TRAFFIC IMPACT ANALYSIS

SE 92nd LOOP DEVELOPMENT

MARION COUNTY, FLORIDA

Prepared for:

Red Jacket Development Group
625 Waltham Avenue,
Orlando, Florida 32809

Prepared by:

Traffic Planning and Design, Inc.
535 Versailles Drive
Maitland, Florida 32751
407-628-9955

June 2023
Revised
April 2024

TPD № 5735

PROFESSIONAL ENGINEERING CERTIFICATION

I hereby certify that I am a Professional Engineer properly registered in the State of Florida practicing with Traffic Planning & Design, Inc., a corporation authorized to operate as an engineering business, EB-3702, by the State of Florida Department of Professional Regulation, Board of Professional Engineers, and that I have prepared or approved the evaluations, findings, opinions, conclusions, or technical advice attached hereto for:

PROJECT: SE 92nd Loop Development

LOCATION: Marion County, Florida

CLIENT: Red Jacket Development Group

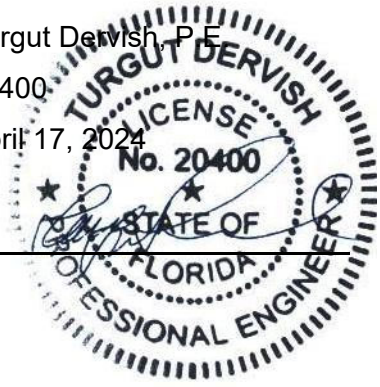
I hereby acknowledge that the procedures and references used to develop the results contained in these computations are standard to the professional practice of Transportation Engineering as applied through professional judgment and experience.

NAME: Turgut Dervish, P.E.

P.E. No.: 20400

DATE: April 17, 2024

SIGNATURE: _____



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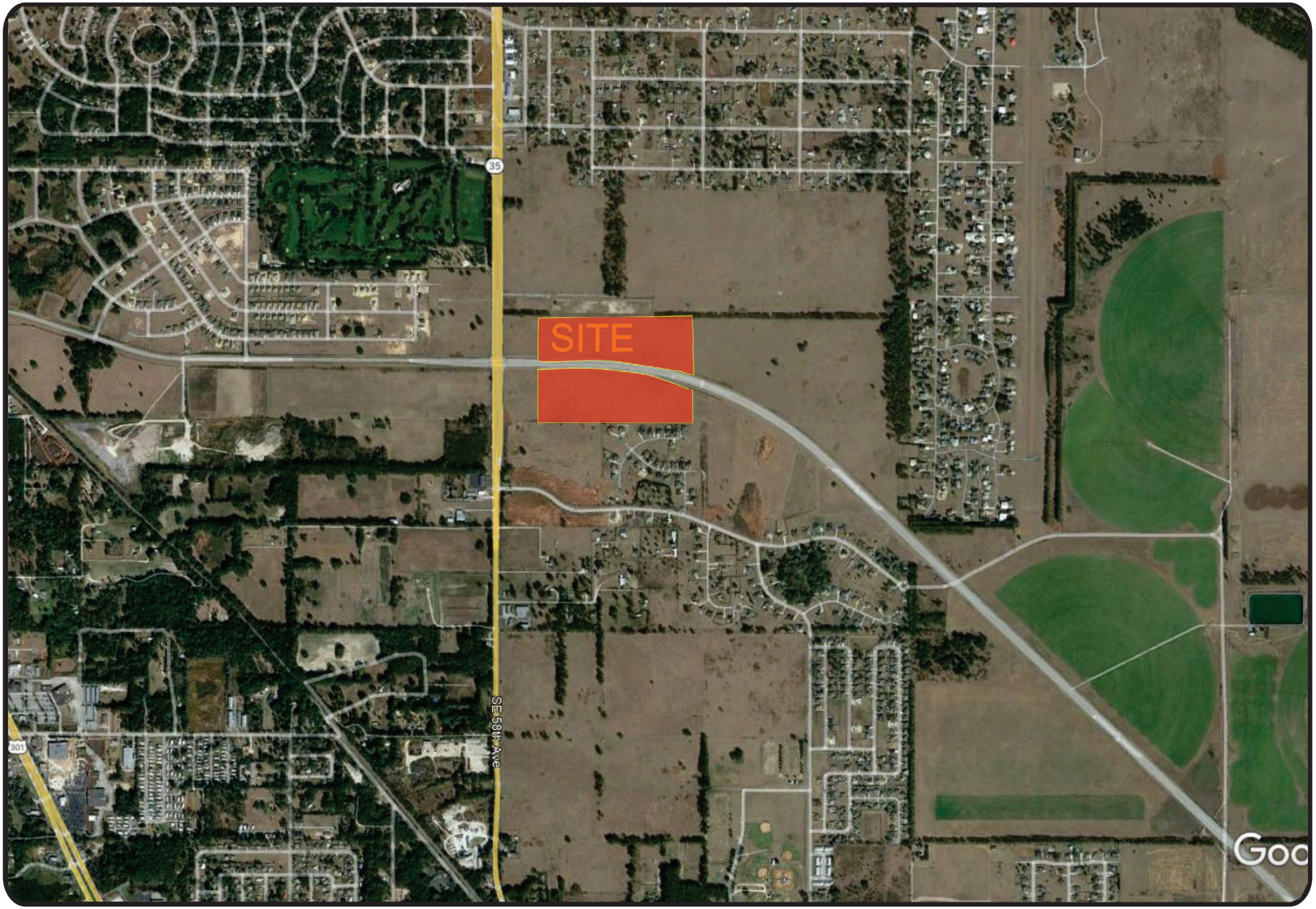
INTRODUCTION

This traffic analysis was undertaken in order to update an earlier traffic impact study for a proposed residential development in Marion County, Florida. The development now consists of 58 single family dwelling units and 304 multi-family units. In the earlier study, there were 176 townhomes units instead of 304 multifamily units. The site is located approximately 630 feet east of the intersection of SE 92nd Loop and Baseline Road (SR 35) and will have single family units located on the south side of SE 92nd Loop and townhomes on the north side. Access to the site is proposed via two access driveways on the north side of SE 92nd Loop, and one access driveway on the south side of SE 92nd Loop. **Figure 1** depicts the location of the project site and the surrounding roadway network, and the preliminary site plan is provided in **Figure 2.** The project is anticipated to be completed by the end of 2025.

Methodology

This analysis was conducted in accordance with Marion County's Traffic Impact Analysis Guidelines. A traffic study methodology was submitted to and approved by the County in June 2023. The study methodology and correspondence are included in **Appendix A**. Based on the trip generation of the proposed project, as discussed later in this report, the project generates more than 100 peak hour trips and therefore a Traffic Impact Analysis (TIA) is required. Data utilized in the analysis consists of a preliminary site plan provided by Project Engineers, traffic volume data and Level of Service standards obtained from FDOT and the County's *Traffic Counts & Trends Manual* and the County's *Comprehensive Plan: Transportation Element*, and intersection turning movement counts obtained by TPD, Inc.



SE 92nd Loop Development
Project № 5735
Figure 1

Site Location

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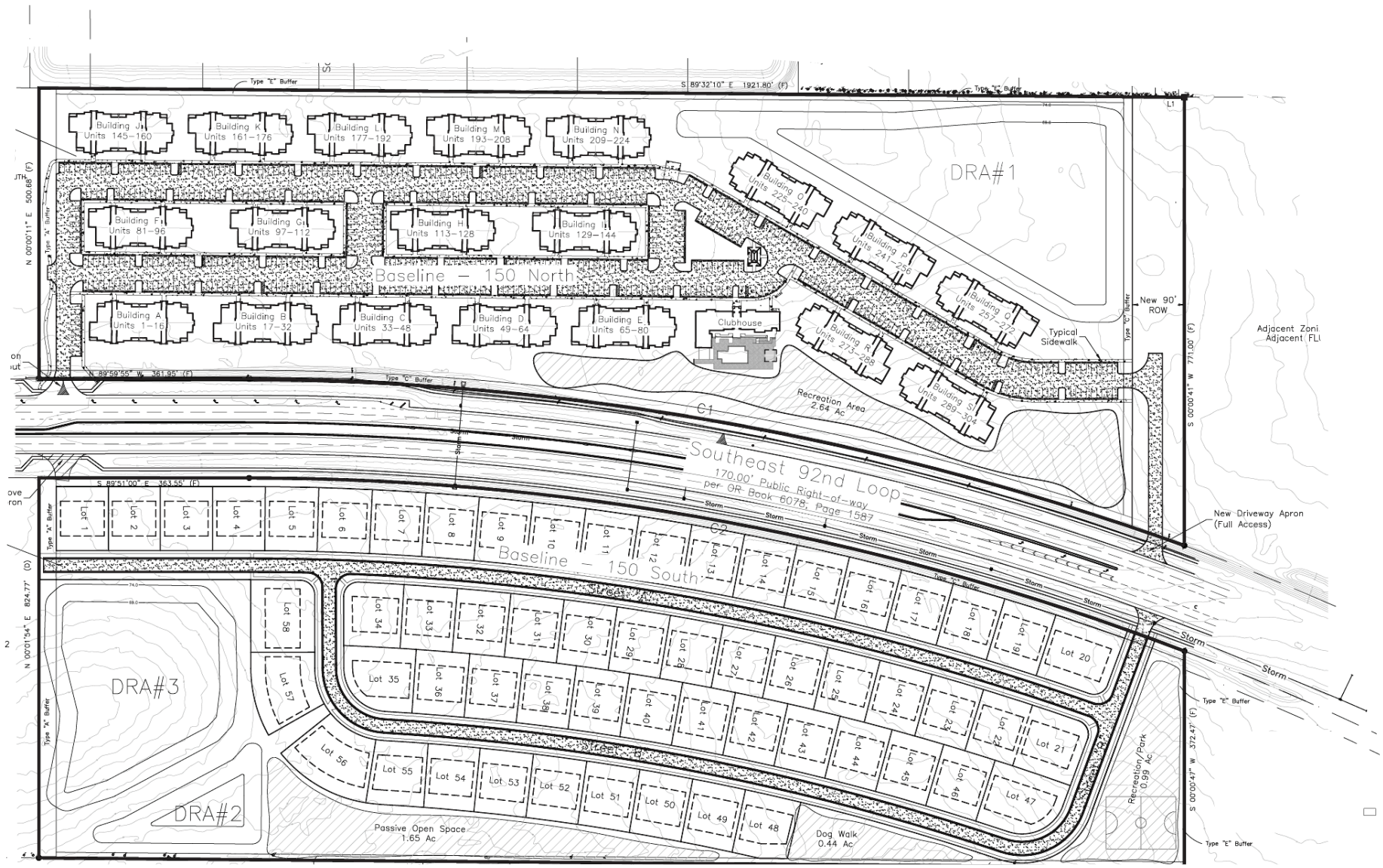

Baseline (North & South) SE 92nd Loop Development
Project № 5735
Figure 2

Site Plan

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Significance Analysis

The County's Traffic Impact Analysis Guidelines require that the impact area of the development include any roadway segment where the net new traffic from the proposed project is at least 3% of the maximum service volume of the roadway, plus one segment beyond. To determine the traffic impact area for this project, a significance test was conducted using the two-way peak hour capacity, as summarized in **Table 1**.

Table 1
Significance Analysis

Segment	Lanes	LOS Std*	2-Way Capacity**	Project Trips***		Significance
				%	Volume	
SE 92nd Place Road						
US 301 to 92nd Loop	2U	E	1,440	20%	42	2.92%
SE 92nd Loop						
Adjacent to the site	4LD	D	3,222	80%	169	5.25%
Site to SE 110th St	4LD	D	3,222	20%	42	1.30%
Baseline Road (SR 35)						
SR 464 to SE 92nd Loop	4LD	D	3,580	40%	84	2.35%
SE 92nd Loop to SE 110th St	2LD	D	1,600	20%	42	2.63%

* Based upon Marion County's "Comprehensive Plan: Transportation Element"
** Based upon FDOT's Generalized Service Volume Tables
*** Highest on Segment

Study Area

Based on the significance analysis, the following roadway segments and intersections were determined to be included in the analysis:

The roadway segments included in the analysis:

- SE 92nd Place Road,
  - US 301 to SE 92nd Loop
- SE 92nd Loop,
  - SR 35 to SE 110th Street
- SR 35,
  - SR 464 to SE 92nd Loop
  - SE 92nd Loop to SE 110th Street

The intersections included in the area analysis are:

- SR 35 & SE 92nd Loop/SE 92nd Place Road
- Site Access Driveways

EXISTING CONDITIONS ANALYSIS

An existing conditions analysis was conducted for the study roadway segments and intersection utilizing existing traffic volumes and roadway geometry to establish their current operating conditions.

Roadway Segment Analysis

The study roadway segments were analyzed by comparing the existing traffic volumes of each segment with the adopted LOS/capacity values for the daily roadway conditions and the P.M. peak hour. Level of Service Standards were obtained from the County's *Comprehensive Plan: Transportation Element*. Capacities for each segment were obtained from FDOT's Generalized Service Volume Tables. Existing traffic counts were obtained from the 2023 Marion County Traffic Counts Map and P.M. peak hour intersection counts collected at the study intersections by TPD, Inc. The existing P.M. peak hour roadway capacity analysis is summarized in **Table 2**, which shows the study roadway segments are currently operating at satisfactory Levels of Service. The existing daily roadway capacity analysis is summarized in **Table 3,** which shows the study roadway segments are also operating satisfactorily during the daily roadway conditions. Relevant information on existing traffic volumes and roadway capacities is included in **Appendix B**.

Table 2
Existing P.M. Peak Hour Roadway Capacity Analysis

Segment	Lanes	Adopted		Existing Volume**	LOS
		LOS Std	2-Way Capacity*		
SE 92nd Place Road					
US 301 to SE 92nd Loop	2U	E	1,440	980	C
SE 92nd Loop					
SR 35 to SE 110th St	4LD	D	3,222	893	C
Baseline Road (SR 35)					
SR 464 to SE 92nd Loop	4LD	D	3,580	2,111	C
SE 92nd Loop to SE 110th St	2LD	D	1,600	1,442	C

* Capacities obtained from FDOT's Generalized Service Volume Tables

** Volumes obtained from P.M. Peak Hour intersection counts

Table 3
Existing Daily Roadway Capacity Analysis

Segment	Lanes	Adopted		Existing Volume**	LOS
		LOS Std	Daily Capacity*		
SE 92nd Place Road					
US 301 to SE 92nd Loop	2U	E	15,930	10,400	C
SE 92nd Loop					
SR 35 to SE 110th St***	4LD	D	35,820	9,922	C
Baseline Road (SR 35)					
SR 464 to SE 92nd Loop	4LD	D	39,800	26,500	C
SE 92nd Loop to SE 110th St	2LD	D	17,700	12,600	C

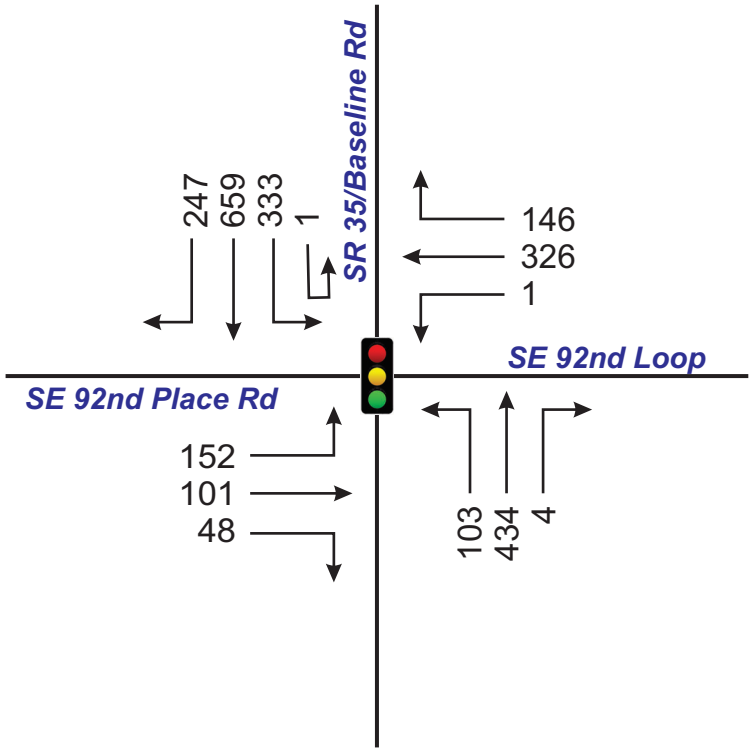
* Capacities obtained from the FDOT Generalized Service Volume Tables
** Volumes obtained from the 2023 Marion County Traffic Counts Map
*** No count stations available for this segment, volume based upon intersection counts and a K = 0.09 factor

Intersection Analysis

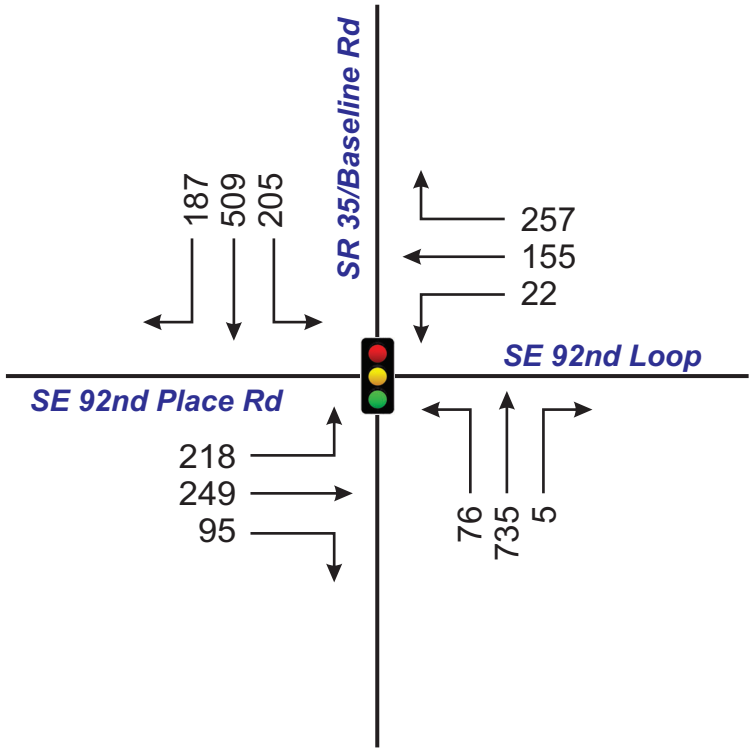
The study intersection was analyzed in accordance with the procedures of the *Highway Capacity Manual (HCM)* using the latest version of *Highway Capacity Software (HCS).* The capacity analysis at the intersection was performed using the existing intersection geometry and traffic volumes during the A.M. and P.M. peak hour. The traffic counts were taken on January 10th, 2023, when the FDOT's seasonal factor was 1.05, and were therefore adjusted using this seasonal factor. **Figure 3** depicts the adjusted A.M. and P.M. peak hour traffic volumes at the study intersections. The raw intersection counts are included in **Appendix C** along with FDOT's Seasonal Factor report and the signal timings. The intersection capacity analysis results are summarized in **Table 4,** which indicates that the study intersection currently operates within the adopted Levels of Service standards. Detailed intersection capacity analysis worksheets are included in **Appendix D**.

