TRANSPORTATION ASSESSMENT

ELFRIDA
URBAN BOUNDARY EXPANSION

CITY OF HAMILTON

PREPARED FOR:

ELFRIDA COMMUNITY BUILDERS LANDOWNERS GROUP INC.

PREPARED BY:

C.F. CROZIER & ASSOCIATES INC.
2800 HIGH POINT DRIVE, SUITE 100
MILTON, ON, L9T 6P4

NOVEMBER 2024

CFCA FILE NO. 2545-6847

CELEBRATING 20 YEARS · C · SINCE 2004

CROZIER

Revision Number	Date	Comments
Rev.0	November 2024	**1st** Submission

Executive Summary

Elfrida Community Builders Group Inc. retained C.F. Crozier & Associates Inc. (Crozier) to provide Transportation Engineering services to support the proposed Urban Boundary Expansion that encompasses the Elfrida Community development.

Elfrida Community is an area of land that consists of approximately 1,200 ha in the southeastern portion of the City of Hamilton.

The current concept dated October 18th, 2024, proposes the following:

- 18,939 Low Density Units
- 7,444 Medium Density Units
- 13,248 Low Density Units
- Commercial Space and Schools

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing and Planned Boundary Road Network
- Existing and planned active transportation network
- Expected new vehicular trips generated by the development
- Development compatibility with the City of Hamilton's Truck, Transit, Cycling and Pedestrian goals.

Assumptions were made in order to develop the surveyed traffic volumes into the 2041 volumes used in the screenline analysis.

The full buildout of the proposed development is expected to generate a total of 27,762 and 32,644 gross two-way vehicular trips during the weekday a.m. and p.m. peak hours, respectively.

After the reductions for internal zone trip travel, pass-by rates and internal trip capture, the full-buildout of the proposed development is expected to generate a total of 12,062 and 11,959 two-way trips that were used for the analysis during the weekday a.m. and p.m. peak hours, respectively.

The screenline analysis initially identifies over capacity conditions for the Trinity Church Road screenline and Mud Street screenline, along the western and northern limits of the development, respectively.

This analysis equated to a 1.77 v/c maximum ratio at the Trinity Church Road Screenline and 1.56 maximum v/c ratio at the Mud Street Screenline. However, the screenline analysis did not account for the creation of a continuous grid-like collector network system that would be required to support the Subject Lands.

Along Trinity Church Rd, the subject lands have 1600 m of frontage; which can accommodate up to 4 collector road connections. These collector roads would run east-west, offering additional capacity of 500 vph, allowing traffic volumes to efficiently access the road network due to increased capacity on parallel roads. The configuration of the collector road network will be explored in more detail at the Secondary Plan stage; however, the lands sufficiently allow for a number of collector roads to add capacity such that the screenline would operate below capacity.

Truck routes are expected to continue operating along existing arterial roads and will be supplemented by planned arterial roads, where the major commercial destinations are contemplated.

The development area can support potential transit stops at arterial intersections that offer 400m transit coverage for a large proportion of the development lands. However, greater transit stop density is expected, should transit stops be implemented at future collector-collector road intersections within the community - significantly increasing transit access to the community. Such increased transit coverage along with the planned BRT and local service will help to contribute to the City's transit mode share target of 12 %.

Further analysis including the development of more refined service plans in coordination with HSR will be undertaken during the next stages of evaluation.

The active transportation network's interconnectivity and the improved safety with dedicated or improved facilities are key factors when users choose their mode of transportation. This philosophy should be kept in mind when incorporating the active transportation features into the development.

The City has set a target of 15% of daily trips to be made by walking or cycling by 2031, with plans for dedicated bike routes and multi-use paths.

The Transportation Demand Management strategies envisioned will help lower the vehicular traffic by promoting the other modes of transportation. Further details will be explored during the Secondary Plan stage.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICIES

1.0 Introduction

Elfrida Community Builders Group Inc. retained C.F. Crozier & Associates Inc. (Crozier) to provide Transportation Engineering services to support the proposed Urban Boundary Expansion that encompasses the Elfrida Community development.

1.1 Developments Lands

The Elfrida Community encompasses approximately 1,200 hectares in the southeastern region of the City of Hamilton, as delineated in **Figure 1**. The primary roads intersecting the Elfrida Community include Mud Street West, Upper Centennial Parkway, Rymal Road East, Golf Club Road, Second Road East, and Trinity Church Road.

The City of Hamilton produced the Growth-Related Integrated Development Strategy (GRIDS 2) in October 2021. In the GRIDS2 report, the City of Hamilton defined the Elfrida area as the "largest potential urban boundary expansion" with an estimated $200M in road infrastructure improvements envisioned. From this report, the Elfrida Community was expected to require over 38.5 centreline kilometres of road infrastructure to support the Elfrida expansion area.

According to the latest concept plan dated October 18th, 2024, the development is proposed to include the following:

- 18,939 Low Density Units
- 7,444 Medium Density Units
- 13,248 Low Density Units

This conceptual plan categorized the areas as follows:

- Potential Residential Area
- Potential Intensification Hubs
- Potential Intensification Corridor
- Preliminary Natural Heritage System Areas

As part of the creation of a complete community, a number of additional land uses are also contemplated including elementary schools, secondary schools, local commercial uses, etc.

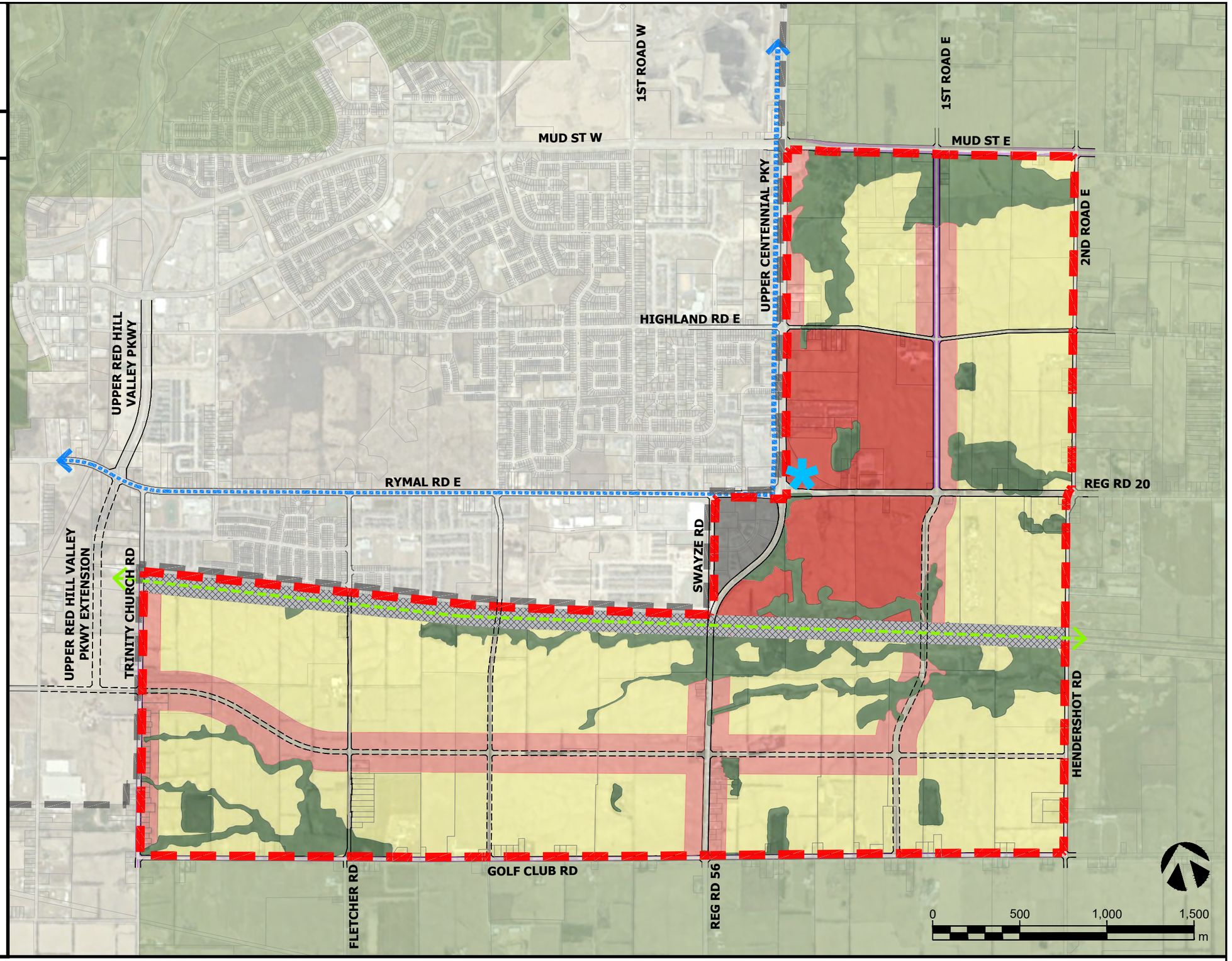
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

1.2 Study Purpose and Scope

The purpose of this study is to review the existing and planned mobility network surrounding the subject lands and confirm their ability to support the proposed urban boundary expansion.

The study reviews the following main aspects of the proposed development from a transportation engineering perspective:

- Existing and Planned Boundary Road Network
- Existing and planned active transportation network
- Expected new vehicular trips generated by the development
- Development compatibility with the City of Hamilton's Truck, Transit, Cycling and Pedestrian goals.

Appendix A includes the requirements for this study as outlined by City Staff.

This Transportation Assessment considers the following study intersections:

- Rymal Road at Upper Red Hill Valley Parkway
- Upper Centennial Parkway at Mud Street
- Rymal Road at Fletcher Road
- Rymal Road at Second Road West
- Rymal Road at Upper Centennial Parkway
- Upper Centennial Parkway at Highland Road

2.0 Existing Conditions

This section describes the current conditions of the transportation network near the site. It includes information about the road network, such as traffic controls, lane configurations, speed limits, transit routes and stops, active transportation infrastructure, and other relevant transportation elements.

2.1 Study Road Network

The study road network consists of the existing road network near the development, which includes the study intersections and the adjoining roadway segments. **Table 1** delineates the study roadways.

Table 1: Study Roadways

Feature	Roadways						
	Rymal Road East	**Fletcher Road**	**Upper Centennial Parkway**	**Second Road West**	**Upper Red Hill Valley Parkway**	**Mud Street**	**Highland Road**
Direction	Two-way (East-West)	Two-way (North-South)	Two-way (North-South)	Two-way (North-South)	Two-way (North-South)	Two-way (East-West)	Two-way (East-West)
Classification	Major Arterial	Collector	Major Arterial	Collector	Parkway/Major Arterial	Collector	Collector
Jurisdiction	City of Hamilton	City of Hamilton	City of Hamilton	City of Hamilton	City of Hamilton	City of Hamilton	City of Hamilton
Speed Limit	60 km/h	50 km/h 40 km/h during school operations	70 km/h	40 km/h[1]	60 km/h	70 km/h	50 km/h East of Upper Centennial 40 km/h West of Upper Centennial
Number of travel lanes	Four	Two	Four	Two	Four	Four	Two
Median type	None	None	None	None	Concrete Median	Grass	None
Active Transportation	1.5 m Sidewalks (Both Sides)	1.5 m Sidewalks (Both Sides	None	1.5 m Sidewalks (Both Sides	None	3.0 m Multi-Use Path (South Side)	1.5 m Sidewalks (Both Sides) West of Upper Centennial

2.2 Transportation Data

A variety of transportation data was obtained and used to support the analysis in this study. **Table 2** summarizes the study intersections, date of data collection and the source of the information. Traffic data was collected during the hours of 12:00 a.m. on Tuesday. October 8, 2024, to 12:00 a.m. on Wednesday, October 9, 2024. This data is included in **Appendix A.**

Table 2: Traffic Data

Intersection	TMC Date	Source
Rymal Road at Upper Red Hill Valley Parkway	Tuesday, October 8, 2024	Spectrum
Rymal Road at Fletcher Road		
Rymal Road at Second Road West		
Rymal Road at Upper Centennial Parkway		
Upper Centennial Parkway at Highland Road		
Upper Centennial Parkway at Mud Street		

Appendix A contains all transportation data used in support of this study.

3.0 Study Assumptions

In order to analyze the study network both with and without the planned development a number of assumptions need to be made as the analysis examines the future road network conditions.

3.1 Land Use Assumptions

This study uses a number of assumptions in the analysis due to the preliminary nature of the concept plan. These assumptions include:

- Commercial Area for trip generation consists of the intensification corridor and the intensification hub total area
- Commercial Area coverage is considered at 40 percent, similar to other commercial areas in southeast Hamilton
- Elementary school population at a rate of 0.25 students per single-family household and 0.19 students per townhouse from the HWDSB website
- Number of Elementary schools determined by total school population divided by 465 students per school
- Secondary school population at a rate of 0.08 students per single-family household and 0.04 students per townhouse from the HWDSB website

- Number of Secondary schools determined by total school population divided by 1,050 students per school

3.2 Road Network Assumptions

This study also makes assumptions that affect the screenline analysis but are not dependent on the concept plan including:

- Arterial roads have a capacity of 800 vehicles per lane per direction
- Collector roads have a capacity of 500 vehicles per lane per direction
- Auxiliary and two-way left turn lanes were not considered to contribute to the capacity of the roadways
- The planned extension of the Upper Red Hill Valley Parkway will be completed before the horizon year
- Twenty Road East's improvements will be completed before the horizon year
- Base growth rate of 1%

3.3 Trip Generation Assumptions

This study also makes assumptions that were focused on the trip generation calculations for the development.

- Trip reductions for mode split were set at 5% for the schools and 10% for all other uses
- Commercial trips reduced by 34% in the p.m. peak hour due to pass-by trips
- Trip reduction for internal trip capture rate at 6% for commercial and 2% for residential
- All trips generated by schools are internal to the Elfrida Community
- All other uses have internal zone travel trip rates based on TTS survey of nearby areas
- Both the medium-density and high-density residential land uses will be covered by the Multifamily Housing (Mid-Rise) ITE land use code

These assumptions are used throughout the analysis as needed in both the background scenario and the scenario with the expected trips generated.

