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TIS Version 1
7/24/2024

Sherrill Boulevard Business Park

Traffic Impact Study

Project #: 22-V051006-011

Submitted to:
Knoxville/Knox County Planning
July 24, 2024

Prepared By:
Johnson, Mirmiran & Thompson (JMT)

JOHN D RILEY
Digitally signed by JOHN D RILEY
Date: 2024.07.24 21:49:53 -04'00'

1 Executive Summary

The objective of this study is to evaluate the impact of the proposed Sherrill Lane Business Park on traffic operation along Sherrill Boulevard and develop any needed improvement recommendation. Sherrill Lane Business Park is a proposed commercial development consisting of five office buildings and four warehouses. The proposed site will be located along Sherrill Boulevard, a service road, at the northeast quadrant of the I-40 at I-440 system interchange in the City of Knoxville, TN. The proposed development is expected to generate 1,021 daily, 215 AM Peak hour, and 237 PM peak hour trips. Access to the site will be provided from Sherrill Boulevard via one full-movement driveway with a single exiting lane. Traffic operations at the proposed site driveway intersection were analyzed based on the year 2031 (build out year plus 5 years) traffic volume condition. Based on the analysis results, it is anticipated that the proposed site driveway intersection would operate at LOS B or better during both AM and PM peak hours. The following improvement measure is recommended at the site driveway:

- Provide a left turn lane with 100 feet minimum storage and appropriate taper by restriping existing pavement.

2 Existing Condition

Sherrill Lane Business Park is a proposed commercial development consisting of office buildings and warehouses and is proposed to be located approximately 4,200' south of the intersection of Mabry Hood Road at Sherrill Boulevard in the City of Knoxville, Tennessee. The proposed site location is presented in Figure 1 and the site plan of the proposed development is presented in Figure 2. It should be noted that while the proposed site and the site driveway belong to Knox County, the surrounding roadways and interchanges referenced in this report are within the City of Knoxville limit. As can be seen from Figure 2, the proposed development will consist of five office buildings, each having a 10,000 square-feet (sf) floor space. The site will also have four warehouses; two warehouses each with 12,000 sf floor space, while each of the two remainder warehouses will have 14,400 sf floor space. Access to the site will be provided from Sherrill Boulevard via an existing full-movement driveway. This driveway will be stop-controlled. It is anticipated that the proposed development will be constructed in a single phase and completed by 2026.

Sherrill Boulevard is a four-lane undivided frontage road with a posted speed limit of 40 miles per hour (mph). No annual average daily traffic (AADT) data is available on Sherrill Boulevard near the vicinity of the proposed site. Existing roadway geometry at the existing driveway intersection at Sherrill Boulevard is presented in Figure 3. Sherrill Boulevard provides connection to I-40 via N Cedar Bluff Road interchange east of the proposed development, and to State Route 162 (Pellissippi Parkway) via Dutchtown Road interchange north of the proposed development.

Weekday AM and PM peak period turning movement counts (TMCs) were collected at the study area intersection on December 19, 2023, when the Knoxville City public schools were in session. Traffic volumes were collected between 7:00 AM to 9:00 AM and between 4:00 PM to 6:00 PM. Peak hour TMCs are presented in Figure 4, while the detail counts are included in Attachment A. As it is shown in Figure 1, there is no development along the proposed driveway and as a result, no meaningful traffic volume from/to the existing driveway was recorded during the data collection. Currently, the existing site driveway is gated (closed) and has no entering/exiting traffic; therefore, no capacity analysis was performed for the existing peak hours.

3 Growth Rates

Tennessee Department of Transportation (TDOT) publishes historic AADTs of their roadways in Traffic Count Database System (TCDS). As of the time of preparing this report, no published AADT data is available along Sherrill Boulevard in TCDS. The nearest count station is located on Mabry Hood Road (ID 47000553), and historic AADTs (from 2016-2023) for this location were used to calculate the growth rate. Linear and compound growth rates for Mabry Hood Road were calculated and are presented in Figure 5. As it can be seen from Figure 5, linear growth rate is 3.07% and compound growth rate is 1.7%. Most of the traffic along the service road is commuter traffic and a 3% growth rate along a service road is deemed too high. An annual 2% growth rate, which is higher than the compound growth rate, was considered more realistic and was used to calculate the growth of the background traffic.

It is anticipated that the development will be built by 2026. Therefore, per TDOT guidelines, 2031 (build out year plus 5 years) is used as the target analysis year. Existing traffic volume was grown by 2% per year (from 2023 to 2031) and the resulting background volume is presented in Figure 4.

4 Site Traffic

4.1 Trip Generation

ITE Trip Generation Manual, 11th Edition was used to calculate estimated trips for the proposed development. ITE Trip Generation Manual provides equations and average rates that estimate the predicted number of trips that will be generated by a development based on similarly sized developments across the country. Trip generation summary for the proposed development is presented in Table 1. ITE Trip Generation report is presented in Appendix B.

Table 1: Proposed Trip Generation

Land Use	Land Use Code	Units	Weekday Trips						
			Daily	AM Peak Hour			PM Peak Hour		
			Total	In	Out	Total	In	Out	Total
General Office (Lots 4,5,6,7,9)	710	50,000 SF	785	100	15	115	20	105	125
Warehouse (Lots 1,8) 12K SF	150	24,000 SF	114	38	12	50	16	40	56
Warehouse (Lots 2,3) 14.4K SF	150	28,800 SF	122	40	10	50	16	40	56
		Total	1,021	178	37	215	52	185	237

4.2 Trip Distribution and Assignment

The proposed site is located along Sherrill Boulevard that acts as a service road and connects to Dutchtown Road interchange to north and N Cedar Bluff Road interchange to the east. It is assumed that most of the site traffic from west, north, and south will access the site via Dutchtown Road interchange. Traffic to/from east can access the site via N Cedar Bluff Road interchange. The trip distribution percentage for the proposed site was developed based on this observation and is

presented in Figure 4. The site generated peak hour trips were distributed to the proposed site driveway based on the proposed distribution, and the trip assignment is presented in Figure 4.

5 Future Conditions

Capacity analysis was performed for the 2031 horizon year assuming a single exiting lane with shared left-/right-turn movements. To calculate peak hour traffic volume for the horizon year, existing traffic volume grew by a 2% annual growth rate for seven years and added to the site traffic. Horizon year peak hour volume is presented in Figure 4.

5.1 Capacity Analysis

Level of Service (LOS) at the site driveway was analyzed following the methodologies presented in Highway Capacity Manual (HCM) 6th Edition and utilizing the Synchro capacity analysis software. Traffic operation analysis results for the horizon year (2031) for both AM and PM peak hours are summarized in Table 2. Detail Synchro results are presented in Attachment C.

Table 2: Capacity Analysis Results-2031 Build Conditions

Intersection	Intersection Control	Approach	LOS/Delay (in seconds)			
			AM Peak Hour		PM Peak Hour	
			Delay(1)	LOS(1)	Delay(1)	LOS(1)
Sherrill Boulevard at Site Driveway	Unsignalized (TWSC)	WB	12.0	B	14.2	B
		SBL	8.1	A	8.5	A

Note: (1) HCM6th Edition TWSC

As can be seen from Table 2, the site driveway will operate at LOS B or better during the AM and PM peak hours of horizon year (2031).

5.2 Turn Lane Analysis

The need for left and right turn lanes were analyzed based on nomograph presented in the Policy on Street and Driveway Access to North Carolina Highways, July 2003 and the analysis results are presented in Figure 6. Based on the analysis, the following turn lane recommendations are made at intersection of Sherill Boulevard at Site Driveway:

- No right turn lane was recommended on the northbound approach of Sherill Boulevard as the maximum peak hour right turn volume is less than 100 vehicles per hour (vph).
- A dedicated left turn with 100 feet of minimum storage and appropriate taper is recommended on the southbound approach of Sherill Boulevard. This left turn will allow a safe refuge for the turning vehicle as they wait to find an acceptable gap in the opposing traffic to cross Sherill Boulevard.

6 Recommendations

- The site driveway at Sherrill Boulevard is expected to operate at LOS B or better. Therefore, it is recommended that the site driveway should continue to operate as stop controlled.
- Provide a left turn lane with 100 feet minimum storage and appropriate taper by restriping existing pavement.

