14 October 2016; **Revised: 13 July 2017**

Ms. Vivian Bonet
Ocean Land Investments, Inc.
1800 E. Las Olas Boulevard
Fort Lauderdale, Florida 33301

Re: Riverwalk Residences at Las Olas Traffic Impact Statement
Fort Lauderdale, Florida
Langan Project No.: 330019401

Dear Ms. Bonet:

Langan Engineering & Environmental Services, Inc. prepared this traffic analysis for Riverwalk Residences at Las Olas (Project) located at 333 North New River Drive, Fort Lauderdale, Florida (folio 5042-10-05-0010). **Attachment A** provides an aerial photograph of the project's location. The project is a proposed multi-story building that will replace an existing office building. The project includes senior independent living facilities, assisted living facilities, hotel suites and a small retail area and is expected to be built-out by 2019. A copy of the ground floor site plan is included in **Attachment B**. This analysis evaluates the project's estimated vehicle trip generation.

We prepared daily, morning peak hour and afternoon peak hour vehicle trip estimates for the project using equations from the 9th Edition of the Institute of Transportation Engineers' *Trip Generation Manual*. The 8-suite hotel is considered an ancillary use and will allow guests of residents to stay there. It will not generate additional traffic because it will only serve people who are visiting residents of the building. A pass-by reduction was applied to the retail land use to account for automobile drivers that visit the retail use on their way to another destination. An internalization reduction was applied to account for the interaction between the residential and retail land uses. These reduction rates are from the ITE *9th Edition User's Guide and Handbook*.

The trip generation estimates for the proposed land use are summarized in **Table 1** and show that the project is expected to generate 1,250 daily, 72 morning peak hour and 107 afternoon peak-hour vehicle trips. However, the net-new vehicle trips generated by the site after applying credit for the existing office building will be 921 daily, 27 morning peak hour and 10 afternoon peak hour net-new trips. We calculated the trip generation of the existing office building and subtracted it from the project's trips to estimate the number of net new trips. Trip generation tables, internalization tables and excerpts from the ITE manual are included in **Attachment C**.

Table 1 - Trip Generation Analysis

USE	Size	Daily	Weekday Morning Peak Hour			Weekday Afternoon Peak Hour		
			In	Out	Total	In	Out	Total
Existing Use								
General Office	16,199 SF	329	40	5	45	16	81	97
Proposed Uses								
Senior Adult Housing - Attached	192 DU's	586	13	25	38	24	21	45
Assisted Living Facility	238 Beds	626	21	12	33	21	28	49
Specialty Retail	1,619 SF	38	1	0	1	6	7	13
Total		1,250	35	37	72	51	56	107
Net New Trips		**921**	**-5**	**32**	**27**	**35**	**-25**	**10**

Section 47-25 of the City of Fort Lauderdale's Unified Land Development Code requires a traffic impact study for projects that generate more than 1,000 trips per day or if it is expected to generate 20 percent of its daily traffic within a one half-hour period. This project does not meet either criterion. Therefore, no further traffic analysis should be required. Please contact me at (786) 264-7226 with any questions or comments.

Sincerely,

Langan Engineering and Environmental Services, Inc.

JOHN P. KIM
LICENSE
No. 62400
STATE OF FLORIDA
PROFESSIONAL ENGINEER
7/13/2017

John P. Kim, P.E., PTOE
Professional Engineer - License No. 62400
Florida Certification Authorization No. 6601

Eric Schwarz, P.E., LEED AP
Principal/Vice President

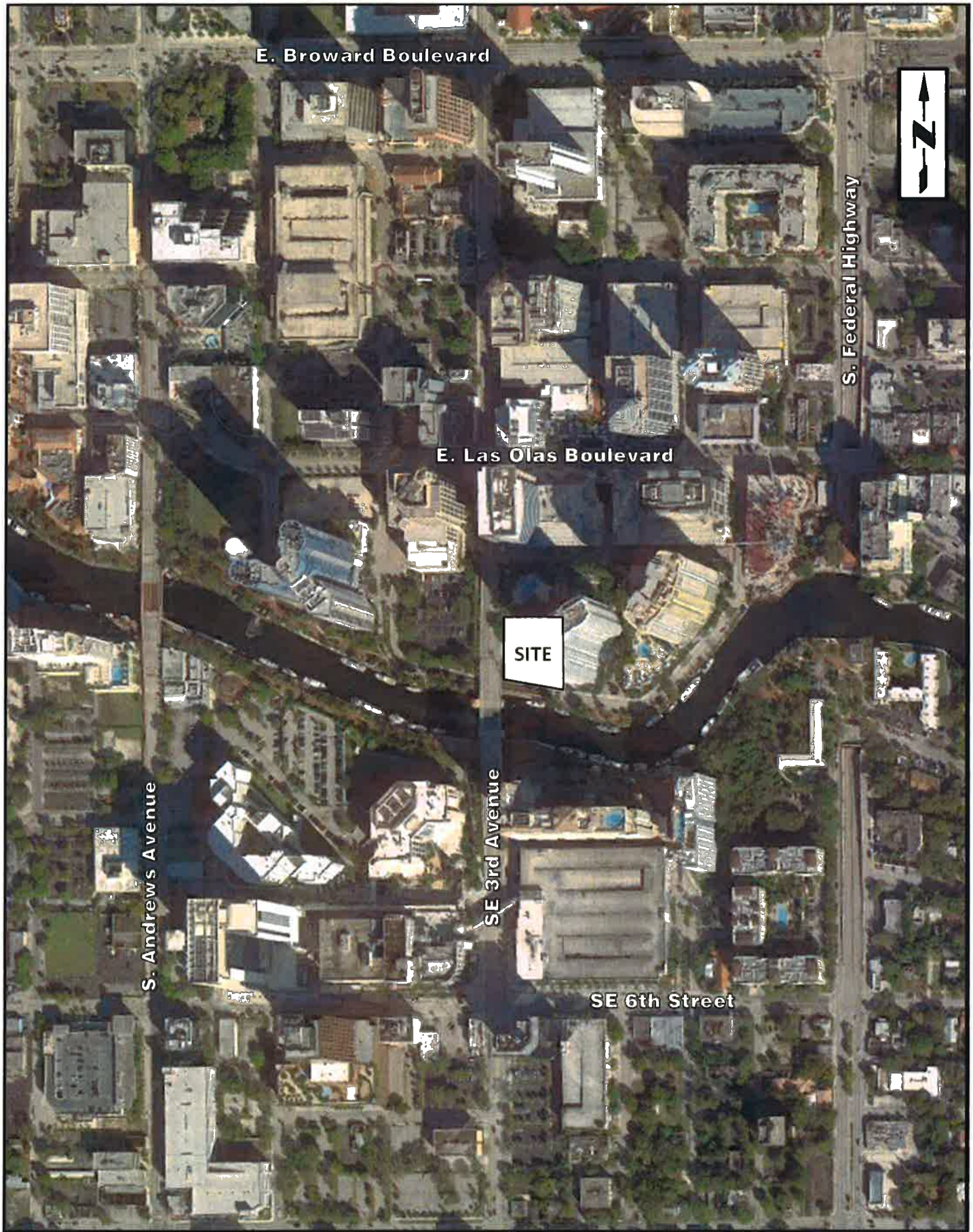
JPK:jpk

Attachments:

Attachment A – Site Aerial Photograph
Attachment B – Site Plan
Attachment C – Trip Generation Tables and Data

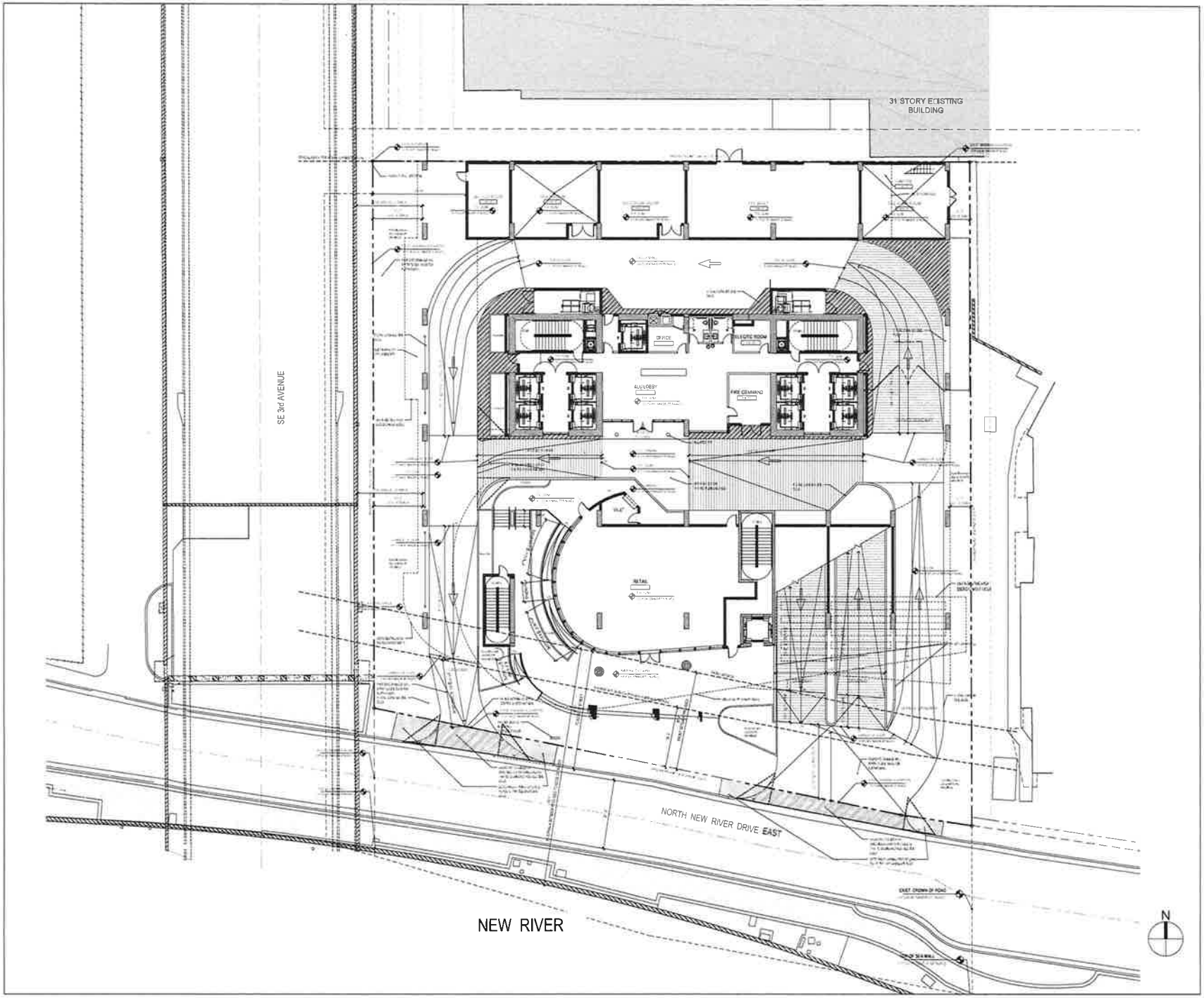
1 \\langan.com\data\FTL\data4\330019401\Engineering Data\Traffic\Report Materials\2017-07-13 Report\2017-07-13 New River ALF TIS.docx