4.0 Future Improvements

In order to understand the impact of the proposed development on the existing transportation infrastructure,

4.1 Future Roadway Improvements

A number of improvements are considered as part of the future analysis as the City is already working towards implementing theses improvements. Twenty Road East is planned to be improved to an arterial road and extended to Trinity Church Road. This improvement ties into the planned extension of the Upper Red Hill Valley Parkway from Rymal Road. The extension of the Upper Red Hill Valley Parkway will end at the extended Twenty Road East, similar to how it currently ends at Rymal Road.

4.2 Future Transit Improvements

The City has identified a number of improvements that are planned for the City. The City's Rail Ready System Map envisions the development of major transit hubs across the City that will connect all of the City's residents to more accessible transit. One of these hubs is located at Rymal Road East and Upper Centennial Parkway and is labeled as the Elfrida Gateway. This map is included in **Appendix C.**

The BLAST network is a proposed transit network consisting of five (5) different lines, each corresponding to a letter in the title BLAST, that are envisioned as either light rail transit (LRT) services or bus rapid transit (BRT) services.

The S-Line is envisioned as a BRT line that would travel along Rymal Road from the Ancaster Business Park before turning north and going along Centennial Parkway to the Confederation GO Station. This line would include a stop at the Elfrida Gateway.

4.3 Future Active Transportation Improvements

The City has envisioned a number of active transportation improvements in the surrounding area. These include dedicated bike routes along Highland Road as well as multi-use paths along Regional Road 56 and First Road East and are incorporated in the City's plans. There are also minor shoulder improvements on other surrounding roads to encourage active transportation modes of travel such as cycling and walking.

5.0 Future Background Traffic

Using the assumptions outlined in Section 3, the existing traffic was grown to the horizon year of 2041 to see the effects of the growth of the city without the development area on the study road network. The midblock volumes as a result of these growth rates can be seen in **Figure 2.**

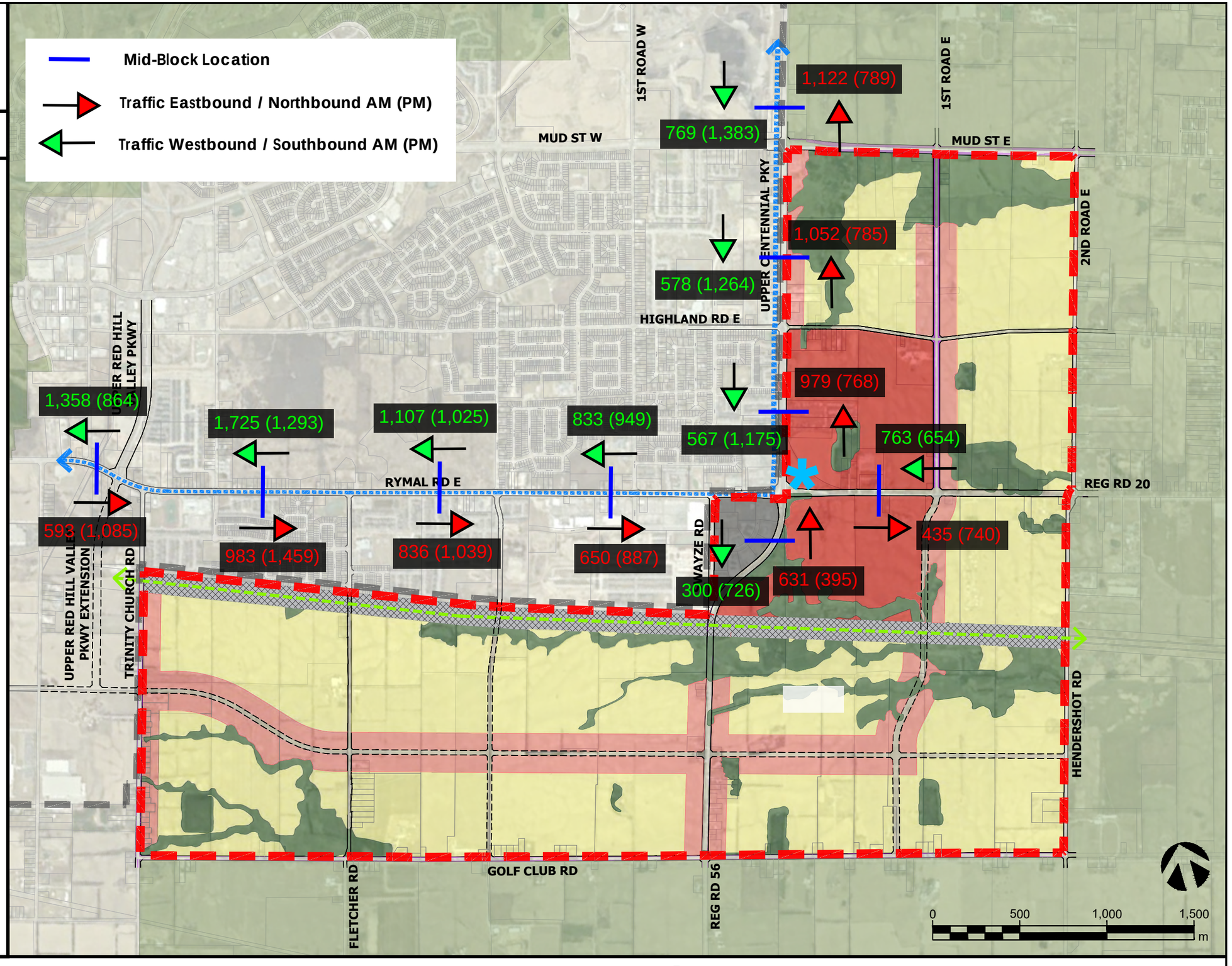
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

6.0 Site Generated Traffic

The proposed development will result in additional vehicle flows at the study intersections. Therefore, this section describes the trip forecasting methodology and results of this forecast for the development proposal.

The site generated traffic forecasting methodology for this study consists of two steps. The first step, Trip Generation, projects the number of trips that originate or are destined for the proposed development, while the second step, Trip Distribution and Assignment, assigns trips to the study road network based on the expected distribution of trips to catchment areas and expected shortest paths for trips destined for particular locations.

6.1 Trip Generation

As noted, the development is proposed to consist of the following:

- 18,939 Low Density Units
- 7,444 Medium Density Units
- 13,248 Low Density Units
- Commercial Space and Schools as described in **Section 3.0**

The trip generation of the proposed residential dwelling and commercial units was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition.

The applicable average rates and fitted curve equations for Land Use Category (LUC) 220 "Multifamily Housing (Low-Rise)" and LUC 221 "Multifamily Housing (Mid-Rise) were applied to the proposed residential dwelling units. The fitted curve for the peak hour of generator for LUC 820 "Shopping Centre(>150k)" was applied to the proposed commercial GFA. Employees for the schools were estimated at 50 per Elementary School and 100 per Secondary School.

Relevant excerpts from the ITE Trip Generation Manual, 11th Edition and ITE Trip Generation Handbook, 3rd Edition have been included in **Appendix E**. The forecasted trip generation of the proposed mixed-use development is summarized in **Table 3.**

Table 3: Trip Generation without Reductions

Land Use	Statistic	Calculation Type	AM			PM		
			In	Out	Total	In	Out	Total
Commercial	112 ha	Fitted Curve Equation	4,061	2,489	6,550	7,708	8,349	16,057
Low Density	18,939 units	Fitted Curve Equation	1,507	4,932	6,439	4,327	2,652	6,980
Medium Density	7,444 units	Fitted Curve Equation	592	1,939	2,531	1,701	1,042	2,743
High Density	13,248 units	Fitted Curve Equation	1,054	3,450	4,504	3,027	1,855	4,883
Elementary School	900 employees	Average Rate	3,724	2,909	6,632	835	864	1,698
Secondary School	300 employees	Average Rate	620	485	1,106	139	143	283
Total			**11,558**	**16,204**	**27,762**	**17,737**	**14,905**	**32,644**

Therefore, the full buildout of the proposed development is expected to generate a total of 27,762 and 32,644 gross two-way vehicular trips during the weekday a.m. and p.m. peak hours, respectively. However, as discussed in **Section 3.0**, reductions were also applied to the base trip generation and the trip generation after these reductions can be seen in **Table 4.** These reductions include mode splits, internal capture rates and pass-by trips and a summary of the trip generation methodology can be found in **Appendix D.**

Table 4: Trip Generation used in Analysis

Land Use	Statistic	Calculation Type	AM			PM		
			In	Out	Total	In	Out	Total
Commercial	112 ha	Fitted Curve Equation	1,380	847	2,227	1,465	1,586	3,051
Low Density	18,939 units	Fitted Curve Equation	1,100	3,600	4,700	2,639	1,618	4,257
Medium Density	7,444 units	Fitted Curve Equation	432	1,415	1,847	1,038	635	1,673
High Density	13,248 units	Fitted Curve Equation	769	2,518	3,288	1,846	1,132	2,978
Elementary School	900 employees	Average Rate	0	0	0	0	0	0
Secondary School	300 employees	Average Rate	0	0	0	0	0	0
Total			**3,681**	**8,380**	**12,062**	**6,988**	**4,971**	**11,959**

Therefore, the full buildout of the proposed development is expected to generate a total of 12,062 and 11,959 two-way vehicular trips for use in the analysis during the weekday a.m. and p.m. peak hours, respectively.

6.2 Trip Distribution and Assignment

The trips generated by the proposed development were distributed to the study road network using 2016 Transportation Tomorrow Survey (TTS) data. Excerpts from the TTS query have been included in **Appendix B.** A summary of the trip distribution can be seen in **Table 5**.

Table 5: Trip Distribution

Direction	A.M. Inbound	A.M. Outbound	P.M. Inbound	P.M. Outbound
Northwest	53%	22%	46%	33%
North	0%	17%	10%	33%
Northeast	0%	7%	0%	5%
East	0%	6%	0%	5%
Southeast	0%	0%	0%	0%
South	0%	2%	27%	2%
Southwest	8%	11%	2%	0%
West	39%	36%	15%	22%
Total	**100%**	**100%**	**100%**	**100%**

6.3 Trip Assignment

The trips generated by the proposed development were distributed to the study road network as outlined previously. These trips were assigned to the study road network based on the trip distribution and then were added to the Future Background volumes to generate the Future Total scenario. The volumes as a result of this process can be seen in **Figure 3.**

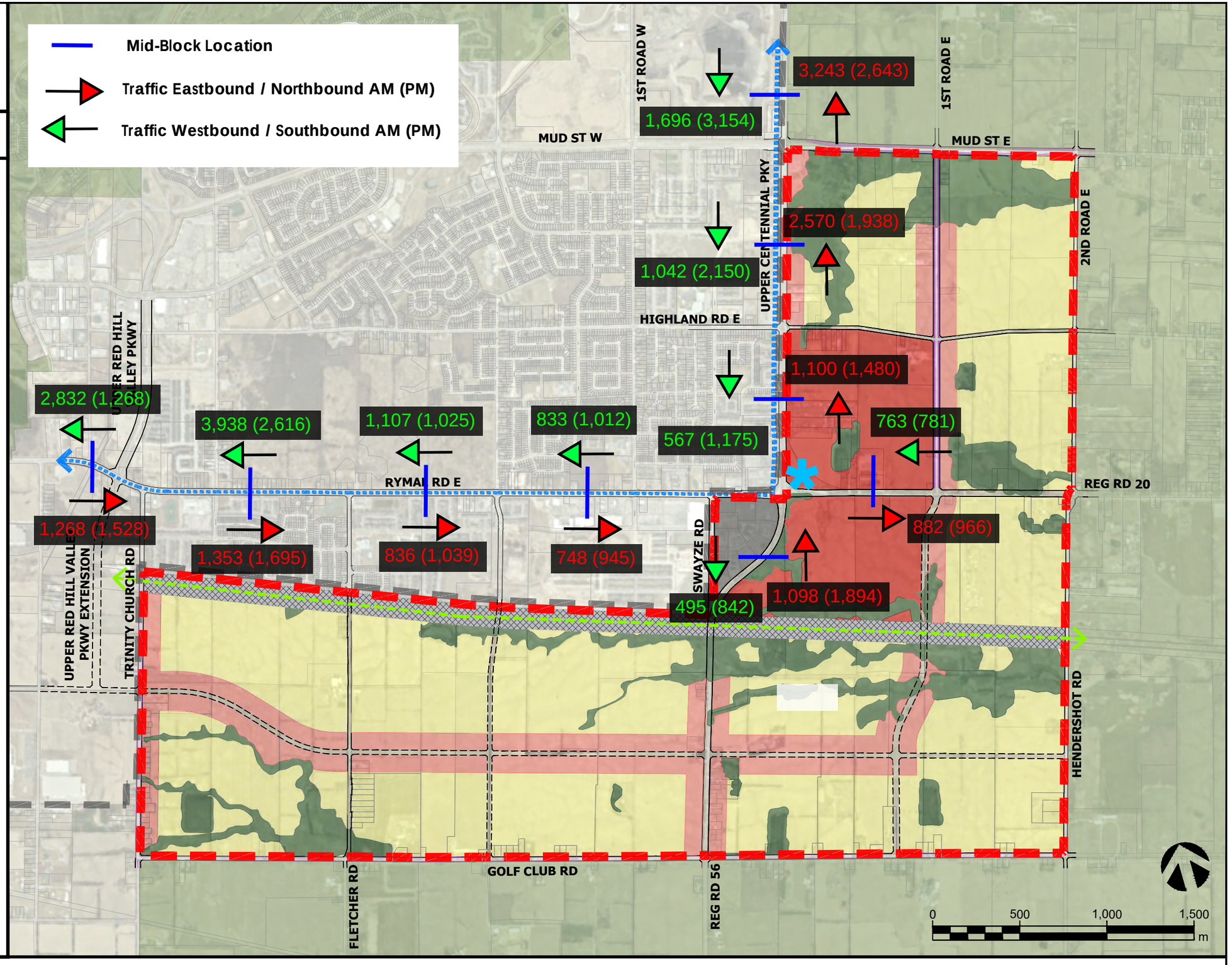
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

7.0 Screenline Analysis

The following section provides an analysis of the screenline evaluation conducted as part of the Transportation Assessment for the proposed development. This analysis aims to determine the impact on the study road network, examining how the existing infrastructure meets the anticipated traffic demands and to understand the future collector road needs within the Elfrida community. **Figure 4** shows the internal screenlines for the study area that were used in this analysis.

