

MEMORANDUM

TO: Mr. Dante Angelucci
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FROM: Mr. Jeffrey S. Dirk, P.E., PTOE, FITE
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DATE: February 17, 2022

RE: 9141

SUBJECT: Transportation Impact Assessment
3000 Minuteman Road – Building 3 Lab/cGMP Conversion
Andover, Massachusetts

Vanasse & Associates, Inc. (VAI) has conducted a Transportation Impact Assessment (TIA) in order to determine the potential impacts on the transportation infrastructure associated with the renovation of Building 3 within the former Philips Healthcare campus located at 3000 Minuteman Road in Andover, Massachusetts, to accommodate a laboratory/cGMP use (hereafter referred to as the “Project”). Specifically, this assessment provides a comparative evaluation of the traffic characteristics of the former use that occupied Building 3 (electronics manufacturing and associated office space) to those of the proposed laboratory/cGMP use.

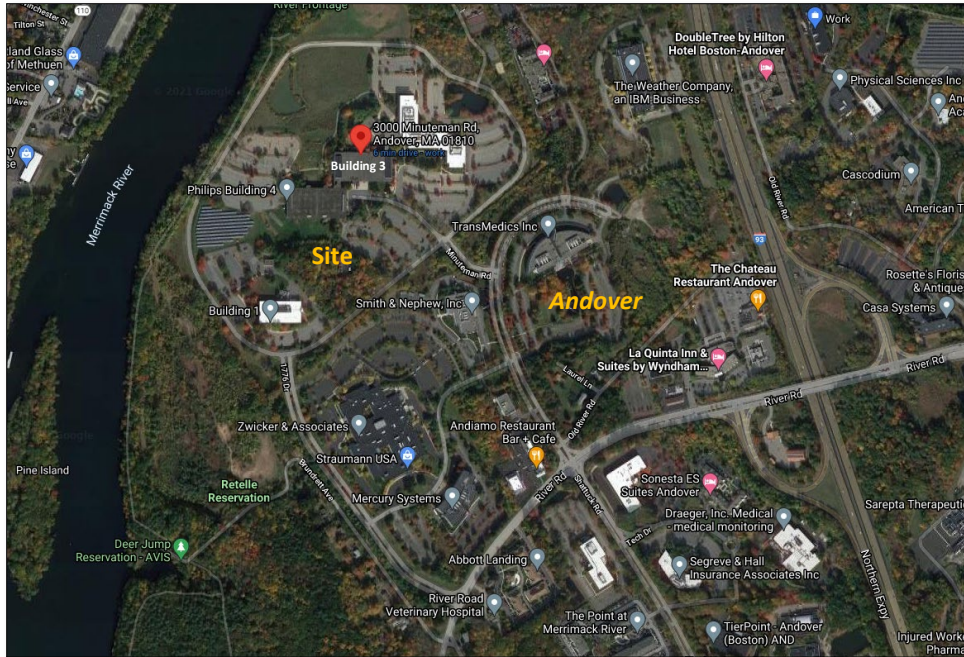
Based on this assessment it has been concluded that the renovation of Building 3 to accommodate a laboratory/cGMP use will not result in a material increase in traffic over the former use that occupied the building and, as such, will not result in additional impacts on the transportation infrastructure.

The following details our assessment of the renovation of Building 3.

PROJECT DESCRIPTION

The Project will entail the renovation of Building 3 as a part of the phased redevelopment of the former Phillip Healthcare campus that is located at 3000 Minuteman Road in Andover, Massachusetts. The campus currently contains four (4) buildings that encompass approximately 726,000± square foot (sf) of office/manufacturing space. The redevelopment plan will transform the former office/manufacturing campus into a life sciences campus consisting of a mix of laboratory, research and development, office, current Good Manufacturing Practice (cGMP) manufacturing and warehouse space, and will include an expansion of one (1) of the existing building (Building 1) and the addition of two (2) new buildings. When complete, the campus will contain approximately 1.126± million sf of space. The overall Project site is bounded by areas of open and wooded space and the Merrimack River to the north and west, and commercial properties to the south and east.





Imagery ©2021 Google

Building 3 encompasses 171,200± sf of space that was formerly used as office (42,800± sf) and associated electronics manufacturing space (128,400± sf). In conjunction with the Project, the interior of the building will be renovated to accommodate a similar amount of laboratory/office (42,800± sf) and associated cGMP space (128,400± sf).

Access to the overall Project site and Building 3 will continue to be provided by way of the existing driveways that serve the campus and connected to 1776 Drive and Minuteman Road, both of which provide access to River Road.

