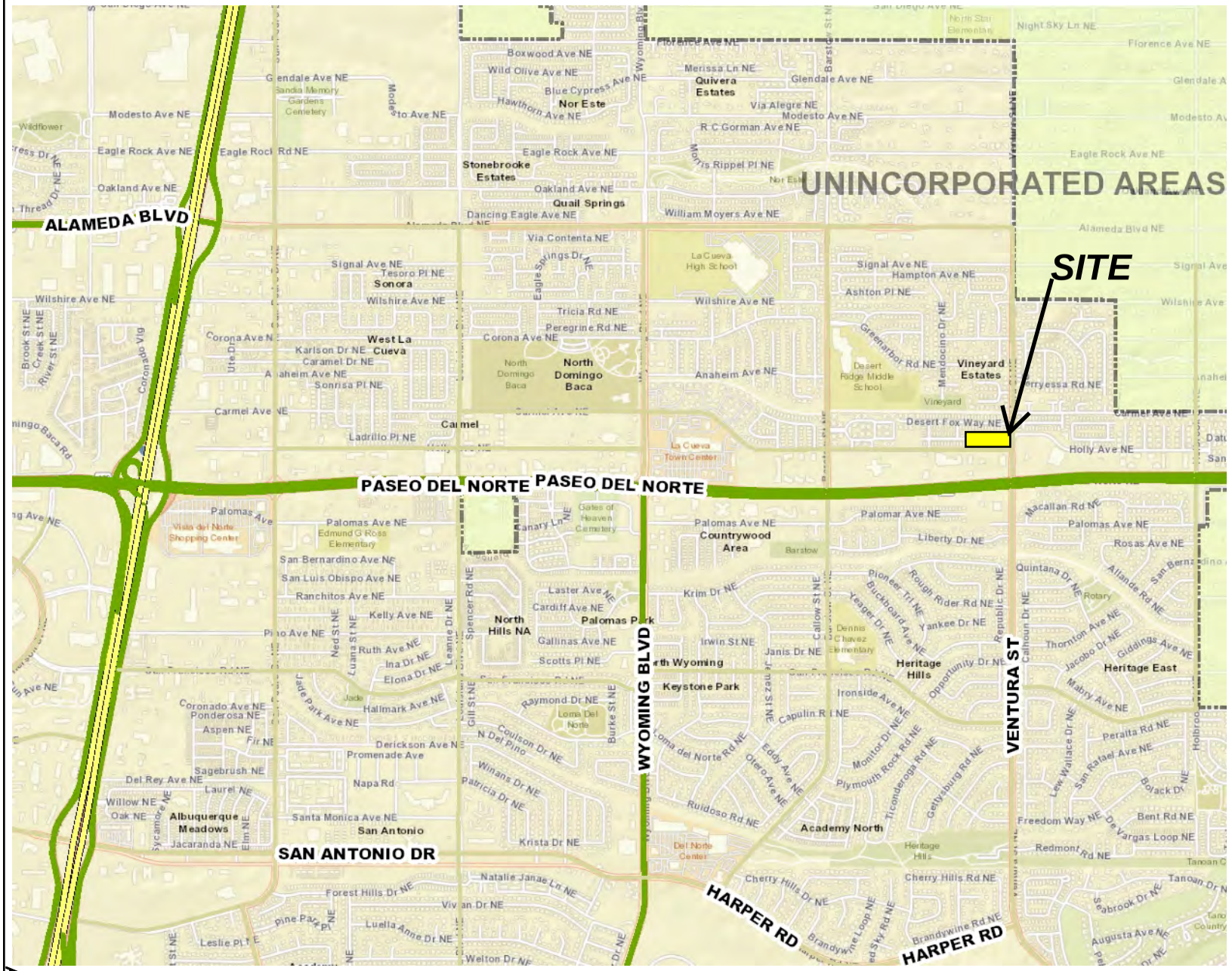
- LOS at the intersections in the study area meet the Minimum Acceptable Level of Service Standards (LOS=D or better, City of Albuquerque Development Process Manual (DPM) for NO BUILD and BUILD conditions for all intersections in the study area.
- Level of Service (LOS) remains constant for all intersections for the NO BUILD and BUILD conditions and overall intersection delays are only worse for the BUILD condition by less than two seconds.
- The significant delays and LOS=E in the EBL, EBR, WBL and WBR movements during the PM peak hour at PdN & Ventura St. intersection may be alleviated by retiming the signal. However, this is an existing problem not made significantly worse by the traffic generated by the development.
- Volume to Capacity Ratios at the intersections in the study area are less than one for all approaches except the southbound approach of PdN and Ventura St., which is an existing problem not made significantly worse by the traffic generated by the development.
- Analysis of the two roundabout scenarios for the W. Holly/Ventura intersection demonstrates that a roundabout at this intersection would improve the the LOS from B to A during the AM peak hour and from C to A during the PM peak hour.
- No significant vertical or horizontal curves exist along W. Holly Ave. or Ventura St. in the vicinity of the driveways and there are no structures blocking sight distances into and out of the entrances. **Driveways shall be designed to ensure access for fire trucks and delivery vehicles and to maintain adequate site distances.**
- Turn lane warrant analysis indicates that no turn lanes are warranted for this project at proposed driveways. See A-59 for warrant analysis results.

