

Theriault, John

From: Theriault, John
Sent: Wednesday, September 14, 2022 2:17 PM
To: 'jadams@bartonandloguidice.com'; 'Randy Dunton'; 'Jason Ready'
Cc: Krieg, Anne M.
Subject: Trip generation for Townhouse

Tracking:	Recipient	Delivery	Read
	'jadams@bartonandloguidice.com'		
	'Randy Dunton'		
	'Jason Ready'		
	Krieg, Anne M.	Delivered: 9/14/2022 2:17 PM	Read: 9/14/2022 6:41 PM

Hi John, Randy, and Jason

Can each of you do me a favor and please provide me with the typical trip generation associated with a development of townhouses being proposed in Bangor. The project includes 30 duplex buildings, so 60 total units.

I am looking for weekday total trips, weekday AM Peak Hour, and weekday PM Peak Hour. Feel free to bill me accordingly. I need this by tomorrow. Call me if you have questions. Thank you for your help.

John Theriault
Bangor City Engineer
992-4249

Theriault, John

From: Jason Ready <jready@vhb.com>
Sent: Wednesday, September 14, 2022 2:54 PM
To: Theriault, John
Cc: Krieg, Anne M.; 'Randy Dunton'; 'jadams@bartonandloguidice.com'
Subject: RE: [External] Trip generation for Townhouse

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John,

For 30 Duplexes (60 Housing Units) sounds like LUC 215 (Single Family Attached Housing) and, using the ITE Trip Generation Manual 11th Edition, would be (average rate):

<u>LUC</u>	<u>Name</u>	<u>Time</u>	<u>Quantity</u>	<u>Rate</u>	<u>Total</u>
215	Single Family Attached Housing	Daily	60	7.20	432
215	Single Family Attached Housing	AM Peak Hour	60	0.55	33
215	Single Family Attached Housing	PM Peak Hour	60	0.61	37

There isn't too much of a difference if you use the fitted curve for the totals:

<u>LUC</u>	<u>Name</u>	<u>Time</u>	<u>Total</u>
215	Single Family Attached Housing	Daily	407
215	Single Family Attached Housing	AM Peak Hour	33
215	Single Family Attached Housing	PM Peak Hour	39

No Charge.

Let me know if you need anything else.

Jason Ready, PE, PTOE, PTP

Senior Traffic Engineer

Licensed in ME

P 207.430.9631 | M 207.944.2745

www.vhb.com

From: Theriault, John <john.theriault@bangormaine.gov>
Sent: Wednesday, September 14, 2022 2:17 PM
To: 'jadams@bartonandloguidice.com' <jadams@bartonandloguidice.com>; 'Randy Dunton' <rdunton@gorrillpalmer.com>; Jason Ready <jready@vhb.com>
Cc: Krieg, Anne M. <anne.krieg@bangormaine.gov>
Subject: [External] Trip generation for Townhouse

Theriault, John

From: Randy Dunton <rdunton@gorrillpalmer.com>
Sent: Wednesday, September 14, 2022 3:18 PM
To: Theriault, John; 'Jason Ready'
Cc: Krieg, Anne M.; 'jadams@bartonandloguidice.com'
Subject: RE: [External] Trip generation for Townhouse
Attachments: SKM_C360i22091415080.pdf

Importance: High

WARNING: This email originated outside of our organization. Messages claiming or appearing to be from someone within our organization may be fraudulent. **DO NOT CLICK** links or attachments unless you can verify the sender and know the content is safe.

Hi John,

We concur with the limited information that Jason provided. However, if you want even more information such as adjacent street trip generation, I have attached the reports so you can be better informed. 😊

Randy Dunton P.E., PTOE | Project Manager



707 Sable Oaks Drive, Suite 30 | South Portland, ME 04106
207.772.2515 x 246 (office) | 207.239.7430 (mobile)
www.gorrillpalmer.com

From: Theriault, John <john.theriault@bangormaine.gov>
Sent: Wednesday, September 14, 2022 3:04 PM
To: 'Jason Ready' <jready@vhb.com>
Cc: Krieg, Anne M. <anne.krieg@bangormaine.gov>; Randy Dunton <rdunton@gorrillpalmer.com>; 'jadams@bartonandloguidice.com' <jadams@bartonandloguidice.com>
Subject: RE: [External] Trip generation for Townhouse

Thank you. Please know that it will not go unnoticed that Jason was the first to get back to me.

Sincerely,

John Theriault

Land Use: 215

Single-Family Attached Housing

Description

Single-family attached housing includes any single-family housing unit that shares a wall with an adjoining dwelling unit, whether the walls are for living space, a vehicle garage, or storage space.

Additional Data

The database for this land use includes duplexes (defined as a single structure with two distinct dwelling units, typically joined side-by-side and each with at least one outside entrance) and townhouses/rowhouses (defined as a single structure with three or more distinct dwelling units, joined side-by-side in a row and each with an outside entrance).

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, the 2000s, and the 2010s in British Columbia (CAN), California, Georgia, Illinois, Maryland, Massachusetts, Minnesota, New Jersey, Ontario (CAN), Oregon, Pennsylvania, South Dakota, Utah, Virginia, and Wisconsin.