PROJECT-GENERATED TRAFFIC

In order to determine the traffic characteristics of the Project, trip-generation methodologies established by the Institute of Transportation Engineers (ITE)¹ were used. The ITE provides trip-generation information for various types of land uses developed as a result of scientific studies that have been conducted over the past 50 plus years, the most recent update of which was published in 2021. This data includes trip estimates for similar functional areas to those that formerly and will continue to occupy Building 3 at the completion of the proposed renovations (functionally classified as research and development (R&D) and manufacturing for trip-generation purposes). ITE Land Use Codes (LUCs) 140, *Manufacturing* and 760, *Research and Development Center*, were used to establish the traffic characteristics of the Project, the results of which are summarized in Table 1.

¹*Trip Generation*, 11th Edition; Institute of Transportation Engineers; Washington, DC; 2021.



**Table 1
BUILDING 3 TRIP GENERATION SUMMARY**

Time Period/Direction	Vehicle Trips		(A + B) Total trips
	(A) Proposed Research/Laboratory/ Office Space (42,800 sf) ^a	(B) Proposed Manufacturing/ Warehouse Space (cGMP) (128,400 sf) ^b	
<i>Average Weekday Daily:</i>			
Entering	332	343	675
<u>Exiting</u>	<u>332</u>	<u>343</u>	<u>675</u>
Total	664	686	1,350
<i>Weekday Morning Peak Hour:</i>			
Entering	51	67	118
<u>Exiting</u>	<u>12</u>	<u>21</u>	<u>33</u>
Total	63	88	151
<i>Weekday Evening Peak Hour:</i>			
Entering	10	29	39
<u>Exiting</u>	<u>51</u>	<u>65</u>	<u>116</u>
Total	61	94	155

^aBased on ITE LUC 760, *Research and Development Center*.

^bBased on ITE LUC 140, *Manufacturing*.

Project-Generated Traffic Volume Summary

As can be seen in Table 1, the former and proposed use of Building 3 was shown to generate approximately 1,350 vehicle trips on an average weekday (two-way, 24-hour volume, or 675 vehicles entering and 675 exiting), with approximately 151 vehicle trips (118 vehicles entering and 33 exiting) expected during the weekday morning peak-hour and 155 vehicle trips (39 vehicles entering and 116 exiting) expected during the weekday evening peak-hour.

SUMMARY

VAI has conducted a TIA in order to determine the potential impacts on the transportation infrastructure associated with the renovation of Building 3 within the former Philips Healthcare campus located at 3000 Minuteman Road in Andover, Massachusetts, to accommodate a laboratory/cGMP use. This assessment has provided a comparative evaluation of the traffic characteristics of the former use that occupied Building 3 (electronics manufacturing and associated office space) to those of the proposed laboratory/cGMP use. Based on this assessment it has been concluded that the renovation of Building 3 to accommodate a laboratory/cGMP use will not result in a material increase in traffic over the former use that occupied the building and, as such, will not result in additional impacts on the transportation infrastructure.

cc: File

Attachments: Trip-Generation Calculations





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[How to Use ITETripGen](#)

[TGM Desk Reference](#)

[TGM Applications](#)

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Query Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 760

LAND USE GROUP: (700-799) Office

LAND USE: 760 - Research and Development Center

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

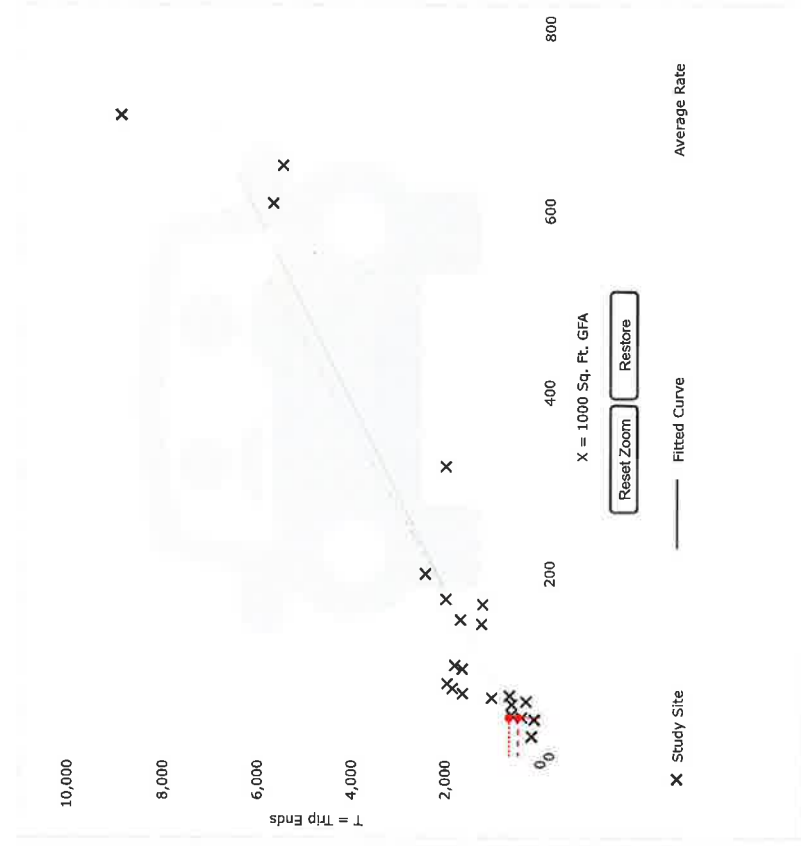
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 42.8

