

TRAFFIC ANALYSIS REPORT

Manderlie III
Port St. Lucie, FL

Prepared for:
Mattamy Homes

Prepared by:



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EXECUTIVE SUMMARY

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from the Manderlie III (SG-4c) Parcel within the Southern Grove DRI. The project is located on the south side of Paar Drive, west of Village Parkway, Port St. Lucie, Florida. The applicant proposes to construct 220 single family dwelling units.

The analysis was conducted in accordance with the requirements of the City of Port St. Lucie for a project within an approved development of regional impact (Southern Grove DRI).

The proposed project is expected to generate the following net new external trips:

2,084 daily, 153 AM peak hour (40 in/113 out), and 209 PM peak hour (132 in/77 out) trips.

And the following peak driveway trips:

2,084 daily, 163 AM peak hour (42 in/121 out), and 216 PM peak hour (138 in/78 out) trips.

The analysis shows that the roadways are projected to operate acceptably with the addition of the proposed development because the project is part of the approved Southern Grove DRI, concurrency is satisfied.

The driveway entrance is a single lane roundabout.

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INTRODUCTION

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from the SG 3 Commercial Parcel. The project is located south of Discovery Way between Village Parkway and Community Boulevard in the Southern Grove DRI in Port St. Lucie, Florida. The applicant proposes to construct 220 single family residences

The analysis was conducted in accordance with the requirements of the use within an approved DRI in the City of Port St. Lucie.

Figure 1. Site Location Map



INVENTORY AND PLANNING DATA

The traffic data used in this analysis includes:

- Roadway geometrics
- Mackenzie Engineering and Planning, Inc. data collection

Kimley Horn and Associates, Inc. provided site information.

PROJECT TRAFFIC

Trip Generation

The study uses the following trip generation rates published in the Institute of Traffic Engineers' (ITE) report, *Trip Generation (11th Edition)* for Single Family Housing (ITE Land Use 210). Table 1 shows the trip generation for the site.

The proposed project is expected to generate the following net new external and driveway trips:

- 2,084 daily, 153 AM peak hour (40 in/113 out), and 209 PM peak hour (132 in/77 out) trips.

Internal Capture

The site contains no internal capture.

Pass-by Trip Capture

The pass-by trip capture rate is 0.

Table 1. Trip Generation (Concurrency Trips)

Land Use	Intensity		Daily Trips	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Proposed Use									
Single Family Detached	220	DU	2,084	153	40	113	209	132	77
NET CHANGE IN TRIPS (FOR THE PURPOSES OF CONCURRENCY)			2,084	153	40	113	209	132	77
Note: Trip generation was calculated using the following data:									
	ITE			Pass-by	AM Peak Hour		PM Peak Hour		
Land Use	Code	Unit	Daily Rate	Rate	in/out	Rate	in/out	Equation	
Single Family Detached	210	DU	$\text{Ln}(T) = 0.92 \text{Ln}(X) + 2.68$	0%	26/74	$\text{Ln}(T) = 0.91 \text{Ln}(X) + 0.12$	63/37	$\text{Ln}(T) = 0.94 \text{Ln}(X) + 0.27$	

Table 2. Peak Hour of Generator (Driveway) Trip Generation

Land Use	Intensity		Daily Trips	AM Peak Hour			PM Peak Hour		
				Total	In	Out	Total	In	Out
Proposed FLU Traffic									
Single Family Detached	220	DU	2,084	163	42	121	216	138	78
Total Proposed Driveway Volumes			2,084	163	42	121	216	138	78
Note: Trip generation was calculated using the following data:									
	ITE			Pass-by	AM Peak Hour		PM Peak Hour		
Land Use	Code	Unit	Daily Rate	Rate	in/out	Rate	in/out	Equation	
Single Family Detached	210	DU	$\text{Ln}(T) = 0.92 \text{Ln}(X) + 2.68$	0%	26/74	$T = 0.71 (X) + 7.23$	64/36	$\text{Ln}(T) = 0.93 \text{Ln}(X) + 0.36$	