Source Numbers

168, 204, 211, 237, 305, 306, 319, 321, 357, 390, 418, 525, 571, 583, 638, 735, 868, 869, 870, 896, 912, 959, 1009, 1046, 1056, 1058, 1077

Single-Family Attached Housing (215)

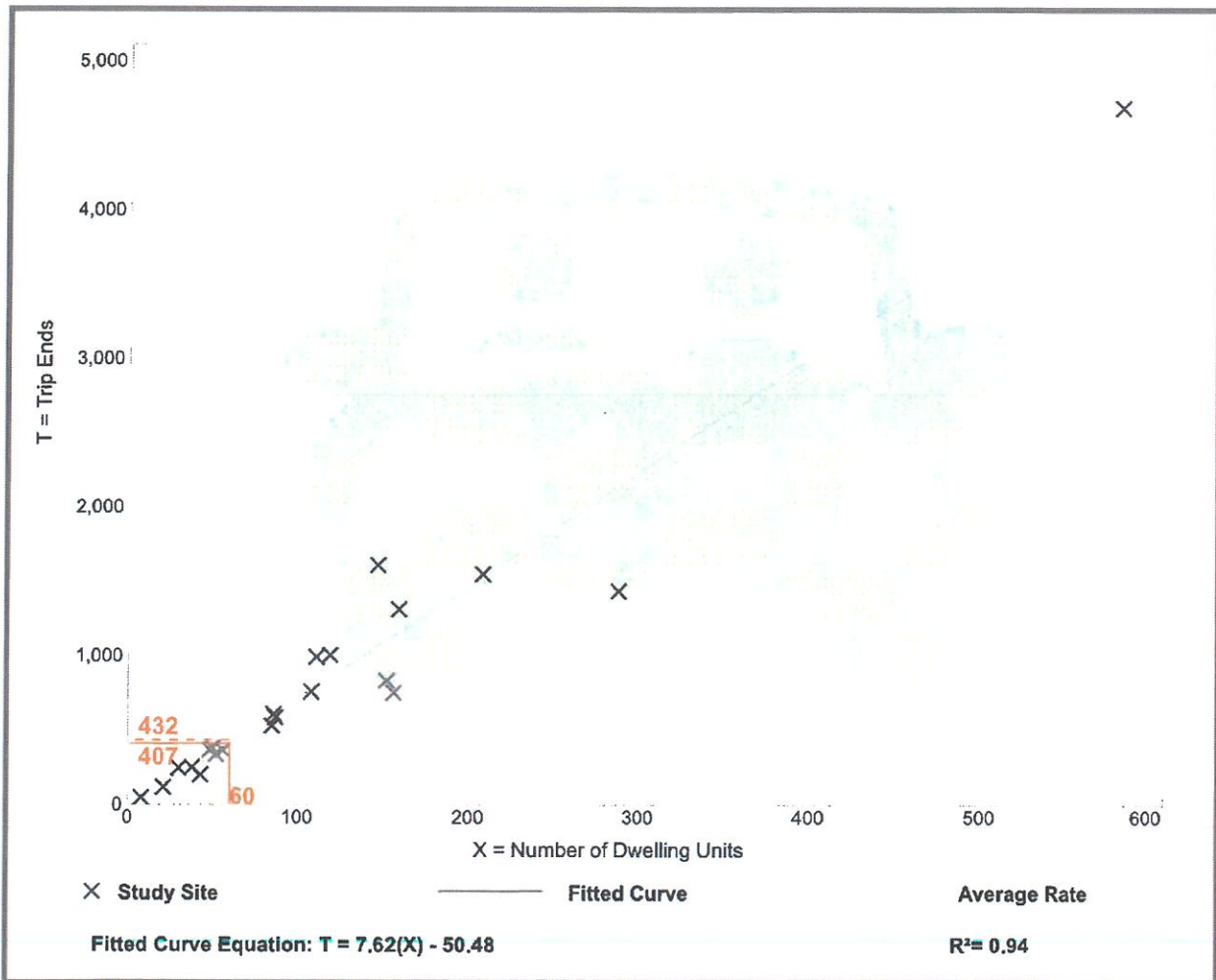
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 120
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
7.20	4.70 - 10.97	1.61

Data Plot and Equation



Single-Family Attached Housing (215)

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: 46

Avg. Num. of Dwelling Units: 135

Directional Distribution: 31% entering, 69% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate

0.48

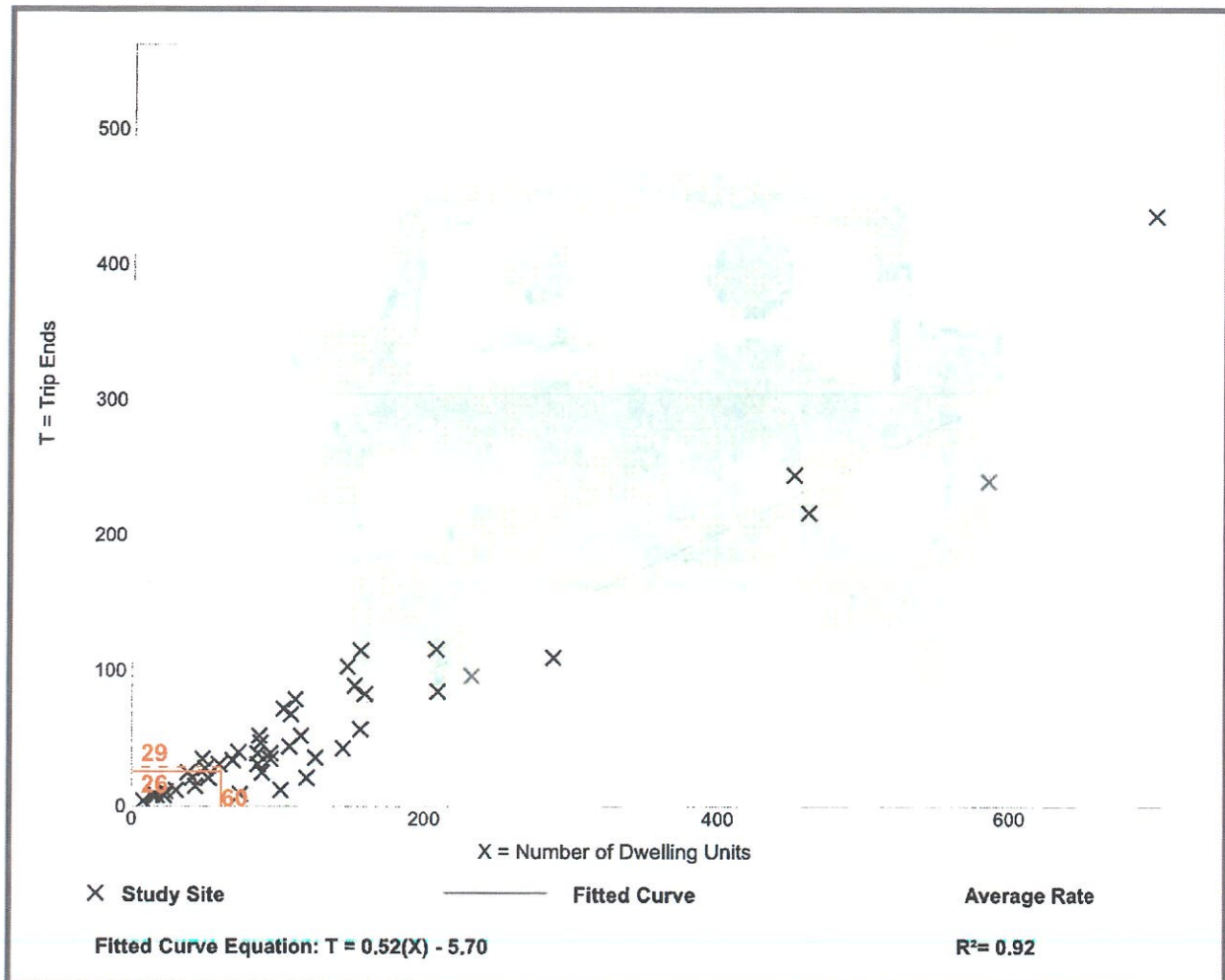
Range of Rates

0.12 - 0.74

Standard Deviation

0.14

Data Plot and Equation



Single-Family Attached Housing (215)

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: 51

Avg. Num. of Dwelling Units: 136

Directional Distribution: 57% entering, 43% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate

0.57

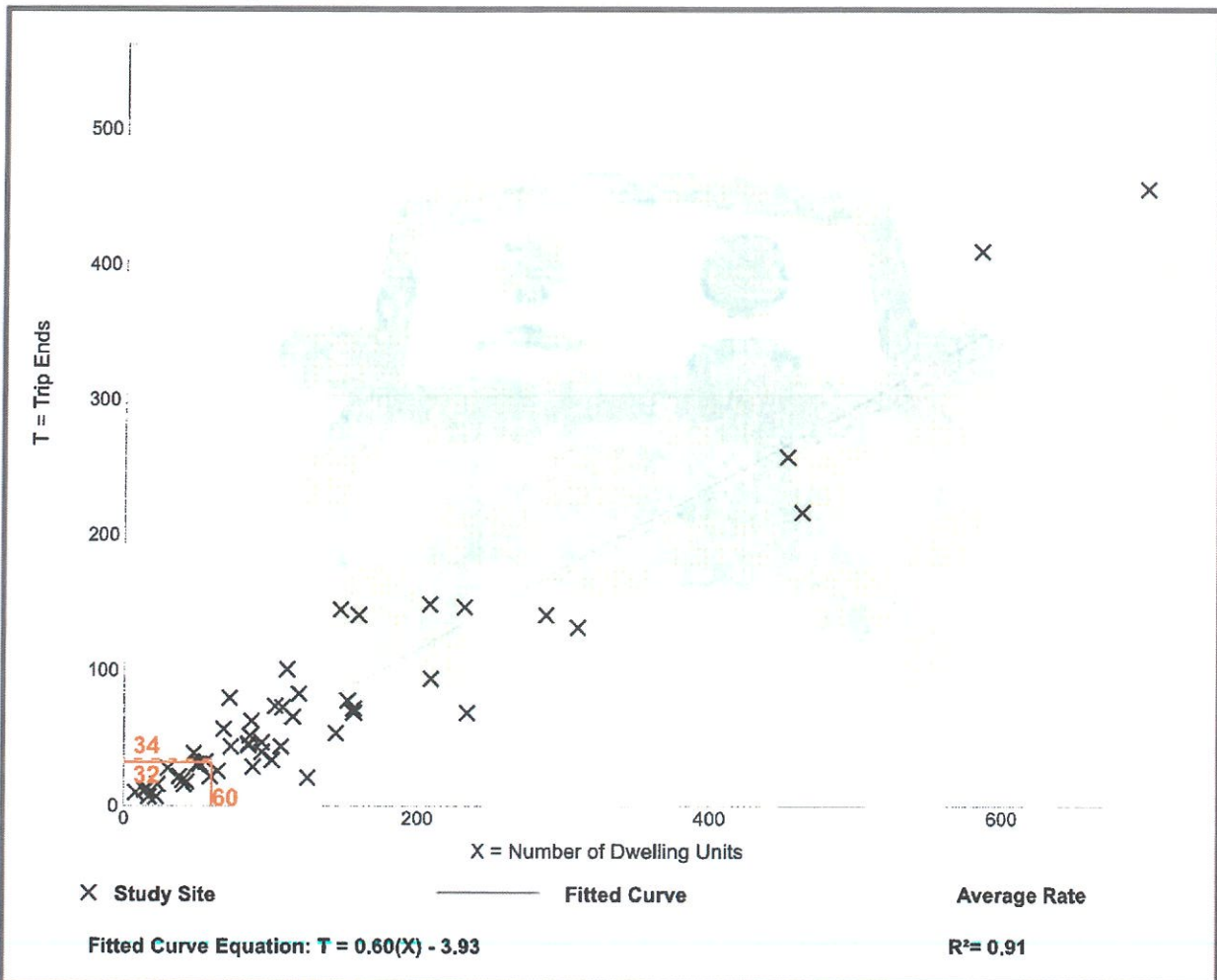
Range of Rates

0.17 - 1.25

Standard Deviation

0.18

Data Plot and Equation



Single-Family Attached Housing (215)