Data Plot and Equation



DATA STATISTICS

Land Use: Research and Development Center (760) [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: 22

Avg. 1000 Sq. Ft. GFA: 179

Average Rate: 11.08

Range of Rates: 3.48 - 24.95

Standard Deviation: 4.45

Fitted Curve Equation: $T = 9.70(X) + 247.71$

R²: 0.89

Directional Distribution: 50% entering, 50% exiting

Calculated Trip Ends: Average Rate: 474 (Total), 237 (Entry), 237 (Exit)
Fitted Curve: 663 (Total), 331 (Entry), 332 (Exit)

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

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Query Filter

DATA SOURCE:

Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE:

760

LAND USE GROUP:

(700-799) Office

LAND USE:

760 - Research and Development Center

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:

42.8

Calculate

Data Plot and Equation

Land Use:
Research and Development Center (760) [Click for Description and Data Plot](#)

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:
39

Avg. 1000 Sq. Ft. GFA:
173

Average Rate:
1.03

Range of Rates:
0.17 - 3.73

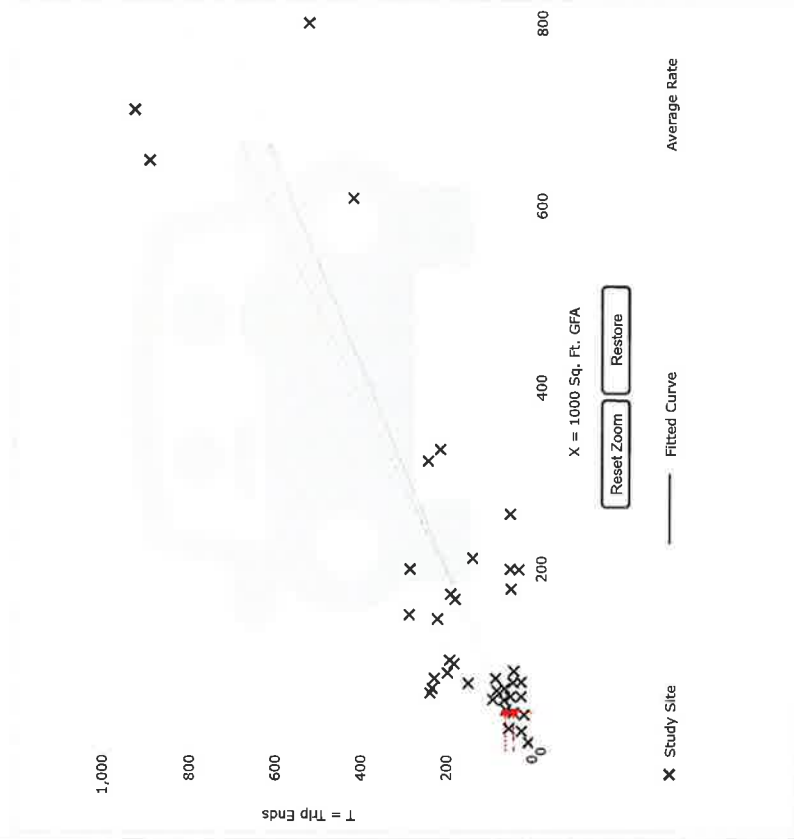
Standard Deviation:
0.65

Fitted Curve Equation:
 $T = 0.89(X) + 24.54$

R²:
0.70

Directional Distribution:
82% entering, 18% exiting

Calculated Trip Ends:
Average Rate: 44 (Total), 36 (Entry), 8 (Exit)
Fitted Curve: 63 (Total), 51 (Entry), 12 (Exit)



