

MILLENNIUM ENGINEERING, INC.
Land Surveyors and Civil Engineers

October 28, 2024

Amesbury Planning Board
c/o Nipun Jain, Planning Director
39 South Hunt Road
Amesbury, MA. 01913

Re: Traffic Memo
Site Development Plans
80 Haverhill Road

Members of the Board,

On behalf of the applicant, 80 Haverhill Road LLC, Millennium Engineering, Inc. hereby submits this traffic memo for the proposed multi-family development at 80 Haverhill Road Amesbury, MA. The project consists of one, 8-unit, multi-family dwelling with access via Haverhill Road.

This previous use of the property was a 4-unit multifamily dwelling.

Existing Trip Generation

The trip generation rates and fitted-curve equations used for the proposed Project were taken from the Trip Generation Manual, 11th Edition published by the Institute of Transportation Engineers (ITE) in 2021. LUC 220 –Multi-family (Low-Rise) was used with a total of 4 Residential Units for the existing use. The Table below shows the estimated base site-generated trips for the existing uses on the subject site.

Land Use Code: 220	Multifamily Housing (low-Rise)				
	Weekday AM Peak Hour	Weekday PM Peak Hour	Weekday Daily	Saturday Entire Day	Sunday Entire Day
Size (Per # of Dwelling Units)	4	4	4	4	4
Average Rate	0.47	0.57	6.74	4.55	3.86
Total Trips (T)	2	2	27	18	16
Entering %	24%	62%	50%	50%	50%
Exiting %	76%	38%	50%	50%	50%
Entering Trips	.48	1.24	13.5	9	8
Exiting Trips	1.52	0.76	13.5	9	8

As shown in the table, the existing multi-family/motel use is expected to generate 2 trips during the Weekday AM peak hour, 2 trips during the Weekday PM peak hour, and 27 trips during a typical weekday, 18 trips during a typical Saturday, and 16 trips during a typical Sunday.



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Proposed Trip Generation

The trip generation rates and fitted-curve equations used for the proposed Project were taken from the Trip Generation Manual, 11th Edition published by the Institute of Transportation Engineers (ITE) in 2021. LUC 220 –Multi-family (Low-Rise) was used with a total of 8 Residential Units for the proposed use. The Table below shows the estimated base site-generated trips for the proposed use on the subject site.

Land Use Code: 220		Multifamily Housing (low-Rise)			
	Weekday AM Peak Hour	Weekday PM Peak Hour	Weekday Daily	Saturday Entire Day	Sunday Entire Day
Size (Per # of Dwelling Units)	8	8	8	8	8
Average Rate	0.47	0.57	6.74	4.55	3.86
Total Trips (T)	4	4	54	36	30
Entering %	24%	62%	50%	50%	50%
Exiting %	76%	38%	50%	50%	50%
Entering Trips	1	2.5	27	18	15
Exiting Trips	3	1.5	27	18	15

As shown in the table, the proposed multi-family housing use is expected to generate 4 trips during the Weekday AM peak hour, 4 trips during the Weekday PM peak hour, and 54 trips during a typical weekday, 36 trips during a typical Saturday, and 30 trips during a typical Sunday.

Conclusion

As noted in the traffic generation comparison, there is a slight increase in trips during the AM and PM peak hours (2 additional trips). The increase of 27 daily trips is de minimus and will have no impact on the traffic flow in Haverhill Road. Additionally, ample parking space is provided for residents.

We trust this response letter provides the necessary information for the Board's review. If you have any questions or comments, please feel free to contact our office at your convenience.

Sincerely,

Millennium Engineering, Inc.

Sam Colombo, E.I.T.
Project Manager

Land Use: 220

Multifamily Housing (Low-Rise)

Description

Low-rise multifamily housing includes apartments, townhouses, and condominiums located within the same building with at least three other dwelling units and that have two or three floors (levels). Various configurations fit this description, including walkup apartment, mansion apartment, and stacked townhouse.

- A walkup apartment typically is two or three floors in height with dwelling units that are accessed by a single or multiple entrances with stairways and hallways.
- A mansion apartment is a single structure that contains several apartments within what appears to be a single-family dwelling unit.
- A fourplex is a single two-story structure with two matching dwelling units on the ground and second floors. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.
- A stacked townhouse is designed to match the external appearance of a townhouse. But, unlike a townhouse dwelling unit that only shares walls with an adjoining unit, the stacked townhouse units share both floors and walls. Access to the individual units is typically internal to the structure and provided through a central entry and stairway.

Multifamily housing (mid-rise) (Land Use 221), multifamily housing (high-rise) (Land Use 222), affordable housing (Land Use 223), and off-campus student apartment (low-rise) (Land Use 225) are related land uses.

Land Use Subcategory

Data are presented for two subcategories for this land use: (1) not close to rail transit and (2) close to rail transit. A site is considered close to rail transit if the walking distance between the residential site entrance and the closest rail transit station entrance is ½ mile or less.

Additional Data

For the three sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.72 residents per occupied dwelling unit.

For the two sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96.2 percent of the total dwelling units were occupied.

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip

generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

For the three sites for which data were provided for both occupied dwelling units and residents, there was an average of 2.72 residents per occupied dwelling unit.

It is expected that the number of bedrooms and number of residents are likely correlated to the trips generated by a residential site. To assist in future analysis, trip generation studies of all multifamily housing should attempt to obtain information on occupancy rate and on the mix of residential unit sizes (i.e., number of units by number of bedrooms at the site complex).

The sites were surveyed in the 1980s, the 1990s, the 2000s, the 2010s, and the 2020s in British Columbia (CAN), California, Delaware, Florida, Georgia, Illinois, Indiana, Maine, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, and Washington.

Source Numbers

188, 204, 237, 300, 305, 306, 320, 321, 357, 390, 412, 525, 530, 579, 583, 638, 864, 866, 896, 901, 903, 904, 936, 939, 944, 946, 947, 948, 963, 964, 966, 967, 1012, 1013, 1014, 1036, 1047, 1056, 1071, 1076

Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 22

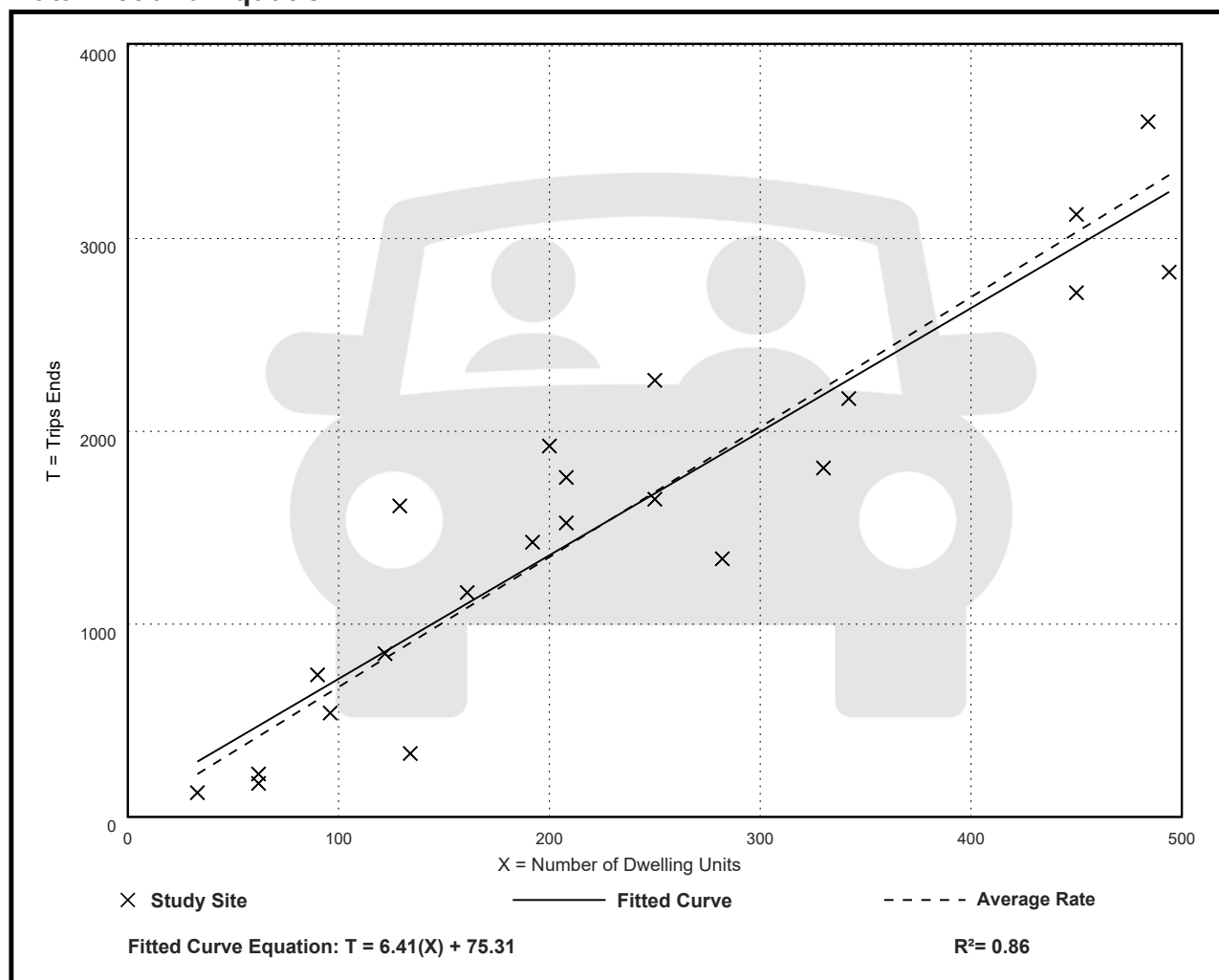
Avg. Num. of Dwelling Units: 229

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
6.74	2.46 - 12.50	1.79

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 49

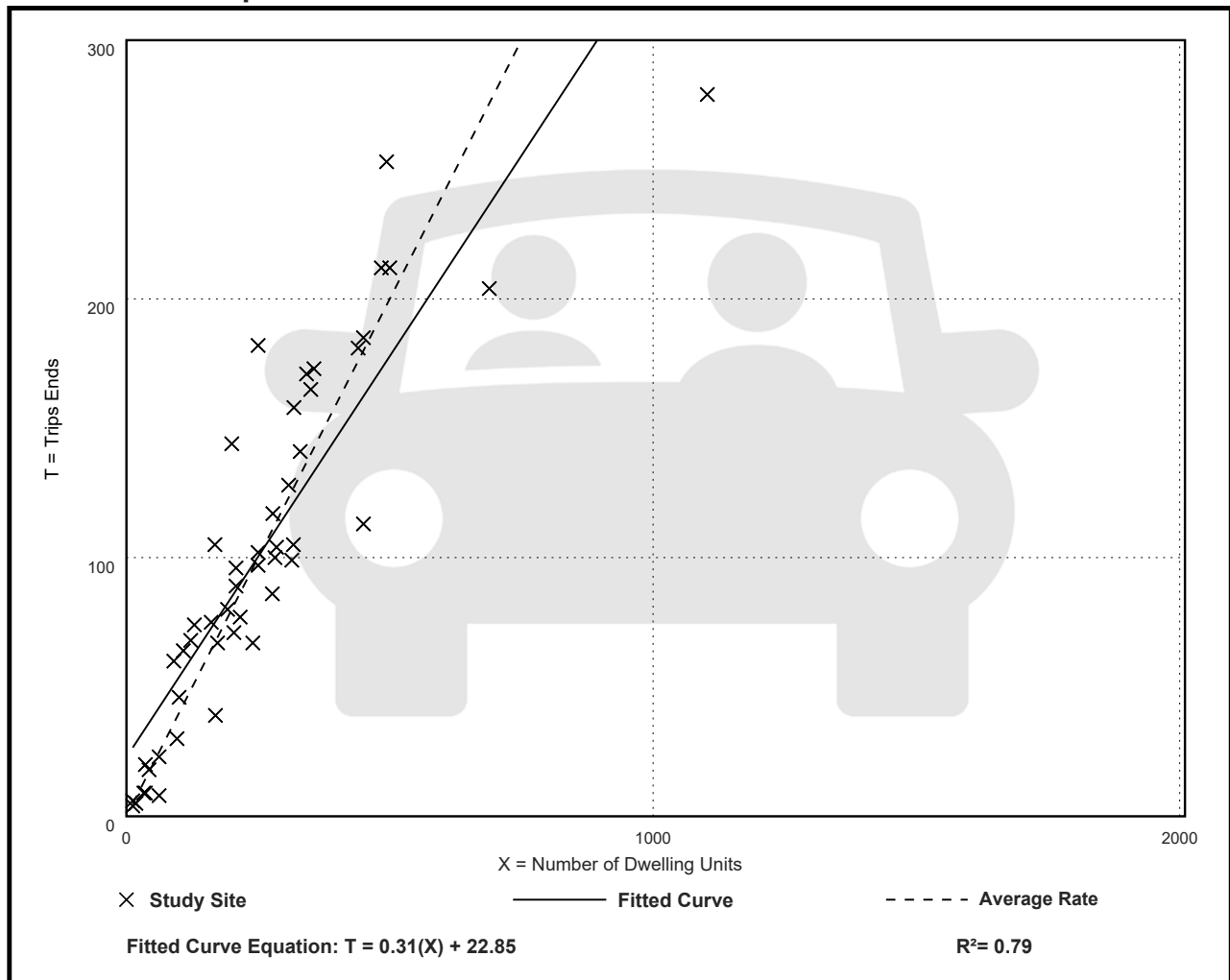
Avg. Num. of Dwelling Units: 249

Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.40	0.13 - 0.73	0.12

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 59

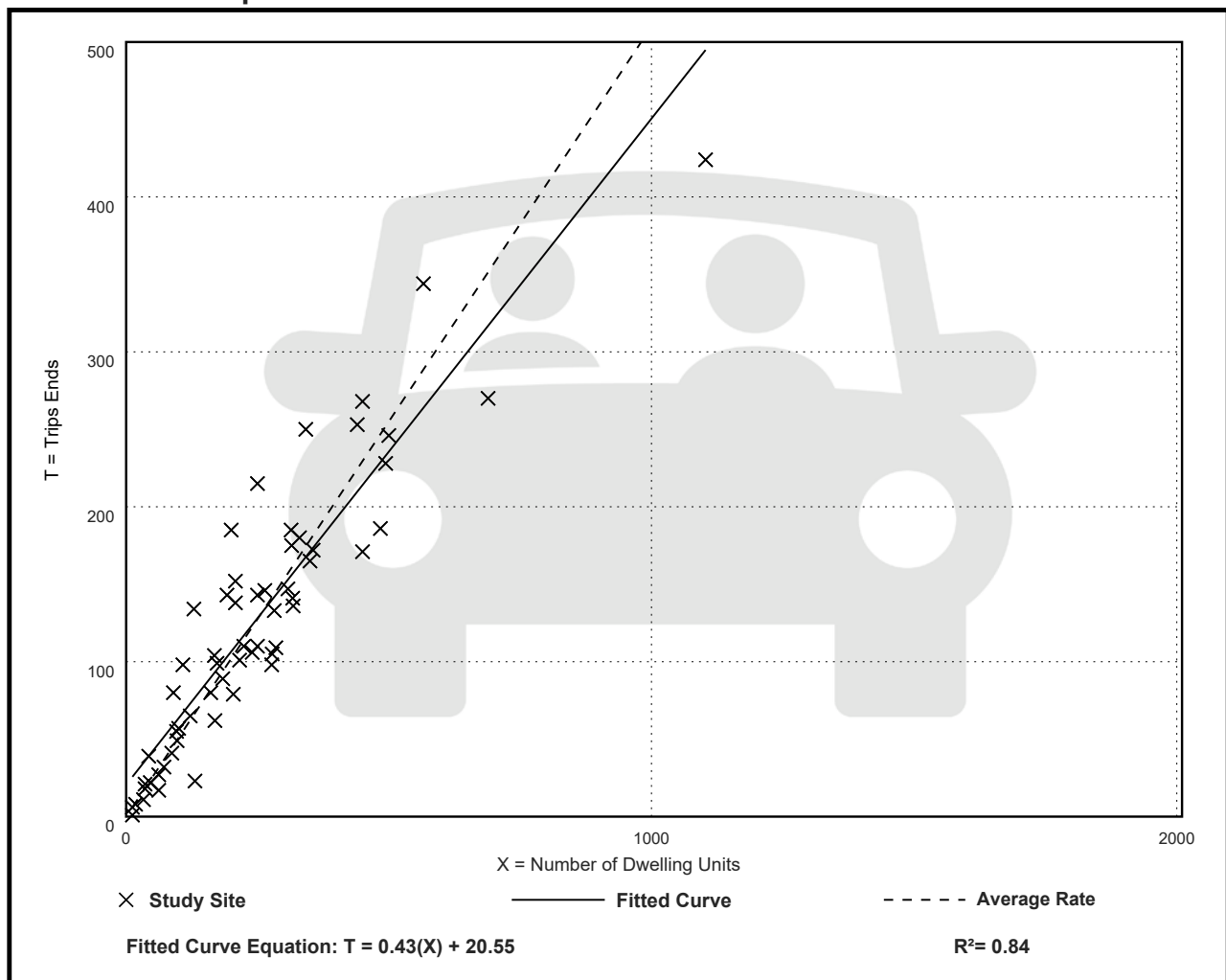
Avg. Num. of Dwelling Units: 241

Directional Distribution: 63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.51	0.08 - 1.04	0.15