TRAFFIC DISTRIBUTION

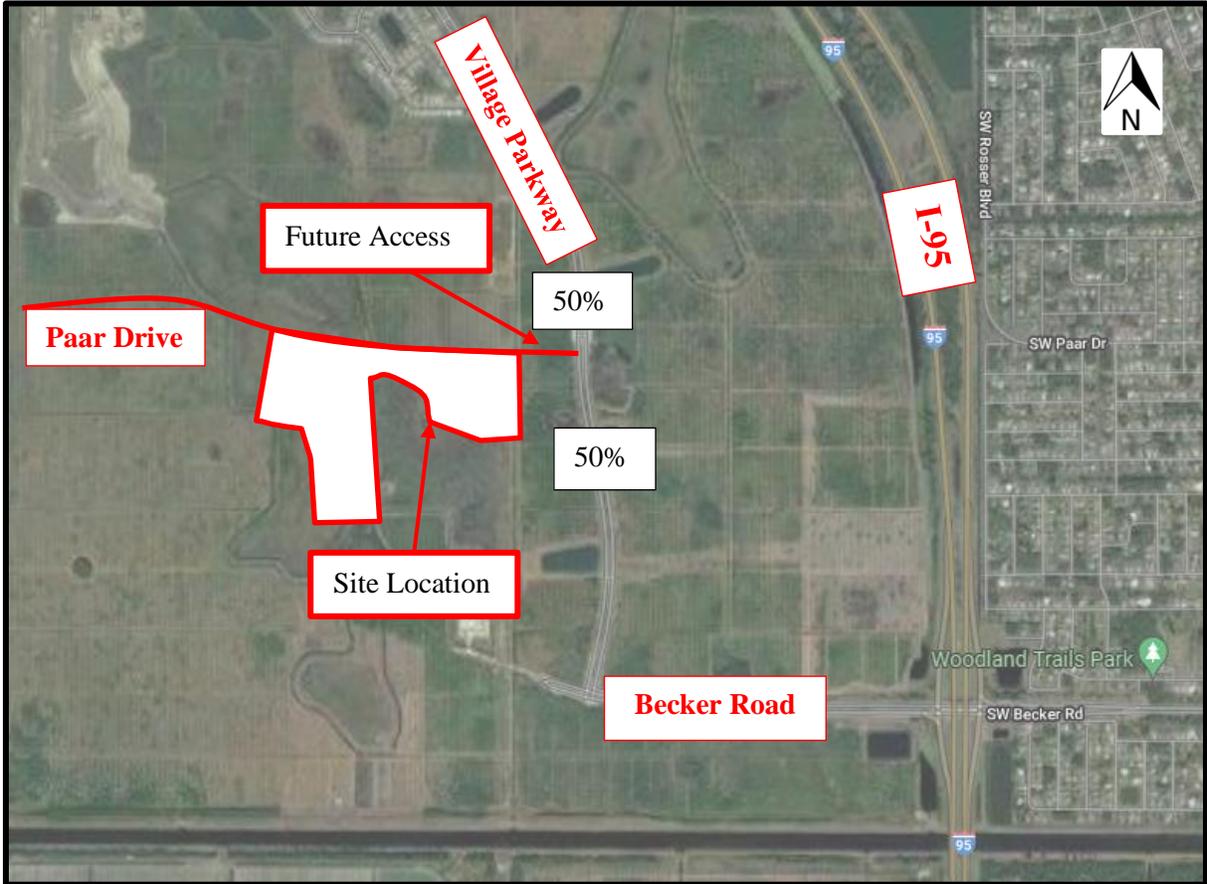
Traffic distribution and assignment was determined using engineering judgment, trip lengths, surrounding uses and review of the roadway network. The overall distribution is summarized by general directions and is depicted below:

- NORTH - 50 percent
- SOUTH - 50 percent

TRAFFIC ASSIGNMENT

The distributed external trips for the project were assigned to the roadway network within the radius of influence. The project assignment is shown in Figure 2.

Figure 2. Traffic Assignment



HISTORICAL GROWTH

Historic growth rate was determined based on FDOT Traffic Online data as shown in Table 3. The historic annual growth on the surrounding facilities between 2015 and 2019 is 9.7%.

Table 3. Growth Rate Calculation

Road Name	ID #	From	To	2015	2016	2017	2018	2019	Annual Absolute Growth	Growth Rate
Becker Rd	948005	Village Pkwy	I-95		1,550			4,300	917	21.3%
	947067	I-95	PSL Blvd		9,900			13,200	1100	8.3%
Gatlin Blvd	945075	I-95	Savage Blvd	28,500	36,500	34,000	38,000	50,500	4550	9.0%
Total								68000	6567	
								Weighted Average		9.7%
Growth Rate Used										9.7%