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

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TGM Approvals

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Query Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 760

LAND USE GROUP: (700-799) Office

LAND USE: 760 - Research and Development Center

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

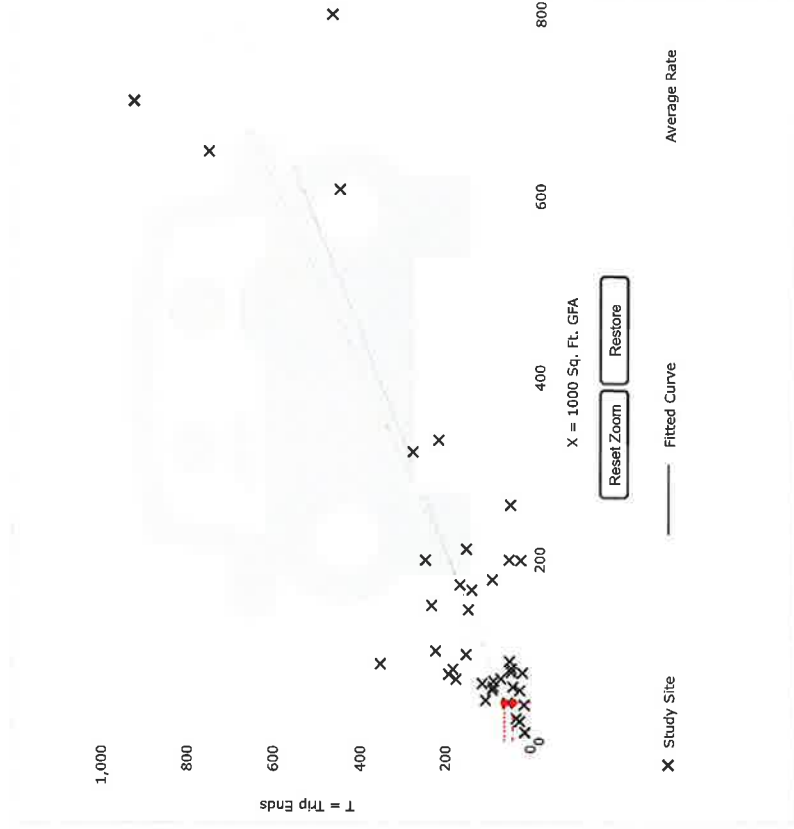
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 42.8

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.

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Graph Look Up

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TGM Data Reference

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Query Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 140

LAND USE GROUP: (100-199) Industrial

LAND USE : 140 - Manufacturing

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

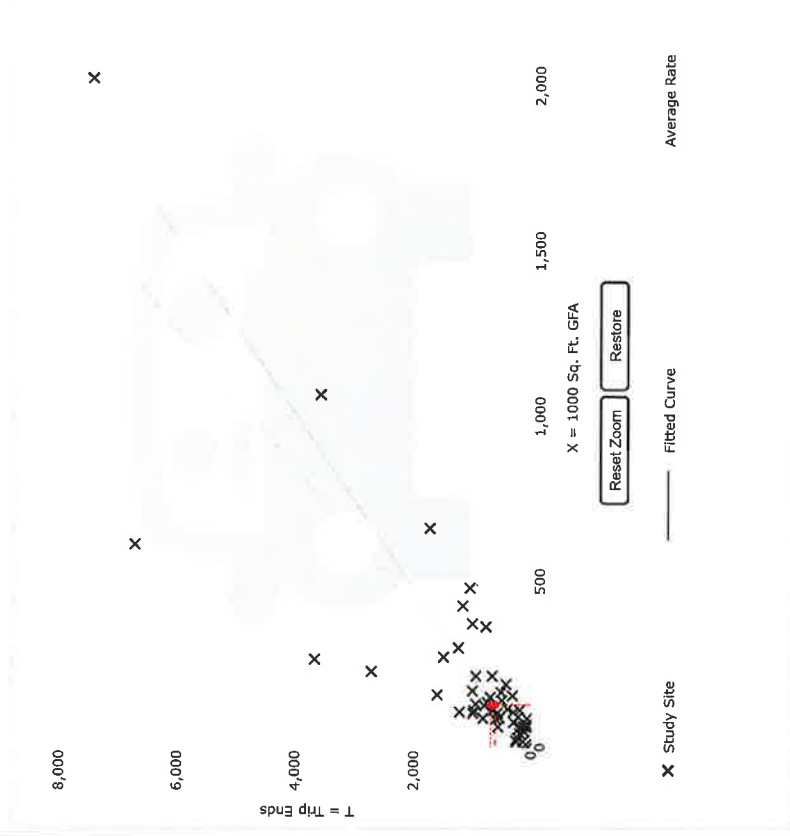
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 128.4

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.