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 40

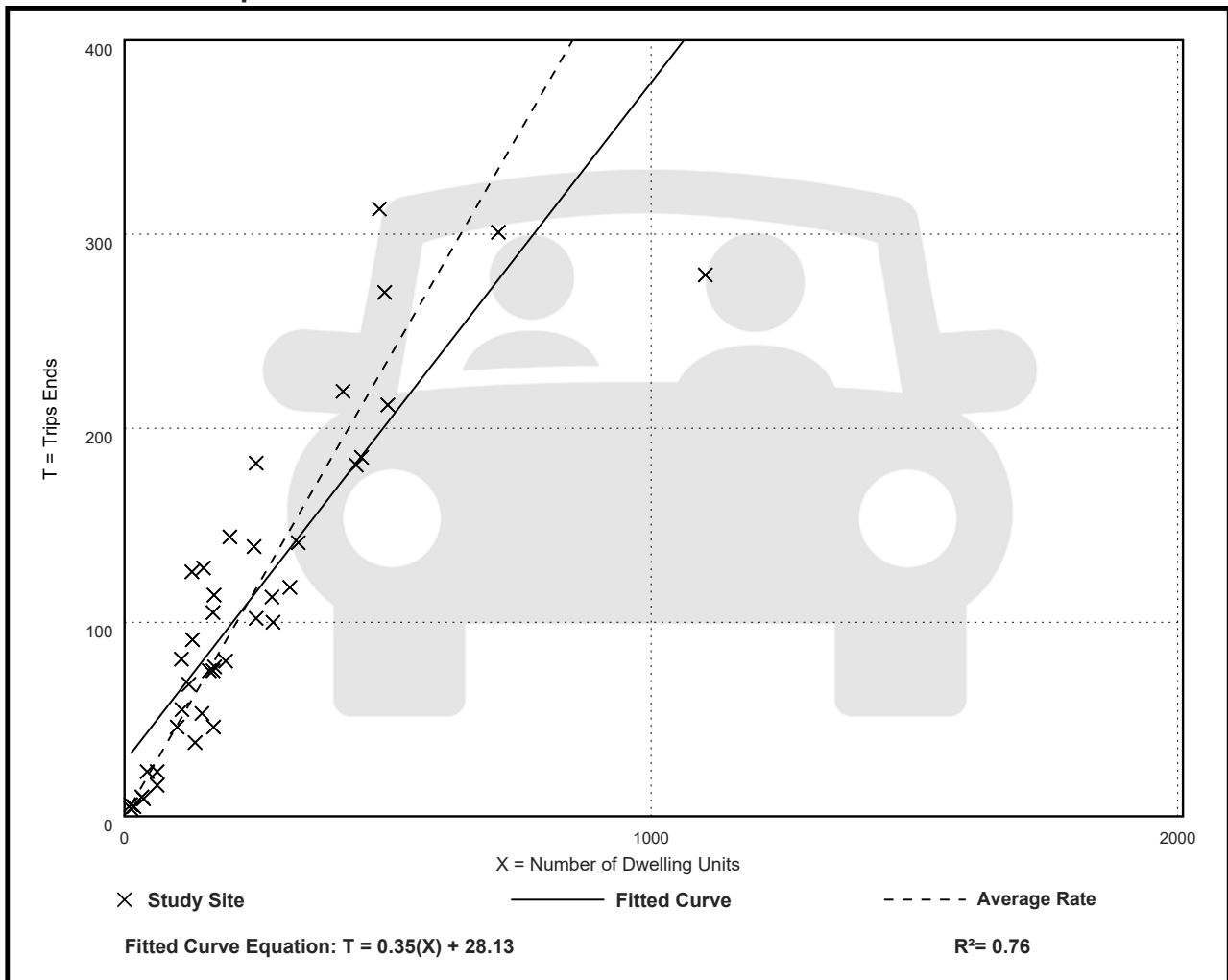
Avg. Num. of Dwelling Units: 234

Directional Distribution: 24% entering, 76% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.47	0.25 - 0.98	0.16

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 38

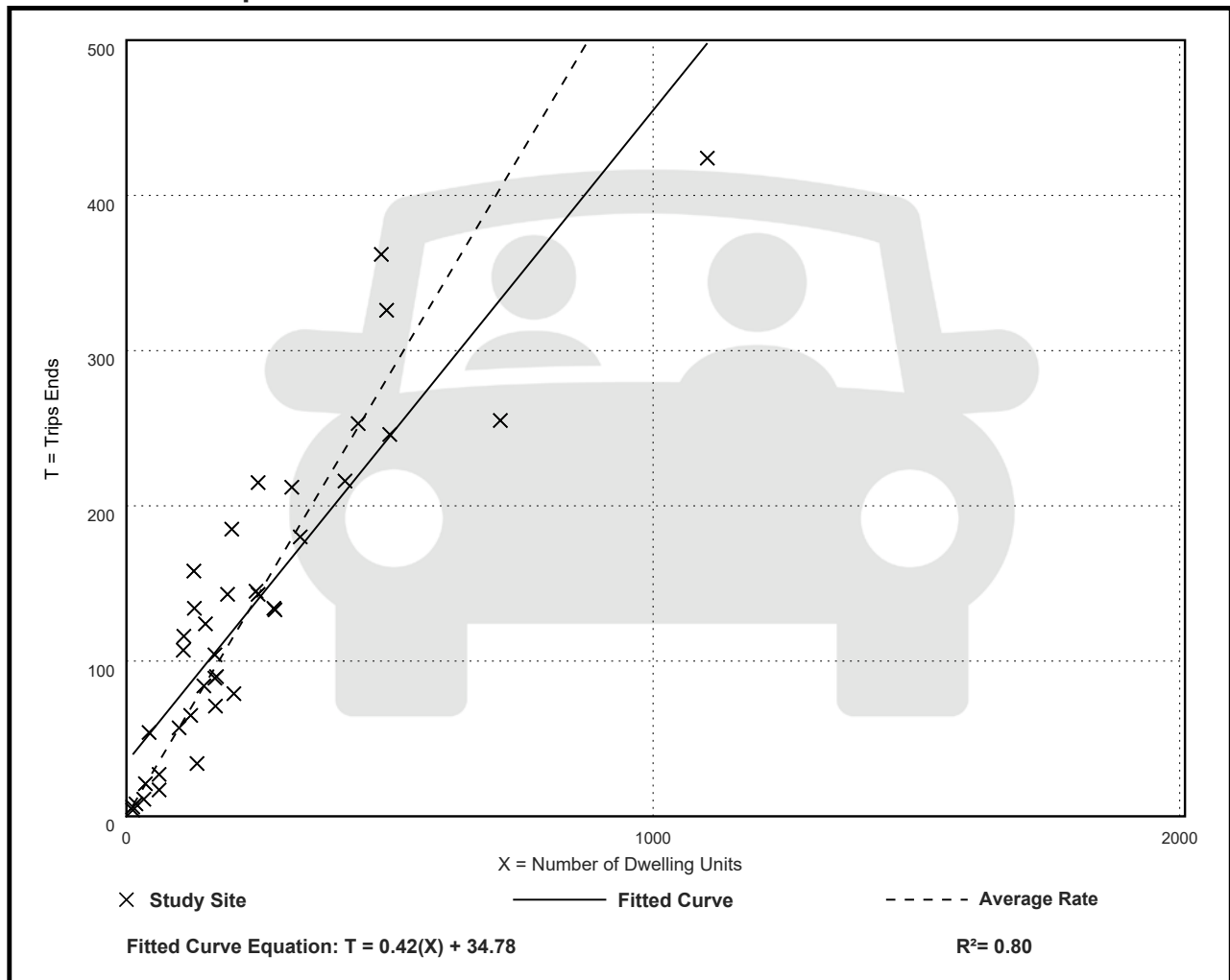
Avg. Num. of Dwelling Units: 231

Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.25 - 1.26	0.20

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Saturday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 282

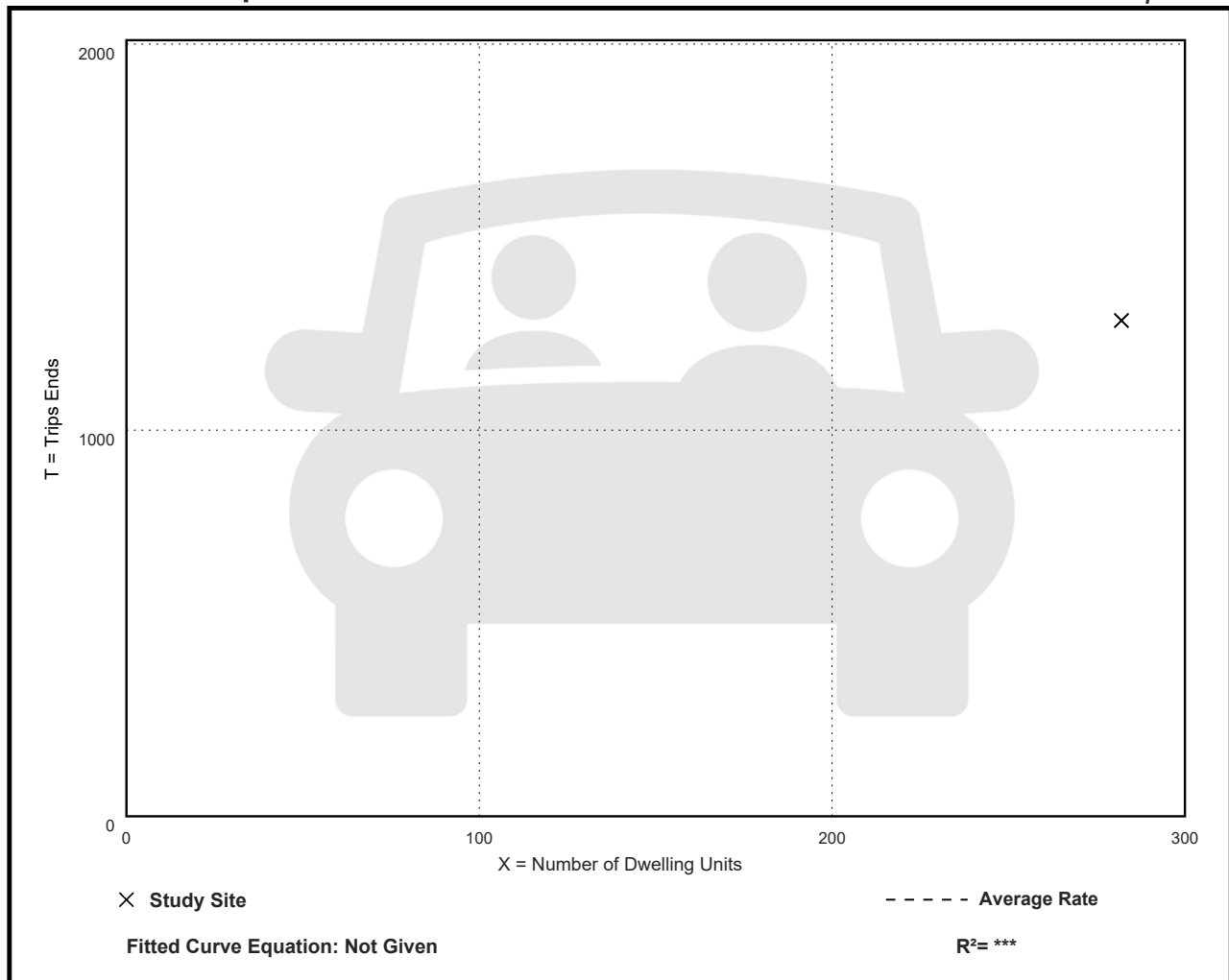
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.55	4.55 - 4.55	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 282