Table 4
Existing Intersection Capacity Analysis

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SE 92nd Loop & Baseline Rd / SR 35	Signal	A.M.	32.1	C	31.6	C	32.2	C	29.7	C	30.9	C
		P.M.	36.8	D	42.5	D	35.6	D	32.1	C	35.8	D



A.M. Peak Hour



P.M. Peak Hour

PROPOSED DEVELOPMENT AND TRIP GENERATION

To determine the impact of the proposed development, an analysis of its trip generation characteristics was conducted. This included the determination of the trips to be generated as well as their distribution and assignment to the area roadways.

Trip Generation

Trip generation equations obtained from the 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* were used to estimate the trip generation for the proposed development. **Table 5** provides a summary of the trip generation for the proposed development. As can be seen in the table, the project is expected to generate a total of 2,635 daily trips, of which 162 will occur during the A.M. peak hour and 211 will occur during P.M. peak hour. Copies of the ITE trip generation worksheets are included in the Study Methodology in Appendix A.

Table 5
Trip Generation Summary

ITE Code	Land Use	Size (DU)*	Daily		A.M. Peak Hour				P.M. Peak Hour			
			Rate**	Trips	Rate**	Enter	Exit	Total	Rate**	Enter	Exit	Total
220	Multifamily	304	6.56	2,024	0.385	28	89	117	0.50	95	56	151
210	Single Family Detached	58	10.54	611	0.78	12	33	45	1.03	38	22	60
Total Trips:				**2,635**	**----**	**40**	**122**	**162**	**----**	**133**	**78**	**211**

* DU = Dwelling Units
** $R^2 > 0.75$, therefore Equations used

Trip Distribution / Trip Assignment

At the request of Marion County, the trip distribution was consistent with the study for the parcel just west of the site as follows:

- To/From the north on SR 35 – 40%
- To/From the south on SR 35 – 20%
- To/From the east on SE 92nd Loop – 20%
- To/From the west on SE 92nd Place Road – 20%

The trip distribution on the area roadways is illustrated in **Figure 4.** Utilizing this distribution, the development project trips were assigned to the area roadways.

SE 92nd Loop Development
Project № 5735
Figure 4

Trip Distribution

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PROJECTED TRAFFIC CONDITIONS

Projected traffic conditions were assessed in order to evaluate the impact of the proposed development within its area of influence. The projected conditions were estimated by combining daily and P.M. roadway segment volumes and A.M./P.M. intersection counts with peak hour project trips with background traffic volumes.

Background Traffic Projections

Based upon the TPO's 2022 Traffic Count Report, an overall 6% growth rate was used for all segments. This growth rate was applied to the existing traffic volumes as appropriate in order to determine the projected background volumes in the project buildout year of 2025. Additionally, vested trips from the first phase of the adjacent project (gas station/convenience store) were included in the background traffic at the request of the County.

Roadway Segment Analysis

The projected roadway segment analysis was performed by comparing the total projected daily and P.M. peak hour traffic volume of each segment with the respective capacity at the adopted LOS standard. The P.M. peak hour analysis, as summarized in **Table 6** with the exception of one segment, revealed that the study roadway segments will continue to operate within the adopted LOS standards upon the addition of project trips. The segment of Baseline Road from SE 92nd Loop to SE 110th Street will fail due to the background growth of the existing traffic. This segment will fail regardless of the addition of the project trips. The daily analysis, as summarized in **Table 7,** revealed that all of the study roadway segments will continue to operate satisfactorily in the projected daily conditions.

Intersection Analysis

To assess the projected operating conditions at the study intersection, intersection capacity analyses were conducted using the *Highway Capacity Software (HCS)*. The total A.M./P.M. peak hour traffic volumes were determined by combining background traffic and project trips as previously discussed. **Figures 5a** and **5b** show the projected A.M. and P.M. peak hour intersection turning movement volumes for the study intersection and site access driveways. The results of the analysis are summarized in **Table 8,** which indicates the study intersection and site access driveways are projected to operate at satisfactory Levels of Service upon the addition of project trips, similar to existing conditions. Detailed intersection capacity analysis worksheets are included in **Appendix E.**

Table 6
Projected P.M. Peak Hour Roadway Capacity Analysis

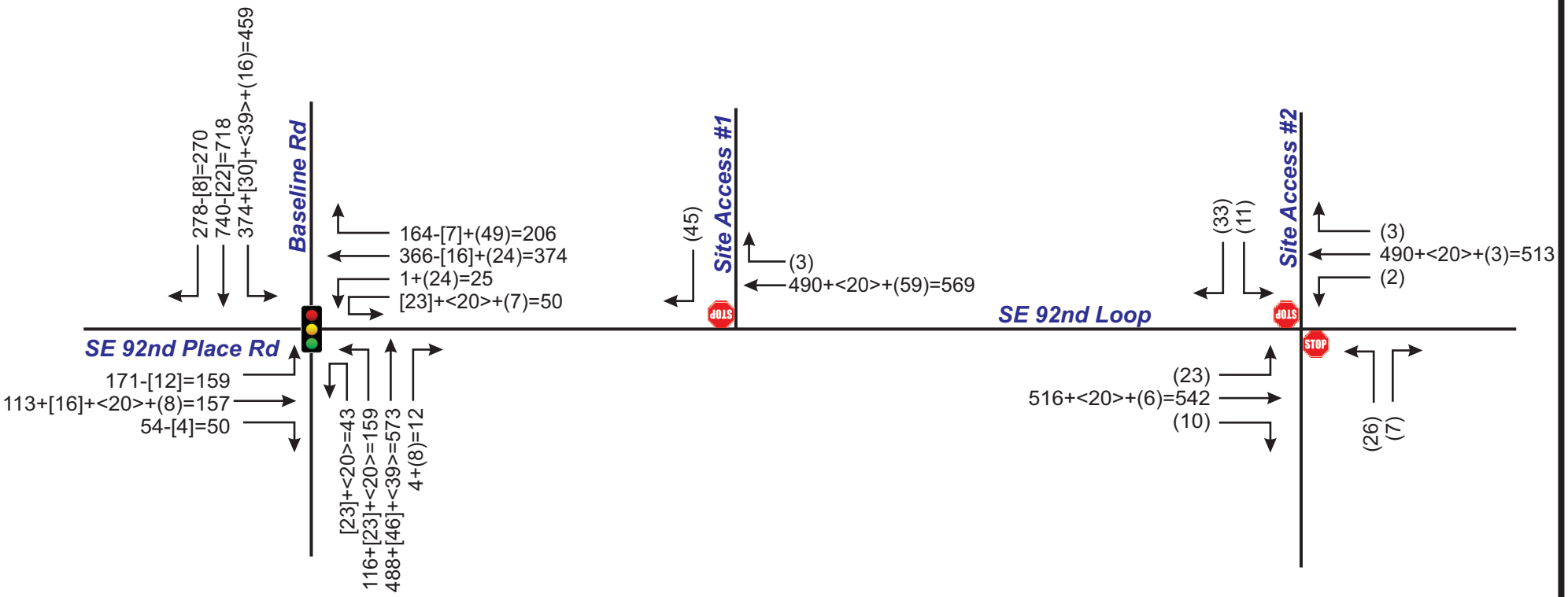
Segment	Lanes	Adopted		Bkgd Volume*	Project Trips**		Total Traffic	LOS
		LOS Std	2-Way Capacity		%	Volume		
SE 92nd Place Road								
US 301 to SE 92nd Loop	2U	E	1,440	1,101	20%	42	1,143	C
SE 92nd Loop								
SR 35 to SE 110th St	4LD	D	3,222	1,003	80%	169	1,177	C
Baseline Road (SR 35)								
SR 464 to SE 92nd Loop	4LD	D	3,580	2,372	40%	84	2,456	C
SE 92nd Loop to SE 110th St	2LD	D	1,600	1,620	20%	42	1,662	F

* Existing volumes with 6% growth rate applied
** Highest on Segment

Table 7
Projected Daily Roadway Capacity Analysis

Segment	Lanes	Adopted		Bkgd Volume*	Project Trips**		Total Traffic	LOS
		LOS Std	Daily Cap.		%	Volume		
SE 92nd Place Road								
US 301 to SE 92nd Loop	2U	E	15,930	11,685	20%	527	12,065	C
SE 92nd Loop								
SR 35 to SE 110th St***	4LD	D	35,820	11,148	80%	2,108	12,670	C
Baseline Road (SR 35)								
SR 464 to SE 92nd Loop	4LD	D	39,800	29,775	40%	1,054	30,536	C
SE 92nd Loop to SE 110th St	2LD	D	17,700	14,157	20%	527	14,537	C

* Existing volumes with 6% growth rate applied
** Highest on Segment



SE 92nd Loop Development
Project № 5735
Figure 5a

Projected A.M. Peak Hour Traffic Volumes

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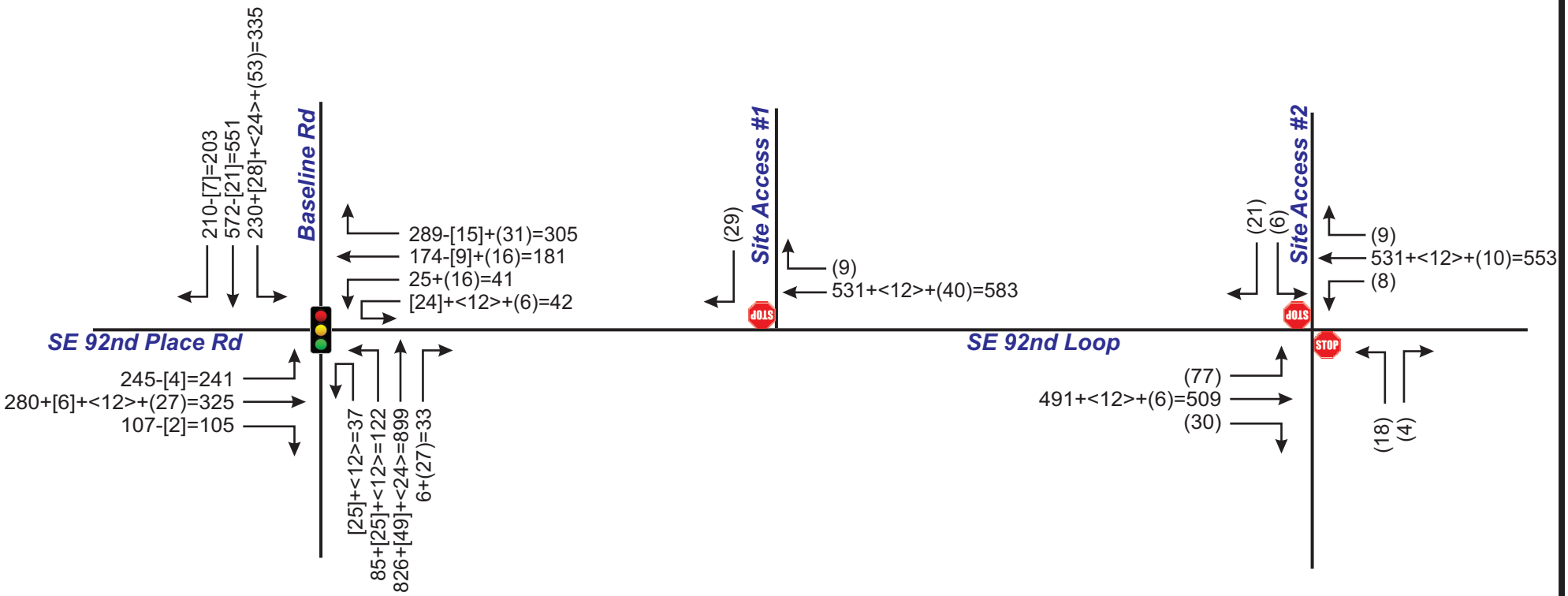

Legend:
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- Total Traffic
- Project Trips
- Vested Trips
- Pass-by Trips
- Background Traffic

SE 92nd Loop Development
Project № 5735
Figure 5b

Projected P.M. Peak Hour Traffic Volumes

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Table 8
Projected Intersection Capacity Analysis

Intersection	Control	Time Period	EB		WB		NB		SB		Overall	
			Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
SE 92nd Loop & Baseline Rd / SR 35	Signal	A.M.	41.0	D	42.4	D	37.3	D	36.1	D	38.2	D
		P.M.	50.0	D	67.8	E	50.1	D	43.4	D	50.9	D
SE 92nd Loop & Site Access #1	Stop	A.M.	--	--	--	--	--	--	10.7	B	--	--
		P.M.	--	--	--	--	--	--	10.6	B	--	--
SE 92nd Loop & Site Access #2	Stop	A.M.	0.3	A	0.0	A	14.7	B	11.6	B	--	--
		P.M.	1.1	A	0.1	A	16.6	C	11.8	B	--	--

Turn Lane Analysis

To assess the need for auxiliary turn lanes at the site access driveways, analysis was conducted using *NCHRP Report 457 – Evaluating Intersection Improvements: An Engineering Study Guide*. The analysis worksheets are included in **Appendix F.** Based on this analysis, exclusive turn lanes are not warranted at the site access driveways. To assess the adequacy of the existing turn lanes at Site Access #2, turn lane analysis was conducted. The results are summarized in **Table 9,** which shows that the eastbound and westbound left turn lanes at Site Access #2 are both sufficient to serve the project traffic.

Table 9
Turn Lane Analysis

Driveway	Auxiliary Lane	Deceleration Distance (ft)*	Queue Length**		Total Length (ft)	Existing Length (ft)
			Vehicles	Feet		
Site Access #2	EBL	350	0.3	25	375	365
	WBL	350	0	0	350	365

* As per FDM 212 for 50 mph posted speed
** As per HCS P.M. Peak analysis, use minimum 1 veh = 25 ft

STUDY CONCLUSIONS

This traffic analysis was undertaken in order to assess the traffic impact of a proposed residential development in Marion County, Florida. The development consists of 58 single family dwelling units and 304 multifamily units. The project is anticipated to be completed by the end of 2025. The site is located approximately 630 feet east of the intersection of SE 92nd Loop and Baseline Road (SR 35), and will have single family units located on the south side of SE 92nd Loop and townhomes on the north side. The results of the study as documented herein are summarized below:

- The proposed development is projected to generate 2,635 daily trips, of which 162 will occur in the A.M peak hour and 211 will occur in the P.M. peak hour.

- The roadway segment analysis indicated that with the exception of one segment, the study roadway segments currently operate at acceptable Levels of Service and will continue to do so upon the addition of project trips. The segment of Baseline Road from SE 92nd Loop to SE 110th Street will fail in the P.M. peak hour in the buildout year, due to the background growth of the existing traffic volumes. This segment will fail regardless of the addition of the project trips, and will operate satisfactorily in the overall daily condition.

- The intersection analysis indicated that the study intersection currently operates at overall acceptable Levels of Service and will continue to do so upon the addition of project trips.

- Access to the site is proposed via two access driveways on the north side of SE 92nd Loop, and one access driveway on the south side of SE 92nd Loop. The site access driveways will all operate at acceptable Levels of Service upon project completion.

APPENDICES

APPENDIX A

Study Methodology and Correspondence

Marion County
Board of County Commissioners
Office of the County Engineer
412 SE 25th Ave.
Ocala, FL 34471
Phone: 352-671-8686
Fax: 352-671-8687

June 30, 2023

TRAFFIC PLANNING & DESIGN, INC.
TURGUT DERVISH, P.E.
535 VERSAILLES DRIVE
MAITLAND , FL 32751

SUBJECT: **TRAFFIC METHODOLOGY APPROVAL LETTER**
PROJECT NAME: BASELINE (NORTH AND SOUTH)
PROJECT #2022100091 APPLICATION: #30037 PARCEL #37515-004-00

Dear Turgut,

The Traffic Methodology dated May 30, 2023 for the above referenced project was approved by Marion County on June 30, 2023. Please submit the Traffic Study in accordance with this approved Methodology. The following comments are for your review. You need not reply to the comments, and if the comments have been previously completed, simply disregard.

DEPARTMENT: ENGTRF - TRAFFIC REVIEW
REVIEW ITEM: Additional Traffic comments
STATUS OF REVIEW: INFO
REMARKS: The current PUD is expired. The proposed rezoning for the new PUD was continued indefinitely at the Planning & Zoning Commission meeting on 3/27/2023. If the proposed rezoning is eventually approved, the traffic methodology is subject to change based on any conditions placed on the PUD.