ATTACHMENT A
SITE AERIAL PHOTOGRAPH



LANGAN ENGINEERING & ENVIRONMENTAL SERVICES 15150 NW 79th Court, Suite 200, Miami Lakes, FL 33016 P: 786.264.7221 F: 786.264.7201 www.langan.com FL CERTIFICATE OF AUTHORIZATION No. 00006601	Project **RIVERWALK RESIDENCES AT LAS OLAS** CITY OF FORT LAUDERDALE BROWARD COUNTY FLORIDA	Figure Title **SITE LOCATION MAP**	Project No. 330019401 Date 3/15/2017 Scale NTS	

ATTACHMENT B
SITE PLAN



ISSUE DATE: 02.24.2017

No	DATE	DESCRIPTION

borges architects + associates

architecture urban planning interior design

OWNER

PROJECT TEAM

STRUCTURAL ENGINEERS
CHIN STRUCTURAL ENGINEERS
7300 SW 117TH AVE #122
MIAMI, FL 33183
305 378 2338

MEP ENGINEERS
STEVEN FELLER

CIVIL ENGINEER
LANGAN
110 EAST BROWARD BLVD #1700
FT. LAUDERDALE, FL 33301
954 320 8180

LIFE SAFETY
SLS CONSULTING, INC.
1825 PONCE DE LEON BLVD #685
CORAL GABLES, FL 33134
786 536 7611

LANDSCAPE ARCHITECT
cadence
438 N ANDREWS AVE, NO 2
FORT LAUDERDALE, FL 33301
954 764 4572

PROJECT NAME

RIVERWALK RESIDENCES
OF LAS OLAS

333 N. NEW RIVER DRIVE
FT. LAUDERDALE, FL 33304

PROJECT NUMBER 161050

DRAWING NAME

SITE PLAN

SCALE 3/32" = 1'-0"

DRAWING NUMBER A-101

ATTACHMENT C
TRIP GENERATION TABLES AND DATA

TRIP GENERATION ANALYSIS
RIVERWALK RESIDENCES AT LAS OLAS

DAILY

Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips			Internal Trips				External Trips			Pass-by		Net New Trips		
						In	Out	Total	In	Out	Total	%	In	Out	Total	Trips	%	In	Out	Total
Existing Use																				
Office	710	16,199 SF	Ln (T) = 0.76 Ln(X) + 3.68	50%	50%	165	164	329	0	0	0	0	165	164	329	0	0%	165	164	329
Proposed Uses																				
Senior Adult Housing - Attached	252	192 DU's	T = 2.98 (X) + 21.05	50%	50%	297	296	593	4	3	7	1.2%	293	293	586	0	0%	293	293	586
Assisted Living Facility	254	238 Beds	T = 2.66 (X)	50%	50%	317	316	633	4	3	7	1.1%	313	313	626	0	0%	313	313	626
Specialty Retail	826	1,619 SF	T = 44.32 (X)	50%	50%	36	36	72	6	8	14	19.4%	30	28	58	20	34%	20	18	38
					Total	**650**	**648**	**1,298**	**14**	**14**	**28**		**636**	**634**	**1,270**	**20**		**626**	**624**	**1,250**
					Difference	**485**	**484**	**969**	**14**	**14**	**28**		**471**	**470**	**941**	**20**		**461**	**460**	**921**

MORNING PEAK HOUR

Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips			Internal Trips				External Trips			Pass-by		Net New Trips		
						In	Out	Total	In	Out	Total	%	In	Out	Total	Trips	%	In	Out	Total
Existing Use																				
Office	710	16,199 SF	Ln (T) = 0.8 Ln(X) + 1.57	88%	12%	40	5	45	0	0	0	0	40	5	45	0	0%	40	5	45
Proposed Uses																				
Senior Adult Housing - Attached	252	192 DU's	T = 0.2 (X) - 0.13	34%	66%	13	25	38	0	0	0	0.0%	13	25	38	0	0%	13	25	38
Assisted Living Facility	254	238 Beds	T = 0.14 (X)	65%	35%	21	12	33	0	0	0	0.0%	21	12	33	0	0%	21	12	33
Specialty Retail*	826	1,619 SF	T = 0.96 (X)	62%	38%	1	1	2	0	0	0	0.0%	1	1	2	1	34%	1	0	1
					Total	**35**	**38**	**73**	**0**	**0**	**0**		**35**	**38**	**73**	**1**		**35**	**37**	**72**
					Difference	**-5**	**33**	**28**	**0**	**0**	**0**	**0**	**-5**	**33**	**28**	**1**	**0**	**-5**	**32**	**27**

* Used shopping center rate for morning specialty retail

AFTERNOON PEAK HOUR

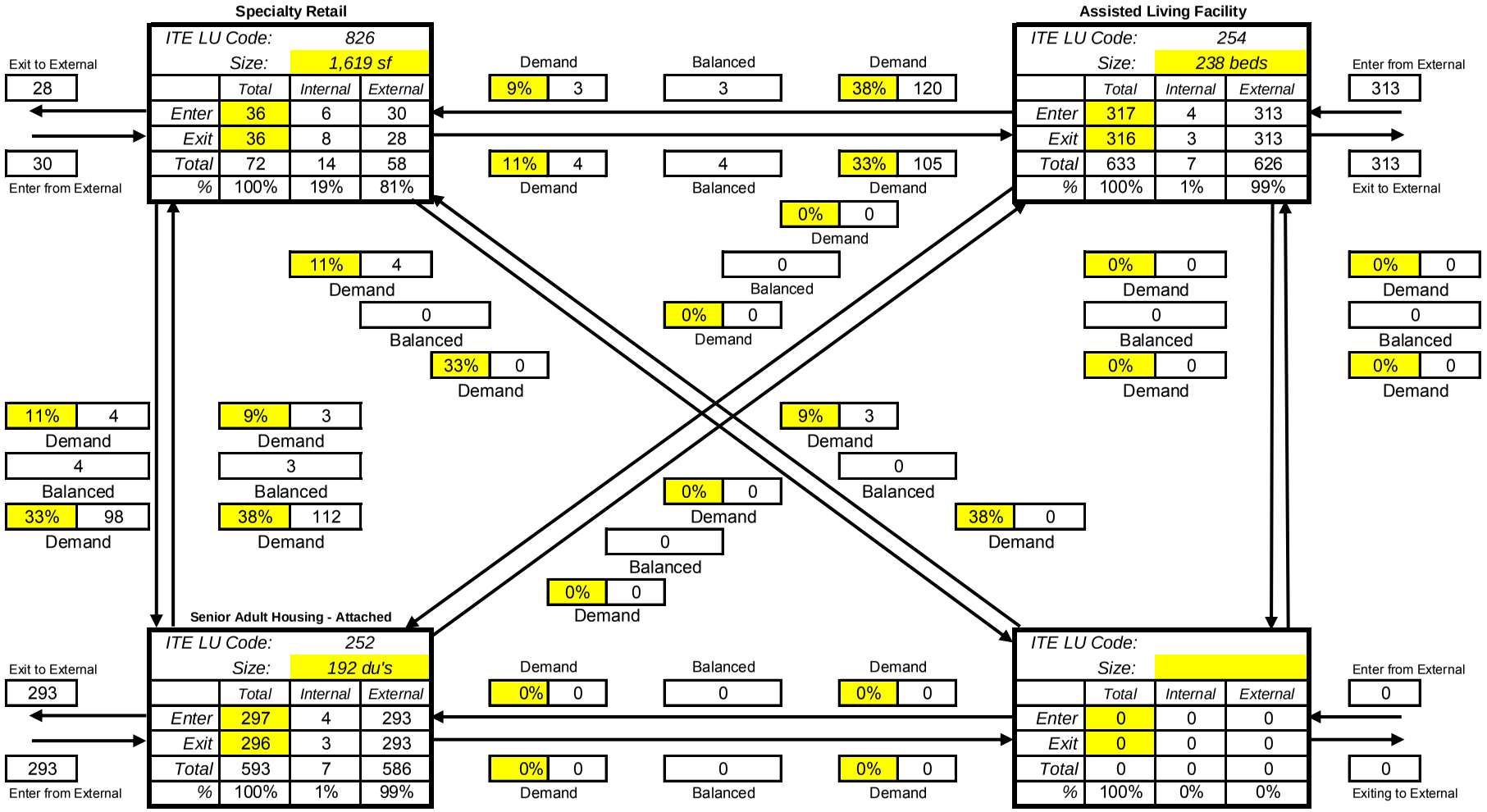
Land Use	ITE Code	Intensity	Trip Generation Rate	In	Out	Total Trips			Internal Trips				External Trips			Pass-by		Net New Trips		
						In	Out	Total	In	Out	Total	%	In	Out	Total	Trips	%	In	Out	Total
Existing Use																				
Office	710	16,199 SF	T = 1.12 (X) + 78.45	17%	83%	16	81	97	0	0	0	0	16	81	97	0	0%	16	81	97
Proposed Uses																				
Senior Adult Housing - Attached	252	192 DU's	T = 0.24 (X) + 1.64	54%	46%	26	22	48	2	1	3	6.3%	24	21	45	0	0%	24	21	45
Assisted Living Facility	254	238 Beds	T = 0.22 (X)	44%	56%	23	29	52	2	1	3	5.8%	21	28	49	0	0%	21	28	49
Specialty Retail	826	1,619 SF	T = 2.4 (X) + 21.48	44%	56%	11	14	25	2	4	6	24.0%	9	10	19	6	34%	6	7	13
					Total	**60**	**65**	**125**	**6**	**6**	**12**		**54**	**59**	**113**	**6**		**51**	**56**	**107**
					Difference	**44**	**-16**	**28**	**6**	**6**	**12**	**0**	**38**	**-22**	**16**	**6**	**0**	**35**	**-25**	**10**