Figures

Figure 1: Project Location

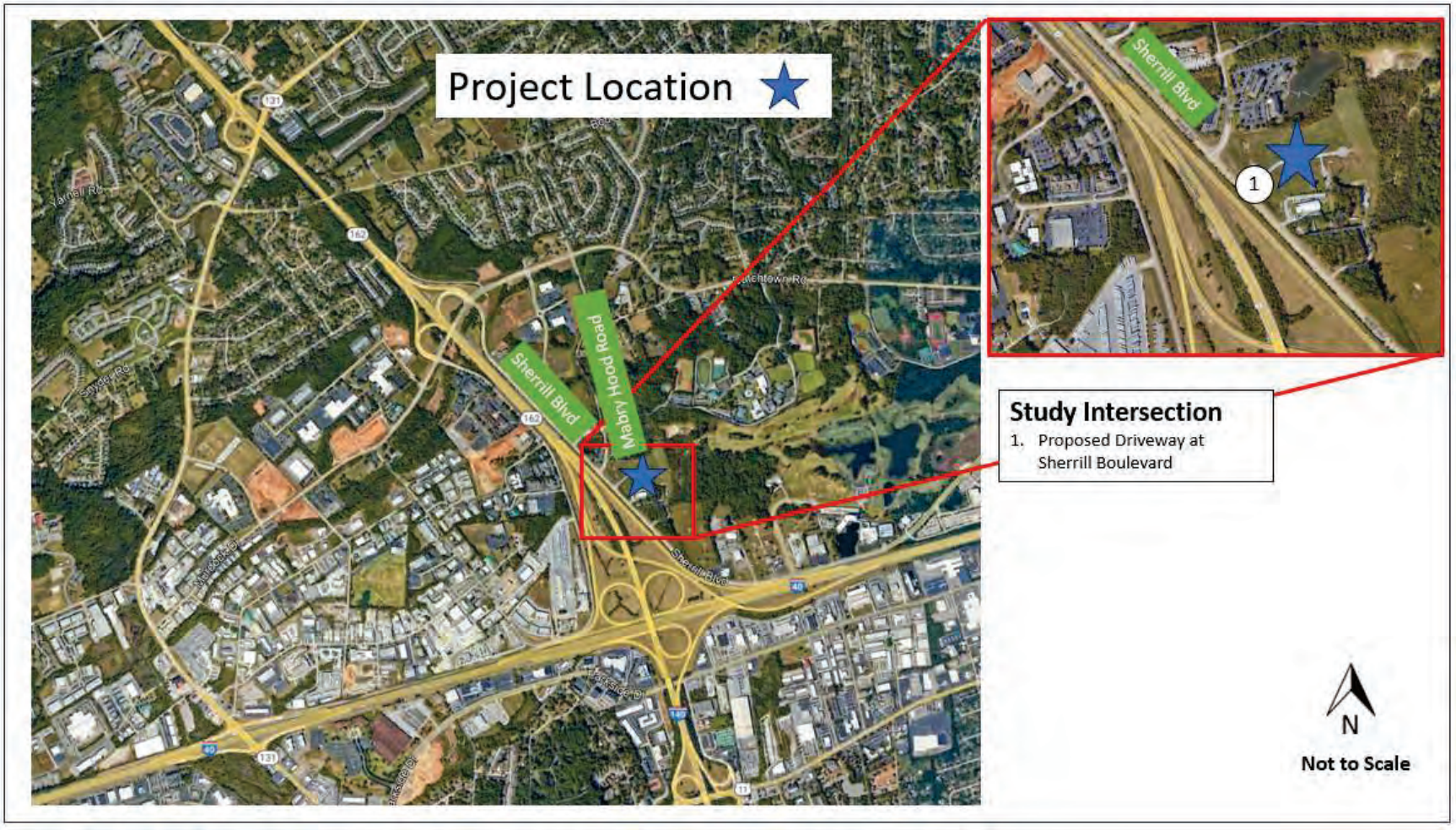


Figure 2: Proposed Site Plan

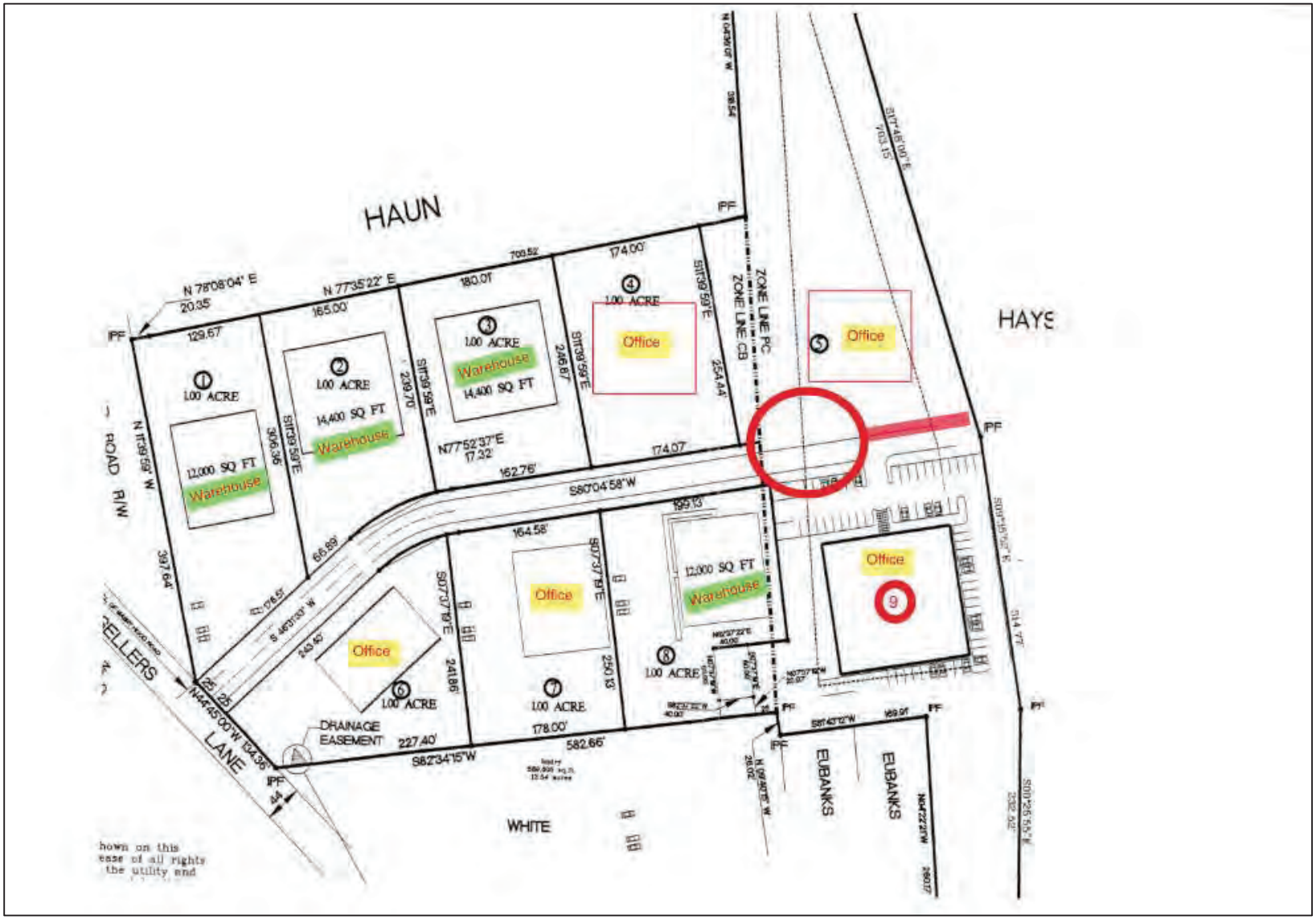


Figure 3: Existing Lane Configuration

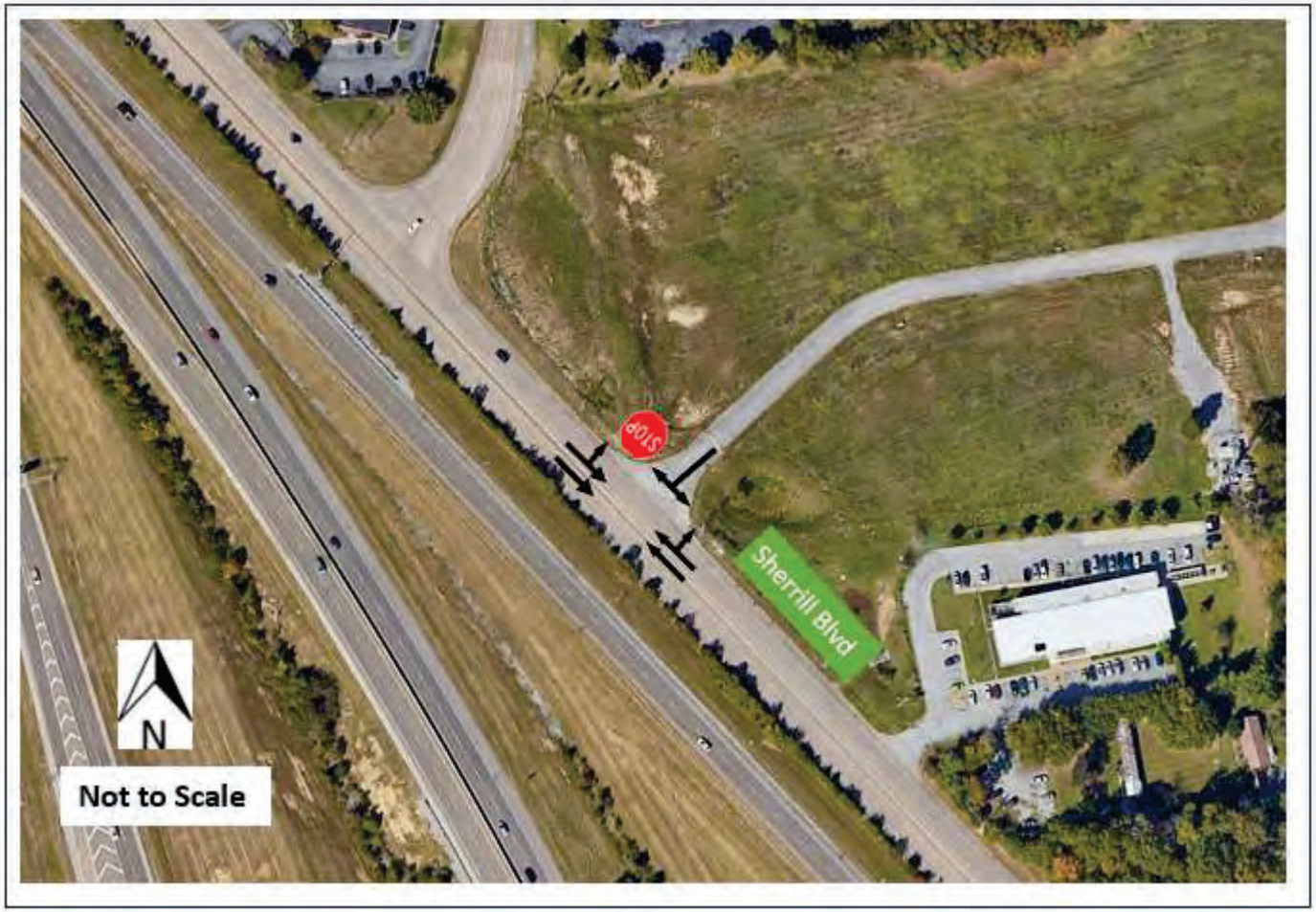


Figure 4: Existing and Horizon Year Traffic Volumes, Trip Distribution Percentage and Site Trips

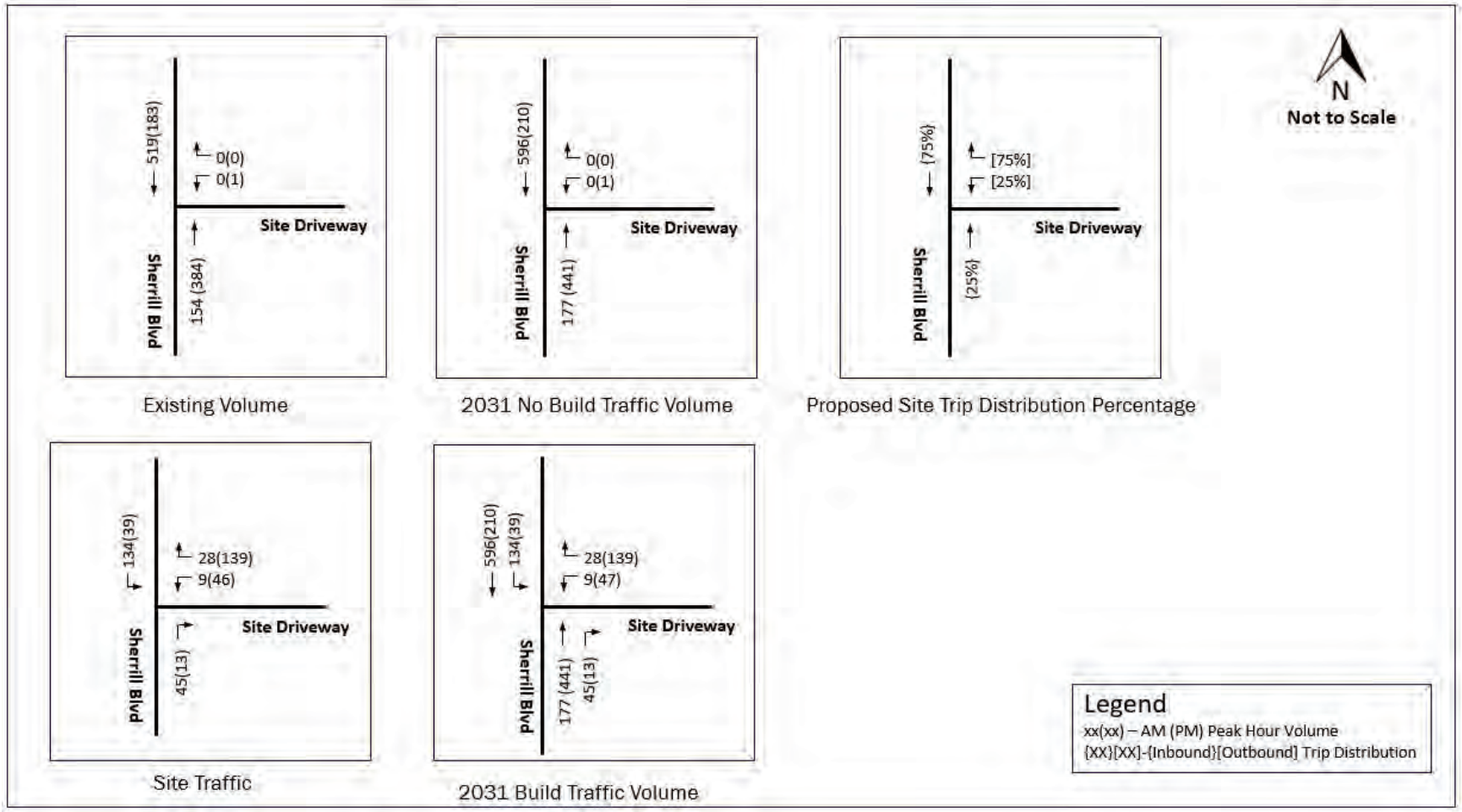