DEPARTMENT: ENGIN - DEVELOPMENT REVIEW
REVIEW ITEM: Provide one signed original after approval
STATUS OF REVIEW: INFO
REMARKS:

Feel free to contact the Office of the County Engineer at (352) 671-8686 or DevelopmentReview@marionfl.org should you have questions.

Sincerely,

Your Development Review Team
Office of the County Engineer

To: Development Review

Date: May 30, 2023

From: Turgut Dervish, P.E.

Re: Traffic Impact Analysis Methodology (Revised)
Baseline (North & South) SE 92nd Loop Development
TPD No. 5735

The following is an outline of the proposed methodology for the Traffic Impact Study for the residential development in Marion County, Florida. The development is located on both sides of SE 92nd Loop with the townhomes on the north side and the single-family units on the south side. **Figure 1** depicts the site location and the area roadways.

1. Proposed Development

The development consists of 234 multi-family dwelling units with 176 townhomes and 58 single family units. Access to the site is proposed to be provided via three access driveways serving the townhomes and two driveways serving the single-family units. **Figure 2** depicts the preliminary site plan. The project is anticipated to be built by 2025.

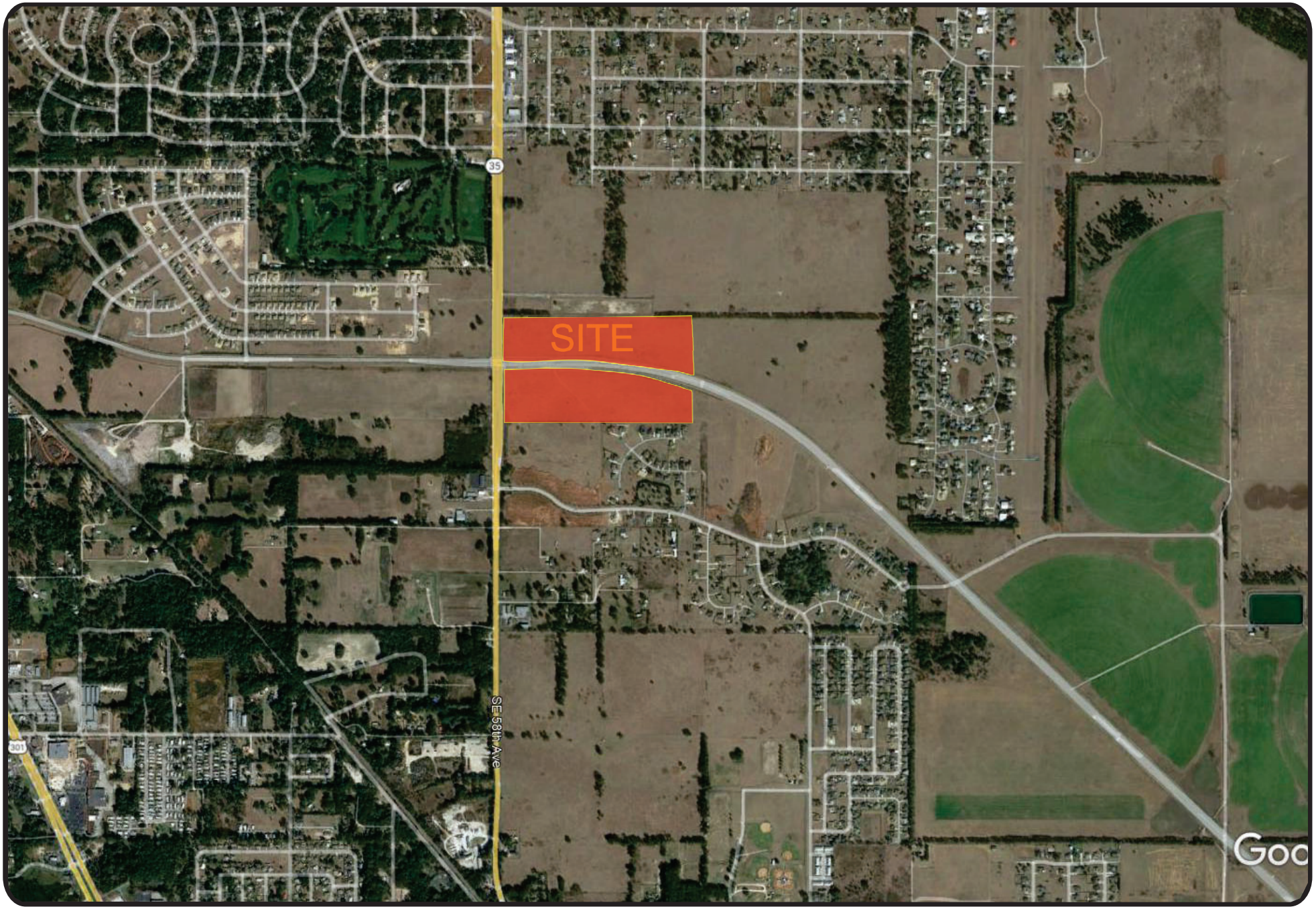
2. Trip Generation

Trip generation data from the 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* will be used for the trip generation estimation of the development. **Table 1** provides a summary of the trip generation for the proposed development. The project is expected to generate a total of 1,902 daily trips of which 131 will occur during the A.M. peak hour and 162 will occur during P.M. peak hour. The ITE trip generation worksheets are included in **Attachment A**.

Table 1
Trip Generation Calculation Summary

ITE Code	Land Use	Size (DU)	Daily		A.M. Peak Hour				P.M. Peak Hour			
			Rate	Trips	Rate	Enter	Exit	Total	Rate	Enter	Exit	Total
215	Single-Family Attached (Townhomes)	176	7.33	1,291	0.49	21	65	86	0.58	58	44	102
210	Single Family Detached	58	10.54	611	0.78	12	33	45	1.03	38	22	60
Total Trips				**1,902**	**----**	**33**	**98**	**131**	**----**	**96**	**66**	**162**

*DU=Dwelling Units
**Equations Used, R^2 >0.75



Baseline (North & South) SE 92nd Loop Development
Project № 5735
Figure 1

Site Location

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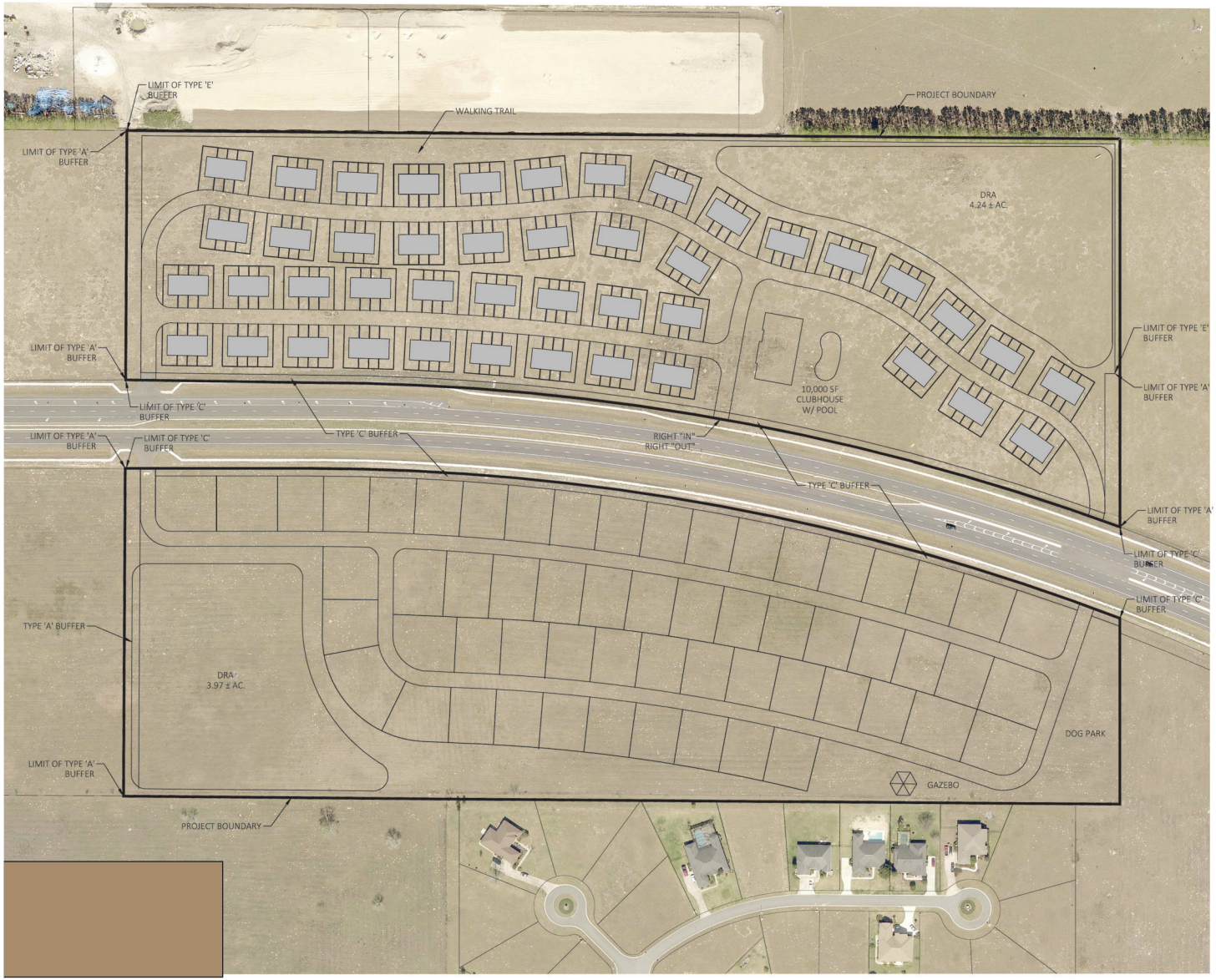

Baseline (North & South) SE 92nd Loop Development
Project № 5735
Figure 2

Site Plan

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NTS

3. Trip Distribution

At the request of Marion County, the trip distribution will be consistent with the study for the parcel just west of the site as follows:

- To/From the north on SR 35……..…40%
- To/From the south on SR 35……..20%
- To/From the east on SE 92nd Loop……20%
- To/From the west SE 92nd Place Road…….20%

The trip distribution on the area roadways is shown in **Figure 3.** The P.M. peak hour counts at the intersection are included in **Attachment B**.

4. Impact Area

The County's Traffic Impact Analysis Guidelines require that the impact area of the development include any roadway segment where the net new traffic from the proposed project is at least 3% of the maximum service volume of the roadway plus one segment beyond. To determine the traffic impact area for this project, a significance test was conducted using the two-way peak hour capacity, as summarized in **Table 2**.

Table 2
Significance Analysis

Roadway	Segment Limits	# of Lns	LOS(1)	Two-Way Capacity(2)	Trip Dist(3)	Project Trips	Significance
SR 35/Baseline Road/SE 58th Ave	SR 646 to SE 92nd Loop	4 LD	D	3,580	40%	65	1.82%
	SE 92nd Loop to SE 110th St	2 LD	D	1,600	20%	32	2.00%
SE 92nd Place Rd	US 301 to SE 92nd Loop	2L	E	1,440	20%	32	2.22%
SE 92nd Loop	Adjacent to the site	4LD	E	3,222	80%	130	4.03%
	Site to SE 110 St	4LD	D	3,222	20%	32	0.99%

(1) Based on Marion County's "Comprehensive Plan: Transportation Element"

(2) Based on FDOT's Generalized Service Volume Tables

(3) Highest distribution on the segment

Baseline (North & South) SE 92nd Loop Development
Project № 5735
Figure 3

Trip Distribution

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NTS

Based on the significance analysis, the adjacent segment of SE 92nd Loop will be significantly impacted. Therefore, this segment and one segment beyond were included in the analysis along with the adjacent segments of SR 35 as follows:

- SE 92nd Place Road, US 301 to SE 92nd Loop
- SE 92nd Loop, SR 35 to SE 110th Street
- SR 35, SR 464 to SE 92nd Loop
- SR 35, SE 92nd Loop to SE 110th Street

It is proposed that the following intersections be included in the area analysis are:

- SR 35 and SE 92nd Loop/SE 92nd Place Road
- Site Entrances

5. Background Traffic Determination

Based upon the TPO's 2022 Traffic Count Report, an overall 6% growth rate will be used for all segments. Additionally, the initial phase (gas/convenience store) trips from the adjacent project just west of the project site will be included in the background traffic.

6. Traffic Impact Assessment

a) Roadway

- Obtain existing traffic volumes on study roadway segment from FDOT/Marion County count stations and intersection counts for use in the traffic analysis.
- Combine project traffic with background traffic to obtain total traffic volumes.
- Perform daily and P.M. peak hour/peak direction roadway analyses utilizing the County's LOS standards.

b) Intersections

- Conduct intersection counts during the A.M. and P.M. peak periods at the study intersections.
- Combine project traffic with background traffic to obtain total traffic.
- Perform intersection capacity analysis utilizing HCS or Synchro software following HCM operational analysis procedures for existing, background and buildout conditions.
- The need for right and left turn lanes at the proposed driveways will be evaluated as per Marion County's guidelines.

7. Traffic Report

Prepare traffic report summarizing study procedures, analyses and recommendations.
If you have any questions or concerns, please contact us at (407) 628-9955.

Attachment A

Single-Family Attached Housing
(215)

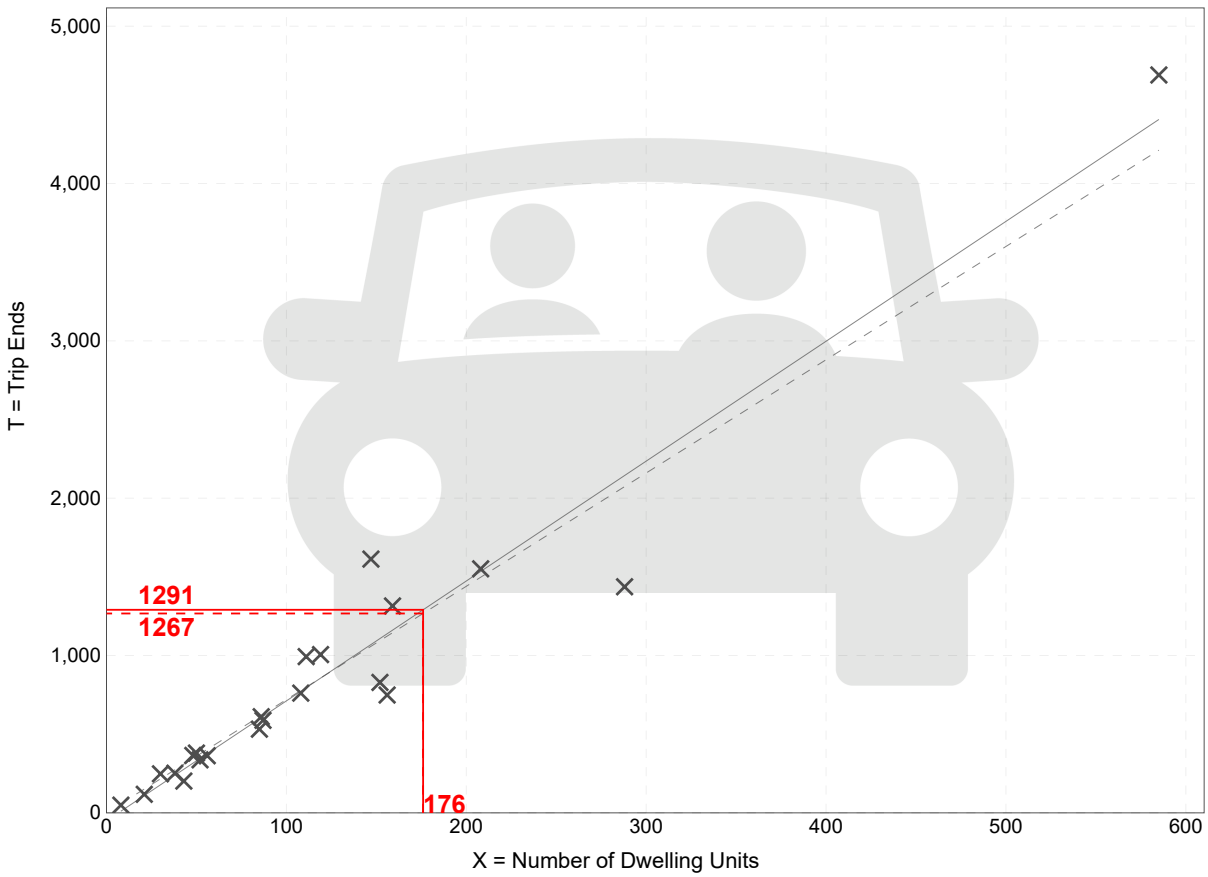
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

Setting/Location: **General Urban/Suburban**
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