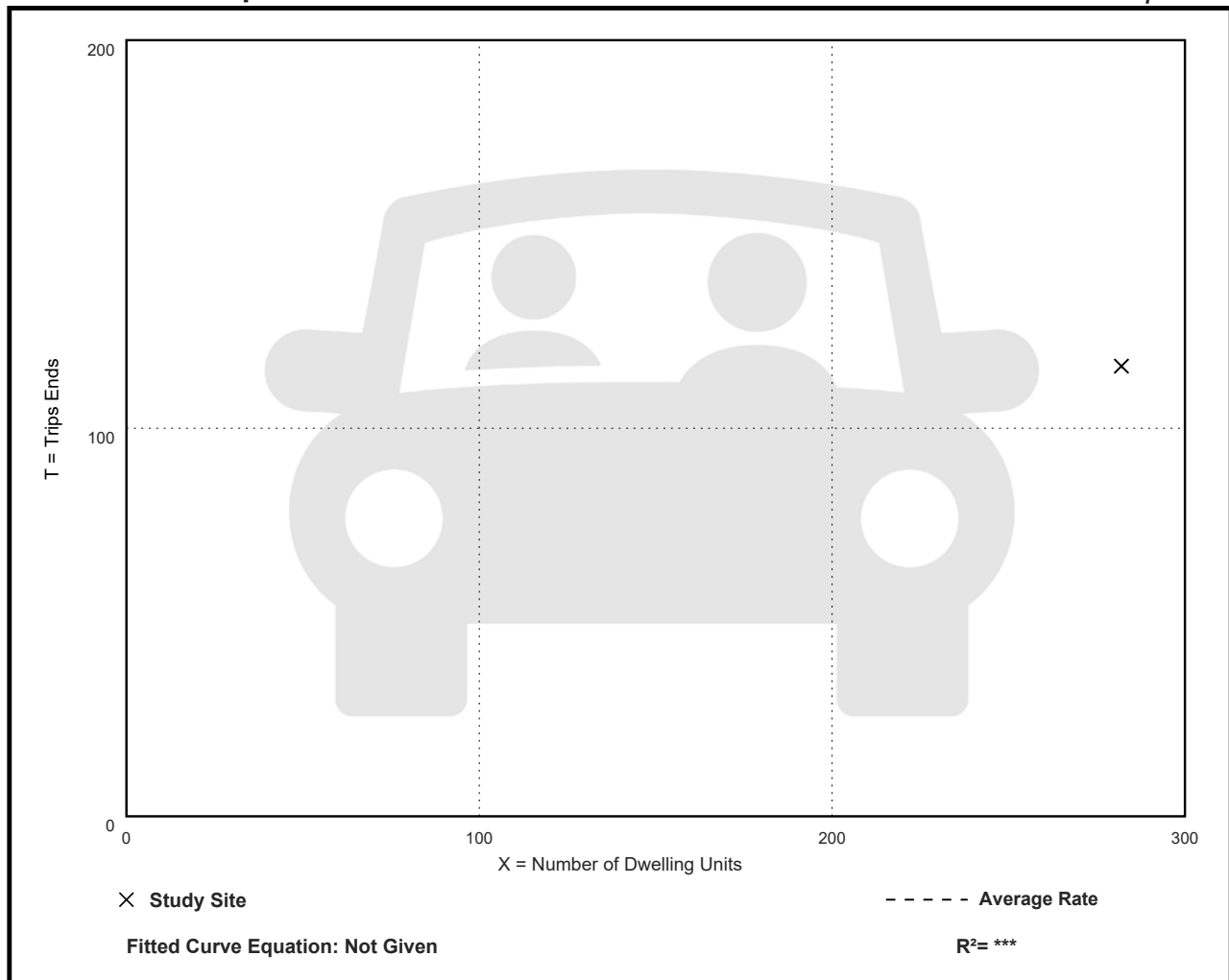
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.41	0.41 - 0.41	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Sunday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 282

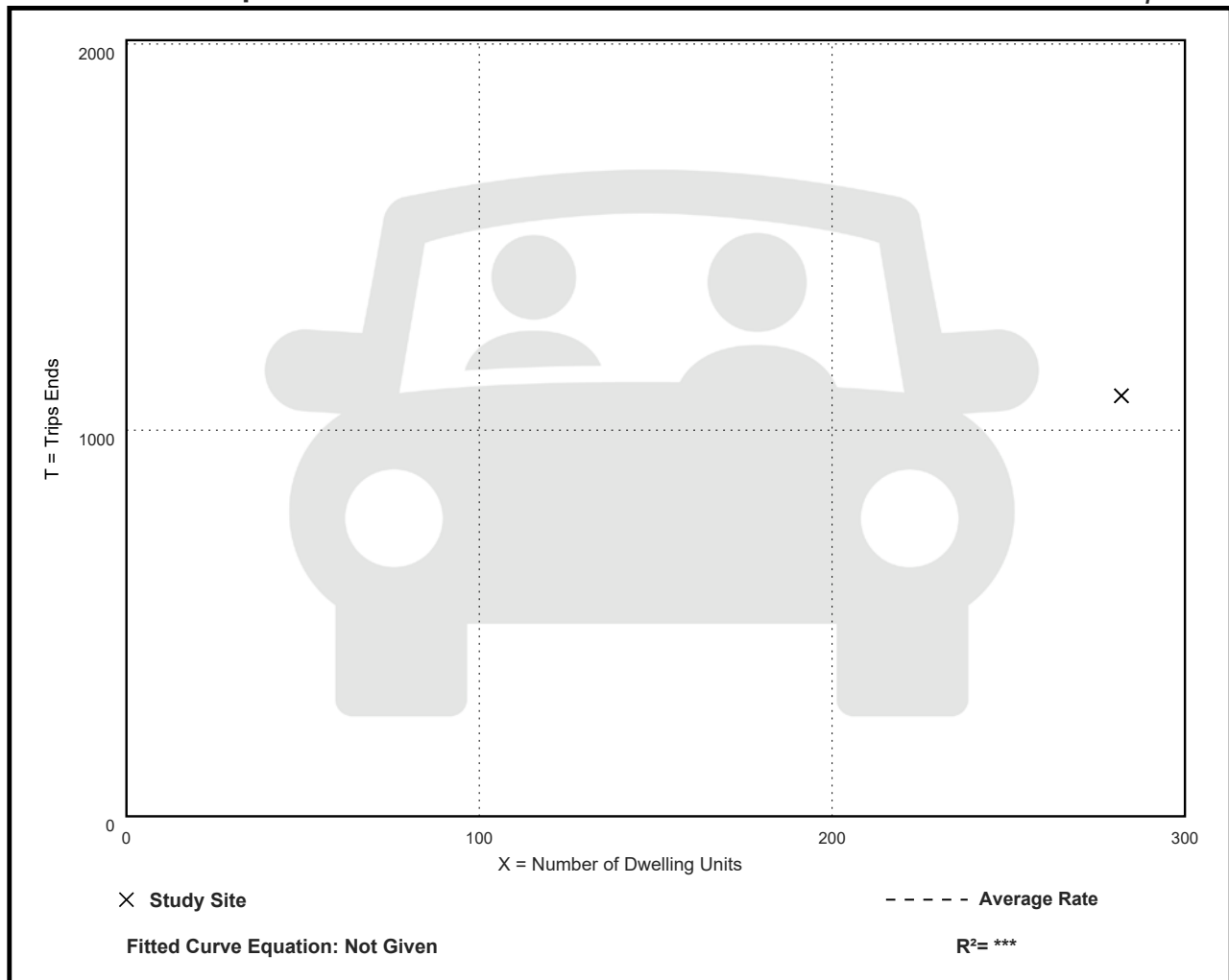
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.86	3.86 - 3.86	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 282

