



BOARDWALK PLACE

BOARDWALK PLACE

Oak Island, NC

PREPARED FOR: Boardwalk Place, LLC

February 10, 2023

PROJECT # 220277

TRANSPORTATION IMPACT ANALYSIS



Celebrating
20



DAVENPORT



Transportation Impact Analysis

Boardwalk Place
Oak Island, NC

Prepared for Boardwalk Place LLC
February 10, 2023

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EXECUTIVE SUMMARY

The Boardwalk Place development is in Oak Island, NC. **The proposed development will consist of one building with up to 5,350 square feet of restaurant space, 8,995 square feet of commercial/retail space, and 106 hotel rooms.** The project proposes to extend 3rd Place East in an existing public right of way and dedicate for public use with a driveway onto the new extension. Two site accesses are proposed for Dolphin Drive, one full access and a one-way drop off loop. The one-way loop is separated with one each ingress and egress lane. The expected build-out year for this development is 2025. Information regarding the property was provided by *Boardwalk Place LLC*.

Using the Institute for Transportation Engineering's 11th Edition Trip Generation for multiple uses on the same site, the site has a potential maximum trip generation of 1,897 daily trips, 100 trips in the AM peak hour, and 136 trips in the PM peak hour. **It should be noted that the ITE Trip Generation Manual would generally consider these trips as generated for a typical suburban site with three non-integrated uses on the same lot.** This project contains three completely integrated uses that compliment and serve each other, significantly reducing trips. As the TIA process does not have protocol to reflect such, these trips have been carried through into the analysis and reflect higher impacts than anticipated. For comparison, alternate trip generation has been provided for a Resort Hotel. The descriptions provided for the ITE Resort Hotel are nearly identical to the description of the Boardwalk proposed uses. To represent the highest impacts, the data in the report reflects three separate uses with trips only reduced by the amount allowed by the typical TIA protocols.

In conclusion, this study has determined the project has **no significant impacts** to the roadway network. No improvements are recommended to accommodate the impacts of new development traffic. The site drives should be constructed according to applicable local standards. Figure A depicts the recommended improvements.

Table 4.3 - ITE Trip Generation

Average Weekday Driveway Volumes				Data Source	Volume	24 Hour		AM Peak Hour		PM Peak Hour	
Land Use	ITE Land Code	Size	Two-Way			Enter	Exit	Enter	Exit	Enter	Exit
Retail (<40k)	822	9.00	1000 Sq. Ft. GLA	Adjacent - Equation	609	16	11	36	36		
Hotel	310	106	Rooms	Adjacent - Equation	726	26	20	26	25		
Fine Dining Restaurant	931	134	Seats	Generator - Rate	348	14	6	23	16		
High - Turnover (Sit-Down) Restaurant	932	2.00	1000 Sq. Ft. GLA	Adjacent - Rate	214	11	8	11	7		
Unadjusted Trips					1,897	67	45	96	84		
Internal Capture Overall %					--	10.7%		24.4%			
Internal Capture: Retail Trips Reduction					--	-2	-2	-10	-4		
Internal Capture: Combined Restaurant Trips Reduction					--	-4	-1	-12	-11		
Internal Capture: Hotel Trips Reduction					--	0	-3	-4	-3		
Total Internal Trips Reduction					--	-6	-6	-26	-18		
Total External Full Build Trips					--	61	39	70	66		

**Table 4.3ALT - ITE Trip Generation**

Boardwalk Place, Oak Island, NC

Average Weekday Driveway Volumes				24 Hour	AM Peak Hour		PM Peak Hour		
Land Use	ITE Land Code	Size		Data Source	Volume	Enter	Exit	Enter	Exit
Resort Hotel	330	106.00	Rooms	Average Rate	N/A	24	10	19	24
Unadjusted Trips					0	24	10	19	24



Table A – Summary of Recommended Improvements

INTERSECTION	RECOMMENDATIONS
East Dolphin Drive and 3 rd Place East / Site Access 1	<ul style="list-style-type: none"> • Design site drive according to applicable local standards. • No additional improvements recommended
East Dolphin Drive and Site Access 2	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.
East Dolphin Drive and Site Access 3	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.
East Dolphin Drive and Site Access 4	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.

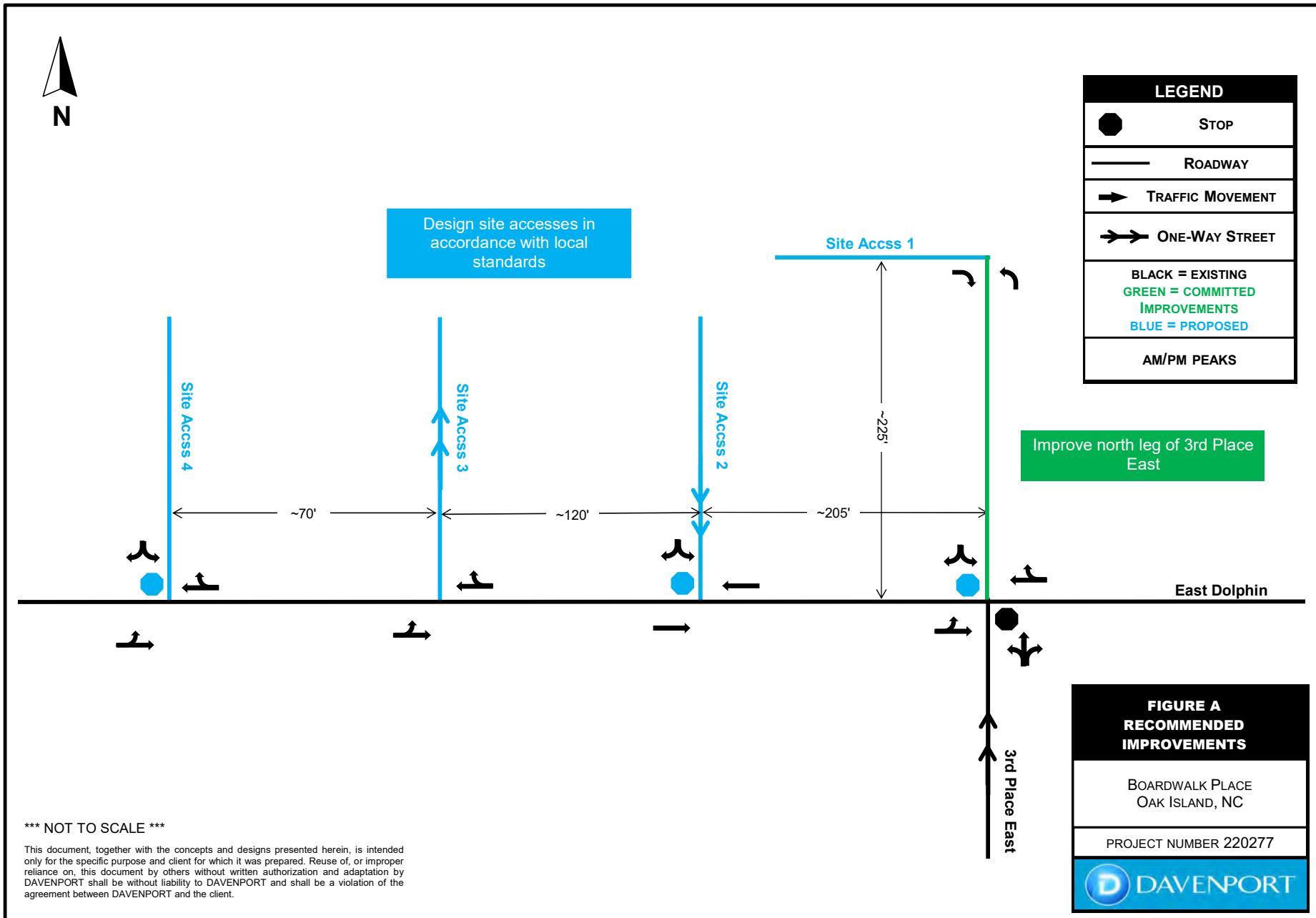




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1.0 Introduction

The Boardwalk Place development is in Oak Island, NC. The proposed development will consist of one building with up to 5,350 square feet of restaurant space, 8,995 square feet of commercial/retail space, and 106 hotel rooms. It should be noted that the ITE Trip Generation Manual would generally consider these trips as generated for a typical suburban site with three non-integrated uses on the same lot. This project contains three completely integrated uses that compliment and serve each other, significantly reducing trips. As the TIA process does not have protocol to reflect such, these trips have been carried through into the analysis and reflect higher impacts than anticipated. For comparison, alternate trip generation has been provided for a Resort Hotel. The descriptions provided for the ITE Resort Hotel are nearly identical to the description of the Boardwalk proposed uses. To represent the highest impacts, the data in the report reflects three separate uses with trips only reduced by the amount allowed by the typical TIA protocols. The project proposes to extend 3rd Place East in an existing public right of way and dedicate for public use with a driveway onto the new extension. Two site accesses are proposed for Dolphin Drive, one full access and a one-way drop off loop. The one-way loop is separated with one each ingress and egress lane. The expected build-out year for this development is 2025. Information regarding the property was provided by *Boardwalk Place LLC*.

A conceptual site plan is shown in Figure 1, and a site location map and a vicinity map are provided in Figures 2A and 2B, respectively.

DAVENPORT was retained to determine the potential traffic impacts of this development and to identify transportation improvements that may be required to accommodate the impacts of the new development traffic. The following intersections are included in the study:

1. 3rd Place East and East Dolphin Drive / Site Access 1 (unsignalized)
2. East Dolphin Drive and Site Access 2
3. East Dolphin Drive and Site Access 3
4. East Dolphin Drive and Site Access 4

These intersections were analyzed during the AM and PM peaks for the following conditions:

- 2022 Existing Conditions
- 2025 Future No Build Conditions
- 2025 Future Build Conditions

The Transportation Impact Analysis (TIA) was performed according to NCDOT standards and best practices of the transportation engineering profession.

