



4/25/2023

Jarrell Properties, Inc.  
c/o James Jarrell, IV  
1005 Sophia St  
Fredericksburg, VA 22401

RE: Walnut Hill Subdivision – Preliminary Traffic Analysis (Owens Dr & Dahlgren Rd)

Mr. Jarrell,

Per your request, this letter provides an initial opinion of probable traffic impact associated with the proposed Walnut Hill rezoning (R-3) request and its subsequent development, in particular as it relates to the intersection of Route 624 (Owens Dr) and Route 206 (Dahlgren Rd). This summary statement should be reviewed in context to previously prepared statements associated with this same project, including my letter to you dated Feb 14, 2022.

Updating for the most recent version of ITE's *Trip Generation Manual, 11<sup>th</sup> Edition*, the site's 25 single family detached homes and 75 townhomes can be anticipated to generate approximately 742 vehicular trips per average weekday (VPD). It is important to view this number in context. Virginia Code (24VAC30-155) governs the requirement of localities to submit traffic impact analyses associated with rezoning requests "that will substantially affect transportation on state-controlled highways." This section of code defines "substantial impact" as a proposal that "generates more than 5,000 vehicle trips per day at the site's connection to a state-controlled highway." As existing zoning allows for 42 single family detached homes, which can be expected to generate 396 VPD, the proposed rezoning has a net addition of only 346 VPD; less than 7% of the threshold determined by Virginia Code to generate a "substantial impact" on state-controlled highways. This project's net trip generation is even less than the Code's allowances for a Low Volume Roadway Submission, which has a minimum trip generation requirement of 400 VPD (*note that the Low Volume requirement also requires that a site double existing traffic on the connecting roadway, and this project adds only 18% to Owens Dr; project thus falls significantly short of either requirement*). Trip generation reports for the development's proposed uses are attached for reference.

As it relates specifically to the intersection of Owens Dr & Dahlgren Rd, it is worth noting that there are presently existing turn lanes of sufficient size and configuration on Dahlgren Rd serving both right- and left-turning vehicles maneuvering onto Owens Dr. The southbound

Owens Dr approach is a single-lane configuration serving both turning and through movements. During recent on-site observations during AM and PM peak hours (as performed by Jeh Hicks on March 27), it was noticed that southbound approach volume was relatively light and that queueing only exceeded 2 vehicles once or twice. The approach allows for a minimum of 5 vehicles to queue before any impact would be noticed on the nearest upstream entrance. As the proposed request can only be expected to generate an additional 19 vehicular trips during the AM Peak Hour (largest impact on outbound traffic) than existing zoning allows for, with roughly 14 exiting toward this intersection, this equates to roughly 1 additional vehicle approaching the intersection every 4 minutes. No discernable queueing impact can be expected from such a minor addition, and the intersections queueing allowance would be in no jeopardy of reaching capacity.

In effort to analyze crash history at this intersection, crash data between 2018-2022 was retrieved from the Traffic Records Electronic Data System<sup>1</sup>. The intersection was found to witness 0.6 accidents/year during this timeframe, with only one involving personal injury. Of the 108 King George County intersections for which multiple accidents were reported, the Dahlgren Rd & Owens Dr intersection ranked 60<sup>th</sup>. As such, this intersection does not currently present itself as overly problematic from an accident occurrence standpoint; the minimal traffic added by the proposed rezoning cannot reasonably be expected to have any significant impact on these figures.

In sum, the proposed rezoning generates new traffic that is extremely light in comparison to Virginia Code minimum requirements for traffic impact analyses, and is expected to have negligible impact to the nearest intersection of consequence. Additional time and cost to formally analyze the intersection does not appear to be warranted in any fashion, and would not be expected to produce any quantifiable mitigation recommendations to tie to this proposed rezoning request.

It is my hope that this preliminary analysis addresses your immediate concerns relating to the proposed impact of Walnut Hill residential traffic on the surrounding roadway network. If you should have any questions regarding this letter or its attachments, however, please contact me at your earliest convenience.