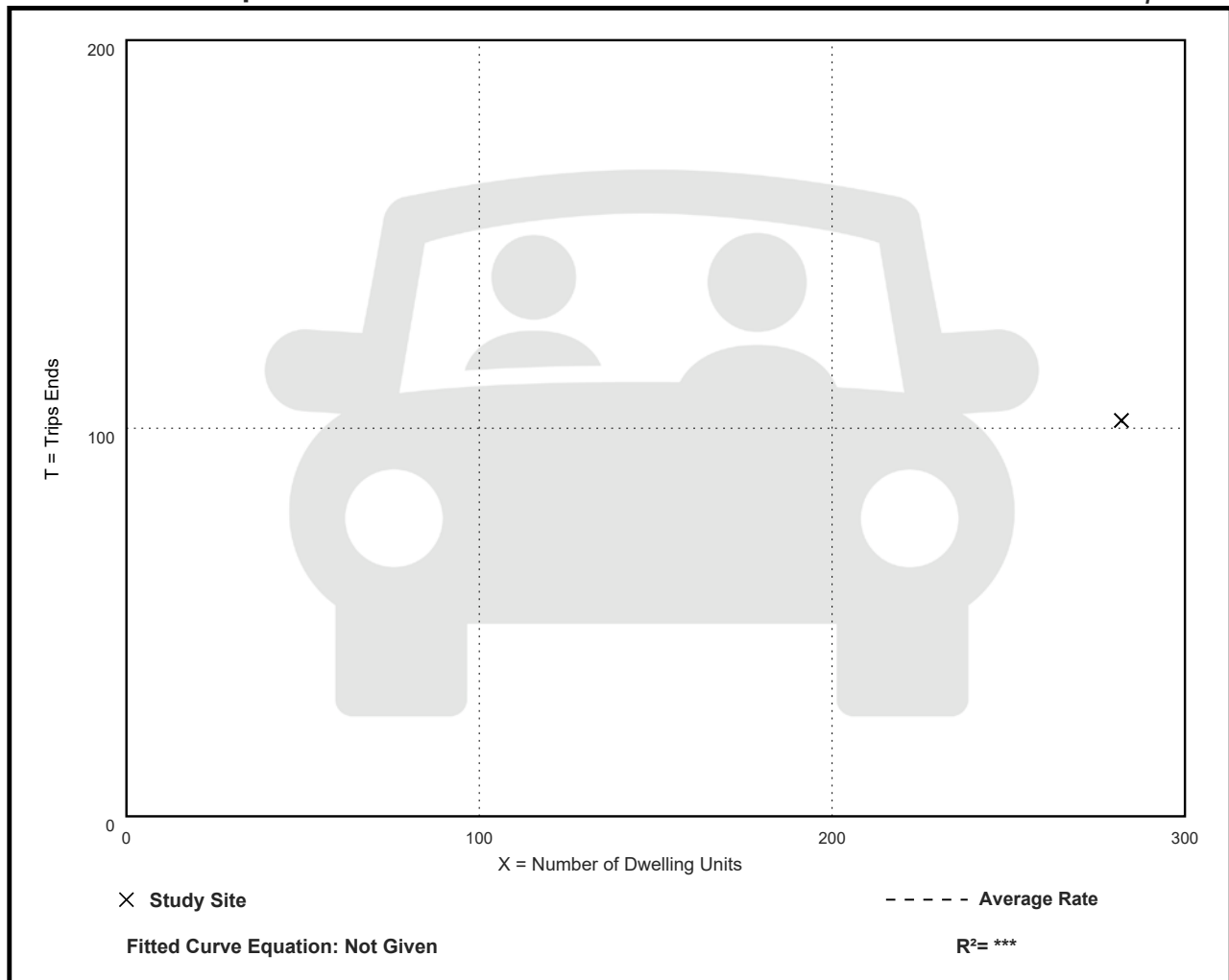
Directional Distribution: Not Available

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.36	0.36 - 0.36	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Residents

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Residents: 177

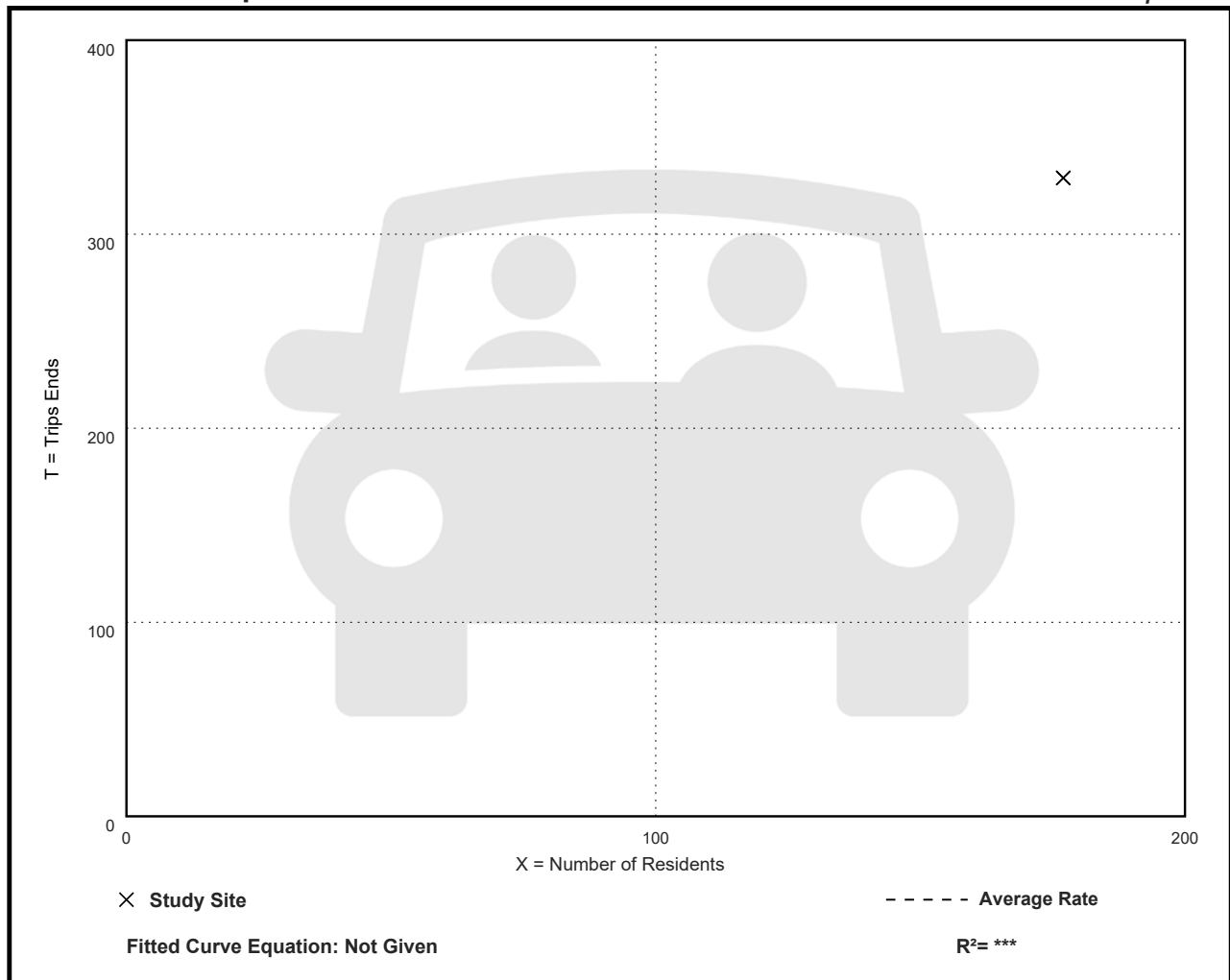
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
1.86	1.86 - 1.86	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Residents

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 9

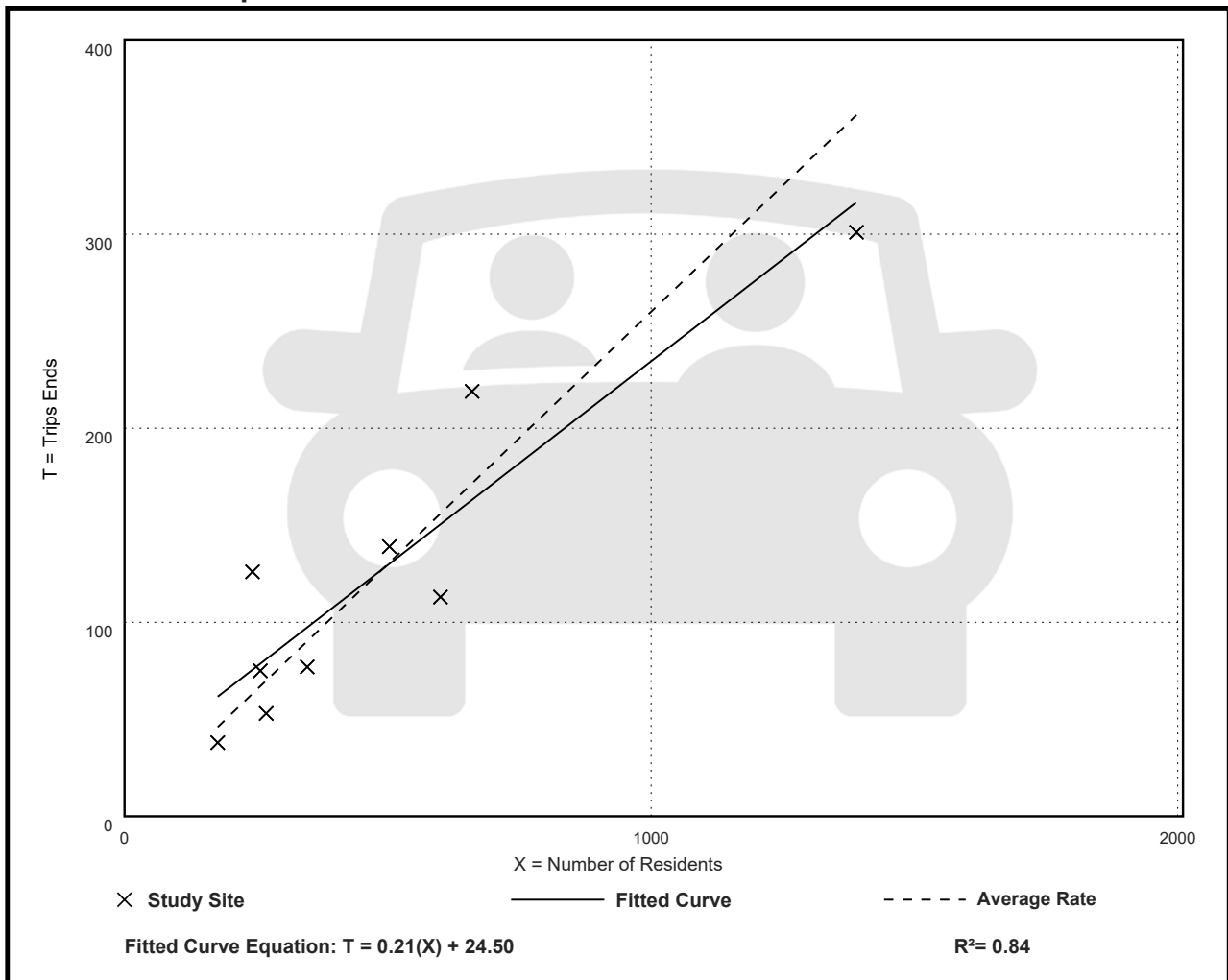
Avg. Num. of Residents: 494

Directional Distribution: 17% entering, 83% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.26	0.19 - 0.52	0.08

