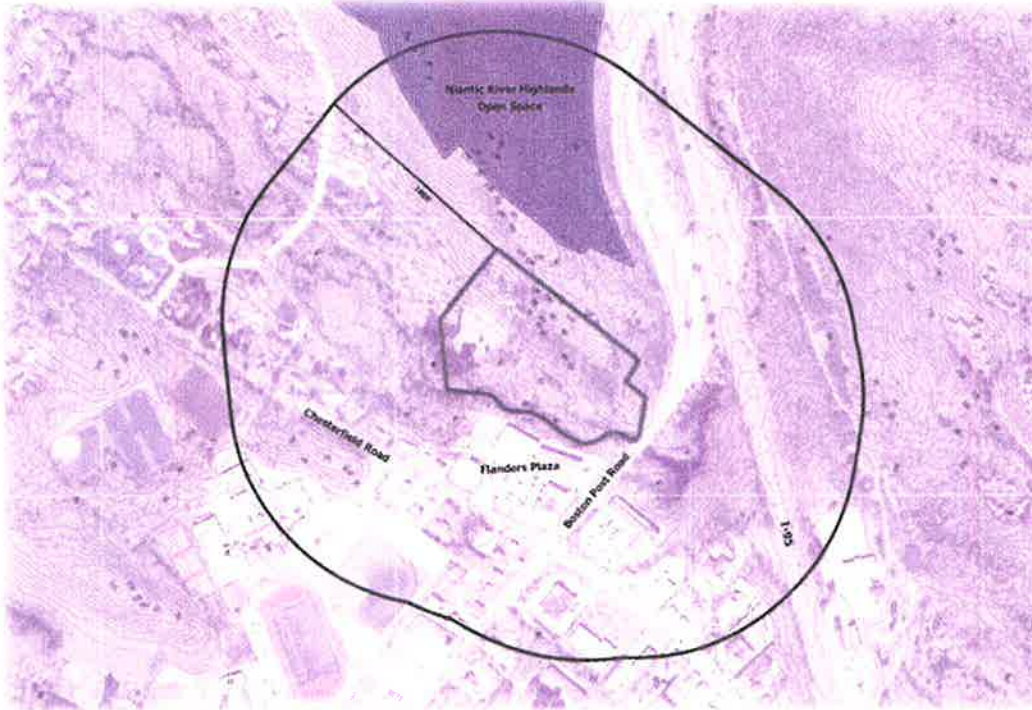


To: William Mulholland, Town on East Lyme Zoning Official  
From: Kristen Clarke, PE, PTOE  
Subject: Proposed Age Restricted (55+) Residential Development – Boston Post Road in East Lyme, CT  
Date: January 14, 2024



**Background**

This memo was prepared to provide supplemental traffic analysis for the proposed age restricted (55+) residential development located off 91 Boston Post Road in East Lyme, CT as seen in Figure 1.



*Figure 1. Project Location*

**Proposed Development**

The proposed site development plan by May Engineering, LLC is for the parcel located along the north side of Boston Post Road in East Lyme, CT. The 11.36-acre parcel is currently a largely open site. The proposed site development is for six duplexes and two six-unit apartment buildings (24 units total), and associated private roads. The plan also includes renovation of the existing single family residence.

The proposed site plan, shown in Appendix B, includes a raised channelization island at the driveway and Boston Post Road intersection to allow left and right turn in and right turn out only.

## Trip Generation

To quantify the amount of traffic that will be generated by the new residential homes, the Institute of Transportation Engineers, *Trip Generation Manual*, Eleventh Edition was applied. The most applicable ITE Land Use (LUC) codes for this type of development are LUC 210 (Single-Family Detached Housing) for the renovated home and LUC 252 (Senior Adult Housing-Multifamily) for duplex and apartment units, using the number of dwelling units as the independent variable.

The ITE Trip Generation Manual provides two ways of calculating trips, the average rate and a fitted curve/regression equation. ITE recommends using regression equation when the sample size is at least 20 data points and has an R<sup>2</sup> value of 0.75 or higher. Table 1 provides analysis of which method should be used for each of the LUCs.

Table 1. ITE Average Rate vs. Regression Equation

Average Rate vs. Regression Equation Analysis			
	Data Points	R <sup>2</sup>	Recommendation
<b>LUC 210- Single Family Detached Housing</b>			
Weekday, Peak Hour of Adjacent Street Traffic (7-9 AM)	192	.90	Regression
Weekday, Peak Hour of Adjacent Street Traffic (4-6 PM)	208	.92	Regression
Weekday Total	174	.95	Regression
<b>LUC 252- Senior Adult Housing- Multifamily</b>			
Weekday, Peak Hour of Adjacent Street Traffic (7-9 AM)	9	.85	Average Rate
Weekday, Peak Hour of Adjacent Street Traffic (4-6 PM)	9	.84	Average Rate
Weekday Total	6	.99	Average Rate

The regression equations/average rates were applied and Table 2 summarizes the results of the analyses for trips in the peak hour of the adjacent street and per weekday. See Appendix A for ITE tables.