LANGAN
ENGINEERING & ENVIRONMENTAL SERVICES

Analyst JPK
Data 3/15/2017

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY

Name of Dvlpt River Walk Residences
Time Period Daily



Net External Trips for Multi-Use Development

	Specialty Retail	Assisted Living Facility	enior Adult Housing - Attache	0	TOTAL
Enter	30	313	293	0	636
Exit	28	313	293	0	634
Total	58	626	586	0	1270
Single-Use Trip Gen.Est	72	633	593	0	1298

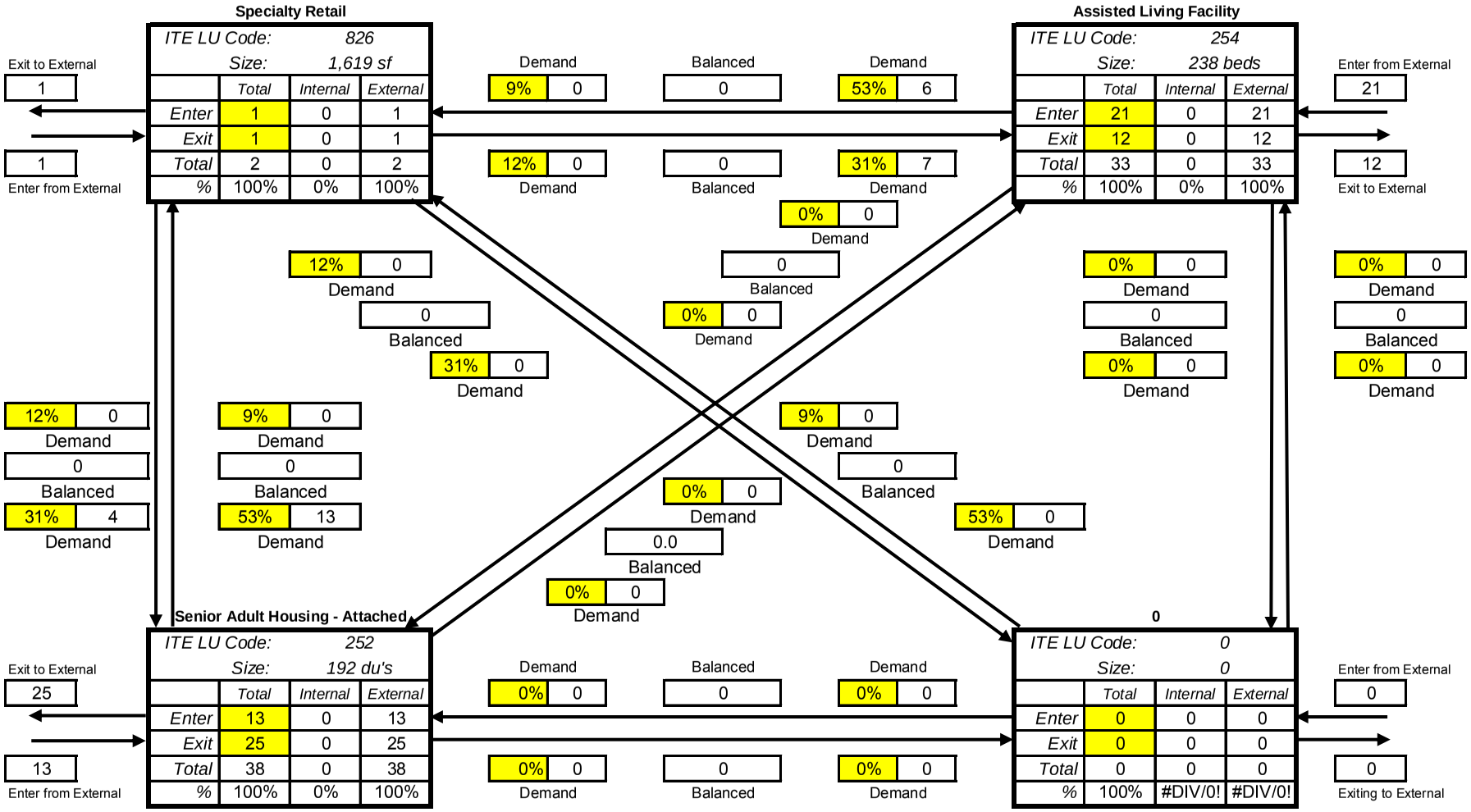
Source: Kaku Associates, Inc.

INTERNAL CAPTURE 2%

Analyst JPK
Data 3/15/2017

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY

Name of Dvlpt River Walk Residences
Time Period AM Peak Hour



Net External Trips for Multi-Use Development

	Specialty Retail	Assisted Living Facility	Senior Adult Housing - Attache		TOTAL
Enter	1	21	13	0	35
Exit	1	12	25	0	38
Total	2	33	38	0	73
Single-Use Trip Gen.Est	2	33	38	0	73

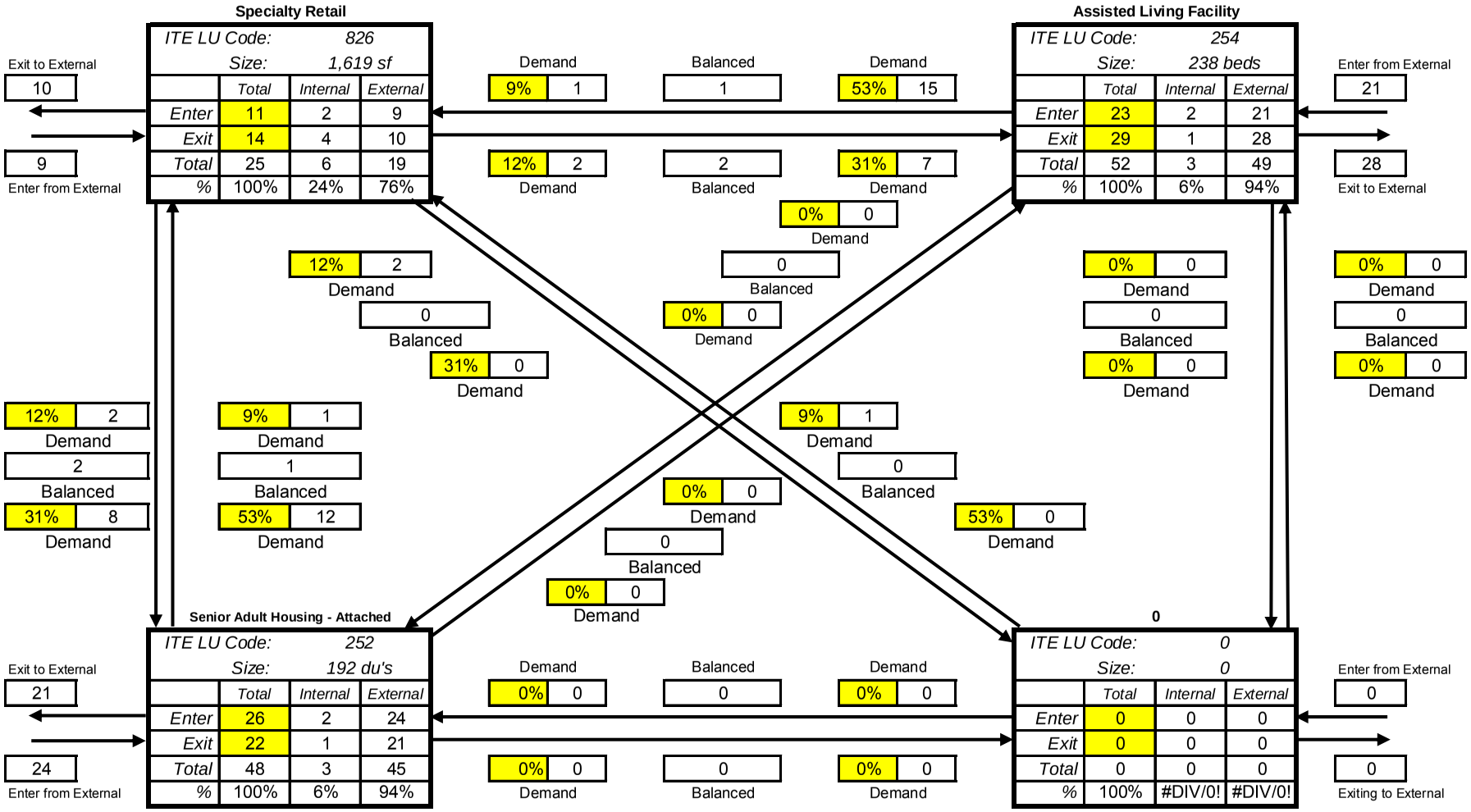
Source: Kaku Associates, Inc.

INTERNAL CAPTURE 0%

Analyst JPK
Data 3/15/2017

MULTI-USE DEVELOPMENT
TRIP GENERATION
AND INTERNAL CAPTURE SUMMARY

Name of Dvlpt River Walk Residences
Time Period PM Peak Hour



Net External Trips for Multi-Use Development

	Specialty Retail	Assisted Living Facility	Senior Adult Housing - Attache		TOTAL
Enter	9	21	24	0	54
Exit	10	28	21	0	59
Total	19	49	45	0	113
Single-Use Trip Gen.Est	25	52	48	0	125

Source: Kaku Associates, Inc.