7.1 Future Background Screenline Analysis

This section examines the screenlines under the Future Background traffic as outlined in Section 4.0. **Table 5** summarizes the screenline volumes along with the planned road lanes and capacity. These volumes represent future background levels for subsequent comparison to the Future Total scenario. **Figure 5** represents the Future background volumes across the study area that were used in this screenline analysis.

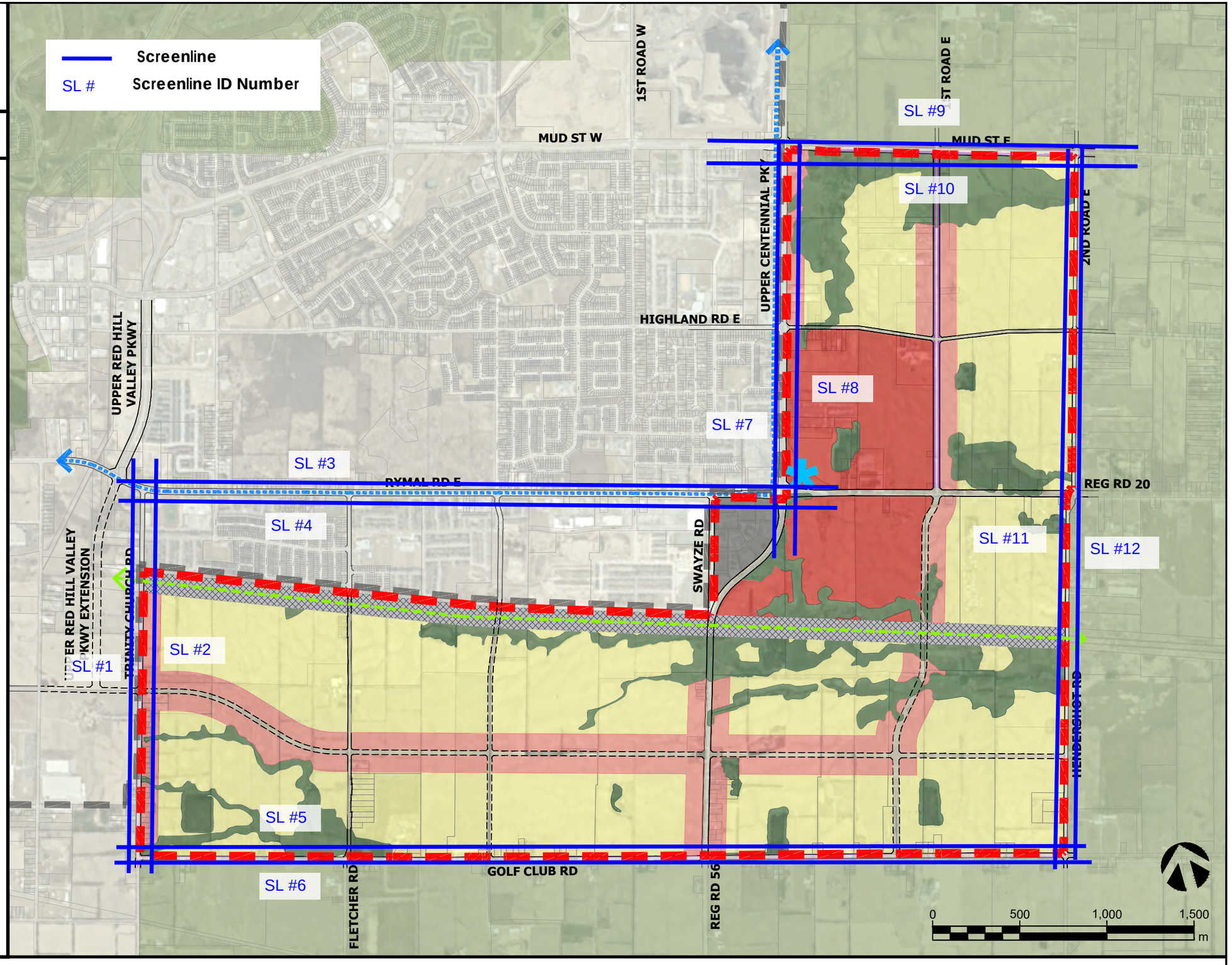
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

Table 6: Future Background Screenline Analysis

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
Trinity Church Road	1	East Of	Rymal Road East	**2120**	**1728**	2		**3700**	**0.57**	**0.47**
			Golf Club Road				1			
			New Arterial Road/Twenty Road			2				
			Total			**4**	**1**			
	2	West Of	Rymal Road East	**1358**	**1085**	2		**3700**	**0.37**	**0.29**
			Golf Club Road				1			
			New Arterial Road/Twenty Road			2				
			Total			**4**	**1**			
Rymal Road East	3	North Of	Trinity Church Road	**1447**	**1323**		1	**3100**	**0.47**	**0.43**
			Fletcher Road				1			
			Second Road West				1			
			Upper Centennial Parkway			2				
			Total			**2**	**3**			
	4	South Of	Trinity Church Road	**1275**	**1284**		1	**3100**	**0.41**	**0.41**

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
			Fletcher Road				1			
			Second Road West				1			
			Upper Centennial Parkway			2				
			Total			**2**	**3**			
Golf Club Road[1]	5	North Of	Trinity Church Road	**731**	**846**		1	**2800**	**0.26**	**0.30**
			Fletcher Road				1			
			Second Road West				1			
			Upper Centennial Parkway			1				
			First Road East				1			
			Total			**1**	**4**			
	6	South Of	Trinity Church Road	**731**	**846**		1	**2800**	**0.26**	**0.30**
			Fletcher Road				1			
			Second Road West				1			
			Upper Centennial Parkway			1				
			First Road East				1			
			Total			**1**	**4**			
	7	East Of	Rymal Road East	**834**	**1312**	2		**2900**	**0.29**	**0.45**

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
Upper Centennial Parkway			Mud Street East			1				
			Highland Road East				1			
			Total			**3**	**1**			
	8	West Of	Rymal Road East	**1891**	**1773**	2		**3700**	**0.51**	**0.48**
			Mud Street East			2				
			Highland Road East				1			
			Total			**4**	**1**			
Mud Street East	9	North Of	Upper Centennial Parkway	**1122**	**1383**	2		**2600**	**0.43**	**0.53**
			First Road East				1			
			Second Road East				1			
			Total			**2**	**2**			
	10	South Of	Upper Centennial Parkway	**1023**	**1260**	2		**2600**	**0.39**	**0.48**
			First Road East				1			
			Second Road East				1			
			Total			**2**	**2**			
Second Road East[1]	11	East Of	Rymal Road East	**1495**	**1458**	1		**3300**	**0.45**	**0.44**
			Mud Street East				1			
			Highland Road East				1			

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
			New Arterial Road/Twenty Road				2			
			Golf Club Road				1			
			Total			**1**	**5**			
	12	West Of	Rymal Road East	**1495**	**1458**	1		**3300**	**0.45**	**0.44**
			Mud Street East				1			
			Highland Road East				1			
			New Arterial Road/Twenty Road				2			
			Golf Club Road				1			
			Total			**1**	**5**			

Note 1: Volumes south of Rymal Road East and east of Upper Centennial Parkway were assumed to carry on past Golf Club Road and Second Road East respectively.

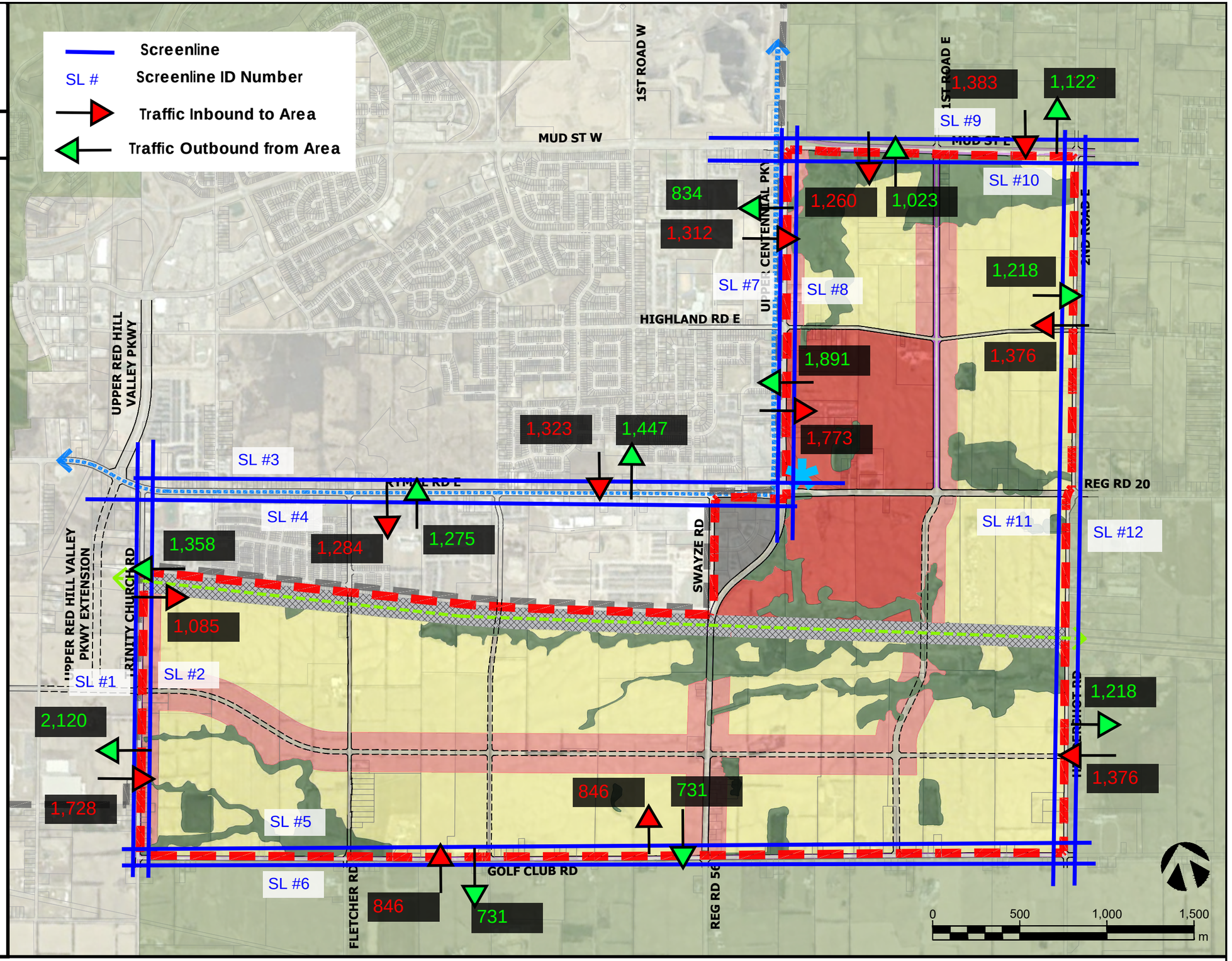
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

Table 6 indicates that there is room for traffic growth on the area's roads with the planned capital widening and other improvements. These planned improvements will provide enough capacity to accommodate the corridor growth in the surrounding area.

7.2 Future Total Screenline Analysis

This section examines the Future Total scenario based on the volumes outlined in **Section 5.3** which are shown in **Figure 6**. **Table 7** highlights the screenline assessment when considering the Future Total conditions, including the buildout of the Elfrida community.

This analysis does not include the internal collector roads, but will be used to identify collector road requirements for further refinement of the Secondary Plan

Table 7: Future Total Screenline Analysis Results

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
Trinity Church Road	1	East Of	Rymal Road East	**6535**	**2171**	2		1600	**1.77**	**0.59**
			Golf Club Road				1	500		
			New Arterial Road/Twenty Road			2		1600		
			Total			**4**	**1**	**3700**		
	2	West Of	Rymal Road East	**2832**	**1528**	2		1600	**0.77**	**0.41**
			Golf Club Road				1	500		
			New Arterial Road/Twenty Road			2		1600		
			Total			**4**	**1**	**3700**		
Rymal Road East	3	North Of	Trinity Church Road	**1532**	**1323**		1	500	**0.49**	**0.43**
			Fletcher Road				1	500		
			Second Road West				1	500		
			Upper Centennial Parkway			2		1600		
			Total			**2**	**3**	**3100**		

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
Golf Club Road[1]	4	South Of	Trinity Church Road	**1752**	**1430**		1	500	**0.57**	**0.46**
			Fletcher Road				1	500		
			Second Road West				1	500		
			Upper Centennial Parkway			2		1600		
			Total			**2**	**3**	**3100**		
	5	North Of	Trinity Church Road	**991**	**2837**		1	500	**0.35**	**1.01**
			Fletcher Road				1	500		
			Second Road West				1	500		
			Upper Centennial Parkway			1		800		
			First Road East				1	500		
			Total			**1**	**4**	**2800**		
	6	South Of	Trinity Church Road	**991**	**2837**		1	500	**0.35**	**1.01**
			Fletcher Road				1	500		
			Second Road West				1	500		
			Upper Centennial Parkway			1		800		

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
			First Road East				1	500		
			Total			**1**	**4**	**2800**		
Upper Centennial Parkway	7	East Of	Rymal Road East	**2028**	**1463**	2		1600	**0.70**	**0.50**
			Mud Street East			1		800		
			Highland Road East				1	500		
			Total			**3**	**1**	**2900**		
	8	West Of	Rymal Road East	**2760**	**2510**	2		1600	**0.75**	**0.68**
			Mud Street East			2		1600		
			Highland Road East				1	500		
			Total			**4**	**1**	**3700**		
Mud Street East	9	North Of	Upper Centennial Parkway	**3243**	**3154**	2		1600	**1.25**	**1.21**
			First Road East				1	500		
			Second Road East				1	500		
			Total			**2**	**2**	**2600**		
	10	South Of	Upper Centennial Parkway	**4058**	**3031**	2		1600	**1.56**	**1.17**
			First Road East				1	500		
			Second Road East				1	500		
			Total			**2**	**2**	**2600**		

Screenline	Screenline ID Number	Direction	Road	Volumes		City Arterial Lanes	Collector Lanes	Capacity	v/c ratio	
				AM Out	PM In				AM Out	PM In
Second Road East[1]	11	East Of	Rymal Road East	**1665**	**1527**	1		800	**0.50**	**0.46**
			Mud Street East				1	500		
			Highland Road East				1	500		
			New Arterial Road/Twenty Road				2	1000		
			Golf Club Road				1	500		
			Total			**1**	**5**	**3300**		
	12	West Of	Rymal Road East	**1665**	**1527**	1		800	**0.50**	**0.46**
			Mud Street East				1	500		
			Highland Road East				1	500		
			New Arterial Road/Twenty Road				2	1000		
			Golf Club Road				1	500		
			Total			**1**	**5**	**3300**		

Note 1: Volumes south of Rymal Road East and east of Upper Centennial Parkway were assumed to carry on past Golf Club Road and Second Road East respectively.

ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions

Screenline
SL # Screenline ID Number
Traffic Inbound to Area
Traffic Outbound from Area

1ST ROAD W
MUD ST W
1ST ROAD E
MUD ST E
PER CENTENNIAL PK
2ND ROAD E
HIGHLAND RD E
UPPER RED HILL VALLEY PKWY
UPPER RED HILL VALLEY PKWY EXTENSION
TRINITY CHURCH RD
SWAYZE RD
REG RD 20
GOLF CLUB RD
FLETCHER RD
REG RD 56
FENDERSHOT RD

SL #1 6,535 2,171
SL #2 2,832 1,528
SL #3 1,323 1,532
SL #4 1,430 1,752
SL #5 2,837 991
SL #6 2,837 991
SL #7 2,028 1,483
SL #8 2,760 2,510
SL #9 3,154 3,243
SL #10 3,031 4,058
SL #11 1,665 1,527
SL #12 1,665 1,527

0 500 1,000 1,500 m

BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

A review of the screenline assessment for Future Total conditions highlights that some of the screenlines may experience over-capacity conditions, as indicated in **Table 7.** However, these results are somewhat conservative as they do not account for the future internal collector network that will ultimately be required to support the Elfrida Community.

This future grid system of collector roads will provide additional collector capacity for each screenline. Particularly, it will add additional capacity for parallel roads, assumed as 500 vehicles per hour (vph) for each collector lane, that would allow new trips within the Elfrida Secondary Plan to utilize routes with low delays to access the boundary road network.

For instance, the frontage along Trinity Church Rd is approximately 1600 m; and can support approximately four (4) collector road connections at an approximate spacing of 250 m - 300m with the planned arterial road as well. These four (4) east-west collectors would add up to 2000 vph of capacity assuming a two (2)-lane cross-section, providing alternate routes for east-west travel besides Rymal Road. This collector road network is examined further in **Section 7.0.**

The planned extension of Upper Red Hill Parkway will provide connectivity options for collector roads and local roads, similar to the configurations between Rymal Road and Stone Church Rd, where collector roads have full moves (signalized) connections and local roads have right-in/right-out (RIRO) connections. Similar connections are expected with the extension which will provide direct connectivity.

The importance of the Upper Red Hill Parkway extension could lead to plans to develop the eastern portions of the development first while waiting for the new connection to be determined and built.

Mud street's arterial expansion would match its built form on the west side of Upper Centennial Parkway and would encourage more drivers to head west to the Upper Red Hill Valley Parkway rather than north to the QEW via Upper Centennial Parkway. This, along with other collector roads, would help distribute the volumes to the north end of the development.

8.0 Future Road Network

The Elfrida Community's transportation planning includes the development of a future grid system of collector roads, which is essential to accommodate the anticipated traffic volumes and alleviate potential over-capacity conditions at certain screenlines as examined in **Section 6.0.** This grid system will enhance the connectivity and capacity of the road network, facilitating smoother traffic flow and reducing delays.

The proposed collector road network will integrate with existing and planned arterial roads, providing additional routes for internal circulation. For example, the frontage along Trinity Church Road can support up to four collector road connections, with each connection spaced approximately 250 to 300 meters apart as discussed previously. These connections will offer an estimated total capacity of 2000 vehicles per hour, considering a two-lane cross-section for each collector road. This network will provide alternative east-west routes, reducing the dependency on Rymal Road and improving overall traffic distribution.

Moreover, the arterial expansion of Mud Street is expected to match its current form west of Upper Centennial Parkway. This expansion will encourage more traffic to flow westward towards the Upper Red Hill Valley Parkway rather than northward to the QEW via Upper Centennial Parkway. By distributing the traffic volumes more evenly, the expanded collector road network will effectively divert the traffic in an effort to mitigate congestion and support the overall development plan.

The grid system will promote walkability and provide a structure for efficient transit service and active transportation connectivity. While these details will be defined through the secondary plan process, there are no expected impediments to establishing continuous collector roads within the Secondary Plan lands connecting to the boundary road network even with Natural Heritage System.

These planned improvements will not only enhance mobility but also support the efficient movement of goods and services, aligning with the broader transportation strategy for the Elfrida Community.

9.0 Multi-Modal Network Review

This section primarily looks at the other transportation aspects not directly related to the vehicle trips generated by the development.

9.1 Truck Routes & Circulation

The truck routes envisioned for this development are expected to be primarily heading towards the main commercial destinations which are proposed to be along the current planned arterial roads within the Elfrida Community Area. These are located primarily near the Upper Centennial Parkway and Rymal Road intersection. Both of these conditions lead to truck operations that are primarily along the major arterial roads and should not have a significant impact on planned residential areas.

Major trucking demand is anticipated for the future commercial node and transit hub by Rymal Road and Upper Centennial Road (Highway 56) which are both arterial roads. These land uses front arterial roadways and support truck circulation without the need to travel through residential areas. This area is also surrounded by existing commercial uses that require frequent truck deliveries for day-to-day operations

9.2 Transit Opportunities

As transit will play a vital role in the community contributing to the City's sustainable mode share targets, this section reviews potential transit opportunities that support establishment of future transit service within the future Elfrida community.

9.2.1 Existing Transit Infrastructure and Initiatives

Currently, one route of the Hamilton Street Railway (HSR) uses the transit stops on the western side of the Rymal Road East and Upper Centennial Parkway and at entrance of the South Mount Health Centre along Upper Centennial Parkway to move passengers across the City of Hamilton in this area.

HSR route number "44", also known as Rymal, goes from the Meadowlands to the Elfrida Gateway with stops at Redeemer University, Heritage Greene, and Highland with a headway of 15 minutes on regular weekday schedule. The university connection provides a useful method of travel for students and staff while the Heritage Greene stop provides connections to five (5) other routes that do not utilize the stops near the Elfrida Community. This route connects the area to the greater Hamilton area and the route maps can be seen in **Appendix C.**

HSR route number "43", also known as Stone Church, goes from Downtown Dundas to the Heritage Greene stop via the stops in the residential area near the Elfrida Community with headways of 30 minutes on the regular schedule. Stone Church has other stops at McMaster University, CF Lime Ridge and Wilson. This route provides connections across a substantial portion of the City of Hamilton with key stops at the university, major transit hubs and the shopping mall.

9.2.2 Future Transit Infrastructure and Initiatives

The City of Hamilton set a long-term target of 12% of daily trips being made by using municipal transit by the year 2031. As such, improvements are needed to the transit infrastructure to serve the new users and encourage the transition from single-occupant vehicle (SOV) trips.

The City's Rail Ready System Map envisions the development of major transit hubs across the City that will connect all of the City's residents to more accessible transit. One of these hubs is located at Rymal Road East and Upper Centennial Parkway and is labeled as the Elfrida Gateway. This map is included in **Appendix C.** The HSR routes 44 and 43 described in 8.2.1. are envisioned to be modified to connect to the Elfrida Gateway hub and provide services to the Elfrida Community via this hub.

The BLAST network is a proposed transit network consisting of five (5) different lines, each corresponding to a letter in the title BLAST, that are envisioned as either light rail transit (LRT) services or bus rapid transit (BRT) services. The network would connect major hubs across the City of Hamilton such as McMaster University, Hamilton Airport, Confederation GO Station, Hamilton GO Station and the Downtown Hamilton Core.

The S-Line is envisioned as a BRT line that would travel along Rymal Road from the Ancaster Business Park before turning north and going along Centennial Parkway to the Confederation GO Station. This is the primary point of contact for the BLAST network for the Elfrida Community as this line runs along the borders of the Elfrida Community. Using this line would provide access to the entire BLAST network and, with the GO station the end point of this line, the wider Ontario transit network. No specific timeline has been provided regarding the S-Line, however the target deadline for the line was originally 2041.

Specifically, the GRIDS 2 report explored the Elfrida Community and concluded that, with the possibility for more than 16,000 - 20,000 new units in the Elfrida Area and with estimated minimum target densities of 77 person and jobs per hectare, the Elfrida Community would support the investments in the S-Line. In addition, ridership on the S-Line could further be maximized by providing efficient feeder services and cycling walking corridors from the core of the Elfrida Community, or conversely, creating a branch of the S-Line to extend into the new Elfrida Community.

These improvements could mean that future communities could have higher targets than the goal of 12% of daily trips due to the investment in the infrastructure. By having these communities have higher targets, they can be used to bring up the average usage for the City to the goal of 12% trips. These improvements can also be timed to be implemented at the same time as the Elfrida Community buildout.

9.2.3 Development Transit Infrastructure and Initiatives

While the BLAST network provides opportunities via the rapid and rail transit lines, new bus routes could also be explored to serve the Elfrida Community in line with the City of Hamilton's transit goals. The Hamilton Airport via Twenty Road East could be a route that serves the community as well as more local routes that bring passengers from the community to the Elfrida Gateway stop. Both of the HSR routes in the area, numbers 36 and 40, could also be extended into the Elfrida Community so long as service goals were still met.

For new service, transit stops would be expected at major arterial-arterial, arterial-collector and collector-collector road intersections. **Figure 7** illustrates arterial-arterial intersections and the coverage for typical walking distance, and it is expected that more refined service plans in coordination with HSR will be undertaken during the next stages of evaluation as the plans develop.

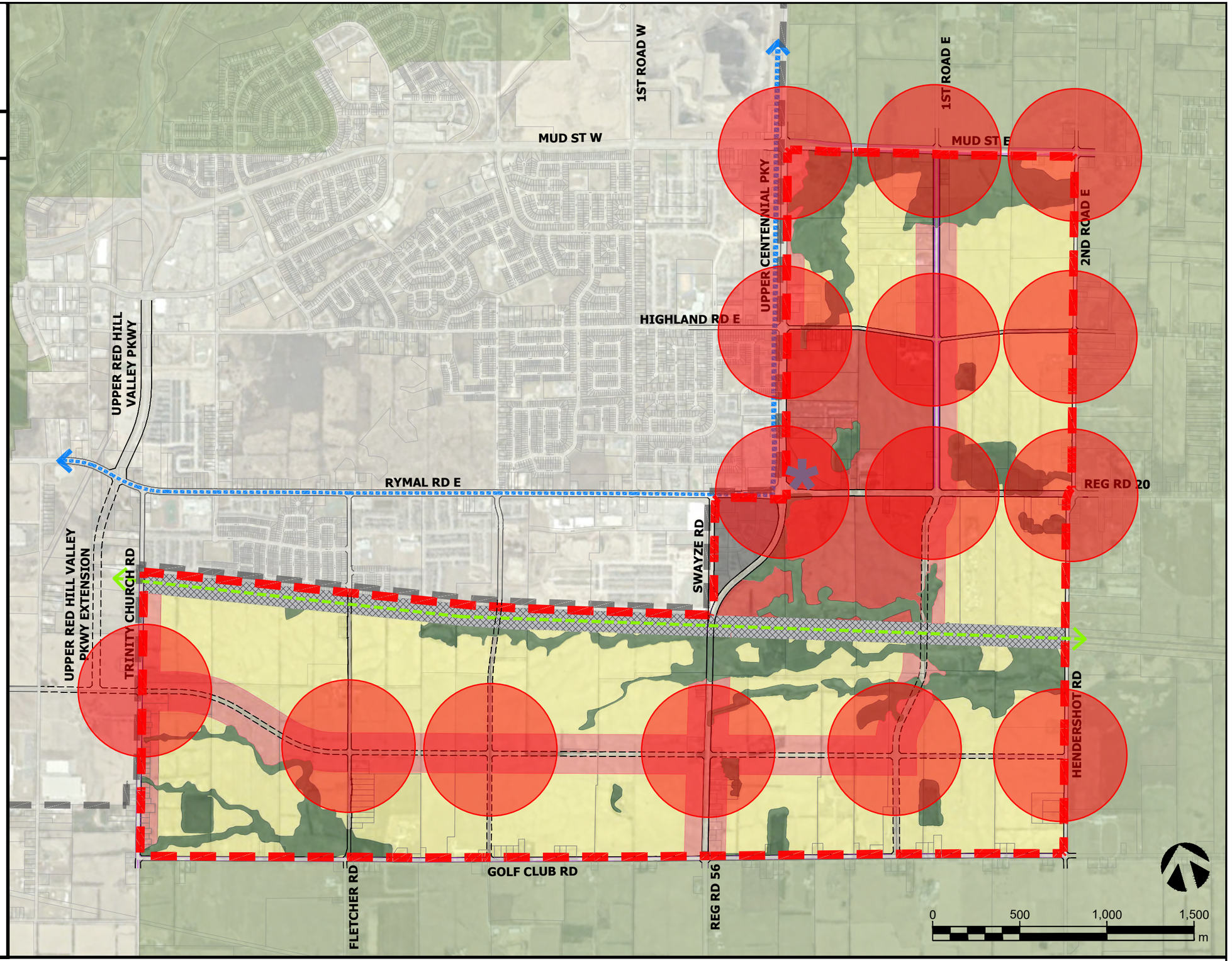
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

9.3 Active Transportation Opportunities

Active Transportation will play a role in moving people both within the Elfrida Community and to other nearby communities.