DRIVEWAYS

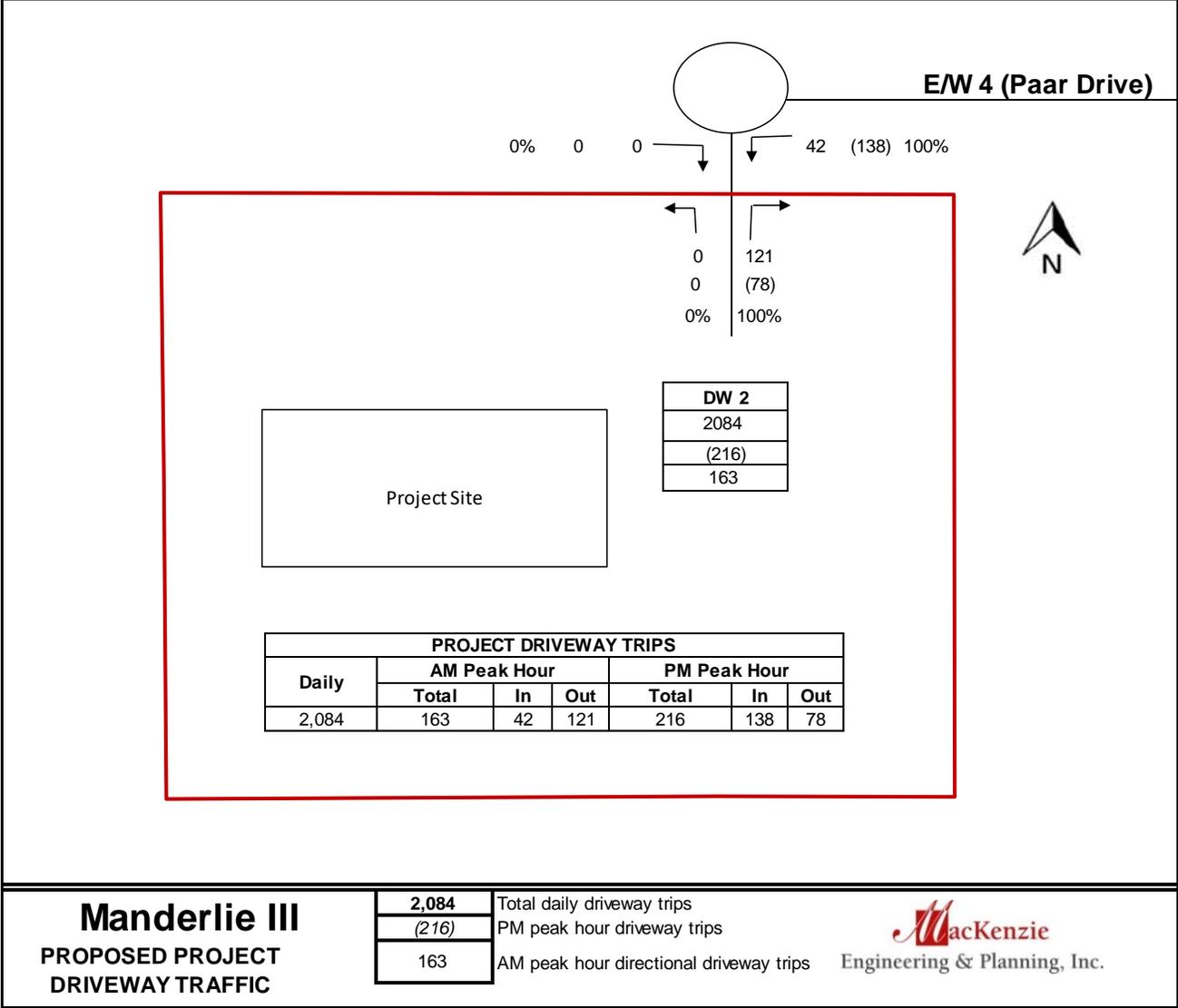
Proposed Access

The site proposes one (1) points of access along an unbuilt portion of E/W 4 (Paar Drive):

- DW 1 – Full Opening

Figure 3 shows the proposed driveway volumes.

Figure 3. Driveway Map



Driveway 1 (West) & E/W 4 (Paar Drive)

Driveway 1 is a roundabout (full opening). No turn lanes are required.

CONCLUSION

MacKenzie Engineering and Planning, Inc. performed an analysis of the traffic impacts resulting from the Manderlie III (SG-4c) Parcel within the Southern Grove DRI. The project is located on the south side of Paar Drive, west of Village Parkway, Port St. Lucie, Florida. The applicant proposes to construct 220 single family dwelling units.

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The driveway entrance is a single lane roundabout.

APPENDICES

Exhibit 1. Trip Generation

A- Institute of Transportation Engineers (ITE) Trip Generation Rates:

- Single Family Housing (ITE Use 210)

B- Site Plan

Exhibit 1A
Trip Generation - Net External Trips (Concurrency)
Manderlie III

Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Proposed Use Single Family Detached	220 DU	2,084	153	40	113	209	132	77
NET CHANGE IN TRIPS (FOR THE PURPOSES OF CONCURRENCY)		2,084	153	40	113	209	132	77

Note: Trip generation was calculated using the following data:

Land Use	ITE Code	Unit	Daily Rate	Pass-by Rate	AM Peak Hour		PM Peak Hour	
					in/out	Rate	in/out	Equation
Single Family Detached	210	DU	$\ln(T) = 0.92 \ln(X) + 2.68$	0%	26/74	$\ln(T) = 0.91 \ln(X) + 0.12$	63/37	$\ln(T) = 0.94 \ln(X) + 0.27$

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Exhibit 1B
Trip Generation - Peak Hour of Generator
Manderlie III

Land Use	Intensity	Daily Trips	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out
Proposed FLU Traffic								
Single Family Detached	220 DU	2,084	163	42	121	216	138	78
Total Proposed Driveway Volumes		2,084	163	42	121	216	138	78

Note: Trip generation was calculated using the following data:

Land Use	ITE Code	Unit	Daily Rate	Pass-by Rate	AM Peak Hour		PM Peak Hour	
					in/out	Rate	in/out	Equation
Single Family Detached	210	DU	$\ln(T) = 0.92 \ln(X) + 2.68$	0%	26/74	$T = 0.71 (X) + 7.23$	64/36	$\ln(T) = 0.93 \ln(X) + 0.36$