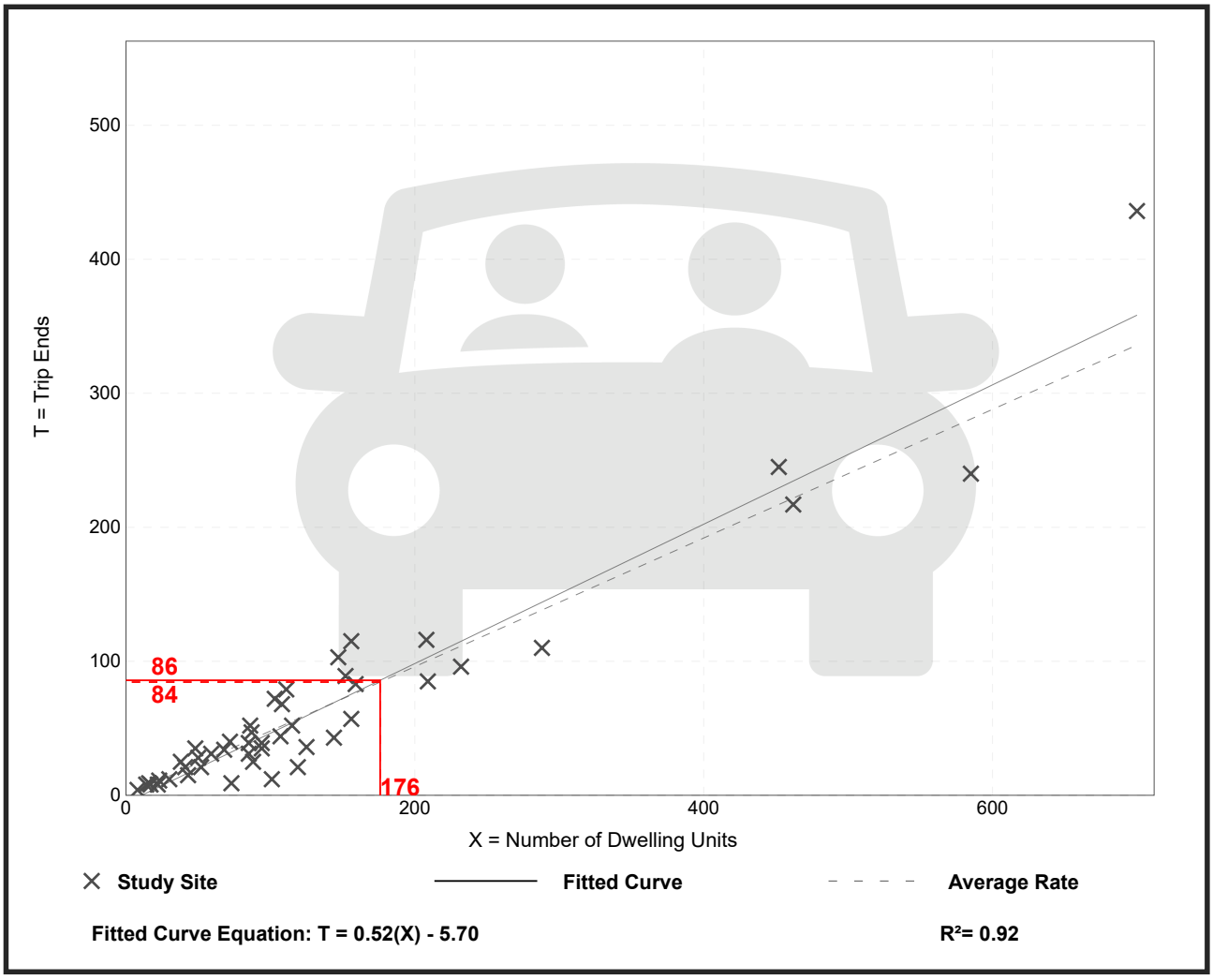
Single-Family Attached Housing
(215)

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: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

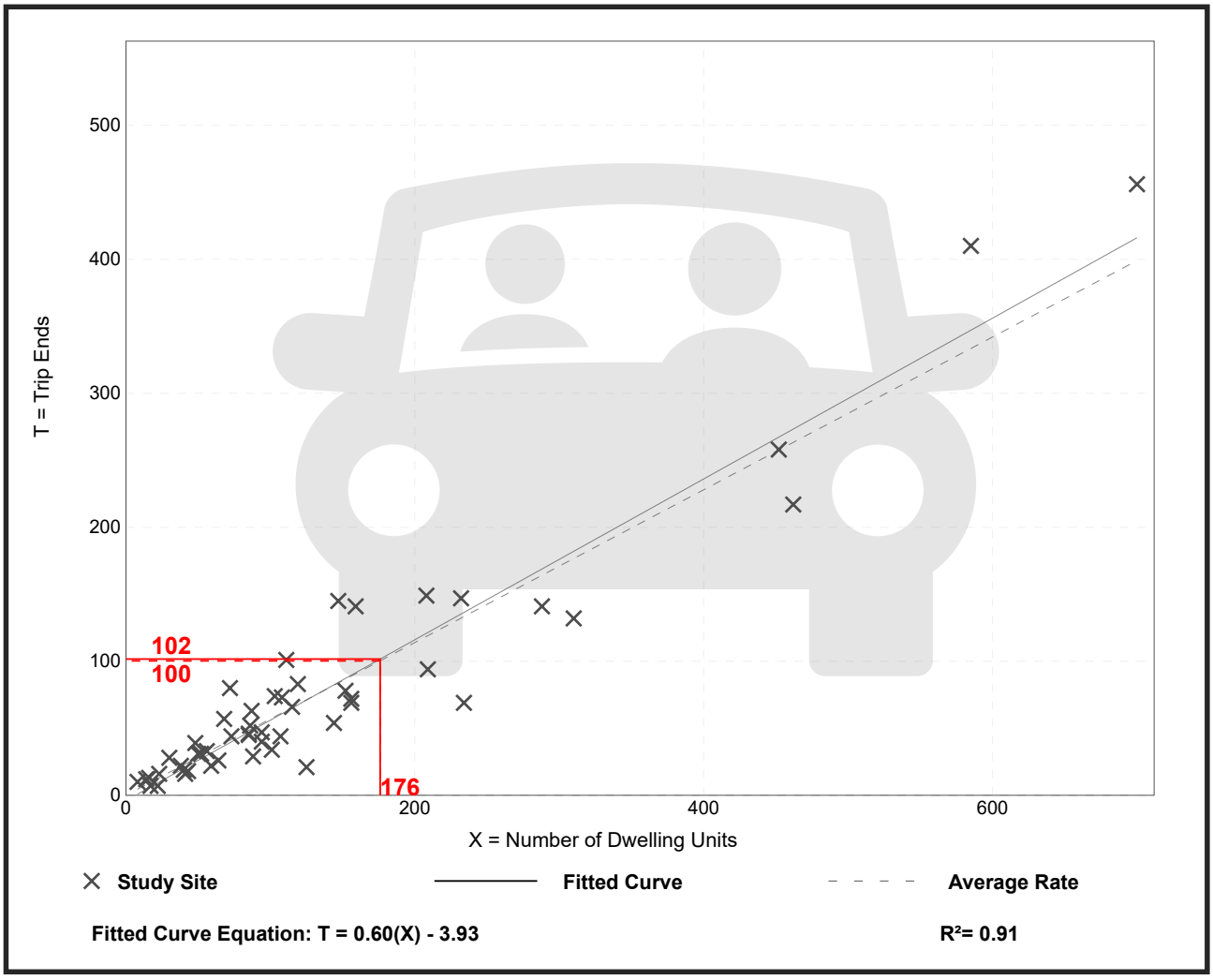
Single-Family Attached Housing
(215)

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: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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Single-Family Detached Housing
(210)

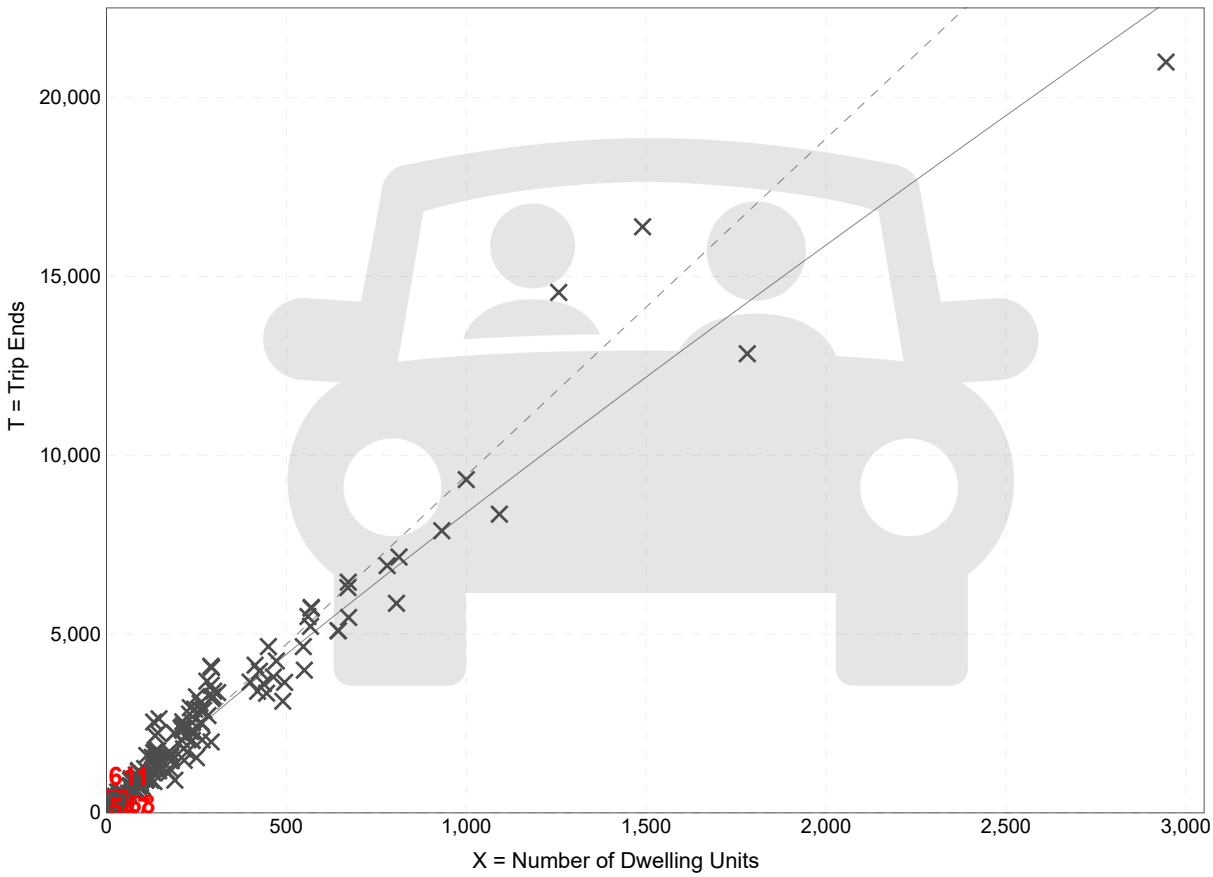
Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday**

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



Fitted Curve Equation: Ln(T) = 0.92 Ln(X) + 2.68 **R^2= 0.95**

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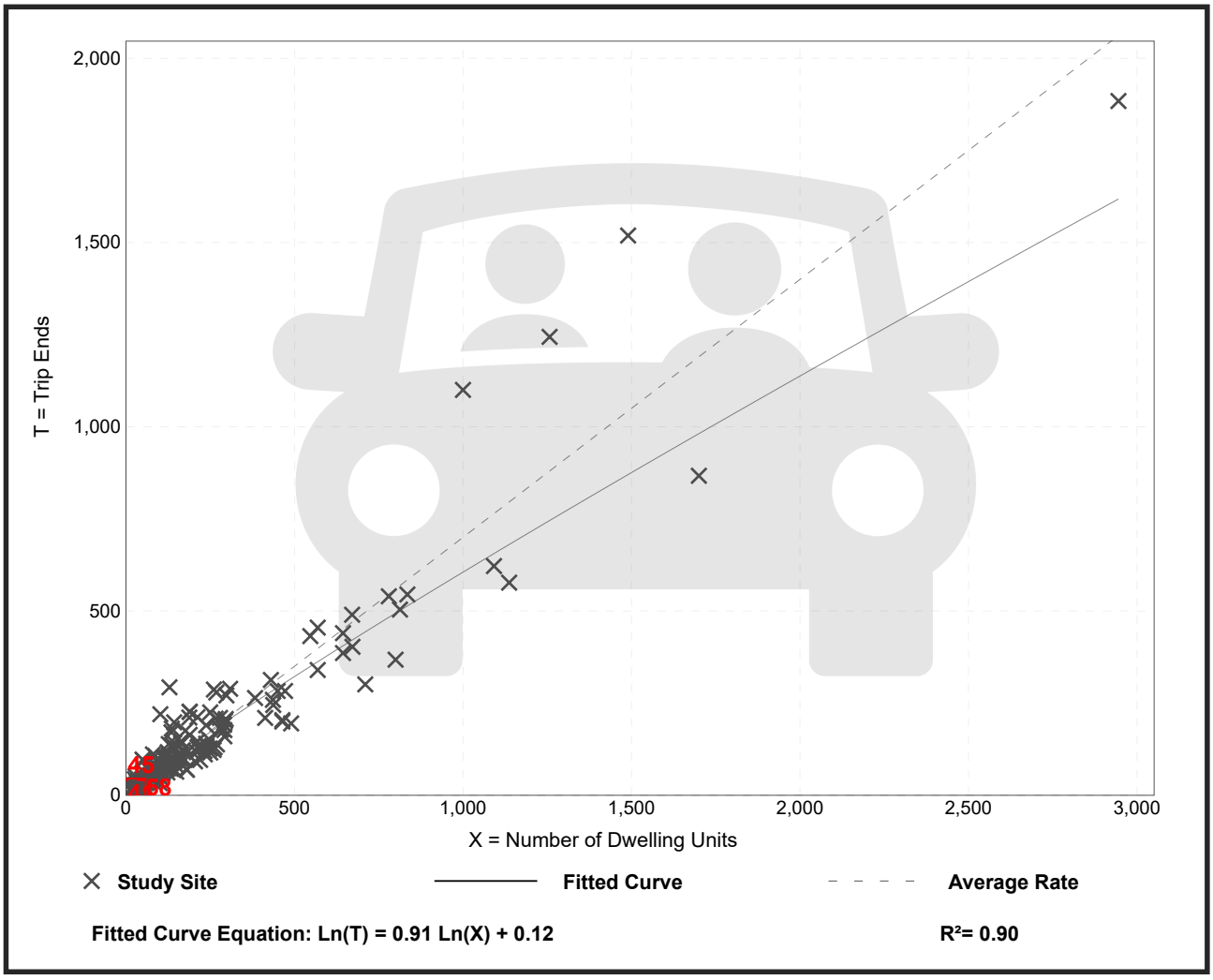
Single-Family Detached Housing
(210)

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: 25% entering, 75% 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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

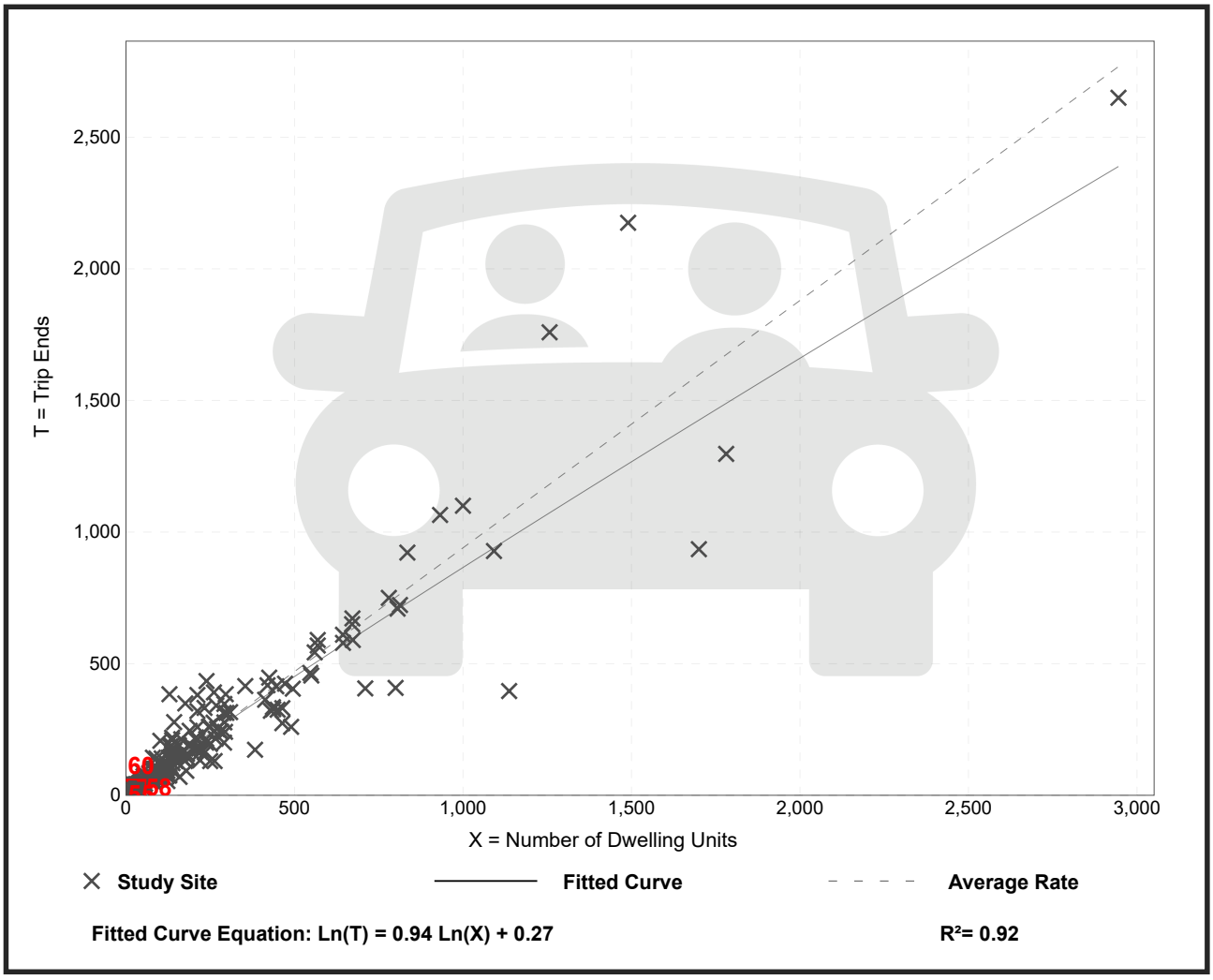
Single-Family Detached Housing
(210)

