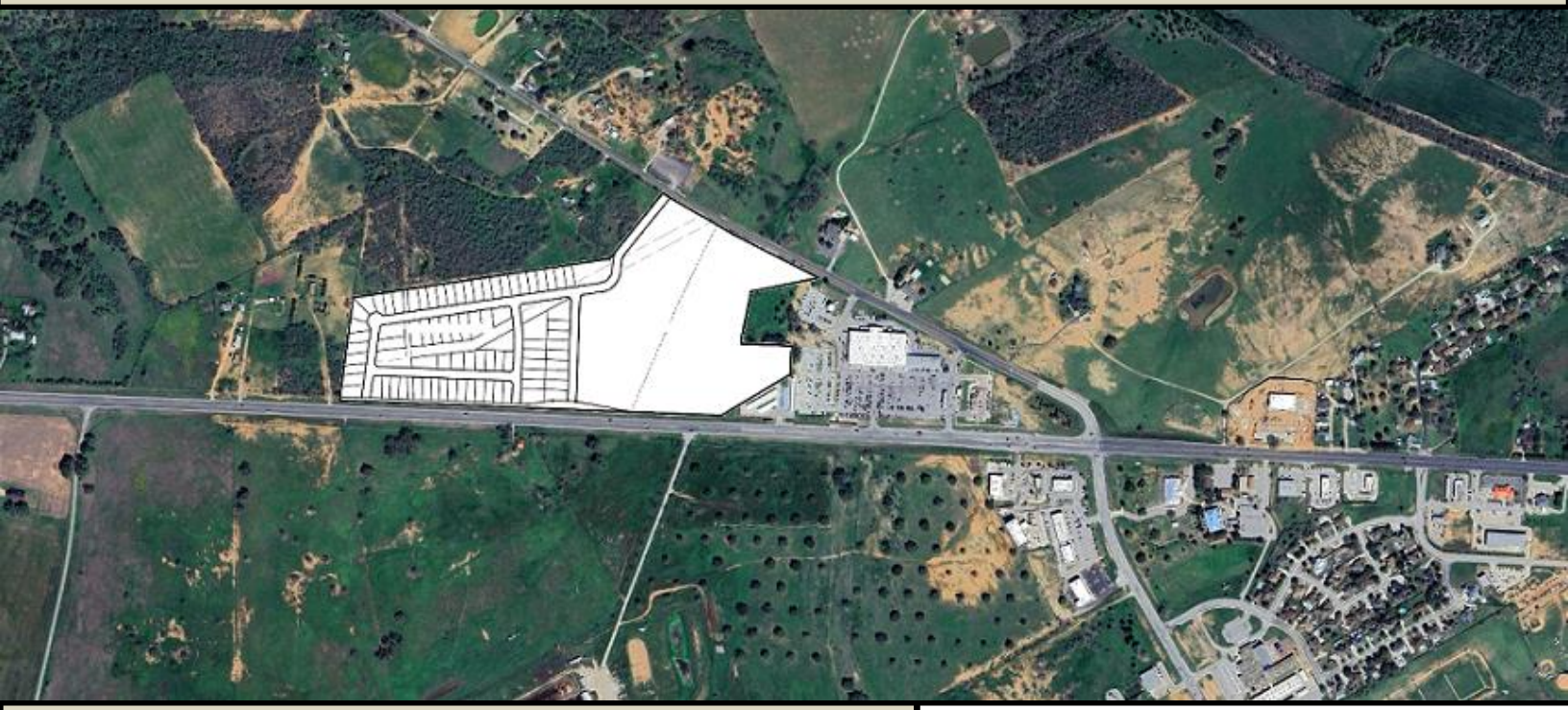
TRAFFIC IMPACT ANALYSIS

NP Homes Subdivision

US Highway 87

La Vernia, Texas



Prepared for: Intrepid Surveying & Engineering
109 Dilworth Plaza
Poth, Texas 78147

Prepared by: AC Group, LLC
5828 Sebastian Place, Suite 108
Seguin, Texas 78249

March 28, 2024
Project No. 2024000800

STATE OF TEXAS
RENE ARREDONDO
91678
LICENSED
PROFESSIONAL ENGINEER

3/28/24

AC GROUP LLC
TRANSPORTATION AND TRAFFIC ENGINEERING

Texas TBPE Firm No. F-11727

TRAFFIC IMPACT ANALYSIS

NP Homes Subdivision
La Vernia, Texas

March 2024
Version 1

Prepared by:

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Seguin, Texas 78249
(210) 535-3558
TBPE Firm Registration No. F-11727

EXECUTIVE SUMMARY

Project Description

As required by the Texas Department of Transportation (TxDOT), a Traffic Impact Analysis (TIA) has been prepared on behalf of Intrepid Surveying & Engineering for the proposed NP Homes Subdivision to be located along US Highway 87 and FM 1346 in La Vernia, Texas. The proposed NP Homes Subdivision will include as many as 81 Single-Family Residential (ITE Code: 210) lots and as many as 220 Multi-family (ITE Code: 220) residential units. The proposed subdivision would generate 145 morning peak hour trips and 188 evening peak hour trips.

Access Driveways

Access to the proposed NP Homes Subdivision will include three proposed driveways along US Highway 87 and one proposed driveway along FM 1346. The three proposed driveways along US Highway 87 will be located approximately 4,115' (Driveway No. 1), 3,260' (Driveway No. 2), and 2,920' (Driveway No. 3) west of FM 1346. The one proposed driveway along FM 1346 will be located approximately 2,850' (Driveway No. 4) north of US Highway 87.

Traffic Impact Analysis

Based on trip generation and distribution projections for the proposed NP Homes Subdivision, it is not anticipated that trips entering or exiting the proposed subdivision would have a significant impact on the surrounding roadway system, specifically US Highway87 and FM 1346.

Turn Lane Analysis

Table 2-3 of the TxDOT *Access Management Manual* requires that a left or right-turn lane be installed when turn volumes exceed 50 vehicles per hour in a 45 mile per hour (or greater) speed zone and 60 vehicles per hour in speed zones less than 45 miles per hour. US Highway 87 and FM 1346 both have a posted speed limit of 45 miles per hour in the vicinity of the proposed development; therefore the 50 vehicle per hour threshold was used for the determination of turn lane requirements. Based on entering and exiting trip projects, none of the proposed access intersections are forecasted to exceed the 50 vehicle per hour threshold and would not be required turn lane installations.

TRAFFIC IMPACT ANALYSIS
NP Homes Subdivision
La Vernia, Texas

PROJECT SCOPE

As required by the Texas Department of Transportation (TxDOT), a Traffic Impact Analysis (TIA) has been prepared on behalf of Intrepid Surveying & Engineering for the proposed NP Homes Subdivision to be located along US Highway 87 and FM 1346 in La Vernia, Texas. The proposed NP Homes Subdivision will include as many as 81 Single-Family Residential (ITE Code: 210) lots and as many as 220 Multi-family (ITE Code: 220) residential units. The proposed subdivision would generate 145 morning peak hour trips and 188 evening peak hour trips. Figure 1 below shows a location map for the proposed NP Homes Subdivision at the intersection of US Highway 87 and FM 1346 in La Vernia, Texas.