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Land Use: 210

Single-Family Detached Housing

Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing -- single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077, 1078, 1079

Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 174

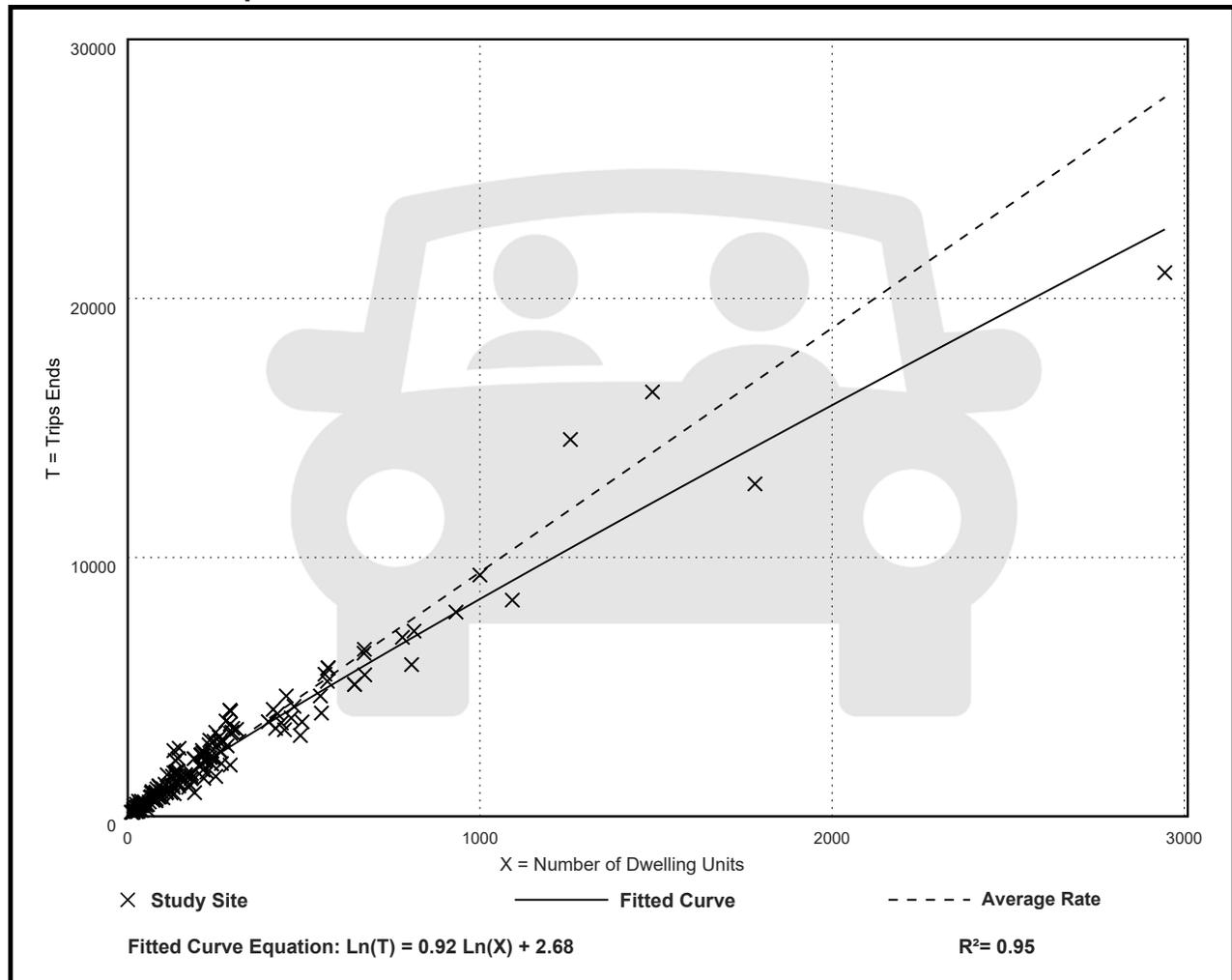