Table 2. ITE Trip Generation Calculations

Trip Generation Analysis			
<b>LUC 210- Single Family Detached Housing (1 units)</b>			
	Enter	Exit	Total
Weekday, Peak Hour of Adjacent Street Traffic (7-9 AM)	0	1	1
Weekday, Peak Hour of Adjacent Street Traffic (4-6 PM)	1	0	1
Weekday Total	7	8	15
<b>LUC 252- Senior Adult Housing- Multifamily (24 units)</b>			
	Enter	Exit	Total
Weekday, Peak Hour of Adjacent Street Traffic (7-9 AM)	2	3	5
Weekday, Peak Hour of Adjacent Street Traffic (4-6 PM)	3	3	6
Weekday Total	39	39	78
<b>TOTAL Development Trip Generation</b>			
	Enter	Exit	Total
Weekday, Peak Hour of Adjacent Street Traffic (7-9 AM)	2	4	6
Weekday, Peak Hour of Adjacent Street Traffic (4-6 PM)	4	3	7
Weekday Total	46	47	93

## Crash History

Crash data maintained by The Connecticut Transportation Safety Research Center at the University of Connecticut was evaluated on Boston Post Road in the vicinity of the driveway access for the past five (5) years. As seen in Figure 2, there were two adjacent rear end crashes.

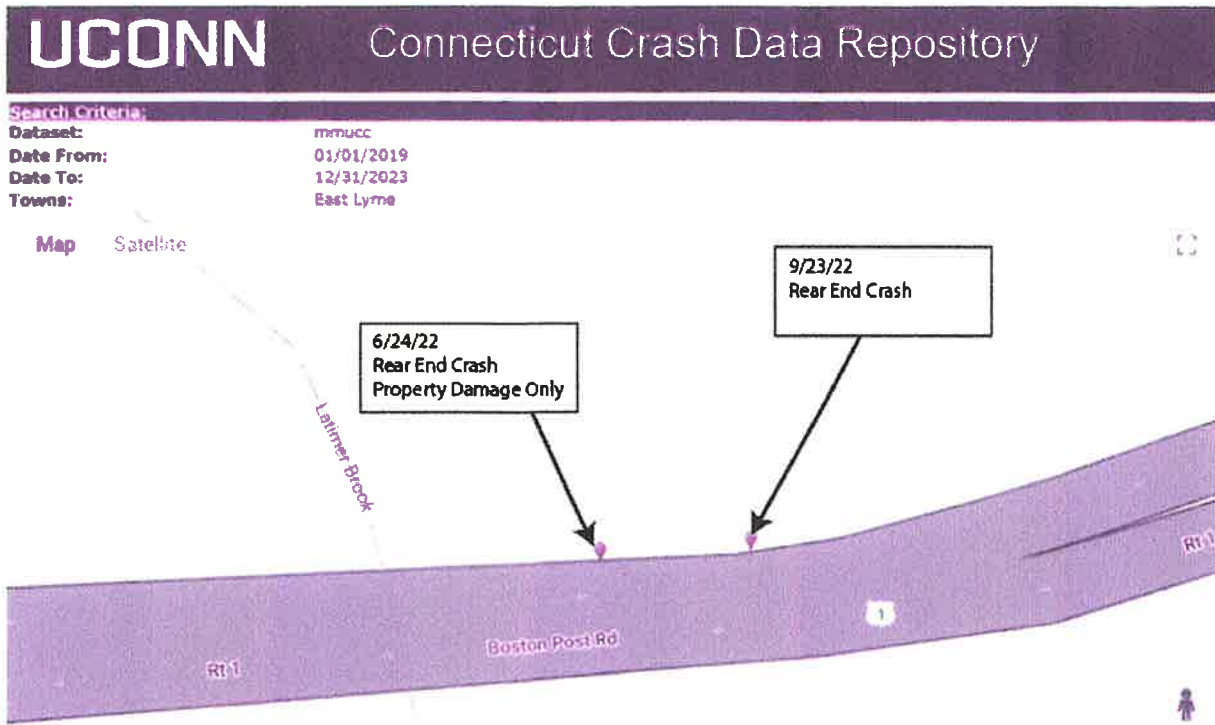


Figure 2. Connecticut Crash Data Repository

## Findings

The trip generation analysis indicates that the proposed residential development will generate approximately 6 (AM) and 7 (PM) vehicle-trips during the worst-case weekday peak hour periods, once fully occupied. For residential development, there are higher volumes exiting the site in the AM Peak and entering during the PM Peak. This means that during the highest hour of the AM peak, there will be one additional trip exiting the site approximately every 15 minutes. In the highest hour of the PM peak, there will be one additional trip entering the site approximately every 15 minutes. It is not expected to result in a notable increase to area traffic volumes or impact to area traffic operations.

## Land Use: 210

# Single-Family Detached Housing

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### Description

A single-family detached housing site includes any single-family detached home on an individual lot. A typical site surveyed is a suburban subdivision.

### Specialized Land Use

Data have been submitted for several single-family detached housing developments with homes that are commonly referred to as patio homes. A patio home is a detached housing unit that is located on a small lot with little (or no) front or back yard. In some subdivisions, communal maintenance of outside grounds is provided for the patio homes. The three patio home sites total 299 dwelling units with overall weighted average trip generation rates of 5.35 vehicle trips per dwelling unit for weekday, 0.26 for the AM adjacent street peak hour, and 0.47 for the PM adjacent street peak hour. These patio home rates based on a small sample of sites are lower than those for single-family detached housing (Land Use 210), lower than those for single-family attached housing (Land Use 251), and higher than those for senior adult housing – single-family (Land Use 251). Further analysis of this housing type will be conducted in a future edition of *Trip Generation Manual*.