INTERNAL CAPTURE 10%

Specialty Retail Center
(826)

Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Leasable Area
On a: Weekday

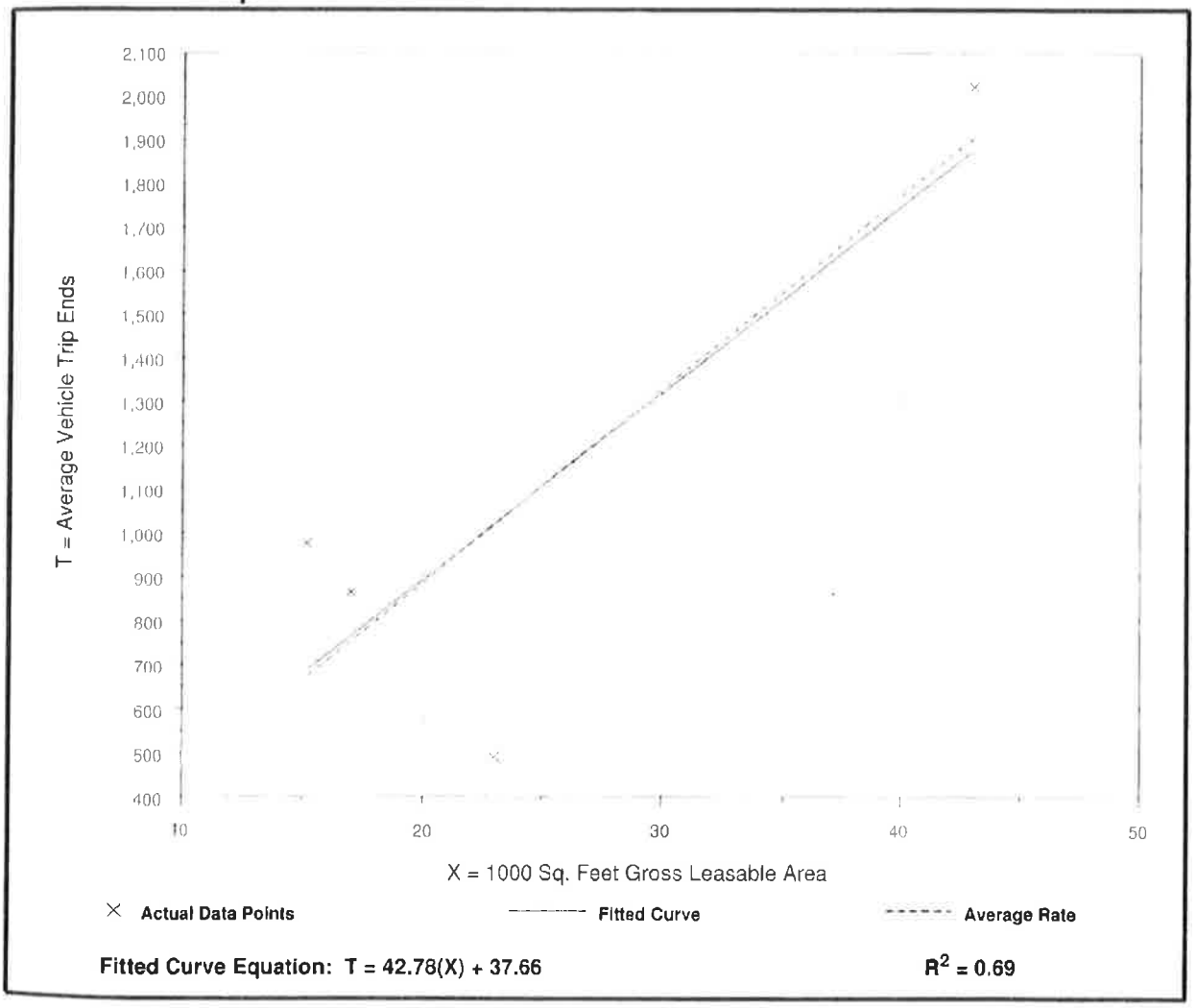
Number of Studies: 4
Average 1000 Sq. Feet GLA: 25
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Leasable Area

Average Rate	Range of Rates	Standard Deviation
44.32	21.30 - 64.21	15.52

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: T = 42.78(X) + 37.66

R^2 = 0.69

Shopping Center
(820)

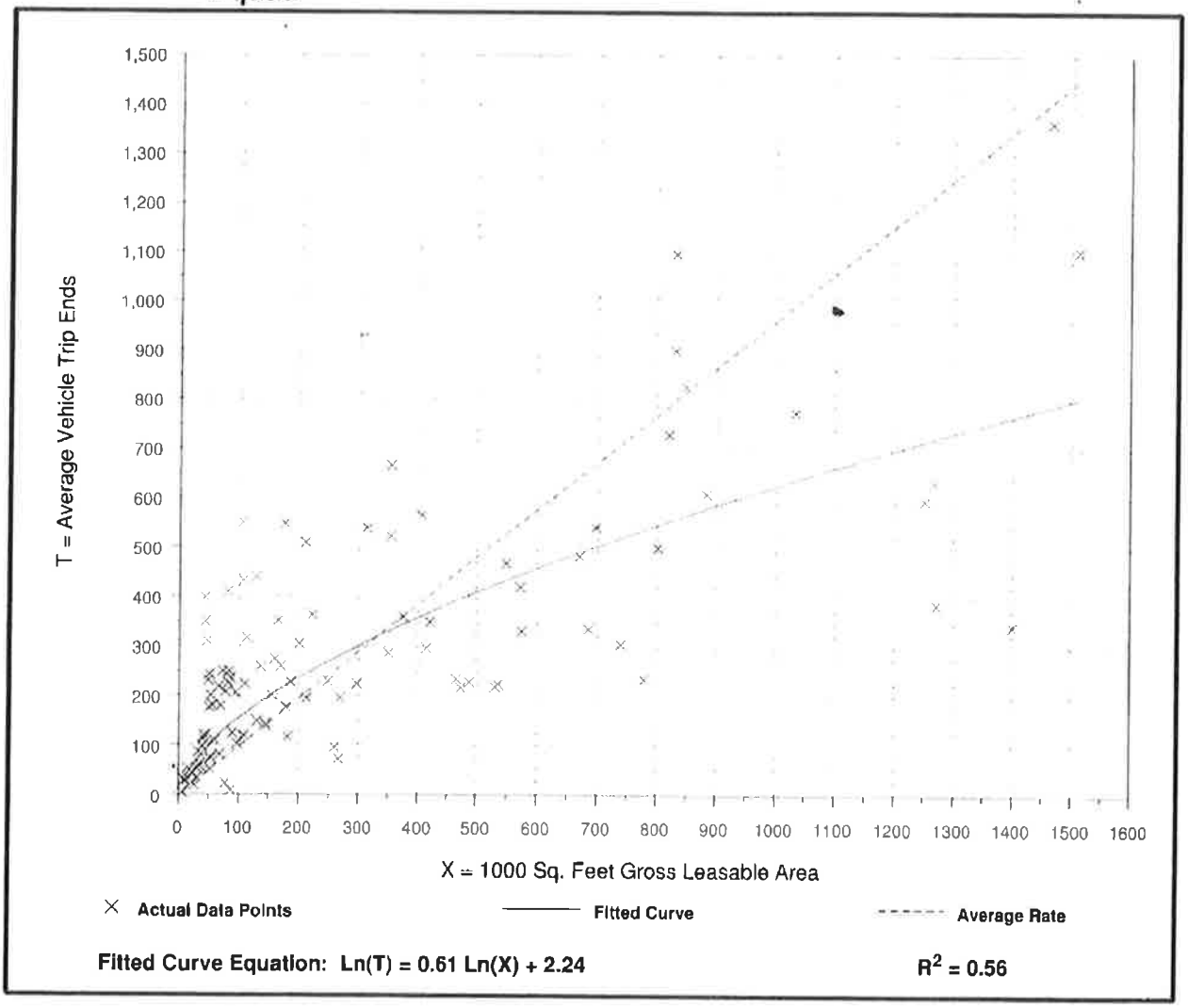
Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Leasable Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 104
Average 1000 Sq. Feet GLA: 310
Directional Distribution: 62% entering, 38% exiting

Trip Generation per 1000 Sq. Feet Gross Leasable Area

Average Rate	Range of Rates	Standard Deviation
0.96	0.10 - 9.05	1.31

Data Plot and Equation



Fitted Curve Equation: $Ln(T) = 0.61\ Ln(X) + 2.24$

$R^2 = 0.56$

Specialty Retail Center
(826)

Average Vehicle Trip Ends vs: **1000 Sq. Feet Gross Leasable Area**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

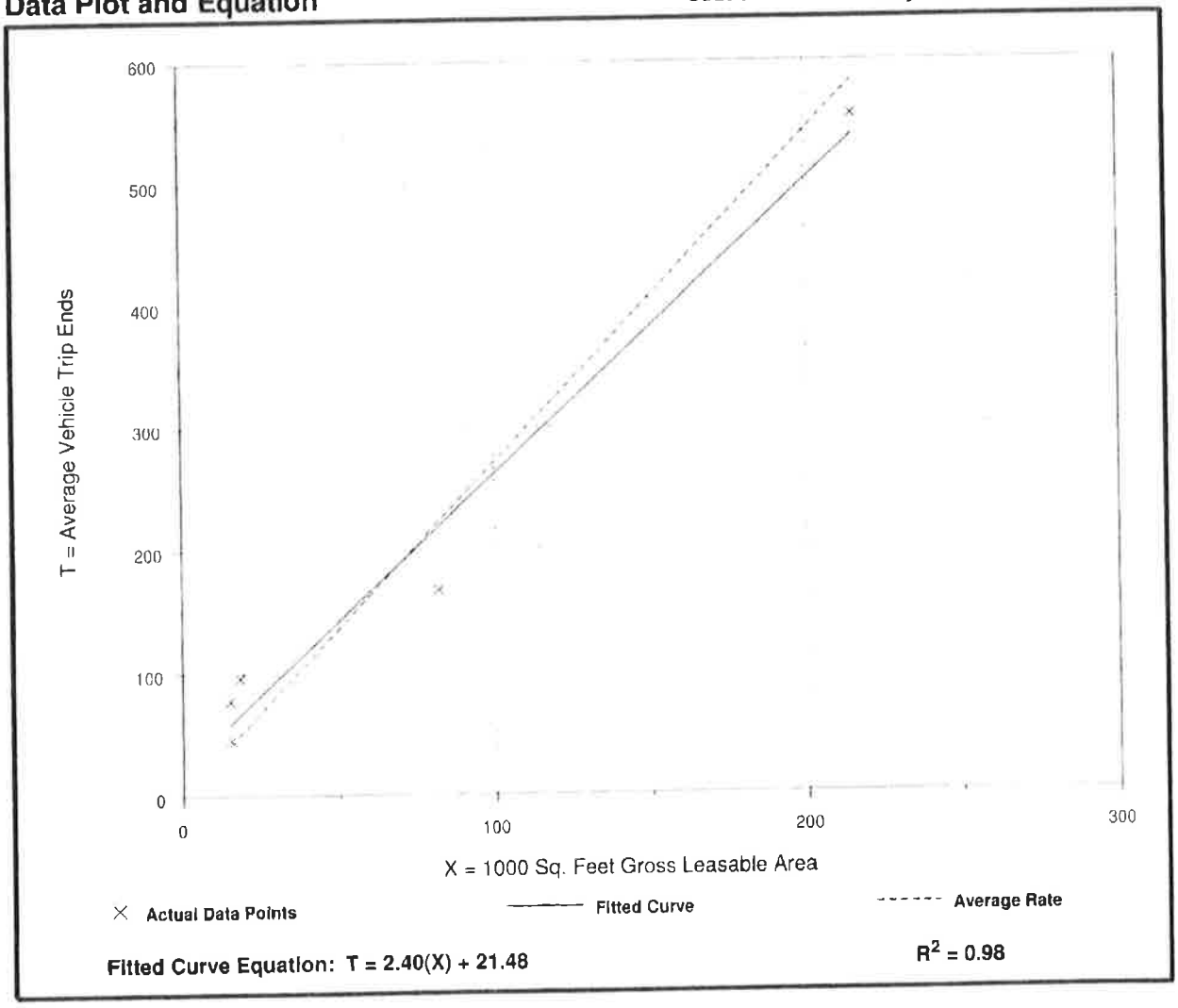
Number of Studies: 5
Average 1000 Sq. Feet GLA: 69
Directional Distribution: 44% entering, 56% exiting