Figure 5: Annual Growth Rate Calculation Based on Historic AADTs

Year	AADT
2016	500
2017	578
2018	424
2019	606
2020	517
2021	395
2022	476
2023	618

Growth Rate Calculation

Compund Growth Rate: 1.70%
Linear Growth Rate 3.07%

Linear Growth Rate Calculation

2016 AADT	500
2023 AADT	618
Annual Growth Rate	3.07%

Compound Rate

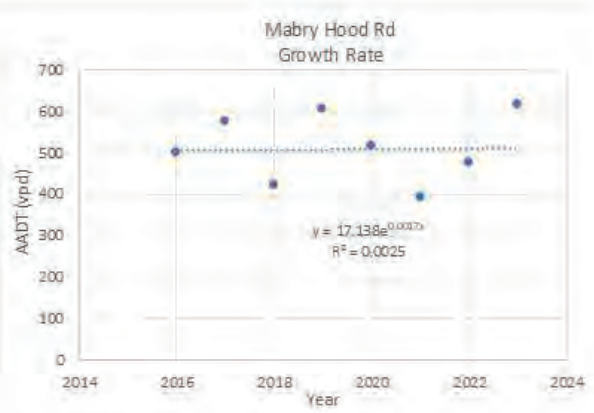
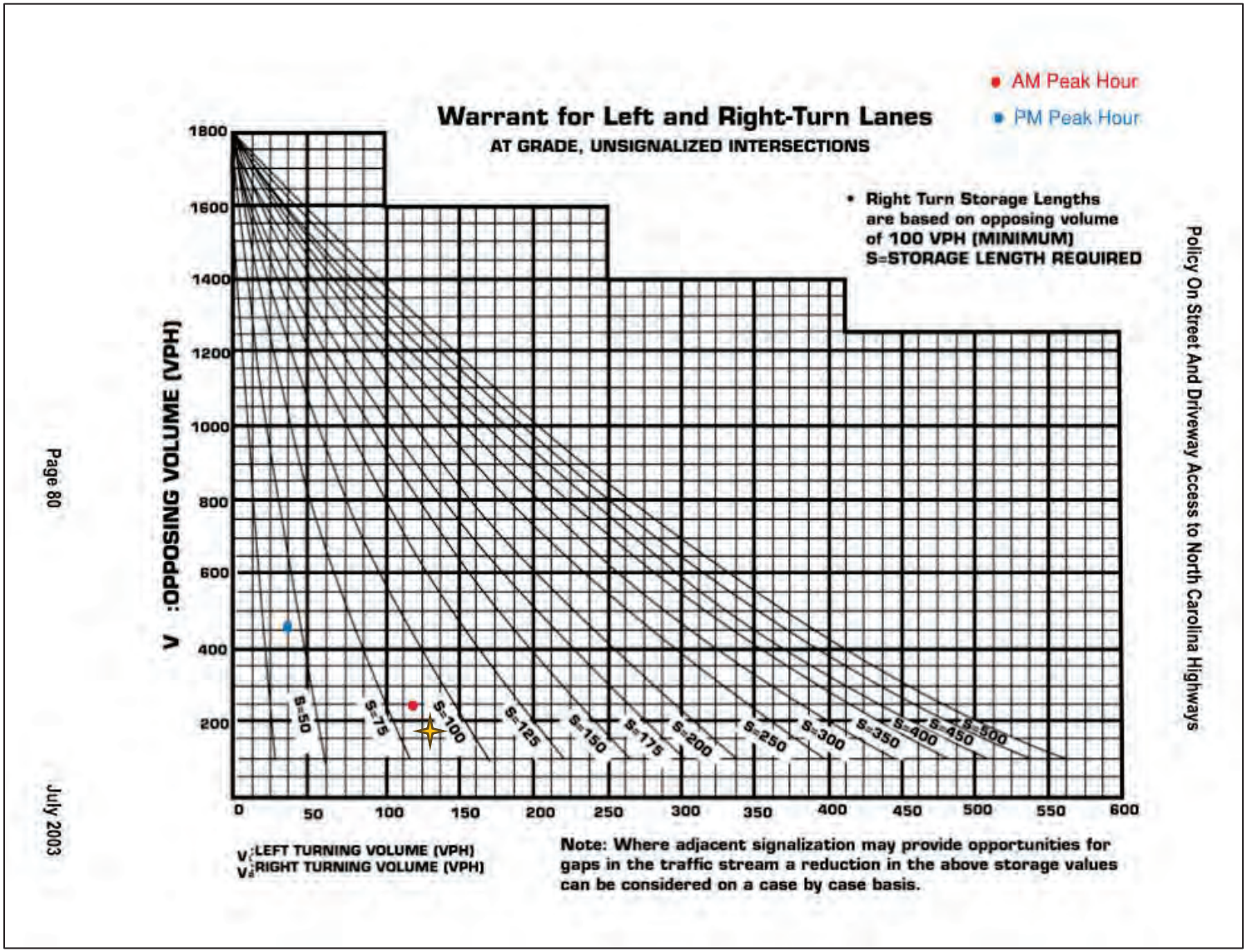