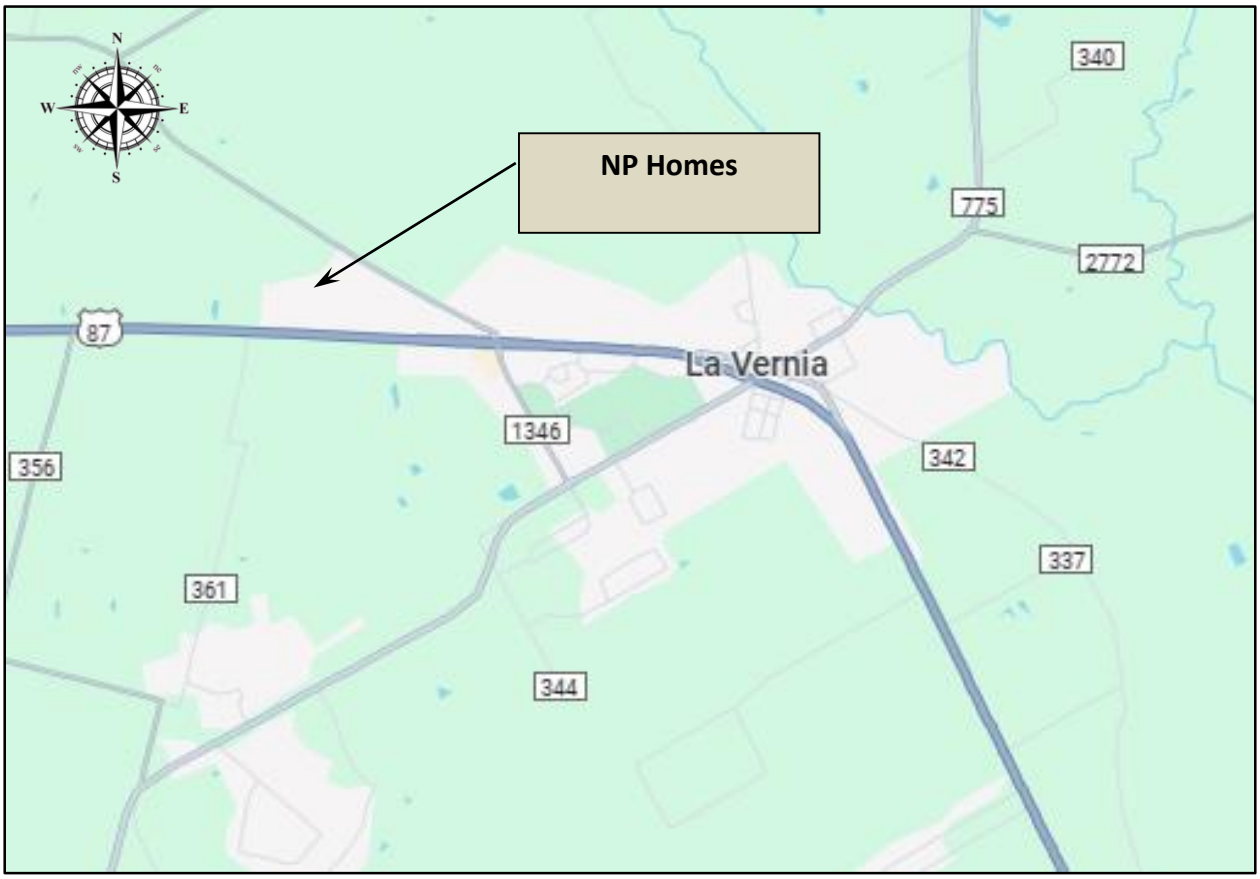


Figure 1. Location Map for the Proposed NP Homes Subdivision

Access to the proposed NP Homes Subdivision will include three proposed driveways along US Highway 87 and one proposed driveway along FM 1346. The three proposed driveways along US Highway 87 will be located approximately 4,115' (Driveway No. 1), 3,260' (Driveway No. 2), and 2,920' (Driveway No. 3) west of FM 1346. The one proposed driveway along FM 1346 will be located approximately 2,850' (Driveway No. 4) north of US Highway 87. Figure 2 below shows an aerial location map of the proposed NP Homes Subdivision at US Highway 87 and FM 1346. Figure 3 shows a site layout of the proposed NP Homes Subdivision.

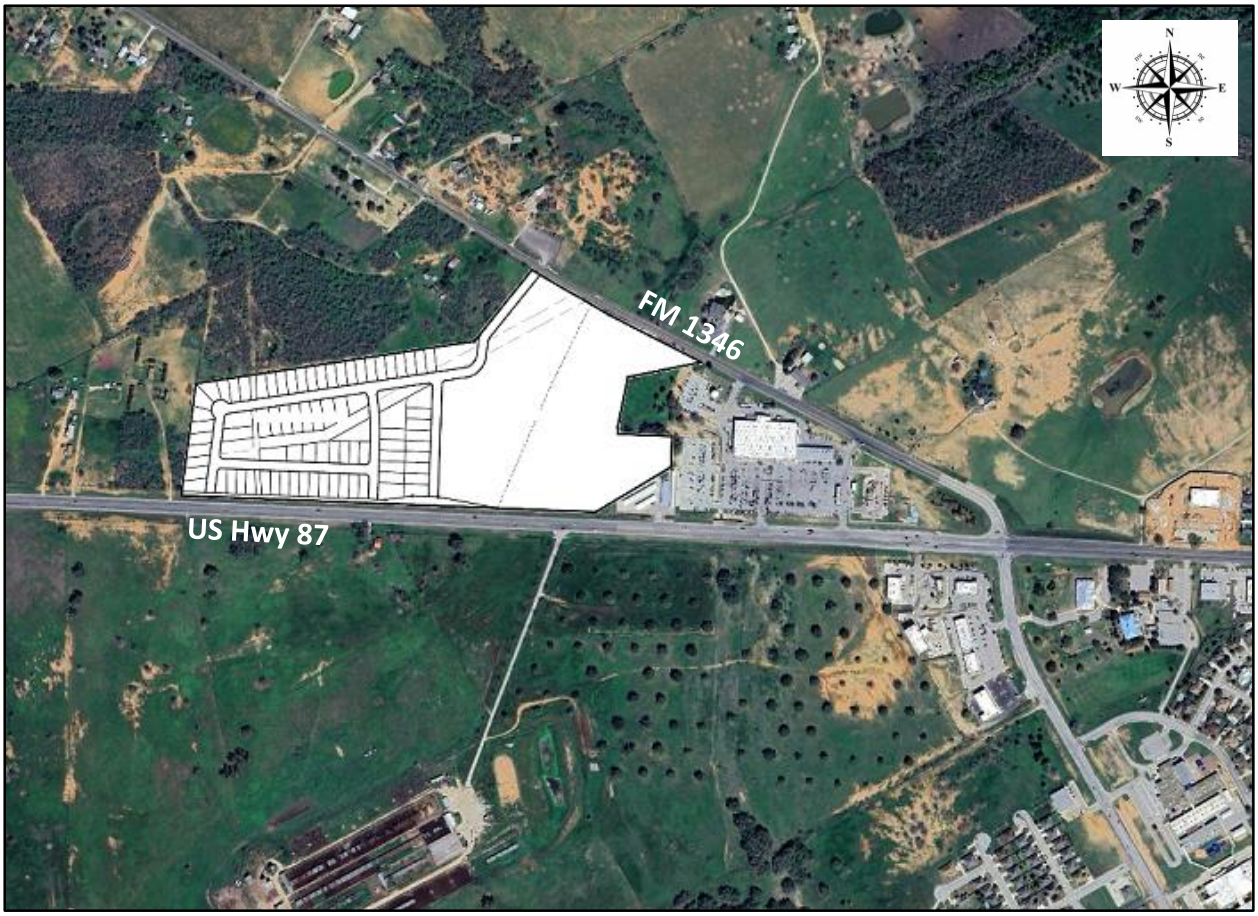


Figure 2. Aerial Location Map for the Proposed NP Homes Subdivision

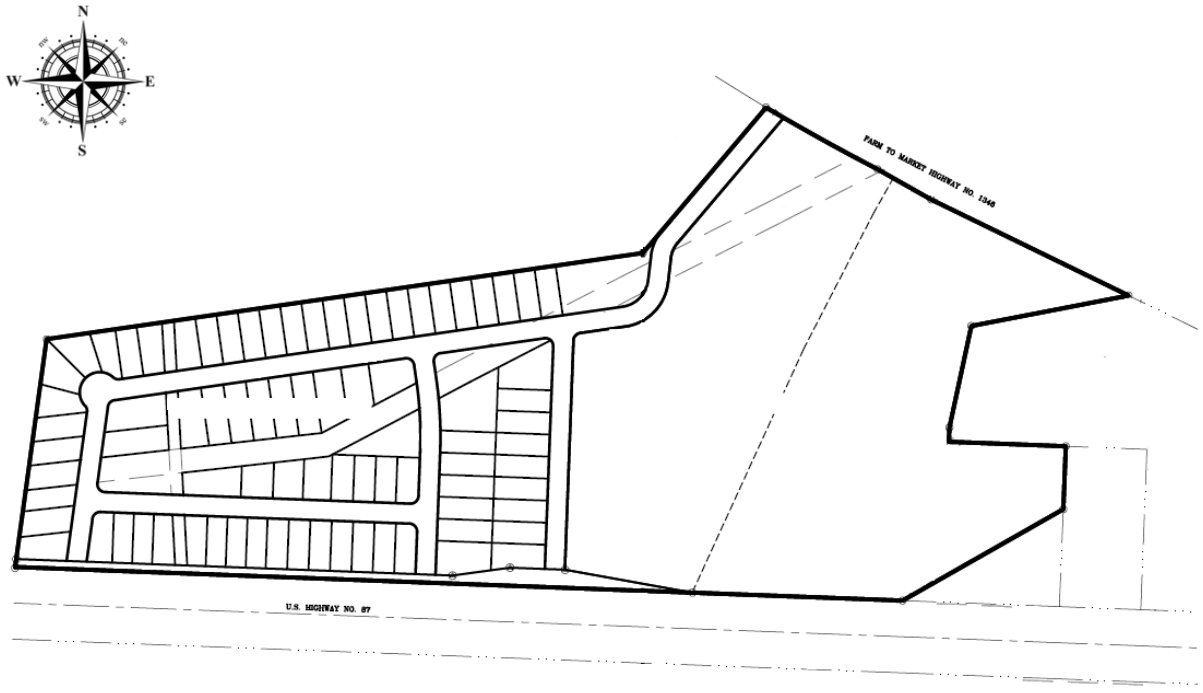


Figure 3. Site Plan for Proposed NP Homes Subdivision with Proposed Driveways

STUDY AREA

The study area for this traffic impact analysis includes each of the proposed access driveways along US Highway 87 and FM 1346. The Texas Department of Transportation (TxDOT) does require a traffic impact analysis during the access permitting process and would include each of the proposed access driveways, as shown in Figure 4 below.