Trip Generation per 1000 Sq. Feet Gross Leasable Area

Average Rate	Range of Rates	Standard Deviation
2.71	2.03 - 5.16	1.83

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: T = 2.40(X) + 21.48

R^2 = 0.98

Assisted Living
(254)

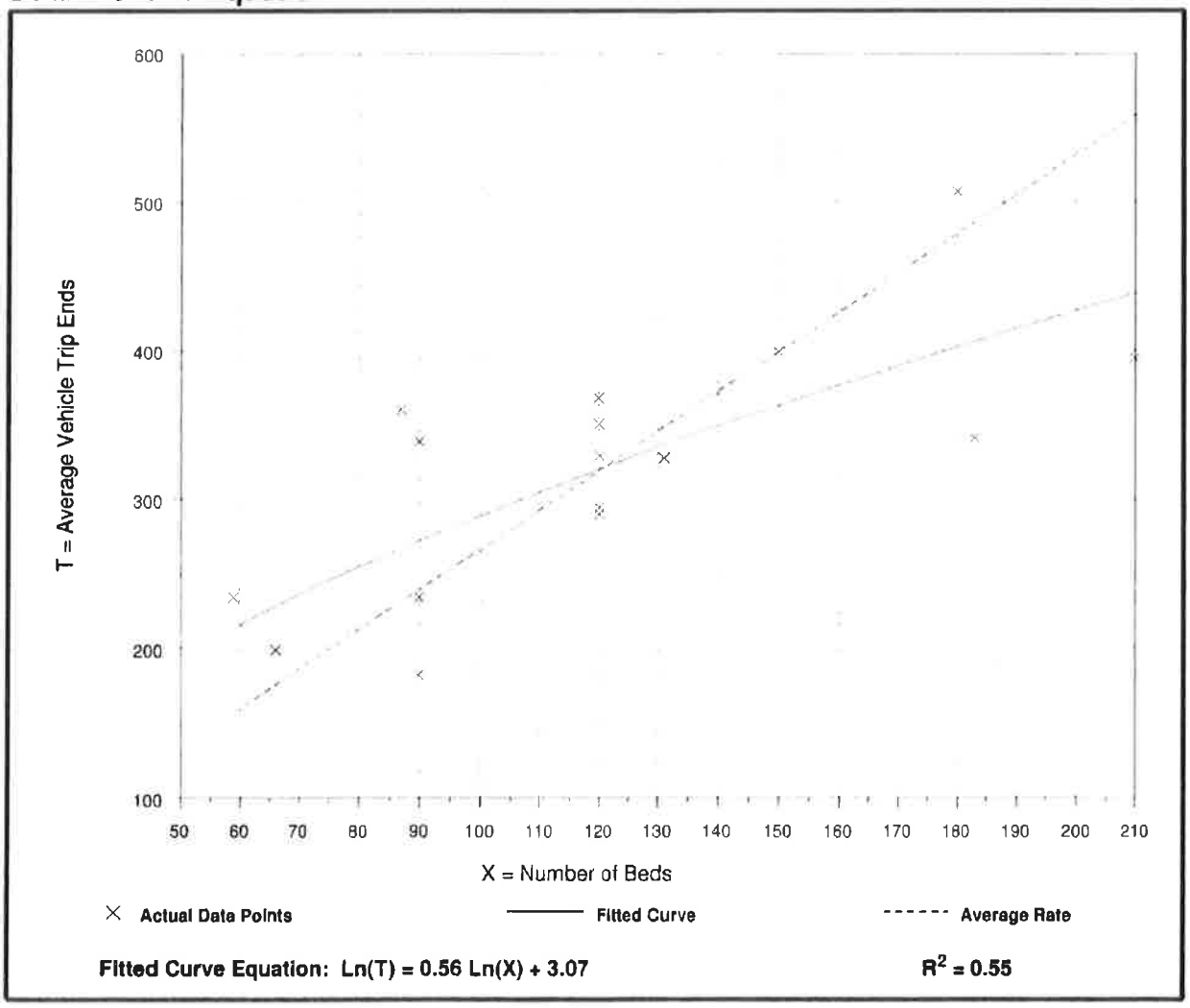
Average Vehicle Trip Ends vs: Beds
On a: Weekday

Number of Studies: 16
Average Number of Beds: 121
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Bed

Average Rate	Range of Rates	Standard Deviation
2.66	1.86 - 4.14	1.74

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.56 Ln(X) + 3.07

R^2 = 0.55

Assisted Living
(254)

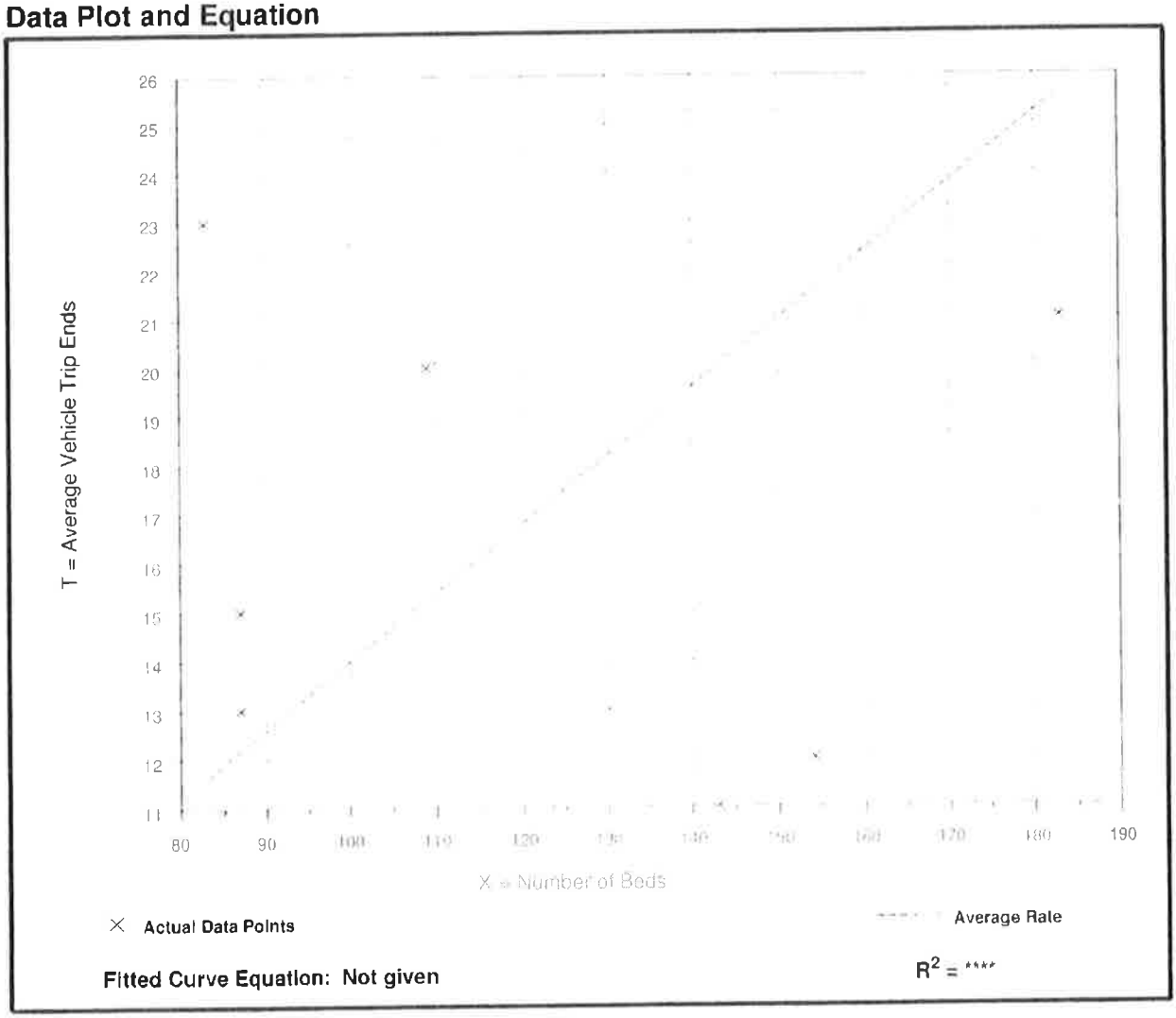
Average Vehicle Trip Ends vs: **Beds**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 7
Average Number of Beds: 121
Directional Distribution: 65% entering, 35% exiting

Trip Generation per Bed

Average Rate	Range of Rates	Standard Deviation
0.14	0.08 - 0.28	0.37

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Assisted Living
(254)