Figure 6: Turn Lane Warrant Analysis



Attachment A

Traffic Count

Prepared by National Data & Surveying Services

Sherrill Blvd & Star Construction Dwy/N/O Contemporary Women's Health Dwy

Peak Hour Turning Movement Count

ID: 23-190069-001
City: Knoxville

Day: Tuesday
Date: 12/19/2023

PEAK HOURS
AM: 07:30 AM - 08:30 AM
NOON: NONE
PM: 04:30 PM - 05:30 PM

COUNT PERIODS
AM: 7:00 AM - 09:00 AM
NOON: NONE
PM: 4:00 PM - 06:00 PM

Sherrill Blvd

SOUTHBOUND

AM	0	519	0	0	154	AM
NOON	0	0	0	0	0	NOON
PM	0	183	0	0	385	PM

0 2 0 0

EASTBOUND

AM	NOON	PM	
0	0	0	
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
AM	NOON	PM	

WESTBOUND

PM	NOON	AM	
1	0	0	0
0	0	0	1
0	0	0	0
0	0	0	0
1	0	0	
PM	NOON	AM	

CONTROL
No Control

TEV	673	0	569
	AM	NOON	PM
PHF	0.75		0.89

0 0 2 0

NORTHBOUND

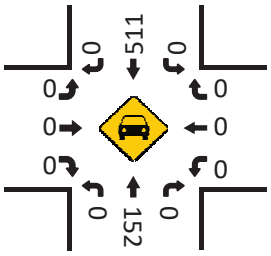
PM	183	0	0	384	1	PM
NOON	0	0	0	0	0	NOON
AM	519	0	0	154	0	AM

Sherrill Blvd

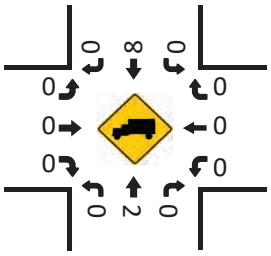
Star Construction Dwy/N/O Contemporary Women's Health Dwy

Star Construction Dwy/N/O Contemporary Women's Health Dwy

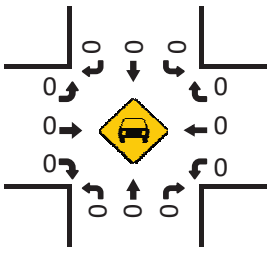
Cars (AM)



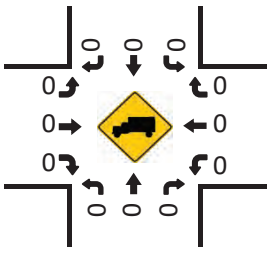
HT (AM)



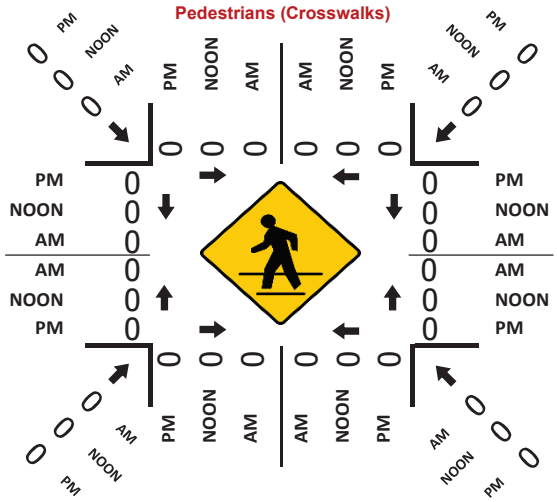
Cars (NOON)



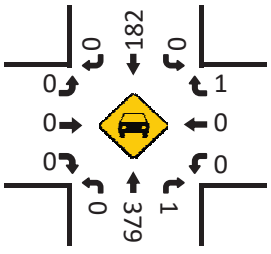
HT (NOON)



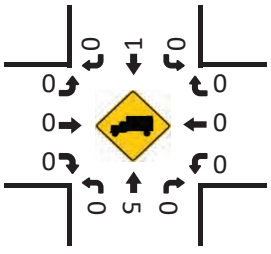
Pedestrians (Crosswalks)



Cars (PM)



HT (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Sherrill Blvd & Star Construction Dwy/N/O Contemporary Women's Health Dwy
City: Knoxville
Control: No Control

Project ID: 23-190069-001
Date: 12/19/2023

Data - Total

NS/EW Streets:	Sherrill Blvd				Sherrill Blvd				Star Construction Dwy/N/O Contemporary Women's Health Dwy				Star Construction Dwy/N/O Contemporary Women's Health Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	11	0	0	0	64	0	0	0	0	0	0	0	0	0	0	75
7:15 AM	0	23	0	0	0	82	0	0	0	0	0	0	0	0	0	0	105
7:30 AM	0	32	0	0	0	126	0	0	0	0	0	0	0	0	0	0	158
7:45 AM	0	50	0	0	0	175	0	0	0	0	0	0	0	0	0	0	225
8:00 AM	0	40	0	0	0	129	0	0	0	0	0	0	0	0	0	0	169
8:15 AM	0	32	0	0	0	89	0	0	0	0	0	0	0	0	0	0	121
8:30 AM	0	29	0	0	0	69	0	1	0	0	0	0	0	0	0	0	99
8:45 AM	0	40	0	0	0	67	0	0	0	0	0	0	0	0	0	0	107
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	257	0	0	0	801	0	1	0	0	0	0	0	0	0	0	1059
APPROACH %'s :	0.00%	100.00%	0.00%	0.00%	0.00%	99.88%	0.00%	0.12%									
PEAK HR :	**07:30 AM - 08:30 AM**																TOTAL
PEAK HR VOL :	0	154	0	0	0	519	0	0	0	0	0	0	0	0	0	0	673
PEAK HR FACTOR :	0.000	0.770	0.000	0.000	0.000	0.741	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.748
		0.770				0.741											

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	0	0	0	2	0	0	0	0	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	93	0	0	0	47	0	0	0	0	0	0	0	0	0	0	140
4:15 PM	0	58	0	0	0	43	0	0	0	0	0	0	0	0	0	0	101
4:30 PM	0	98	1	0	0	55	0	0	0	0	0	0	0	0	1	0	155
4:45 PM	0	103	0	0	0	37	0	0	0	0	0	0	0	0	0	0	140
5:00 PM	0	107	0	0	0	52	0	0	0	0	0	0	0	0	0	0	159
5:15 PM	0	76	0	0	0	39	0	0	0	0	0	0	0	0	0	0	115
5:30 PM	0	61	0	0	0	42	0	0	0	0	0	0	0	0	0	0	103
5:45 PM	0	34	0	0	0	24	0	0	0	0	0	0	0	0	0	0	58
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	630	1	0	0	339	0	0	0	0	0	0	0	0	1	0	971
APPROACH %'s :	0.00%	99.84%	0.16%	0.00%	0.00%	100.00%	0.00%	0.00%					0.00%	0.00%	100.00%	0.00%	
PEAK HR :	**04:30 PM - 05:30 PM**																TOTAL
PEAK HR VOL :	0	384	1	0	0	183	0	0	0	0	0	0	0	0	1	0	569
PEAK HR FACTOR :	0.000	0.897	0.250	0.000	0.000	0.832	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.250	0.000	0.895
		0.900				0.832									0.250		