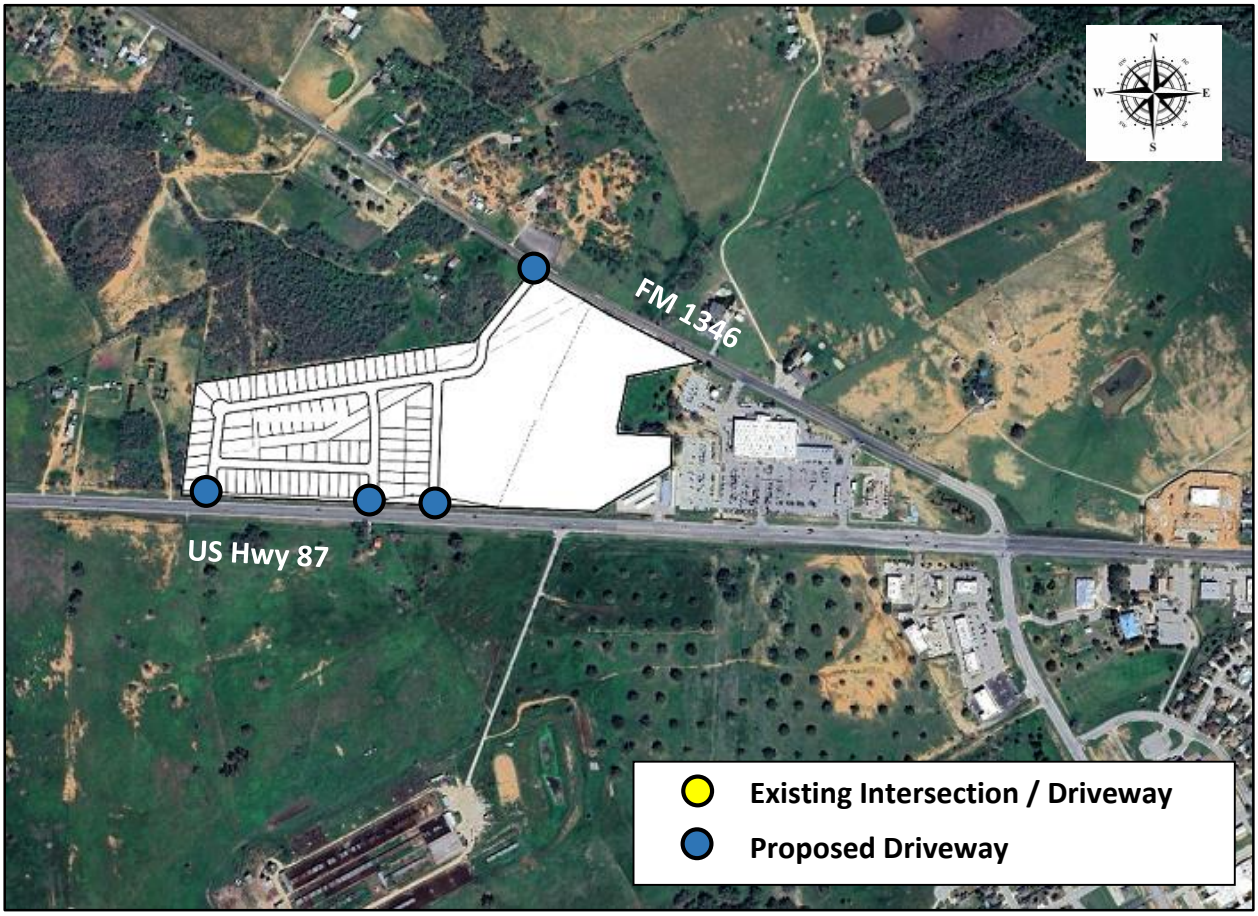


Figure 4. Study Intersections for the Proposed NP Homes Subdivision Traffic Impact Analysis

LAND USE AND ZONING

The proposed NP Homes Subdivision Development is to be located on a site zoned as General Commercial (C-2) and has a legal description of CITY OF LA VERNIA, LOT 101B, ACRES 45.75. The surrounding zoning districts include other General Commercial (C-2) and Single Family Agriculture (R-A) along US Highway 87, as shown in Figure 5 below.

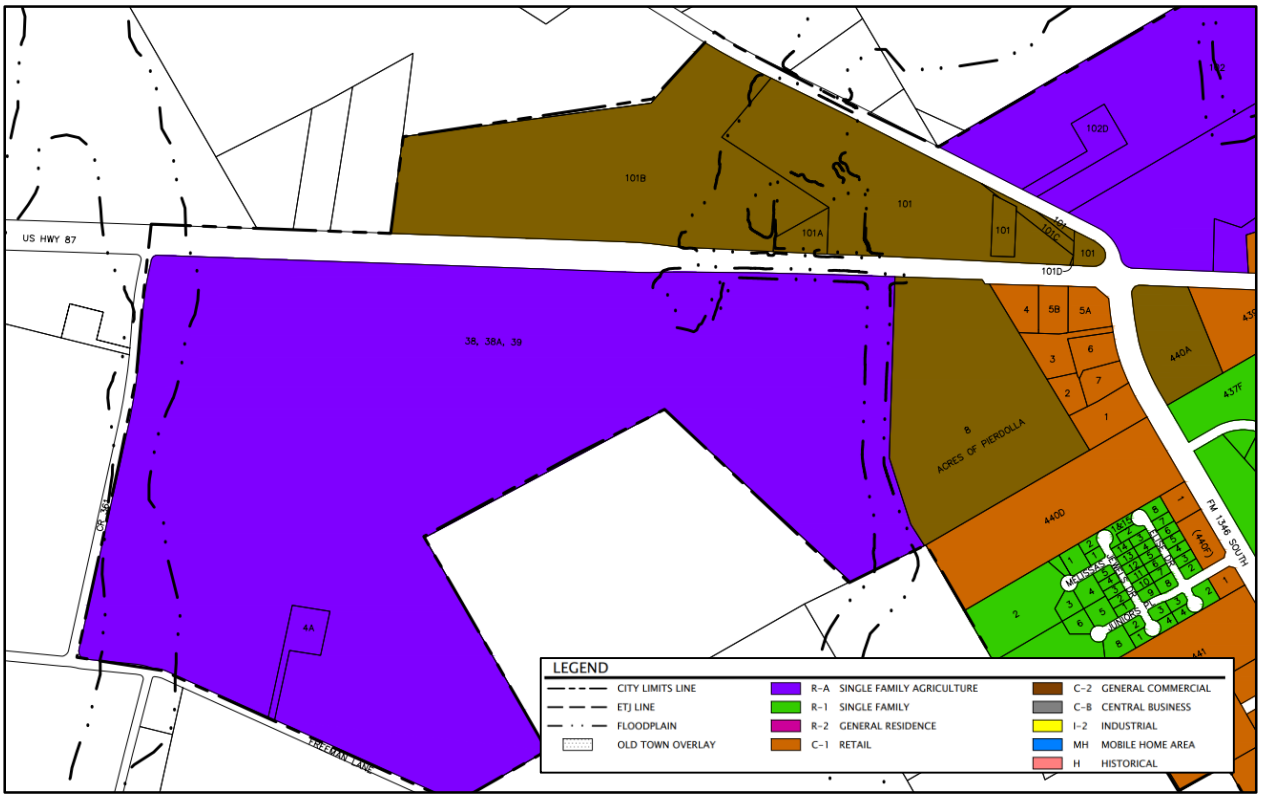


Figure 5. City of La Vernia Zoning in the Vicinity of the Proposed NP Homes Subdivision

EXISTING ROADWAYS

US Highway 87 is an uncurbed 70' wide paved roadway with two 12' lanes in each direction of travel and 11' shoulders. US Highway 87 has no sidewalks and no bicycle lanes in the vicinity of the proposed development. US Highway 87 is classified as an Existing Arterial Street (100' ROW) on the City of La Vernia Master Thoroughfare Plan (October 2019) and has a posted speed limit of 45 miles per hour adjacent to the proposed development. US Highway 87 currently has fair pavement conditions with visible pavement markings. Figure 6 below shows US Highway 87 adjacent to the proposed development. Appendix G includes the City of La Vernia 2019 Master Thoroughfare Plan updated in October 2019.