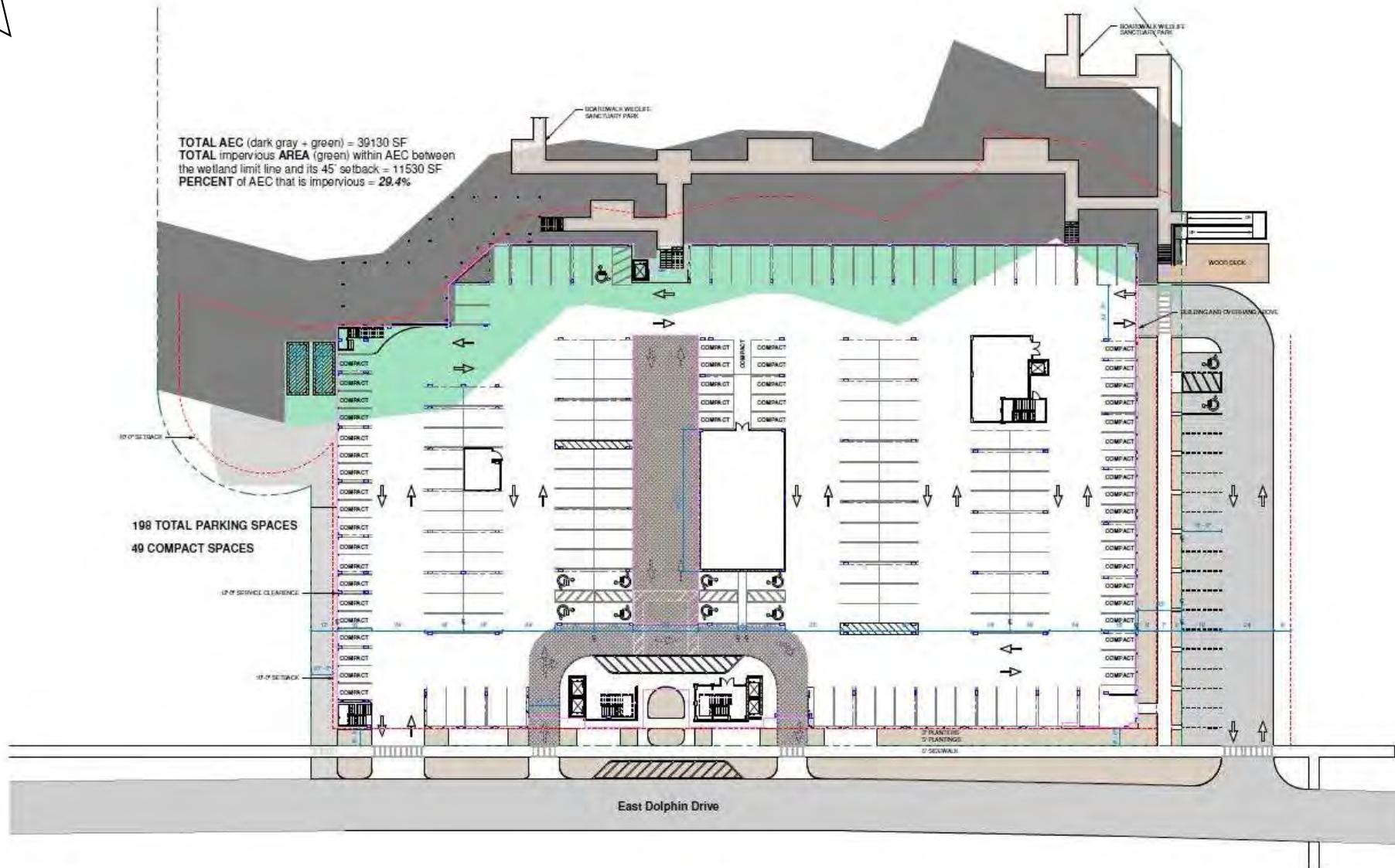


FIGURE 1
CONCEPTUAL SITE PLAN

Boardwalk Place
 Project Number 220277



FIGURE 1 (continued)
CONCEPTUAL SITE PLAN



FIGURE 1 (continued)
CONCEPTUAL SITE PLAN

Boardwalk Place
Project Number 220277

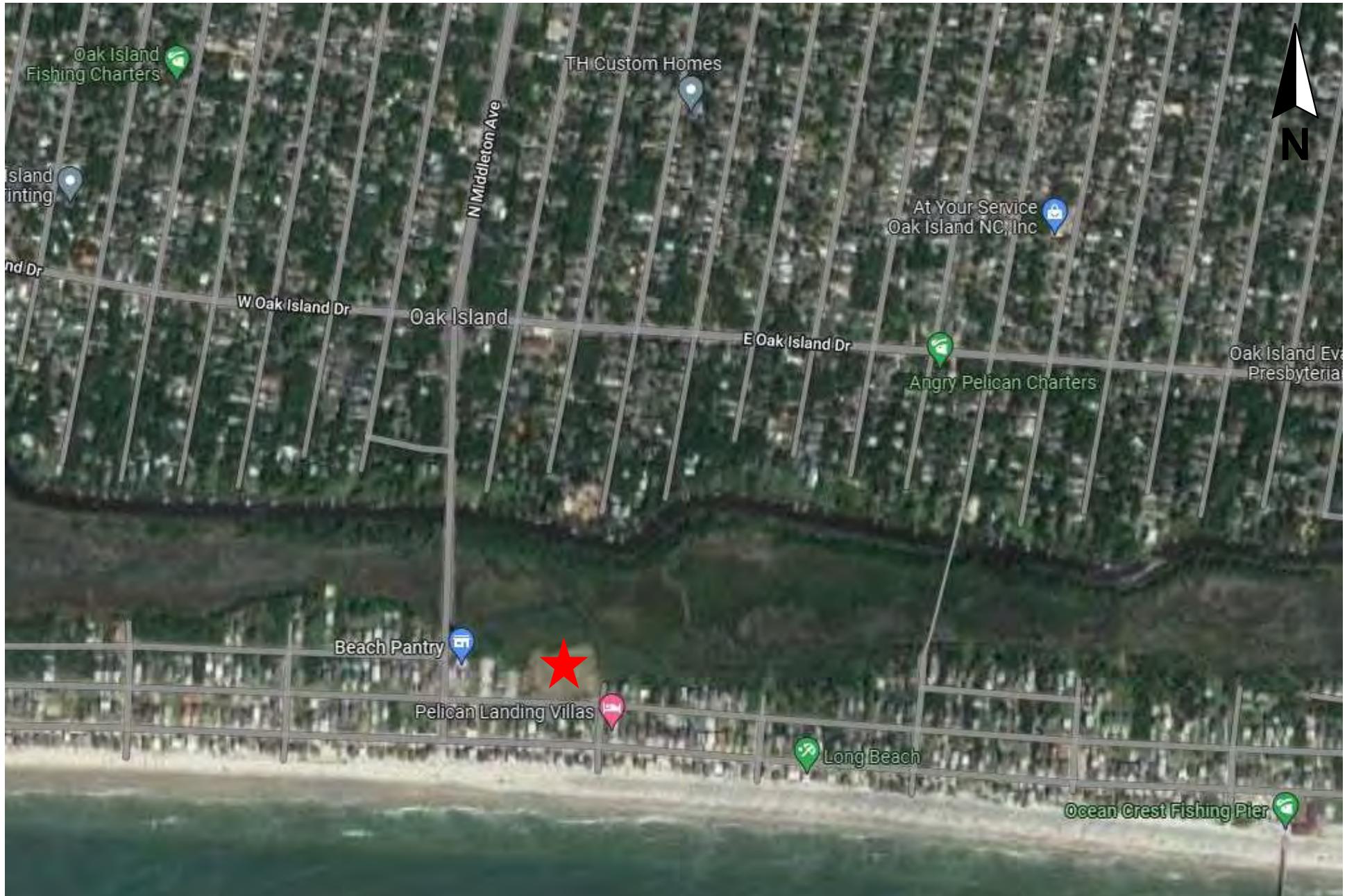


FIGURE 2A
SITE LOCATION MAP
PROJECT NUMBER 220277

SITE INDICATOR



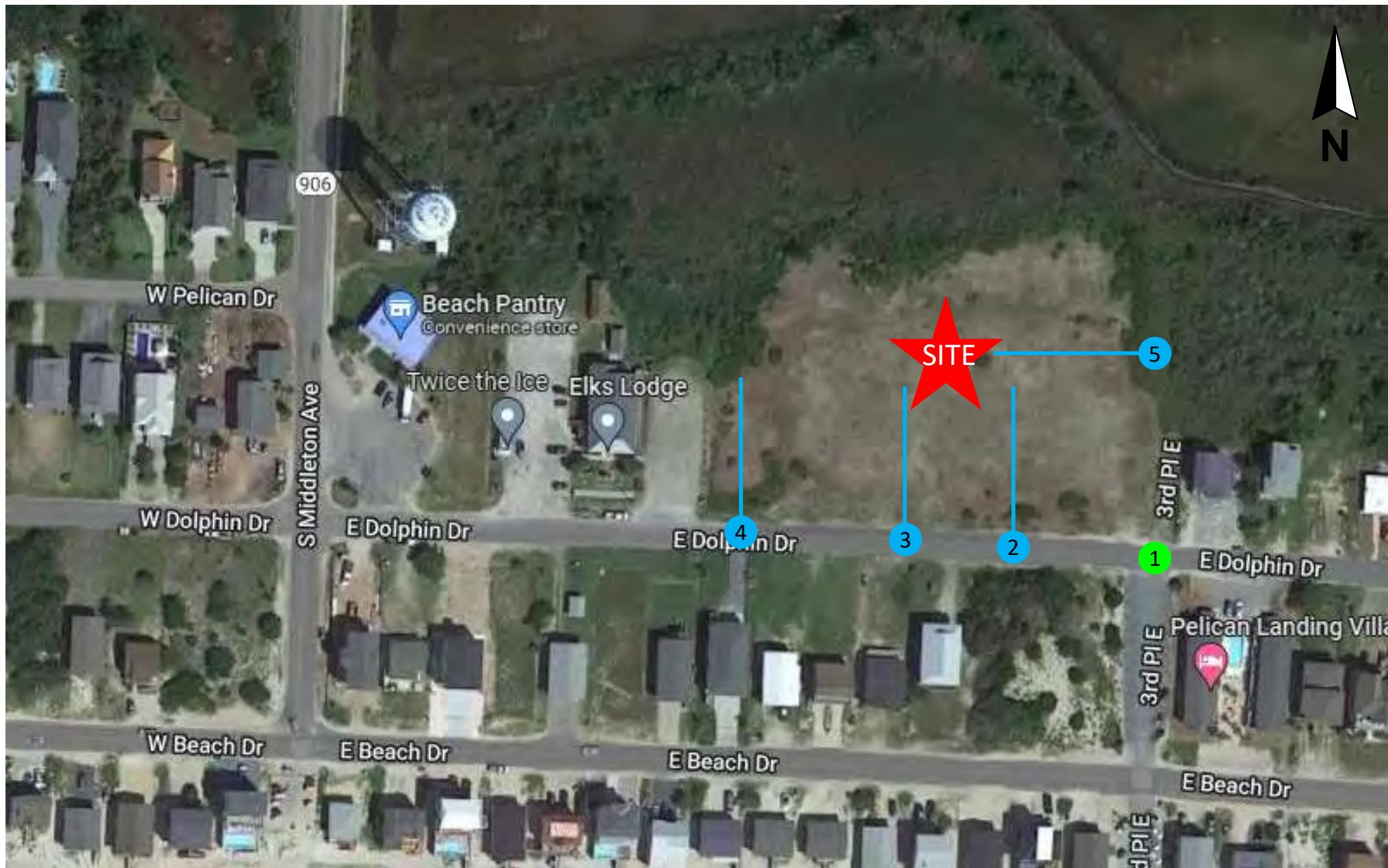


FIGURE 2B
BOARDWALK PLACE VICINITY MAP
PROJECT NUMBER 220277

EXISTING STUDY INTERSECTION
PROPOSED STUDY INTERSECTION





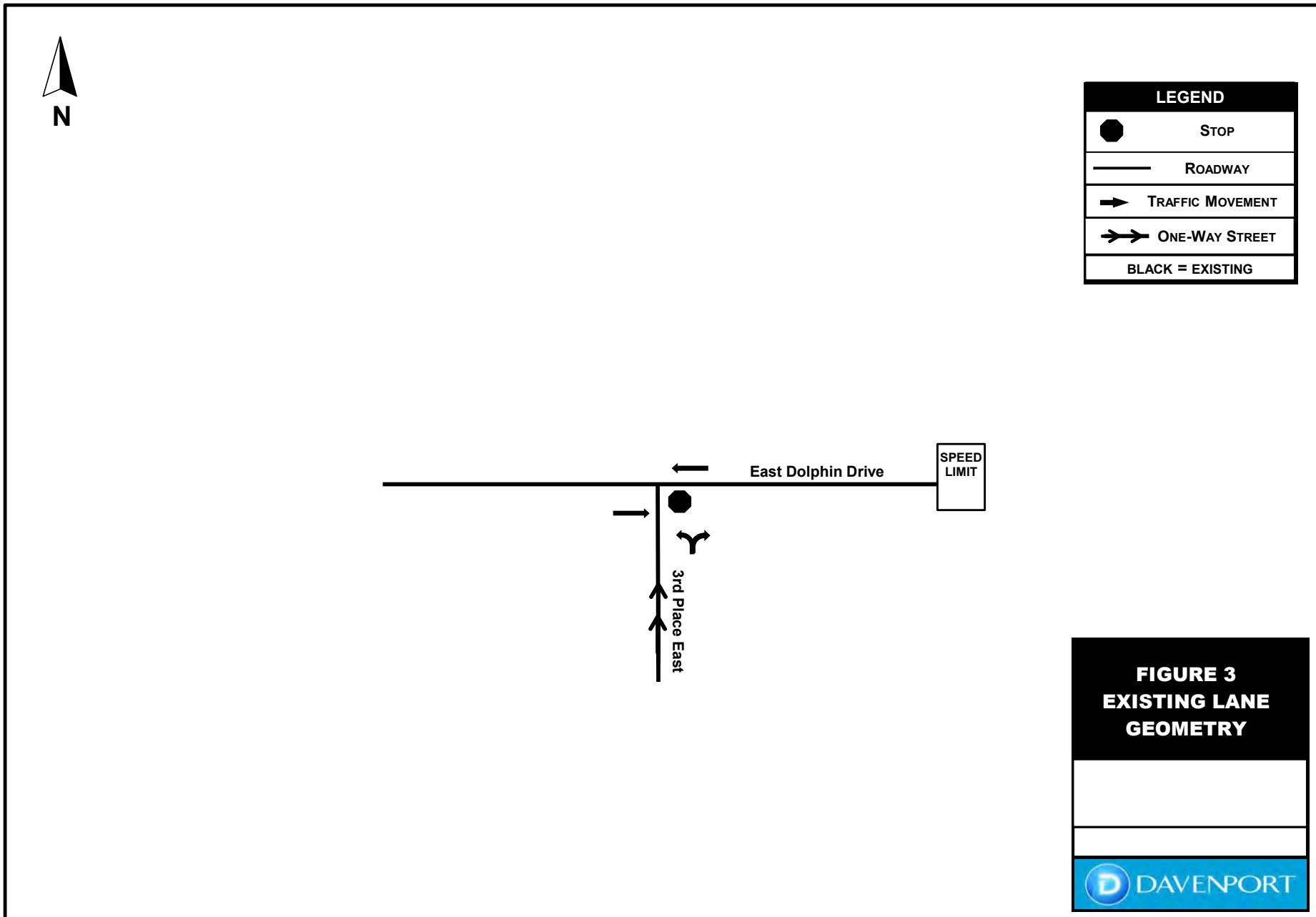
2.0 Existing Conditions

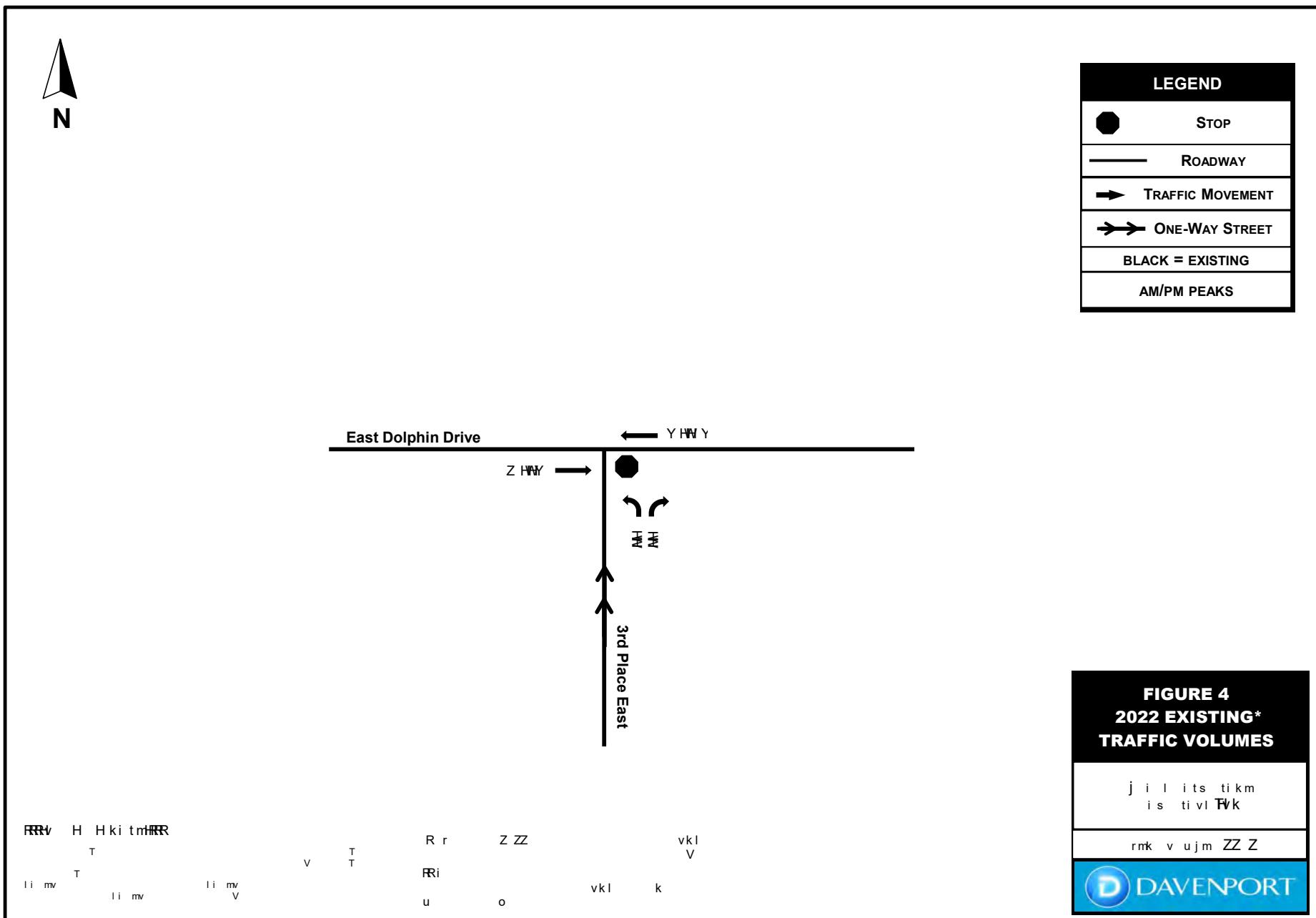
Table 2.1 presents a summary of the study area roadway conditions. Figure 3 shows the existing lane geometry.

Table 2.1 - Street Inventory						
Facility Name	Route #	AADT (vpd)	Typical Cross Section	Pavement Width	Speed Limit (MPH)	Maintained By
East Dolphin Drive	N/A	22,000	2-lane undivided	12-foot lanes	35	Local
3 rd Place East	N/A	Not reported	1-lane NB	12-foot lane	Not posted	Local

Turning movement counts for this project were collected by True Direction Traffic Services Inc. when schools were in session. Table 2.2 contains the location, dates, and times these counts were conducted. January counts were inflated by NCDOT standard correction factors provided in the appendix to represent summer traffic demands. Additionally, a minimum of four vehicles per hour were assigned to all movements, per NCDOT Congestion Management standards. The existing AM and PM peak hour volumes are shown in Figure 4. Traffic count data are provided in the Appendix.

Table 2.2 - Traffic Volume Data		
Count Location	Date Taken	Hours
East Dolphin Drive at 3 rd Place East	Tuesday, January 10, 2023	7-9 AM, 4-6 PM







3.0 Approved Development and Committed Improvements

Approved developments are developments that have been recently approved in the area but are not yet constructed. No approved developments were considered in this study.

Committed improvements are improvements that are planned by NCDOT, the County, or City, or that are associated with a prior approved development in the area but are not yet constructed. As part of the project, the unfinished portion of 3rd Place East (north of Dolphin Drive) would be constructed by the project and dedicated to the Town. The project also proposes to construct sidewalks on the project as well as extensions to the adjacent existing sidewalk network and directly to the 3rd Place East beach access.

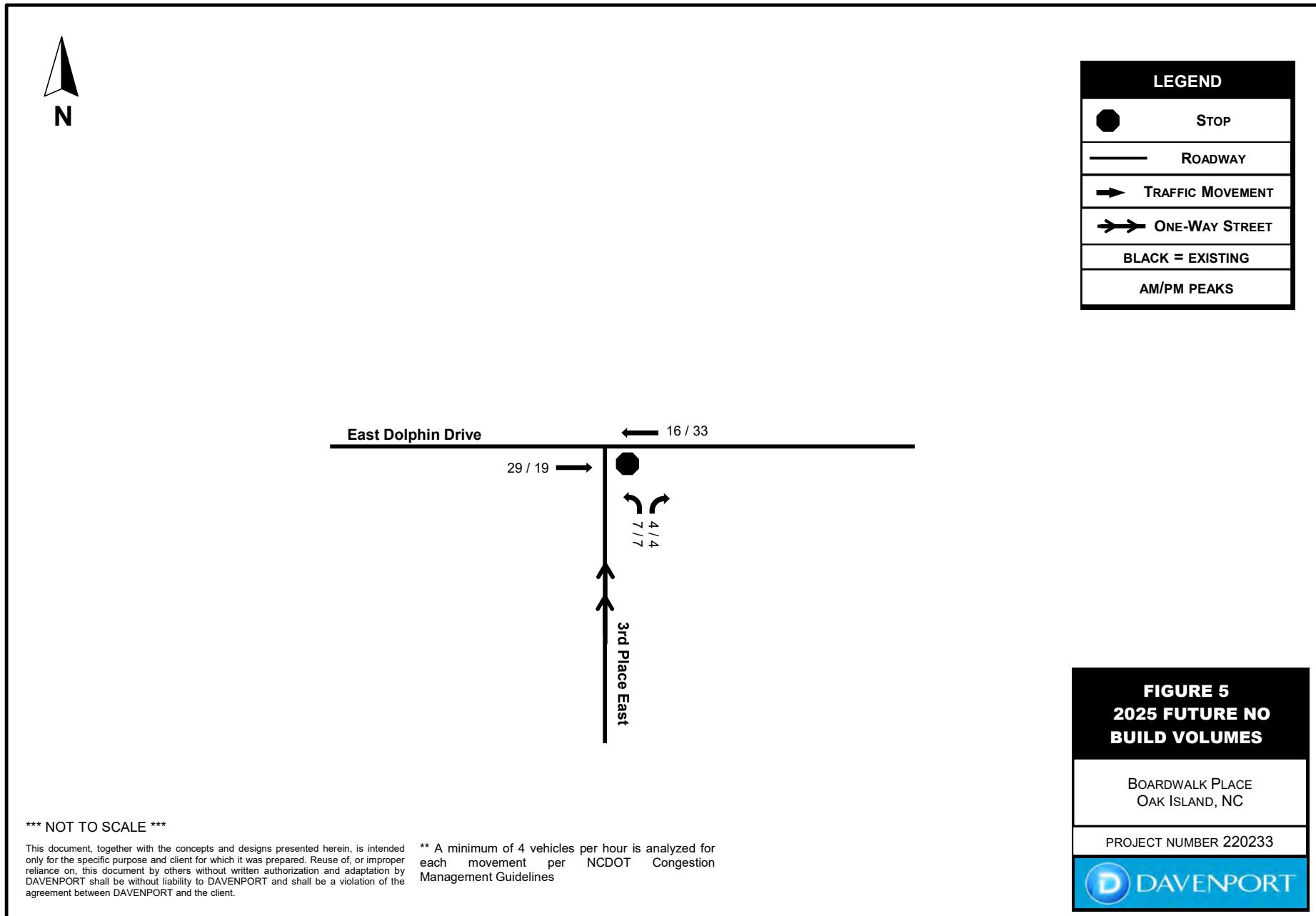
4.0 Methodology

In general, the analysis for this project was conducted utilizing commonly accepted NCDOT standards. Table 4.1 contains a summary of the base assumptions.

Table 4.1 - Assumptions

Annual Growth Rate	2%
Analysis Software	Synchro/SimTraffic
Lane Widths	12 feet
Peak Hour Factor	0.90
Truck Percentage	2%

The 2025 future no build traffic volumes were computed by applying a one percent (2%) compounded annual growth rate to the calculated 2022 traffic volumes. Figure 5 shows 2024 future no build traffic volumes for AM and PM peaks.





The proposed development will contain retail, a fine dining restaurant, a high turnover sit-down restaurant and a Hotel. The trip generation potential of this site was projected based on the 11th Edition of the Institute of Transportation Engineers (ITE) *Trip Generation Manual* and guidance from NCDOT Congestion Management on the selection of appropriate variables. Table 4.2 presents the results. It should be noted that the site has many features of the ITE Land Use code for Resort Hotel. To be conservative and evaluate maximum impacts, separate uses were used in all calculations. The trip generation for resort hotel is included in the appendix for comparison. The trip calculations also assume motor vehicle as the primary mode serving the site. It is anticipated that both pedestrian, bike and golf carts will constitute a significant mode of access for the site given the nature of the surrounding area.

Internal capture is defined as trips that visit different land uses while remaining within the site. The NCHRP 684 Internal Trip Capture Estimation Tool was used to calculate the reduction in the number of primary (external) trips. Primary trips are new trips on the roadway.

Table 4.3 - ITE Trip Generation

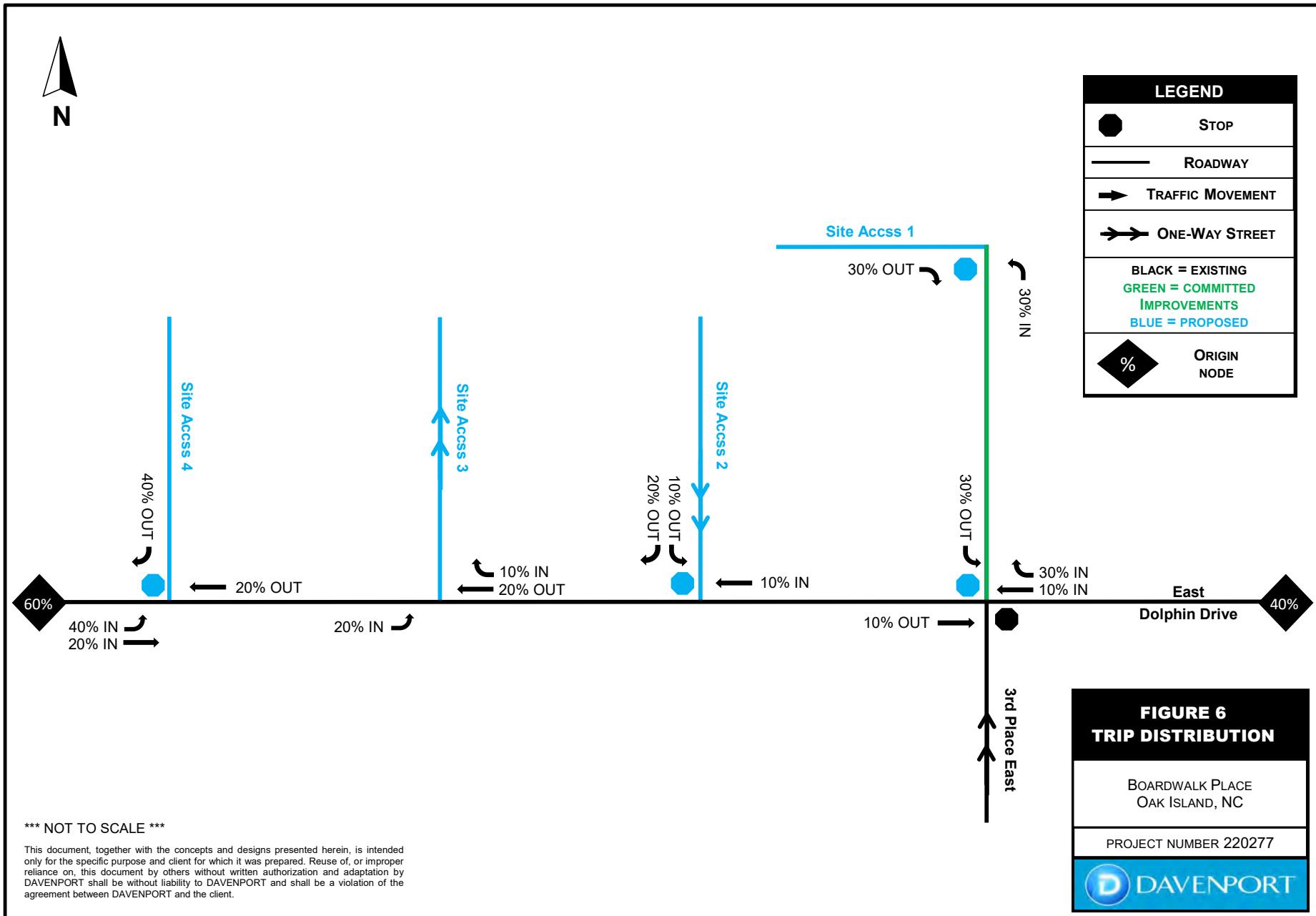
Average Weekday Driveway Volumes				Data Source	24 Hour	AM Peak Hour		PM Peak Hour	
					Two-Way	Enter	Exit	Enter	Exit
Land Use	ITE Land Code	Size	1000 Sq. Ft. GLA		Volume	Enter	Exit	Enter	Exit
Retail (<40k)	822	9.00	1000 Sq. Ft. GLA	Adjacent - Equation	609	16	11	36	36
Hotel	310	106	Rooms	Adjacent - Equation	726	26	20	26	25
Fine Dining Restaurant	931	134	Seats	Generator - Rate	348	14	6	23	16
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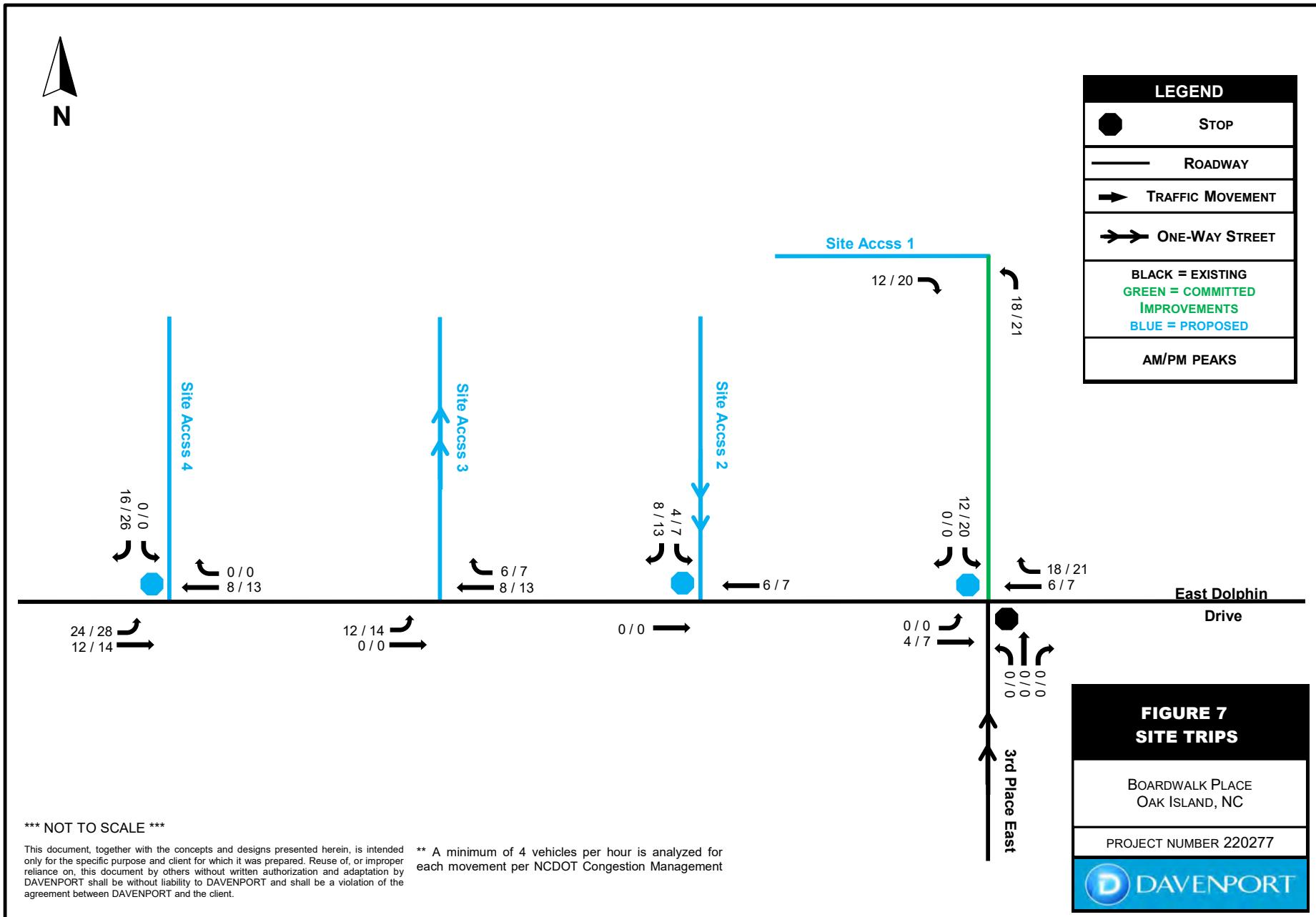