Attachment B

ITE Trip Generation Report

Weekday Trip-12K SF Warehouse

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

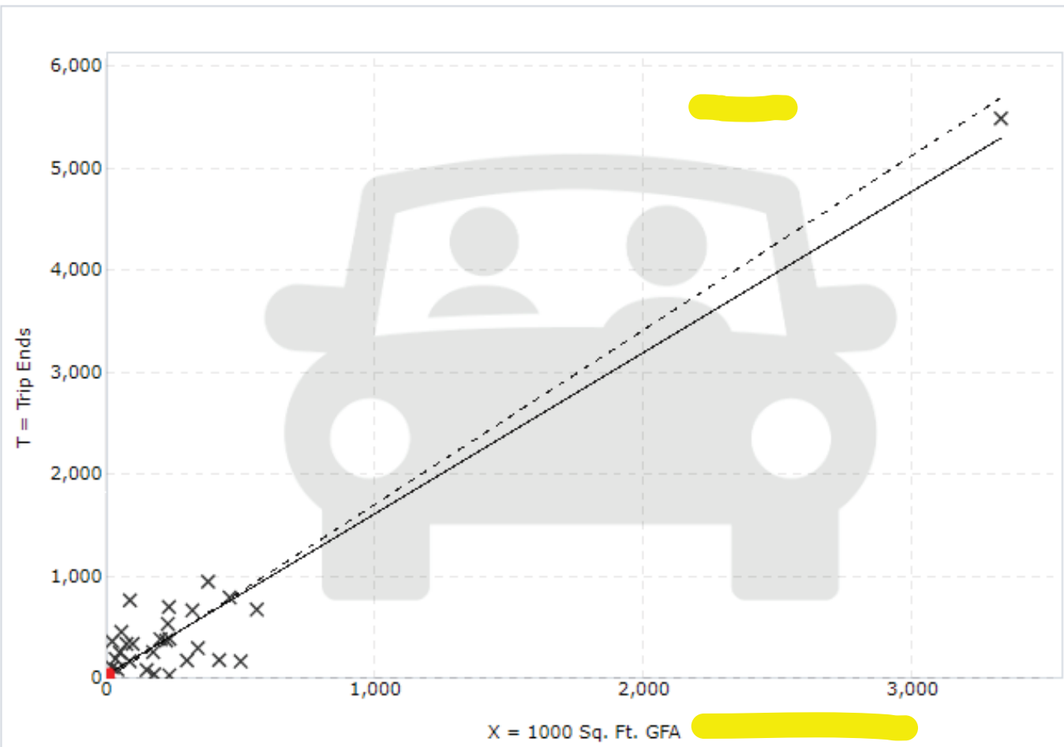
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
12 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

D
Land Use:
Warehousing (150
Plots
Independent Vari
1000 Sq. Ft. GFA
Time Period:
Weekday
Setting/Location:
General Urban/Su
Trip Type:
Vehicle
Number of Studie
31
Avg. 1000 Sq. Ft.
292
Average Rate:
1.71
Range of Rates:
0.15 - 16.93
Standard Deviati
1.48
Fitted Curve Equ
T = 1.58(X) + 38.2
R^2:
0.92
Directional Distri
50% entering, 50%
Calculated Trip E
Average Rate: 21
Fitted Curve: 57 (T

AM Peak Hour Trip-12K SF Warehouse

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

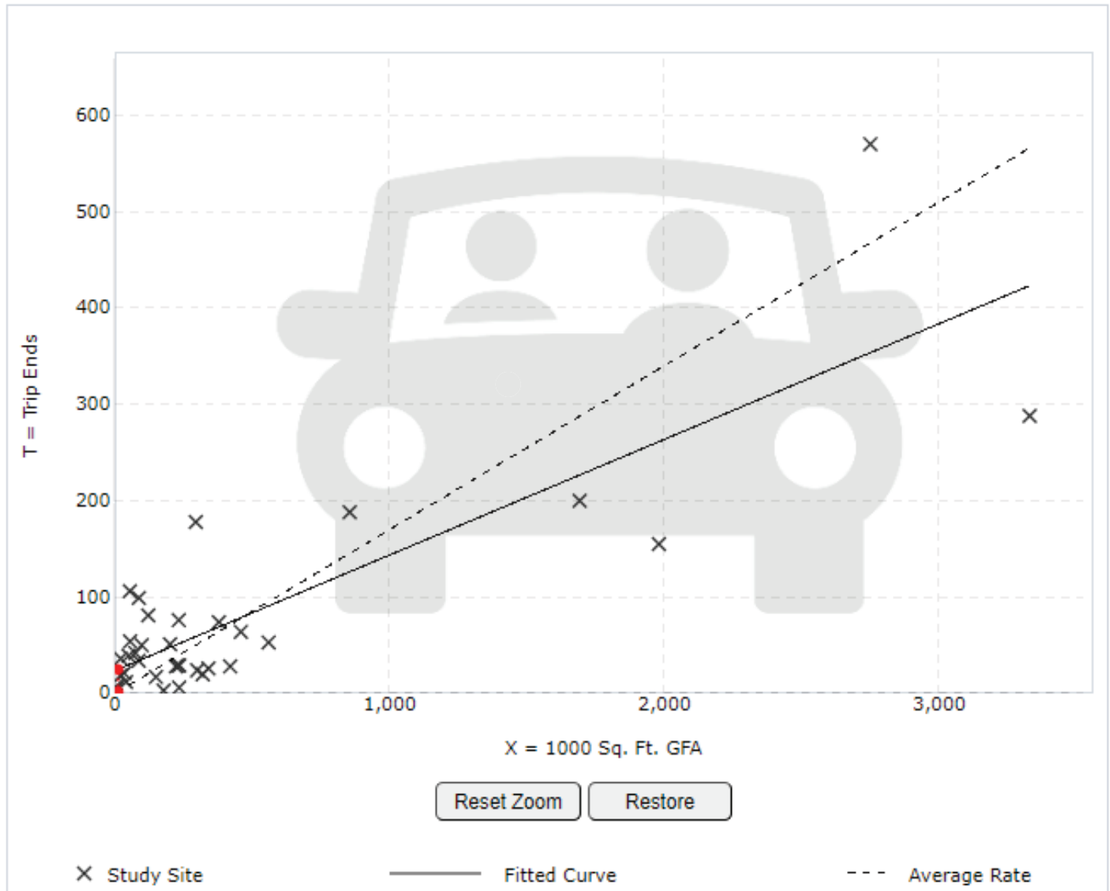
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
12 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) 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:
36

Avg. 1000 Sq. Ft. GFA:
448

Average Rate:
0.17

Range of Rates:
0.02 - 1.93

Standard Deviation:
0.19

Fitted Curve Equation:
T = 0.12(X) + 23.62

R^2:
0.69

Directional Distribution:
77% entering, 23% exiting

Calculated Trip Ends:
Average Rate: 2 (Total), 2 (Entry), 0 (Exit)
Fitted Curve: 25 (Total), 19 (Entry), 6 (Exit)