### Additional Data

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 30 of the study sites, data on the number of residents and number of household vehicles are available. The overall averages for the 30 sites are 3.6 residents per dwelling unit and 1.5 vehicles per dwelling unit.

The sites were surveyed in the 1980s, the 1990s, the 2000s, and the 2010s in Arizona, California, Connecticut, Delaware, Illinois, Indiana, Kentucky, Maryland, Massachusetts, Minnesota, Montana, New Jersey, North Carolina, Ohio, Ontario (CAN), Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Vermont, Virginia, and West Virginia.

### Source Numbers

100, 105, 114, 126, 157, 167, 177, 197, 207, 211, 217, 267, 275, 293, 300, 319, 320, 356, 357, 367, 384, 387, 407, 435, 522, 550, 552, 579, 598, 601, 603, 614, 637, 711, 716, 720, 728, 735, 868, 869, 903, 925, 936, 1005, 1007, 1008, 1010, 1033, 1066, 1077, 1078, 1079

## 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.**

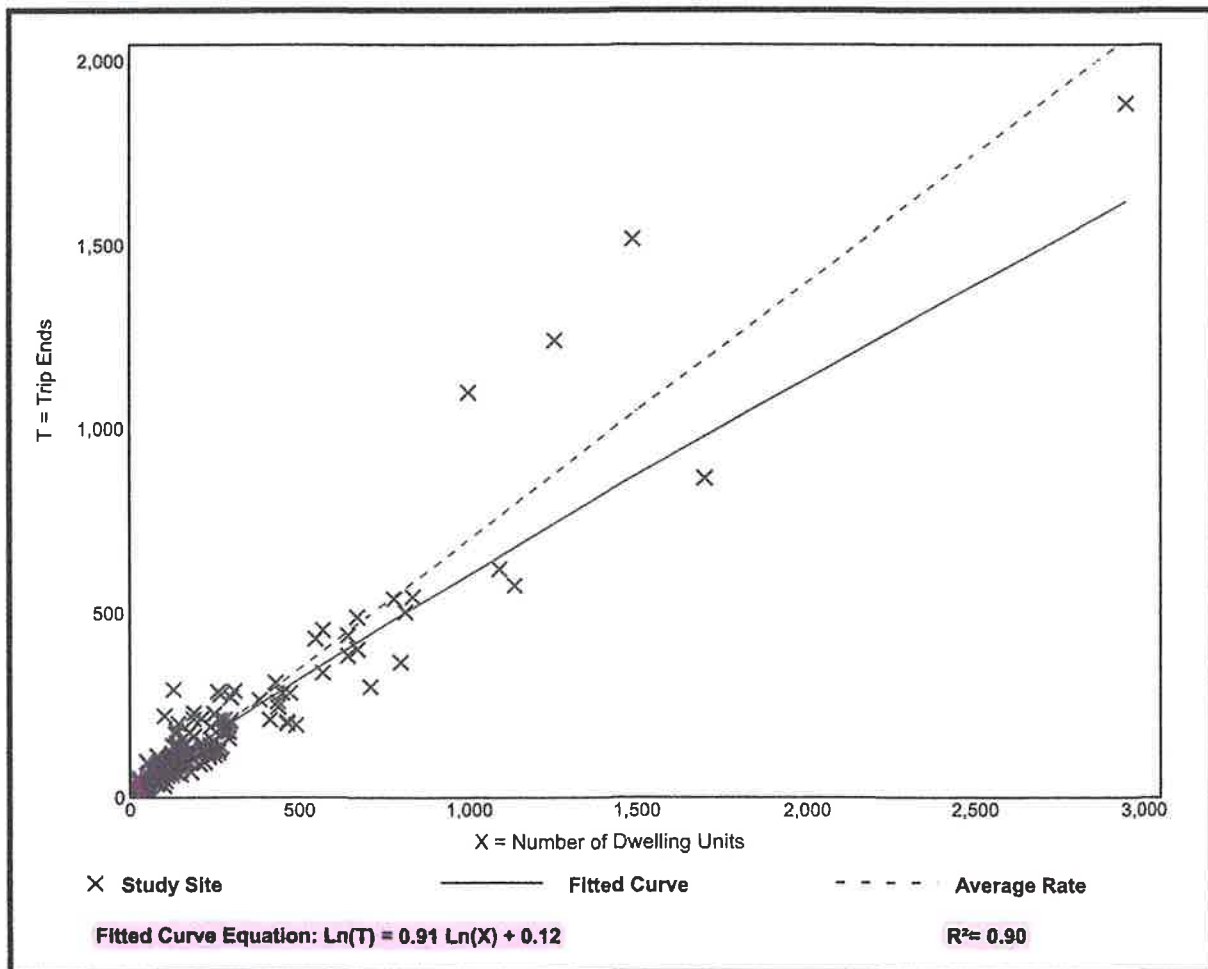
**Setting/Location: General Urban/Suburban**