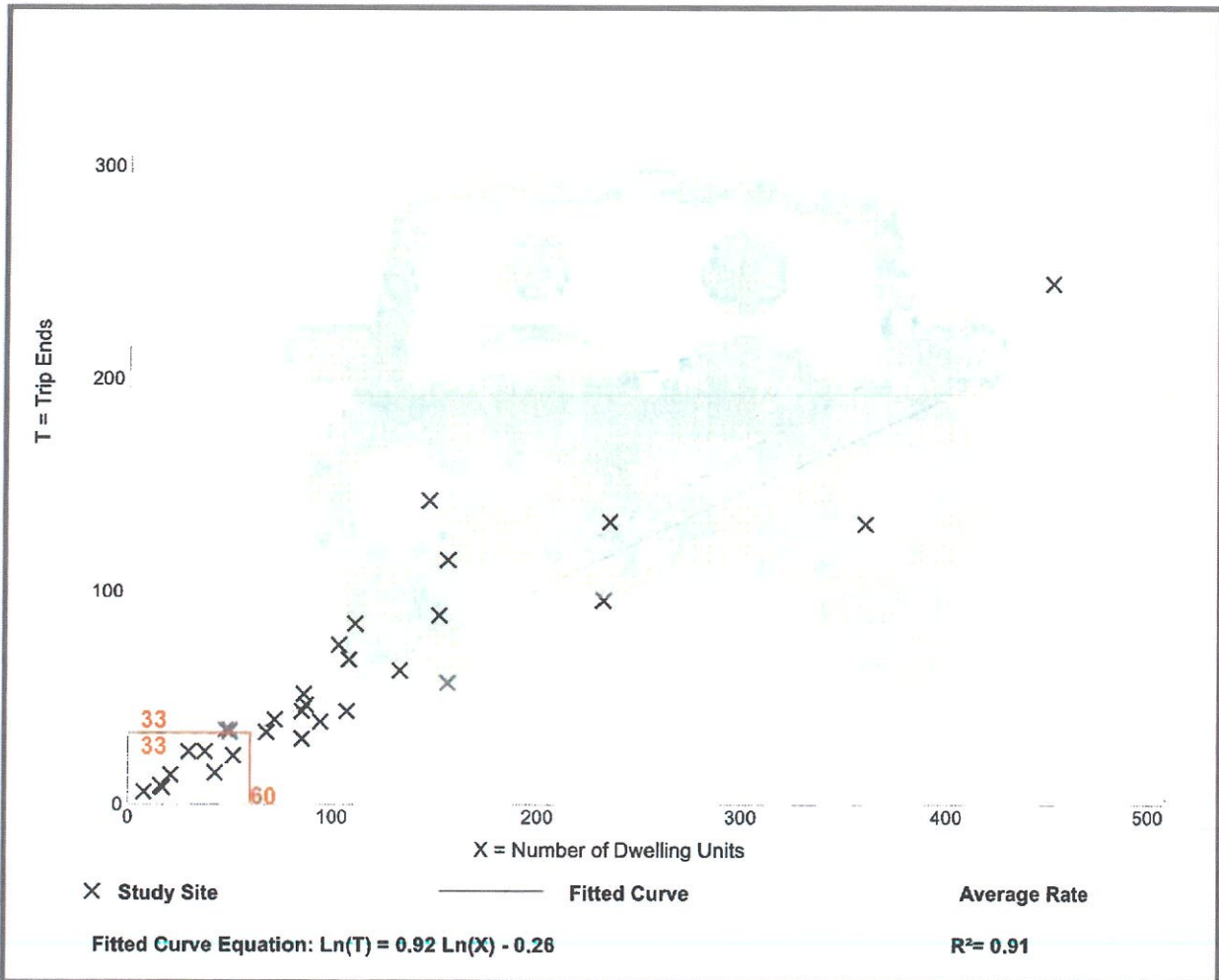
Vehicle Trip Ends vs: Dwelling Units
 On a: Weekday,
 AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 31
 Avg. Num. of Dwelling Units: 110
 Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.55	0.35 - 0.97	0.16

Data Plot and Equation



Single-Family Attached Housing (215)