PM Peak Hour Trip-12K SF Warehouse

Query | Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 150

LAND USE GROUP: (100-199) Industrial

LAND USE : 150 - Warehousing

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

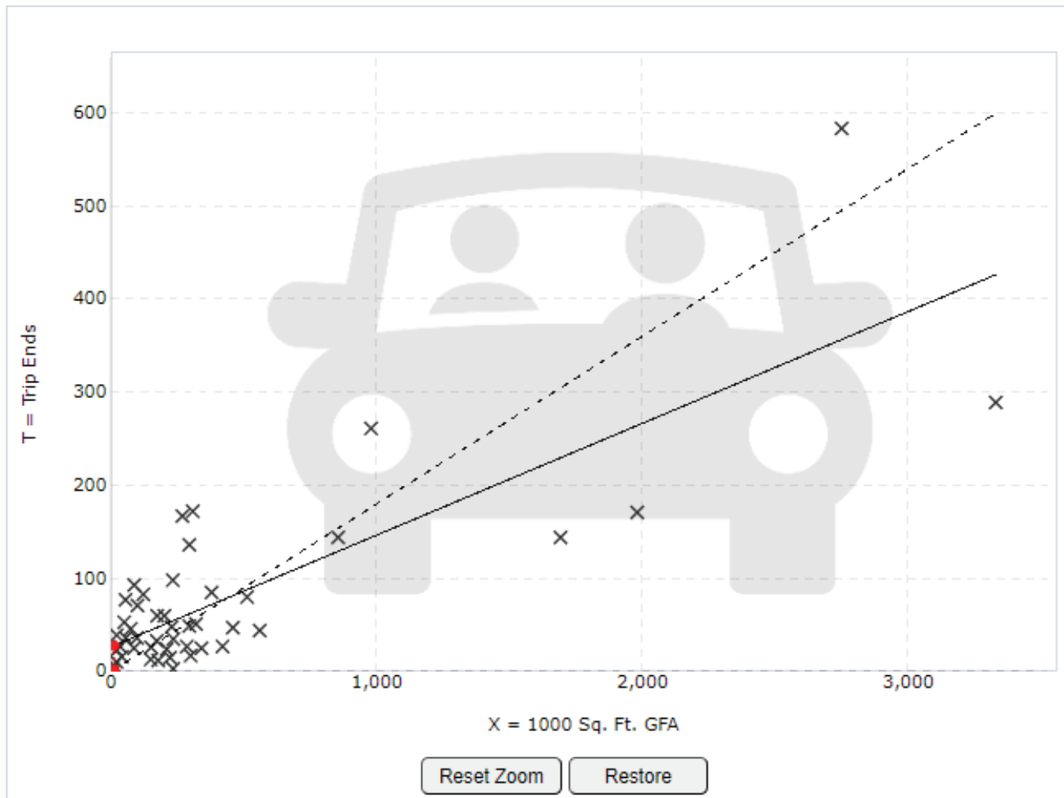
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 12 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) 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:
49

Avg. 1000 Sq. Ft. GFA:
400

Average Rate:
0.18

Range of Rates:
0.01 - 1.80

Standard Deviation:
0.18

Fitted Curve Equation:
T = 0.12(X) + 26.48

R^2:
0.65

Directional Distribution:
28% entering, 72% exiting

Calculated Trip Ends:
Average Rate: 2 (Total), 1 (Entry), 1 (Exit)
Fitted Curve: 28 (Total), 8 (Entry), 20 (Exit)

Weekday 14.4K SF Warehouse

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

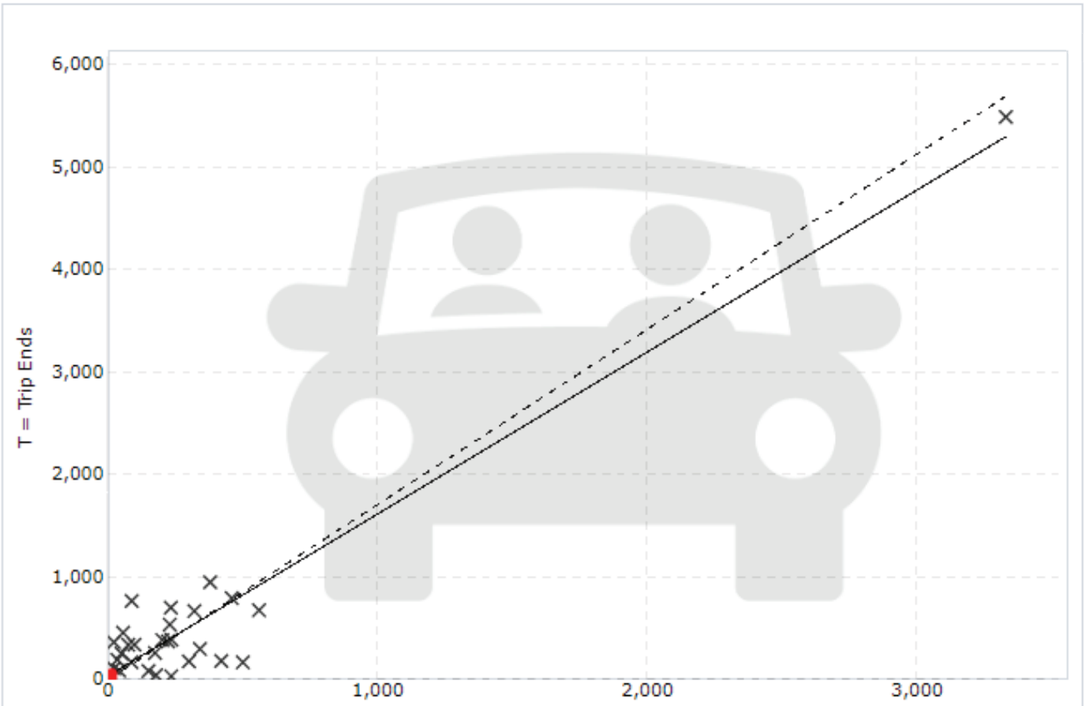
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
14.4 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
Warehousing (150) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
31

Avg. 1000 Sq. Ft. GFA:
292

Average Rate:
1.71

Range of Rates:
0.15 - 16.93

Standard Deviation:
1.48

Fitted Curve Equation:
T = 1.58(X) + 38.29

R^2:
0.92

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 25 (Total), 12 (Entry), 13 (Exit)
Fitted Curve: 61 (Total), 31 (Entry), 30 (Exit)

AM Peak Hour 14.4K SF Warehouse

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150
Trip Generation Manual, 11th Ed

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

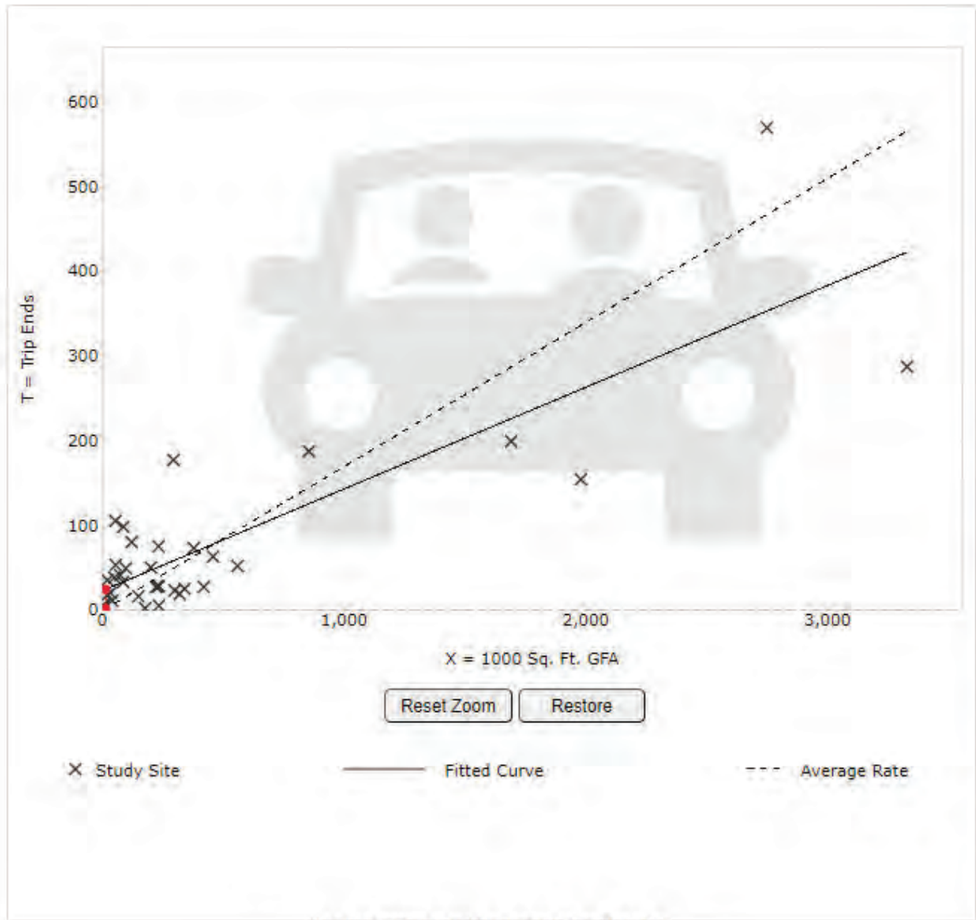
SETTING/LOCATION:
General Urban/Suburban

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:
14.4
Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

Warehousing (150) 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:
36

Avg. 1000 Sq. Ft. GFA:
448

Average Rate:
0.17

Range of Rates:
0.02 - 1.93

Standard Deviation:
0.19

Fitted Curve Equation:
T = 0.12(X) + 23.62

R^2:
0.69

Directional Distribution:
77% entering, 23% exiting

Calculated Trip Ends:
Average Rate: 2 (Total), 2 (Entry), 0 (Exit)
Fitted Curve: 25 (Total), 20 (Entry), 5 (Exit)