Figure 6. US Highway87 – Facing east towards FM 1346

FM 1346 is an uncurbed 30’ wide paved roadway with one 12’ lane in each direction of travel and 3’ shoulders. FM 1346 has no sidewalks and no bicycle lanes in the vicinity of the proposed development. FM 1346 is classified as an Existing Arterial Street (100’ ROW) on the City of La Vernia Master Thoroughfare Plan (October 2019) and has a posted speed limit of 45 miles per hour adjacent to the proposed development. FM 1346 currently has fair pavement conditions with visible pavement markings. Figure 7 below shows FM 1346 north of US Highway 87 and adjacent to the proposed development.

Figure 7. FM 1346 – Facing North from US Highway 87

ACCESS DRIVEWAYS

Access to the proposed NP Homes Subdivision will include three proposed driveways along US Highway 87 and one proposed driveway along FM 1346. The three proposed driveways along US Highway 87 will be located approximately 4,115' (Driveway No. 1), 3,260' (Driveway No. 2), and 2,920' (Driveway No. 3) west of FM 1346. The one proposed driveway along FM 1346 will be located approximately 2,850' (Driveway No. 4) north of US Highway 87. Figure 8 below shows the location of each of the proposed access driveways along US Highway87 and FM 1346.

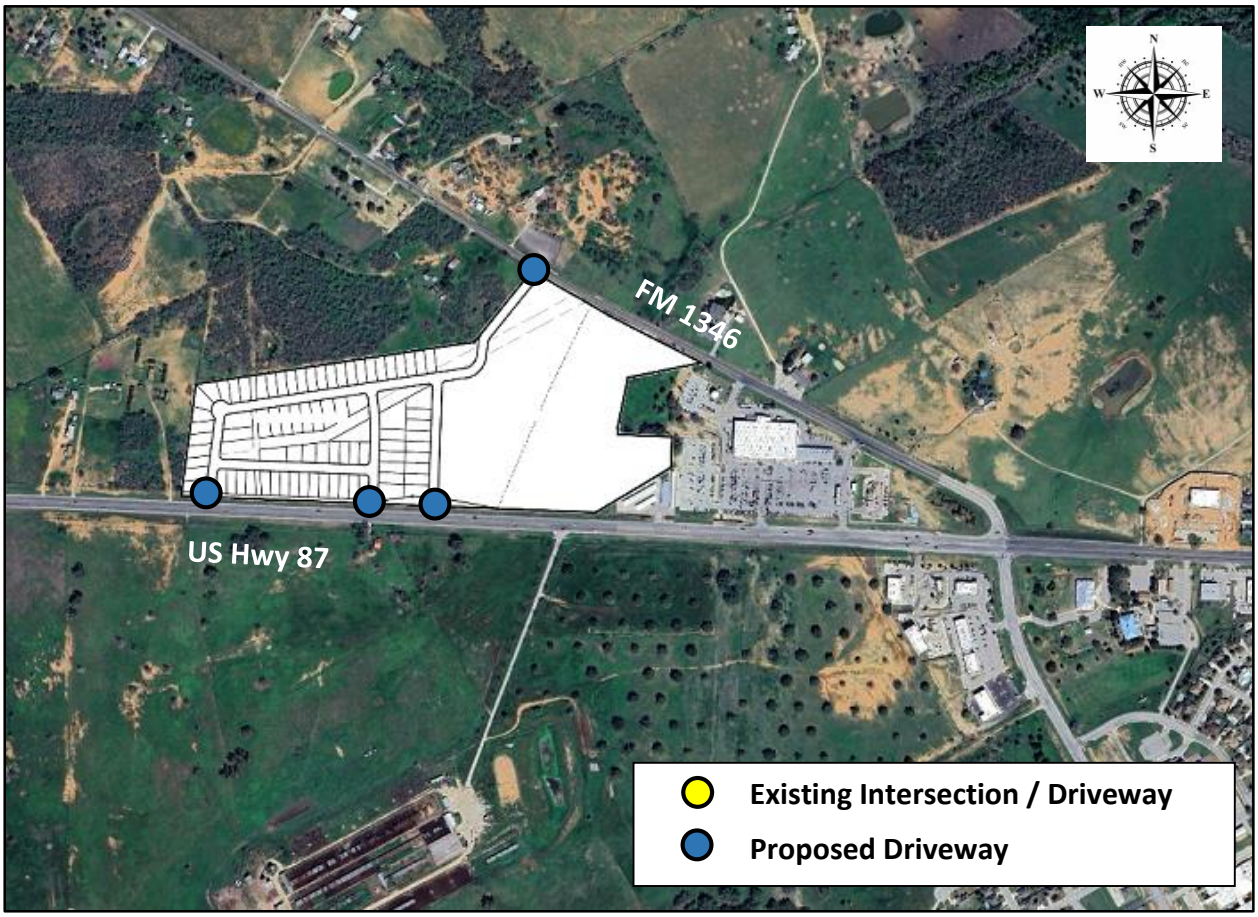


Figure 8. Existing and Proposed Access Driveways for the NP Homes

EXISTING TRAFFIC DATA

The TxDOT Traffic Count Database System (TCDS) shows that US Highway 87 east of FM 1346 had an average daily traffic (ADT) volume of 14,427 vehicles per day in 2020 and 16,809 vehicles per day in 2022. Traffic data count sheets are included in Appendix D.

BACKGROUND TRAFFIC GROWTH

An annual average growth rate (AAGR) was estimated at **8.00%** per year based on historical average daily traffic (ADT) counts available on the Texas Department of Transportation (TxDOT) Traffic Count Database System (TCDS) for 2020 and 2022. Historical average daily traffic data was available for US Highway 87 east of FM 1346. This rate represents the annual average growth rate (AAGR) for the area surrounding in the vicinity of the proposed development. The table below illustrates ADT data for US Highway 87 east of FM 1346.

Table 1. Annual Average Growth Rate for US Highway 87, East of FM 1346

Location	Year	ADT	Rate of Growth	Proposed AAGR (%)
	2020	14,427	-	
US Hwy 87	2022	16,809	0.07940	8 .00%

PROJECTED TRAFFIC DATA

Projected traffic volume data may be calculated for a 2025 project completion using a 8.00% annual average growth rate (AAGR), as determined in the previous section. The 2025 projected average daily traffic (ADT) volume for US Highway 87 east of FM 1346 and in the vicinity of the proposed development, was calculated as 21,174 vehicles per day.

TRIP GENERATION

Using the Eleventh Edition of the ITE *TRIP GENERATION MANUAL* reference, the proposed NP Homes Subdivision is projected to generate trips based on the total number of Single-Family Detached Housing (ITE Code: 210) lots and multi-family Housing (ITE Code: 220) units. Table 2 shows projected trip generation trips for the proposed NP Homes Subdivision with 81 single-family residential lots and 220 multifamily housing units.