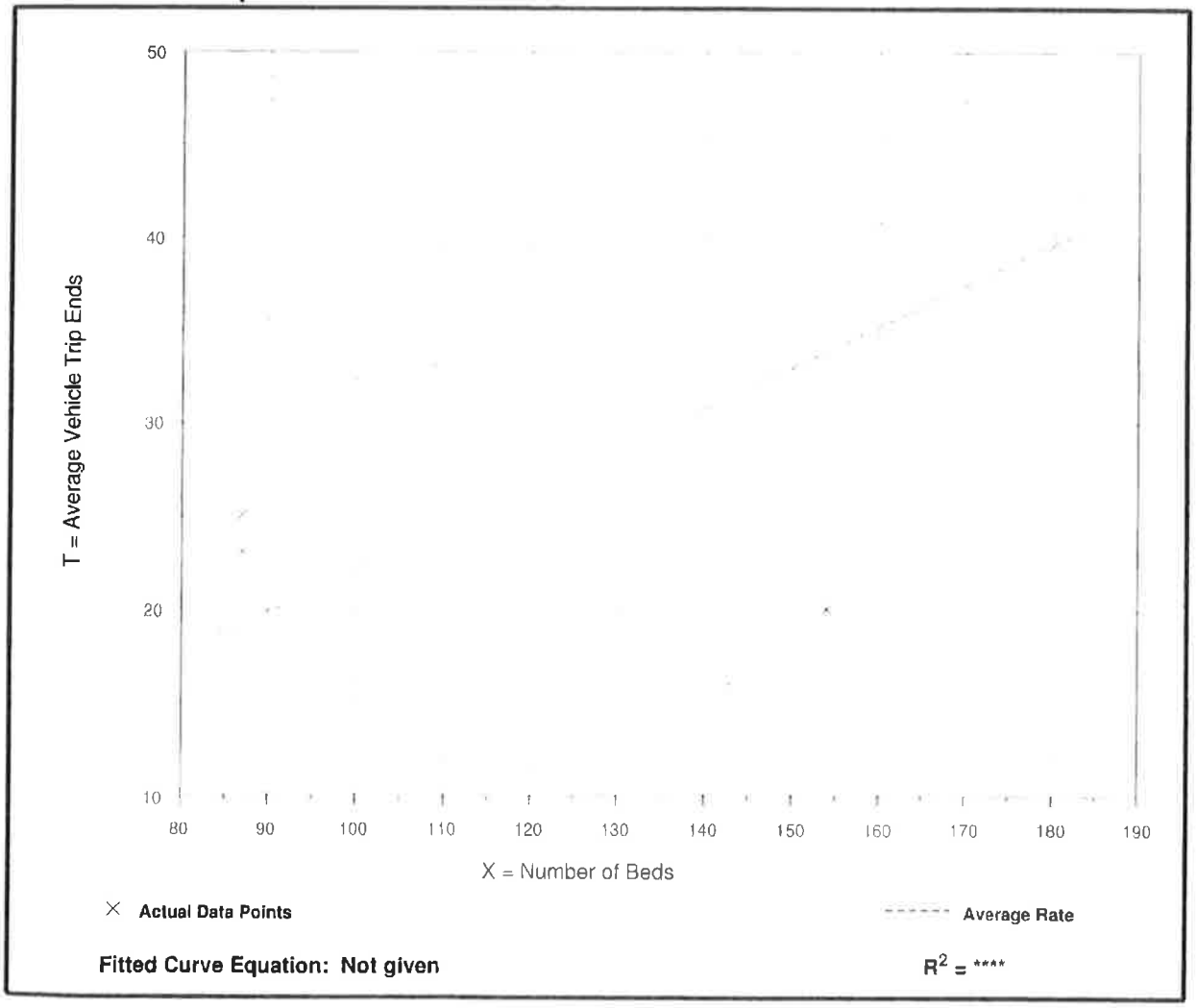
Average Vehicle Trip Ends vs: **Beds**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 7
Average Number of Beds: 121
Directional Distribution: 44% entering, 56% exiting

Trip Generation per Bed

Average Rate	Range of Rates	Standard Deviation
0.22	0.11 - 0.30	0.47

Data Plot and Equation



Fitted Curve Equation: Not given

R^2 = ****

Senior Adult Housing - Attached
(252)

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

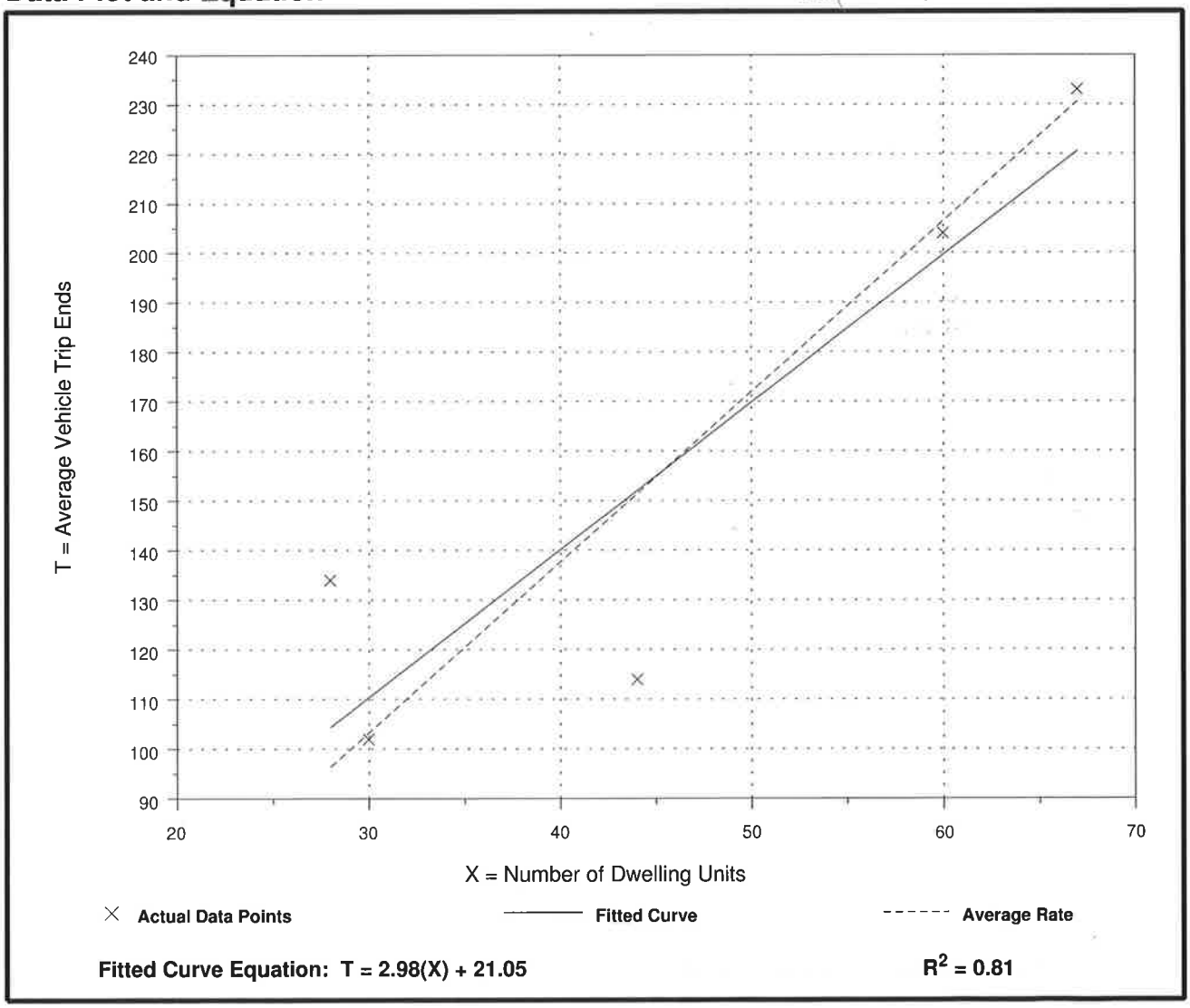
Number of Studies: 5
Avg. Number of Dwelling Units: 46
Directional Distribution: 50% entering, 50% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.44	2.59 - 4.79	1.93

Data Plot and Equation

Caution - Use Carefully - Small Sample Size



Fitted Curve Equation: T = 2.98(X) + 21.05

R^2 = 0.81

Senior Adult Housing - Attached
(252)

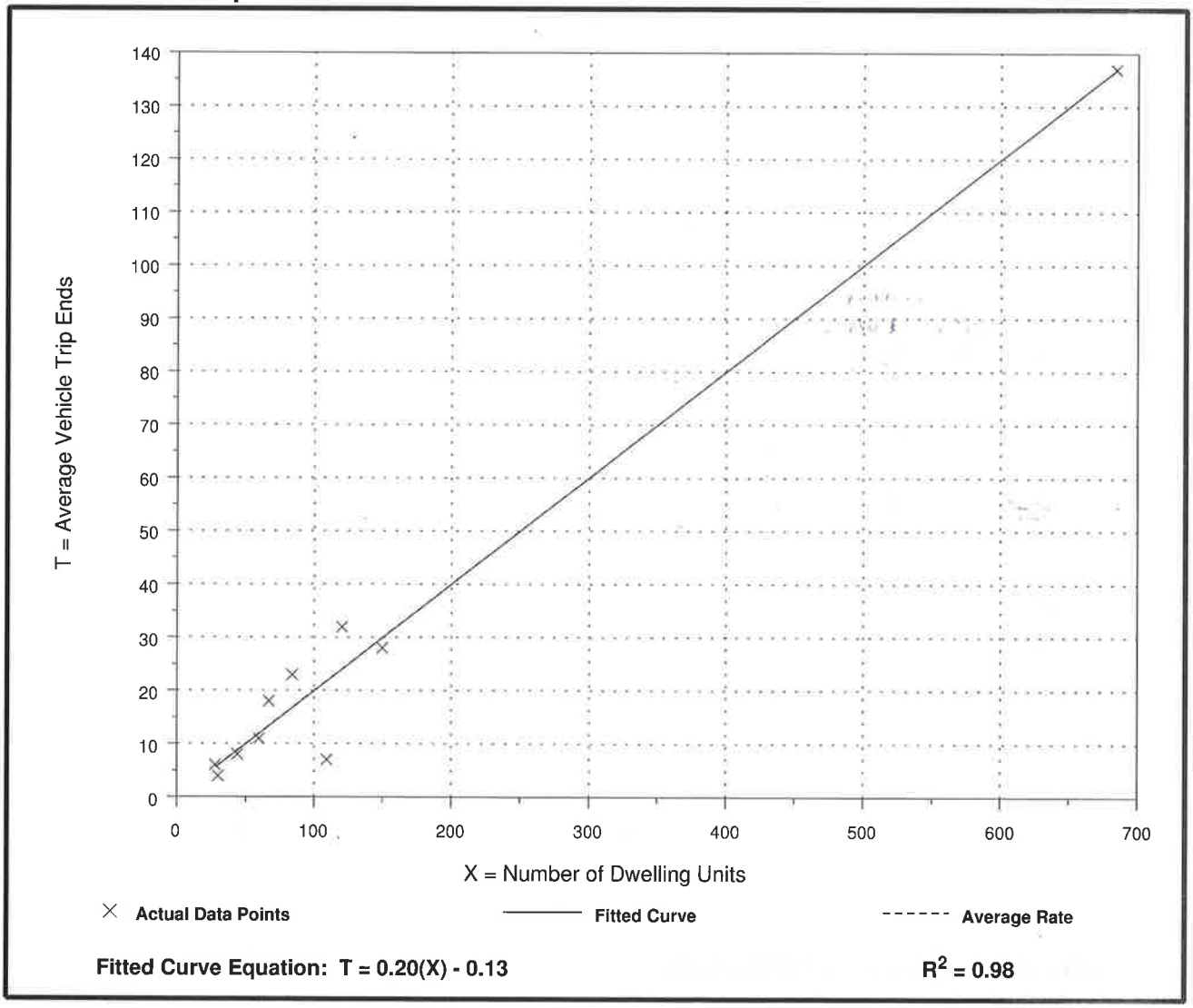
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.