PM Peak Hour 14.4K SF Warehouse

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
150

LAND USE GROUP:
(100-199) Industrial

LAND USE :
150 - Warehousing

LAND USE SUBCATEGORY:
All Sites

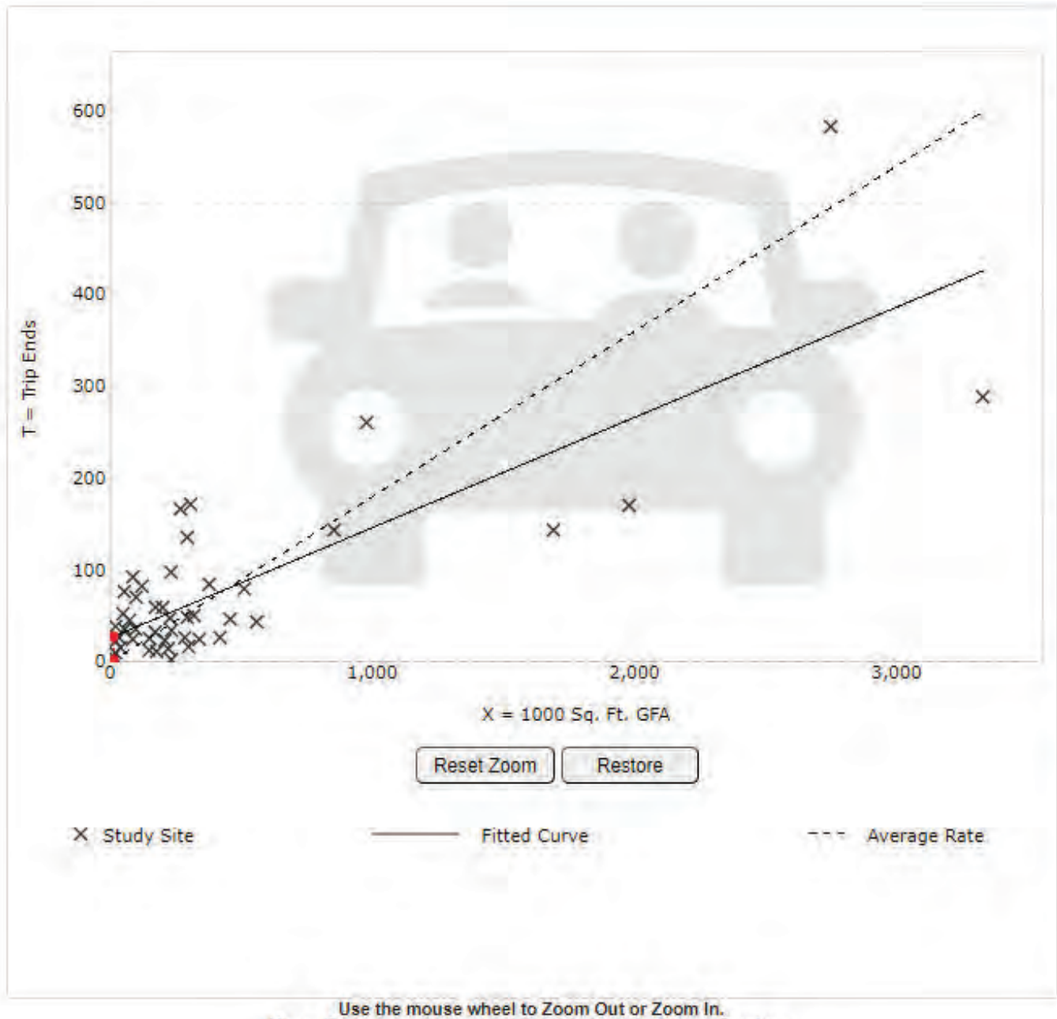
SETTING/LOCATION:
General Urban/Suburban

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:
14.4
Calculate



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

Land Use:
Warehousing (150) 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:
49

Avg. 1000 Sq. Ft. GFA:
400

Average Rate:
0.18

Range of Rates:
0.01 - 1.80

Standard Deviation:
0.18

Fitted Curve Equation:
T = 0.12(X) + 26.48

R^2:
0.65

Directional Distribution:
28% entering, 72% exiting

Calculated Trip Ends:
Average Rate: 3 (Total), 1 (Entry), 2 (Exit)
Fitted Curve: 28 (Total), 8 (Entry), 20 (Exit)

Weekday

Query | Plot

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE :
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

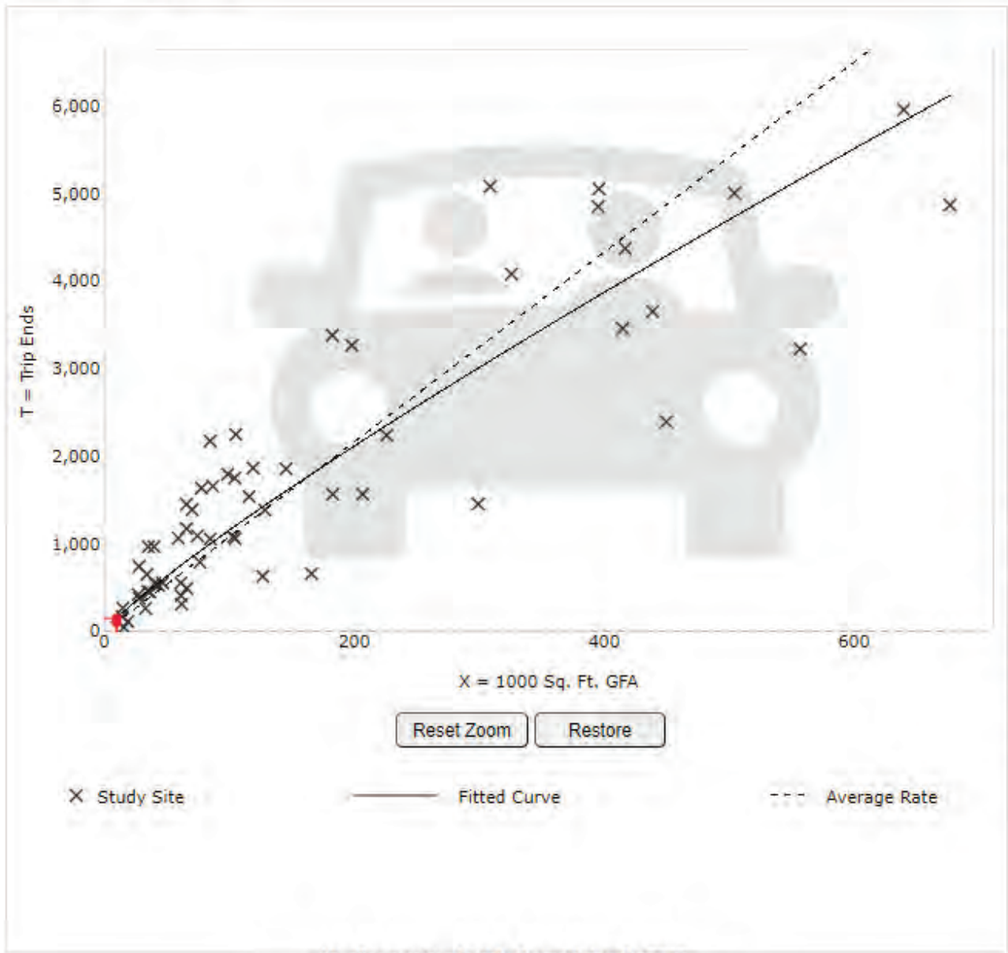
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
10 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Office Building (710) Click for Description and Data Plots

Independent Variable:
1000 Sq. Ft. GFA

Time Period:
Weekday

Setting/Location:
General Urban/Suburban

Trip Type:
Vehicle

Number of Studies:
59

Avg. 1000 Sq. Ft. GFA:
163

Average Rate:
10.84

Range of Rates:
3.27 - 27.56

Standard Deviation:
4.76

Fitted Curve Equation:
Ln(T) = 0.87 Ln(X) + 3.05

R^2:
0.78

Directional Distribution:
50% entering, 50% exiting

Calculated Trip Ends:
Average Rate: 108 (Total), 54 (Entry), 54 (Exit)
Fitted Curve: 157 (Total), 78 (Entry), 79 (Exit)

AM Peak Hour

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE :
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