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Vehicle Trip Ends vs: Residents

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 9

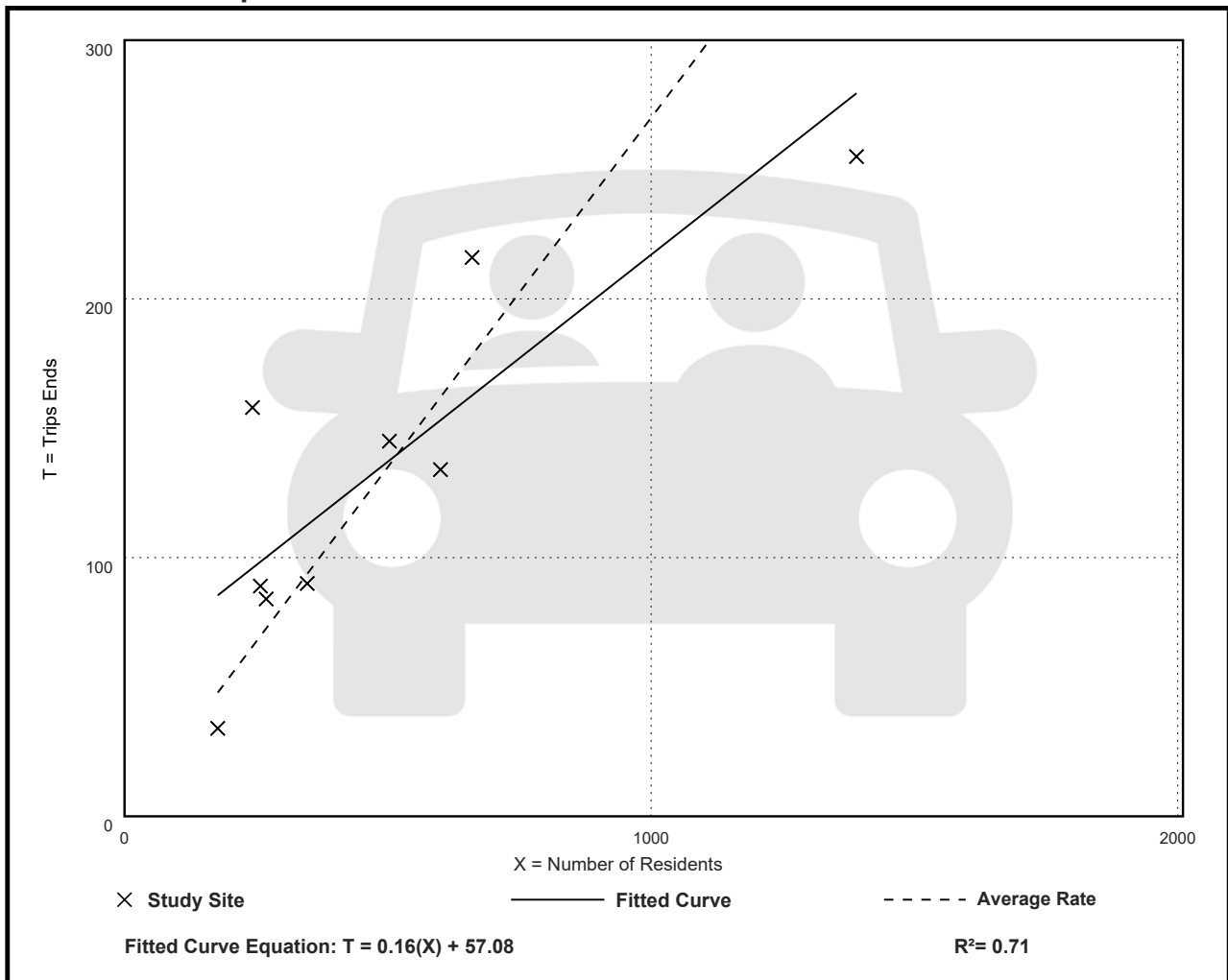
Avg. Num. of Residents: 494

Directional Distribution: 66% entering, 34% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.27	0.18 - 0.65	0.11

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Walk+Bike+Transit Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 8

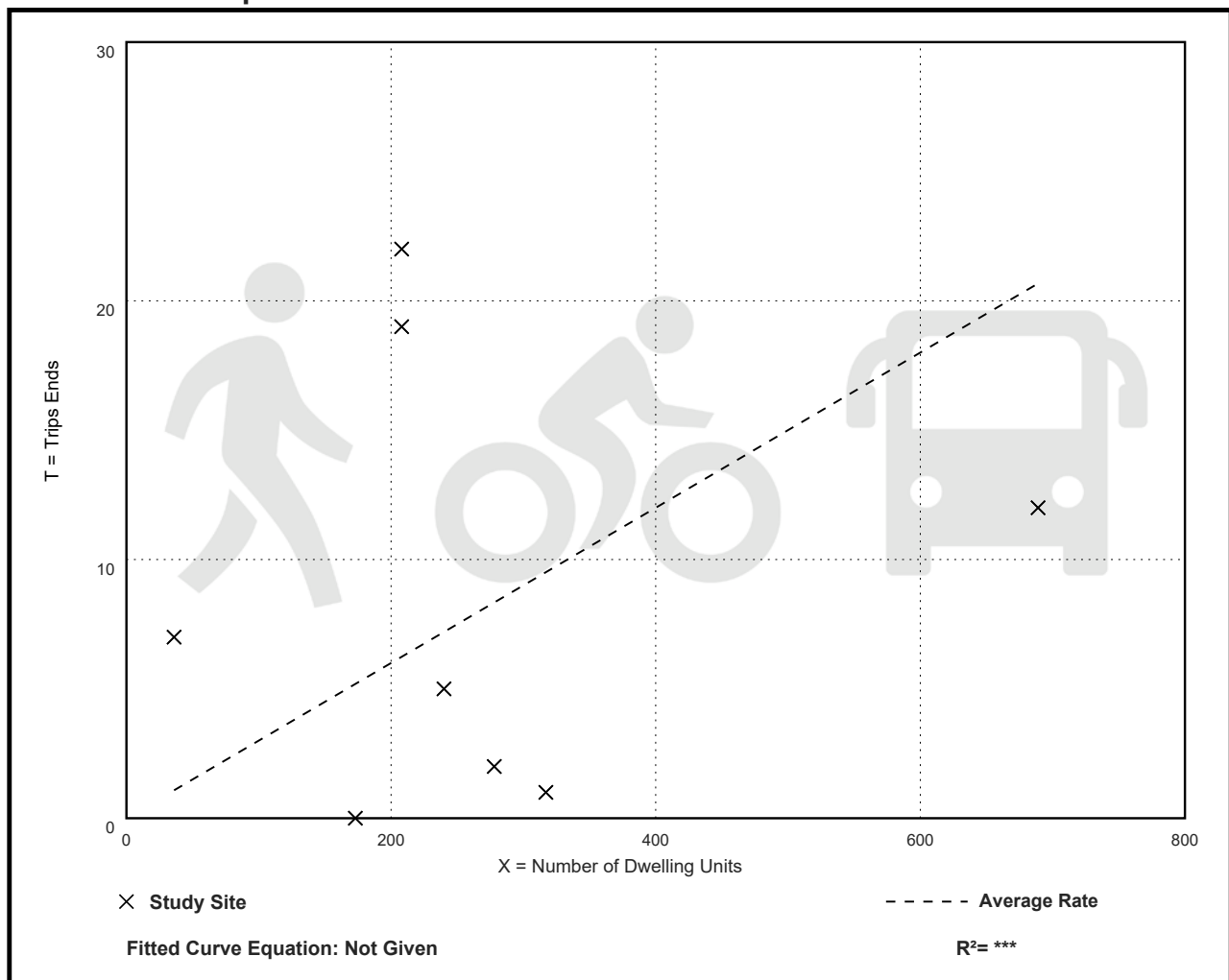
Avg. Num. of Dwelling Units: 269

Directional Distribution: 43% entering, 57% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.19	0.04

Data Plot and Equation



Multifamily Housing (Low-Rise) Not Close to Rail Transit (220)