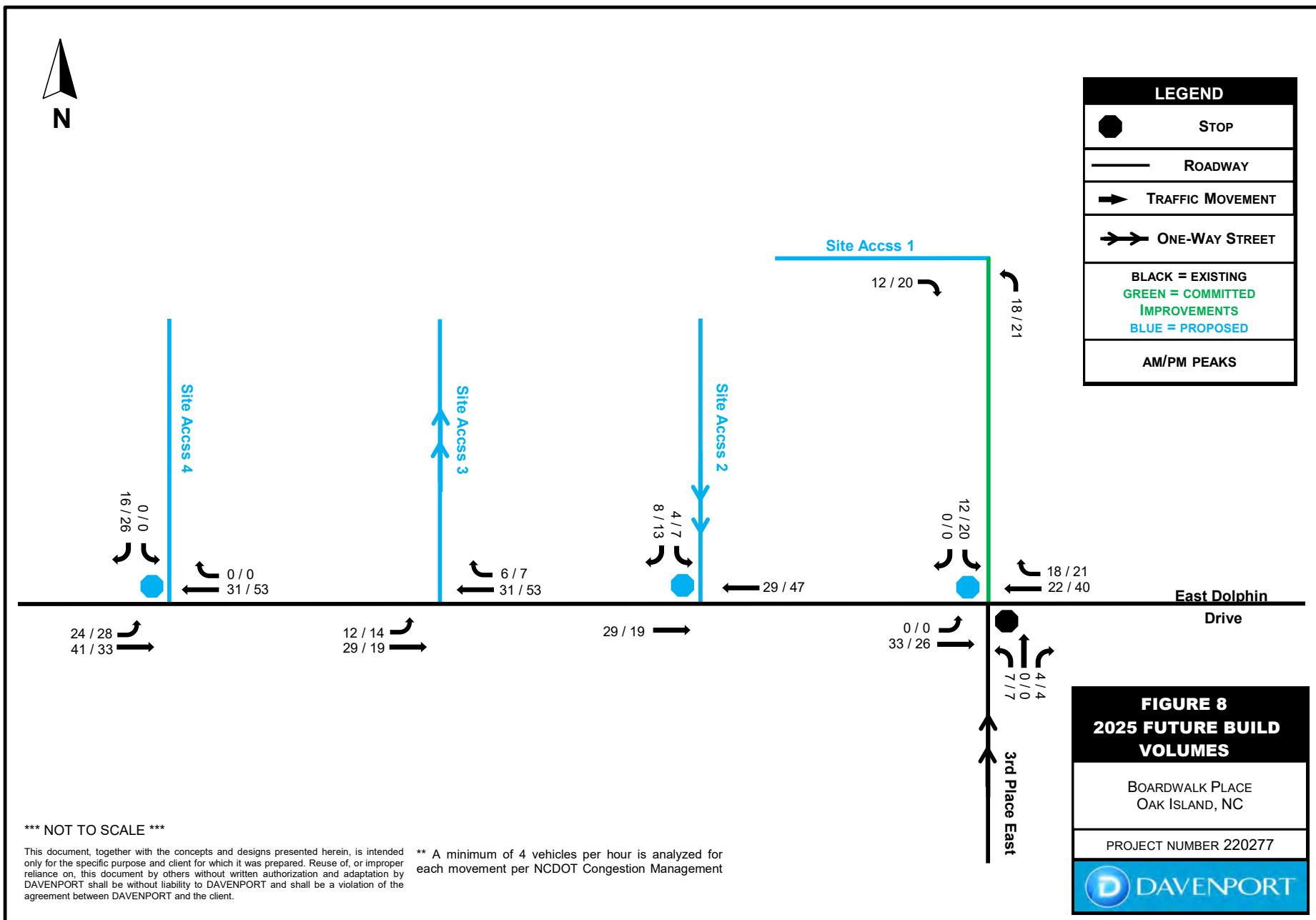
Site trips for this proposed development were distributed based on the existing traffic patterns and engineering judgment. The primary trip distribution model is shown in Figure 6. The directional distribution for new primary site trips is:

- 60% entering from and exiting to the west on Dolphin Drive
- 40% entering from and exiting to the east on Dolphin Drive

Site trip volumes were added to the future no build volumes to compute the 2025 Future Build volumes. Trip reductions for the AM and PM peak period were applied only for internal capture. Site trips are shown in Figure 7 and Future Build volumes are shown in Figure 8.









5.0 Capacity Analysis

The Transportation Research Board's *Highway Capacity Manual* (HCM) utilizes a term "level of service" (LOS) to measure how traffic operates in intersections and on roadway segments. There are six levels of service ranging from A to F as shown in Table 5.1. Level of service "A" represents low-volume traffic operations and level of service "F" represents high-volume, oversaturated traffic operations. Synchro traffic modeling software is used to determine the LOS and delay for study intersections. Synchro analysis worksheet reports are provided in the Appendix.

Table 5.1 – Highway Capacity Manual			
Levels of Service and Control Delay Criteria			
Signalized Intersection		Unsignalized Intersection	
Level of Service	Control Delay Per vehicle (seconds)	Level of Service	Delay Range (seconds)
A	≤ 10	A	≤ 10
B	$> 10 \text{ and } \leq 20$	B	$> 10 \text{ and } \leq 15$
C	$> 20 \text{ and } \leq 35$	C	$> 15 \text{ and } \leq 25$
D	$> 35 \text{ and } \leq 55$	D	$> 25 \text{ and } \leq 35$
E	$> 55 \text{ and } \leq 80$	E	$> 35 \text{ and } \leq 50$
F	> 80	F	> 50

A queueing analysis was performed using Synchro and SimTraffic simulation, based on a minimum 10-minute seeding, a 60-minute recording period, and 10 runs. The maximum SimTraffic queues and 95th-percentile Synchro queues are provided. Synchro and SimTraffic queue reports are provided in the Appendix.

The results of the capacity and queue analyses are discussed by intersection in the following paragraphs. The LOS, delay, and queue results are summarized in Tables 5.2 to 5.4. Queues are shown to be less than two vehicles during the AM and PM peak hours for all studied movements and contained by available storage under each scenario.



As shown in Table 5.2, the approaches operate at LOS A in existing, future no build, and future build scenarios for AM and PM peak hours. No improvements are recommended.

Table 5.2 - LOS and Queueing Analysis for 3rd Place East & East Dolphin Drive

AM Peak Hour					
Scenario	LOS of Worst Approach	Level of Service (Delay) per Movement & by Approach (Delay in seconds/vehicle)			
		Eastbound	Westbound	Northbound	Southbound
2023 Existing	A (8.7) NB Approach	T	T	LR	
		A (0.0)	A (0.0)	A (8.7)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	0	0	0	
	Max Queue (ft)	0	0	30	
2025 NoBuild	A (8.7) NB Approach	T	T	LR	
		A (0.0)	A (0.0)	A (8.7)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	0	0	0	
	Max Queue (ft)	0	0	30	
2025 Build	A (9.1) NB Approach	T	T	LR	LR
		A (0.8)	A (0.0)	A (9.1)	A (9.0)
	Available Storage (ft)	FULL	FULL	FULL	FULL
	95th% Queue (ft)	0	0	3	3
	Max Queue (ft)	8	0	33	42
PM Peak Hour					
2023 Existing	A (8.7) NB Approach	T	T	LR	
		A (0.0)	A (0.0)	A (8.7)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	0	0	0	
	Max Queue (ft)	0	0	30	
2025 NoBuild	A (8.7) NB Approach	T	T	LR	
		A (0.0)	A (0.0)	A (8.7)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	0	0	0	
	Max Queue (ft)	0	0	30	
2025 Build	A (9.1) NB Approach	T	T	LR	LR
		A (1.0)	A (0.0)	A (9.1)	A (9.1)
	Available Storage (ft)	FULL	FULL	FULL	FULL
	95th% Queue (ft)	0	0	3	3
	Max Queue (ft)	6	0	33	40



As shown in Table 5.3, the approaches operate at LOS A in future build scenarios for AM and PM peak hours. No improvements are recommended.

Table 5.3 - LOS and Queueing Analysis for East Dolphin Drive at Site Access 2				
AM Peak Hour				
Scenario	LOS of Worst Approach	Level of Service (Delay) per Movement & by Approach (Delay in seconds/vehicle)		
		Eastbound	Westbound	Southbound
2025 Build	A (8.6) SB Approach	T	T	LR
		A (0.0)	A (0.0)	A (8.6)
	Available Storage (ft)	FULL	FULL	FULL
	95th% Queue (ft)	0	0	0
	Max Queue (ft)	0	0	31
PM Peak Hour				
2025 Build	A (8.7) SB Approach	T	T	LR
		A (0.0)	A (0.0)	A (8.7)
	Available Storage (ft)	FULL	FULL	FULL
	95th% Queue (ft)	0	0	3
	Max Queue (ft)	0	0	33

As shown in Table 5.4, the approaches operate at LOS A in future build scenarios for AM and PM peak hours. No improvements are recommended.

Table 5.4 - LOS and Queueing Analysis for East Dolphin Drive at Site Access 3				
AM Peak Hour				
Scenario	LOS of Worst Approach	Level of Service (Delay) per Movement & by Approach (Delay in seconds/vehicle)		
		Eastbound	Westbound	
2025 Build	A (0.0)	T	T	
		A (0.0)	A (0.0)	
	Available Storage (ft)	FULL	FULL	
	95th% Queue (ft)	0	0	
	Max Queue (ft)	6	0	
PM Peak Hour				
2025 Build	A (0.0)	T	T	
		B (12.9)	A (0.0)	
	Available Storage (ft)	FULL	FULL	
	95th% Queue (ft)	0	0	
	Max Queue (ft)	15	0	



As shown in Table 5.5, the approaches operate at LOS A in future build scenarios for AM and PM peak hours. No improvements are recommended.

Table 5.5 - LOS and Queueing Analysis for East Dolphin Drive at Site Access 4					
AM Peak Hour					
Scenario	LOS of Worst Approach	Level of Service (Delay) per Movement & by Approach (Delay in seconds/vehicle)			
		Eastbound	Westbound	Southbound	
2025 Build	A (8.7) SB Approach	LT	TR	LR	
		A (2.7)	A (0.0)	A (8.7)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	3	0	3	
	Max Queue (ft)	9	0	35	
PM Peak Hour					
2025 Build	A (8.8) SB Approach	LT	TR	LR	
		A (3.4)	A (0.0)	A (8.8)	
	Available Storage (ft)	FULL	FULL	FULL	
	95th% Queue (ft)	3	0	3	
	Max Queue (ft)	30	0	46	

6.0 Summary and Conclusion

The Boardwalk Place development is in Oak Island, NC. The proposed development will consist of one building with up to 5,350 square feet of restaurant space, 8,995 square feet of commercial/retail space, and 106 hotel rooms. The project proposes to extend 3rd Place East in an existing public right of way and dedicate for public use with a driveway onto the new extension. Two site accesses are proposed for Dolphin Drive, one full access and a one-way drop off loop. The one-way loop is separated with one each ingress and egress lane. The expected build-out year for this development is 2025. Information regarding the property was provided by *Boardwalk Place LLC*.

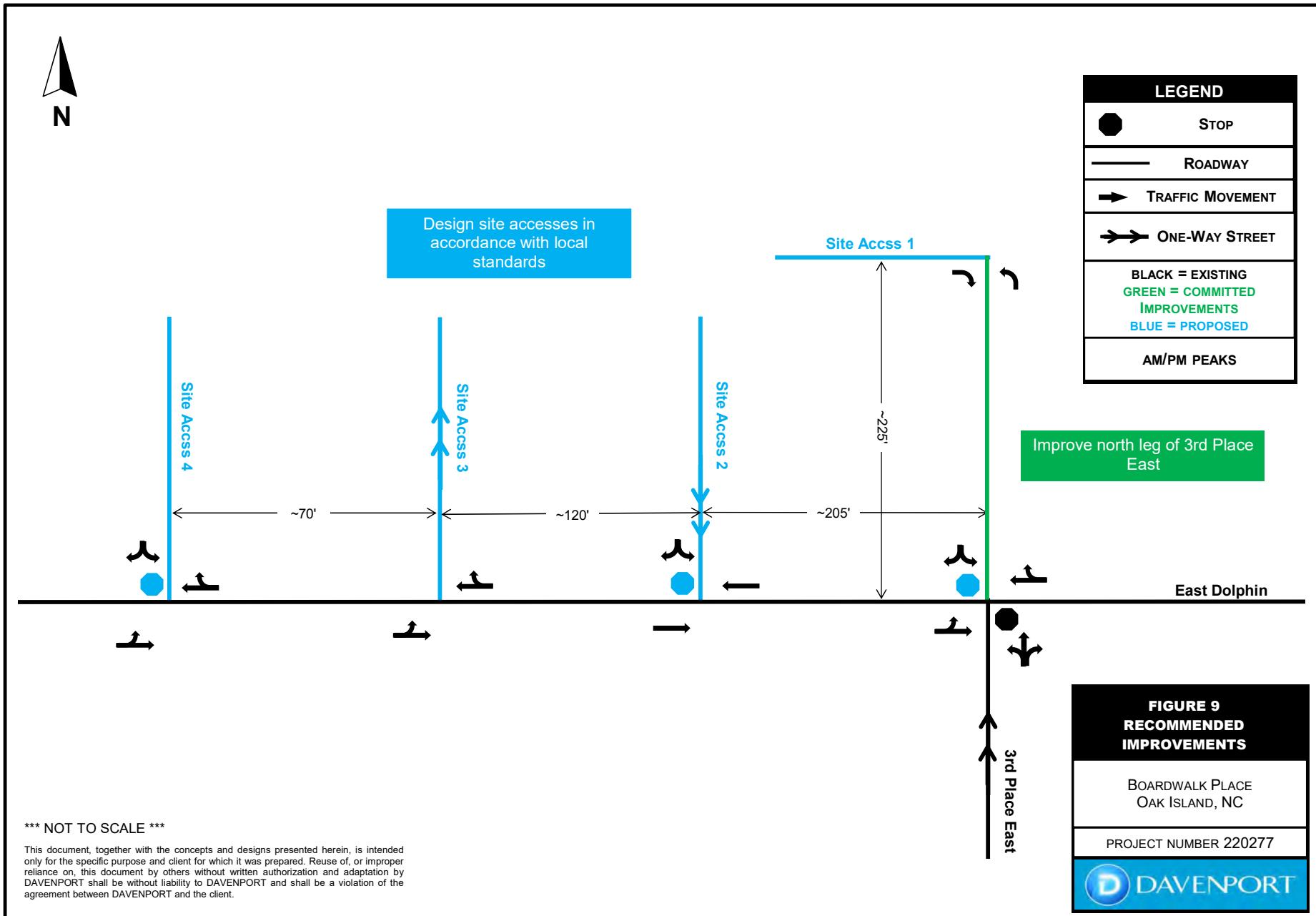
Using the Institute for Transportation Engineering's 11th Edition Trip Generation for multiple uses on the same site, the site has a potential maximum trip generation of 1,897 daily trips, 100 trips in the AM peak hour, and 136 trips in the PM peak hour.

In conclusion, this study has determined the project has no significant impacts to the roadway network. No improvements are recommended to accommodate the impacts of new development traffic. The site drives should be constructed according to applicable local standards. Figure 9 depicts the recommended improvements.



Table 6.1 – Summary of Recommended Improvements

INTERSECTION	RECOMMENDATIONS
East Dolphin Drive and 3 rd Place East / Site Access 1	<ul style="list-style-type: none"> • Design site drive according to applicable local standards. • No additional improvements recommended
East Dolphin Drive and Site Access 2	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.
East Dolphin Drive and Site Access 3	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.
East Dolphin Drive and Site Access 4	<ul style="list-style-type: none"> • Design site drive according to applicable local standards.