Avg. Num. of Dwelling Units: 246

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 192

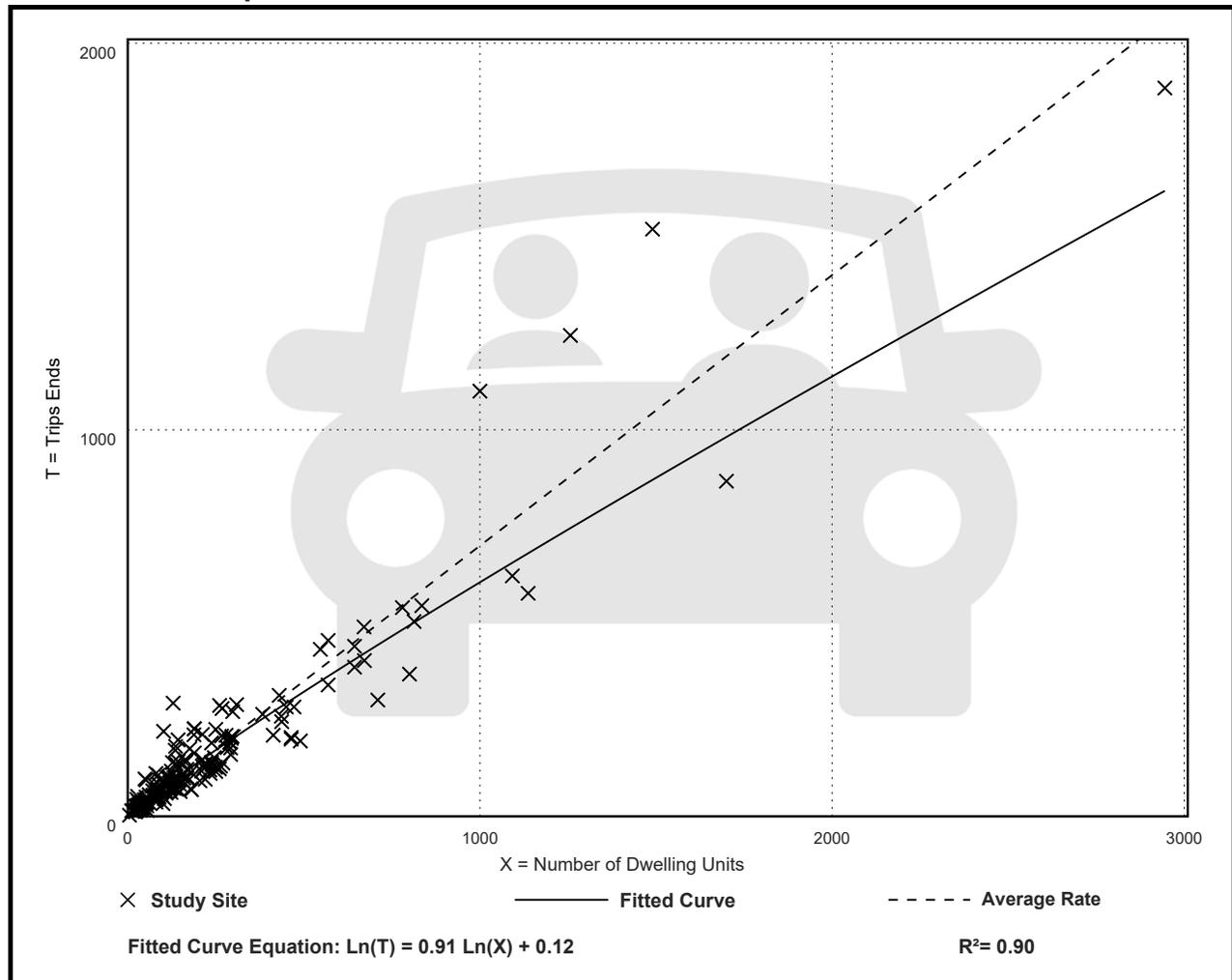
Avg. Num. of Dwelling Units: 226

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 208

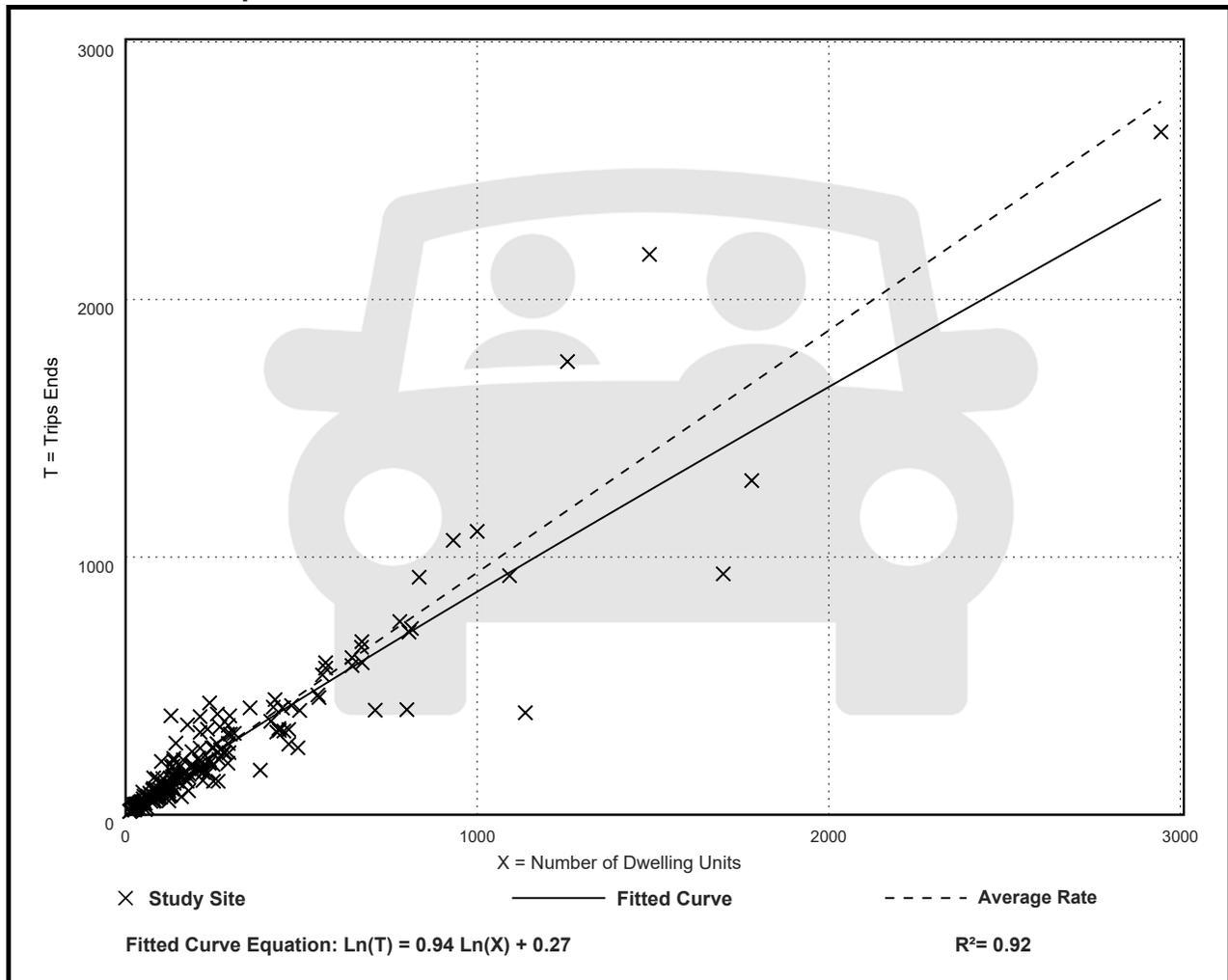
Avg. Num. of Dwelling Units: 248