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



Trip Gen Manual, 11th Edition ● Institute of Transportation Engineers

Attachment B

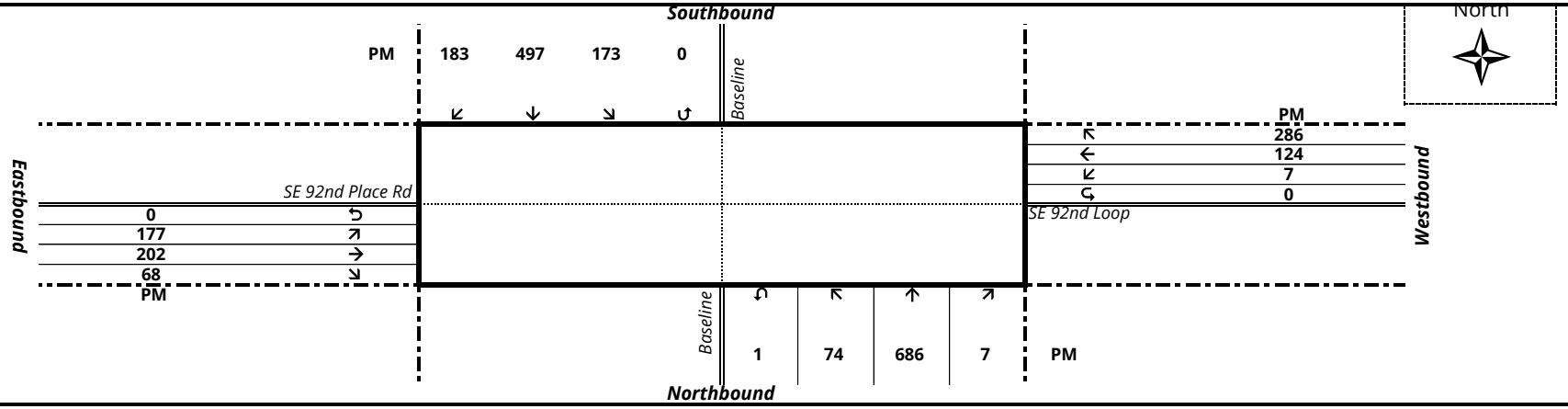
15 MINUTE TURNING MOVEMENT COUNTS

(Cars and Trucks)

DATE: September 27, 2022 (Tuesday) **CITY:** Belleview **LATITUDE:** 0

LOCATION: Baseline & SE 92nd Place Rd/SE 92nd Loop **COUNTY:** Marion County **LONGITUDE:** 0

	Baseline					Baseline						SE 92nd Place Rd						SE 92nd Loop						
TIME	NORTHBOUND					SOUTHBOUND					N/S	EASTBOUND					WESTBOUND					E/W	GRAND
BEGIN	L	T	R	*U-turn*	TOTAL	L	T	R	*U-turn*	TOTAL	TOTAL	L	T	R	*U-turn*	TOTAL	L	T	R	*U-turn*	TOTAL	TOTAL	TOTAL
04:00 PM	6	192	2	0	**200**	30	108	38	1	**177**	**377**	74	40	11	0	**125**	2	32	60	0	**94**	**219**	**596**
04:15 PM	7	184	3	0	**194**	35	107	42	0	**184**	**378**	74	55	18	0	**147**	1	29	62	0	**92**	**239**	**617**
04:30 PM	10	172	3	0	**185**	33	122	35	0	**190**	**375**	62	48	13	0	**123**	3	50	80	0	**133**	**256**	**631**
04:45 PM	8	194	0	0	**202**	30	94	43	0	**167**	**369**	45	45	12	0	**102**	2	35	76	0	**113**	**215**	**584**
TOTAL	31	742	8	0	**781**	128	431	158	1	**718**	**1,499**	255	188	54	0	**497**	8	146	278	0	**432**	**929**	**2,428**
05:00 PM	16	162	4	0	**182**	37	135	50	0	**222**	**404**	50	51	18	0	**119**	0	35	69	0	**104**	**223**	**627**
05:15 PM	16	158	0	0	**174**	47	113	35	0	**195**	**369**	45	60	9	0	**114**	1	39	83	0	**123**	**237**	**606**
05:30 PM	18	184	1	1	**204**	48	115	47	0	**210**	**414**	43	52	19	0	**114**	5	16	67	0	**88**	**202**	**616**
05:45 PM	24	182	2	0	**208**	41	134	51	0	**226**	**434**	39	39	22	0	**100**	1	34	67	0	**102**	**202**	**636**
TOTAL	74	686	7	1	**768**	173	497	183	0	**853**	**1,621**	177	202	68	0	**447**	7	124	286	0	**417**	**864**	**2,485**
PM Peak																						**Peak Hour Factor:**	**0.977**
05:00 PM to 06:00 PM	**74**	**686**	**7**	**1**	**768**	**173**	**497**	**183**	**0**	**853**	**1,621**	**177**	**202**	**68**	**0**	**447**	**7**	**124**	**286**	**0**	**417**	**864**	**2,485**



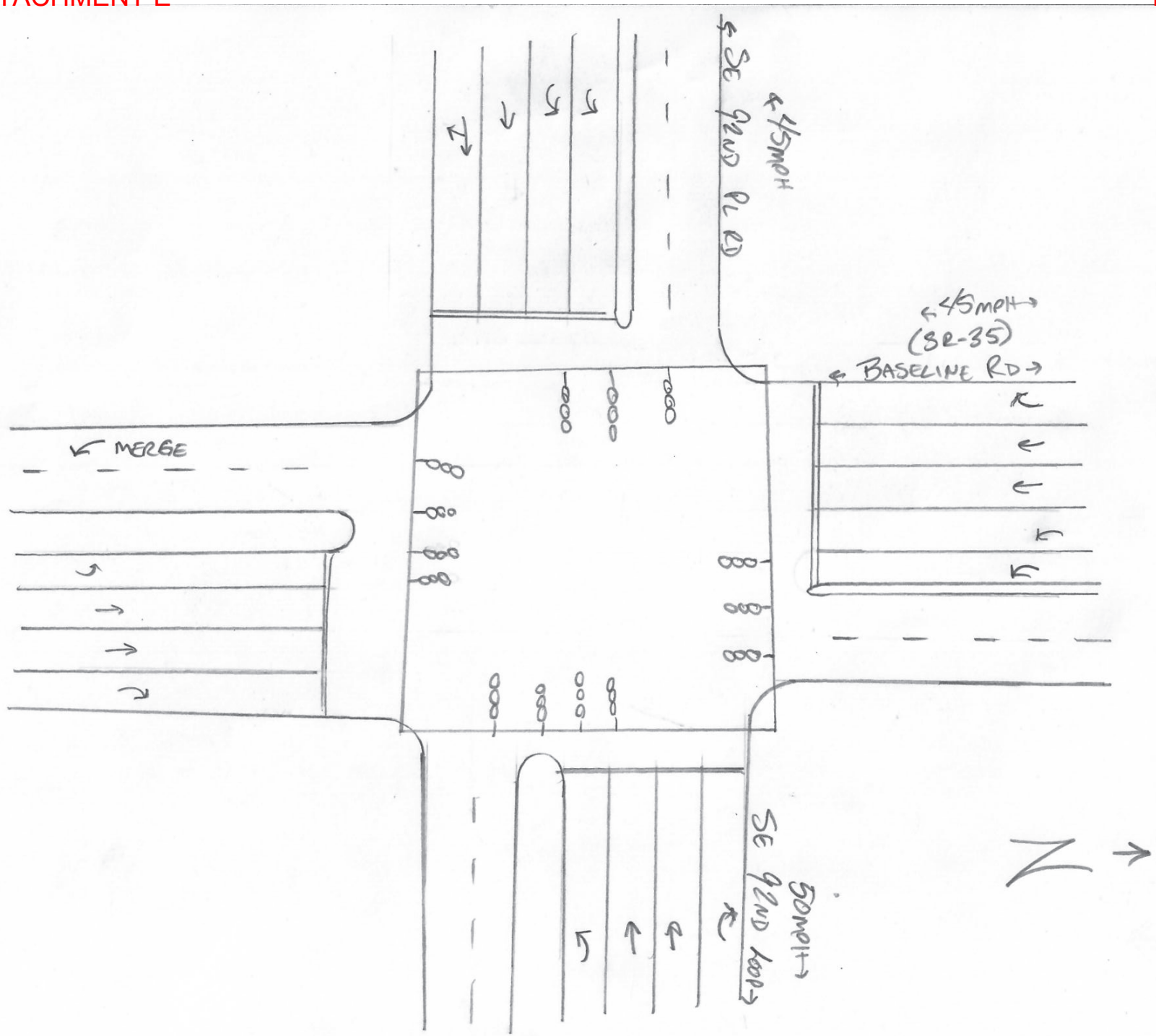
15 MINUTE TURNING MOVEMENT COUNTS

(Trucks Only)

DATE: September 27, 2022 (Tuesday) **CITY:** Belleview **LATITUDE:** 0

LOCATION: Baseline & SE 92nd Place Rd/SE 92nd Loop **COUNTY:** Marion County **LONGITUDE:** 0

	Baseline					Baseline						SE 92nd Place Rd					SE 92nd Loop						
TIME	NORTHBOUND					SOUTHBOUND					N/S	EASTBOUND					WESTBOUND					E/W	GRAND
BEGIN	L	T	R	*U-turn*	TOTAL	L	T	R	*U-turn*	TOTAL	TOTAL	L	T	R	*U-turn*	TOTAL	L	T	R	*U-turn*	TOTAL	TOTAL	TOTAL
04:00 PM	0	3	0	0	**3**	1	8	1	0	**10**	**13**	1	1	1	0	**3**	0	3	0	0	**3**	**6**	**19**
04:15 PM	0	4	0	0	**4**	4	4	4	0	**12**	**16**	3	1	1	0	**5**	0	0	1	0	**1**	**6**	**22**
04:30 PM	0	2	0	0	**2**	1	2	3	0	**6**	**8**	2	0	0	0	**2**	0	1	2	0	**3**	**5**	**13**
04:45 PM	0	5	0	0	**5**	0	2	2	0	**4**	**9**	0	2	1	0	**3**	0	0	0	0	**0**	**3**	**12**
TOTAL	0	14	0	0	**14**	6	16	10	0	**32**	**46**	6	4	3	0	**13**	0	4	3	0	**7**	**20**	**66**
05:00 PM	0	4	0	0	**4**	0	2	1	0	**3**	**7**	1	2	2	0	**5**	0	2	0	0	**2**	**7**	**14**
05:15 PM	0	2	0	0	**2**	2	1	0	0	**3**	**5**	0	0	0	0	**0**	0	2	0	0	**2**	**2**	**7**
05:30 PM	0	1	0	0	**1**	0	0	1	0	**1**	**2**	0	0	0	0	**0**	0	0	0	0	**0**	**0**	**2**
05:45 PM	0	0	0	0	**0**	0	1	0	0	**1**	**1**	0	1	0	0	**1**	0	0	0	0	**0**	**1**	**2**
TOTAL	0	7	0	0	**7**	2	4	2	0	**8**	**15**	1	3	2	0	**6**	0	4	0	0	**4**	**10**	**25**
PM Peak 05:00 PM to 06:00 PM	**0**	**7**	**0**	**0**	**7**	**2**	**4**	**2**	**0**	**8**	**15**	**1**	**3**	**2**	**0**	**6**	**0**	**4**	**0**	**0**	**4**	**10**	**25**


SE 92ND PL RD
45MPH
45MPH
(SR-35)
BASELINE RD
MERGE
SE 92ND Loop
50MPH
N

APPENDIX B

Roadway Capacity Information

Location	Source	Count Type	2018	2019	2020	2021	2022	Ave Annual Growth Rate (%)
SE 110th Street								
W of US 441	MC	3	5,600	5,800	5,600	6,500	6,600	4.4%
SE 132nd Street								
E of CR 484	MC	3	12,000	11,400	11,200	13,500	13,700	3.8%
W of US 441	MC	3	10,500	11,000	10,000	13,200	14,100	8.6%
SE 100th Avenue								
S of CR 25	MC	3	5,300	5,400	5,100	4,700	5,000	-1.3%
SE 147th Street/147th Place								
W of US 441	MC	3	4,300	4,400	5,500	4,800	5,600	7.8%
SE 110th Street Road								
E of Oak Rd	MC	3	2,800	2,900	3,300	3,200	3,400	5.1%
SE 114th Street Road								
W of CR 464C	MC	3	3,500	3,600	4,200	4,500	5,000	9.4%
SE Oak Road								
S of CR 464	MC	3	3,200	3,500	5,000	5,100	5,300	14.5%
SE 44th Avenue Road								
N of SE 52nd St	MC	3	7,300	7,500	7,600	8,100	8,300	3.3%
SE 92nd Place Road								
E of US 441	MC	3	7,100	7,200	7,000	9,900	10,400	11.3%
SE 92nd Loop								
SE 110th St Rd & E HWY 25	MC	3	NC	NC	NC	8,100	12,300	N/A
South Magnolia Avenue								
SE 3rd St to SE 8th Street	OCA	1	4,800	4,000	3,200	5,900	5,200	9.0%
SR 19								
N of CR 316	FDOT	4	3,100	3,500	3,800	3,800	3,800	5.4%
S of CR 316	FDOT	4	4,200	4,200	4,300	4,300	4,300	0.6%
SE of CR 314	FDOT	4	2,100	1,900	1,900	1,900	2,200	1.6%
N of SR 40	FDOT	4	1,700	1,700	1,900	1,900	1,900	2.9%
SR 35								
S of SR 40	FDOT	4	14,700	12,200	12,000	12,200	15,800	3.1%
N of SR 464	FDOT	4	21,000	21,000	20,400	20,500	20,500	-0.6%
S of SR 464	FDOT	4	21,500	26,000	26,000	27,000	26,500	5.7%
N of SR 25	FDOT	4	11,600	11,800	12,400	12,600	12,600	2.1%
N of SE 92nd	FDOT	4	21,500	26,000	26,000	27,000	26,500	5.7%

APPENDIX C

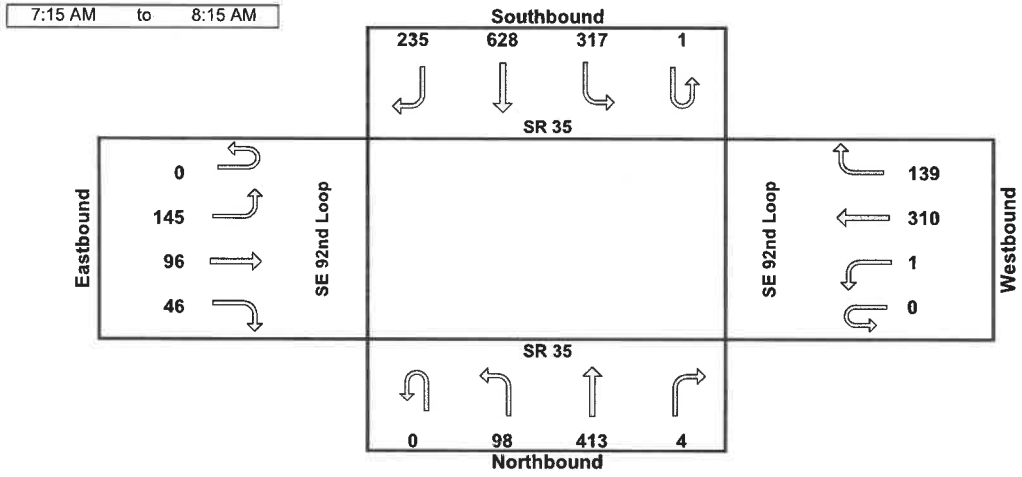
Intersection Traffic Counts, Signal Timings, and FDOT's Seasonal Factors

TURNING MOVEMENT COUNT ANALYSIS

(Passenger Cars, Heavy Vehicles, U-Turns)

Intersection (N/S): SR 35
Intersection (E/W): SE 92nd Loop
Date: 1/10/2023

		SR 35				SE 92nd Loop				SR 35				SE 92nd Loop				
		SB				WB				NB				EB				
Start	End	R	T	L	UT	R	T	L	UT	R	T	L	UT	R	T	L	UT	TOTAL
7:00 AM	7:15 AM	35	142	57	0	45	83	1	0	0	99	30	0	10	16	36	0	554
7:15 AM	7:30 AM	47	185	91	1	38	106	0	0	1	93	31	0	11	17	23	0	644
7:30 AM	7:45 AM	61	134	86	0	44	87	0	0	0	112	23	0	8	27	40	0	622
7:45 AM	8:00 AM	61	151	62	0	31	65	1	0	0	99	27	0	13	25	39	0	574
	Total:	**204**	**612**	**296**	**1**	**158**	**341**	**2**	**0**	**1**	**403**	**111**	**0**	**42**	**85**	**138**	**0**	**2394**
8:00 AM	8:15 AM	66	158	78	0	26	52	0	0	3	109	17	0	14	27	43	0	593
8:15 AM	8:30 AM	36	124	67	0	38	43	0	0	4	79	14	0	8	24	31	0	468
8:30 AM	8:45 AM	70	111	65	0	24	36	10	0	1	72	19	0	7	33	29	0	477
8:45 AM	9:00 AM	53	86	44	0	4	34	1	0	2	80	12	1	9	16	36	0	378
	Total:	**225**	**479**	**254**	**0**	**92**	**165**	**11**	**0**	**10**	**340**	**62**	**1**	**38**	**100**	**139**	**0**	**1916**
	2 HR Total	*429*	*1091*	*550*	*1*	*250*	*506*	*13*	*0*	*11*	*743*	*173*	*1*	*80*	*185*	*277*	*0*	*4310*
7:15 AM	**8:15 AM**	**Total Peak Hour:**																
	Volume	235	628	317	1	139	310	1	0	4	413	98	0	46	96	145	0	2433
	Approach Percent	19.9	53.2	26.8	0.1	30.9	68.9	0.2	0.0	0.8	80.2	19.0	0.0	16.0	33.4	50.5	0.0	
	Approach Total	1181				450				515				287				
	Intersection Percent	9.7	25.8	13.0	0.0	5.7	12.7	0.0	0.0	0.2	17.0	4.0	0.0	1.9	3.9	6.0	0.0	
	Intersection PHF:	0.944																