9.3.1 Existing Active Transportation Infrastructure and Initiatives

Highland Road is the first of the surrounding road network to have dedicated bike lanes. However, Rymal Road is currently under construction in portions to have pedestrian-friendly facilities as part of its transition to the BRT line.

The Elfrida Community provides an opportunity to connect into pedestrian trails that lead to the nearby Eramosa Karst Conservation Area while other smaller parks such as Maplewood, Cline and the Red Hill Summit East Park also provide opportunities for active transportation.

9.3.2 Future Active Transportation Infrastructure and Initiatives

The City of Hamilton set a long-term target of 15% of daily trips being made by walking or cycling by the year 2031.

As part of these goals, dedicated bike routes along Highland Road as well as multi-use paths along Regional Road 56 and First Road East are incorporated in the City's plans. There are also minor shoulder improvements on other surrounding roads to encourage the active transportation modes.

9.3.3 Development Active Transportation Infrastructure and Initiatives

These improvements can be tied into the Elfrida Community via these road connections. By doing so, it would lead to a connected network that would allow users to travel throughout the city using active transportation. This interconnectivity and improved safety with dedicated or improved facilities are key factors when users choose their mode of transportation.

The GRIDS 2 report explored specific connections for the Elfrida Community that could be made to the existing bike lanes on Stone Church Road as well as the Red Hill Valley trail and Paramount Road links. Several existing links would need to be upgraded to make existing/planned facilities more accessible for all ages and abilities.

Improved cycling infrastructure on Rymal Road would be desirable to maximize active transportation shares from Elfrida and other new growth areas. One major opportunity outlined in GRIDS 2 that could support greater levels of active transportation under the ambitious density scenario is the development of a major east-west spine pathway system. The major east-west spine would follow the hydro corridor between Rymal Road and Twenty Road, as envisioned in the Recreational Trails Master Plan.

The Hydro corridor within the Elfrida development can connect to the Chippewa Trail to the west and then to the proposed Natural Heritage System areas within the development. **Figure 8**shows potential connections to the existing active transportation infrastructure.

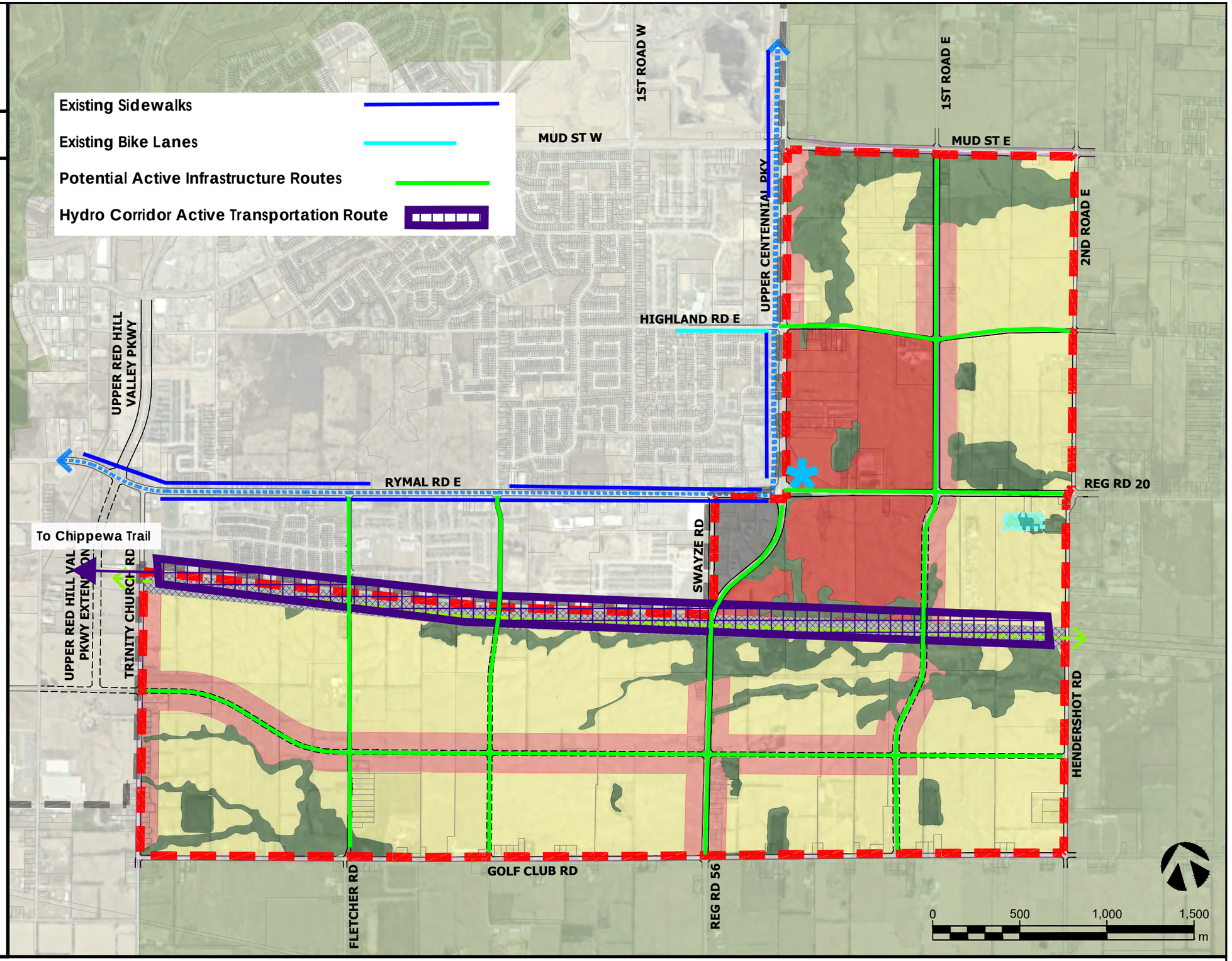
ELFRIDA
URBAN EXPANSION AREA

CITY OF HAMILTON

LEGEND:

- Elfrida Study Area (Urban Boundary Expansion Lands)
- Urban Boundary *(UHOP - Schedule E)*
- Existing Roads
- Proposed Roads
- Planned ROW *(RHOP / UHOP)*
- Potential Linear Greenway
- Preliminary Natural Heritage System Area *(Stantec)*
- Greenbelt Plan Area
- Hydro Corridor (Utility) *(RHOP - Schedule B)*
- Existing Developed Industrial / Commercial Uses
- Potential Residential
- Potential Intensification Hub
- Potential Intensification Corridor
- Potential Higher Order Transit *(UHOP - Appendix B)*
- Planned Elfrida Gateway Station *(As per "(Re)envision the HSR" Concept Network Plan)*

Image source: First Base Solutions



BOUSFIELDS inc.
Nov 13 - 24

Concept Plan

9.4 Transportation Demand Management.

As noted in **Sections 8.2 to 8.3,** there are opportunities for the trips generated in **Section 5.0** to be reduced due to the increased transit and active transportation opportunities for the residents of and visitors to the Elfrida Community. These reductions would go beyond the assumed reductions as the minimum transit and active transportation goals are 12% and 15% respectively for the trips. Combined, these other modes would account for 27% of the trips rather than the current 10% assumption.

This assumes that the City's goals were only met and not exceeded per section 8.3.2 which explained how the transit goal in this area could be higher than the City's average goal.

Further Transportation Demand Management methodologies would be explored as part of the Secondary Plan evaluation and would require coordination with the City of Hamilton.

10.0 Conclusions

This study has assessed the transportation impacts of the proposed development in the City of Hamilton. The study has assessed the development proposal for its ability to facilitate access and interact with the proposed network. A number of conclusions have been identified as a result of the study process.

10.1 Conclusions

The analysis contained within this study has resulted in the following key findings:

- Elfrida Community is an area of land that consists of approximately 1,200 ha in the southeastern portion of the City of Hamilton.
- The development is proposed to consist of the following:
    - 18,939 Low Density Units
    - 7,444 Medium Density Units
    - 13,248 Low Density Units
    - Commercial Space and Schools
- Assumptions were made in order to develop the surveyed traffic volumes into the 2041 volumes used in the screenline analysis.
- The full buildout of the proposed development is expected to generate a total of 27,762 and 32,644 gross two-way vehicular trips during the weekday a.m. and p.m. peak hours, respectively.
- After the reductions for internal zone trip travel, pass-by rates and internal trip capture, the full-buildout of the proposed development is expected to generate a total of 12,062 and 11,959 two-way trips that were used for the analysis during the weekday a.m. and p.m. peak hours, respectively.
- The screenline analysis initially identifies over capacity conditions for the Trinity Church Road screenline and Mud Street screenline, along the western and northern limits of the development, respectively.
- This analysis equated to a 1.77 v/c maximum ratio at the Trinity Church Road Screenline and 1.56 maximum v/c ratio at the Mud Street Screenline. However, the screenline analysis did not account for the creation of a continuous grid-like collector network system that would be required to support the Subject Lands.
- Along Trinity Church Rd, the subject lands have 1600 m of frontage, which can accommodate up to 4 collector road connections. These collector roads would run east-west, offering additional capacity of 500 vph, allowing traffic volumes to efficiently access the road network due to increased capacity on parallel roads. The configuration of the collector road network will be explored in more detail at the Secondary Plan stage; however, the lands sufficiently allow for a number of collector roads to add capacity such that the screenline would operate below capacity.

- Truck routes are expected to continue operating along existing arterial roads and will be supplemented by planned arterial roads, where the major commercial destinations are contemplated.

- The development area can support potential transit stops at arterial intersections that offer 400 m transit coverage for a large proportion of the development lands. However, greater transit stop density is expected, should transit stops be implemented at future collector-collector road intersections within the community - significantly increasing transit access to the community. Such increased transit coverage along with the planned BRT and local service will help to contribute to the City's transit mode share target of 12 %.

- Further analysis including the development of more refined service plans in coordination with HSR will be undertaken during the next stages of evaluation.

- The active transportation network's interconnectivity and the improved safety with dedicated or improved facilities are key factors when users choose their mode of transportation. This philosophy should be kept in mind when incorporating the active transportation features into the development.

- The City has set a target of 15% of daily trips to be made by walking or cycling by 2031, with plans for dedicated bike routes and multi-use paths.

- The Transportation Demand Management strategies envisioned will help lower the vehicular traffic by promoting the other modes of transportation. Further details will be explored during the Secondary Plan stage.

In conclusion, the urban boundary expansion can be supported from a traffic, transit and pedestrian operations perspective.

Respectfully submitted by,

C.F. CROZIER & ASSOCIATES INC.

Ian Lindley, MASc., P. Eng.
Project Engineer, Transportation

C.F. CROZIER & ASSOCIATES INC.

R. Aaron Wignall, Associate
Senior Project Manager, Transportation

C.F. CROZIER & ASSOCIATES INC.

Alexander Fleming, MBA, P.Eng
Director, Transportation

IL;jp

J:\2500\2545 - Elfrida Community Builders Group Inc. co Delta Urban Inc\6847 - Elfrida Secondary Plan\Reports\Transportation\2024.11.15 _(2545-6847) - UBE Elfrida TIS _FINAL.docx

Appendix A
Traffic Movement Counts

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (3 . RYMAL ROAD EAST & FLETCHER ROAD)

Start Time	E Approach RYMAL RD					S Approach FLETCHER RD					W Approach RYMAL RD					Int. Total (15 min)	Int. Total (1 hr)
	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	UTurn W:W	Peds W:	Approach Total		
00:00:00	16	4	0	0	20	1	4	0	0	5	16	21	0	0	37	62	
00:15:00	13	3	0	0	16	2	1	0	0	3	7	18	0	0	25	44	
00:30:00	13	0	0	0	13	0	1	0	0	1	3	16	0	0	19	33	
00:45:00	9	2	0	1	11	1	0	0	0	1	6	12	0	0	18	30	169
01:00:00	5	0	0	0	5	1	1	0	0	2	0	11	0	0	11	18	125
01:15:00	6	0	0	0	6	3	2	0	0	5	4	4	0	0	8	19	100
01:30:00	9	0	0	0	9	1	3	0	0	4	2	9	0	0	11	24	91
01:45:00	9	2	0	0	11	1	3	0	0	4	1	10	0	0	11	26	87
02:00:00	6	0	0	0	6	0	1	0	0	1	2	7	0	0	9	16	85
02:15:00	4	0	0	0	4	0	0	0	0	0	3	7	0	0	10	14	80
02:30:00	6	0	0	0	6	0	1	0	0	1	1	6	0	0	7	14	70
02:45:00	5	0	0	0	5	0	3	0	0	3	1	5	0	0	6	14	58
03:00:00	5	0	0	0	5	0	1	0	0	1	0	12	0	0	12	18	60
03:15:00	8	0	0	0	8	0	2	0	0	2	2	4	0	0	6	16	62
03:30:00	7	0	0	0	7	0	2	0	0	2	3	6	0	0	9	18	66
03:45:00	5	1	0	0	6	0	1	0	0	1	0	4	0	0	4	11	63
04:00:00	12	0	0	0	12	1	5	0	0	6	1	2	0	0	3	21	66
04:15:00	7	0	0	0	7	0	4	0	0	4	0	5	0	0	5	16	66
04:30:00	29	0	0	0	29	1	10	0	0	11	0	12	0	0	12	52	100
04:45:00	28	1	0	0	29	3	12	0	0	15	1	12	0	0	13	57	146
05:00:00	36	3	0	0	39	3	13	0	0	16	3	19	0	0	22	77	202
05:15:00	38	2	0	0	40	0	8	0	0	8	2	26	0	0	28	76	262
05:30:00	54	0	0	0	54	3	27	0	0	30	0	24	1	0	25	109	319
05:45:00	65	2	0	1	67	2	23	0	1	25	7	21	0	0	28	120	382
06:00:00	80	1	0	0	81	5	25	0	0	30	4	38	0	0	42	153	458
06:15:00	104	0	0	1	104	7	34	0	1	41	7	40	0	0	47	192	574
06:30:00	117	3	0	0	120	10	50	0	0	60	7	62	0	0	69	249	714
06:45:00	114	5	0	2	119	9	37	0	1	46	16	90	0	0	106	271	865
07:00:00	153	5	0	0	158	10	41	0	2	51	15	66	0	2	81	290	1002
07:15:00	158	6	0	0	164	12	39	0	1	51	18	102	0	1	120	335	1145
07:30:00	234	10	0	0	244	19	66	0	3	85	24	102	0	0	126	455	1351
07:45:00	244	27	0	0	271	29	68	0	1	97	25	170	0	1	195	563	1643
08:00:00	197	19	0	3	216	9	53	0	4	62	37	176	0	2	213	491	1844
08:15:00	175	35	0	1	210	21	65	0	2	86	52	136	0	0	188	484	1993