Appendix



Trip Generation

Data Plot and Equation

DATA STATISTICS

Land Use:

Hotel (310) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

28

Avg. Num. of Rooms:

182

Average Rate:

0.46

Range of Rates:

0.20 - 0.84

Standard Deviation:

0.14

Fitted Curve Equation:

 $T = 0.50(X) - 7.45$ R^2 :

0.84

Directional Distribution:

56% entering, 44% exiting

Calculated Trip Ends:

Average Rate: 49 (Total), 27 (Entry), 22 (Exit)

Fitted Curve: 46 (Total), 26 (Entry), 20 (Exit)

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

310



LAND USE GROUP:

(300-399) Lodging

LAND USE :

310 - Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

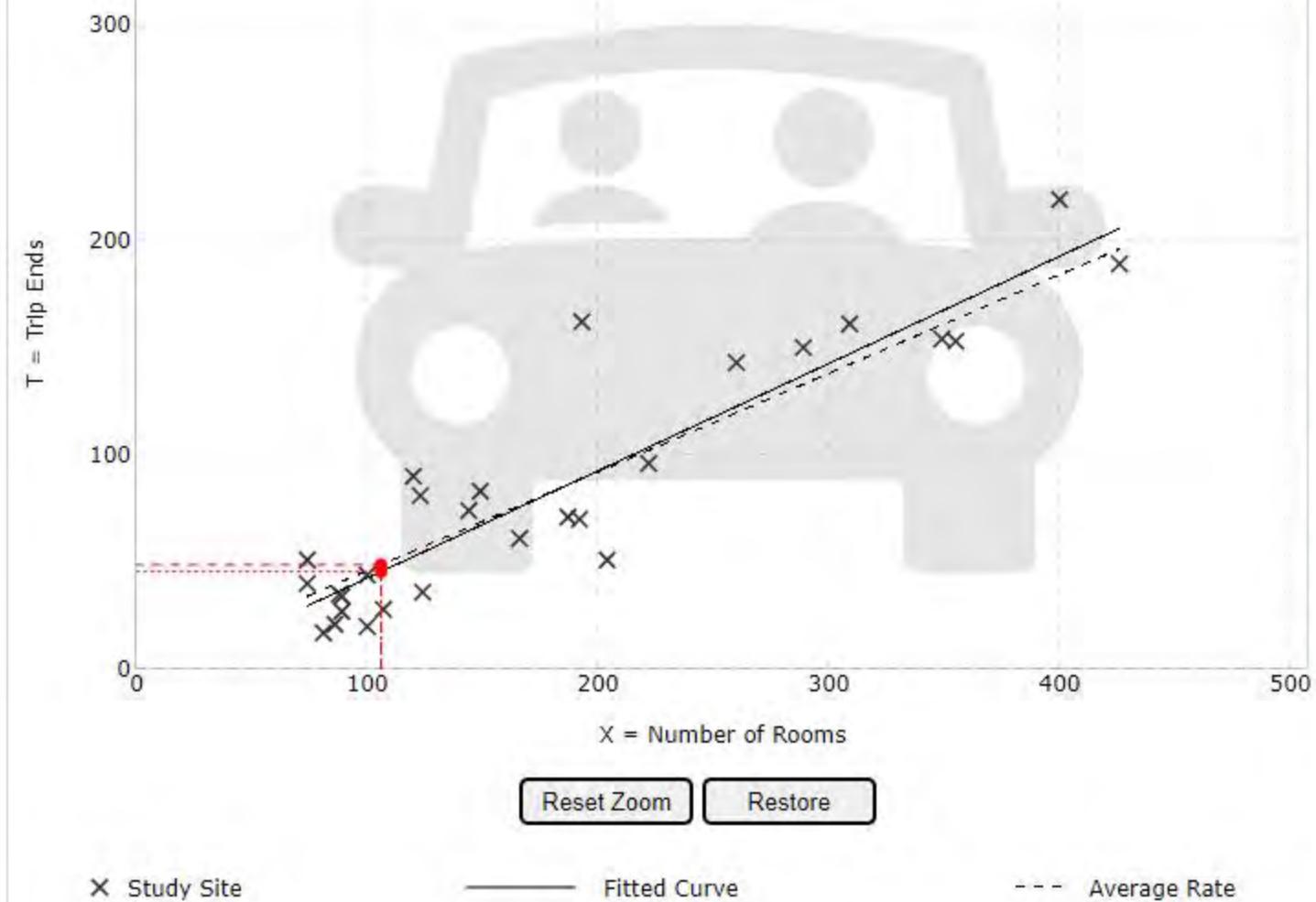
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate



Data Plot and Equation

DATA STATISTICS

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

310



LAND USE GROUP:

(300-399) Lodging

LAND USE :

310 - Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

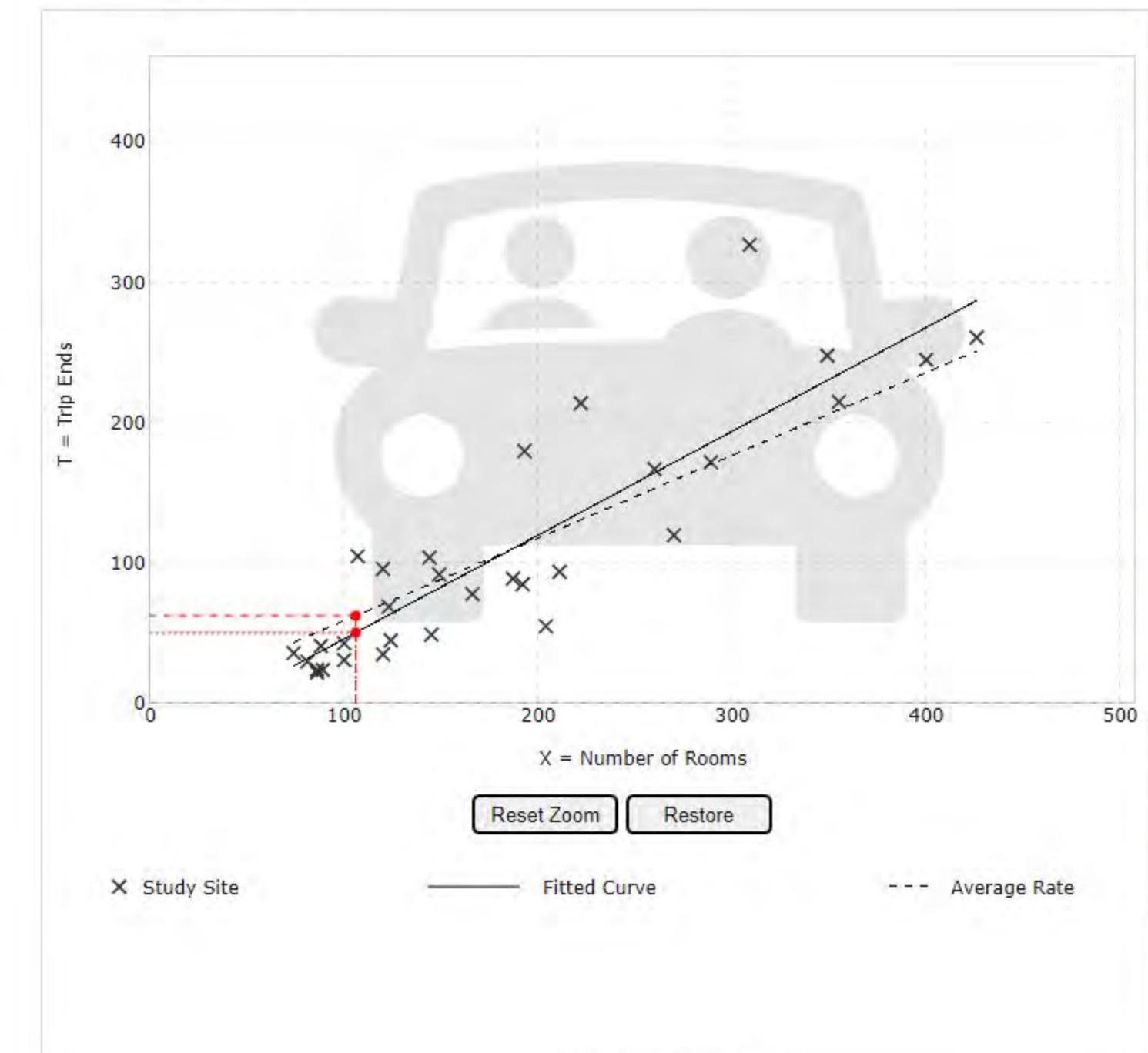
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate



Land Use:

Hotel (310) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 4 and 6 p.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

31

Avg. Num. of Rooms:

186

Average Rate:

0.59

Range of Rates:

0.26 - 1.06

Standard Deviation:

0.22

Fitted Curve Equation:

$$T = 0.74(X) - 27.89$$

 R^2 :

0.78

Directional Distribution:

51% entering, 49% exiting

Calculated Trip Ends:

Average Rate: 63 (Total), 32 (Entry), 31 (Exit)

Fitted Curve: 51 (Total), 26 (Entry), 25 (Exit)

Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

310



LAND USE GROUP:

(300-399) Lodging

LAND USE:

310 - Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday

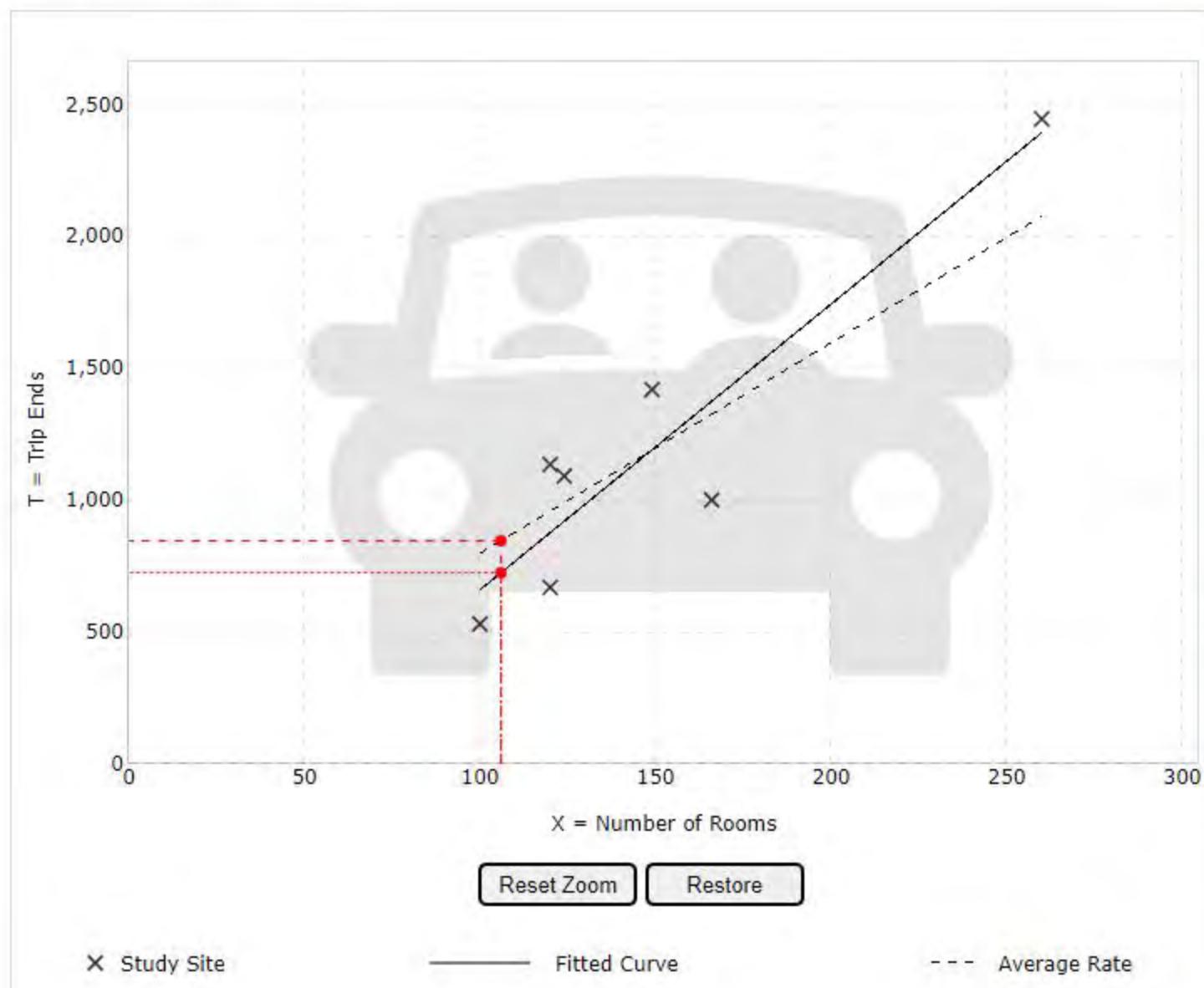
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate



DATA STATISTICS

Land Use:

Hotel (310) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

7

Avg. Num. of Rooms:

148

Average Rate:

7.99

Range of Rates:

5.31 - 9.53

Standard Deviation:

1.92

Fitted Curve Equation:

 $T = 10.84(X) - 423.51$ R²:

0.85

Directional Distribution:

50% entering, 50% exiting

Calculated Trip Ends:

Average Rate: 847 (Total), 423 (Entry), 424 (Exit)

Fitted Curve: 726 (Total), 363 (Entry), 363 (Exit)

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

822



LAND USE GROUP:

(800-899) Retail

LAND USE:

822 - Strip Retail Plaza (<40k)

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

1000 Sq. Ft. GLA

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

9

Calculate

Data Plot and Equation

Caution – Small Sample Size

DATA STATISTICS

Land Use:

Strip Retail Plaza (<40k) (822) [Click for Description and Data Plots](#)

Independent Variable:

1000 Sq. Ft. GLA

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

5

Avg. 1000 Sq. Ft. GLA:

18

Average Rate:

2.36

Range of Rates:

1.60 - 3.73

Standard Deviation:

0.94

Fitted Curve Equation:

 $Ln(T) = 0.66 \ln(X) + 1.84$ R^2 :

0.57

Directional Distribution:

60% entering, 40% exiting

Calculated Trip Ends:

Average Rate: 21 (Total), 13 (Entry), 8 (Exit)

Fitted Curve: 27 (Total), 16 (Entry), 11 (Exit)



Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

822



LAND USE GROUP:

(800-899) Retail

LAND USE:

822 - Strip Retail Plaza (<40k)

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

1000 Sq. Ft. GLA

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

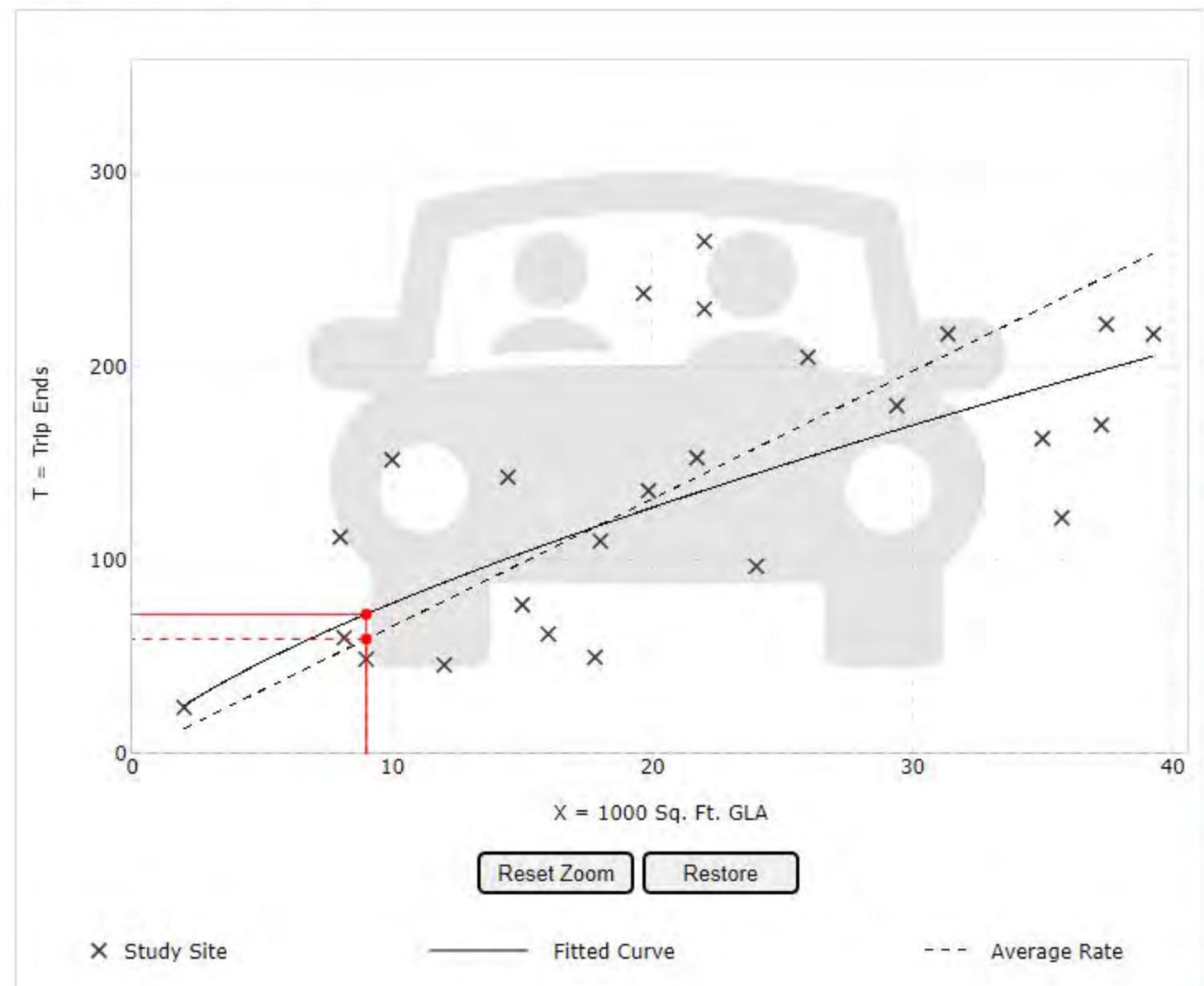
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

9

Calculate



DATA STATISTICS

Land Use:

Strip Retail Plaza (<40k) (822) [Click for Description and Data Plots](#)

Independent Variable:

1000 Sq. Ft. GLA

Time Period:

Weekday
Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

25

Avg. 1000 Sq. Ft. GLA:

21

Average Rate:

6.59

Range of Rates:

2.81 - 15.20

Standard Deviation:

2.94

Fitted Curve Equation:

 $\ln(T) = 0.71 \ln(X) + 2.72$ R^2 :

0.56

Directional Distribution:

50% entering, 50% exiting

Calculated Trip Ends:

Average Rate: 59 (Total), 30 (Entry), 29 (Exit)

Fitted Curve: 72 (Total), 36 (Entry), 36 (Exit)

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

822



LAND USE GROUP:

(800-899) Retail

LAND USE:

822 - Strip Retail Plaza (<40k)

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

1000 Sq. Ft. GLA

TIME PERIOD:

Weekday

TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

9

Calculate

Data Plot and Equation

Caution – Small Sample Size

DATA STATISTICS

Land Use:

Strip Retail Plaza (<40k) (822) [Click for Description and Data Plots](#)

Independent Variable:

1000 Sq. Ft. GLA

Time Period:

Weekday

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

4

Avg. 1000 Sq. Ft. GLA:

19

Average Rate:

54.45

Range of Rates:

47.86 - 65.07

Standard Deviation:

7.81

Fitted Curve Equation:

 $T = 42.20(X) + 229.68$ R^2 :

0.96

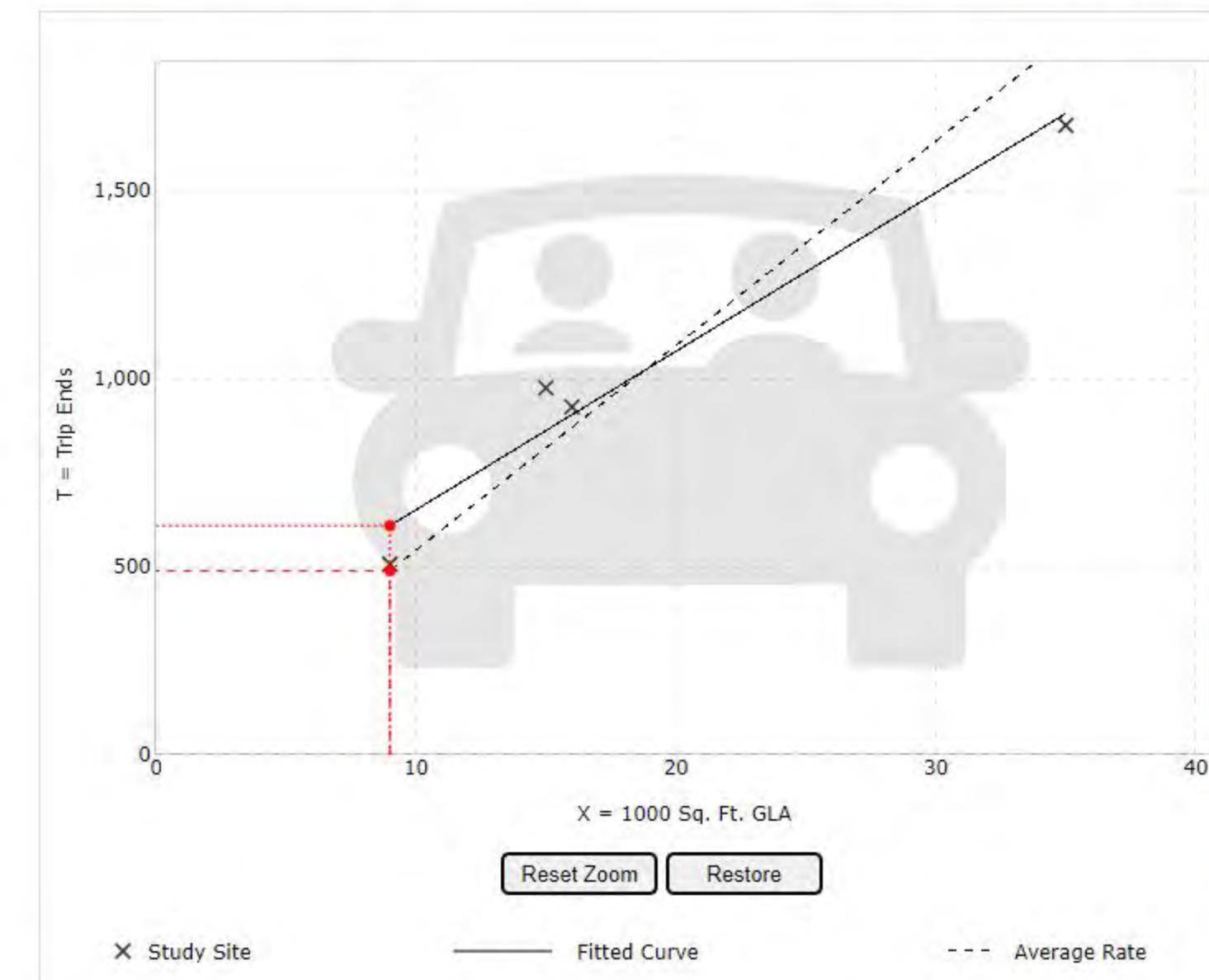
Directional Distribution:

50% entering, 50% exiting

Calculated Trip Ends:

Average Rate: 490 (Total), 245 (Entry), 245 (Exit)

Fitted Curve: 609 (Total), 305 (Entry), 304 (Exit)



SEARCH

PRINT

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

931



LAND USE GROUP:

(900-999) Services

LAND USE :

931 - Fine Dining Restaurant

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Seats

TIME PERIOD:

Weekday, AM Peak Hour of Generator

TRIP TYPE:

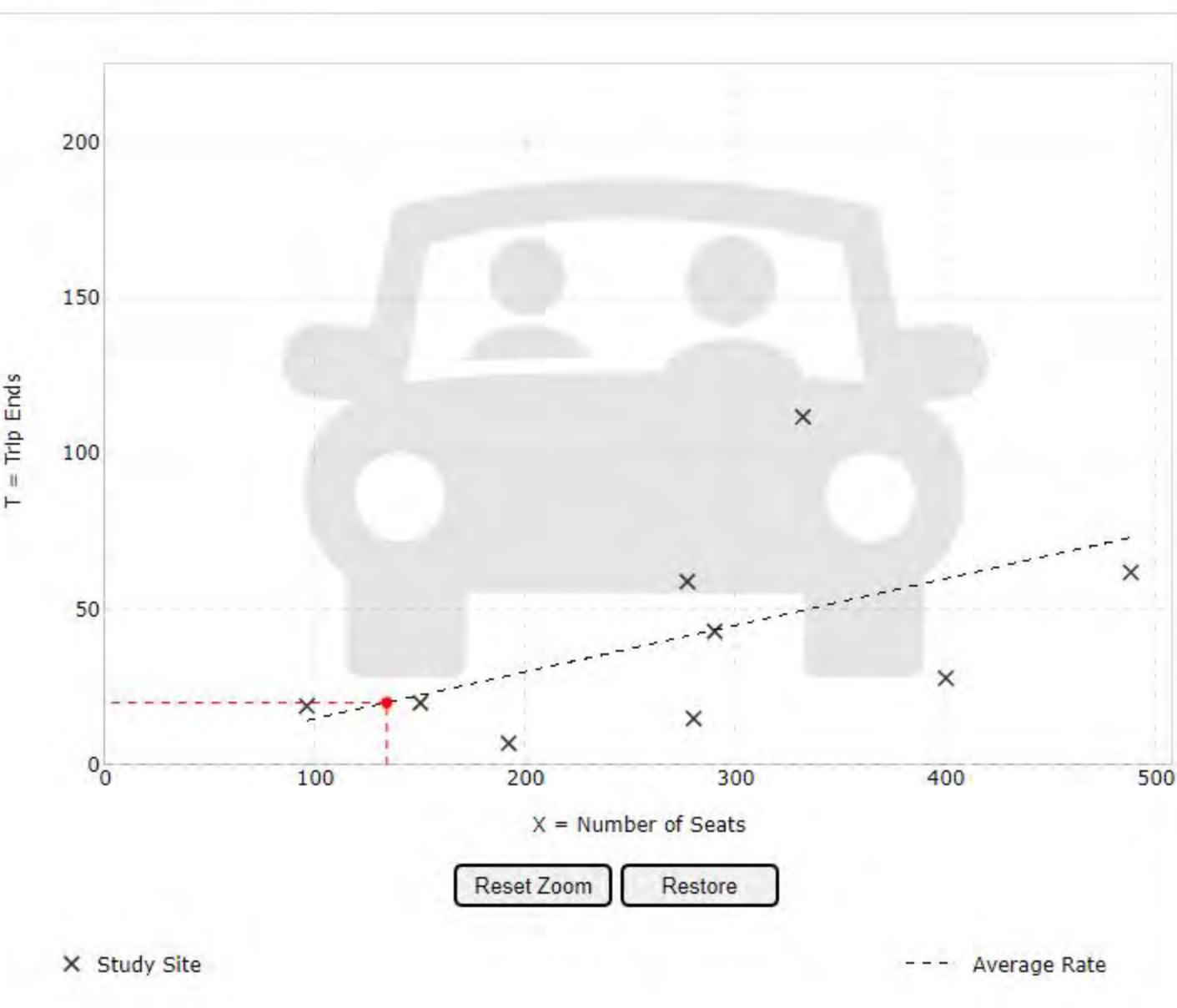
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

134

Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:

Fine Dining Restaurant (931) [Click for Description and Data Plots](#)

Independent Variable:

Seats

Time Period:

Weekday

AM Peak Hour of Generator

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

9

Avg. Num. of Seats:

278

Average Rate:

0.15

Range of Rates:

0.04 - 0.34

Standard Deviation:

0.10

Fitted Curve Equation:

Not Given

 R^2 :

Directional Distribution:

69% entering, 31% exiting

Calculated Trip Ends:

Average Rate: 20 (Total), 14 (Entry), 6 (Exit)

Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

931



LAND USE GROUP:

(900-999) Services

LAND USE:

931 - Fine Dining Restaurant

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Seats

TIME PERIOD:

Weekday, PM Peak Hour of Generator

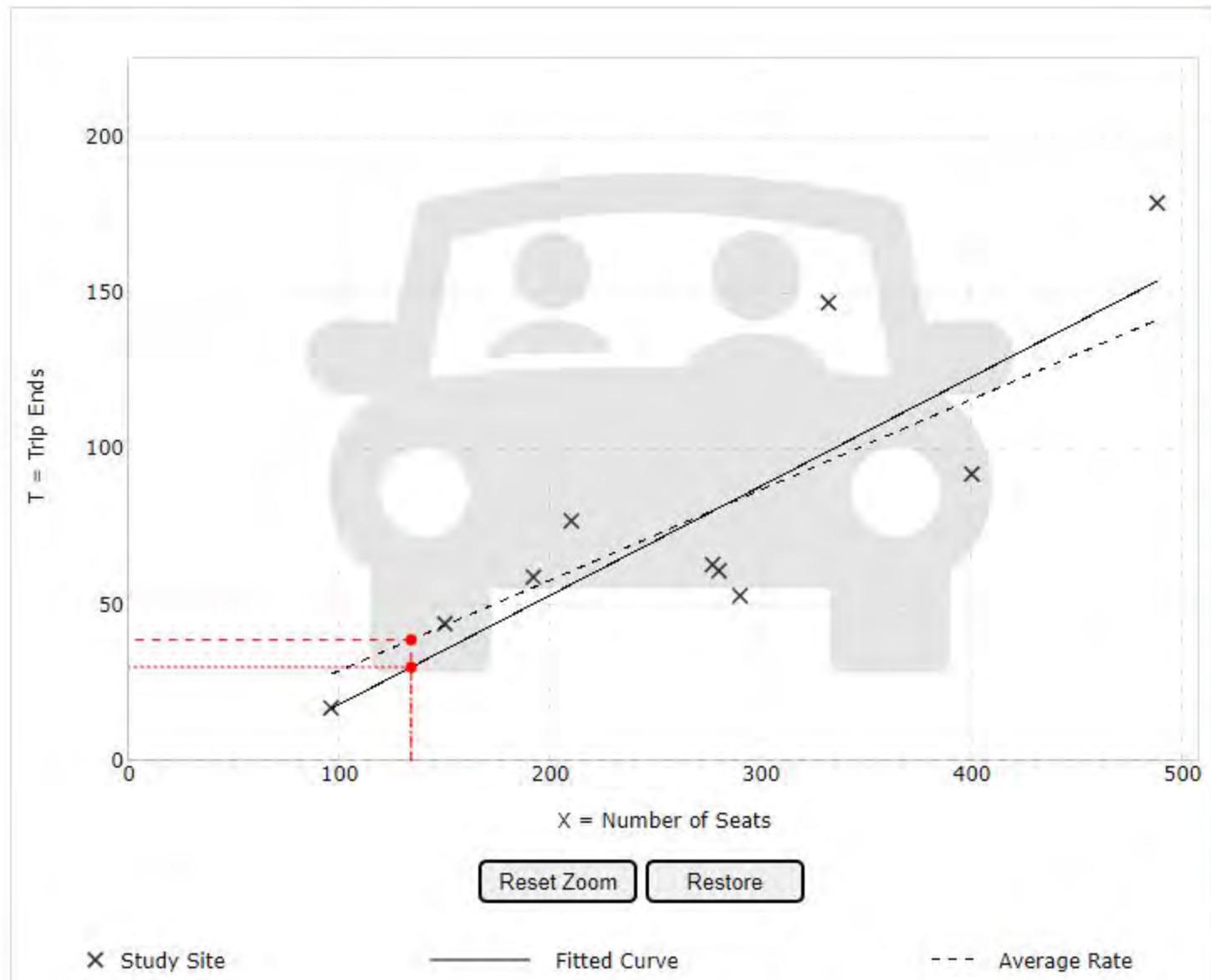
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

134

Calculate



DATA STATISTICS

Land Use:

Fine Dining Restaurant (931) [Click for Description and Data Plots](#)

Independent Variable:

Seats

Time Period:

Weekday

PM Peak Hour of Generator

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

10

Avg. Num. of Seats:

272

Average Rate:

0.29

Range of Rates:

0.18 - 0.44

Standard Deviation:

0.09

Fitted Curve Equation:

 $T = 0.35(X) - 16.83$ R^2 :

0.72

Directional Distribution:

59% entering, 41% exiting

Calculated Trip Ends:

Average Rate: 39 (Total), 23 (Entry), 16 (Exit)

Fitted Curve: 30 (Total), 18 (Entry), 12 (Exit)

Query

Filter

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

931



LAND USE GROUP:

(900-999) Services

LAND USE:

931 - Fine Dining Restaurant

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Seats

TIME PERIOD:

Weekday, AM Peak Hour of Generator

TRIP TYPE:

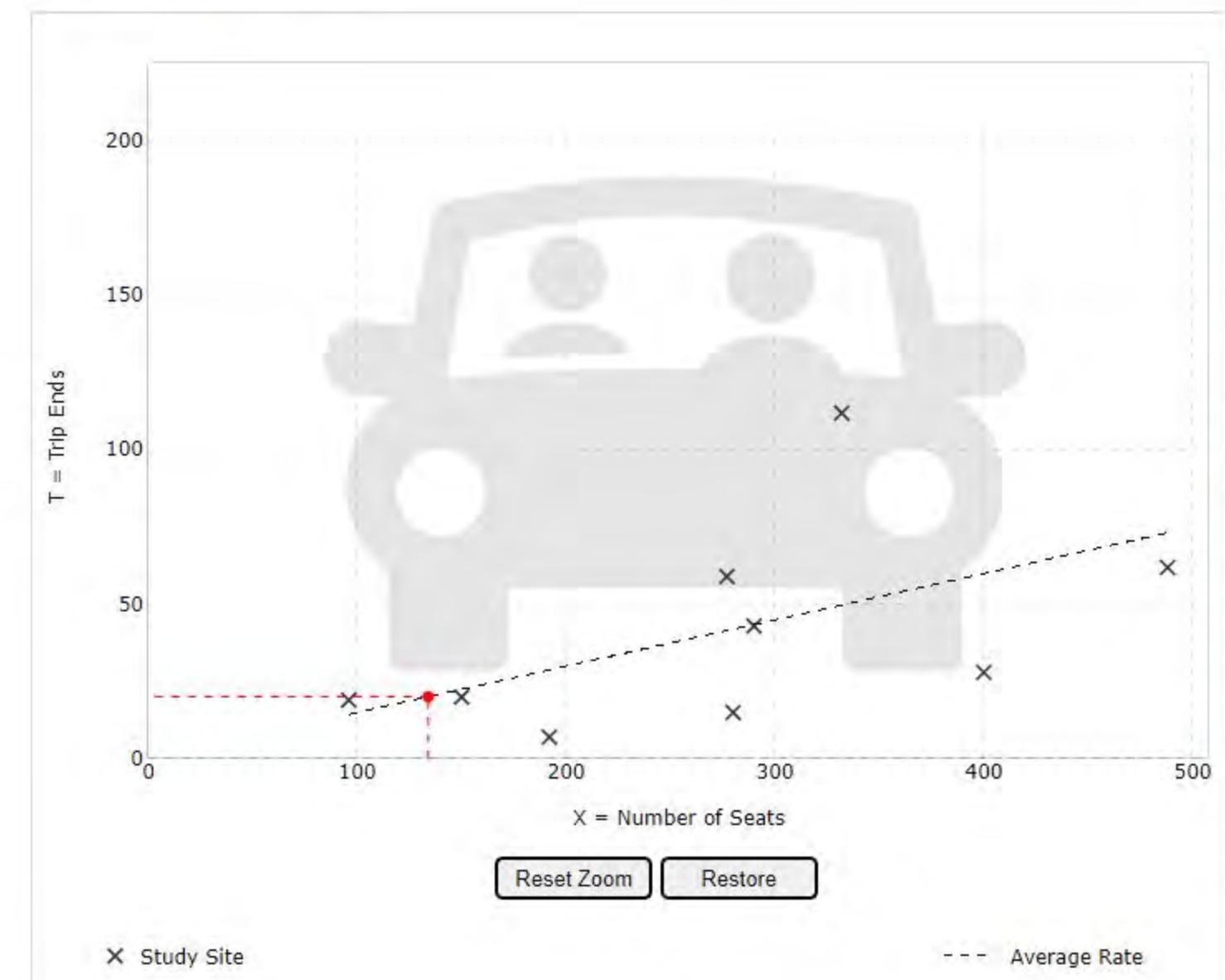
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

134

Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:

Fine Dining Restaurant (931) [Click for Description and Data Plots](#)

Independent Variable:

Seats

Time Period:

Weekday

AM Peak Hour of Generator

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

9

Avg. Num. of Seats:

278

Average Rate:

0.15

Range of Rates:

0.04 - 0.34

Standard Deviation:

0.10

Fitted Curve Equation:

Not Given

 R^2 :

Directional Distribution:

69% entering, 31% exiting

Calculated Trip Ends:

Average Rate: 20 (Total), 14 (Entry), 6 (Exit)

Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

932



LAND USE GROUP:

(900-999) Services

LAND USE :

932 - High-Turnover (Sit-Down) Restaurant

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

1000 Sq. Ft. GFA

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

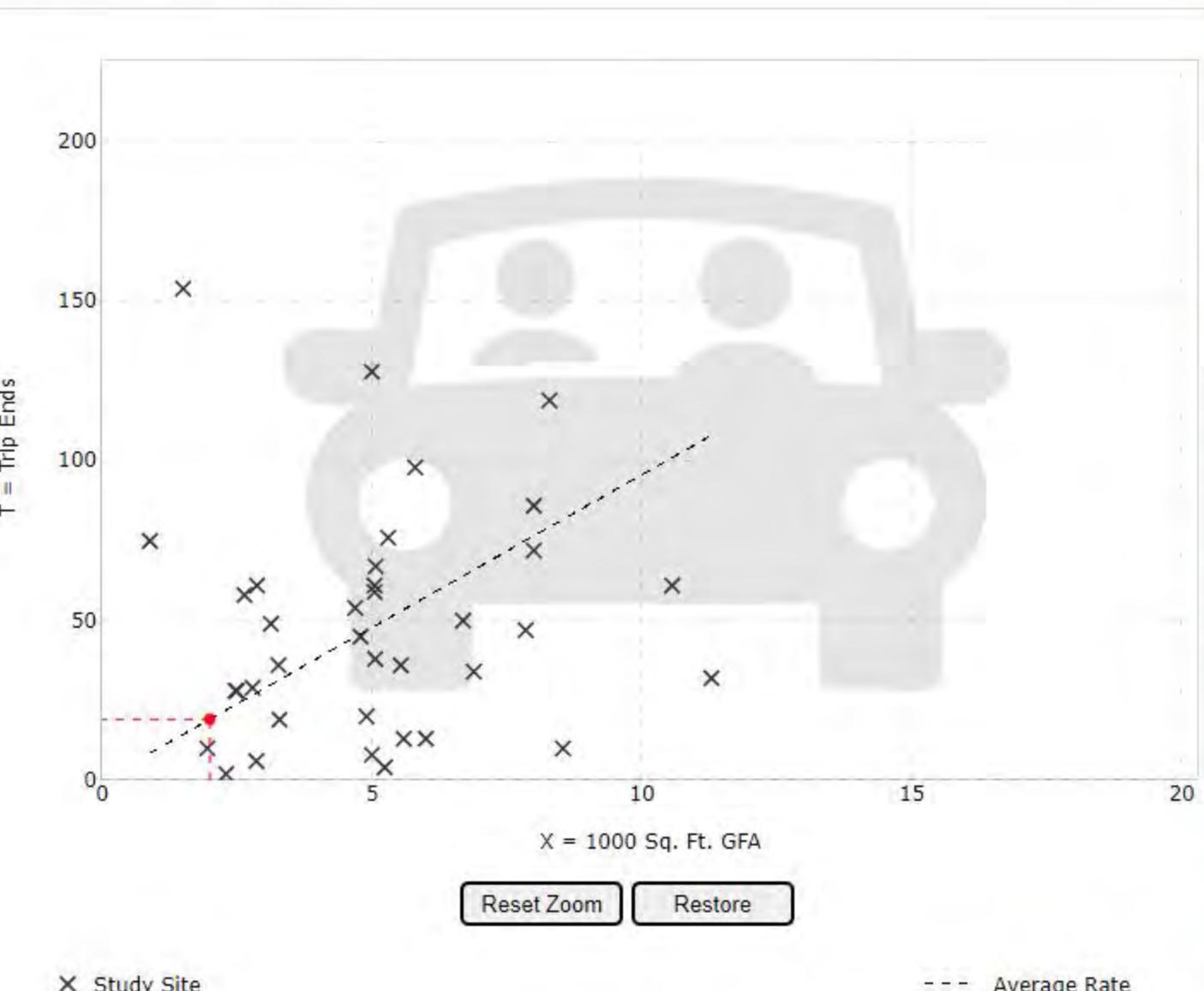
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

2.0

Calculate



DATA STATISTICS

Land Use:

High-Turnover (Sit-Down) Restaurant (932) [Click for Description and Data Plots](#)

Independent Variable:

1000 Sq. Ft. GFA

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

37

Avg. 1000 Sq. Ft. GFA:

5

Average Rate:

9.57

Range of Rates:

0.76 - 102.39

Standard Deviation:

11.61

Fitted Curve Equation:

Not Given

 R^2 :

Directional Distribution:

55% entering, 45% exiting

Calculated Trip Ends:

Average Rate: 19 (Total), 11 (Entry), 8 (Exit)

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

932



LAND USE GROUP:

(900-999) Services

LAND USE:

932 - High-Turnover (Sit-Down) Restaurant

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

1000 Sq. Ft. GFA

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:

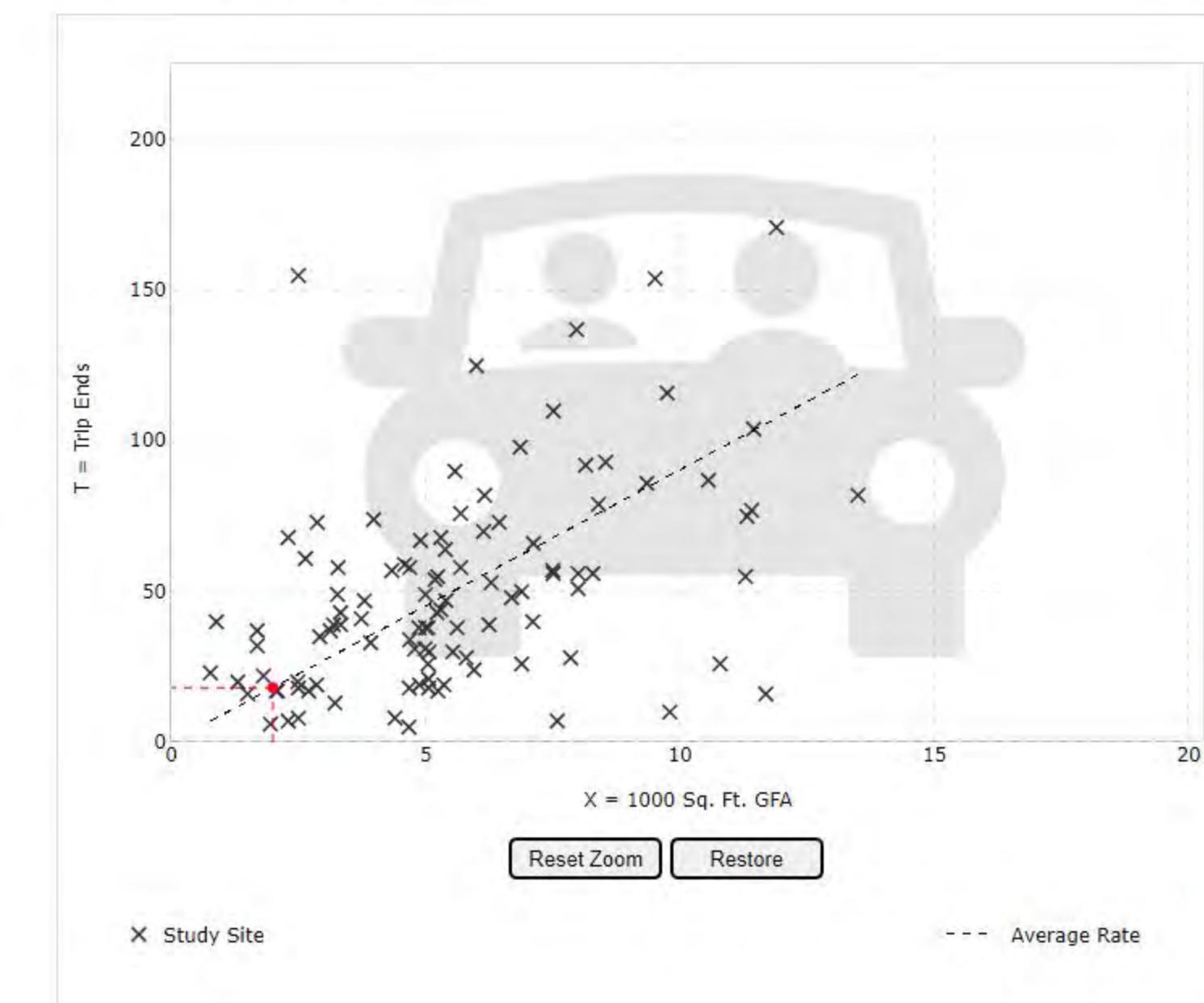
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