The ITE Trip Generation Manual describes Single-Family Detached Housing (ITE Code: 210) as a site that includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

The ITE Trip Generation Manual describes a Multifamily Housing (Low-Rise) (ITE Code: 220) as housing that includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Table 2. ITE Trip Generation for the Proposed NP Homes Subdivision

TRIP GENERATION											
ITE Code	**Weekday 24 Hour**		**Weekday AM Peak**		**Weekday PM Peak**		**Saturday 24 Hour**		**Saturday Peak**	
210	**Single-Family Detached Housing**									
Rate / Lot	9.43		**0.70**		0.94		9.48		0.92	
Lots	81		**81**		**81**		81		81	
Trips	764		**57**		**76**		768		75	
% Enter/Exit	50%	50%	**26%**	**74%**	63%	37%	50%	50%	54%	46%
# Enter/Exit	382	382	**15**	**42**	48	28	384	384	41	34
220	**Multifamily Housing (Low Rise)**									
Rate / Unit	6.74		**0.40**		0.51		4.55		0.41	
Units	220		**220**		220		220		220	
Trips	1,483		**88**		112		1,001		90	
% Enter/Exit	50%	50%	**24%**	**76%**	63%	37%	50%	50%	50%	50%
# Enter/Exit	741	742	**21**	**67**	71	41	500	501	45	45
Total Trips	1,123	1,124	**36**	**109**	119	69	884	885	86	79
	2,247		**145**		188		1,769		165	

Source: *ITE Trip Generation Manual, Eleventh Edition*

TRIP DISTRIBUTION

Trip distribution for the proposed NP Homes Subdivision was based on the surrounding roadway system and anticipated routes to and from the surrounding major highway system, specifically US Highway 87 and FM 1346. Trip distribution for the proposed NP Homes Subdivision was forecasted as 10% from areas west of the proposed development traveling along US Highway87, 40% from areas east of the proposed development traveling along US Highway 87, 10% from areas north of the proposed development traveling along FM 1346, and 40% from areas south of the proposed development traveling along FM 1346. Table 3 below shows projected trip distribution for trips to be generated by the proposed NP Homes Subdivision to be located on the north-west corner of the US Highway 87 and FM 1346 intersection (west of the HEB retail center) in La Vernia, Texas.

Table 3. Trip Distribution for the Proposed NP Homes Subdivision

TRIP DISTRIBUTION								
	AM Peak				PM Peak			
Enter	EB US 87	WB US 87	NB FM 1346	SB FM 1346	EB US 87	WB US 87	NB FM 1346	SB FM 1346
	10%	40%	40%	10%	10%	40%	40%	10%
	4	14	14	4	12	47	48	12
	36				119			
Exit	EB US 87	WB US 87	NB FM 1346	SB FM 1346	EB US 87	WB US 87	NB FM 1346	SB FM 1346
	40%	10%	10%	40%	40%	10%	10%	40%
	43	11	11	44	277	7	7	28
	109				69			

TURN LANE ANALYSIS

Table 2-3 of the TxDOT *Access Management Manual* requires that a left or right-turn lane be installed when turn volumes exceed 50 vehicles per hour in a 45 mile per hour (or greater) speed zone and 60 vehicles per hour in speed zones less than 45 miles per hour. US Highway 87 and FM 1346 both have a posted speed limit of 45 miles per hour in the vicinity of the proposed development; therefore the 50 vehicle per hour threshold was used for the determination of turn lane requirements.

Proposed Access No. 1 along US Highway 87 has a projected eastbound left-turn volume of 2 vehicles per hour during the morning peak hour and 6 vehicles per hour during the evening peak hour. Based on turning volume criteria, a left-turn lane would NOT be required for proposed Access No. 1 along eastbound US Highway 87.

Proposed Access No. 1 also has a projected westbound right-turn volume of 4 vehicles per hour during the morning peak hour and 12 vehicles per hour during the evening peak hour. Based on turning volume criteria, a right-turn lane would NOT be required for proposed Access No. 1 along westbound US Highway 87.

Proposed Access No. 2 along US Highway 87 has a projected eastbound left-turn volume of 0 vehicles per hour during the morning peak hour and 0 vehicles per hour during the evening peak hour. Based on turning volume criteria, a left-turn lane would NOT be required for proposed Access No. 2 along eastbound US Highway 87.

Proposed Access No. 2 also has a projected westbound right-turn volume of 4 vehicles per hour during the morning peak hour and 12 vehicles per hour during the evening peak hour. Based on turning volume criteria, a right-turn lane would NOT be required for proposed Access No. 2 along westbound US Highway 87.

Proposed Access No. 3 along US Highway 87 has a projected eastbound left-turn volume of 2 vehicles per hour during the morning peak hour and 6 vehicles per hour during the evening peak hour. Based on turning volume criteria, a left-turn lane would NOT be required for proposed Access No. 3 along eastbound US Highway 87.

Proposed Access No. 3 also has a projected westbound right-turn volume of 12 vehicles per hour during the morning peak hour and 47 vehicles per hour during the evening peak hour. Based on turning volume criteria, a right-turn lane would NOT be required for proposed Access No. 3 along westbound US Highway 87.

Proposed Access No. 4 along FM 1346 has a projected northbound left-turn volume of 8 vehicles per hour during the morning peak hour and 24 vehicles per hour during the evening peak hour. Based on turning volume criteria, a left-turn lane would NOT be required for proposed Access No. 4 along northbound FM 1346.

Proposed Access No. 4 also has a projected southbound right-turn volume of 4 vehicles per hour during the morning peak hour and 12 vehicles per hour during the evening peak hour. Based on turning volume criteria, a right-turn lane would NOT be required for proposed Access No. 4 along southbound FM 1346.

CONCLUSION

Based on trip generation and distribution projections for the proposed NP Homes Subdivision, it is not anticipated that trips entering or exiting the proposed subdivision would have a significant impact on the surrounding roadway system, specifically US Highway 87 and FM 1346.

Turn Lane Analysis

Table 2-3 of the TxDOT *Access Management Manual* requires that a left or right-turn lane be installed when turn volumes exceed 50 vehicles per hour in a 45 mile per hour (or greater) speed zone and 60 vehicles per hour in speed zones less than 45 miles per hour. US Highway 87 and FM 1346 both have a posted speed limit of 45 miles per hour in the vicinity of the proposed development; therefore the 50 vehicle per hour threshold was used for the determination of turn lane requirements. Based on entering and exiting trip projects, none of the proposed access intersections are forecasted to exceed the 50 vehicle per hour threshold and would not be required turn lane installations.

Prepared by:

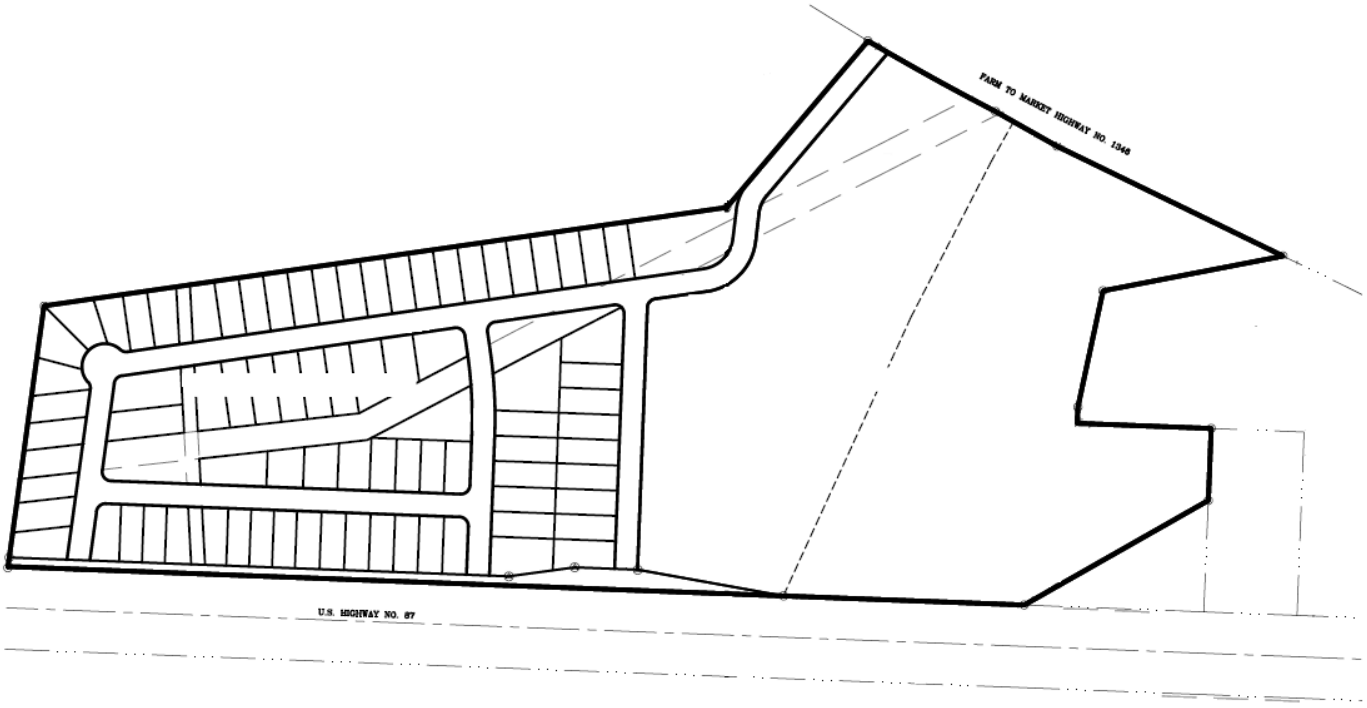
Rene Arredondo, P.E., P.T.O.E.