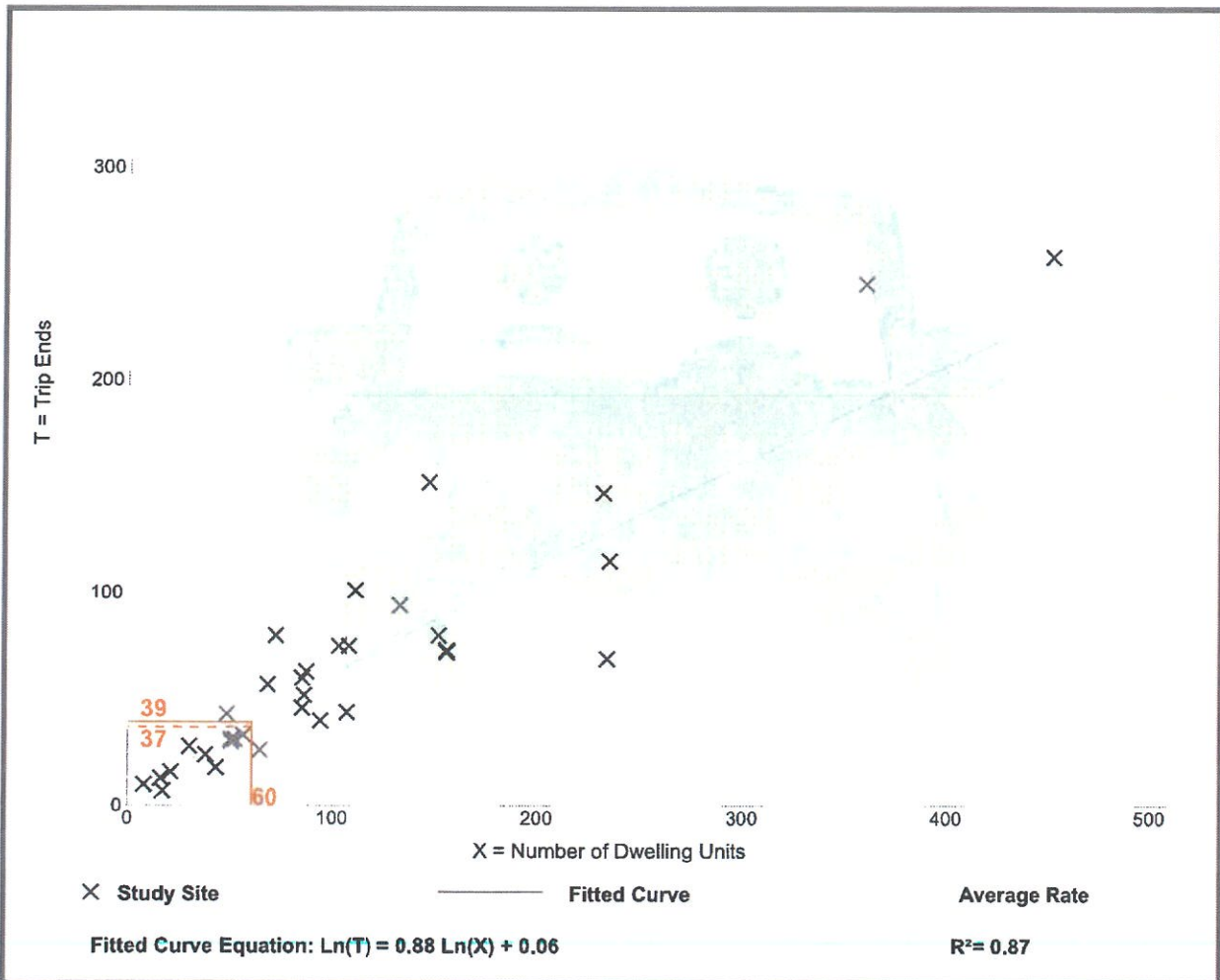
Vehicle Trip Ends vs: Dwelling Units
 On a: Weekday,
 PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
 Number of Studies: 34
 Avg. Num. of Dwelling Units: 110
 Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.61	0.29 - 1.25	0.18

Data Plot and Equation



Single-Family Attached Housing (215)

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

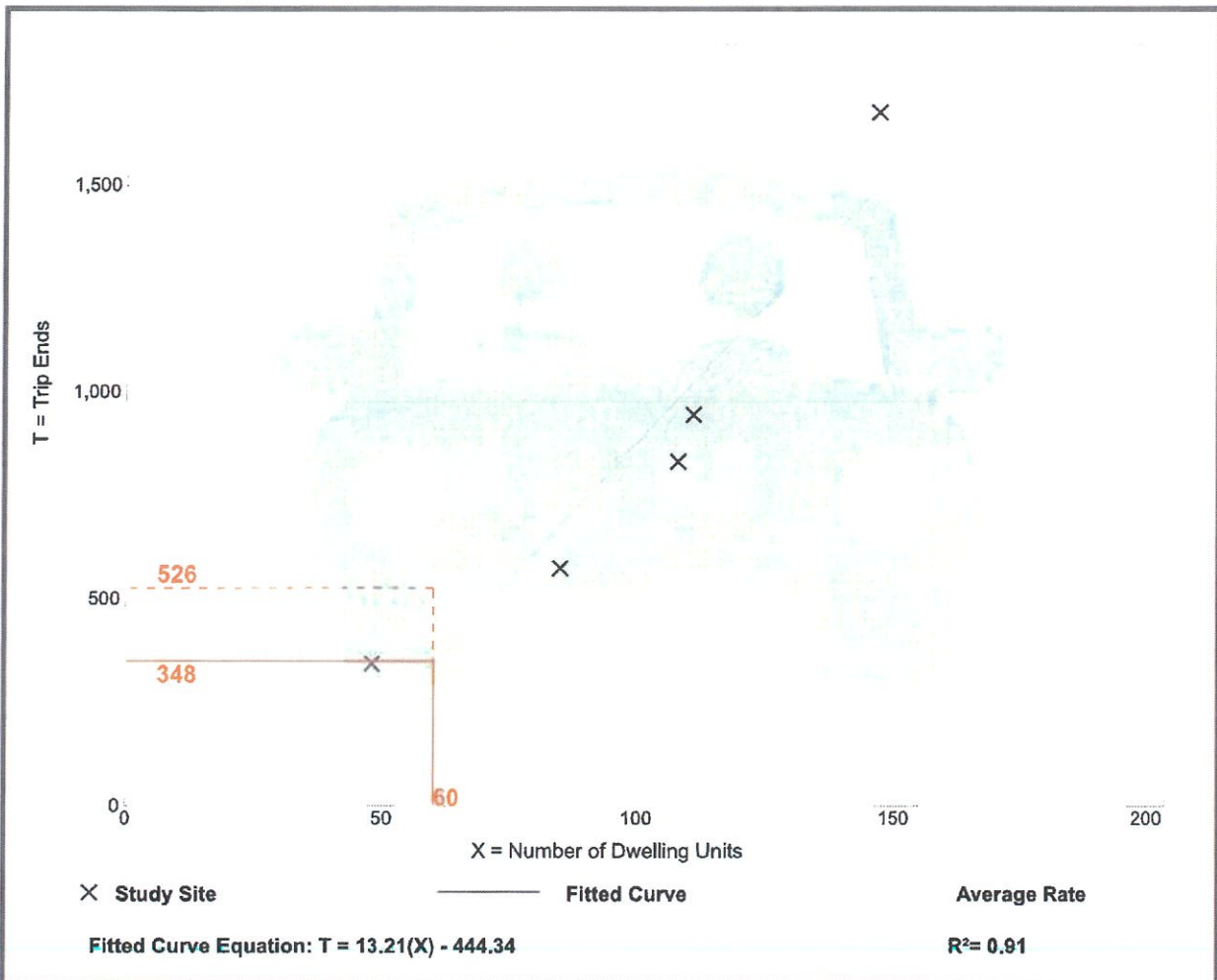
Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 100
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
8.76	6.75 - 11.40	2.02