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

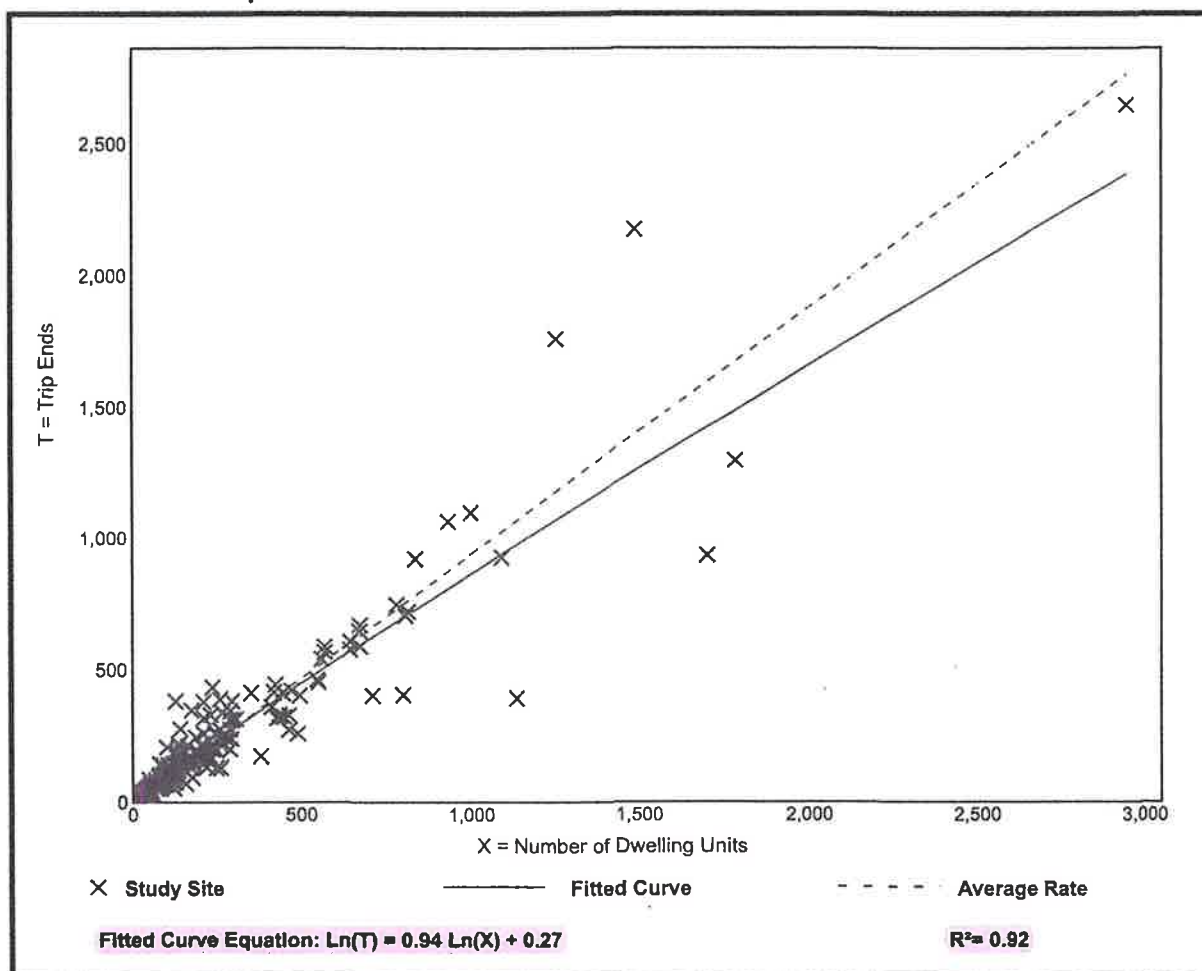
Avg. Num. of Dwelling Units: 248

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



# Single-Family Detached Housing (210)

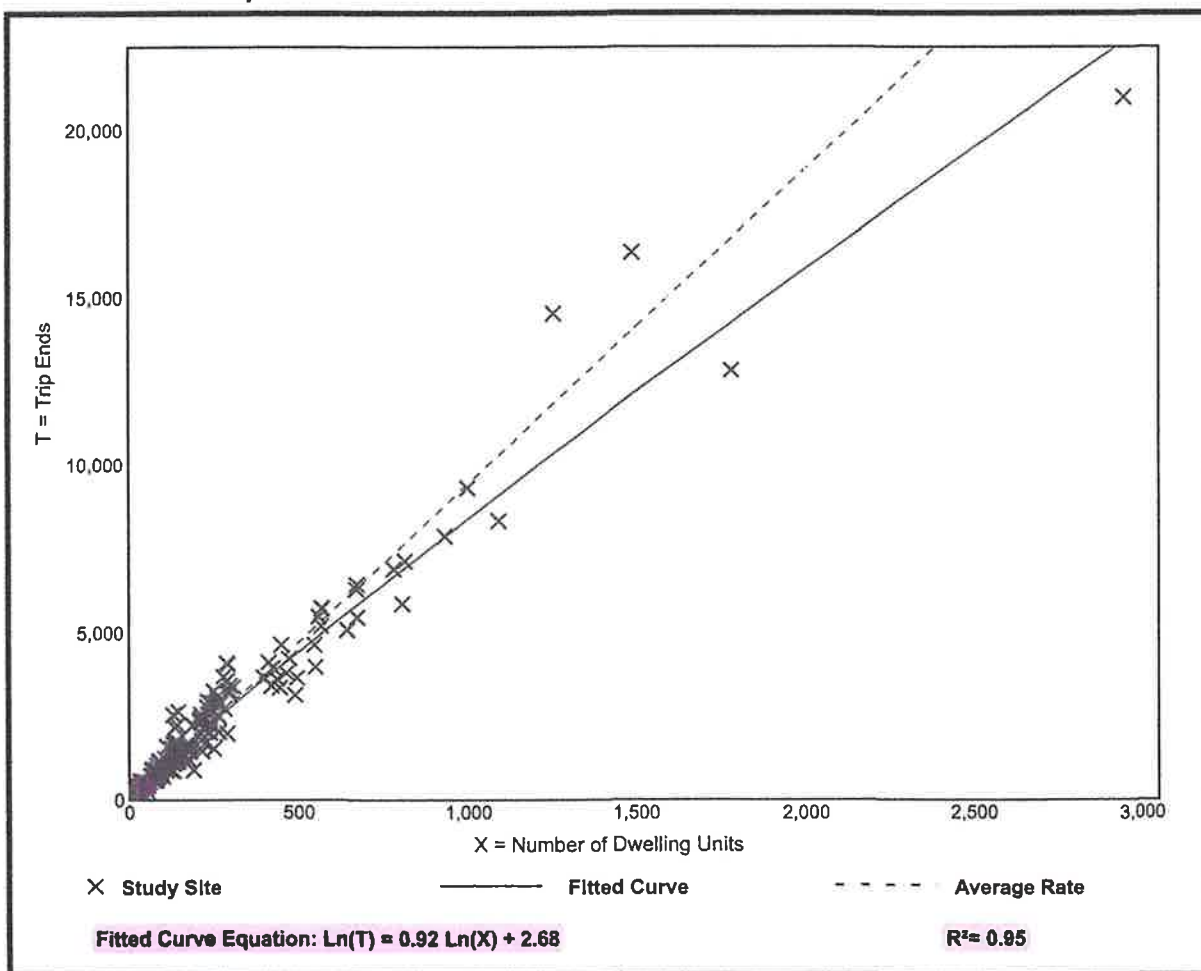
**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday**