Walk+Bike+Transit Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 10

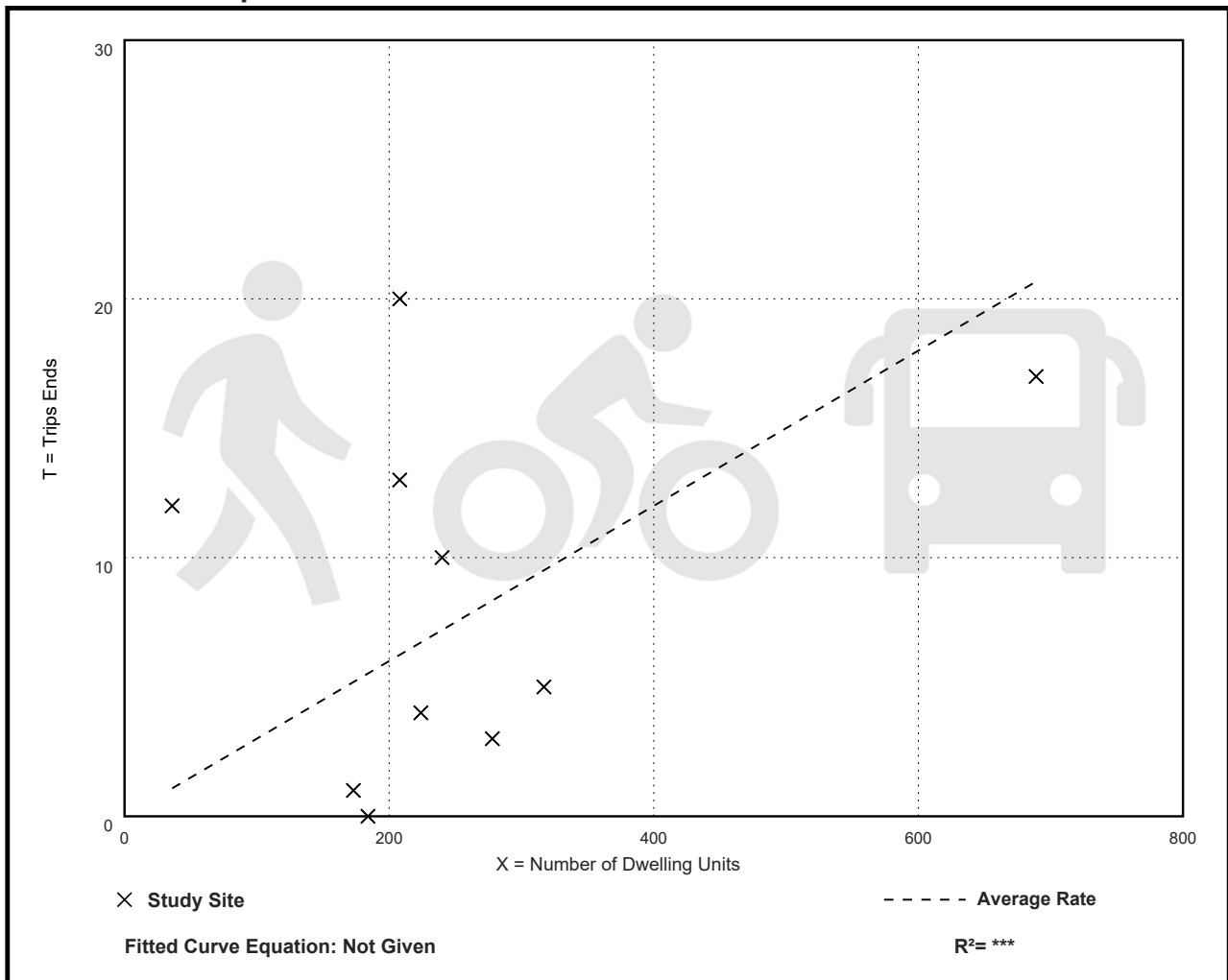
Avg. Num. of Dwelling Units: 256

Directional Distribution: 50% entering, 50% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.03	0.00 - 0.33	0.05

Data Plot and Equation



Multifamily Housing (Low-Rise) Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 9

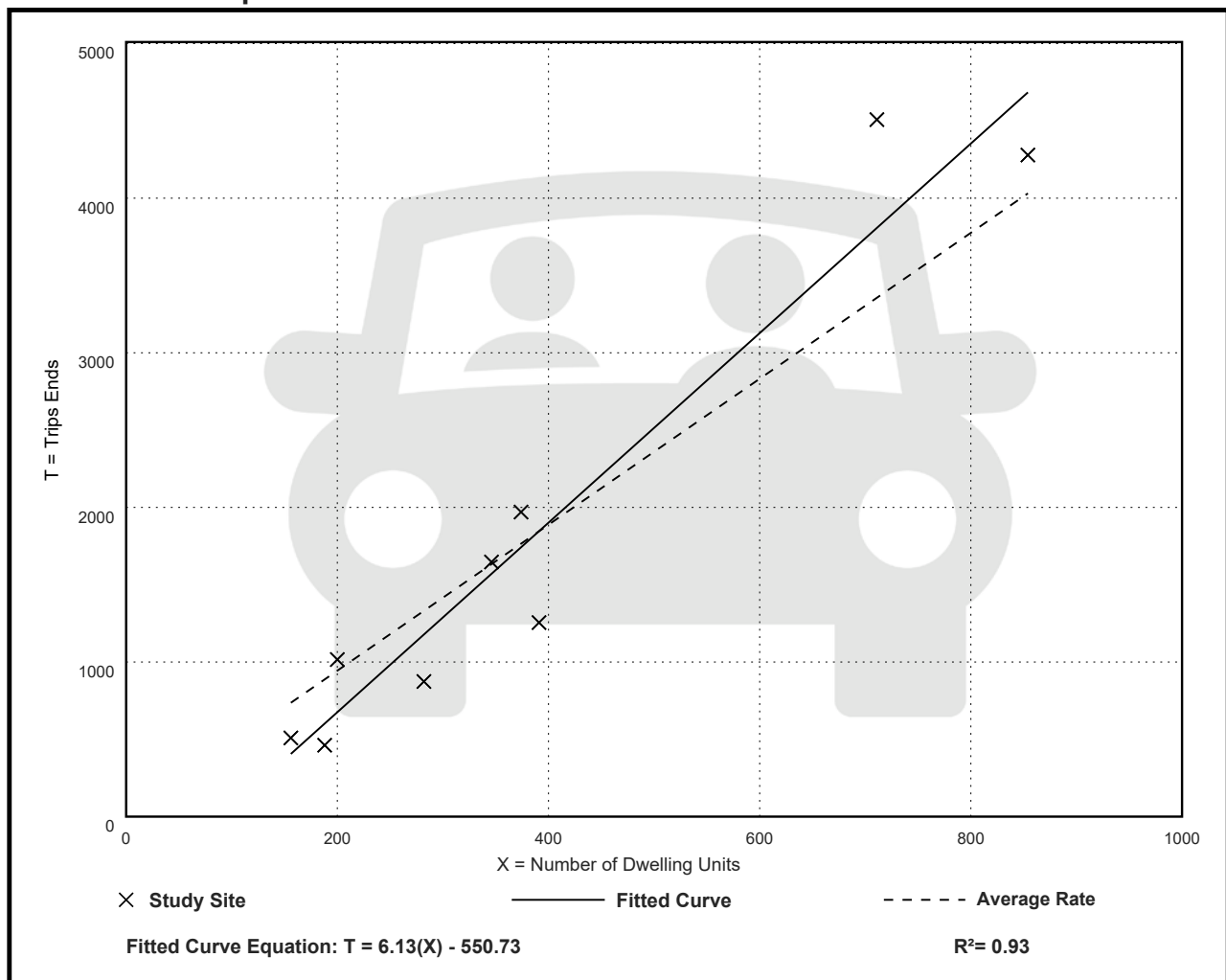
Avg. Num. of Dwelling Units: 389

Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.72	2.46 - 6.34	1.27

Data Plot and Equation



Multifamily Housing (Low-Rise) Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 7 and 9 a.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 374

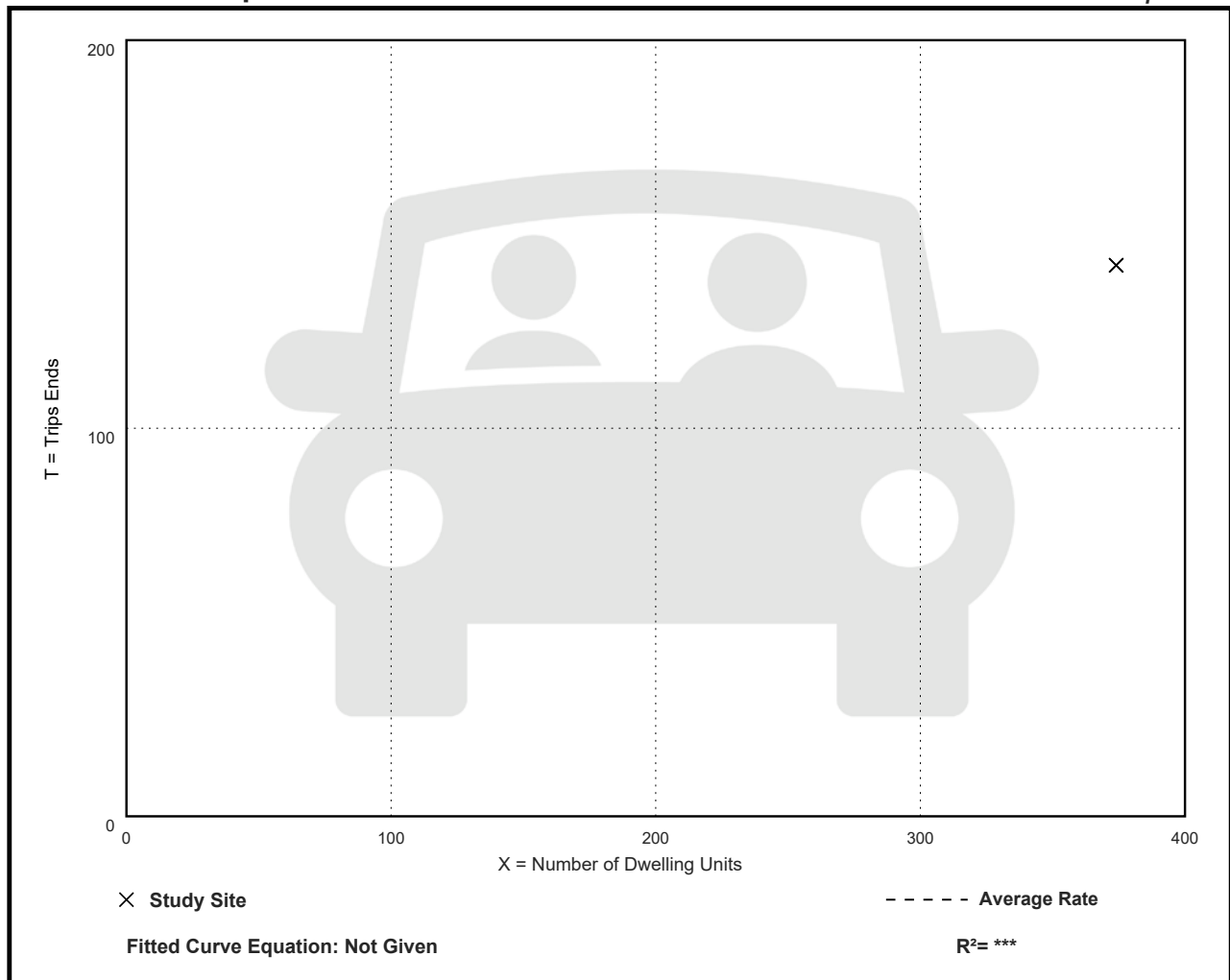
Directional Distribution: 29% entering, 71% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.38	0.38 - 0.38	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