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 169

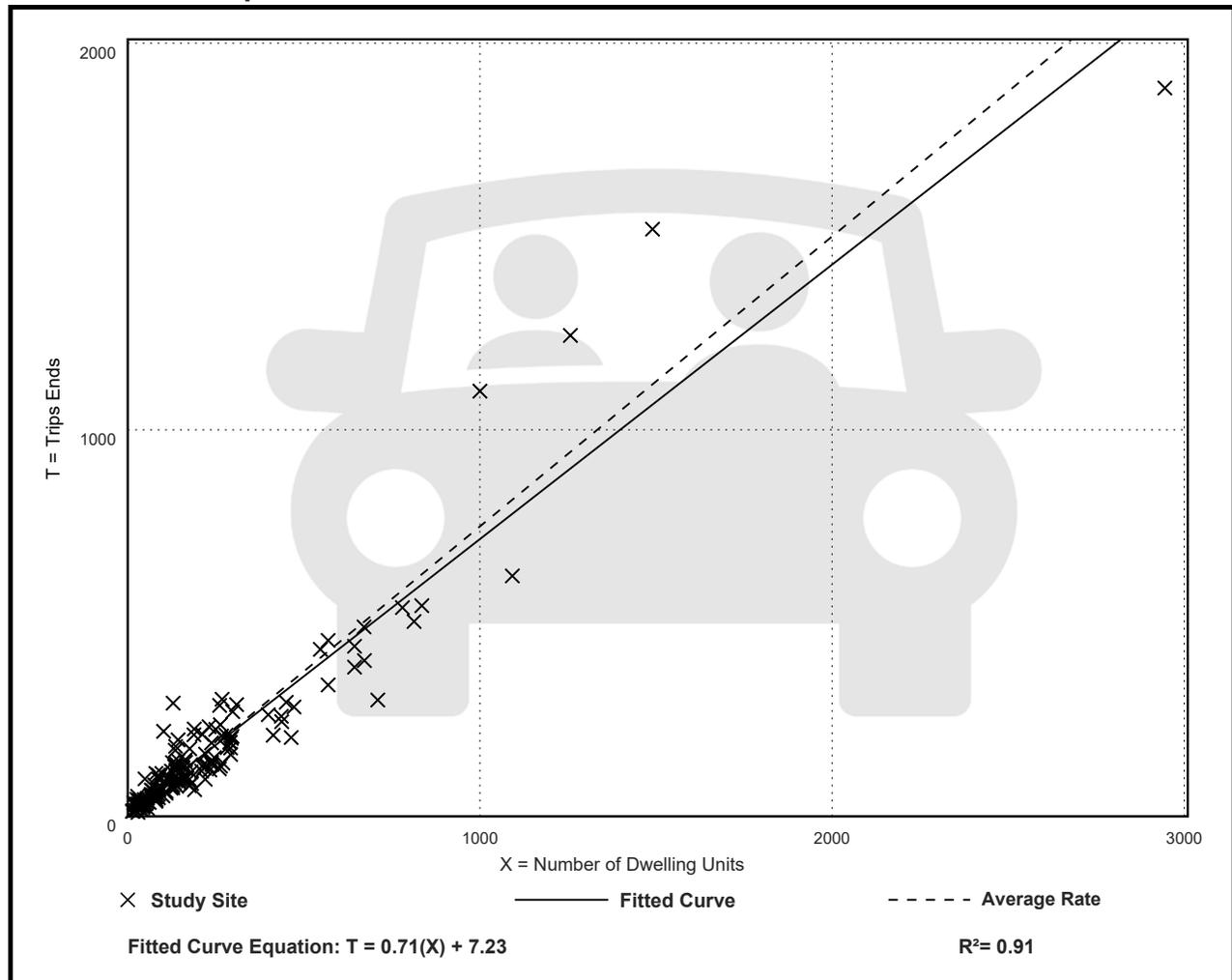
Avg. Num. of Dwelling Units: 217

Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.75	0.34 - 2.27	0.25

Data Plot and Equation



Single-Family Detached Housing (210)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 178