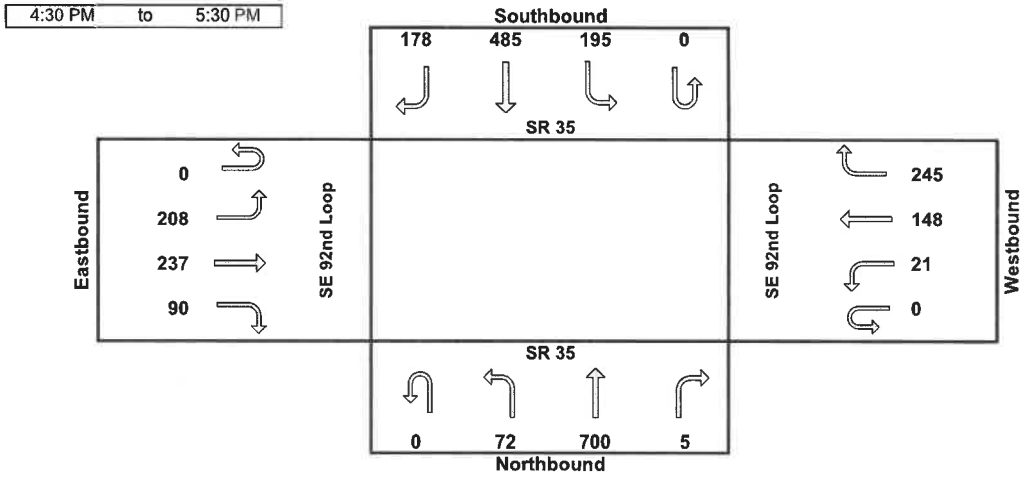
PREPARED BY: TRUCKIN TRAFFIC, LLC

TURNING MOVEMENT COUNT ANALYSIS

(Passenger Cars, Heavy Vehicles, U-Turns)

Intersection (N/S): SR 35
Intersection (E/W): SE 92nd Loop
Date: 1/10/2023

		SR 35				SE 92nd Loop				SR 35				SE 92nd Loop				
		SB				WB				NB				EB				
Start	End	R	T	L	UT	R	T	L	UT	R	T	L	UT	R	T	L	UT	TOTAL
4:00 PM	4:15 PM	52	124	36	0	45	36	0	0	2	168	13	0	18	48		0	542
4:15 PM	4:30 PM	38	84	24	0	58	29	0	1	3	152	15	0	17	57	71	0	549
4:30 PM	4:45 PM	42	102	52	0	59	37	11	0	2	162	24	0	19	52	49	0	611
4:45 PM	5:00 PM	55	109	41	0	67	49	4	0	0	174	16	0	26	60	36	0	637
	Total:	**187**	**419**	**153**	**0**	**229**	**151**	**15**	**1**	**7**	**656**	**68**	**0**	**80**	**217**	**156**	**0**	**2339**
5:00 PM	5:15 PM	37	145	49	0	58	34	2	0	3	203	24	0	21	68	59	0	703
5:15 PM	5:30 PM	44	129	53	0	61	28	4	0	0	161	8	0	24	57	64	0	633
5:30 PM	5:45 PM	31	82	43	0	50	28	7	0	0	166	13	0	15	58	59	0	552
5:45 PM	6:00 PM	32	113	43	0	32	34	3	0	0	145	11	1	16	46	31	0	507
	Total:	**144**	**469**	**188**	**0**	**201**	**124**	**16**	**0**	**3**	**675**	**56**	**1**	**76**	**229**	**213**	**0**	**2395**
	2 HR Total	*331*	*888*	*341*	*0*	*430*	*275*	*31*	*1*	*10*	*1331*	*124*	*1*	*156*	*446*	*369*	*0*	*4734*
4:30 PM	**5:30 PM**	**Total Peak Hour:**																
	Volume	178	485	195	0	245	148	21	0	5	700	72	0	90	237	208	0	2584
	Approach Percent	20.7	56.5	22.7	0.0	59.2	35.7	5.1	0.0	0.6	90.1	9.3	0.0	16.8	44.3	38.9	0.0	
	Approach Total	858				414				777				535				
	Intersection Percent	6.9	18.8	7.5	0.0	9.5	5.7	0.8	0.0	0.2	27.1	2.8	0.0	3.5	9.2	8.0	0.0	
	Intersection PHF:	0.919																



PREPARED BY: TRUCKIN TRAFFIC, LLC

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION - DISTRICT FIVE
SR 35 - TSMO Signal Retiming
Marion County
FIN 440412-1-32-02

Designed By:	S.M.P.
Date:	6/14/2022
Checked By:	R.A.A
Date:	6/14/2022

Section	36009000	**Mile Post**	1.783	**Node**	1
Sig ID	166	**System ID**		**SOP**	10
Maj. Street	SR 35	**Orientation**	N-S	**Controller**	Siemens m60
Min. Street	SE 92nd Place/Loop	**Orientation**	E-W	**Firmware**	3.57b

Data Inputs

Movement # (Controller Phase Ø)	1	2	3	4	5	6	7	8
Direction	***NBL***	***SB***	***EBL***	***WB***	***SBL***	***NB***	***WBL***	***EB***
Speed Limit (mph)	*45*	*45*	*45*	*50*	*45*	*45*	*50*	*45*
Vehicle Traversed Width	*162*	*144*	*158*	*163*	*162*	*152*	*152*	*159*
Approach Grades	*-0.6%*	*-1.4%*	*-2.4%*	*-0.6%*	*-1.4%*	*-0.6%*	*-0.6%*	*-2.4%*
Ped-X (curb to curb)		*103*		*128*		*118*		*120*
Crossing Time		*30*		*37*		*34*		*35*
Ped-X (button to curb)		*7*		*8*		*9*		*9*
Ped-X (button to far curb)		110		136		127		129
Crossing Time (to far curb)		*37*		*46*		*43*		*43*

Controller Timings (seconds)

Movement # (Controller Phase Ø)	1	2	3	4	5	6	7	8
Direction	***NBL***	***SB***	***EBL***	***WB***	***SBL***	***NB***	***WBL***	***EB***
Turn Type	*Prot*		*Prot*		*Prot*		*Prot*	
Min Green	*5*	*15*	*5*	*15*	*5*	*15*	*5*	*15*
Ext	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*	*3.0*
Yellow Change Interval	*4.8*	*4.9*	*5.0*	*5.2*	*4.9*	*4.9*	*5.2*	*5.2*
Red Clearance Interval	*4.0*	*2.0*	*3.9*	*2.0*	*4.0*	*2.0*	*3.7*	*2.0*
Max I	*20*	*45*	*20*	*45*	*20*	*45*	*20*	*45*
Max II								
Walk		*7*		*7*		*7*		*7*
Flashing Don't Walk		*30*		*37*		*34*		*35*
Min Splits	*14.0*	*44.0*	*14.0*	*52.0*	*14.0*	*48.0*	*14.0*	*50.0*
Non-Lock Detection	*Yes*		*Yes*	*Yes*	*Yes*		*Yes*	*Yes*
Det. Cross Switch.								
Recall		*Min*				*Min*		
Dual Entry								
Coord Phase		*ON*				*ON*		

Time Of Day

Weekday

Plan	C-O-S	Time
FREE	0/0/4	0:00
AM*	1/1/1	6:30
MIDDAY*	2/1/1	9:00
PM*	3/1/1	14:30
FREE	0/0/4	18:30

Weekend

Saturday

Plan	C-O-S	Time
FREE	0/0/4	0:00
MIDDAY*	2/1/1	9:00
FREE	0/0/4	17:30

Sunday

Plan	C-O-S	Time
FREE	0/0/4	0:00
MIDDAY*	2/1/1	10:00
FREE	0/0/4	17:00

Coordination Timings (seconds)

Plan	Pattern	C-O-S	Splits								Cycle Length	Offset	Seq
AM		*1/1/1*	*24*	*49*	*19*	*28*	*25*	*48*	*18*	*29*	*120*	*121*	*1*
MIDDAY		*2/1/1*	*22*	*38*	*22*	*28*	*22*	*38*	*20*	*30*	*110*	*111*	*1*
PM		*3/1/1*	*19*	*52*	*20*	*29*	*23*	*48*	*18*	*31*	*120*	*121*	*1*

Notes

*Intersection operates FREE at all times using programmed splits

1) Operate permissive yield

All Patterns

Ring-1	2	1	3	4
Ring-2	5	6	7	8

2022 PEAK SEASON FACTOR CATEGORY REPORT - REPORT TYPE: ALL
CATEGORY: 3600 MARION COUNTYWIDE

MOCF: 0.94

WEEK	DATES	SF	PSCF
1	01/01/2022 - 01/01/2022	1.07	1.14
2	01/02/2022 - 01/08/2022	1.06	1.13
3	01/09/2022 - 01/15/2022	1.05	1.12
4	01/16/2022 - 01/22/2022	1.04	1.11
5	01/23/2022 - 01/29/2022	1.02	1.09
6	01/30/2022 - 02/05/2022	1.01	1.07
7	02/06/2022 - 02/12/2022	1.00	1.06
* 8	02/13/2022 - 02/19/2022	0.98	1.04
* 9	02/20/2022 - 02/26/2022	0.97	1.03
*10	02/27/2022 - 03/05/2022	0.96	1.02
*11	03/06/2022 - 03/12/2022	0.95	1.01
*12	03/13/2022 - 03/19/2022	0.94	1.00
*13	03/20/2022 - 03/26/2022	0.93	0.99
*14	03/27/2022 - 04/02/2022	0.92	0.98
*15	04/03/2022 - 04/09/2022	0.91	0.97
*16	04/10/2022 - 04/16/2022	0.90	0.96
*17	04/17/2022 - 04/23/2022	0.92	0.98
*18	04/24/2022 - 04/30/2022	0.94	1.00
*19	05/01/2022 - 05/07/2022	0.95	1.01
*20	05/08/2022 - 05/14/2022	0.97	1.03
21	05/15/2022 - 05/21/2022	0.99	1.05
22	05/22/2022 - 05/28/2022	0.99	1.05
23	05/29/2022 - 06/04/2022	1.00	1.06
24	06/05/2022 - 06/11/2022	1.00	1.06
25	06/12/2022 - 06/18/2022	1.01	1.07
26	06/19/2022 - 06/25/2022	1.02	1.09
27	06/26/2022 - 07/02/2022	1.02	1.09
28	07/03/2022 - 07/09/2022	1.03	1.10
29	07/10/2022 - 07/16/2022	1.03	1.10
30	07/17/2022 - 07/23/2022	1.03	1.10
31	07/24/2022 - 07/30/2022	1.03	1.10
32	07/31/2022 - 08/06/2022	1.03	1.10
33	08/07/2022 - 08/13/2022	1.03	1.10
34	08/14/2022 - 08/20/2022	1.03	1.10
35	08/21/2022 - 08/27/2022	1.04	1.11
36	08/28/2022 - 09/03/2022	1.05	1.12
37	09/04/2022 - 09/10/2022	1.06	1.13
38	09/11/2022 - 09/17/2022	1.07	1.14
39	09/18/2022 - 09/24/2022	1.05	1.12
40	09/25/2022 - 10/01/2022	1.03	1.10
41	10/02/2022 - 10/08/2022	1.01	1.07
42	10/09/2022 - 10/15/2022	0.99	1.05
43	10/16/2022 - 10/22/2022	0.99	1.05
44	10/23/2022 - 10/29/2022	1.00	1.06
45	10/30/2022 - 11/05/2022	1.00	1.06
46	11/06/2022 - 11/12/2022	1.01	1.07
47	11/13/2022 - 11/19/2022	1.01	1.07
48	11/20/2022 - 11/26/2022	1.03	1.10
49	11/27/2022 - 12/03/2022	1.04	1.11
50	12/04/2022 - 12/10/2022	1.06	1.13
51	12/11/2022 - 12/17/2022	1.07	1.14
52	12/18/2022 - 12/24/2022	1.06	1.13
53	12/25/2022 - 12/31/2022	1.05	1.12

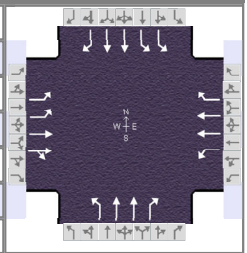
* PEAK SEASON

APPENDIX D

Existing Intersection Capacity Analysis Worksheets

HCS Signalized Intersection Results Summary

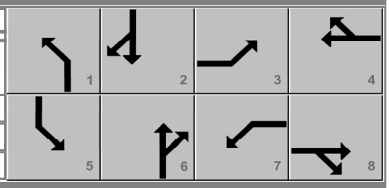
General Information				Intersection Information	
Agency	TPD, Inc.			Duration, h	0.250
Analyst	SS	Analysis Date	6/16/2023	Area Type	Other
Jurisdiction	Marion County	Time Period	Existing AM	PHF	0.94
Urban Street	Baseline Rd / SR 35	Analysis Year	2023	Analysis Period	1> 7:00
Intersection	SE 92nd Place Rd / SE…	File Name	SE 92nd Loop & Baseline Rd - Existing AM.xus		
Project Description	5735				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	152	101	48	1	326	146	103	434	4	334	659	247

Signal Information			
Cycle, s	82.4	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.6	4.8	18.3	0.1	5.9	15.0						
Yellow	4.8	0.0	4.9	5.2	0.0	5.2						
Red	4.0	0.0	2.0	3.7	0.0	2.0						



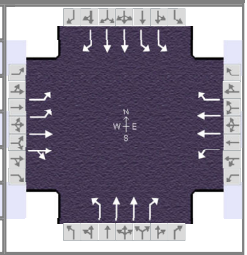
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	2.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	14.9	28.1	9.0	22.2	15.4	25.2	20.1	29.9
Change Period, ($Y+R_c$), s	8.9	7.2	8.9	7.2	8.8	6.9	8.9	6.9
Max Allow Headway (*MAH*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Queue Clearance Time (g_s), s	5.7	5.0	2.0	9.2	6.9	11.4	10.0	16.3
Green Extension Time (g_e), s	0.4	2.4	0.0	2.3	0.3	6.8	1.2	6.8
Phase Call Probability	0.98	1.00	0.02	1.00	0.92	1.00	1.00	1.00
Max Out Probability	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	162	81	78	1	347	155	110	462	4	355	701	263
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1900	1699	1810	1809	1610	1810	1809	1610	1757	1809	1610
Queue Service Time (g_s), s	3.7	2.7	3.0	0.0	7.1	7.2	4.9	9.4	0.2	8.0	14.3	11.6
Cycle Queue Clearance Time (g_c), s	3.7	2.7	3.0	0.0	7.1	7.2	4.9	9.4	0.2	8.0	14.3	11.6
Green Ratio (*g/C*)	0.39	0.25	0.25	0.00	0.18	0.18	0.08	0.22	0.22	0.14	0.28	0.28
Capacity (*c*), veh/h	255	481	430	3	658	293	144	803	357	479	1012	450
Volume-to-Capacity Ratio (*X*)	0.634	0.168	0.181	0.398	0.527	0.530	0.759	0.575	0.012	0.741	0.693	0.583
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)	2.9	2.1	2.0	0.1	5.3	4.8	4.2	6.9	0.1	6.0	9.7	7.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	37.1	24.0	24.1	41.1	30.5	30.5	37.1	28.6	25.0	34.2	26.5	25.5
Incremental Delay (d_2), s/veh	2.6	0.2	0.2	75.3	0.7	1.5	7.9	0.7	0.0	2.3	0.9	1.2
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	39.7	24.2	24.3	116.4	31.2	32.0	45.0	29.2	25.0	36.5	27.4	26.8
Level of Service (LOS)	D	C	C	F	C	C	D	C	C	D	C	C
Approach Delay, s/veh / LOS	32.1	C		31.6	C		32.2	C		29.7	C	
Intersection Delay, s/veh / LOS	30.9						C					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.44	B	2.58	C	2.44	B	2.43	B
Bicycle LOS Score / LOS	0.75	A	0.90	A	0.96	A	1.58	B

HCS Signalized Intersection Results Summary

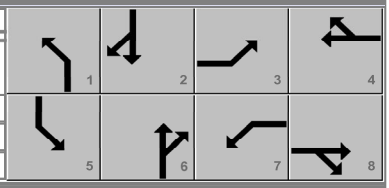
General Information				Intersection Information	
Agency	TPD, Inc.			Duration, h	0.250
Analyst	SS	Analysis Date	6/16/2023	Area Type	Other
Jurisdiction	Marion County	Time Period	Existing PM	PHF	0.92
Urban Street	Baseline Rd / SR 35	Analysis Year	2023	Analysis Period	1> 17:00
Intersection	SE 92nd Place Rd / SE…	File Name	SE 92nd Loop & Baseline Rd - Existing PM.xus		
Project Description	5735				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	218	249	95	22	155	257	76	735	5	205	509	187