See Recommendations at the end of the Executive Summary of this Report.

Appendix

APPENDIX

City of Albuquerque



Legend

Arterial Streets

- Freeway
- Principal Arterial
- Minor Arterial
- BN and SF Railroad

Municipal Limits

- Corrales
- Edgewood
- Los Ranchos
- Rio Rancho
- Tijeras
- UNINCORPORATED

World Street Map

Notes

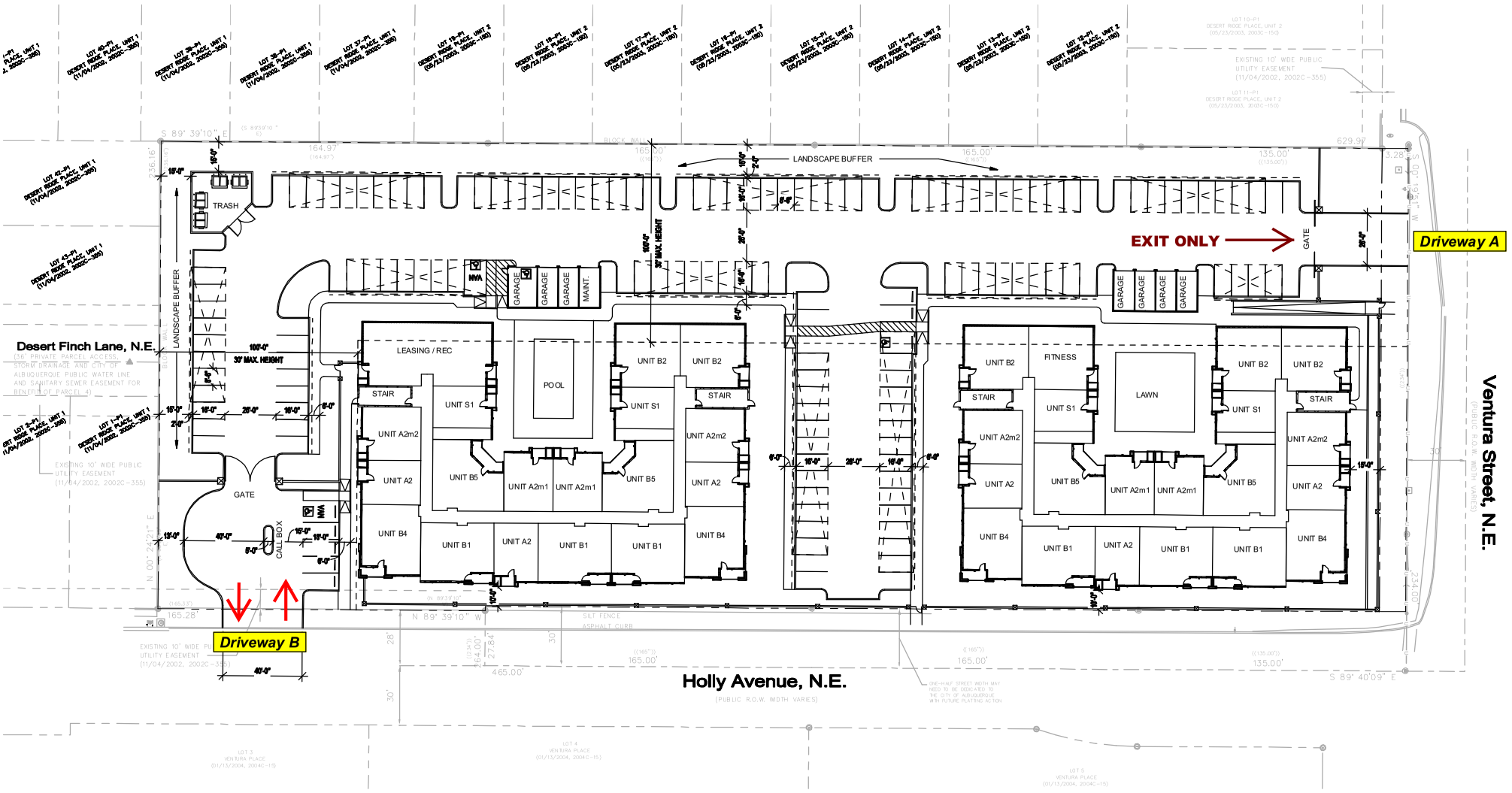
A-1

4,156 0 2,078 4,156 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere

12/14/2020

1: 24,938



PRELIMINARY SITE PLAN

REFERENCED IN : 1 /A3.30

SCALE: 1" = 30'-0"

0' 15' 30' 60'

A-2