**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



# Land Use: 252

## Senior Adult Housing—Multifamily

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### Description

Senior adult housing—multifamily sites are independent living developments that are called various names including retirement communities, **age-restricted housing**, and active adult communities. The development has a specific age restriction for its residents, **typically a minimum of 55 years of age for at least one resident of the household**.

Residents in these communities are typically considered active and requiring little to no medical supervision. The percentage of retired residents varies by development. The development may include amenities such as a golf course, swimming pool, 24-hour security, transportation, and common recreational facilities. They generally lack centralized dining and on-site health facilities.

The dwelling units share both floors and walls with other units in the residential building. Senior adult housing—single-family (Land Use 251), congregate care facility (Land Use 253), assisted living (Land Use 254), and continuing care retirement community (Land Use 255) are related land uses.

### Additional Data

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/>).

The sites were surveyed in the 1980s, the 1990s, and the 2000s in Alberta (CAN), California, Maryland, New Hampshire, New Jersey, Ontario (CAN), and Pennsylvania.

### Source Numbers

237, 272, 576, 703, 734, 970, 1060



## Senior Adult Housing - Multifamily (252)

**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: 9

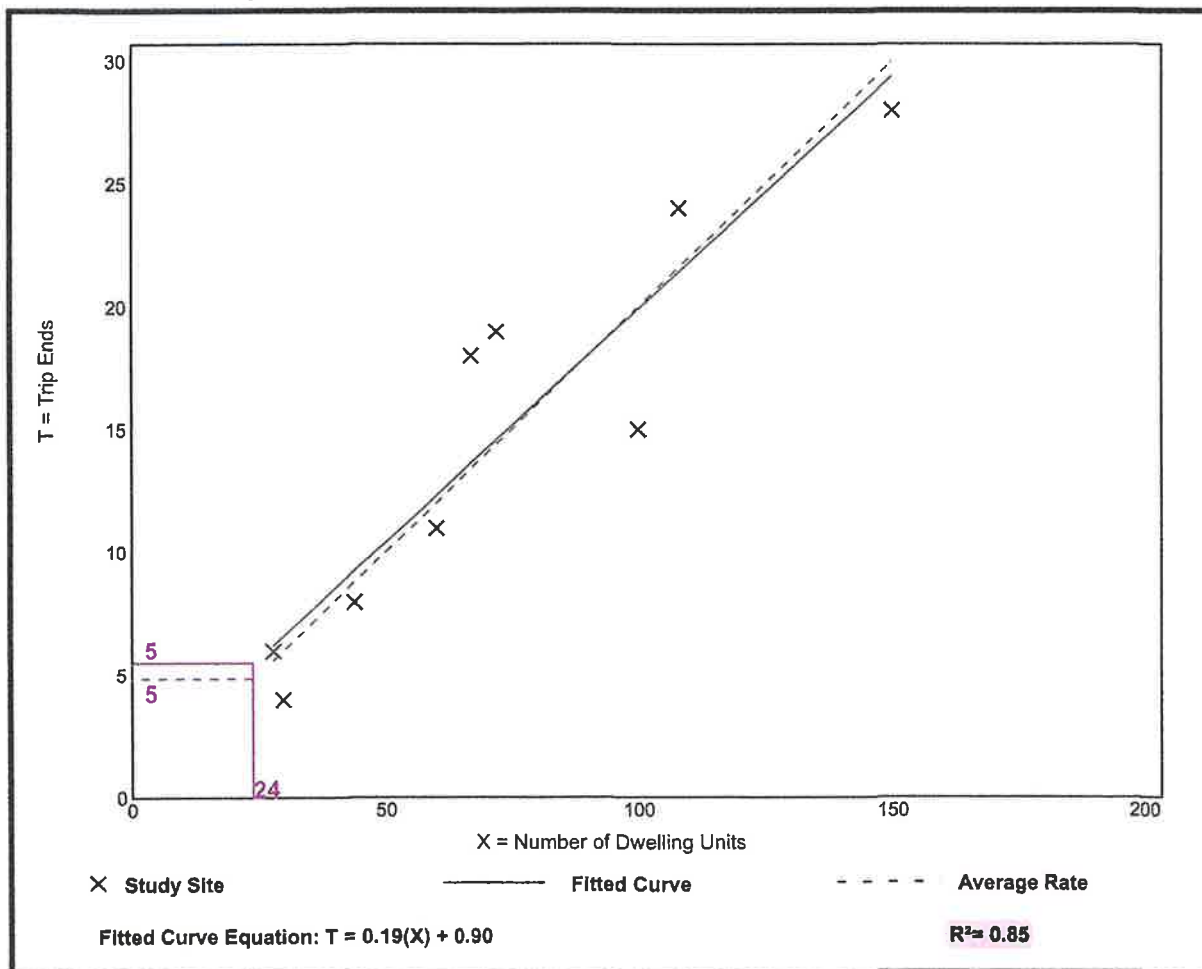
Avg. Num. of Dwelling Units: 73

Directional Distribution: 34% entering, 66% exiting

### Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.13 - 0.27	0.04

### Data Plot and Equation



## Senior Adult Housing - Multifamily (252)

**Vehicle Trip Ends vs: Dwelling Units**  
**On a: Weekday,**  
**Peak Hour of Adjacent Street Traffic,**  
**One Hour Between 4 and 6 p.m.**

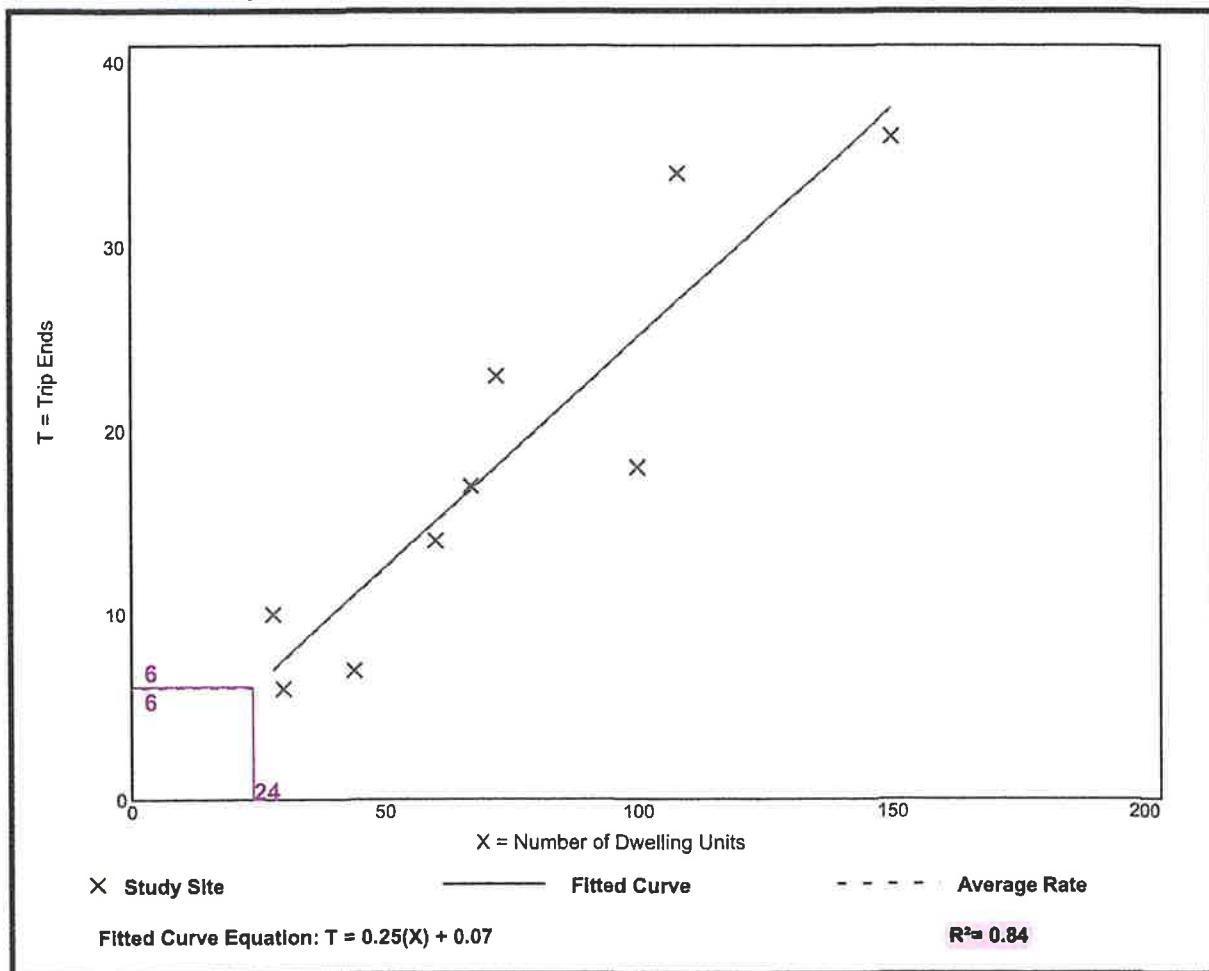
**Setting/Location: General Urban/Suburban**