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Query Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 140

LAND USE GROUP: (100-199) Industrial

LAND USE : 140 - Manufacturing

LAND USE SUBCATEGORY: All Sites

SETTING/LOCATION: General Urban/Suburban

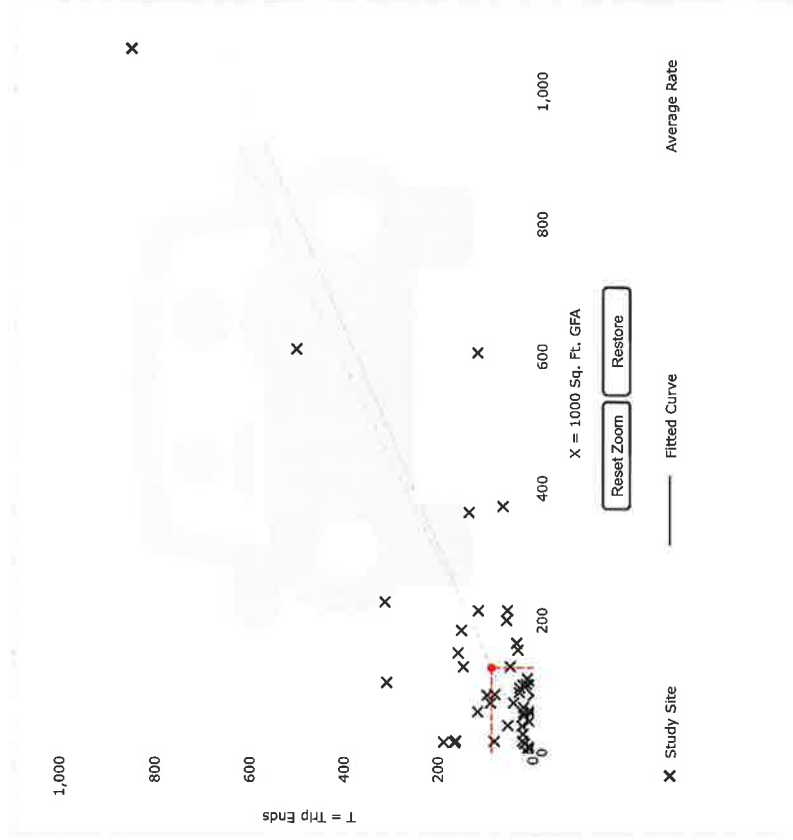
INDEPENDENT VARIABLE (IV): 1000 Sq. Ft. GFA

TIME PERIOD: Weekday, Peak Hour of Adjacent Street Traffic

TRIP TYPE: Vehicle

ENTER IV VALUE TO CALCULATE TRIPS: 128.4 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: Manufacturing (140) [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: 48

Avg. 1000 Sq. Ft. GFA: 138

Average Rate: 0.66

Range of Rates: 0.01 - 11.93

Standard Deviation: 1.03

Fitted Curve Equation: $T = 0.61(X) + 9.54$

R²: 0.62

Directional Distribution: 76% entering, 24% exiting

Calculated Trip Ends: Average Rate: 87 (Total), 66 (Entry), 21 (Exit)
Filled Curve: 89 (Total), 67 (Entry), 21 (Exit)

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Query Filter

DATA SOURCE: Trip Generation Manual, 11th Ed

SEARCH BY LAND USE CODE: 140

LAND USE GROUP: (100-199) Industrial

LAND USE: 140 - Manufacturing

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: 128.4

Data Plot and Equation

Land Use: Manufacturing (140) [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: 55

Avg. 1000 Sq. Ft. GFA: 142

Average Rate: 0.74

Range of Rates: 0.07 - 11.37

Standard Deviation: 0.93

Fitted Curve Equation: $T = 0.87(X) - 17.50$

R²: 0.64

Directional Distribution: 31% entering, 69% exiting

Calculated Trip Ends: Average Rate: 95 (Total), 29 (Entry), 66 (Exit)
Fitted Curve: 94 (Total), 29 (Entry), 65 (Exit)