Sincerely,



Seth Roderick, PE

Managing Partner

Monteverde Engineering & Design Studio

Attachments, as noted

<sup>1</sup> <https://www.treds.virginia.gov/Mapping/Map/CrashesByJurisdiction>; *data points with descriptions including either “Primary Street Dahlgren Road, Intersecting Street Owens Drive” or “Primary Street Owens Drive, Intersecting Street Dahlgren Road” were counted in this analysis*



# Single-Family Detached Housing (210)

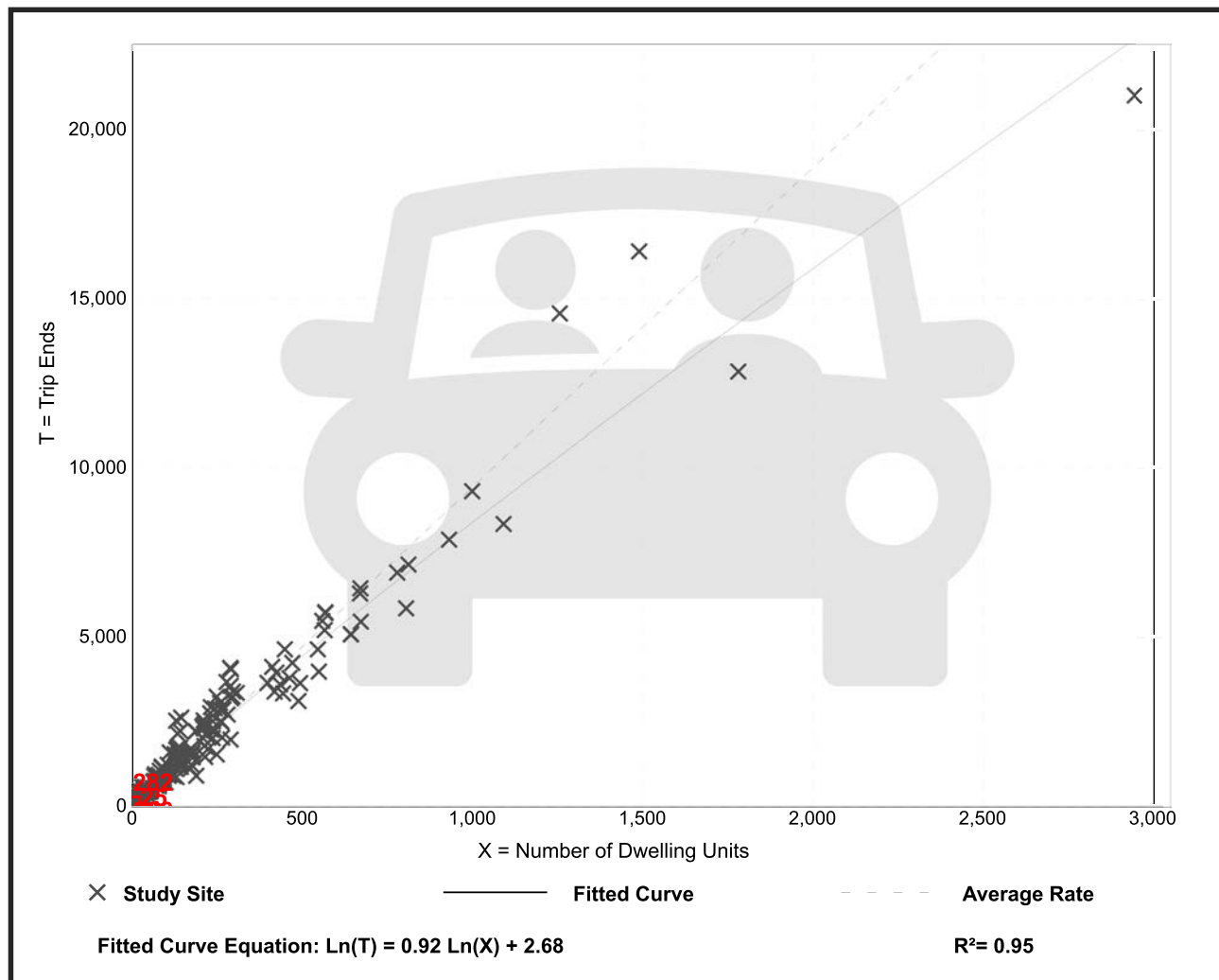
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 174  
Avg. Num. of Dwelling Units: 246  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
9.43	4.45 - 22.61	2.13