2.0

Calculate

Data Plot and Equation



DATA STATISTICS

Land Use:

High-Turnover (Sit-Down) Restaurant (932) [Click for Description and Data Plots](#)

Independent Variable:

1000 Sq. Ft. GFA

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 4 and 6 p.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

104

Avg. 1000 Sq. Ft. GFA:

6

Average Rate:

9.05

Range of Rates:

0.92 - 62.00

Standard Deviation:

6.18

Fitted Curve Equation:

Not Given

 R^2 :

Directional Distribution:

61% entering, 39% exiting

Calculated Trip Ends:

Average Rate: 18 (Total), 11 (Entry), 7 (Exit)

Table 4.3 - ITE Trip Generation								
Boardwalk Place, Oak Island, NC								
Average Weekday Driveway Volumes				24 Hour Two-Way	AM Peak Hour		PM Peak Hour	
<u>Land Use</u>	<u>ITE Land</u>	<u>Size</u>			<u>Volume</u>	<u>Enter</u>	<u>Exit</u>	<u>Enter</u>
Resort Hotel	330	106.00	Rooms	Average Rate	N/A	24	10	19
Unadjusted Trips					0	24	10	19
								24

Land Use: 330 Resort Hotel

Description

A resort hotel is similar to a hotel (Land Use 310) in that it provides sleeping accommodations, full-service restaurants, cocktail lounges, retail shops, and guest services. The primary difference is that a resort hotel caters to the tourist and vacation industry, often providing a wide variety of recreational facilities/programs (e.g., golf courses, tennis courts, beach access, or other amenities) rather than convention and meeting business. Hotel (Land Use 310), all suites hotel (Land Use 311), business hotel (Land Use 312), and motel (Land Use 320) are related uses.

Additional Data

It is recognized that some resort hotels cater to convention business as well as the tourist and vacation industry. The sites in the database do not have convention facilities. A resort hotel with convention facilities is likely to have a different level and pattern of trip generation than is presented in the data plots.

Nine studies provided information on room occupancy at the time of data collection. The average occupancy rate for these sites was approximately 88 percent.

Some properties in this land use provide guest transportation services (e.g., airport shuttle, limousine service, golf course shuttle service) which may have an impact on the overall trip generation rates.

The sites were surveyed in the 1980s and the 1990s in California, Florida, and South Carolina.

For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.

Source Numbers

270, 381, 436

Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

330



LAND USE GROUP:

(300-399) Lodging

LAND USE :

330 - Resort Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

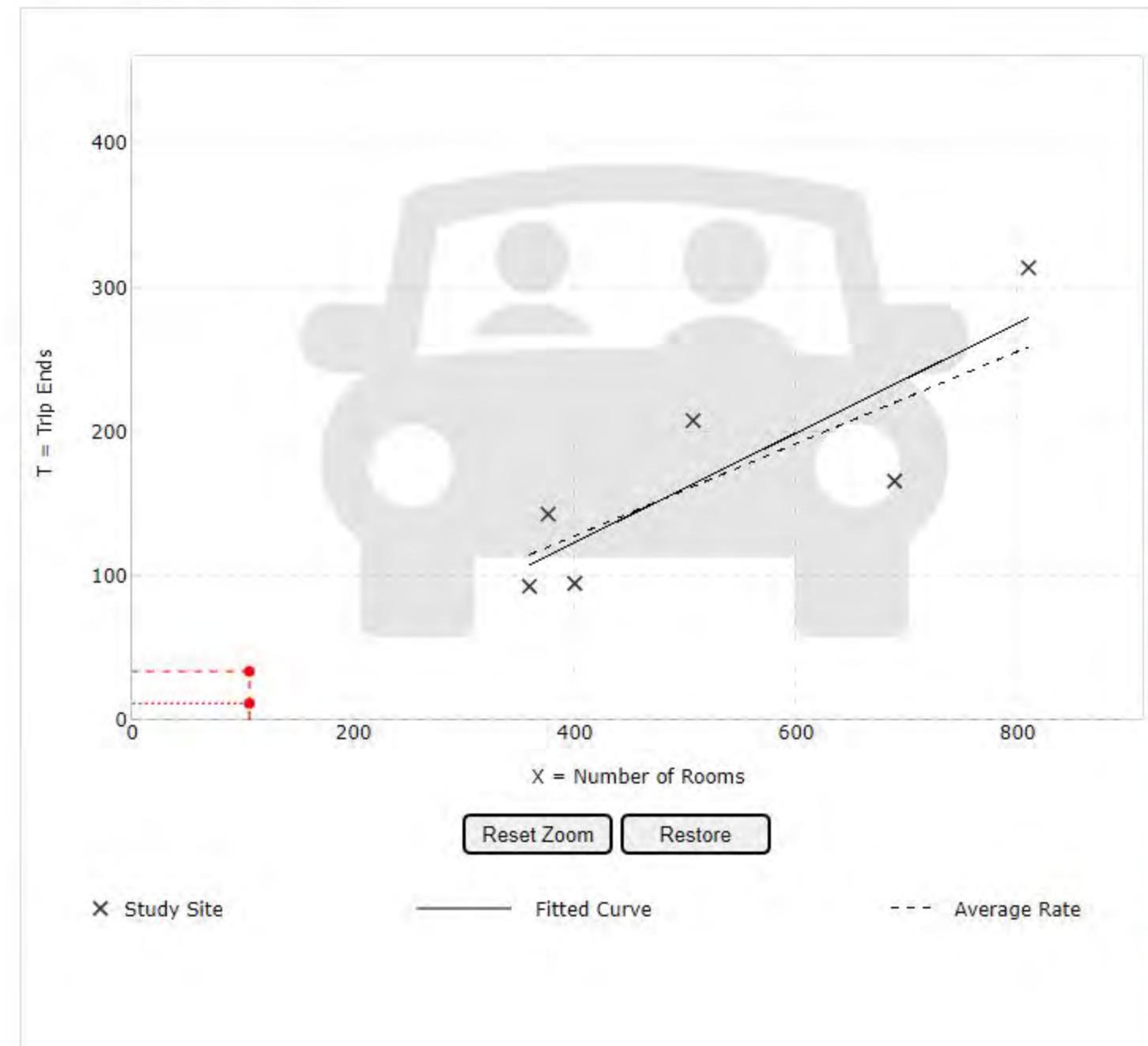
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate



DATA STATISTICS

Land Use:

Resort Hotel (330) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

6

Avg. Num. of Rooms:

524

Average Rate:

0.32

Range of Rates:

0.24 - 0.41

Standard Deviation:

0.08

Fitted Curve Equation:

 $T = 0.38(X) - 28.58$ R^2 :

0.72

Directional Distribution:

72% entering, 28% exiting

Calculated Trip Ends:

Average Rate: 34 (Total), 24 (Entry), 10 (Exit)

Fitted Curve: 12 (Total), 8 (Entry), 4 (Exit)

Data Plot and Equation

DATA STATISTICS

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

330



LAND USE GROUP:

(300-399) Lodging

LAND USE:

330 - Resort Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:

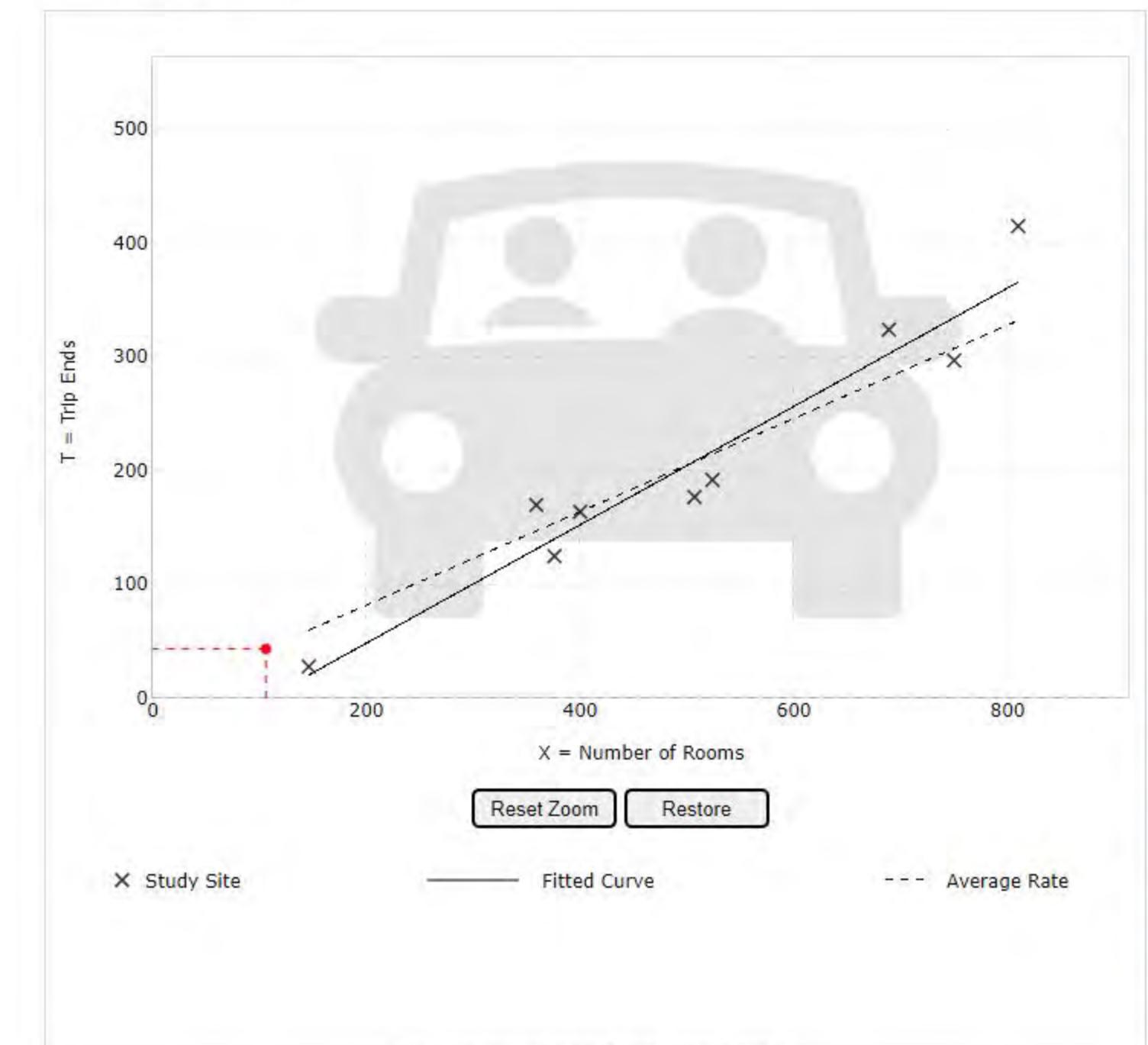
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate

Trip ends are not estimated for some methods as it yields negative values



Land Use:

Resort Hotel (330) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic
One Hour Between 4 and 6 p.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

9

Avg. Num. of Rooms:

507

Average Rate:

0.41

Range of Rates:

0.19 - 0.51

Standard Deviation:

0.08

Fitted Curve Equation:

 $T = 0.52(X) - 55.42$ R^2 :

0.93

Directional Distribution:

43% entering, 57% exiting

Calculated Trip Ends:

Average Rate: 43 (Total), 19 (Entry), 24 (Exit)

Fitted Curve: Not Available

Data Plot and Equation

DATA SOURCE:

Trip Generation Manual 11.1 Ed

SEARCH BY LAND USE CODE:

330



LAND USE GROUP:

(300-399) Lodging

LAND USE :

330 - Resort Hotel

LAND USE SUBCATEGORY:

All Sites

SETTING/LOCATION:

General Urban/Suburban

INDEPENDENT VARIABLE (IV):

Rooms

TIME PERIOD:

Weekday, Peak Hour of Adjacent Street Traffic

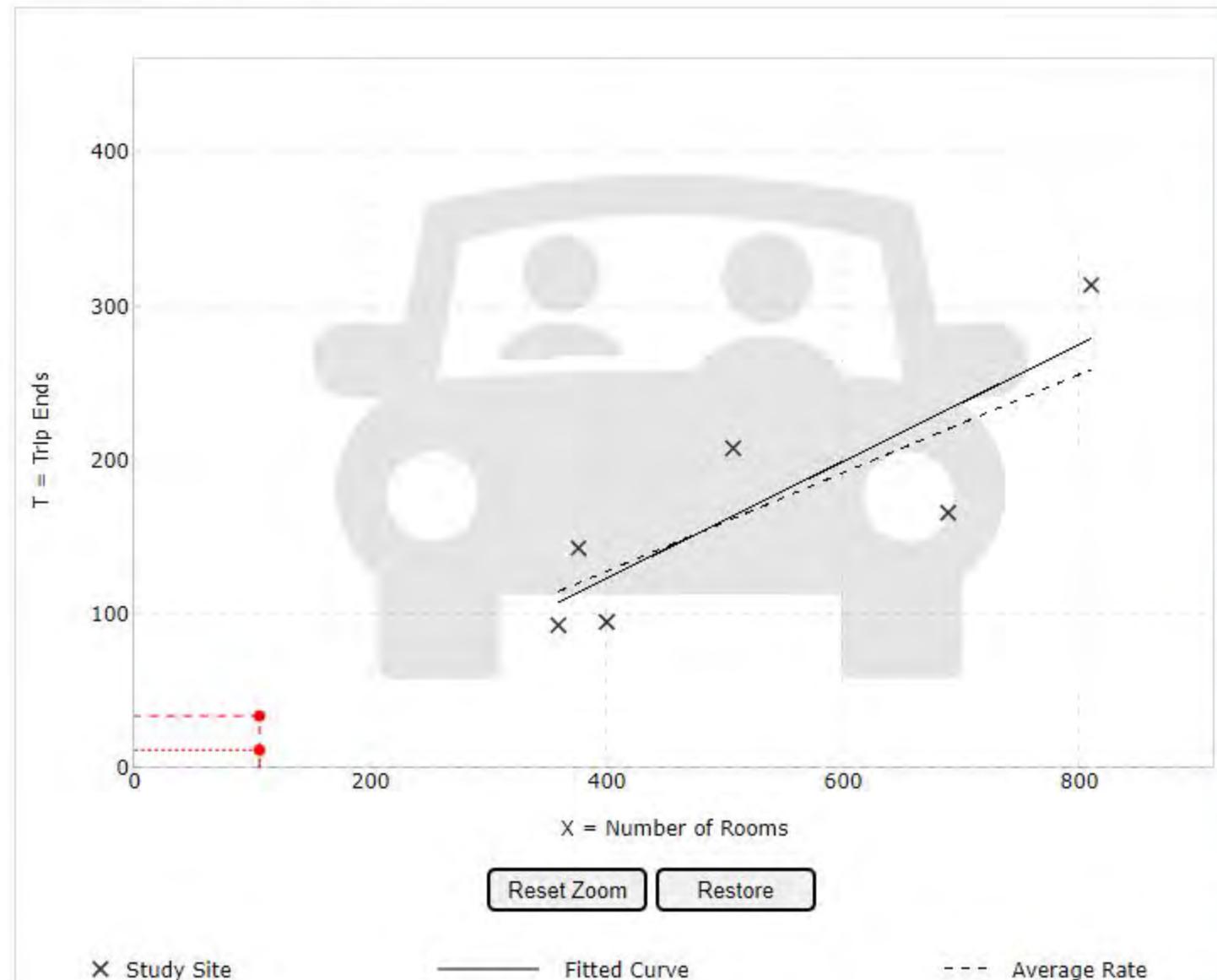
TRIP TYPE:

Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:

106

Calculate



DATA STATISTICS

Land Use:

Resort Hotel (330) [Click for Description and Data Plots](#)

Independent Variable:

Rooms

Time Period:

Weekday

Peak Hour of Adjacent Street Traffic

One Hour Between 7 and 9 a.m.

Setting/Location:

General Urban/Suburban

Trip Type:

Vehicle

Number of Studies:

6

Avg. Num. of Rooms:

524

Average Rate:

0.32

Range of Rates:

0.24 - 0.41

Standard Deviation:

0.08

Fitted Curve Equation:

 $T = 0.38(X) - 28.58$ R^2 :

0.72

Directional Distribution:

72% entering, 28% exiting

Calculated Trip Ends:

Average Rate: 34 (Total), 24 (Entry), 10 (Exit)

Fitted Curve: 12 (Total), 8 (Entry), 4 (Exit)



Growth Rate Calculation

Table - Study Area AADT Information (veh/day)

<u>Year</u>	<u>SR 1105 (Middleton St) north of SR 1104</u>	<u>SR 1104 (Beach Dr) west of SR 1105</u>	<u>SR 1104 (Beach Dr) south of SR 1190</u>	<u>SR 1190 west of SR 1104</u>	
2005		2,400		13,000	
2006	1,600				
2007		2,800			
2008					
2009		1,700		11,000	
2010	2,100		1,800		
2011		1,700		9,300	
2012	1,800		1,900		
2013				8,600	
2014			1,800		
2015		2,200		9,200	
2016	3,800		2,100		
2017		2,500		9,400	
2018	3,800				
2019		4,300		14,000	
2020					
2021					
2022					
Slope from trendline (veh/yr)	207.89	84.59	40.00	-38.00	
% Growth	5.47%	1.97%	1.90%	-0.27%	2.27%



Capacity Analysis Synchro Worksheets



Existing Conditions

HCM 6th TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2023 Existing AM

Intersection

Int Delay, s/veh 1.8

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Vol, veh/h	27	0	0	15	7	4
Future Vol, veh/h	27	0	0	15	7	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	30	0	0	17	8	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	47 30
Stage 1	-	-	-	-	30 -
Stage 2	-	-	-	-	17 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0 0	-	963 1044	
Stage 1	-	0 0	-	993 -	
Stage 2	-	0 0	-	1006 -	
Platoon blocked, %	-				
Mov Cap-1 Maneuver	-	-	-	963	1044
Mov Cap-2 Maneuver	-	-	-	963	-
Stage 1	-	-	-	993	-
Stage 2	-	-	-	1006	-

Approach EB WB NB

HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	991	-	-
HCM Lane V/C Ratio	0.012	-	-
HCM Control Delay (s)	8.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

HCM 6th TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2023 Existing PM

Intersection

Int Delay, s/veh 1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Vol, veh/h	17	0	0	31	7	4
Future Vol, veh/h	17	0	0	31	7	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	19	0	0	34	8	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	53 19
Stage 1	-	-	-	-	19 -
Stage 2	-	-	-	-	34 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0 0	-	955	1059
Stage 1	-	0 0	-	1004	-
Stage 2	-	0 0	-	988	-
Platoon blocked, %	-				
Mov Cap-1 Maneuver	-	-	-	955	1059
Mov Cap-2 Maneuver	-	-	-	955	-
Stage 1	-	-	-	1004	-
Stage 2	-	-	-	988	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	990	-	-
HCM Lane V/C Ratio	0.012	-	-
HCM Control Delay (s)	8.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-



Future No Build Conditions

HCM 6th TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2025 Future No Build AM