APPENDIX INDEX

SITE LAYOUT

EXHIBIT A

APPENDIX A



SITE LAYOUT

NP HOMES SUBDIVISION

NORTH

EXHIBIT A

AC GROUP LLC

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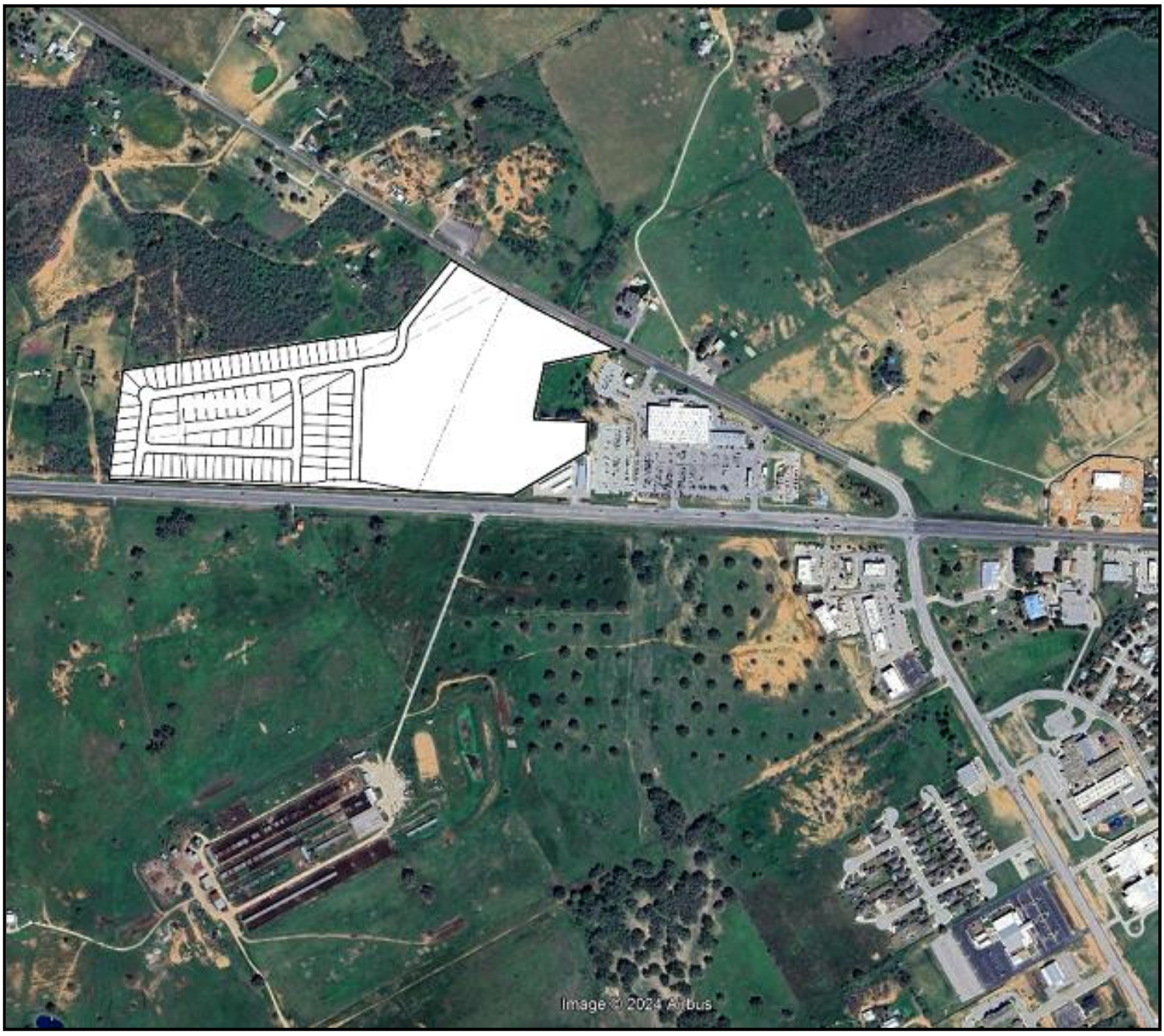
San Antonio, Texas 78250

Office: (210) 258-2447
Fax: (210) 509-9680

AERIAL PHOTOGRAPH

EXHIBIT B

APPENDIX B



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AERIAL PHOTOGRAPH

NP HOMES SUBDIVISION

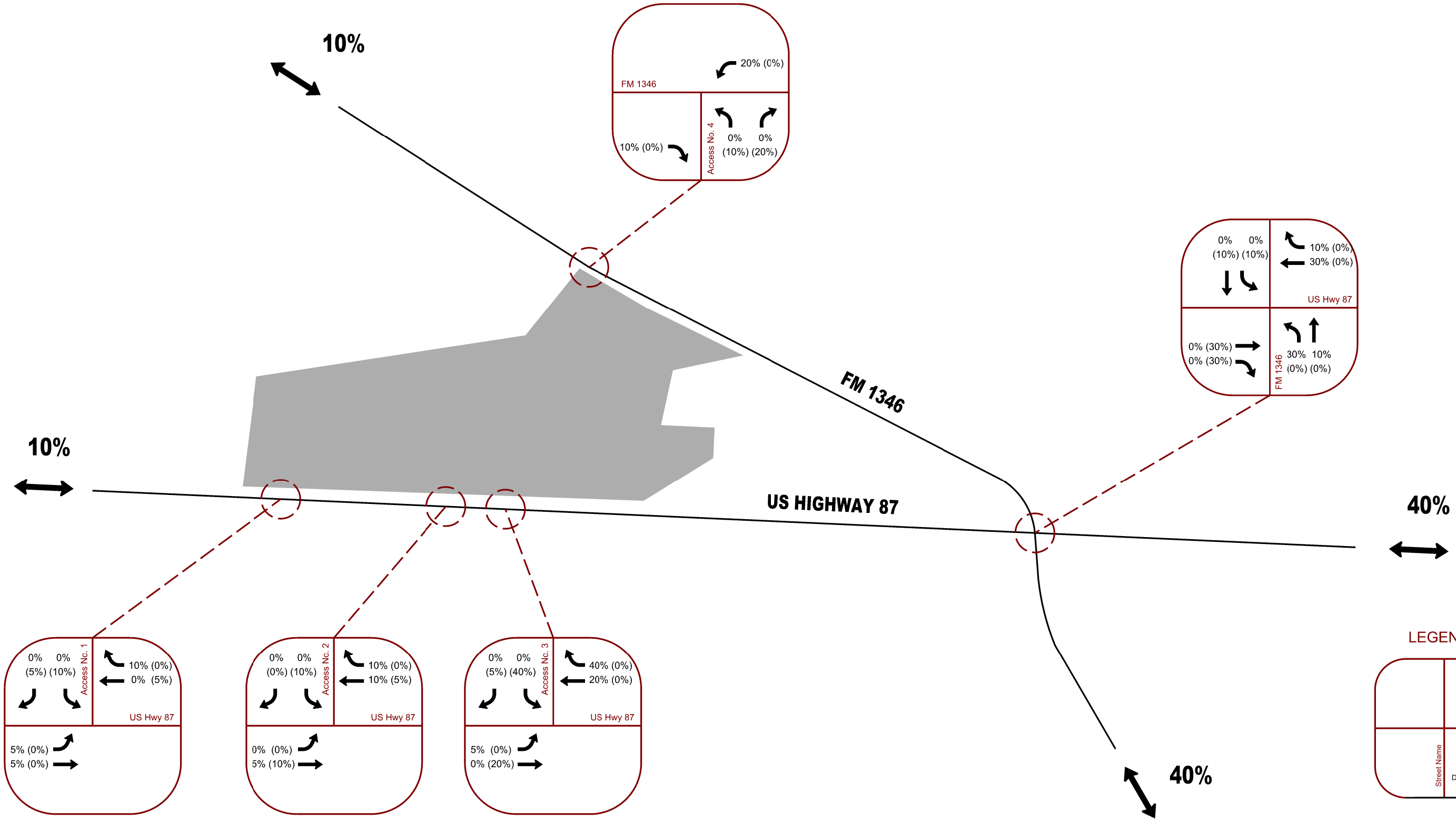
NORTH

EXHIBIT B

TRIP DISTRIBUTION EXHIBITS

- Exhibit C – Trip Generation and Distribution Percentages
- Exhibit D – Trip Generation and Distribution Volumes