Data Plot and Equation

Caution – Small Sample Size



Single-Family Attached Housing (215)

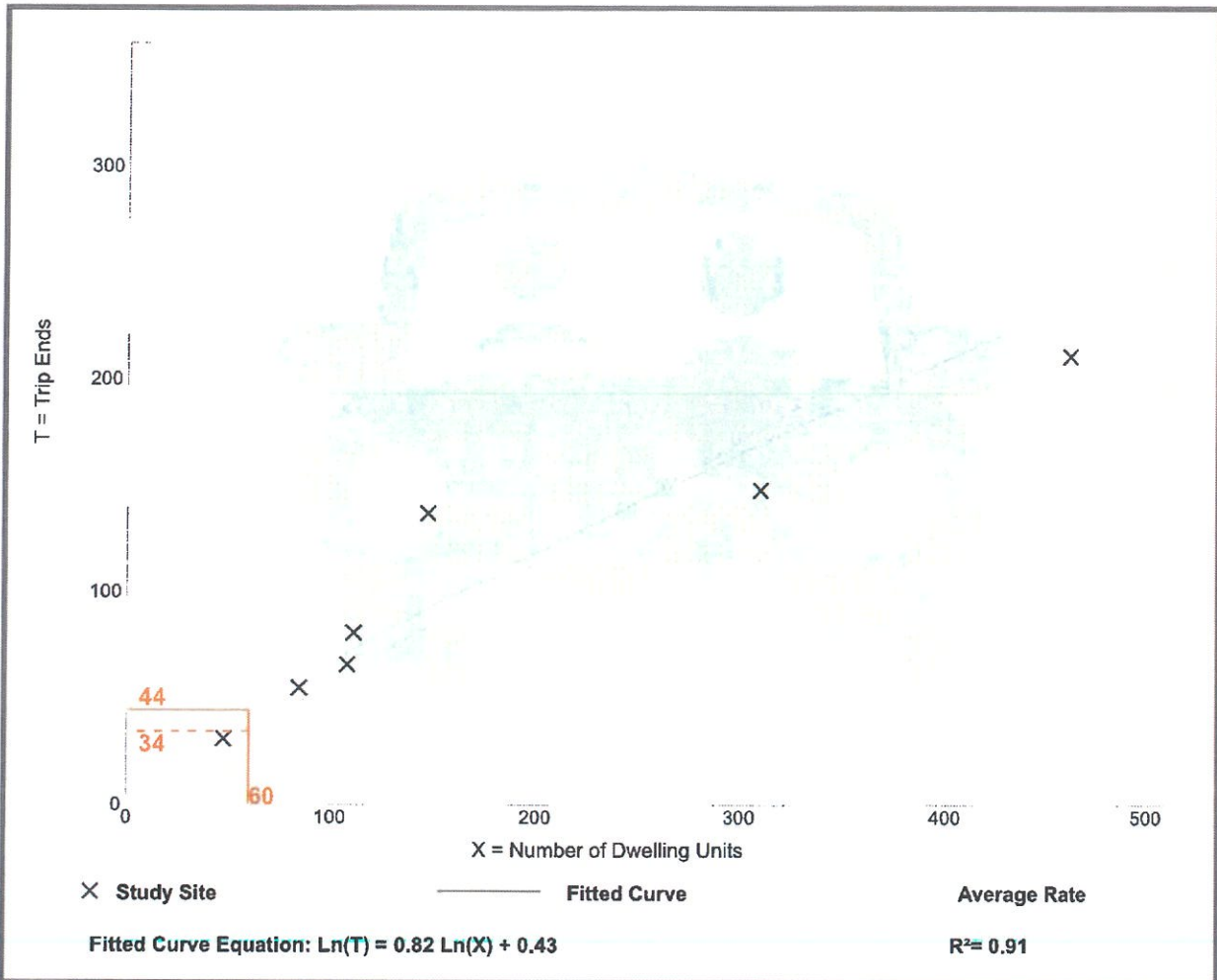
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 7
Avg. Num. of Dwelling Units: 182
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.46 - 0.93	0.17

Data Plot and Equation



Theriault, John

From: John Q. Adams <jadams@bartonandloguidice.com>
Sent: Tuesday, September 20, 2022 1:41 PM
To: Theriault, John
Subject: RE: Trip generation for Townhouse
Attachments: 30 Duplex Residential_Trip Gen.xlsx

Importance: High

WARNING: This email originated outside of our organization. Messages claiming or appearing to be from someone within our organization may be fraudulent. **DO NOT CLICK** links or attachments unless you can verify the sender and know the content is safe.