Peak Hour of Adjacent Street Traffic,

One Hour Between 4 and 6 p.m.

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 374

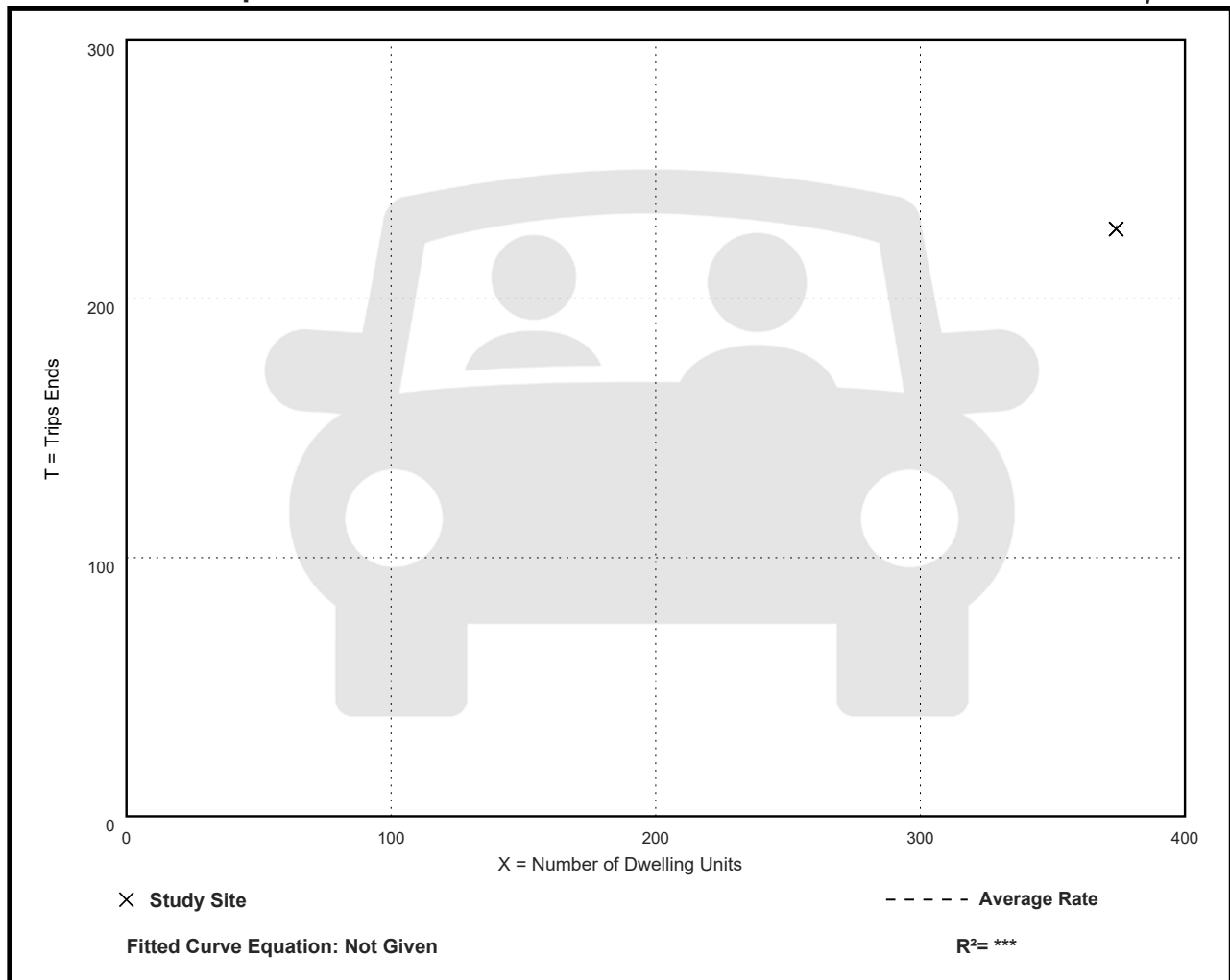
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.61 - 0.61	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 374

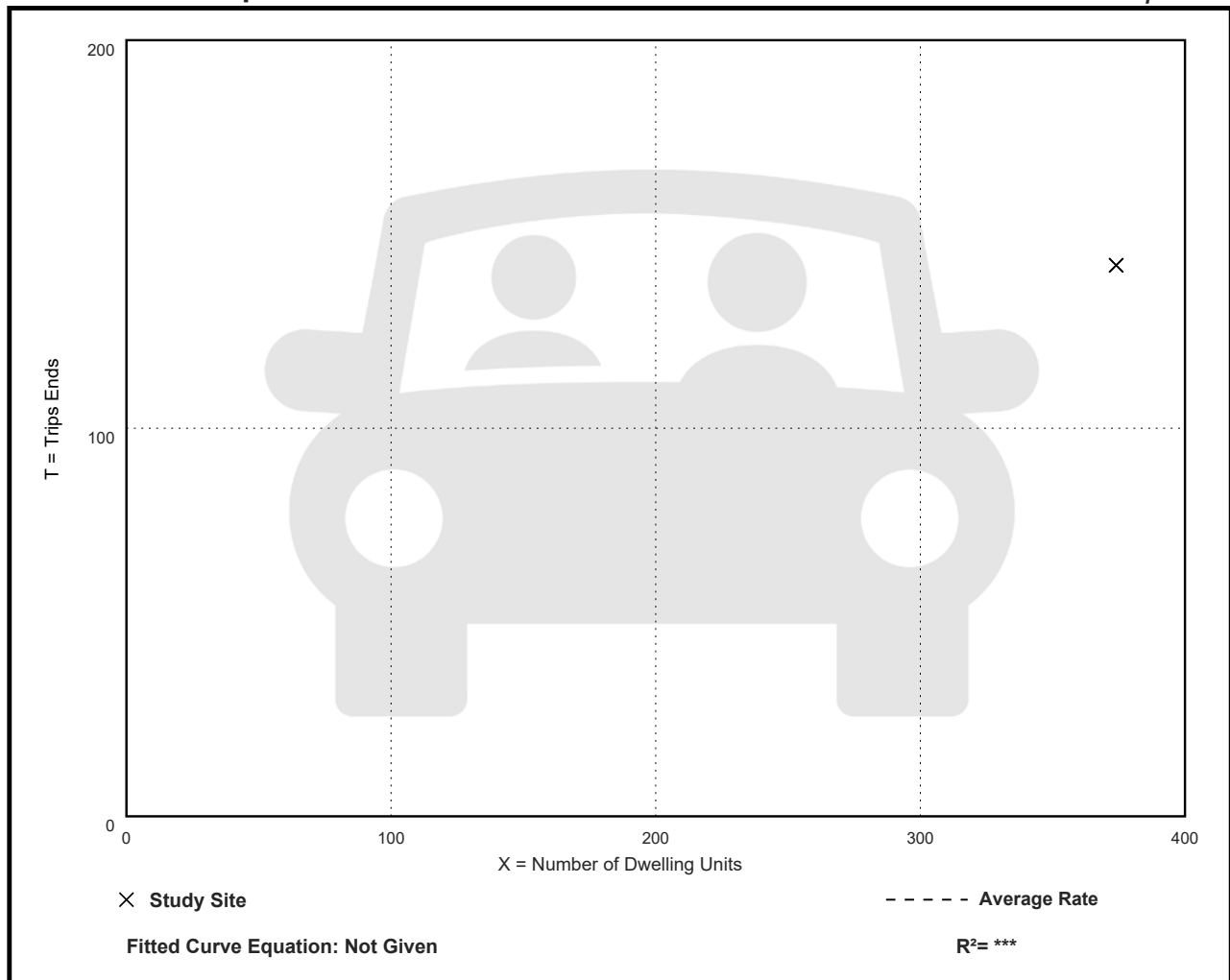
Directional Distribution: 29% entering, 71% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.38	0.38 - 0.38	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Low-Rise) Close to Rail Transit (220)

Vehicle Trip Ends vs: Dwelling Units

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Dwelling Units: 374

Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.61 - 0.61	***

Data Plot and Equation

Caution – Small Sample Size