APPENDIX C



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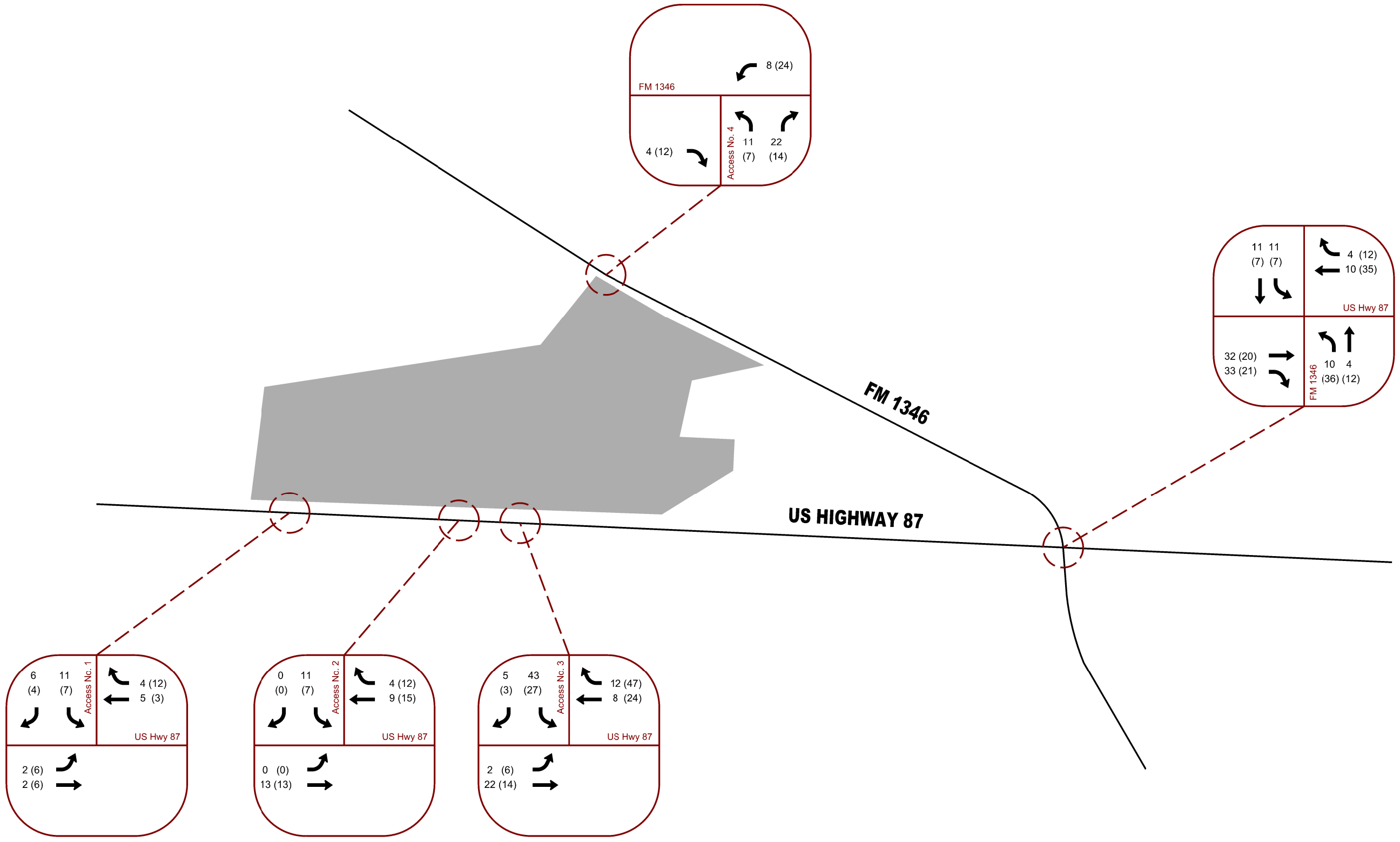
TRIP DISTRIBUTION (PERCENTAGES)

NP HOMES SUBDIVISION

EXHIBIT C



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San Antonio, Texas 78250

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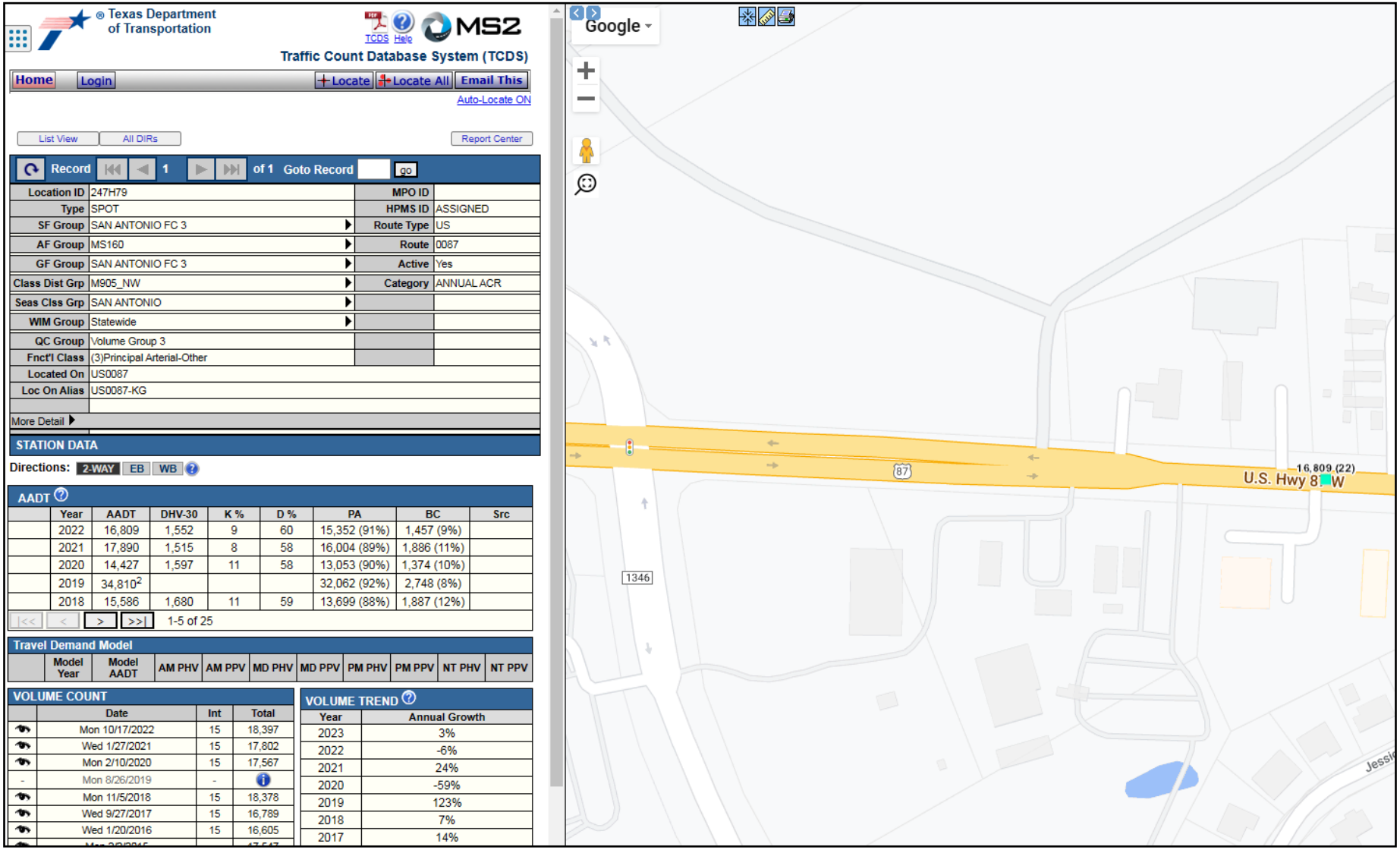
TRIP DISTRIBUTION (VOLUMES)