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

08:30:00	205	21	0	2	226	39	115	0	5	154	40	127	0	0	167	547	2085
08:45:00	169	11	0	1	180	20	58	0	0	78	36	162	0	0	198	456	1978
09:00:00	188	11	0	1	199	18	42	0	0	60	32	148	0	1	180	439	1926
09:15:00	189	14	0	1	203	17	54	0	1	71	34	141	0	0	175	449	1891
09:30:00	175	11	0	0	186	20	61	0	4	81	18	140	0	0	158	425	1769
09:45:00	160	9	0	2	169	22	43	0	1	65	24	119	0	0	143	377	1690
10:00:00	143	7	0	4	150	10	41	0	3	51	17	126	0	1	143	344	1595
10:15:00	163	9	0	0	172	11	37	0	0	48	19	139	0	1	158	378	1524
10:30:00	157	9	0	2	166	11	30	0	0	41	18	144	0	0	162	369	1468
10:45:00	152	12	0	0	164	18	29	0	4	47	18	158	0	1	176	387	1478
11:00:00	156	16	0	3	172	19	39	0	5	58	30	165	0	0	195	425	1559
11:15:00	164	14	0	5	178	13	28	0	3	41	26	170	0	0	196	415	1596
11:30:00	167	6	0	2	173	12	23	0	0	35	19	130	0	0	149	357	1584
11:45:00	168	14	0	0	182	10	35	0	4	45	32	169	0	0	201	428	1625
12:00:00	193	16	0	0	209	9	34	0	5	43	24	179	0	1	203	455	1655
12:15:00	167	26	0	0	193	21	33	0	1	54	24	161	0	1	185	432	1672
12:30:00	190	18	0	1	208	19	33	0	6	52	26	164	0	0	190	450	1765
12:45:00	166	16	0	0	182	14	28	0	1	42	23	193	0	0	216	440	1777
13:00:00	169	17	1	1	187	12	32	0	0	44	33	161	0	0	194	425	1747
13:15:00	173	20	0	2	193	14	36	0	0	50	31	177	0	0	208	451	1766
13:30:00	188	12	0	0	200	17	34	0	0	51	22	132	0	0	154	405	1721
13:45:00	167	17	0	0	184	10	29	0	0	39	36	172	1	0	209	432	1713
14:00:00	168	17	0	1	185	14	27	0	1	41	24	171	0	0	195	421	1709
14:15:00	193	21	0	2	214	14	23	0	1	37	42	179	0	0	221	472	1730
14:30:00	182	27	0	0	209	13	37	0	10	50	51	230	0	0	281	540	1865
14:45:00	178	33	0	4	211	22	24	0	7	46	51	203	0	0	254	511	1944
15:00:00	162	19	0	0	181	39	66	0	8	105	43	212	0	4	255	541	2064
15:15:00	173	20	0	1	193	23	33	0	3	56	55	225	0	2	280	529	2121
15:30:00	195	19	0	2	214	19	27	0	1	46	52	186	0	1	238	498	2079
15:45:00	234	21	0	2	255	27	47	0	2	74	53	175	0	0	228	557	2125
16:00:00	209	19	0	0	228	37	69	0	0	106	65	203	0	0	268	602	2186
16:15:00	192	33	0	1	225	44	48	0	2	92	37	210	0	0	247	564	2221
16:30:00	199	31	0	1	230	25	57	0	1	82	51	217	0	0	268	580	2303
16:45:00	208	29	0	1	237	28	45	0	1	73	59	237	0	0	296	606	2352
17:00:00	222	17	0	0	239	27	54	0	7	81	69	218	0	1	287	607	2357
17:15:00	230	16	0	2	246	27	46	0	2	73	58	233	0	0	291	610	2403
17:30:00	218	24	0	0	242	15	52	0	2	67	45	186	0	0	231	540	2363

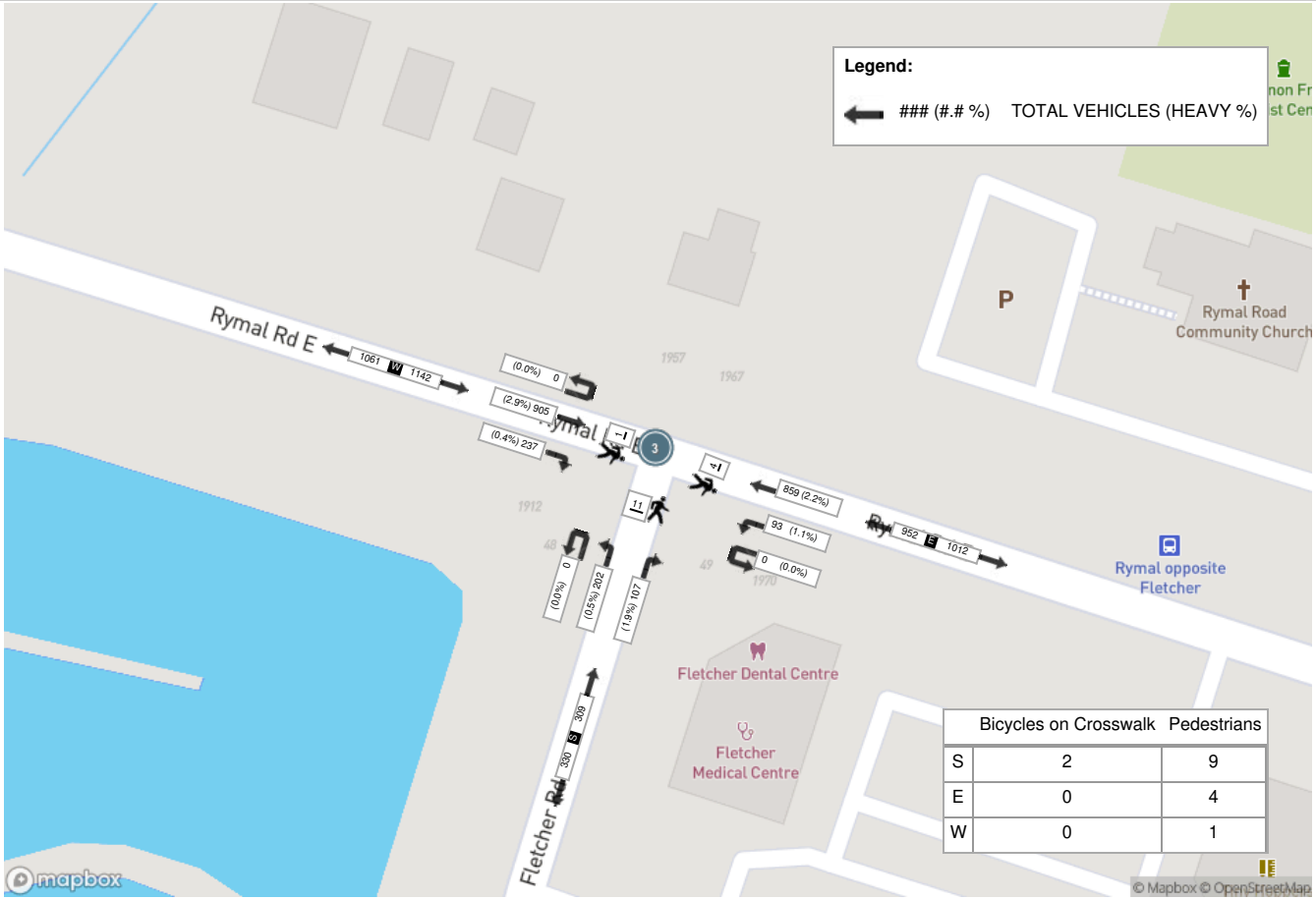
17:45:00	182	30	0	0	212	19	45	0	2	64	45	156	0	0	201	477	2234
18:00:00	167	20	0	0	187	19	56	0	2	75	50	206	0	0	256	518	2145
18:15:00	150	20	0	0	170	21	36	0	4	57	35	188	0	0	223	450	1985
18:30:00	170	20	0	0	190	23	33	0	1	56	34	152	0	0	186	432	1877
18:45:00	163	21	0	3	184	19	30	0	2	49	50	161	0	1	211	444	1844
19:00:00	154	24	0	1	178	14	27	0	2	41	47	189	0	0	236	455	1781
19:15:00	134	16	0	0	150	17	33	0	0	50	47	144	0	0	191	391	1722
19:30:00	132	23	0	0	155	13	30	0	0	43	39	145	0	0	184	382	1672
19:45:00	126	27	0	0	153	16	16	0	2	32	33	114	0	0	147	332	1560
20:00:00	120	15	0	0	135	12	19	0	0	31	40	141	0	0	181	347	1452
20:15:00	88	13	0	0	101	12	20	0	2	32	24	108	0	0	132	265	1326
20:30:00	75	16	0	0	91	13	18	0	0	31	33	96	0	0	129	251	1195
20:45:00	81	15	0	0	96	11	9	0	0	20	21	96	0	0	117	233	1096
21:00:00	71	15	0	0	86	10	17	0	0	27	26	91	0	0	117	230	979
21:15:00	70	10	0	2	80	12	11	0	1	23	27	80	0	0	107	210	924
21:30:00	59	13	0	0	72	7	9	0	1	16	21	91	0	0	112	200	873
21:45:00	51	8	0	0	59	7	8	0	0	15	10	55	0	0	65	139	779
22:00:00	65	12	0	0	77	2	3	0	0	5	15	63	0	0	78	160	709
22:15:00	40	2	0	0	42	5	11	0	0	16	17	55	0	0	72	130	629
22:30:00	40	2	0	0	42	5	6	0	0	11	11	46	0	0	57	110	539
22:45:00	34	2	0	1	36	3	3	0	0	6	12	41	0	0	53	95	495
23:00:00	26	2	1	0	29	1	5	0	0	6	14	33	0	0	47	82	417
23:15:00	23	2	0	0	25	3	6	0	0	9	12	27	0	0	39	73	360
23:30:00	10	0	0	0	10	0	2	0	1	2	6	31	0	0	37	49	299
23:45:00	13	2	0	0	15	0	4	0	0	4	12	21	0	0	33	52	256
Grand Total	10947	1113	2	60	12062	1148	2612	0	127	3760	2288	10247	2	21	12537	**28359**	-
Approach%	90.8%	9.2%	0%		-	30.5%	69.5%	0%		-	18.2%	81.7%	0%		-	**-**	-
Totals %	38.6%	3.9%	0%		42.5%	4%	9.2%	0%		13.3%	8.1%	36.1%	0%		44.2%	**-**	-
Heavy	521	29	0		-	29	38	0		-	42	498	0		-	**-**	-
Heavy %	4.8%	2.6%	0%		-	2.5%	1.5%	0%		-	1.8%	4.9%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

Peak Hour: 04:30 PM - 05:30 PM Weather:

Start Time	E Approach RYMAL RD					S Approach FLETCHER RD					W Approach RYMAL RD					Int. Total (15 min)
	Thru	Left	UTurn	Peds	Approach Total	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	
16:30:00	199	31	0	1	230	25	57	0	1	82	51	217	0	0	268	580
16:45:00	208	29	0	1	237	28	45	0	1	73	59	237	0	0	296	606
17:00:00	222	17	0	0	239	27	54	0	7	81	69	218	0	1	287	607
17:15:00	230	16	0	2	246	27	46	0	2	73	58	233	0	0	291	610
Grand Total	859	93	0	4	952	107	202	0	11	309	237	905	0	1	1142	**2403**
Approach%	90.2%	9.8%	0%		-	34.6%	65.4%	0%		-	20.8%	79.2%	0%		-	**-**
Totals %	35.7%	3.9%	0%		39.6%	4.5%	8.4%	0%		12.9%	9.9%	37.7%	0%		47.5%	**-**
PHF	0.93	0.75	0		0.97	0.96	0.89	0		0.94	0.86	0.95	0		0.96	**-**
Heavy	19	1	0		20	2	1	0		3	1	26	0		27	**-**
Heavy %	2.2%	1.1%	0%		2.1%	1.9%	0.5%	0%		1%	0.4%	2.9%	0%		2.4%	**-**
Lights	840	92	0		932	105	201	0		306	235	879	0		1114	**-**
Lights %	97.8%	98.9%	0%		97.9%	98.1%	99.5%	0%		99%	99.2%	97.1%	0%		97.5%	**-**
Single-Unit Trucks	12	1	0		13	0	1	0		1	1	13	0		14	**-**
Single-Unit Trucks %	1.4%	1.1%	0%		1.4%	0%	0.5%	0%		0.3%	0.4%	1.4%	0%		1.2%	**-**
Buses	5	0	0		5	2	0	0		2	0	10	0		10	**-**
Buses %	0.6%	0%	0%		0.5%	1.9%	0%	0%		0.6%	0%	1.1%	0%		0.9%	**-**
Articulated Trucks	2	0	0		2	0	0	0		0	0	3	0		3	**-**
Articulated Trucks %	0.2%	0%	0%		0.2%	0%	0%	0%		0%	0%	0.3%	0%		0.3%	**-**
Bicycles on Road	0	0	0		0	0	0	0		0	1	0	0		1	**-**
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0.4%	0%	0%		0.1%	**-**
Pedestrians	-	-	-	4	-	-	-	-	9	-	-	-	-	1	-	**-**
Pedestrians%	-	-	-	25%		-	-	-	56.3%		-	-	-	6.3%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	2	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	12.5%		-	-	-	0%		**-**