John,

Here you go, sorry for delay!

John

John Q. Adams, P.E., P.T.O.E.
Associate

Barton&Loguidice

Mobile: 207.331.6694

Email: jadams@bartonandloguidice.com

[Website](#) | [LinkedIn](#) | [Twitter](#) | [Facebook](#) | [Vimeo](#)

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From: Theriault, John <john.theriault@bangormaine.gov>
Sent: Monday, September 19, 2022 4:02 PM
To: John Q. Adams <jadams@bartonandloguidice.com>
Cc: Jacob Sirois <jsirois@bartonandloguidice.com>
Subject: RE: Trip generation for Townhouse

ATTENTION --> This email came from an external source. Do not open attachments or click on links from unknown senders or unexpected emails.

Hey were you guys going to provide some numbers for this?? I am not looking for anything fancy or elaborate. Thank you.

John Theriault
992-4249

Bangor - Proposed 30 Duplex (60 Unit) Residential Development

LAND USE CODE 215, SINGLE-FAMILY ATTACHED HOUSING TRIP GENERATION CALCULATIONS							
Time Period	Size (# of units)	Trip Generation Rate (Trips Per Unit)	Trips Generated	Distribution Entering / Exiting	Enter	Exit	
Weekday	60	7.20	432	50% / 50%	216	216	
AM Weekday Peak Hour (Street)	60	0.48	29	31% / 69%	9	20	
PM Weekday Peak Hour (Street)	60	0.57	35	57% / 43%	20	15	
AM Weekday Peak Hour (Generator)	60	0.55	33	25% / 75%	8	25	
PM Weekday Peak Hour (Generator)	60	0.61	37	62% / 38%	23	14	

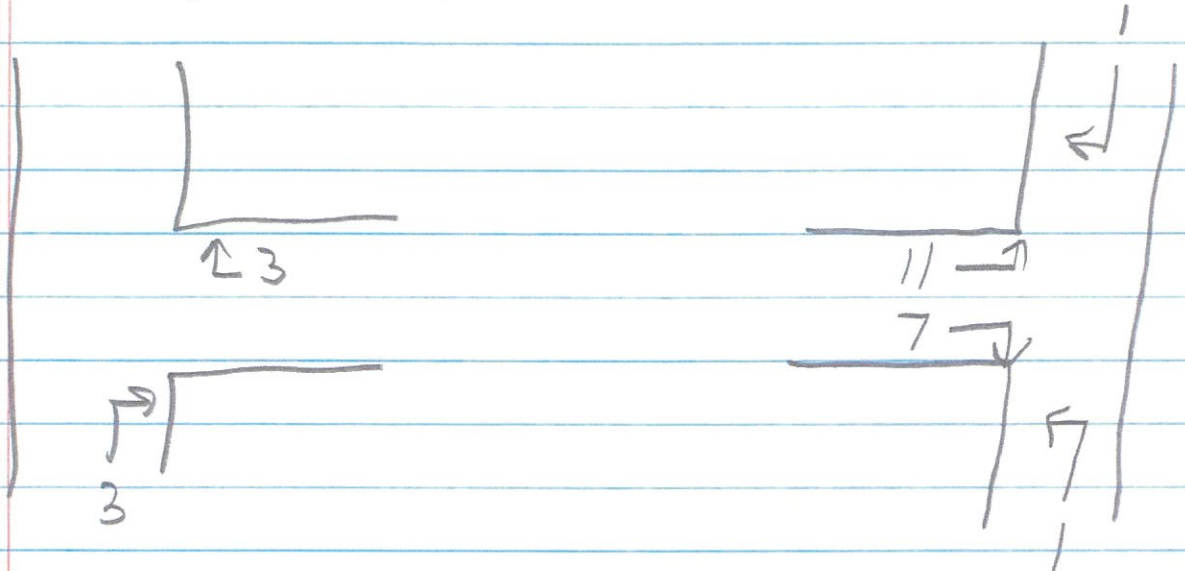
Reference: ITE Trip Gen Manual, 11th Edition