Number of Studies: 10
Avg. Number of Dwelling Units: 138
Directional Distribution: 34% entering, 66% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.20	0.06 - 0.27	0.45

Data Plot and Equation



Fitted Curve Equation: T = 0.20(X) - 0.13

R^2 = 0.98

Senior Adult Housing - Attached
(252)

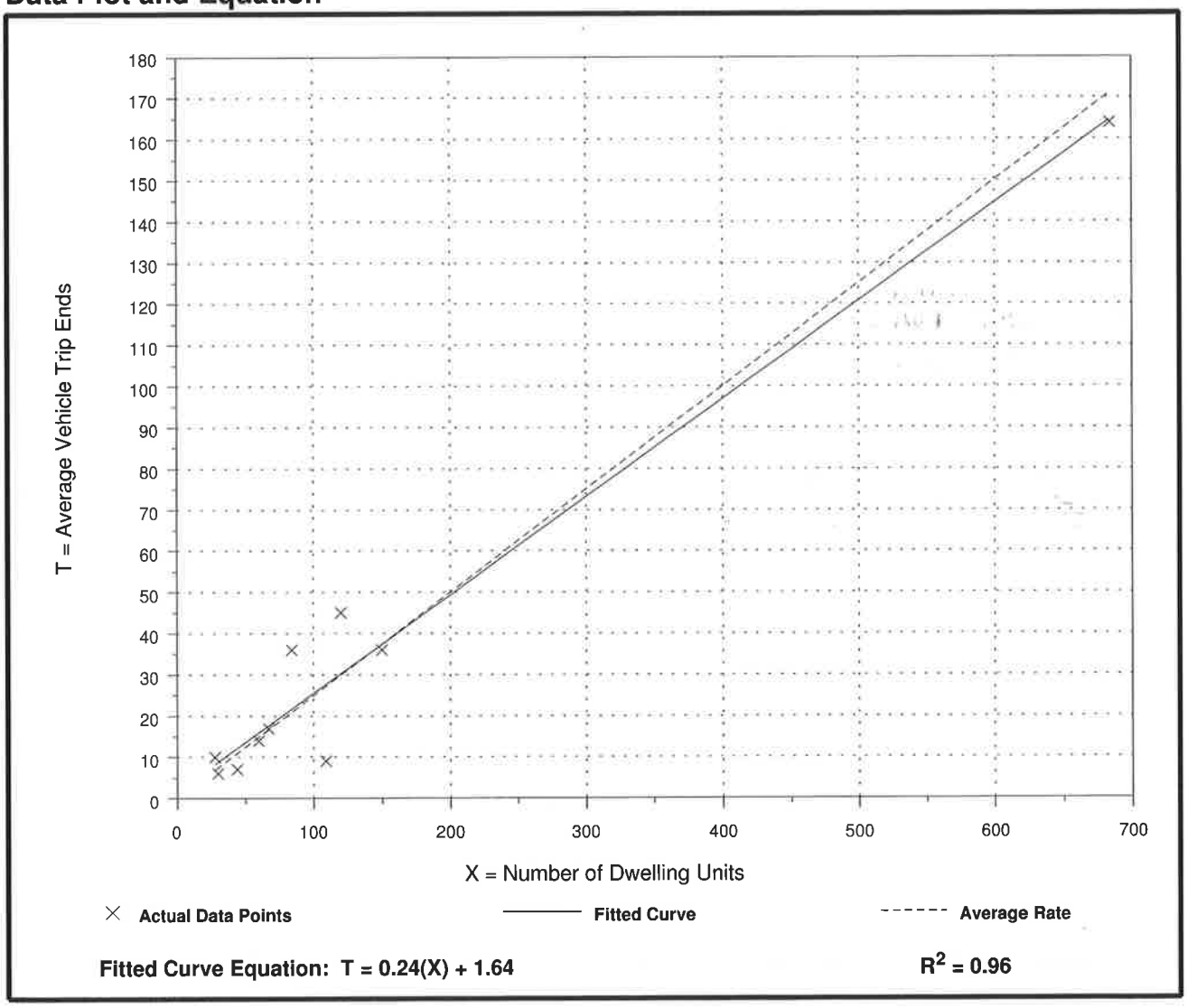
Average Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.

Number of Studies: 10
Avg. Number of Dwelling Units: 138
Directional Distribution: 54% entering, 46% exiting

Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.25	0.08 - 0.43	0.50

Data Plot and Equation



Fitted Curve Equation: T = 0.24(X) + 1.64

R^2 = 0.96

General Office Building
(710)

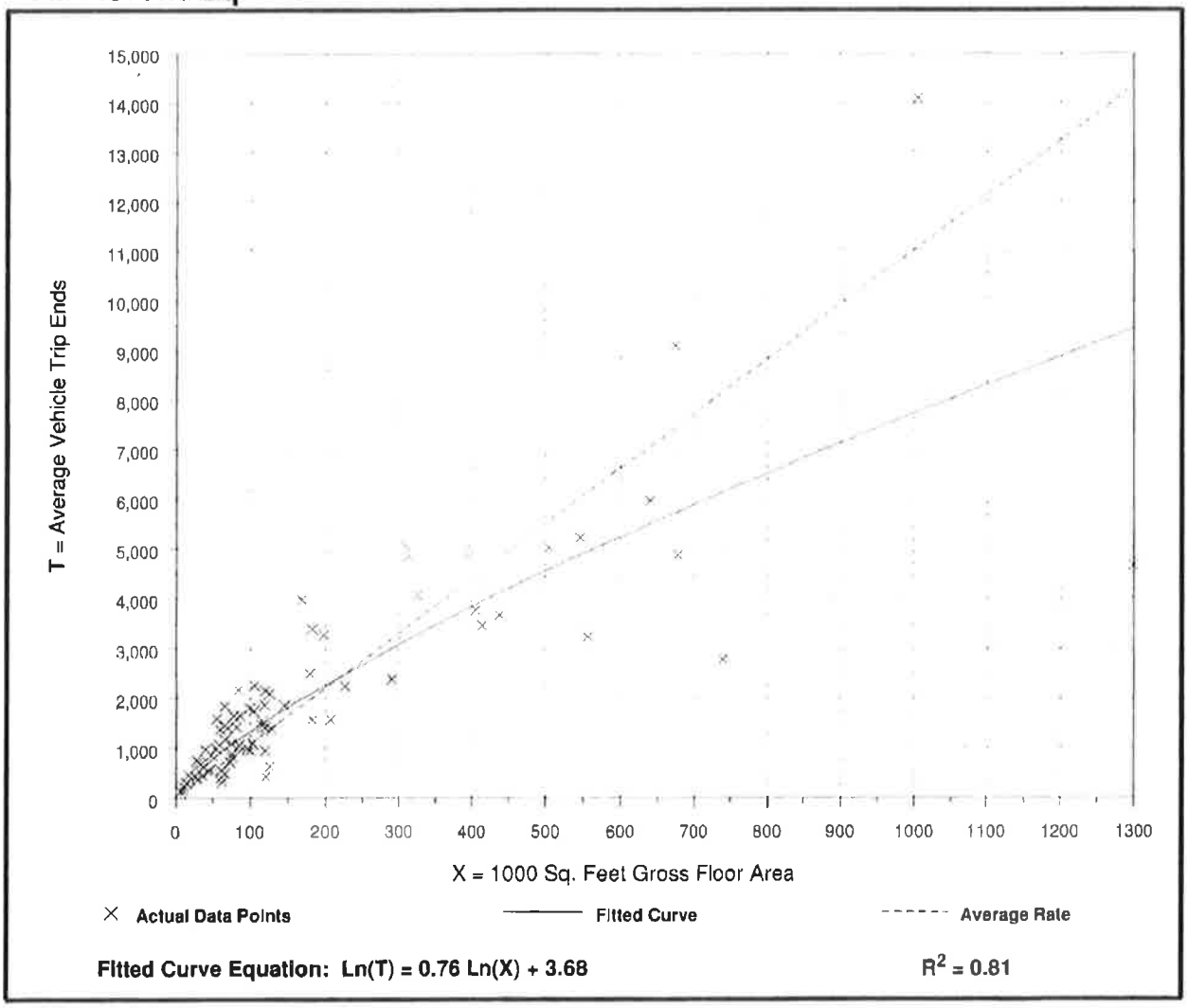
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday

Number of Studies: 79
Average 1000 Sq. Feet GFA: 197
Directional Distribution: 50% entering, 50% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
11.03	3.58 - 28.80	6.15

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.76 Ln(X) + 3.68

$R^2 = 0.81$

General Office Building
(710)

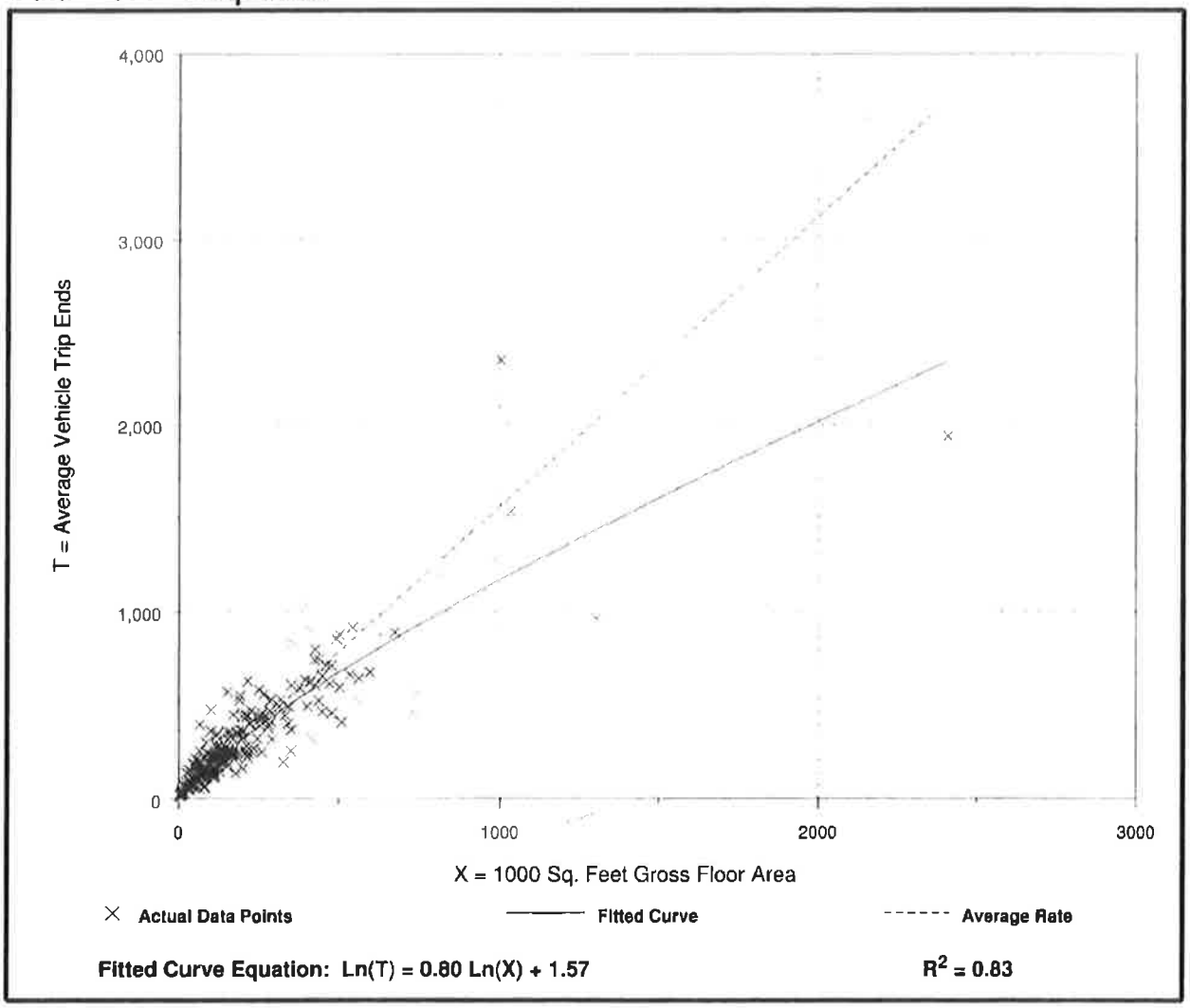
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
A.M. Peak Hour