Number of Studies: 9  
 Avg. Num. of Dwelling Units: 73  
 Directional Distribution: 56% entering, 44% exiting

### Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.25	0.16 - 0.36	0.06

### Data Plot and Equation



# Senior Adult Housing - Multifamily (252)

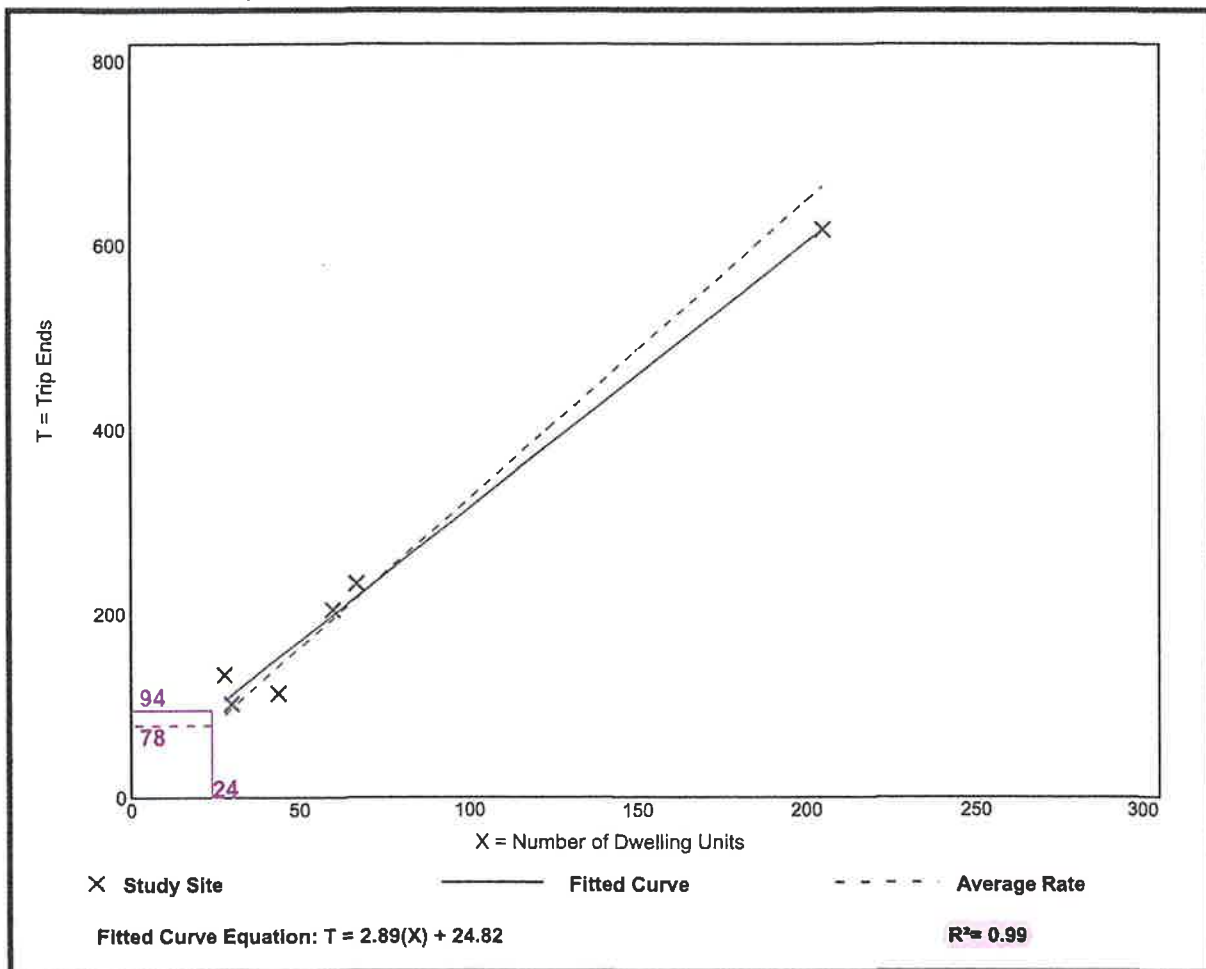
Vehicle Trip Ends vs: Dwelling Units  
On a: Weekday

Setting/Location: General Urban/Suburban  
Number of Studies: 6  
Avg. Num. of Dwelling Units: 72  
Directional Distribution: 50% entering, 50% exiting