Signal Information			
Cycle, s	100.7	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	6.0	3.0	29.5	2.4	6.8	21.1
Yellow	4.8	0.0	4.9	5.2	0.0	5.2
Red	4.0	0.0	2.0	3.7	0.0	2.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	2.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	18.2	35.1	11.3	28.3	14.8	36.4	17.8	39.4
Change Period, ($Y+R_c$), s	8.9	7.2	8.9	7.2	8.8	6.9	8.9	6.9
Max Allow Headway (*MAH*), s	4.0	4.1	4.0	4.1	4.0	4.0	4.0	4.0
Queue Clearance Time (g_s), s	8.6	10.6	3.3	18.7	6.5	22.2	8.2	14.3
Green Extension Time (g_e), s	0.7	3.0	0.0	2.4	0.1	7.3	0.7	7.8
Phase Call Probability	1.00	1.00	0.49	1.00	0.90	1.00	1.00	1.00
Max Out Probability	0.00	0.01	0.00	0.19	0.00	0.07	0.00	0.02

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	237	193	181	24	168	279	83	799	5	223	553	203
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1900	1723	1810	1809	1610	1810	1809	1610	1757	1809	1610
Queue Service Time (g_s), s	6.6	8.2	8.6	1.3	3.9	16.7	4.5	20.2	0.2	6.2	12.3	9.9
Cycle Queue Clearance Time (g_c), s	6.6	8.2	8.6	1.3	3.9	16.7	4.5	20.2	0.2	6.2	12.3	9.9
Green Ratio (*g/C*)	0.35	0.28	0.28	0.02	0.21	0.21	0.06	0.29	0.29	0.09	0.32	0.32
Capacity (*c*), veh/h	324	527	478	44	759	338	108	1061	472	311	1168	520
Volume-to-Capacity Ratio (*X*)	0.732	0.365	0.379	0.544	0.222	0.827	0.762	0.753	0.012	0.716	0.474	0.391
Back of Queue (*Q*), ft/ln (95 th percentile)												
Back of Queue (*Q*), veh/ln (95 th percentile)	5.3	6.5	6.2	1.2	2.9	11.4	4.1	13.2	0.2	4.9	8.8	6.6
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	44.6	29.3	29.4	48.6	33.0	38.1	46.7	32.3	25.3	44.7	27.3	26.5
Incremental Delay (d_2), s/veh	3.2	0.4	0.5	10.0	0.1	8.7	10.4	1.1	0.0	3.1	0.3	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	47.7	29.7	29.9	58.7	33.2	46.8	57.1	33.4	25.3	47.8	27.6	26.9
Level of Service (LOS)	D	C	C	E	C	D	E	C	C	D	C	C
Approach Delay, s/veh / LOS	36.8	D		42.5	D		35.6	D		32.1	C	
Intersection Delay, s/veh / LOS	35.8						D					

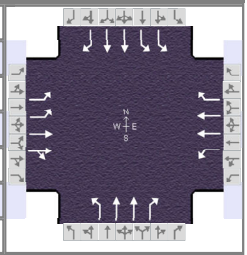
Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.44	B	2.59	C	2.44	B	2.44	B
Bicycle LOS Score / LOS	0.99	A	0.88	A	1.22	A	1.30	A

APPENDIX E

Projected Intersection Capacity Analysis Worksheets

HCS Signalized Intersection Results Summary

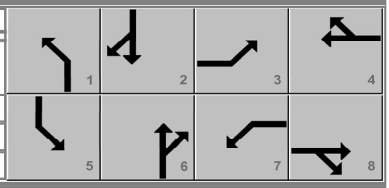
General Information				Intersection Information	
Agency	TPD, Inc.			Duration, h	0.250
Analyst	SS	Analysis Date	6/16/2023	Area Type	Other
Jurisdiction	Marion County	Time Period	Projected AM	PHF	0.94
Urban Street	Baseline Rd / SR 35	Analysis Year	2025	Analysis Period	1> 7:00
Intersection	SE 92nd Place Rd / SE…	File Name	SE 92nd Loop & Baseline Rd - Projected AM.xus		
Project Description	5735				



Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	159	157	50	75	374	206	202	573	12	459	718	270

Signal Information			
Cycle, s	99.6	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On

Green	14.0	2.9	26.1	5.8	1.3	17.7	
Yellow	4.8	0.0	4.9	5.2	0.0	5.2	
Red	4.0	0.0	2.0	3.7	0.0	2.0	



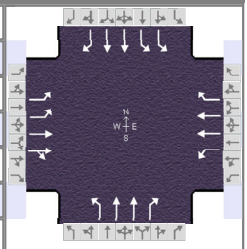
Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	2.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	16.0	26.2	14.7	24.9	22.8	33.0	25.8	36.0
Change Period, ($Y+R_c$), s	8.9	7.2	8.9	7.2	8.8	6.9	8.9	6.9
Max Allow Headway (*MAH*), s	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Queue Clearance Time (g_s), s	6.7	7.3	6.3	14.9	13.5	16.9	15.4	20.9
Green Extension Time (g_e), s	0.4	3.1	0.1	2.7	0.5	8.3	1.5	8.1
Phase Call Probability	0.99	1.00	0.89	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.00	0.01	0.00	0.08	0.01	0.05	0.08	0.07

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	169	112	108	80	398	219	215	610	13	488	764	287
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1900	1746	1810	1809	1610	1810	1809	1610	1757	1809	1610
Queue Service Time (g_s), s	4.7	5.1	5.3	4.3	10.1	12.9	11.5	14.9	0.6	13.4	18.9	15.3
Cycle Queue Clearance Time (g_c), s	4.7	5.1	5.3	4.3	10.1	12.9	11.5	14.9	0.6	13.4	18.9	15.3
Green Ratio (*g/C*)	0.07	0.19	0.19	0.06	0.18	0.18	0.14	0.26	0.26	0.17	0.29	0.29
Capacity (*c*), veh/h	250	362	332	105	641	285	255	950	423	595	1056	470
Volume-to-Capacity Ratio (*X*)	0.677	0.310	0.325	0.761	0.620	0.768	0.843	0.642	0.030	0.821	0.723	0.611
Back of Queue (*Q*), ft/ln (95 th percentile)	93.6	103.1	100.1	97.8	193.6	222.1	232.2	259.6	9.9	245.2	312.9	242.9
Back of Queue (*Q*), veh/ln (95 th percentile)	3.7	4.1	4.0	3.9	7.7	8.9	9.3	10.4	0.4	9.8	12.5	9.7
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	45.2	34.7	34.8	46.3	37.9	39.1	41.8	32.6	27.3	40.0	31.7	30.4
Incremental Delay (d_2), s/veh	3.2	0.5	0.6	10.7	1.0	4.3	7.4	0.7	0.0	4.0	1.0	1.3
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	48.4	35.2	35.4	57.0	38.9	43.4	49.2	33.4	27.4	44.0	32.6	31.7
Level of Service (LOS)	D	D	D	E	D	D	D	C	C	D	C	C
Approach Delay, s/veh / LOS	41.0	D		42.4	D		37.3	D		36.1	D	
Intersection Delay, s/veh / LOS	38.2						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.45	B	2.59	C	2.44	B	2.44	B
Bicycle LOS Score / LOS	0.81	A	1.06	A	1.18	A	1.76	B

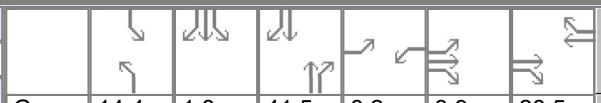
HCS Signalized Intersection Results Summary

General Information				Intersection Information	
Agency	TPD, Inc.			Duration, h	0.250
Analyst	SS	Analysis Date	6/16/2023	Area Type	Other
Jurisdiction	Marion County	Time Period	Projected PM	PHF	0.92
Urban Street	Baseline Rd / SR 35	Analysis Year	2025	Analysis Period	1> 17:00
Intersection	SE 92nd Place Rd / SE…	File Name	SE 92nd Loop & Baseline Rd - Projected PM.xus		
Project Description	5735				

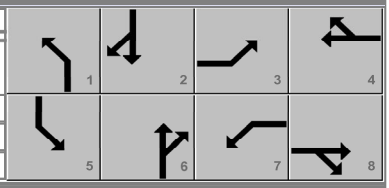


Demand Information	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Demand (*v*), veh/h	241	325	105	83	181	305	159	899	33	335	551	203

Signal Information			
Cycle, s	130.2	Reference Phase	2
Offset, s	0	Reference Point	End
Uncoordinated	Yes	Simult. Gap E/W	On
Force Mode	Fixed	Simult. Gap N/S	On



Green	14.4	1.8	41.5	8.2	3.9	28.5
Yellow	4.8	0.0	4.9	5.2	0.0	5.2
Red	4.0	0.0	2.0	3.7	0.0	2.0



Timer Results	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Assigned Phase	3	8	7	4	1	6	5	2
Case Number	2.0	4.0	2.0	3.0	2.0	3.0	2.0	3.0
Phase Duration, s	21.0	39.7	17.1	35.7	23.2	48.4	25.0	50.2
Change Period, ($Y+R_c$), s	8.9	7.2	8.9	7.2	8.8	6.9	8.9	6.9
Max Allow Headway (*MAH*), s	4.0	4.1	4.0	4.1	4.0	4.0	4.0	4.0
Queue Clearance Time (g_s), s	11.5	16.6	8.4	28.4	14.2	34.8	15.2	19.2
Green Extension Time (g_e), s	0.6	3.3	0.1	0.2	0.2	6.7	0.9	9.7
Phase Call Probability	1.00	1.00	0.96	1.00	1.00	1.00	1.00	1.00
Max Out Probability	0.05	0.11	0.00	1.00	0.56	0.43	0.12	0.07

Movement Group Results	EB			WB			NB			SB		
Approach Movement	L	T	R	L	T	R	L	T	R	L	T	R
Assigned Movement	3	8	18	7	4	14	1	6	16	5	2	12
Adjusted Flow Rate (*v*), veh/h	262	241	226	90	197	332	173	977	36	364	599	221
Adjusted Saturation Flow Rate (*s*), veh/h/ln	1757	1900	1742	1810	1809	1610	1810	1809	1610	1757	1809	1610
Queue Service Time (g_s), s	9.5	14.2	14.6	6.4	5.8	26.4	12.2	32.8	2.0	13.2	17.2	13.8
Cycle Queue Clearance Time (g_c), s	9.5	14.2	14.6	6.4	5.8	26.4	12.2	32.8	2.0	13.2	17.2	13.8
Green Ratio (*g/C*)	0.09	0.25	0.25	0.06	0.22	0.22	0.11	0.32	0.32	0.12	0.33	0.33
Capacity (*c*), veh/h	328	474	434	114	793	353	200	1153	513	435	1203	535
Volume-to-Capacity Ratio (*X*)	0.799	0.509	0.521	0.790	0.248	0.939	0.862	0.847	0.070	0.838	0.498	0.412
Back of Queue (*Q*), ft/ln (95 th percentile)	194	271.4	259.1	144.9	115.2	483.5	268.8	529.8	35.1	254.8	297.8	228
Back of Queue (*Q*), veh/ln (95 th percentile)	7.8	10.9	10.4	5.8	4.6	19.3	10.8	21.2	1.4	10.2	11.9	9.1
Queue Storage Ratio (*RQ*) (95 th percentile)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Uniform Delay (d_1), s/veh	57.9	42.0	42.2	60.2	42.0	50.0	56.9	41.4	30.9	55.8	34.8	33.6
Incremental Delay (d_2), s/veh	4.5	0.9	1.1	11.4	0.2	32.0	19.6	4.7	0.1	6.9	0.3	0.5
Initial Queue Delay (d_3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Control Delay (*d*), s/veh	62.3	42.9	43.3	71.6	42.1	82.0	76.5	46.1	31.0	62.7	35.1	34.1
Level of Service (LOS)	E	D	D	E	D	F	E	D	C	E	D	C
Approach Delay, s/veh / LOS	50.0	D		67.8	E		50.1	D		43.4	D	
Intersection Delay, s/veh / LOS	50.9						D					

Multimodal Results	EB		WB		NB		SB	
Pedestrian LOS Score / LOS	2.45	B	2.60	C	2.45	B	2.45	B
Bicycle LOS Score / LOS	1.09	A	1.00	A	1.47	A	1.46	A

HCS Two-Way Stop-Control Report

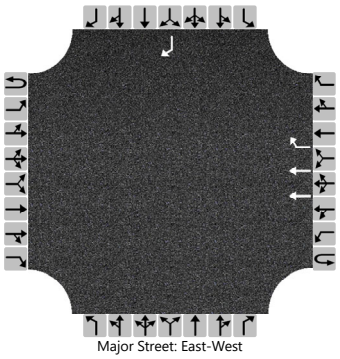
General Information

Analyst	SS
Agency/Co.	TPD, Inc.
Date Performed	6/16/2023
Analysis Year	2025
Time Analyzed	Projected AM
Intersection Orientation	East-West
Project Description	5735

Site Information

Intersection	SE 92nd Loop & Site Access #1
Jurisdiction	Marion County
East/West Street	SE 92nd Loop
North/South Street	Site Access #1
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	2	1		0	0	0		0	0	1
Configuration							T	R								R
Volume (veh/h)							569	3								45
Percent Heavy Vehicles (%)																3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No								No			
Median Type | Storage	Left + Thru								1							

Critical and Follow-up Headways

Base Critical Headway (sec)																6.9
Critical Headway (sec)																6.96
Base Follow-Up Headway (sec)																3.3
Follow-Up Headway (sec)																3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)																49
Capacity, c (veh/h)																684
v/c Ratio																0.07
95% Queue Length, Q_{95} (veh)																0.2
Control Delay (s/veh)																10.7
Level of Service (LOS)																B
Approach Delay (s/veh)													10.7			
Approach LOS													B			

HCS Two-Way Stop-Control Report

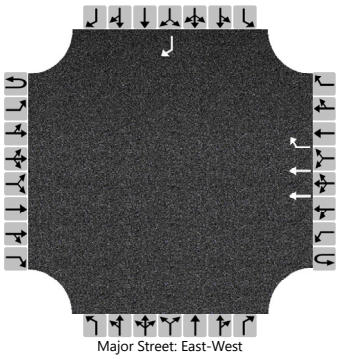
General Information

Analyst	SS
Agency/Co.	TPD, Inc.
Date Performed	6/16/2023
Analysis Year	2025
Time Analyzed	Projected PM
Intersection Orientation	East-West
Project Description	5735

Site Information

Intersection	SE 92nd Loop & Site Access #1
Jurisdiction	Marion County
East/West Street	SE 92nd Loop
North/South Street	Site Access #1
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	2	1		0	0	0		0	0	1
Configuration							T	R								R
Volume (veh/h)							583	9								29
Percent Heavy Vehicles (%)																3
Proportion Time Blocked																
Percent Grade (%)													0			
Right Turn Channelized					No								No			
Median Type | Storage	Left + Thru								1							

Critical and Follow-up Headways

Base Critical Headway (sec)																6.9
Critical Headway (sec)																6.96
Base Follow-Up Headway (sec)																3.3
Follow-Up Headway (sec)																3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)																32
Capacity, c (veh/h)																676
v/c Ratio																0.05
95% Queue Length, Q_{95} (veh)																0.1
Control Delay (s/veh)																10.6
Level of Service (LOS)																B
Approach Delay (s/veh)													10.6			
Approach LOS													B			

HCS Two-Way Stop-Control Report

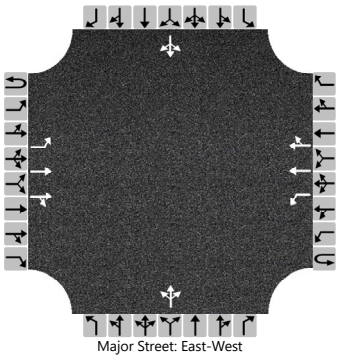
General Information

Analyst	SS
Agency/Co.	TPD, Inc.
Date Performed	6/16/2023
Analysis Year	2025
Time Analyzed	Projected AM
Intersection Orientation	East-West
Project Description	5735

Site Information

Intersection	SE 92nd Loop & Site Access #2
Jurisdiction	Marion County
East/West Street	SE 92nd Loop
North/South Street	Site Access #2
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	23	542	10	0	2	513	3		26	0	7		11	0	33
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type | Storage		Left + Thru								2						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		25				2					36				48	
Capacity, c (veh/h)		1000				966					406				597	
v/c Ratio		0.03				0.00					0.09				0.08	
95% Queue Length, Q_{95} (veh)		0.1				0.0					0.3				0.3	
Control Delay (s/veh)		8.7				8.7					14.7				11.6	
Level of Service (LOS)		A				A					B				B	
Approach Delay (s/veh)		0.3				0.0				14.7				11.6		
Approach LOS		A				A				B				B		

HCS Two-Way Stop-Control Report

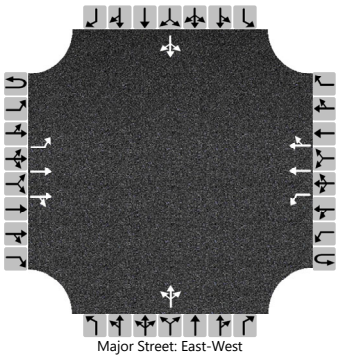
General Information

Analyst	SS
Agency/Co.	TPD, Inc.
Date Performed	6/16/2023
Analysis Year	2025
Time Analyzed	Projected PM
Intersection Orientation	East-West
Project Description	5735

Site Information

Intersection	SE 92nd Loop & Site Access #2
Jurisdiction	Marion County
East/West Street	SE 92nd Loop
North/South Street	Site Access #2
Peak Hour Factor	0.92
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	1	2	0	0	1	2	0		0	1	0		0	1	0
Configuration		L	T	TR		L	T	TR			LTR				LTR	
Volume (veh/h)	0	77	509	30	0	8	553	9		18	0	4		6	0	21
Percent Heavy Vehicles (%)	3	3			3	3				3	3	3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized																
Median Type | Storage		Left + Thru								2						