## Data Plot and Equation



# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 7 and 9 a.m.**

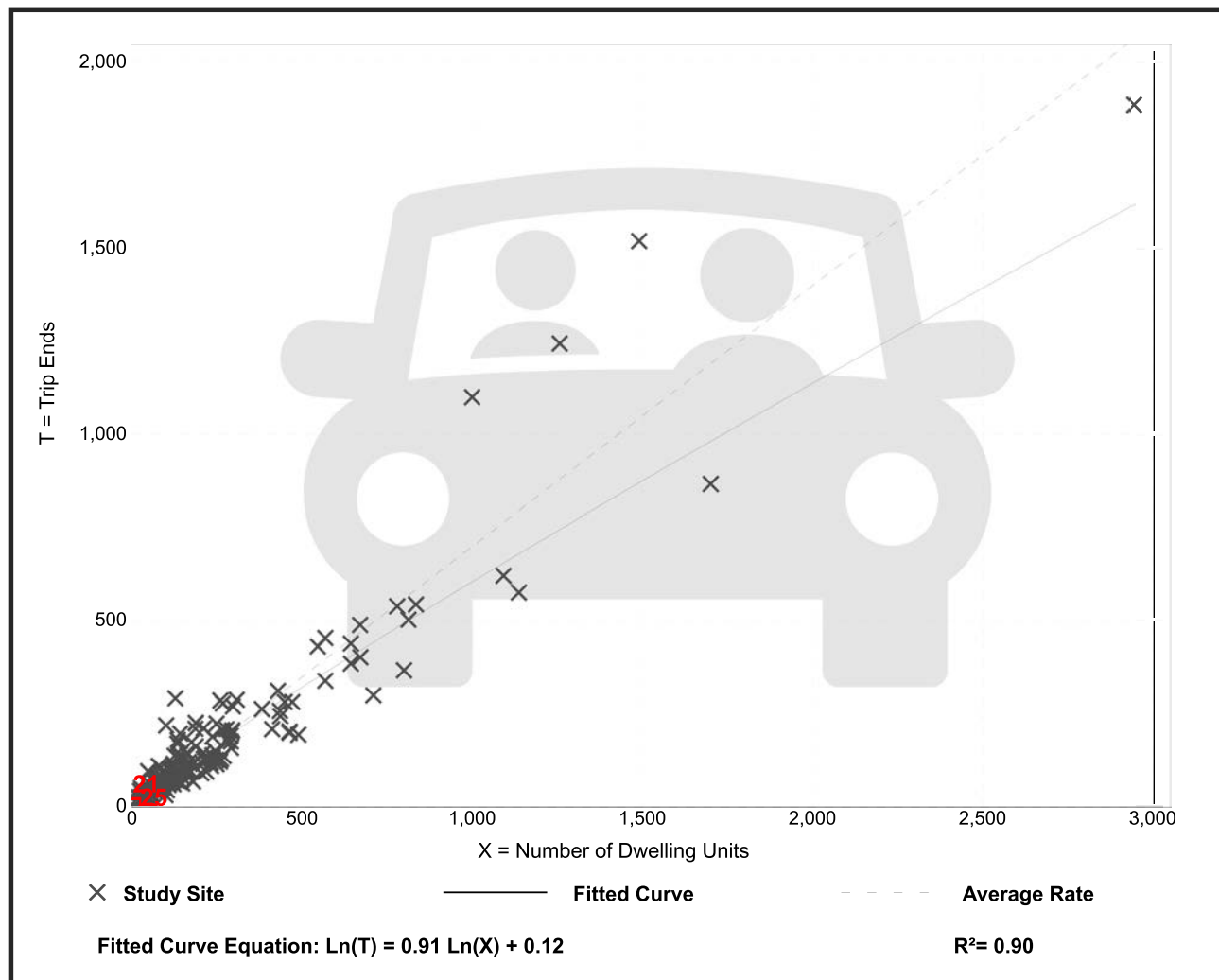
**Setting/Location: General Urban/Suburban**