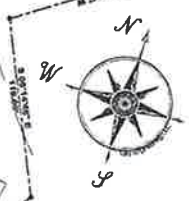
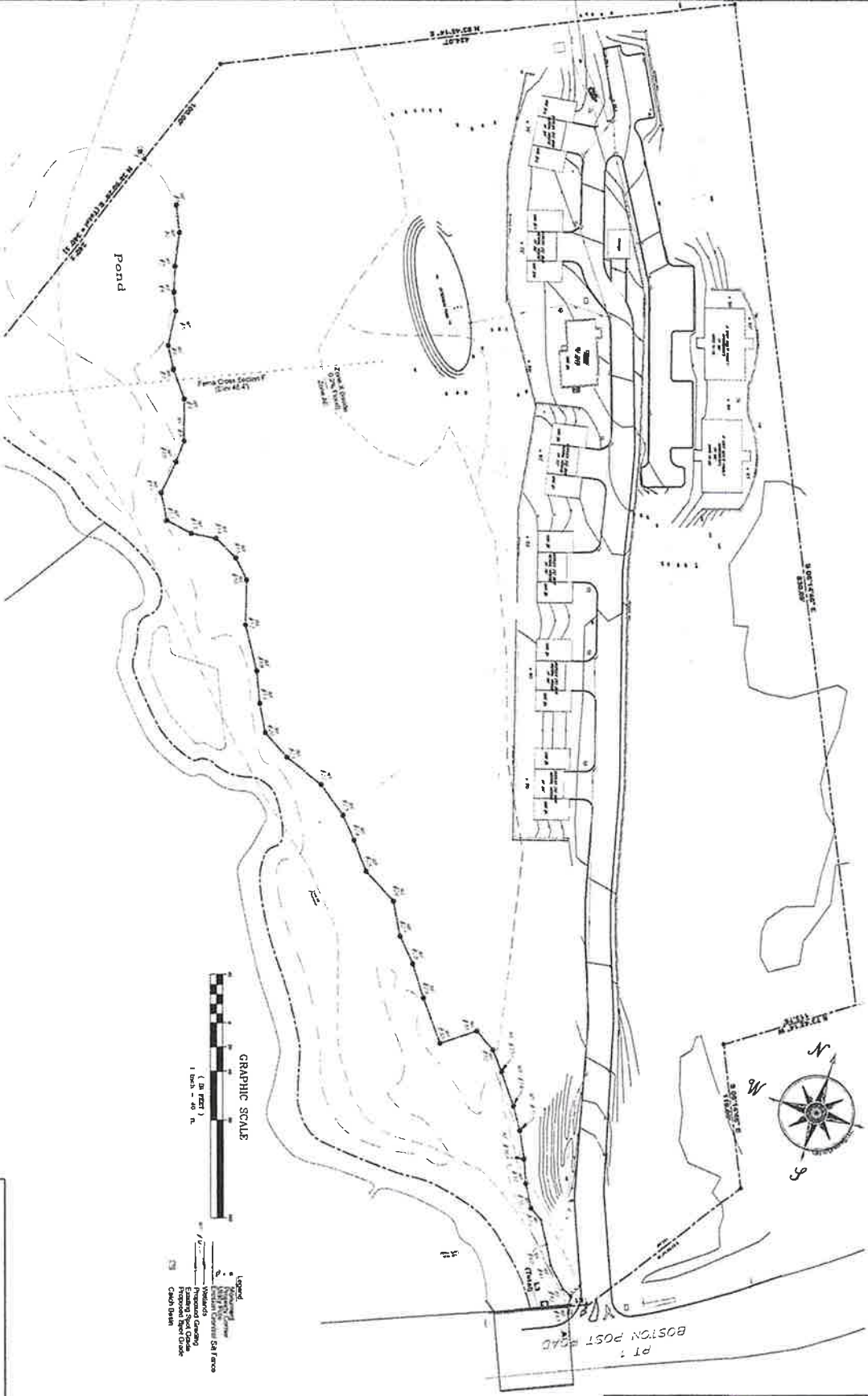
## Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.24	2.59 - 4.79	0.53

## Data Plot and Equation



Appendix B- Site Plan



- Legend**
- Proposed Building Footprint
  - Proposed Parking Lot
  - Proposed Storm Water Collection System
  - Proposed Storm Water Pond
  - Proposed Storm Water Channel
  - Proposed Storm Water Structure
  - Proposed Storm Water Inlet
  - Proposed Storm Water Outlet
  - Proposed Storm Water Valve
  - Proposed Storm Water Manhole
  - Proposed Storm Water Catchment Basin
  - Proposed Storm Water Detention Basin
  - Proposed Storm Water Treatment Basin
  - Proposed Storm Water Storage Basin
  - Proposed Storm Water Distribution Basin
  - Proposed Storm Water Collection Basin
  - Proposed Storm Water Conveyance Basin
  - Proposed Storm Water Discharge Basin
  - Proposed Storm Water Treatment Structure
  - Proposed Storm Water Storage Structure
  - Proposed Storm Water Distribution Structure
  - Proposed Storm Water Collection Structure
  - Proposed Storm Water Conveyance Structure
  - Proposed Storm Water Discharge Structure
  - Proposed Storm Water Treatment Facility
  - Proposed Storm Water Storage Facility
  - Proposed Storm Water Distribution Facility
  - Proposed Storm Water Collection Facility
  - Proposed Storm Water Conveyance Facility
  - Proposed Storm Water Discharge Facility



CONCEPTUAL SITE PLAN  
 AGE RESTRICTED RENTAL HOUSING  
 PER C.G.S. 8-30g  
 91 Boston Post Road  
 East Lyme, Connecticut

**May Engineering LLC**  
 Civil Engineering and Site Planning  
 1297 RT 183 Oxbow, CT 06370  
 860 864-8771

SCALE: 1" = 40'  
 DATE: 15 JANUARY 2024  
 JOB NUMBER: SHEET  
 1 of 1

DESCRIPTION:  
 FEASIBILITY & LAYOUT PLAN