Intersection

Int Delay, s/veh 1.7

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Vol, veh/h	29	0	0	16	7	4
Future Vol, veh/h	29	0	0	16	7	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	32	0	0	18	8	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	50 32
Stage 1	-	-	-	-	32 -
Stage 2	-	-	-	-	18 -
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42 -
Critical Hdwy Stg 2	-	-	-	-	5.42 -
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0 0	-	959 1042	
Stage 1	-	0 0	-	991 -	
Stage 2	-	0 0	-	1005 -	
Platoon blocked, %	-				
Mov Cap-1 Maneuver	-	-	-	959 1042	
Mov Cap-2 Maneuver	-	-	-	959 -	
Stage 1	-	-	-	991 -	
Stage 2	-	-	-	1005 -	

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	988	-	-
HCM Lane V/C Ratio	0.012	-	-
HCM Control Delay (s)	8.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-

HCM 6th TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2025 Future No Build PM

Intersection

Int Delay, s/veh 1.5

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑			↑	↔	
Traffic Vol, veh/h	19	0	0	33	7	4
Future Vol, veh/h	19	0	0	33	7	4
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	21	0	0	37	8	4

Major/Minor	Major1	Major2	Minor1		
Conflicting Flow All	0	-	-	-	58 21
Stage 1	-	-	-	-	21
Stage 2	-	-	-	-	37
Critical Hdwy	-	-	-	-	6.42 6.22
Critical Hdwy Stg 1	-	-	-	-	5.42
Critical Hdwy Stg 2	-	-	-	-	5.42
Follow-up Hdwy	-	-	-	-	3.518 3.318
Pot Cap-1 Maneuver	-	0 0	-	949 1056	
Stage 1	-	0 0	-	1002	-
Stage 2	-	0 0	-	985	-
Platoon blocked, %	-				
Mov Cap-1 Maneuver	-	-	-	949	1056
Mov Cap-2 Maneuver	-	-	-	949	-
Stage 1	-	-	-	1002	-
Stage 2	-	-	-	985	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	WBT
Capacity (veh/h)	985	-	-
HCM Lane V/C Ratio	0.012	-	-
HCM Control Delay (s)	8.7	-	-
HCM Lane LOS	A	-	-
HCM 95th %tile Q(veh)	0	-	-



Future Build Conditions

HCM 2010 TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2025 Future Build AM

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	33	0	0	22	18	7	4	4	12	0	4
Future Vol, veh/h	4	33	0	0	22	18	7	4	4	12	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	37	0	0	24	20	8	4	4	13	0	4

Major/Minor	Major1	Major2			Minor1			Minor2				
Conflicting Flow All	44	0	-	-	-	0	81	89	37	83	79	34
Stage 1	-	-	-	-	-	-	45	45	-	34	34	-
Stage 2	-	-	-	-	-	-	36	44	-	49	45	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1564	-	0	0	-	-	907	801	1035	904	811	1039
Stage 1	-	-	0	0	-	-	969	857	-	982	867	-
Stage 2	-	-	0	0	-	-	980	858	-	964	857	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1564	-	-	-	-	-	901	799	1035	894	809	1039
Mov Cap-2 Maneuver	-	-	-	-	-	-	901	799	-	894	809	-
Stage 1	-	-	-	-	-	-	966	854	-	979	867	-
Stage 2	-	-	-	-	-	-	976	858	-	952	854	-

Approach	EB	WB			NB		SB				
HCM Control Delay, s	0.8	0			9.1		9				
HCM LOS					A		A				
<hr/>											
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1					
Capacity (veh/h)	901	1564	-	-	-	926					
HCM Lane V/C Ratio	0.018	0.003	-	-	-	0.019					
HCM Control Delay (s)	9.1	7.3	0	-	-	9					
HCM Lane LOS	A	A	A	-	-	A					
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0.1					

HCM 2010 TWSC
200: East Dolphin Drive & Site Access 2

Boardwalk Place
2025 Future Build AM

Intersection

Int Delay, s/veh 1.5

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	29	29	0	4	8
Future Vol, veh/h	0	29	29	0	4	8
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	32	32	0	4	9

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	64	32
Stage 1	-	-	-	-	32	-
Stage 2	-	-	-	-	32	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	0	-	-	0	942	1042
Stage 1	0	-	-	0	991	-
Stage 2	0	-	-	0	991	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	942	1042
Mov Cap-2 Maneuver	-	-	-	-	942	-
Stage 1	-	-	-	-	991	-
Stage 2	-	-	-	-	991	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.6
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	1006
HCM Lane V/C Ratio	-	-	0.013
HCM Control Delay (s)	-	-	8.6
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0

HCM 2010 TWSC
400: East Dolphin Drive & Site Access 4

Boardwalk Place
2025 Future Build AM

Intersection

Int Delay, s/veh 2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	24	41	31	4	4	16
Future Vol, veh/h	24	41	31	4	4	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	27	46	34	4	4	18

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	38	0	-	0	136	36
Stage 1	-	-	-	-	36	-
Stage 2	-	-	-	-	100	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1572	-	-	-	857	1037
Stage 1	-	-	-	-	986	-
Stage 2	-	-	-	-	924	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1572	-	-	-	842	1037
Mov Cap-2 Maneuver	-	-	-	-	842	-
Stage 1	-	-	-	-	968	-
Stage 2	-	-	-	-	924	-

Approach	EB	WB	SB
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HCM Control Delay, s 2.7 0 8.7

HCM LOS A

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1572	-	-	-	991
HCM Lane V/C Ratio	0.017	-	-	-	0.022
HCM Control Delay (s)	7.3	0	-	-	8.7
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1

HCM 6th TWSC
100: 3rd Place East & East Dolphin Drive

Boardwalk Place
2025 Future Build PM

Intersection

Int Delay, s/veh 3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	4	26	0	0	40	21	7	4	4	20	0	4
Future Vol, veh/h	4	26	0	0	40	21	7	4	4	20	0	4
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None									
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	4	29	0	0	44	23	8	4	4	22	0	4

Major/Minor	Major1	Major2			Minor1			Minor2				
Conflicting Flow All	67	0	-	-	-	0	95	104	29	97	93	56
Stage 1	-	-	-	-	-	-	37	37	-	56	56	-
Stage 2	-	-	-	-	-	-	58	67	-	41	37	-
Critical Hdwy	4.12	-	-	-	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1535	-	0	0	-	-	888	786	1046	885	797	1011
Stage 1	-	-	0	0	-	-	978	864	-	956	848	-
Stage 2	-	-	0	0	-	-	954	839	-	974	864	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1535	-	-	-	-	-	882	784	1046	875	795	1011
Mov Cap-2 Maneuver	-	-	-	-	-	-	882	784	-	875	795	-
Stage 1	-	-	-	-	-	-	975	861	-	953	848	-
Stage 2	-	-	-	-	-	-	950	839	-	962	861	-

Approach	EB	WB			NB		SB				
HCM Control Delay, s	1	0			9.1		9.1				
HCM LOS					A		A				
<hr/>											
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR	SBLn1					
Capacity (veh/h)	890	1535	-	-	-	895					
HCM Lane V/C Ratio	0.019	0.003	-	-	-	0.03					
HCM Control Delay (s)	9.1	7.4	0	-	-	9.1					
HCM Lane LOS	A	A	A	-	-	A					
HCM 95th %tile Q(veh)	0.1	0	-	-	-	0.1					

HCM 6th TWSC
200: East Dolphin Drive & Site Access 2

Boardwalk Place
2025 Future Build PM

Intersection

Int Delay, s/veh 2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	19	47	0	7	13
Future Vol, veh/h	0	19	47	0	7	13
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	21	52	0	8	14

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	73	52
Stage 1	-	-	-	-	52	-
Stage 2	-	-	-	-	21	-
Critical Hdwy	-	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	0	-	-	0	931	1016
Stage 1	0	-	-	0	970	-
Stage 2	0	-	-	0	1002	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	-	-	931	1016
Mov Cap-2 Maneuver	-	-	-	-	931	-
Stage 1	-	-	-	-	970	-
Stage 2	-	-	-	-	1002	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	8.7
HCM LOS			A

Minor Lane/Major Mvmt	EBT	WBT	SBLn1
Capacity (veh/h)	-	-	985
HCM Lane V/C Ratio	-	-	0.023
HCM Control Delay (s)	-	-	8.7
HCM Lane LOS	-	-	A
HCM 95th %tile Q(veh)	-	-	0.1

HCM 6th TWSC
400: East Dolphin Drive & Site Access 4

Boardwalk Place
2025 Future Build PM

Intersection

Int Delay, s/veh 3.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	28	33	53	4	4	26
Future Vol, veh/h	28	33	53	4	4	26
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	31	37	59	4	4	29

Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	63	0	-	0	160	61
Stage 1	-	-	-	-	61	-
Stage 2	-	-	-	-	99	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1540	-	-	-	831	1004
Stage 1	-	-	-	-	962	-
Stage 2	-	-	-	-	925	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1540	-	-	-	814	1004
Mov Cap-2 Maneuver	-	-	-	-	814	-
Stage 1	-	-	-	-	942	-
Stage 2	-	-	-	-	925	-

Approach	EB	WB	SB
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HCM Control Delay, s	3.4	0	8.8
HCM LOS		A	

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1540	-	-	-	974
HCM Lane V/C Ratio	0.02	-	-	-	0.034
HCM Control Delay (s)	7.4	0	-	-	8.8
HCM Lane LOS	A	A	-	-	A
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1



Queueing Analysis SimTraffic Worksheets

Queuing and Blocking Report 2023 Existing AM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	1032
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report 2025 Future No Build AM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	8
95th Queue (ft)	30
Link Distance (ft)	1032
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

2025 Future Build AM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	EB	NB	SB
Directions Served	LT	LTR	LTR
Maximum Queue (ft)	8	33	42
Average Queue (ft)	0	11	13
95th Queue (ft)	5	35	38
Link Distance (ft)	147	669	169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 200: East Dolphin Drive & Site Access 2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	31
Average Queue (ft)	10
95th Queue (ft)	34
Link Distance (ft)	1056
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 300: East Dolphin Drive & Site Access 3

Movement	EB
Directions Served	LT
Maximum Queue (ft)	6
Average Queue (ft)	0
95th Queue (ft)	4
Link Distance (ft)	20
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report 2025 Future Build AM

Boardwalk Place

Intersection: 400: East Dolphin Drive & Site Access 4

Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	9	35
Average Queue (ft)	0	13
95th Queue (ft)	6	38
Link Distance (ft)	1179	1040
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report 2023 Existing PM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	9
95th Queue (ft)	32
Link Distance (ft)	1032
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report 2025 Future No Build PM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	NB
Directions Served	LR
Maximum Queue (ft)	30
Average Queue (ft)	9
95th Queue (ft)	31
Link Distance (ft)	1032
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Network Summary

Network wide Queuing Penalty: 0

Queuing and Blocking Report

2025 Future Build PM

Boardwalk Place

Intersection: 100: 3rd Place East & East Dolphin Drive

Movement	EB	NB	SB
Directions Served	LT	LTR	LTR
Maximum Queue (ft)	6	33	40
Average Queue (ft)	0	10	16
95th Queue (ft)	4	34	43
Link Distance (ft)	147	1172	169
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 200: East Dolphin Drive & Site Access 2

Movement	SB
Directions Served	LR
Maximum Queue (ft)	33
Average Queue (ft)	14
95th Queue (ft)	39
Link Distance (ft)	1056
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 300: East Dolphin Drive & Site Access 3

Movement	EB
Directions Served	LT
Maximum Queue (ft)	15
Average Queue (ft)	1
95th Queue (ft)	8
Link Distance (ft)	20
Upstream Blk Time (%)	0
Queuing Penalty (veh)	0
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report 2025 Future Build PM

Boardwalk Place

Intersection: 400: East Dolphin Drive & Site Access 4

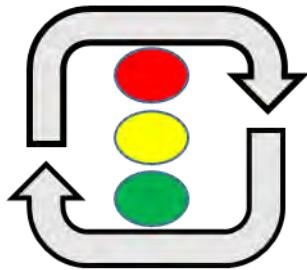
Movement	EB	SB
Directions Served	LT	LR
Maximum Queue (ft)	30	46
Average Queue (ft)	1	19
95th Queue (ft)	14	46
Link Distance (ft)	1179	1040
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Network Summary

Network wide Queuing Penalty: 0



Turning Movement Counts



TRUE DIRECTION

TRAFFIC SERVICES, INC.

236-1 Grandview Dr, Sneads Ferry NC, 28460
919-749-3979 truedirectiontraffic@gmail.com

Count Number: SITE

County: BRUNSWICK

Division: 03

Location: 3RD PACE AND DOLPHIN DR.

Location Type: 3-LEG

Count Type: TURNING
MOVEMENT

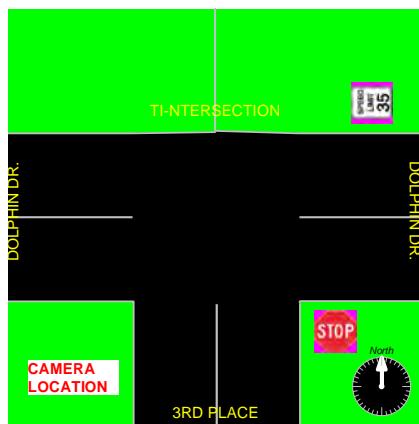
Count Start Date: 01-10-2023

Time: 7:00AM-9:00AM AND
4:00PM-6:00PM

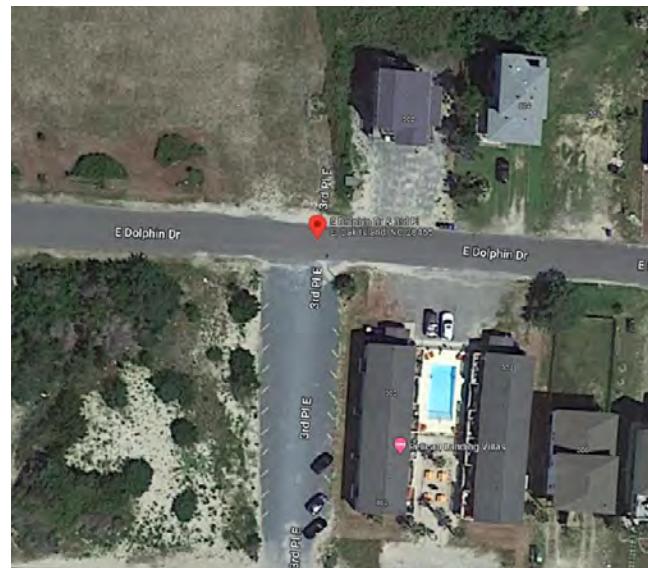
Video Time Used: 7:00AM-
9:00AM AND 4:00PM-6:00PM
(01-10)

Total Volume: 101

Weather: SUNNY NO RAIN



1. School in Session: YES
2. Pedestrians Observed During Count: NO
3. Disabled Pedestrians Present: NO
4. Counted By: JENNIFE LEIKEN
5. Data Processor: MICHAEL JOHNSON
6. Signal Inventory: N/A
7. Intersection Controlled By: STOP SIGN
8. Data Collection Method: Jamar DB-400 Electronic Count Board
9. Equipment Operating Properly: Yes
10. Area Lighting: NO
11. Construction Present: NO
12. Traffic Problems Observed: NONE



LOCATION OF COUNT SITE: SITE 1

Southbound Approach:

Looking Back Southbound:

Southbound Approach:

Stop Sign Within 300':

Traffic Signal Within 300':

Railroad Within 300':

If Yes Distance:

Westbound Approach:



Looking Back Westbound:



Westbound Approach:

Stop Sign Within 300': NO

Traffic Signal Within 300':
NO

Railroad Within 300': NO

If Yes Distance:

Northbound Approach:



Looking Back Northbound:



Northbound Approach:

Stop Sign Within 300': YES

Traffic Signal Within 300':
NO

Railroad Within 300': NO

If Yes Distance:

Eastbound Approach:



Looking Back Eastbound:



Eastbound Approach:

Stop Sign Within 300': NO

Traffic Signal Within 300':
NO

Railroad Within 300': NO

If Yes Distance:

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919-749-3979

MICHAEL JOHNSON

3RD PLACE AND DOLPHIN DR.

OAK ISLAND BRUNSWICK CO.

WEATHER: SUNNY

COUNTED BY: JENNIFER LEIKEN

File Name : SITE 1 OAK ISLAND

Site Code : SITE 1

Start Date : 1/10/2023

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 WEATHER: SUNNY
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File Name : SITE 1 OAK ISLAND
 Site Code : SITE 1
 Start Date : 1/10/2023
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Groups Printed- ALL VEHICLES

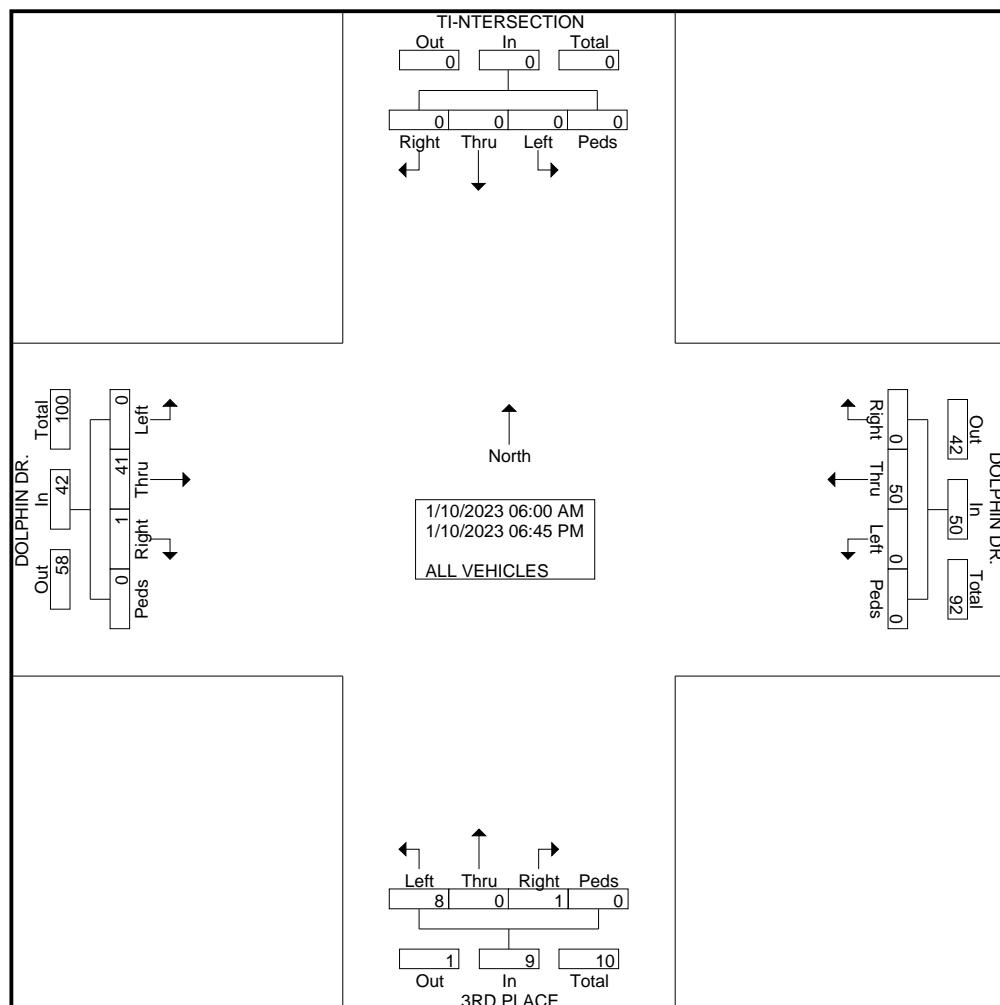
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	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00 PM	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	0	0	0	3	0	0	0	3	8
04:15 PM	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	2	0	0	2	0	0	0	2	0	6
04:30 PM	0	0	0	0	0	0	5	0	0	5	2	0	0	0	2	0	2	0	0	2	0	0	0	2	0	9
04:45 PM	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	3	1	0	4	0	0	0	4	10	
Total	0	0	0	0	0	0	0	18	0	0	18	4	0	0	0	4	0	10	1	0	11	0	0	0	33	
05:00 PM	0	0	0	0	0	0	4	0	0	4	1	0	1	0	2	0	2	0	0	0	2	0	0	0	2	8
05:15 PM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	3	0	0	0	3	0	0	0	3	5
05:30 PM	0	0	0	0	0	0	7	0	0	7	1	0	0	0	1	0	1	0	0	1	0	0	0	1	0	9
05:45 PM	0	0	0	0	0	0	4	0	0	4	2	0	0	0	2	0	2	0	0	0	2	0	0	0	2	8
Total	0	0	0	0	0	0	17	0	0	17	4	0	1	0	5	0	8	0	0	0	8	0	0	0	30	
06:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
06:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Grand Total	0	0	0	0	0	0	50	0	0	50	8	0	1	0	9	0	41	1	0	42	101					
Apprch %	0	0	0	0	0	0	100	0	0	88.9	0	11.1	0	0	97.6	2.4	0	40.6	1	0	41.6					
Total %	0	0	0	0	0	0	49.5	0	0	49.5	7.9	0	1	0	8.9	0	40.6	1	0	41.6						