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather:



	Bicycles on Crosswalk	Pedestrians
S	2	9
E	0	4
W	0	1

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & SECOND ROAD WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (2 . RYMAL ROAD EAST & SECOND ROAD WEST)

Start Time	N Approach SECOND RD W						E Approach RYMAL RD						S Approach SECOND RD W						W Approach RYMAL RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
00:00:00	3	0	1	0	0	4	1	17	2	0	2	20	3	1	0	0	0	4	4	14	2	0	0	20	48	
00:15:00	0	0	0	0	0	0	0	13	0	0	0	13	3	1	2	0	0	6	3	15	1	0	0	19	38	
00:30:00	1	0	1	0	0	2	1	12	0	0	0	13	0	1	0	0	1	1	4	13	1	0	0	18	34	
00:45:00	2	0	0	0	0	2	0	9	0	0	2	9	0	0	0	0	0	0	2	8	2	0	0	12	23	143
01:00:00	2	0	1	0	3	3	0	3	2	0	0	5	1	0	0	0	0	1	0	9	2	0	0	11	20	115
01:15:00	1	0	1	0	3	2	0	4	0	0	0	4	0	0	0	0	0	0	1	4	2	0	0	7	13	90
01:30:00	1	0	1	0	0	2	1	8	0	0	0	9	1	0	1	0	0	2	0	7	4	0	0	11	24	80
01:45:00	1	0	1	0	0	2	0	10	1	0	0	11	0	0	0	0	0	0	2	8	1	0	0	11	24	81
02:00:00	1	0	0	0	0	1	0	5	0	0	0	5	0	0	0	0	0	0	2	4	0	0	0	6	12	73
02:15:00	0	0	0	0	0	0	0	4	0	0	0	4	1	0	0	0	0	1	0	6	2	0	0	8	13	73
02:30:00	0	0	0	0	0	0	2	6	1	0	0	9	0	0	0	0	0	0	1	5	0	0	0	6	15	64
02:45:00	0	0	0	0	0	0	0	5	0	0	0	5	0	1	0	0	0	1	1	4	0	0	0	5	11	51
03:00:00	1	0	0	0	0	1	1	2	1	0	0	4	0	0	2	0	0	2	1	10	1	0	0	12	19	58
03:15:00	2	0	1	0	0	3	0	5	1	0	0	6	1	0	1	0	0	2	0	2	1	0	0	3	14	59
03:30:00	2	0	0	0	0	2	0	5	1	0	0	6	1	0	0	0	0	1	0	6	1	0	0	7	16	60
03:45:00	1	0	0	0	0	1	0	4	1	0	0	5	1	0	1	0	0	2	0	4	0	0	0	4	12	61
04:00:00	1	0	0	0	0	1	0	10	1	0	0	11	1	0	0	0	0	1	0	2	0	0	0	2	15	57
04:15:00	0	0	0	0	0	0	0	7	0	0	0	7	0	0	0	0	0	0	0	5	0	0	0	5	12	55
04:30:00	3	0	0	0	0	3	1	27	0	0	0	28	1	1	2	0	0	4	0	12	1	0	0	13	48	87
04:45:00	2	0	0	0	0	2	0	23	1	0	0	24	1	0	1	0	0	2	1	11	2	0	0	14	42	117
05:00:00	4	0	0	0	0	4	0	32	0	0	0	32	0	0	2	0	0	2	1	16	2	0	0	19	57	159
05:15:00	7	0	1	0	0	8	0	31	0	0	0	31	2	0	3	0	0	5	1	24	2	0	0	27	71	218
05:30:00	12	0	1	0	0	13	1	46	1	0	0	48	2	0	1	0	1	3	0	22	2	0	1	24	88	258
05:45:00	13	0	2	0	0	15	1	48	1	0	0	50	4	0	5	0	1	9	0	21	0	0	0	21	95	311
06:00:00	7	0	0	0	0	7	0	69	1	0	0	70	4	1	8	0	0	13	3	38	2	0	0	43	133	387
06:15:00	13	1	4	0	0	18	1	87	3	0	0	91	4	2	6	0	0	12	1	40	2	0	1	43	164	480
06:30:00	19	1	7	0	0	27	1	101	2	0	0	104	6	1	9	0	0	16	1	64	8	0	1	73	220	612
06:45:00	20	4	2	0	0	26	1	84	8	0	1	93	5	5	15	0	0	25	4	84	3	0	1	91	235	752
07:00:00	29	0	3	0	0	32	1	127	2	0	0	130	6	4	7	0	0	17	1	75	3	0	0	79	258	877
07:15:00	42	1	2	0	2	45	1	106	3	0	2	110	6	4	11	0	1	21	3	98	4	0	1	105	281	994
07:30:00	64	2	4	0	0	70	4	181	7	0	8	192	13	2	9	0	4	24	5	107	17	0	6	129	415	1189
07:45:00	77	6	13	0	1	96	9	185	5	0	1	199	14	7	7	0	1	28	6	149	28	0	1	183	506	1460
08:00:00	26	5	14	0	1	45	12	182	10	0	1	204	12	7	10	0	2	29	6	158	37	0	2	201	479	1681
08:15:00	28	12	6	0	0	46	6	173	13	0	2	192	19	3	14	0	1	36	6	124	16	0	1	146	420	1820
08:30:00	33	11	11	0	0	55	5	194	19	0	1	218	27	7	15	0	3	49	7	150	14	0	1	171	493	1898
08:45:00	25	6	11	0	0	42	9	134	15	0	0	158	21	5	19	0	2	45	6	161	17	0	1	184	429	1821
09:00:00	38	4	14	0	0	56	20	172	23	0	0	215	17	3	8	0	0	28	11	145	14	0	1	170	469	1811
09:15:00	31	5	24	0	0	60	10	162	11	0	3	183	13	4	9	0	3	26	10	135	9	0	1	154	423	1814
09:30:00	26	1	8	0	0	35	13	167	9	0	1	189	27	3	6	0	2	36	4	156	16	0	0	176	436	1757
09:45:00	18	4	16	0	0	38	7	136	10	0	1	153	11	0	14	0	2	25	3	115	11	0	1	129	345	1673
10:00:00	23	3	12	0	0	38	5	128	6	0	0	139	10	1	9	0	1	20	3	131	6	0	0	140	337	1541
10:15:00	10	0	14	0	0	24	9	160	7	0	0	176	12	1	7	0	1	20	3	130	11	0	0	144	364	1482
10:30:00	14	3	11	0	1	28	9	141	5	0	0	155	9	0	7	0	1	16	3	156	8	0	1	167	366	1412
10:45:00	15	4	7	0	0	26	12	151	4	1	0	168	5	4	1	0	3	10	4	151	15	0	0	170	374	1441
11:00:00	24	3	12	0	0	39	11	156	13	0	0	180	10	2	7	0	5	19	7	167	6	0	0	180	418	1522

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

11:15:00	12	1	10	0	0	23	12	161	6	0	2	179	8	5	6	0	0	19	7	173	13	0	0	193	414	1572
11:30:00	15	3	12	0	0	30	21	161	11	0	3	193	10	1	8	0	2	19	5	130	10	0	0	145	387	1593
11:45:00	13	2	12	0	0	27	12	175	9	0	0	196	12	2	11	0	4	25	4	172	14	0	0	190	438	1657
12:00:00	14	3	12	0	0	29	14	204	14	0	0	232	8	2	4	0	0	14	11	164	13	0	2	188	463	1702
12:15:00	16	3	13	0	0	32	15	163	8	0	2	186	8	2	9	0	2	19	8	175	12	0	1	195	432	1720
12:30:00	8	4	14	0	0	26	14	192	16	0	2	222	9	3	10	0	2	22	8	173	16	0	0	197	467	1800
12:45:00	17	2	13	0	0	32	14	159	12	0	0	185	12	3	3	0	5	18	8	186	11	0	0	205	440	1802
13:00:00	16	4	9	0	0	29	13	168	8	0	0	189	12	1	9	0	2	22	9	155	12	0	0	176	416	1755
13:15:00	16	3	12	0	0	31	11	172	16	0	0	199	10	2	5	0	0	17	5	159	20	0	0	184	431	1754
13:30:00	12	3	13	0	0	28	16	180	10	0	0	206	9	4	8	0	0	21	8	136	16	0	0	160	415	1702
13:45:00	17	3	15	0	0	35	13	167	9	0	0	189	11	5	6	0	1	22	4	158	14	0	0	176	422	1684
14:00:00	26	5	10	0	0	41	7	157	11	0	2	175	8	0	8	0	5	16	4	160	20	0	0	184	416	1684
14:15:00	19	1	16	0	0	36	12	182	10	0	0	204	18	4	12	0	1	34	9	166	18	0	0	193	467	1720
14:30:00	26	6	13	0	0	45	16	187	17	0	4	220	13	2	6	0	6	21	7	216	35	0	4	258	544	1849
14:45:00	25	6	14	0	2	45	10	179	24	0	0	213	12	3	6	0	1	21	7	181	30	0	3	218	497	1924
15:00:00	21	5	16	0	0	42	14	169	20	0	5	203	29	11	5	0	4	45	15	205	18	0	3	238	528	2036
15:15:00	12	4	22	0	0	38	20	170	17	0	0	207	17	2	0	0	0	19	14	226	24	0	4	264	528	2097
15:30:00	29	9	20	0	2	58	23	197	25	0	2	245	11	3	5	0	1	19	11	180	18	0	2	209	531	2084
15:45:00	27	5	13	0	1	45	19	209	17	0	1	245	21	8	13	0	1	42	9	158	25	0	1	192	524	2111
16:00:00	22	2	10	0	0	34	17	221	20	0	0	258	32	7	8	0	0	47	13	217	27	0	0	257	596	2179
16:15:00	15	3	14	0	0	32	14	203	23	0	2	240	22	4	12	0	3	38	8	229	18	0	0	255	565	2216
16:30:00	16	6	21	0	0	43	15	215	17	0	0	247	9	4	9	0	1	22	14	207	25	0	0	246	558	2243
16:45:00	27	8	21	0	0	56	14	207	28	0	2	249	20	6	4	0	5	30	17	218	33	0	2	268	603	2322
17:00:00	22	11	13	0	0	46	18	244	23	0	2	285	17	3	9	0	2	29	17	206	28	0	0	251	611	2337
17:15:00	25	8	22	0	0	55	12	201	25	0	0	238	15	4	11	0	2	30	17	215	28	0	1	260	583	2355
17:30:00	22	7	14	0	0	43	18	236	28	0	2	282	19	6	8	0	6	33	15	157	31	0	1	203	561	2358
17:45:00	20	6	10	0	0	36	21	183	17	0	2	221	16	3	10	0	8	29	17	157	26	0	0	200	486	2241
18:00:00	14	8	14	0	0	36	13	174	13	0	5	200	14	5	8	0	1	27	19	177	32	0	0	228	491	2121
18:15:00	21	5	19	0	0	45	17	149	24	0	0	190	17	6	6	0	1	29	17	188	19	0	0	224	488	2026
18:30:00	25	3	18	0	0	46	10	162	17	0	0	189	19	2	5	0	4	26	8	160	16	0	2	184	445	1910
18:45:00	11	8	17	0	4	36	13	166	8	0	4	187	15	0	10	0	4	25	10	169	17	0	6	196	444	1868
19:00:00	16	5	19	0	1	40	15	146	21	0	3	182	16	1	10	0	2	27	13	175	18	0	3	206	455	1832
19:15:00	14	4	17	0	0	35	16	142	23	0	2	181	23	1	5	0	1	29	10	149	15	0	1	174	419	1763
19:30:00	10	3	13	0	0	26	19	139	24	0	1	182	13	4	7	0	4	24	10	137	12	0	0	159	391	1709
19:45:00	12	4	14	0	1	30	17	134	16	1	0	168	9	4	4	0	0	17	9	110	6	0	3	125	340	1605
20:00:00	13	3	10	0	1	26	16	122	20	0	1	158	11	0	2	0	4	13	9	130	13	0	1	152	349	1499
20:15:00	9	1	10	0	0	20	10	85	22	0	0	117	9	1	6	0	2	16	12	103	13	0	0	128	281	1361
20:30:00	4	3	8	0	1	15	9	81	12	0	0	102	13	1	4	0	1	18	10	98	12	0	1	120	255	1225
20:45:00	10	1	4	0	0	15	7	87	14	0	0	108	6	1	4	0	1	11	10	78	15	0	0	103	237	1122
21:00:00	7	0	7	0	1	14	9	73	16	0	1	98	5	3	0	0	2	8	12	72	18	0	1	102	222	995
21:15:00	6	4	8	0	2	18	11	76	9	0	0	96	5	0	3	0	0	8	14	81	13	0	1	108	230	944
21:30:00	7	4	5	0	0	16	3	59	5	0	0	67	3	0	4	0	0	7	6	82	7	0	0	95	185	874
21:45:00	2	1	6	0	0	9	7	54	6	0	1	67	3	1	3	0	1	7	4	59	7	0	0	70	153	790
22:00:00	12	0	2	0	0	14	2	64	3	0	0	69	3	1	0	0	1	4	6	50	11	0	0	67	154	722
22:15:00	4	2	3	0	0	9	4	35	4	0	0	43	1	1	1	0	0	3	7	45	8	0	0	60	115	607
22:30:00	4	1	6	0	0	11	3	36	4	0	0	43	4	1	3	0	1	8	4	43	4	0	0	51	113	535
22:45:00	0	1	1	0	0	2	1	35	5	0	1	41	5	2	0	0	1	7	1	43	1	0	0	45	95	477
23:00:00	2	2	2	0	0	6	6	27	2	0	0	35	4	1	0	0	0	5	6	23	3	0	0	32	78	401