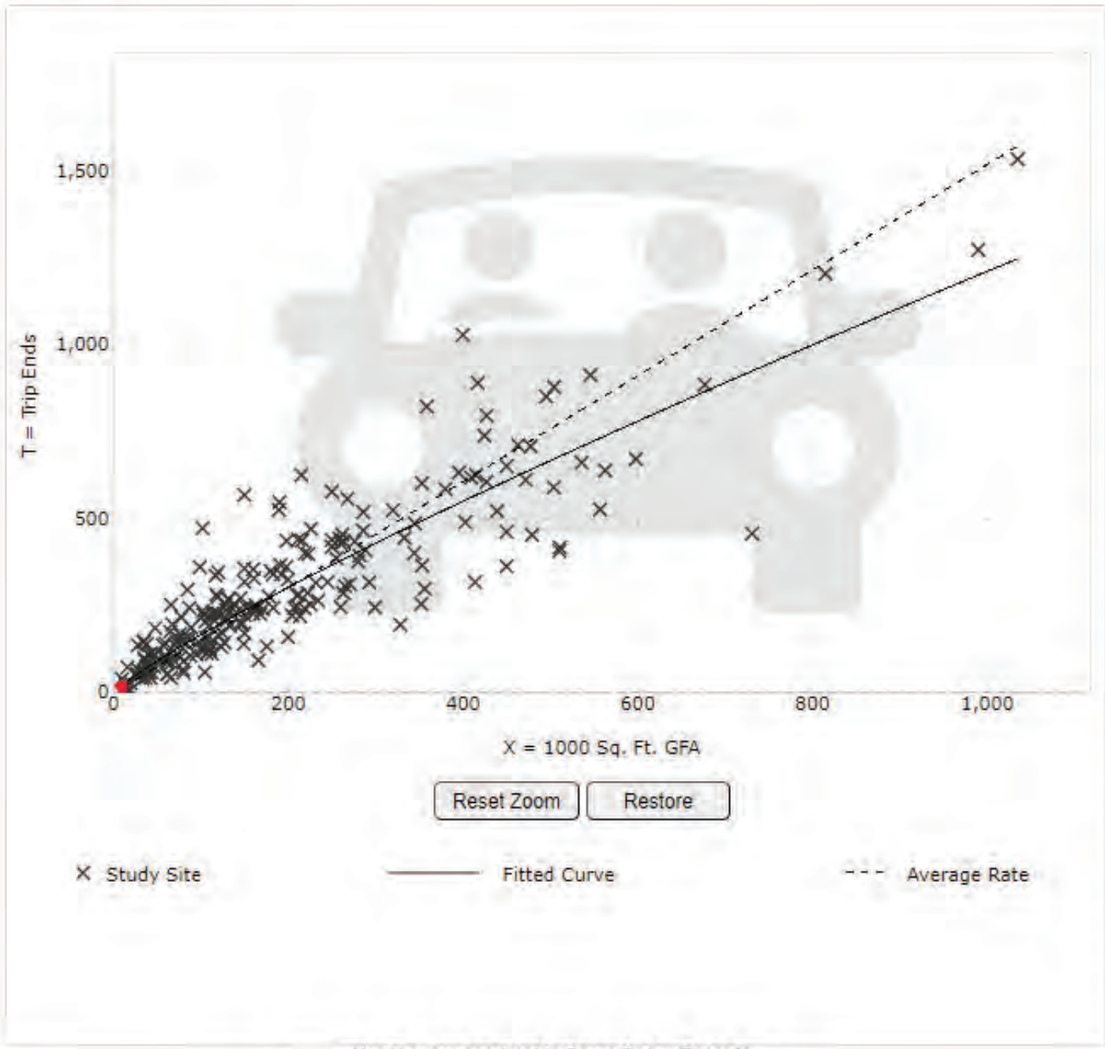
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
10 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Office Building (710) 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:
221

Avg. 1000 Sq. Ft. GFA:
201

Average Rate:
1.52

Range of Rates:
0.32 - 4.93

Standard Deviation:
0.58

Fitted Curve Equation:
Ln(T) = 0.86 Ln(X) + 1.16

R^2:
0.78

Directional Distribution:
88% entering, 12% exiting

Calculated Trip Ends:
Average Rate: 15 (Total), 13 (Entry), 2 (Exit)
Fitted Curve: 23 (Total), 20 (Entry), 3 (Exit)

PM Peak Hour

Query | Filter

DATA SOURCE:
Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:
710

LAND USE GROUP:
(700-799) Office

LAND USE :
710 - General Office Building

LAND USE SUBCATEGORY:
All Sites

SETTING/LOCATION:
General Urban/Suburban

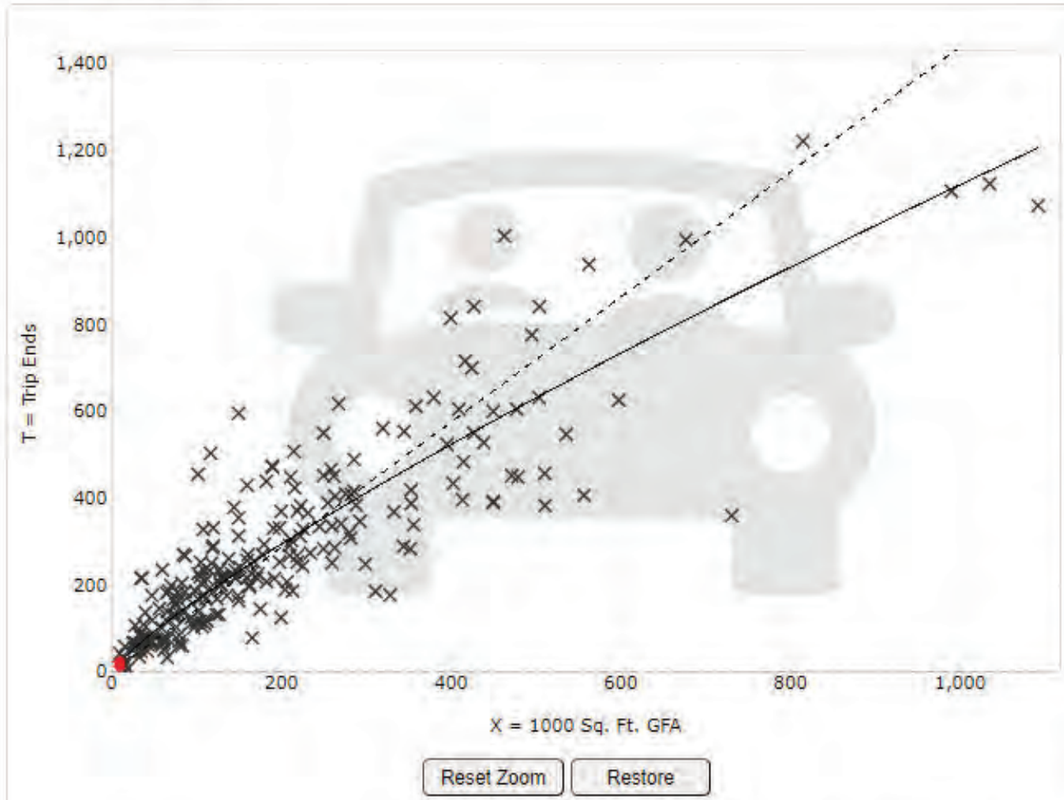
INDEPENDENT VARIABLE (IV):
1000 Sq. Ft. GFA

TIME PERIOD:
Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE:
Vehicle

ENTER IV VALUE TO CALCULATE TRIPS:
10 Calculate

Data Plot and Equation



Use the mouse wheel to Zoom Out or Zoom In.
Hover the mouse pointer on data points to view X and T values.

DATA STATISTICS

Land Use:
General Office Building (710) 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:
232

Avg. 1000 Sq. Ft. GFA:
199

Average Rate:
1.44

Range of Rates:
0.26 - 6.20

Standard Deviation:
0.60

Fitted Curve Equation:
Ln(T) = 0.83 Ln(X) + 1.29

R^2:
0.77

Directional Distribution:
17% entering, 83% exiting

Calculated Trip Ends:
Average Rate: 14 (Total), 2 (Entry), 12 (Exit)
Fitted Curve: 25 (Total), 4 (Entry), 21 (Exit)

Attachment C

Synchro Analysis Results

Intersection	
Int Delay, s/veh	1.9

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	9	28	177	45	134	596
Future Vol, veh/h	9	28	177	45	134	596
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	10	30	192	49	146	648

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	833	121	0	0	241	0
Stage 1	217	-	-	-	-	-
Stage 2	616	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	307	908	-	-	1323	-
Stage 1	798	-	-	-	-	-
Stage 2	501	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	254	908	-	-	1323	-
Mov Cap-2 Maneuver	254	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	415	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12	0	1.9
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	558	1323	-
HCM Lane V/C Ratio	-	-	0.072	0.11	-
HCM Control Delay (s)	-	-	12	8.1	0.5
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	0.2	0.4	-

Intersection	
Int Delay, s/veh	3.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	47	139	441	13	39	210
Future Vol, veh/h	47	139	441	13	39	210
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	51	151	479	14	42	228

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	684	247	0	0	493	0
Stage 1	486	-	-	-	-	-
Stage 2	198	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	382	753	-	-	1067	-
Stage 1	584	-	-	-	-	-
Stage 2	816	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	365	753	-	-	1067	-
Mov Cap-2 Maneuver	365	-	-	-	-	-
Stage 1	584	-	-	-	-	-
Stage 2	779	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	14.2	0	1.4
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	594	1067	-
HCM Lane V/C Ratio	-	-	0.34	0.04	-
HCM Control Delay (s)	-	-	14.2	8.5	0.1
HCM Lane LOS	-	-	B	A	A
HCM 95th %tile Q(veh)	-	-	1.5	0.1	-