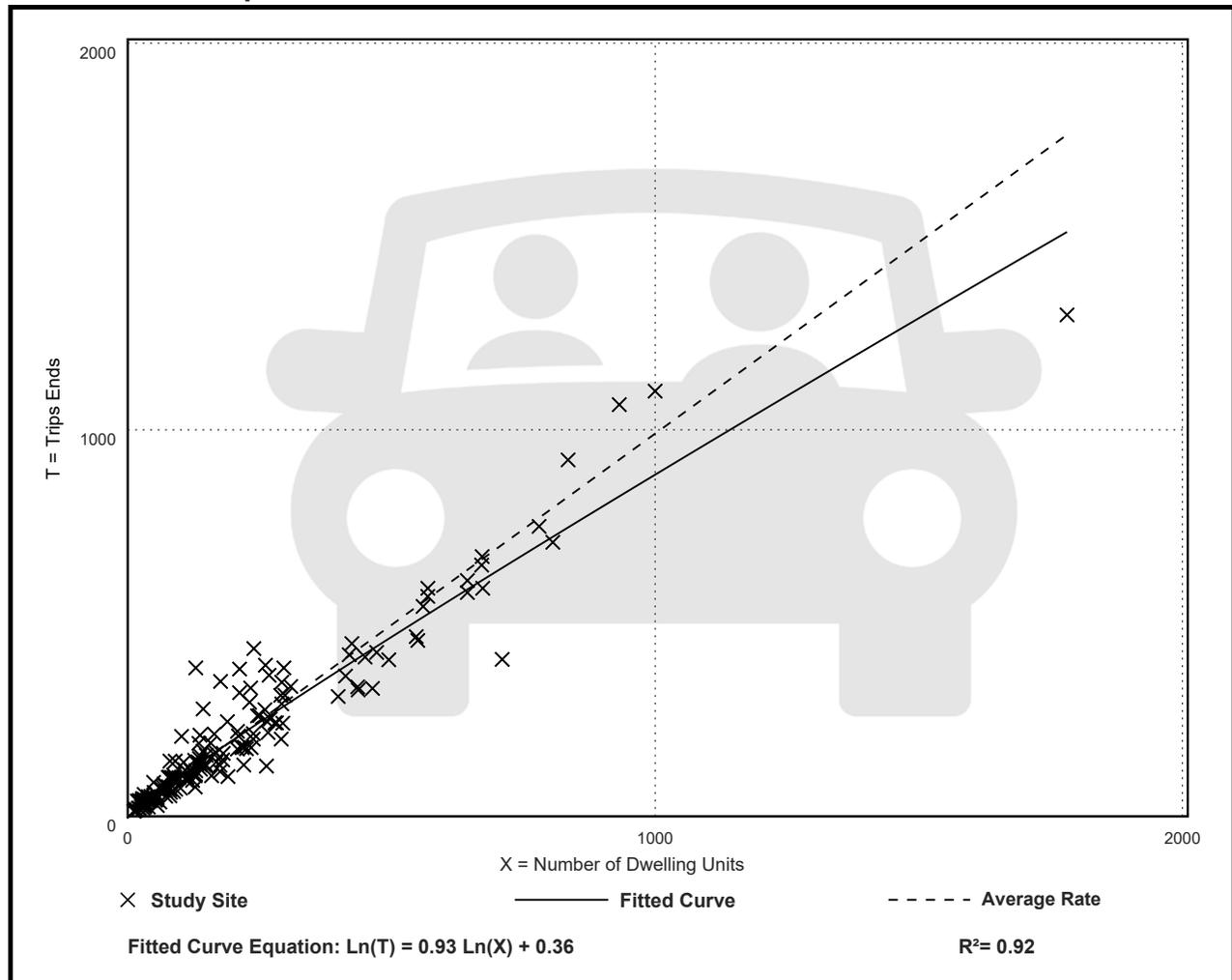
Avg. Num. of Dwelling Units: 203

Directional Distribution: 64% entering, 36% exiting

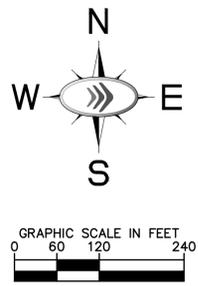
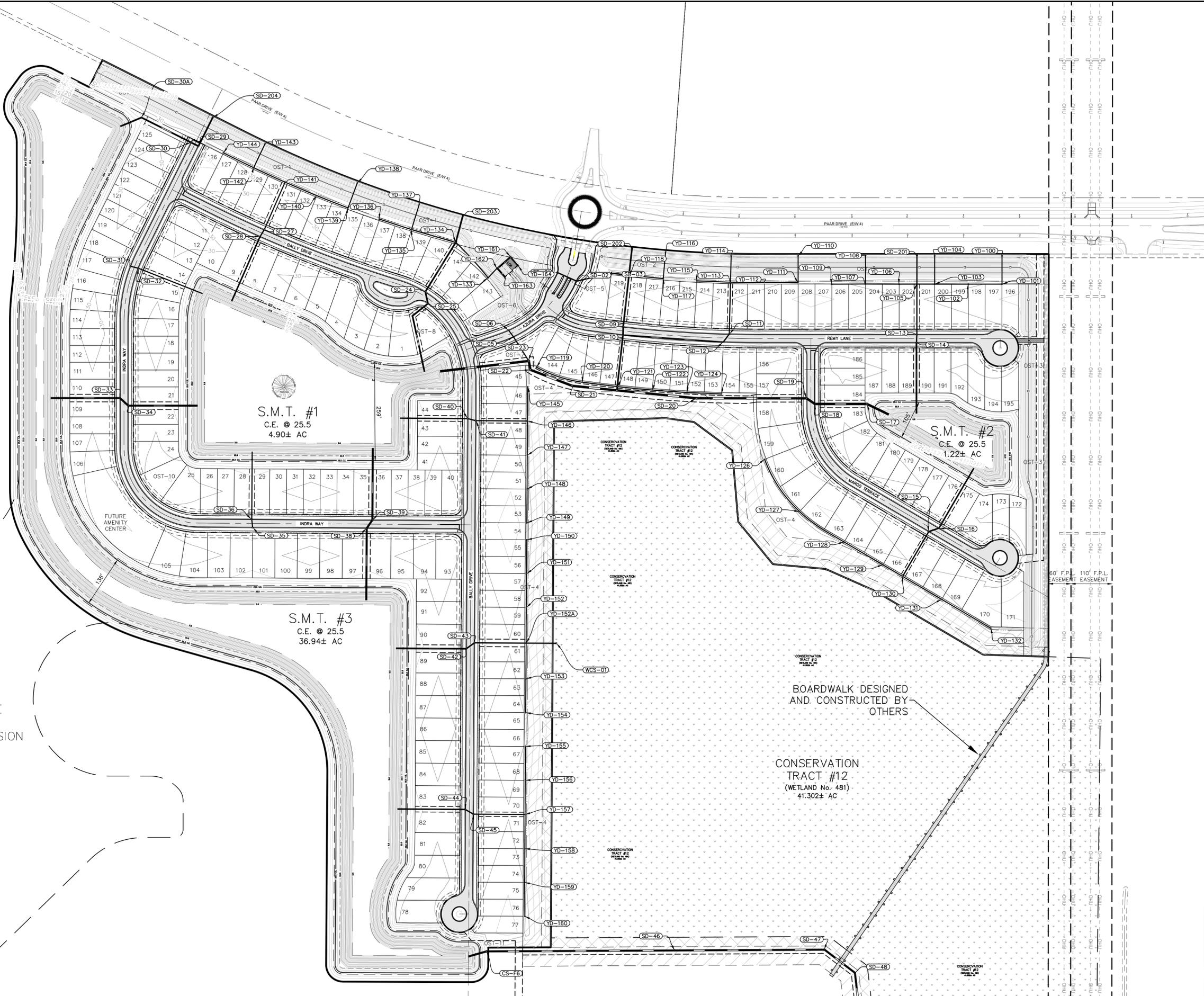
Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.99	0.49 - 2.98	0.28

Data Plot and Equation



Plotted By: Procko, Michael Sheet Set: Mattalia III Layout: C-200 October 06, 2021 10:18:15am K:\VRB\LDVA\Southern Grove IV - Mattamy Homes Manderlie III\CAD\PlanSheets\C-200_FCP_PLAN_Manderlie III.dwg
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 KIMAN F. HUSIANY
 STATE LICENSE NUMBER 75481
 DATE: _____
 CHECKED BY: KFH

**OVERALL PAVING
 GRADING AND
 DRAINAGE PLAN**

SOUTHERN GROVE 4C
 PREPARED FOR
matamy-HOMES
 FLORIDA
 PORT ST. LUCIE

CALL 48 HOURS BEFORE YOU DIG
811
 IT'S THE LAW! DIAL 811
 Know what's below. Call before you dig.

SUNSHINE STATE ONE CALL OF FLORIDA, INC.

VERTICAL DATUM
 ELEVATIONS SHOWN HEREON ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD '88). SUBTRACT 1.50' FROM NAVD '88 ELEVATION TO GET THE NAVD '88 ELEVATION.

PLSUSD PROJECT # **XX-XXX-XX**
 CITY OF PORT ST. LUCIE PROJECT # **P00 - 000**
 SHEET NUMBER **C-200**