Critical and Follow-up Headways

Base Critical Headway (sec)		4.1				4.1				7.5	6.5	6.9		7.5	6.5	6.9
Critical Headway (sec)		4.16				4.16				7.56	6.56	6.96		7.56	6.56	6.96
Base Follow-Up Headway (sec)		2.2				2.2				3.5	4.0	3.3		3.5	4.0	3.3
Follow-Up Headway (sec)		2.23				2.23				3.53	4.03	3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)		84				9					24				29	
Capacity, c (veh/h)		957				978					335				559	
v/c Ratio		0.09				0.01					0.07				0.05	
95% Queue Length, Q_{95} (veh)		0.3				0.0					0.2				0.2	
Control Delay (s/veh)		9.1				8.7					16.6				11.8	
Level of Service (LOS)		A				A					C				B	
Approach Delay (s/veh)	1.1				0.1				16.6				11.8			
Approach LOS	A				A				C				B			

APPENDIX F

Turn Lane Analysis Worksheets

TPD #5735

Site Access #1 @ SE 92nd Loop
EB Right Turn Warrant

A.M. Peak Hour

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

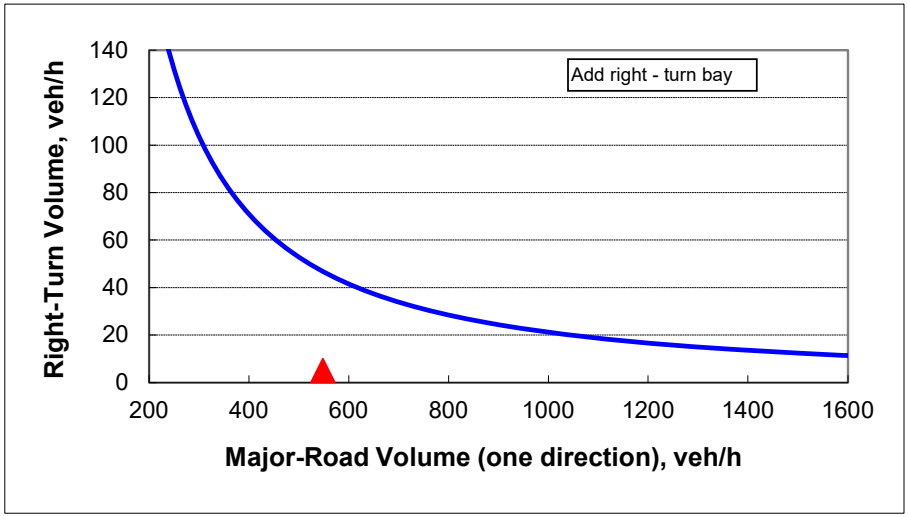
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	548
Right-turn volume, veh/h:	5

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	47
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

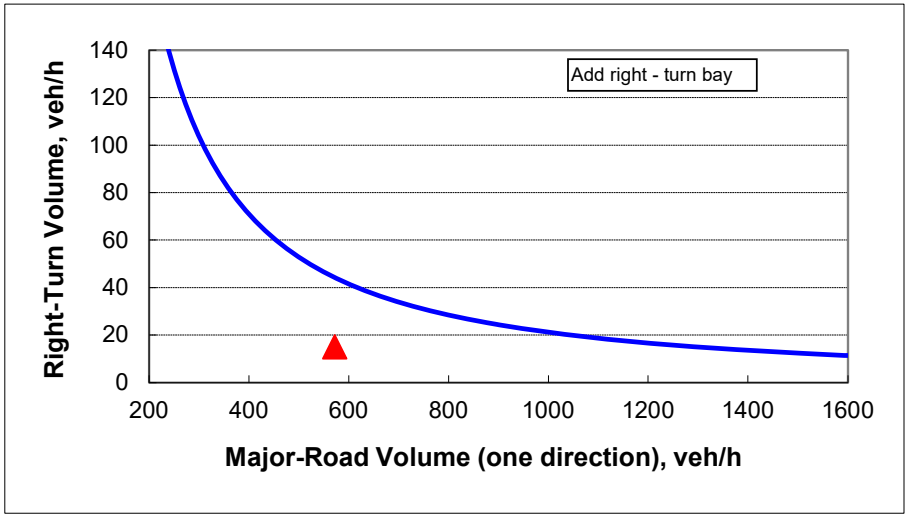
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	572
Right-turn volume, veh/h:	15

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	44
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

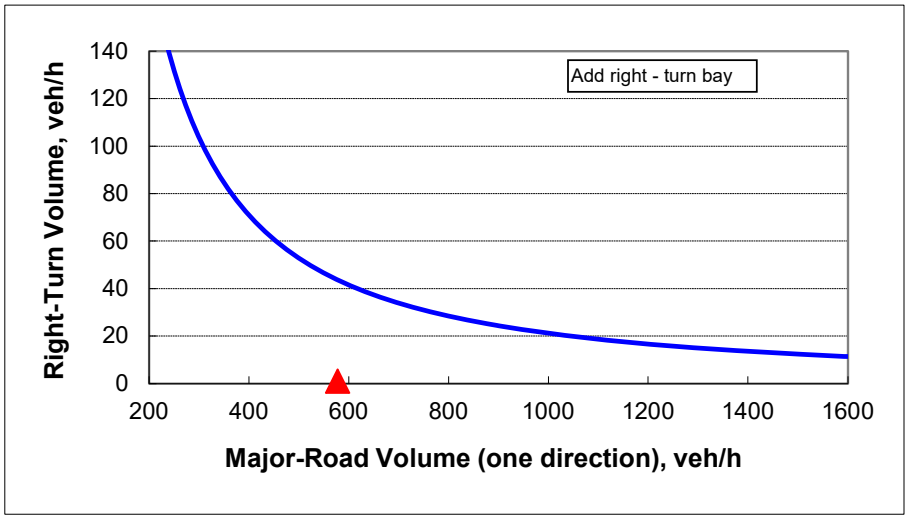
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	578
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	44
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

TPD #5735

Site Access #1 @ SE 92nd Loop
WB Right Turn Warrant

P.M. Peak Hour

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

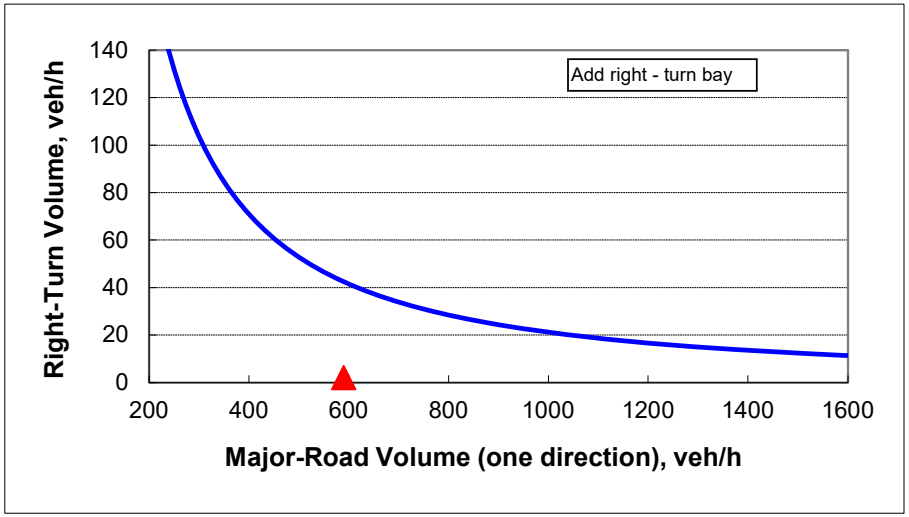
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	590
Right-turn volume, veh/h:	2

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	42
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

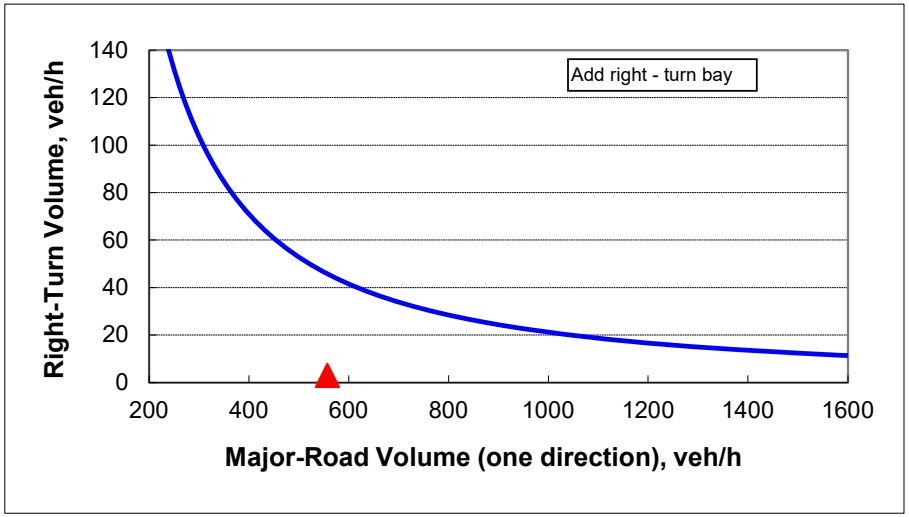
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	557
Right-turn volume, veh/h:	3

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	46
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

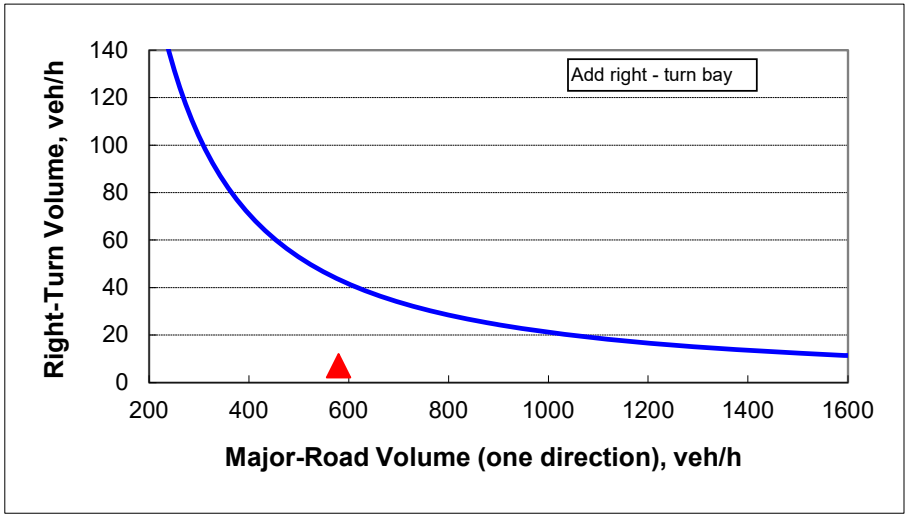
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	580
Right-turn volume, veh/h:	7

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	43
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

TPD #5735

Site Access #3 @ SE 92nd Loop
EB Right Turn Warrant

A.M. Peak Hour

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

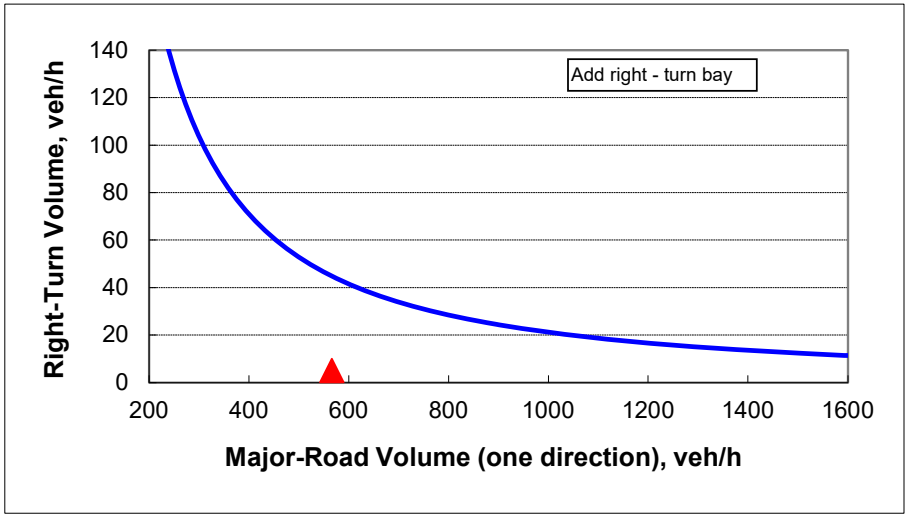
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	566
Right-turn volume, veh/h:	5

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	45
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

TPD #5735

Site Access #3 @ SE 92nd Loop
EB Right Turn Warrant

P.M. Peak Hour

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

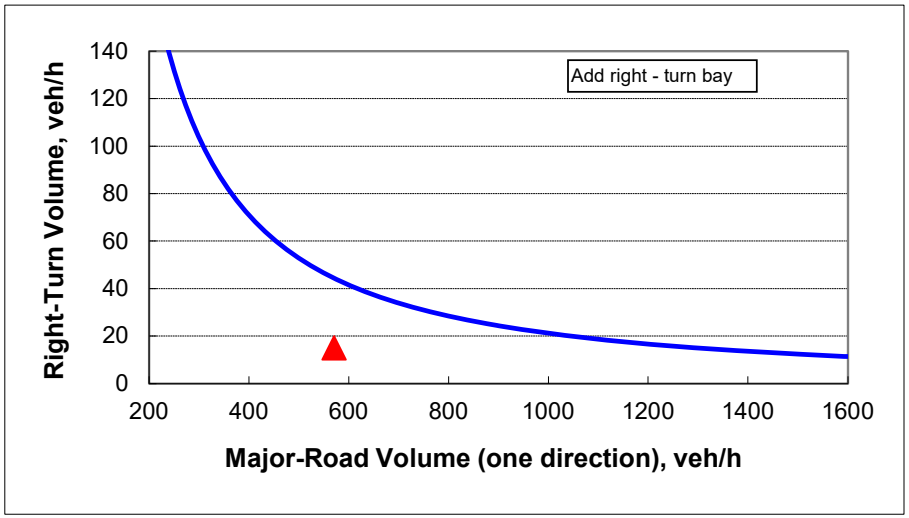
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	571
Right-turn volume, veh/h:	15

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	44
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

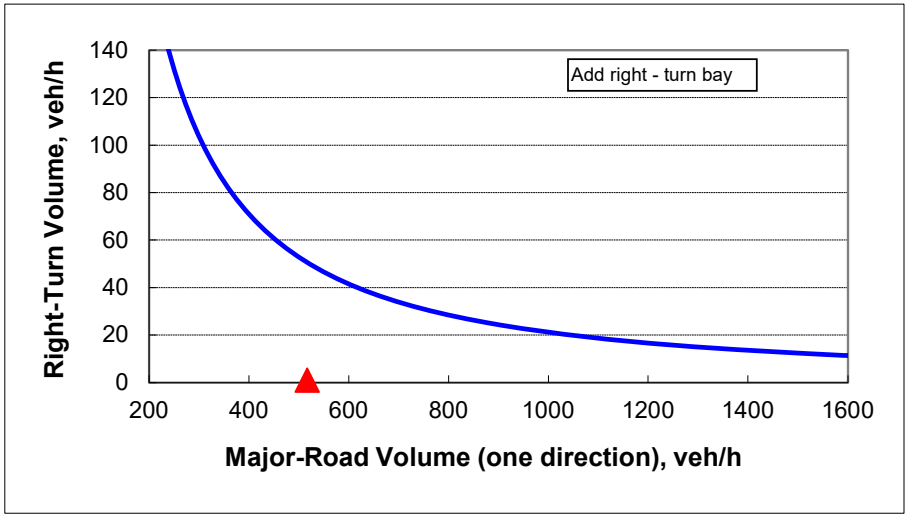
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	517
Right-turn volume, veh/h:	1

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	50
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide

Figure 2 - 6. Guideline for determining the need for a major-road right-turn bay at a two-way stop-controlled intersection.

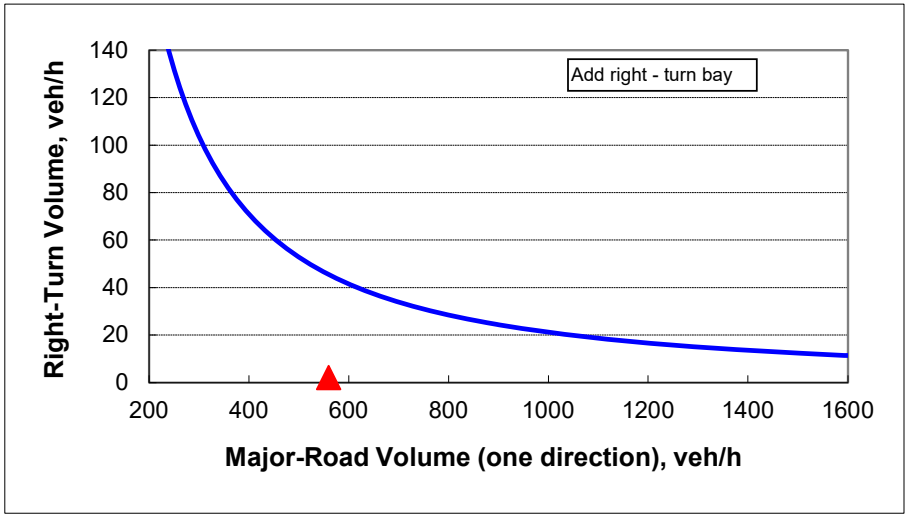
INPUT

Roadway geometry:	4-lane roadway

Variable	Value
Major-road speed, mph:	50
Major-road volume (one direction), veh/h:	560
Right-turn volume, veh/h:	2

OUTPUT

Variable	Value
Limiting right-turn volume, veh/h:	45
Guidance for determining the need for a major-road right-turn bay for a 4-lane roadway:	
Do NOT add right-turn bay.	



Source: National Cooperative Highway Research Program (NCHRP) Report 457- Evaluating Intersection Improvements: An Engineering Study Guide