LANCASTER
ADD'L TRAFFIC

7-27-2022

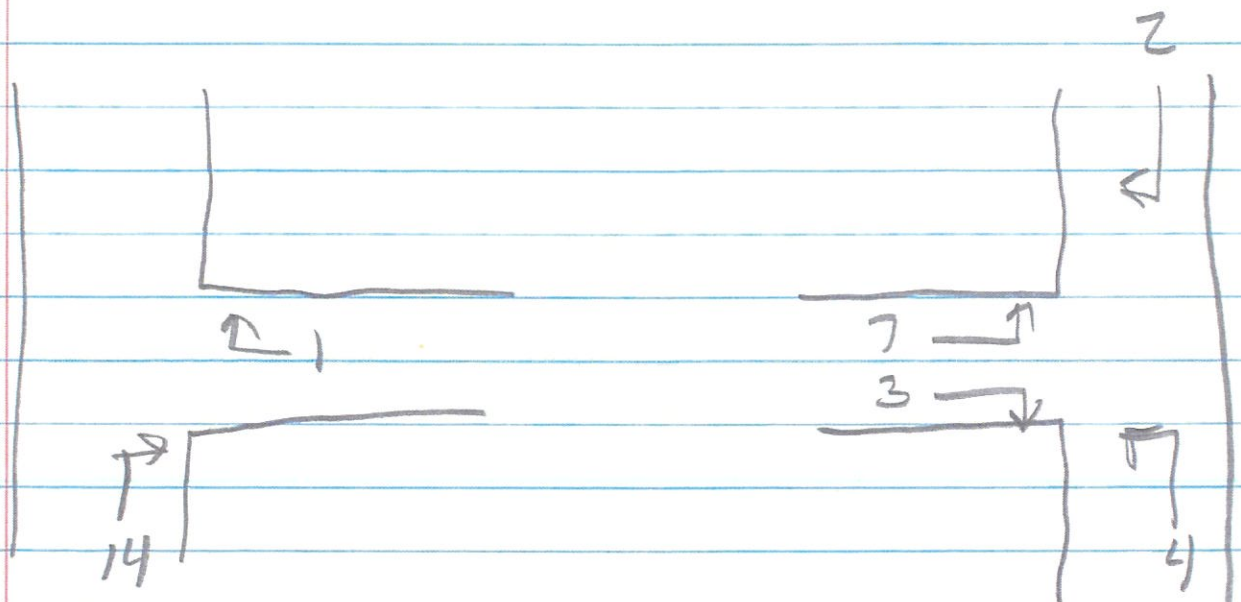
AM PEAK

26 TRIPS \Rightarrow 21 OUT 5 IN



PM PEAK

31 TRIPS \Rightarrow 20 IN 11 OUT



Residential Condominium/Townhouse (230)

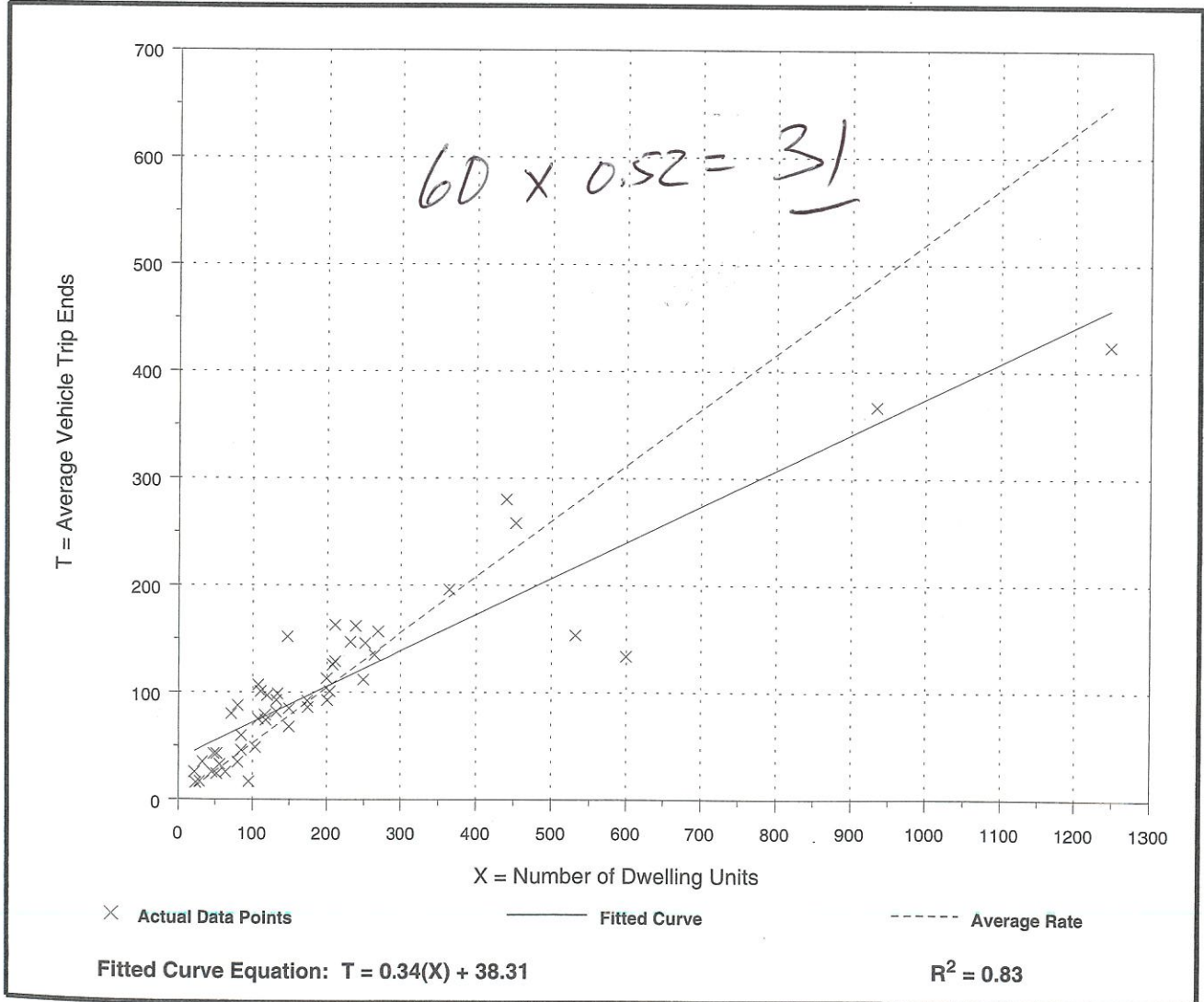
Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
P.M. Peak Hour of Generator

Number of Studies: 50
 Avg. Number of Dwelling Units: 204
 Directional Distribution: 64% entering, 36% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.52	0.18 - 1.24	0.75

Data Plot and Equation



Residential Condominium/Townhouse (230)

Average Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
A.M. Peak Hour of Generator

Number of Studies: 52
 Avg. Number of Dwelling Units: 201
 Directional Distribution: 18% entering, 82% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.44	0.15 - 0.97	0.68

Data Plot and Equation