Number of Studies: 218
Average 1000 Sq. Feet GFA: 222
Directional Distribution: 88% entering, 12% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.56	0.60 - 5.98	1.40

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.80 Ln(X) + 1.57

R^2 = 0.83

General Office Building
(710)

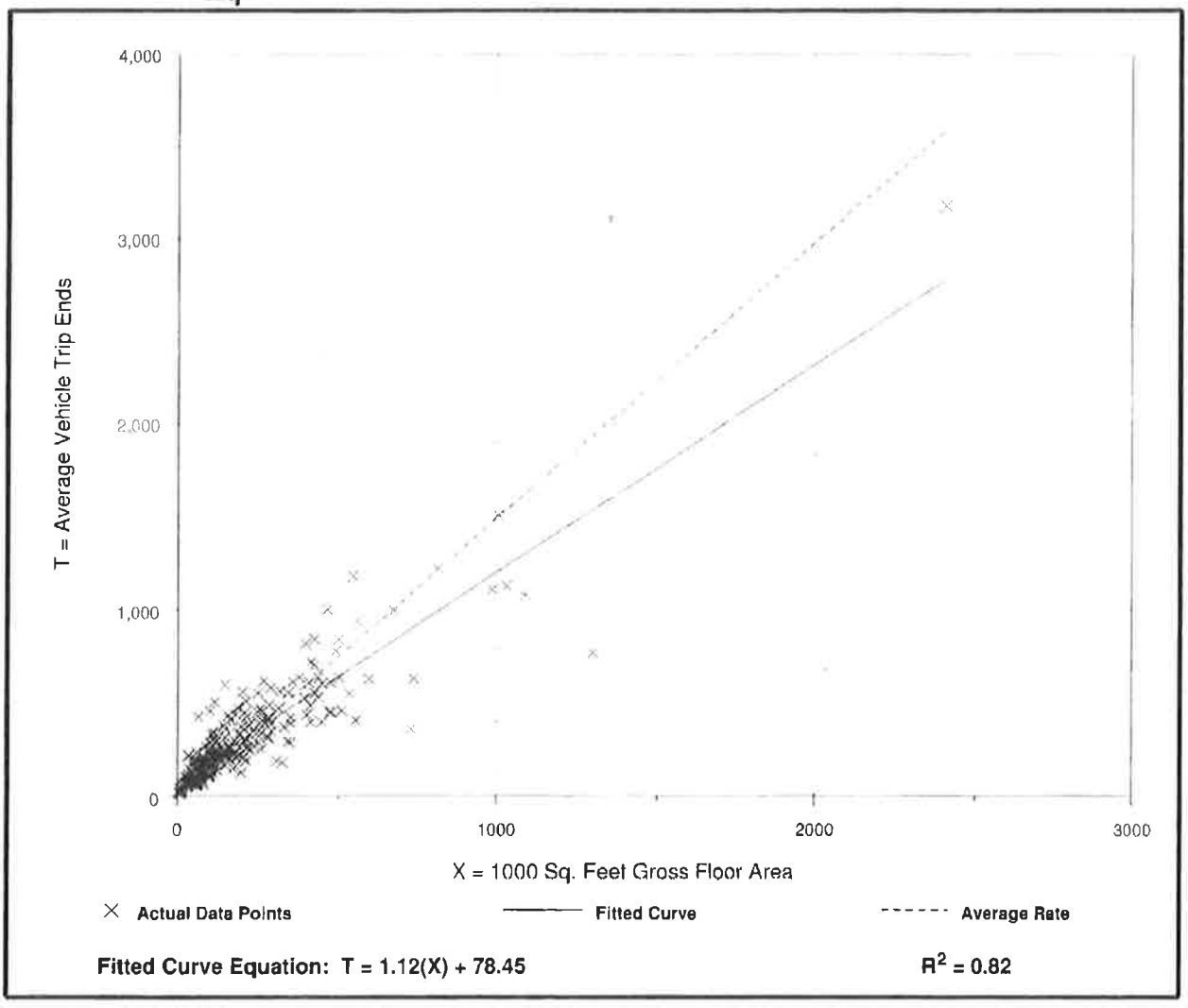
Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area
On a: Weekday,
P.M. Peak Hour

Number of Studies: 236
Average 1000 Sq. Feet GFA: 215
Directional Distribution: 17% entering, 83% exiting

Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
1.49	0.49 - 6.39	1.37

Data Plot and Equation



Fitted Curve Equation: T = 1.12(X) + 78.45

R^2 = 0.82

Table 5.6 (Cont'd)
Pass-By Trips and Diverted Linked Trips
Weekday, p.m. Peak Period

Land Use 820—Shopping Center

SIZE (1,000 SQ. FT. GLA)	LOCATION	WEEKDAY SURVEY DATE	NO. OF INTERVIEWS	TIME PERIOD	PRIMARY TRIP (%)	NON-PASS-BY TRIP (%)	DIVERTED LINKED TRIP (%)	PASS-BY TRIP (%)	ADJ. STREET PEAK HOUR VOLUME	AVERAGE 24-HOUR TRAFFIC	SOURCE
237	W. Windsor Twp, NJ	Winter 1988/89	n/a	4:00–6:00 p.m.	—	52	—	48	n/a	46,000	Booz Allen & Hamilton
242	Willow Grove, PA	Winter 1988/89	n/a	4:00–6:00 p.m.	—	63	—	37	n/a	26,000	McMahon Associates
297	Whitehall, PA	Winter 1988/89	n/a	4:00–6:00 p.m.	—	67	—	33	n/a	26,000	Orth-Rodgers & Assoc. Inc.
360	Broward Cnty., FL	Winter 1988/89	n/a	4:00–6:00 p.m.	—	56	—	44	n/a	73,000	McMahon Associates
370	Pittsburgh, PA	Winter 1988/89	n/a	4:00–6:00 p.m.	—	81	—	19	n/a	33,000	Wilbur Smith
150	Portland, OR	n/a	519	4:00–6:00 p.m.	6	—	26	68	n/a	25,000	Kittleson and Associates
150	Portland, OR	n/a	655	4:00–6:00 p.m.	7	—	28	65	n/a	30,000	Kittleson and Associates
760	Calgary, Alberta	Oct-Dec 1987	15,436	4:00–6:00 p.m.	39	—	41	20	n/a	n/a	City of Calgary DOT
178	Bordentown, NJ	Apr. 1989	154	2:00–6:00 p.m.	—	65	—	35	n/a	37,980	Raymond Keyes Assoc.
144	Manalapan, NJ	Jul. 1990	176	3:30–6:15 p.m.	44	—	24	32	n/a	69,347	Raymond Keyes Assoc.
549	Natick, MA	Feb. 1989	n/a	4:45–5:45 p.m.	26	—	41	33	n/a	48,782	Raymond Keyes Assoc.

Average Pass-By Trip Percentage: 34

Table 7.1 Unconstrained Internal Capture Rates for Trip Origins within a Multi-Use Development

		WEEKDAY		
		MIDDAY PEAK HOUR	p.m. PEAK HOUR OF ADJACENT STREET TRAFFIC	DAILY
from OFFICE	to Office	2%	1%	2%
	to Retail	20%	23%	22%
	to Residential	0%	2%	2%
from RETAIL	to Office	3%	3%	3%
	to Retail	29%	20%	30%
	to Residential	7%	12%	11%
from RESIDENTIAL	to Office	N/A	N/A	N/A
	to Retail	34%	53%	38%
	to Residential	N/A	N/A	N/A

Caution: The estimated typical internal capture rates presented in this table rely directly on data collected at a limited number of multi-use sites in Florida. While ITE recognizes the limitations of these data, they represent the only known credible data on multi-use internal capture rates and are provided as illustrative of typical rates. ***If local data on internal capture rates by paired land uses can be obtained, the local data may be given preference.***

N/A—Not Available; logic indicates there is some interaction between these two land uses; however, the limited data sample on which this table is based did not record any interaction.

Table 7.2 Unconstrained Internal Capture Rates for Trip Destinations Within a Multi-Use Development

		WEEKDAY		
		MIDDAY PEAK HOUR	p.m. PEAK HOUR OF ADJACENT STREET TRAFFIC	DAILY
to OFFICE	from Office	6%	6%	2%
	from Retail	38%	31%	15%
	from Residential	0%	0%	N/A
to RETAIL	from Office	4%	2%	4%
	from Retail	31%	20%	28%
	from Residential	5%	9%	9%
to RESIDENTIAL	from Office	0%	2%	3%
	from Retail	37%	31%	33%
	from Residential	N/A	N/A	N/A

Caution: The estimated typical internal capture rates presented in this table rely directly on data collected at a limited number of multi-use sites in Florida. While ITE recognizes the limitations of these data, they represent the only known credible data on multi-use internal capture rates and are provided as illustrative of typical rates. ***If local data on internal capture rates by paired land uses can be obtained, the local data may be given preference.***

N/A—Not Available; logic indicates there is some interaction between these two land uses; however, the limited data sample on which this table is based did not record any interaction.