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 MICHAEL JOHNSON

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 OAK ISLAND BRUNSWICK CO.
 WEATHER: SUNNY
 COUNTED BY: JENNIFER LEIKEN

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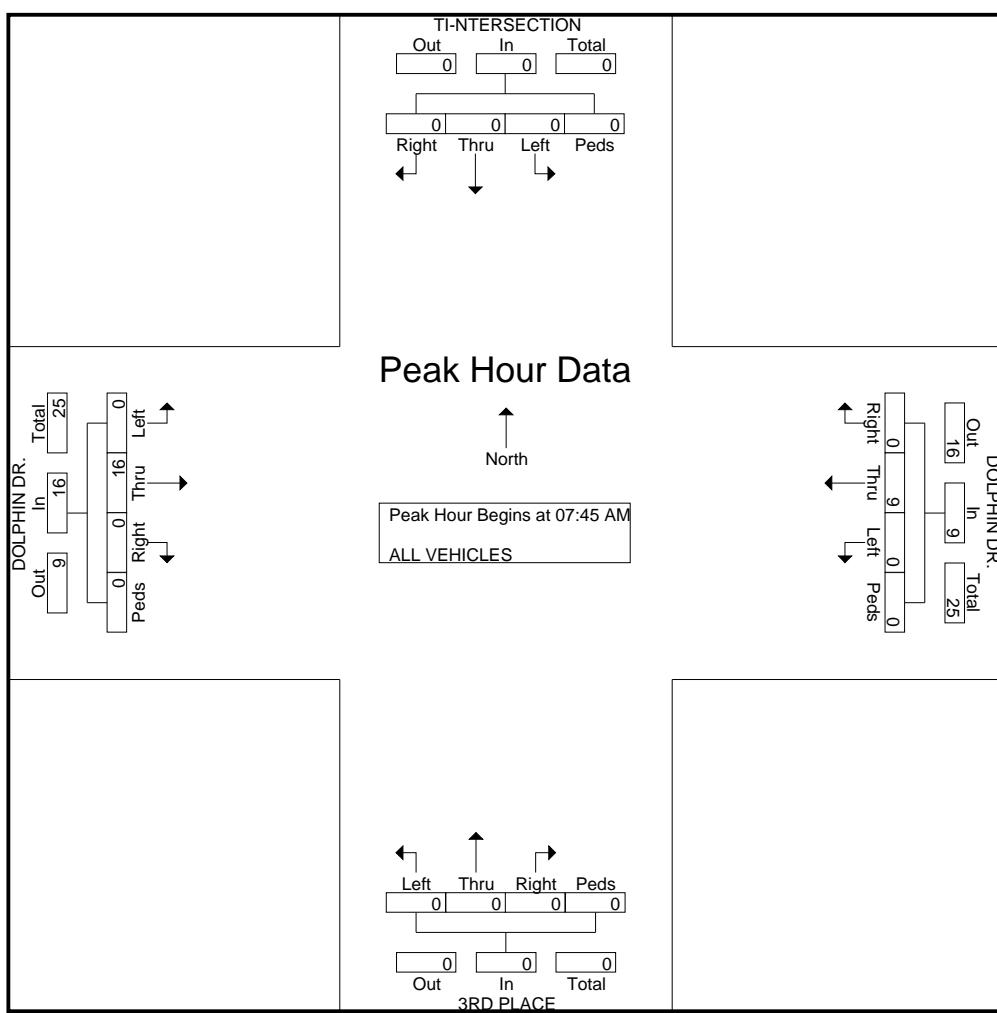
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Start Time	TI-INTERSECTION SOUTHBOUND					DOLPHIN DR. WESTBOUND					3RD PLACE NORTHBOUND					DOLPHIN DR. EASTBOUND					
	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 06:00 AM to 12:00 PM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:45 AM																					
07:45 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	5	0	0	5	7
08:00 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	8	0	0	8	10
08:15 AM	0	0	0	0	0	0	3	0	0	3	0	0	0	0	0	0	1	0	0	1	4
08:30 AM	0	0	0	0	0	0	2	0	0	2	0	0	0	0	0	0	2	0	0	2	4
Total Volume	0	0	0	0	0	0	9	0	0	9	0	0	0	0	0	0	16	0	0	16	25
% App. Total	0	0	0	0	0	0	100	0	0	0	0	0	0	0	0	0	100	0	0	100	0
PHF	.000	.000	.000	.000	.000	.000	.750	.000	.000	.750	.000	.000	.000	.000	.000	.000	.500	.000	.000	.500	.625



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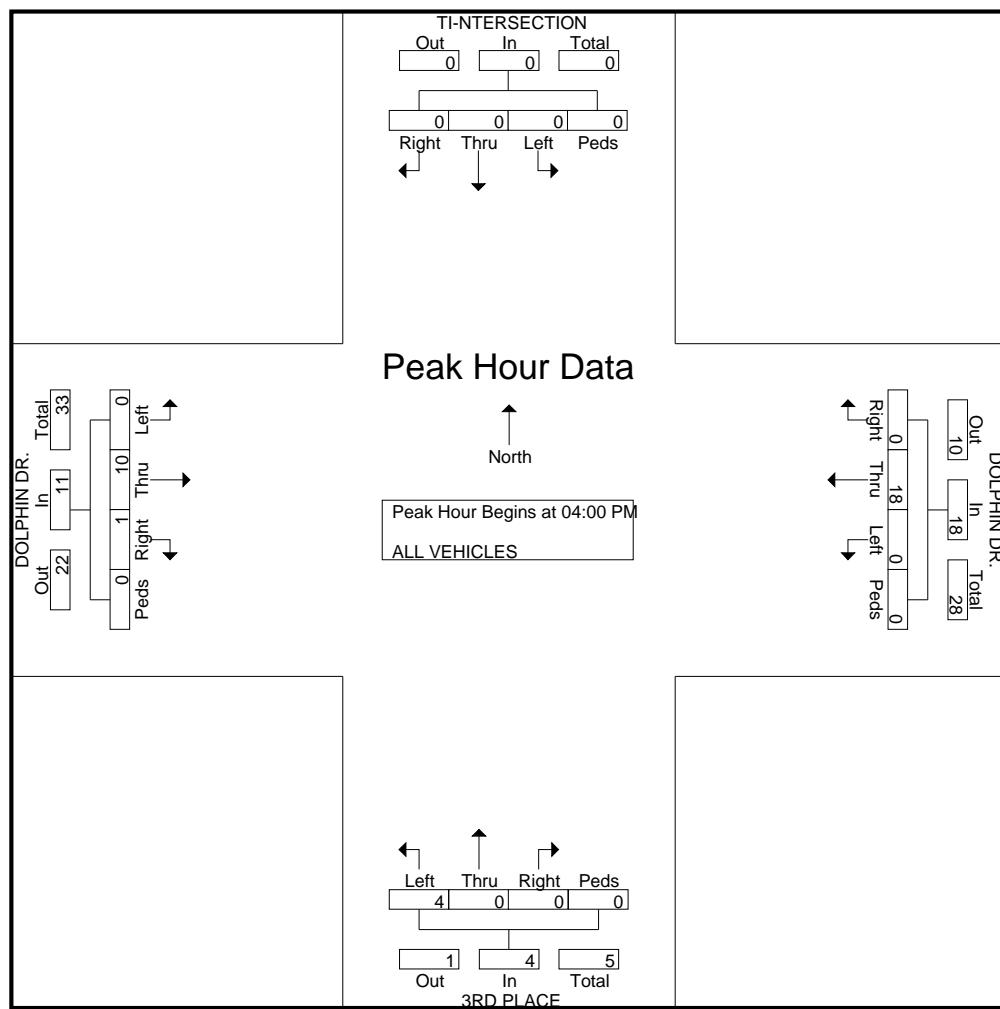
File Name : SITE 1 OAK ISLAND

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	TI-INTERSECTION SOUTHBOUND					DOLPHIN DR. WESTBOUND					3RD PLACE NORTHBOUND					DOLPHIN DR. EASTBOUND						
	Start Time	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Left	Thru	Right	Peds	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 06:45 PM - Peak 1 of 1																						
Peak Hour for Entire Intersection Begins at 04:00 PM																						
04:00 PM	0	0	0	0	0	0	0	5	0	0	5	0	0	0	0	0	0	3	0	0	3	8
04:15 PM	0	0	0	0	0	0	0	3	0	0	3	1	0	0	0	1	0	2	0	0	2	6
04:30 PM	0	0	0	0	0	0	0	5	0	0	5	2	0	0	0	2	0	2	0	0	2	9
04:45 PM	0	0	0	0	0	0	0	5	0	0	5	1	0	0	0	1	0	3	1	0	4	10
Total Volume	0	0	0	0	0	0	0	18	0	0	18	4	0	0	0	4	0	10	1	0	11	33
% App. Total	0	0	0	0	0	0	0	100	0	0	100	0	0	0	0	0	0	90.9	9.1	0	0	
PHF	.000	.000	.000	.000	.000	.000	.900	.000	.000	.900	.500	.000	.000	.000	.000	.500	.000	.833	.250	.000	.688	.825



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WESTBOUND: DOLPHIN DR



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NORTHBOUND: 3RD PLACE



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EASTBOUND: DOLPHIN DR.

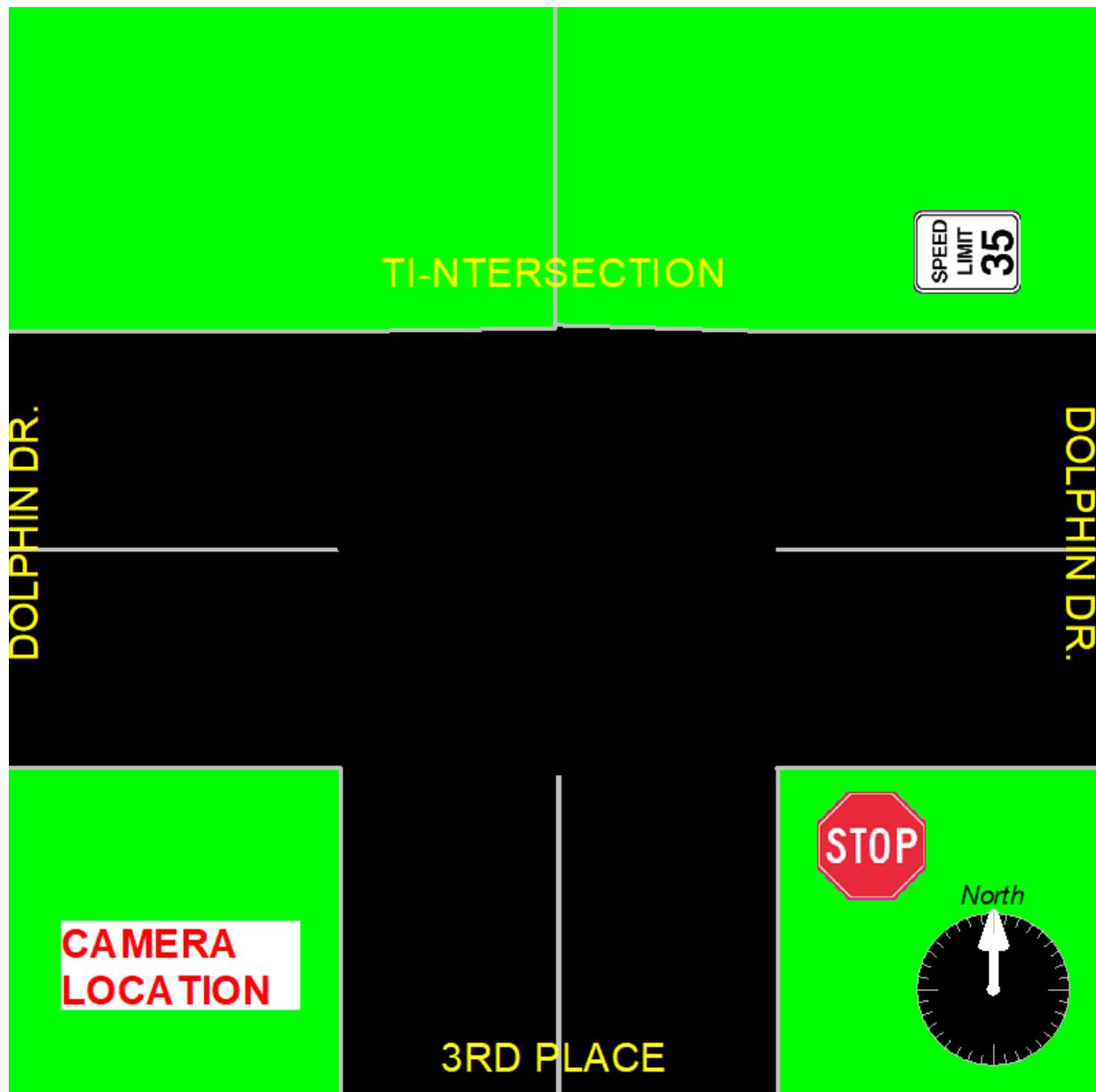


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File Name : SITE 1 OAK ISLAND
Site Code : SITE 1
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Supporting Documentation

NCDOT Traffic Survey Unit

ATR Based Seasonal Factor Groups for Non-Interstate Routes
Factoring from Daily Volume to AADT by Day of Week by Month

ATRGroup	Month	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Avg Wk Day	Updated
1	1		1.11	1.14	1.10	1.09	0.99		1.09	2009
1	2		1.07	1.07	1.06	1.02	0.92		1.03	2009
1	3		1.04	1.05	1.05	0.99	0.94		1.01	2009
1	4		1.01	0.99	0.98	0.95	0.87		0.96	2009
1	5		1.00	0.97	0.95	0.93	0.82		0.93	2009
1	6		0.96	0.96	0.97	0.93	0.83		0.93	2009
1	7		0.95	0.96	0.93	0.96	0.85		0.93	2009
1	8		0.97	0.97	0.97	0.93	0.83		0.93	2009
1	9		1.00	0.98	0.99	0.94	0.83		0.95	2009
1	10		0.99	0.99	0.96	0.93	0.81		0.94	2009
1	11		1.02	1.00	0.97	1.03	0.89		0.98	2009
1	12		1.03	1.05	1.06	1.02	0.91		1.01	2009
2	1		1.28	1.33	1.29	1.27	1.11		1.26	2004
2	2		1.25	1.26	1.26	1.18	1.08		1.21	2004
2	3		1.20	1.16	1.16	1.04	0.98		1.11	2004
2	4		1.08	1.09	1.08	1.02	0.88		1.03	2004
2	5		1.02	1.02	1.03	0.97	0.83		0.97	2004
2	6		0.99	1.00	0.99	0.93	0.79		0.94	2004
2	7		0.94	0.96	0.88	0.93	0.80		0.90	2004
2	8		0.95	0.98	0.96	0.89	0.73		0.90	2004
2	9		0.97	1.02	1.03	0.97	0.80		0.96	2004
2	10		0.96	0.99	0.98	0.92	0.75		0.92	2004
2	11		1.14	1.13	1.09	1.12	0.92		1.08	2004
2	12		1.14	1.15	1.22	1.12	0.99		1.12	2004
3	1		1.72	1.80	1.79	1.73	1.46		1.70	2004
3	2		1.60	1.67	1.63	1.52	1.40		1.56	2004
3	3		1.47	1.48	1.39	1.33	1.19		1.37	2004
3	4		1.13	1.16	1.12	1.08	0.92		1.08	2004
3	5		0.89	1.00	1.02	0.96	0.74		0.92	2004
3	6		0.86	0.88	0.87	0.83	0.69		0.83	2004
3	7		0.77	0.80	0.76	0.75	0.60		0.74	2004
3	8		0.92	0.89	0.85	0.81	0.71		0.84	2004
3	9		0.98	1.10	1.11	1.02	0.84		1.01	2004
3	10		1.09	1.14	1.16	1.07	0.83		1.06	2004
3	11		1.39	1.41	1.40	1.38	1.07		1.33	2004
3	12		1.41	1.44	1.82	1.49	1.32		1.50	2004
4	1		0.96	0.98	0.95	0.94	0.86		0.94	2009
4	2		0.94	0.94	0.95	0.91	0.84		0.92	2009
4	3		0.92	0.93	0.92	0.87	0.86		0.90	2009

4	4		0.90	0.89	0.88	0.86	0.82		0.87	2009
4	5		1.01	1.02	1.00	0.98	0.93		0.99	2009
4	6		0.98	0.99	0.97	0.95	0.90		0.96	2009
4	7		0.94	0.94	0.96	0.98	0.88		0.94	2009
4	8		0.91	0.92	0.92	0.88	0.83		0.89	2009
4	9		0.98	0.89	0.89	0.86	0.81		0.89	2009
4	10		0.91	0.91	0.91	0.89	0.82		0.89	2009
4	11		0.94	0.94	0.90	1.02	0.87		0.93	2009
4	12		0.93	0.96	1.04	0.93	0.85		0.94	2009
5	1		1.42	1.49	1.43	1.40	1.18		1.38	2004
5	2		1.24	1.49	1.41	1.20	0.90		1.25	2004
5	3		1.26	1.33	1.20	0.95	0.72		1.09	2004
5	4		1.10	1.22	1.18	1.06	0.80		1.07	2004
5	5		1.14	1.28	1.24	1.10	0.86		1.12	2004
5	6		1.16	1.26	1.22	1.09	0.83		1.11	2004
5	7		0.98	1.08	0.95	0.96	0.82		0.96	2004
5	8		1.01	1.13	1.10	0.99	0.72		0.99	2004
5	9		1.11	1.36	1.41	1.34	1.02		1.25	2004
5	10		1.22	1.39	1.37	1.26	0.98		1.24	2004
5	11		1.30	1.21	0.86	1.16	1.04		1.11	2004
5	12		0.88	1.12	1.40	0.95	0.75		1.02	2004
6	1	1.76	3.84	4.11	4.14	3.90	2.45	1.64	3.55	2004
6	2	1.30	3.43	3.50	3.71	2.83	1.83	1.09	2.86	2004
6	3	1.04	1.85	1.84	1.85	2.36	1.43	1.01	1.82	2004
6	4	0.77	1.48	1.63	1.41	1.53	0.91	0.75	1.33	2004
6	5	0.85	1.36	1.31	1.37	1.33	0.99	0.83	1.25	2004
6	6	0.58	0.85	0.81	0.80	0.81	0.71	0.56	0.79	2004
6	7	0.54	0.69	0.64	0.65	0.62	0.53	0.49	0.62	2004
6	8	0.65	0.92	0.88	0.83	0.87	0.75	0.57	0.85	2004
6	9	0.67	1.14	1.10	1.27	0.98	0.77	0.56	1.02	2004
6	10	0.51	0.65	0.69	0.66	0.55	0.48	0.46	0.60	2004
6	11	0.69	1.59	1.94	1.69	1.74	0.98	0.75	1.50	2004
6	12	2.00	3.16	2.82	3.28	3.38	2.22	1.68	2.90	2004
7	1	2.26	2.24	2.10	2.14	2.06	1.91	1.97	2.08	2004
7	2	2.33	2.01	2.00	2.12	2.04	1.73	1.77	1.97	2004
7	3	1.67	1.65	1.60	1.77	1.71	1.47	1.28	1.63	2004
7	4	1.10	1.24	1.29	1.20	1.23	1.05	0.90	1.20	2004
7	5	0.93	1.03	1.01	1.00	0.98	0.89	0.78	0.98	2004
7	6	0.62	0.77	0.72	0.67	0.67	0.67	0.46	0.70	2004
7	7	0.57	0.73	0.66	0.64	0.62	0.59	0.41	0.65	2004
7	8	0.59	0.75	0.74	0.64	0.64	0.64	0.41	0.68	2004
7	9	0.82	0.98	0.91	0.90	0.87	0.85	0.60	0.90	2004
7	10	0.88	1.15	1.09	1.06	1.02	0.91	0.68	1.04	2004
7	11	1.21	1.45	1.67	1.62	1.42	1.24	1.03	1.46	2004

7	12	2.44	1.85	1.96	2.03	1.85	1.77	1.93	1.89	2004
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Counts collected on Tuesday in January

From: Scott Stewart <scottstewart6933@yahoo.com>
Sent: Wednesday, February 15, 2023 9:33 PM
To: Lisa Stites <lstites@oakislandnc.gov>
Cc: Scott Stewart <scottstewart6933@yahoo.com>; Grady Richardson <grady@ggrlawoffice.com>
Subject: Re: 3 of 3: Boardwalk Place LLC - 2-13-23 SUP Hearing Exhibits

Lisa,

TIA SUP Hearing Exhibit as requested.

As stated, Don Bennett's Testimony corrected the record and provided the 2-14-23 TIA consistent with his presentation at the 2-13-23 Hearing.

Scott