NP HOMES SUBDIVISION

EXHIBIT D

TxDOT TRAFFIC DATA SHEETS

APPENDIX D


Texas Department of Transportation
TCDS Help
MS2
Traffic Count Database System (TCDS)
Home
Login
Locate
Locate All
Email This
Auto-Locate ON
List View
All DIRs
Report Center
Record 1 of 1 Goto Record go
Location ID 247H79
MPO ID
Type SPOT
HPMS ID ASSIGNED
SF Group SAN ANTONIO FC 3
Route Type US
AF Group MS160
Route 0087
GF Group SAN ANTONIO FC 3
Active Yes
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Category ANNUAL ACR
Seas Clss Grp SAN ANTONIO
WIM Group Statewide
QC Group Volume Group 3
Fnct'l Class (3)Principal Arterial-Other
Located On US0087
Loc On Alias US0087-KG
More Detail
STATION DATA
Directions: 2-WAY EB WB
AADT
Year AADT DHV-30 K % D % PA BC Src
2022 16,809 1,552 9 60 15,352 (91%) 1,457 (9%)
2021 17,890 1,515 8 58 16,004 (89%) 1,886 (11%)
2020 14,427 1,597 11 58 13,053 (90%) 1,374 (10%)
2019 34,810[2] 32,062 (92%) 2,748 (8%)
2018 15,586 1,680 11 59 13,699 (88%) 1,887 (12%)
1-5 of 25
Travel Demand Model
Model Year Model AADT AM PHV AM PPV MD PHV MD PPV PM PHV PM PPV NT PHV NT PPV
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Mon 10/17/2022 15 18,397
Wed 1/27/2021 15 17,802
Mon 2/10/2020 15 17,567
Mon 8/26/2019
Mon 11/5/2018 15 18,378
Wed 9/27/2017 15 16,789
Wed 1/20/2016 15 16,605
VOLUME TREND
Year Annual Growth
2023 3%
2022 -6%
2021 24%
2020 -59%
2019 123%
2018 7%
2017 14%
Google
87
1346
16,809 (22)
U.S. Hwy 87 W

® Texas Department of Transportation

TCDS Help MS2

Traffic Count Database System (TCDS)

Home Back Login Locate Locate All

Auto-Locate ON

Volume Count Report

LOCATION INFO	
Location ID	247H79
Type	SPOT
Fnct'l Class	3
Located On	US0087
Loc On Alias	US0087-KG
Direction	2-WAY
County	Wilson
Community	La Vernia
MPO ID	
HPMS ID	ASSIGNED
Agency	Texas DOT

COUNT DATA INFO	
Count Status	Accepted
Holiday	No
Start Date	Mon 10/17/2022
End Date	Tue 10/18/2022
Start Time	10:30:00 AM
End Time	10:30:00 AM
Direction	
Notes	
Station	
Study	
Speed Limit	
Description	
Sensor Type	Axle/Tube
Source	TCDS_COUNT_IMPORT_COMBINE
Latitude,Longitude	

INTERVAL:15-MIN

Time	15-min Interval 1st	2nd	3rd	4th	Hourly Count
0:00-1:00	26	16	13	26	81
1:00-2:00	14	7	8	15	44
2:00-3:00	21	10	20	15	66
3:00-4:00	13	34	29	31	107
4:00-5:00	45	39	43	65	192
5:00-6:00	65	97	142	170	474
6:00-7:00	216	231	259	257	963
7:00-8:00	319	442	447	365	1,573
8:00-9:00	340	350	277	289	1,256
9:00-10:00	261	263	246	276	1,046
10:00-11:00	260	239	225	222	946
11:00-12:00	257	248	237	277	1,019
12:00-13:00	276	239	266	242	1,023
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14:00-15:00	258	242	272	275	1,047
15:00-16:00	287	359	396	352	1,394
16:00-17:00	479	440	394	340	1,653
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18:00-19:00	304	303	284	221	1,112
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20:00-21:00	153	140	120	96	509
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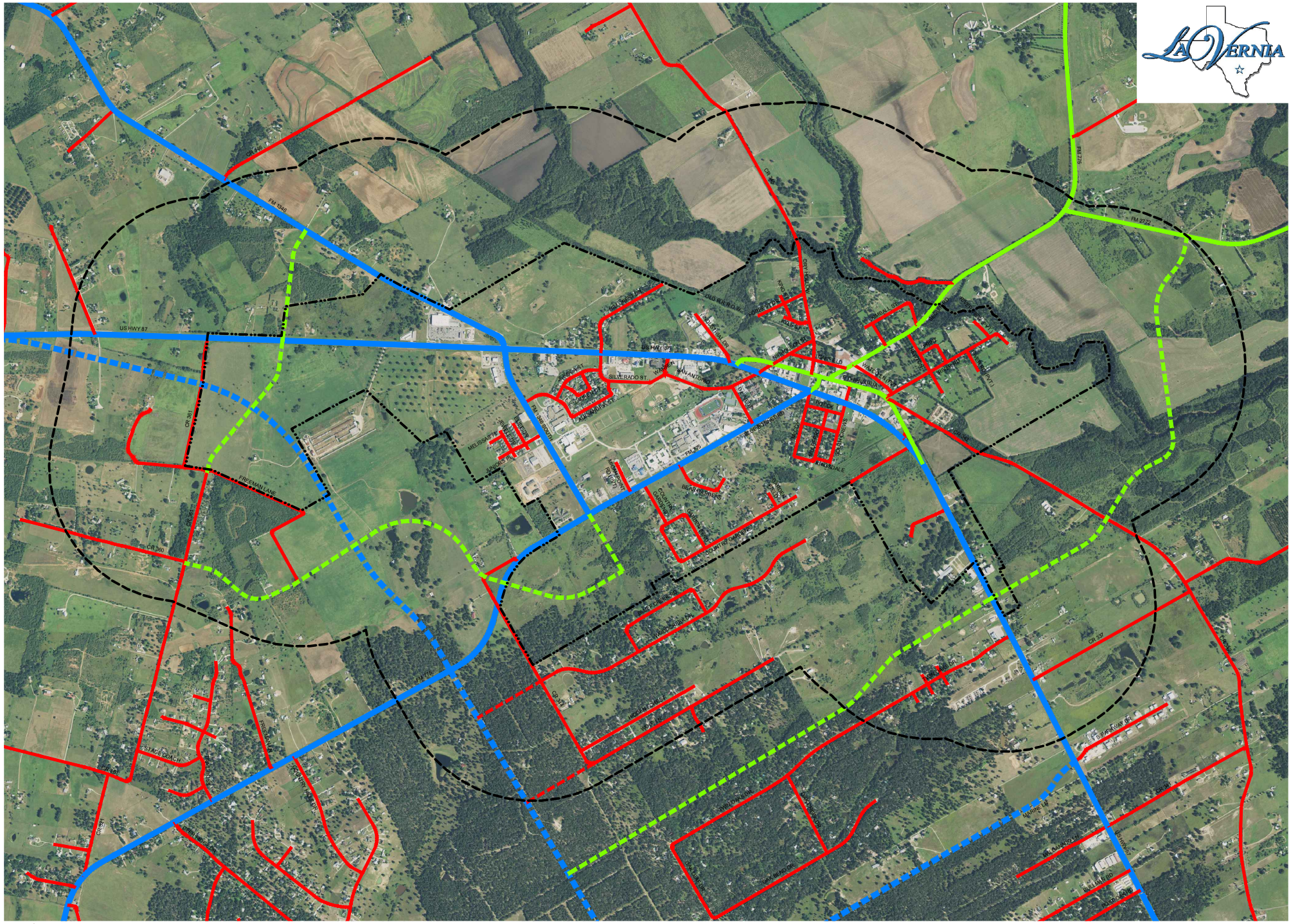
Total					18,397
AADT					16,809
AM Peak					07:15-08:15 1,594
PM Peak					15:30-16:30 1,667

CITY OF LA VERNIA
MASTER THOROUGHFARE PLAN (2019)

APPENDIX E



M&S ENGINEERING
CIVIL | ELECTRICAL | STRUCTURAL | MEP
TEXAS REGISTERED ENGINEERING FIRM F-1344

MASTER THOROUGHFARE PLAN

CITY OF LA VERNIA, TEXAS

DATE: OCTOBER 2019

S:\Active Projects_2019\72 New Braunfels Munis\pdf\21\LAVER.002 La Vernia MTP Update\dwg\Master Thoroughfare Plan Map.dwg