Number of Studies: 192  
 Avg. Num. of Dwelling Units: 226  
 Directional Distribution: 25% entering, 75% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

## Data Plot and Equation



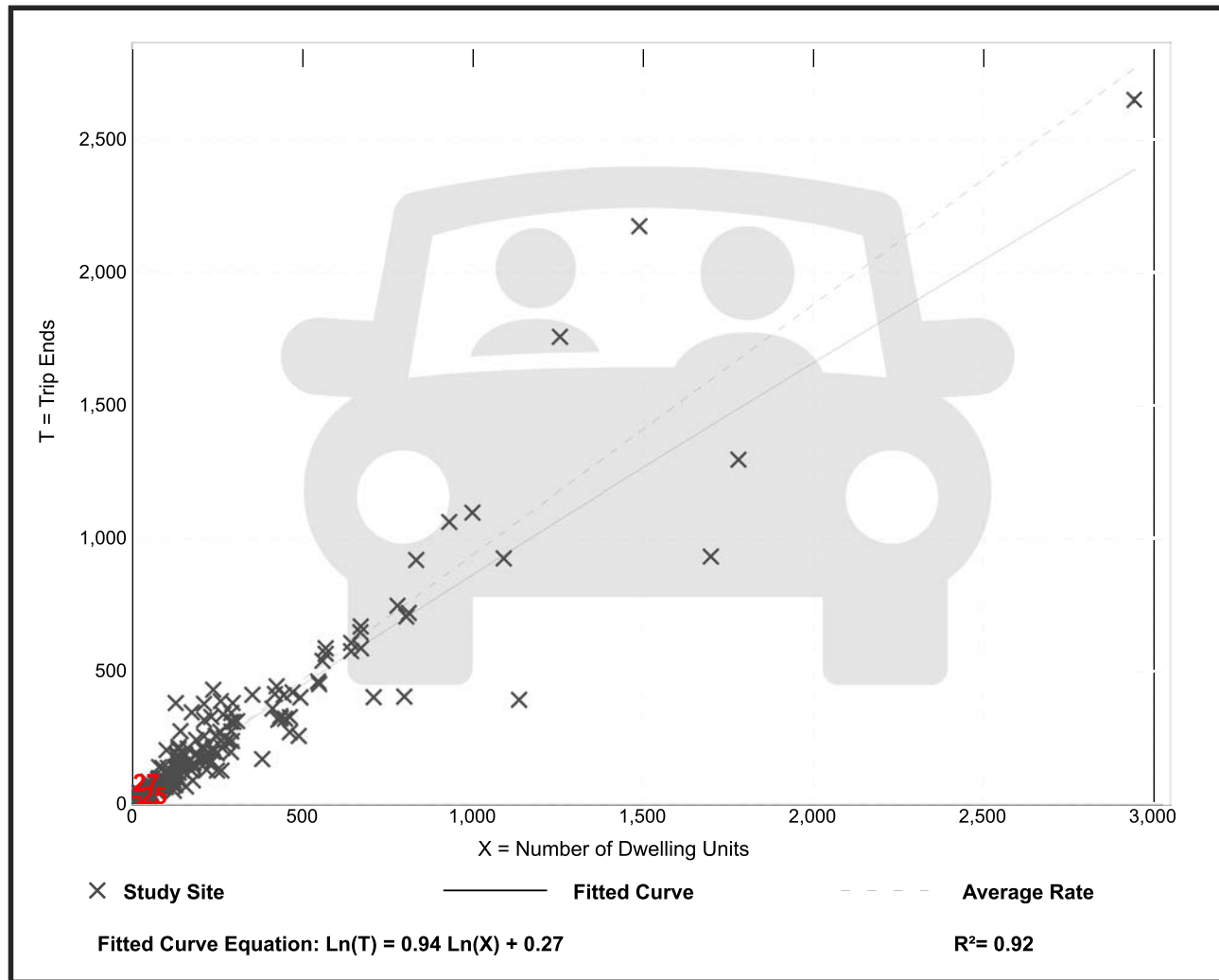
# Single-Family Detached Housing (210)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**  
**Setting/Location: General Urban/Suburban**  
 Number of Studies: 208  
 Avg. Num. of Dwelling Units: 248  
 Directional Distribution: 63% entering, 37% exiting

## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

## Data Plot and Equation



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

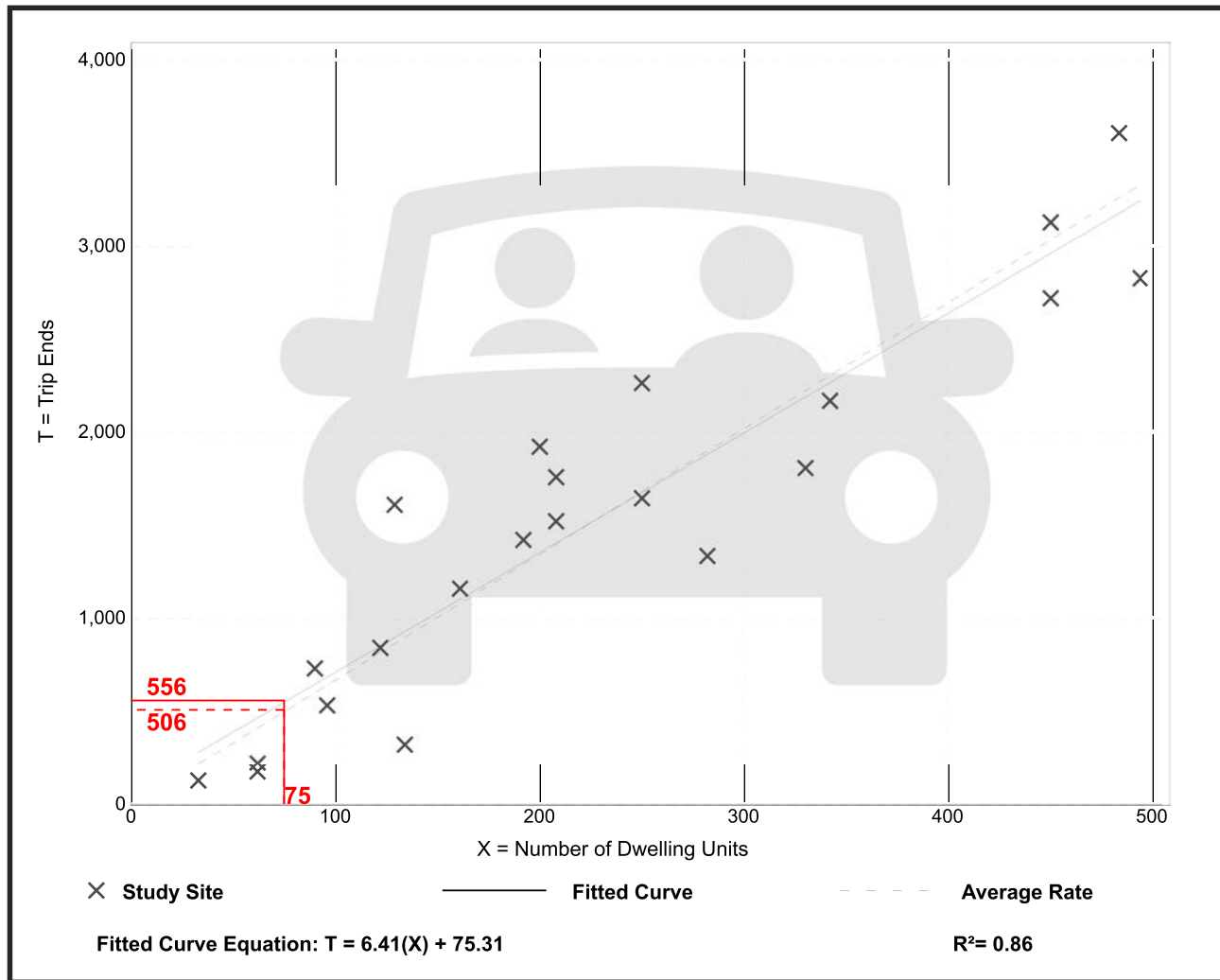
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

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.**

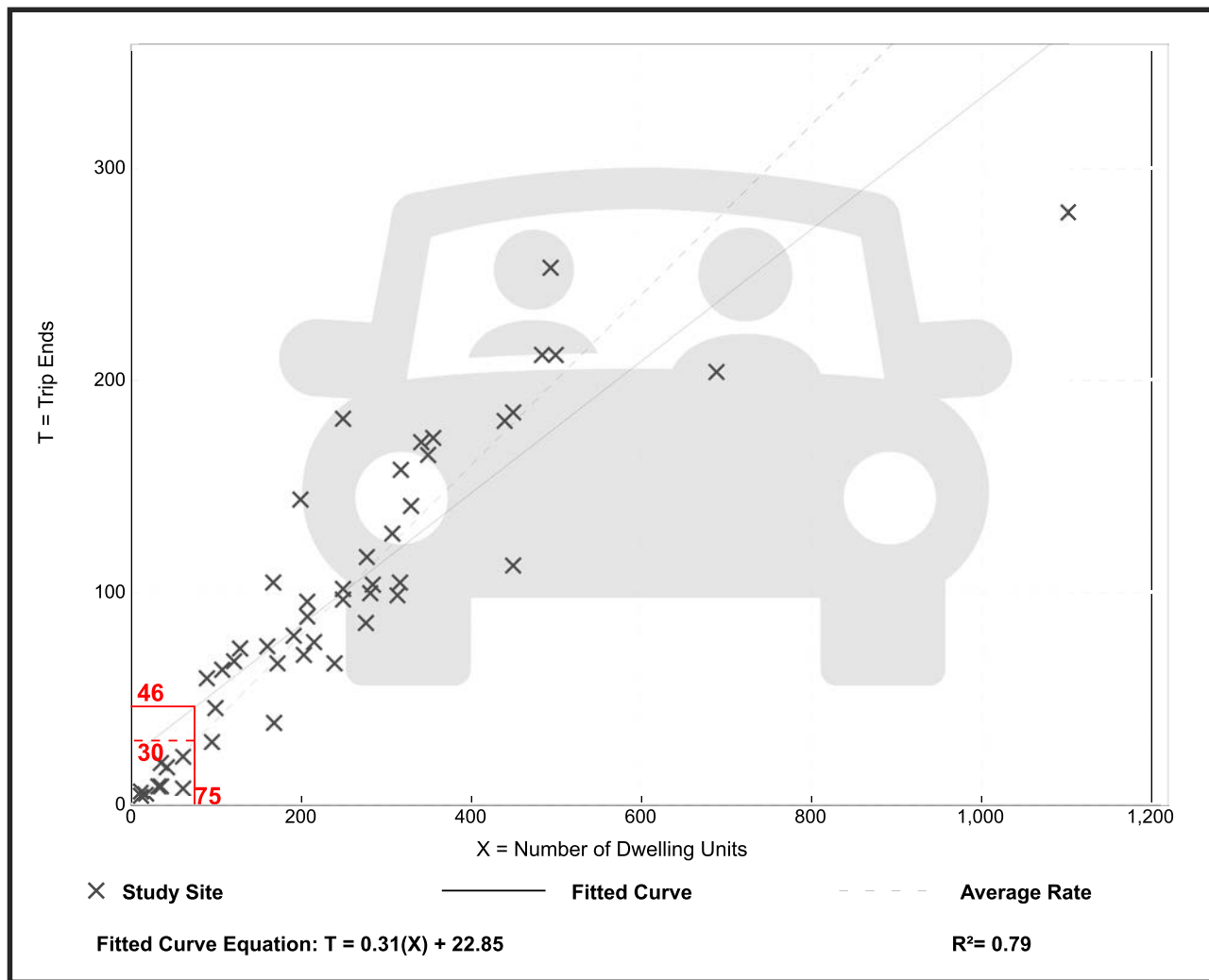
**Setting/Location: General Urban/Suburban**

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