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

23:15:00	2	0	1	0	0	3	1	20	2	0	0	23	1	0	1	0	0	2	2	28	2	0	0	32	60	346
23:30:00	2	0	0	0	0	2	2	8	1	0	0	11	1	1	0	0	0	2	3	25	1	0	0	29	44	277
23:45:00	1	1	4	0	0	6	2	14	3	0	0	19	2	0	0	0	0	2	2	12	5	0	0	19	46	228
Grand Total	1360	263	798	0	27	2421	773	10482	905	2	77	12162	864	208	510	0	130	1582	596	9882	1099	0	64	11577	**27742**	-
Approach%	56.2%	10.9%	33%	0%		-	6.4%	86.2%	7.4%	0%		-	54.6%	13.1%	32.2%	0%		-	5.1%	85.4%	9.5%	0%		-	**-**	-
Totals %	4.9%	0.9%	2.9%	0%		8.7%	2.8%	37.8%	3.3%	0%		43.8%	3.1%	0.7%	1.8%	0%		5.7%	2.1%	35.6%	4%	0%		41.7%	**-**	-
Heavy	23	7	5	0		-	8	548	15	0		-	12	7	3	0		-	4	522	24	0		-	**-**	-
Heavy %	1.7%	2.7%	0.6%	0%		-	1%	5.2%	1.7%	0%		-	1.4%	3.4%	0.6%	0%		-	0.7%	5.3%	2.2%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & SECOND ROAD WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM **Weather:**

Start Time	N Approach SECOND RD W						E Approach RYMAL RD						S Approach SECOND RD W						W Approach RYMAL RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:45:00	27	8	21	0	0	56	14	207	28	0	2	249	20	6	4	0	5	30	17	218	33	0	2	268	603
17:00:00	22	11	13	0	0	46	18	244	23	0	2	285	17	3	9	0	2	29	17	206	28	0	0	251	611
17:15:00	25	8	22	0	0	55	12	201	25	0	0	238	15	4	11	0	2	30	17	215	28	0	1	260	583
17:30:00	22	7	14	0	0	43	18	236	28	0	2	282	19	6	8	0	6	33	15	157	31	0	1	203	561
Grand Total	96	34	70	0	0	200	62	888	104	0	6	1054	71	19	32	0	15	122	66	796	120	0	4	982	**2358**
Approach%	48%	17%	35%	0%		-	5.9%	84.3%	9.9%	0%		-	58.2%	15.6%	26.2%	0%		-	6.7%	81.1%	12.2%	0%		-	**-**
Totals %	4.1%	1.4%	3%	0%		8.5%	2.6%	37.7%	4.4%	0%		44.7%	3%	0.8%	1.4%	0%		5.2%	2.8%	33.8%	5.1%	0%		41.6%	**-**
PHF	0.89	0.77	0.8	0		0.89	0.86	0.91	0.93	0		0.92	0.89	0.79	0.73	0		0.92	0.97	0.91	0.91	0		0.92	**-**
Heavy	1	1	0	0		2	2	21	2	0		25	1	0	0	0		1	0	21	1	0		22	**-**
Heavy %	1%	2.9%	0%	0%		1%	3.2%	2.4%	1.9%	0%		2.4%	1.4%	0%	0%	0%		0.8%	0%	2.6%	0.8%	0%		2.2%	**-**
Lights	95	33	70	0		198	60	867	102	0		1029	70	19	32	0		121	66	775	119	0		960	**-**
Lights %	99%	97.1%	100%	0%		99%	96.8%	97.6%	98.1%	0%		97.6%	98.6%	100%	100%	0%		99.2%	100%	97.4%	99.2%	0%		97.8%	**-**
Single-Unit Trucks	1	0	0	0		1	2	11	2	0		15	1	0	0	0		1	0	11	0	0		11	**-**
Single-Unit Trucks %	1%	0%	0%	0%		0.5%	3.2%	1.2%	1.9%	0%		1.4%	1.4%	0%	0%	0%		0.8%	0%	1.4%	0%	0%		1.1%	**-**
Buses	0	1	0	0		1	0	5	0	0		5	0	0	0	0		0	0	8	1	0		9	**-**
Buses %	0%	2.9%	0%	0%		0.5%	0%	0.6%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	1%	0.8%	0%		0.9%	**-**
Articulated Trucks	0	0	0	0		0	0	5	0	0		5	0	0	0	0		0	0	2	0	0		2	**-**
Articulated Trucks %	0%	0%	0%	0%		0%	0%	0.6%	0%	0%		0.5%	0%	0%	0%	0%		0%	0%	0.3%	0%	0%		0.2%	**-**
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	0	-	-	-	-	-	5	-	-	-	-	-	14	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	0%		-	-	-	-	20%		-	-	-	-	56%		-	-	-	-	16%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	4%		-	-	-	-	4%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & SECOND ROAD WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:45 PM - 05:45 PM **Weather:**

	Bicycles on Crosswalk	Pedestrians
N	0	0
S	1	14
E	1	5
W	0	4

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & UPPER CENTENNIAL PARKWAY
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (1 . RYMAL ROAD EAST & UPPER CENTENNIAL PARKWAY)

Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach RYMAL RD						S Approach UPPER CENTENNIAL PKWY						W Approach RYMAL RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
00:00:00	9	7	2	0	0	18	2	10	1	0	0	13	0	4	0	0	0	4	1	3	8	0	0	12	47	
00:15:00	4	5	3	0	0	12	6	1	3	0	0	10	0	2	1	0	0	3	3	3	5	0	0	11	36	
00:30:00	5	10	1	0	0	16	1	1	0	0	0	2	0	5	2	0	0	7	1	4	6	0	0	11	36	
00:45:00	3	5	2	0	0	10	2	3	0	0	0	5	0	3	1	0	0	4	4	1	0	0	0	5	24	143
01:00:00	2	4	6	0	0	12	1	3	0	0	0	4	0	0	0	0	0	0	0	5	3	0	0	8	24	120
01:15:00	3	6	1	1	0	11	0	5	1	0	0	6	0	7	1	0	0	8	1	0	2	0	0	3	28	112
01:30:00	3	6	4	0	0	13	2	2	0	0	0	4	0	3	0	0	0	3	0	0	3	0	0	3	23	99
01:45:00	4	4	1	0	0	9	2	2	0	0	0	4	0	3	2	0	0	5	2	1	3	0	0	6	24	99
02:00:00	2	4	4	0	0	10	1	0	0	0	0	1	0	4	0	0	0	4	1	0	1	0	0	2	17	92
02:15:00	1	2	2	0	0	5	2	1	1	0	0	4	0	6	0	0	0	6	0	0	3	0	0	3	18	82
02:30:00	3	2	2	0	0	7	0	0	1	0	0	1	0	3	0	0	0	3	0	0	1	0	0	1	12	71
02:45:00	1	3	0	0	0	4	1	3	0	0	0	4	0	0	0	0	0	0	0	0	1	0	0	1	9	56
03:00:00	2	3	2	0	0	7	1	2	0	0	0	3	0	2	1	0	1	3	1	5	5	0	0	11	24	63
03:15:00	2	2	0	0	0	4	0	0	0	0	0	0	0	1	0	0	0	1	0	1	3	0	0	4	9	54
03:30:00	2	3	1	0	0	6	1	3	0	0	0	4	0	1	1	0	0	2	0	2	3	0	0	5	17	59
03:45:00	2	0	1	0	0	3	3	2	0	0	0	5	0	3	0	0	0	3	0	3	0	0	0	3	14	64
04:00:00	1	0	4	0	0	5	1	2	0	0	0	3	0	11	1	0	0	12	1	1	2	0	0	4	24	64
04:15:00	5	4	5	0	0	14	7	3	1	0	0	11	1	11	0	0	0	12	0	3	0	0	0	3	40	95
04:30:00	5	3	3	0	0	11	5	6	0	0	0	11	0	15	4	0	0	19	1	2	5	0	0	8	49	127
04:45:00	8	5	4	0	0	17	13	9	0	0	0	22	2	20	4	0	0	26	0	7	6	0	0	13	78	191
05:00:00	2	4	9	0	0	15	25	10	1	0	0	36	3	31	1	0	0	35	1	6	6	0	0	13	99	266
05:15:00	5	10	17	0	0	32	33	18	1	0	0	52	4	45	9	0	0	58	1	12	9	0	0	22	164	390
05:30:00	9	19	14	0	0	42	29	22	1	0	0	52	3	58	7	0	0	68	0	12	5	0	0	17	179	520
05:45:00	11	21	19	0	0	51	44	22	4	0	0	70	3	63	7	0	0	73	4	11	14	0	0	29	223	665
06:00:00	8	18	16	0	0	42	36	38	1	1	0	76	4	57	6	0	0	67	6	13	15	0	0	34	219	785
06:15:00	18	38	19	0	0	75	45	54	2	0	0	101	4	71	10	0	0	85	9	28	17	0	0	54	315	936
06:30:00	20	27	41	0	0	88	41	45	2	0	0	88	8	77	14	0	0	99	11	20	21	0	0	52	327	1084
06:45:00	19	39	19	0	0	77	34	59	0	0	0	93	7	75	15	0	0	97	17	28	20	0	0	65	332	1193
07:00:00	22	47	27	0	0	96	32	44	7	0	0	83	9	84	14	0	0	107	9	28	18	1	0	56	342	1316
07:15:00	36	39	42	0	0	117	35	60	6	0	0	101	12	99	17	0	0	128	14	37	32	0	0	83	429	1430
07:30:00	27	35	42	0	0	104	63	94	9	0	0	166	8	106	17	0	0	131	17	49	39	0	0	105	506	1609
07:45:00	45	31	40	0	0	116	65	111	13	0	0	189	10	134	28	0	0	172	14	35	43	0	0	92	569	1846
08:00:00	31	54	36	0	0	121	63	75	10	0	0	148	8	92	20	0	0	120	10	61	40	0	1	111	500	2004
08:15:00	37	42	30	0	0	109	38	94	8	0	0	140	9	86	13	0	0	108	9	38	42	0	0	89	446	2021
08:30:00	32	61	32	1	0	126	42	79	7	0	0	128	11	66	40	0	0	117	17	40	50	0	0	107	478	1993
08:45:00	50	43	33	0	0	126	41	85	11	0	0	137	3	94	20	0	0	117	11	50	53	1	0	115	495	1919
09:00:00	49	44	23	1	0	117	53	64	8	0	0	125	7	66	33	0	0	106	23	28	64	0	0	115	463	1882
09:15:00	45	44	33	0	1	122	26	72	7	0	1	105	4	60	28	0	0	92	24	48	29	0	0	101	420	1856
09:30:00	43	64	43	0	0	150	34	65	7	0	0	106	4	75	20	0	0	99	21	54	44	0	0	119	474	1852
09:45:00	38	57	38	0	0	133	28	67	6	0	0	101	1	64	30	0	0	95	20	51	39	1	0	111	440	1797
10:00:00	56	43	33	0	0	132	22	57	7	0	0	86	3	72	18	0	0	93	30	40	45	0	0	115	426	1760
10:15:00	48	38	26	0	0	112	38	63	3	0	0	104	8	56	29	0	0	93	17	36	36	0	0	89	398	1738
10:30:00	43	56	29	0	0	128	28	48	8	0	0	84	6	63	28	0	0	97	20	50	44	0	0	114	423	1687
10:45:00	47	57	34	0	0	138	30	67	9	0	0	106	4	46	17	0	0	67	13	39	43	0	0	95	406	1653
11:00:00	57	53	28	0	0	138	36	63	4	0	0	103	3	36	26	0	0	65	21	62	45	0	0	128	434	1661

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

11:15:00	37	64	31	0	0	132	30	57	5	0	0	92	4	52	29	0	0	85	31	38	53	0	0	122	431	1694
11:30:00	47	50	24	0	0	121	15	53	5	0	0	73	2	50	29	0	0	81	28	51	44	0	0	123	398	1669
11:45:00	41	61	38	1	0	141	21	58	5	0	0	84	7	69	33	0	0	109	26	36	50	0	0	112	446	1709
12:00:00	57	83	34	0	0	174	29	83	8	0	0	120	3	54	18	0	0	75	37	48	42	0	0	127	496	1771
12:15:00	48	62	38	1	0	149	43	63	6	0	0	112	3	57	40	0	0	100	23	58	49	0	0	130	491	1831
12:30:00	56	63	47	1	0	167	21	63	7	0	0	91	6	46	24	0	0	76	32	58	54	1	0	145	479	1912
12:45:00	44	37	39	0	0	120	31	52	1	0	0	84	1	54	21	0	0	76	25	61	50	0	0	136	416	1882
13:00:00	54	48	53	1	1	156	36	47	7	0	0	90	4	61	25	0	0	90	25	45	45	0	0	115	451	1837
13:15:00	54	71	47	0	0	172	29	68	7	0	0	104	6	49	23	0	0	78	28	49	49	0	0	126	480	1826
13:30:00	56	56	38	0	0	150	31	64	8	0	0	103	1	41	18	0	0	60	32	49	39	0	0	120	433	1780
13:45:00	51	52	33	0	0	136	41	70	10	0	0	121	4	60	35	0	0	99	34	63	46	1	0	144	500	1864
14:00:00	55	70	45	0	0	170	30	43	6	0	0	79	3	44	13	0	0	60	23	58	55	0	0	136	445	1858
14:15:00	44	69	43	0	0	156	34	61	6	0	0	101	3	60	26	0	0	89	25	65	48	0	0	138	484	1862
14:30:00	58	85	39	1	0	183	32	90	8	0	0	130	3	52	20	0	0	75	33	58	52	0	0	143	531	1960
14:45:00	62	104	37	0	0	203	33	68	11	0	0	112	9	68	37	0	0	114	36	69	53	1	0	159	588	2048
15:00:00	54	103	53	1	0	211	30	56	16	0	0	102	7	49	15	0	0	71	31	79	72	0	0	182	566	2169
15:15:00	53	92	59	0	0	204	28	91	27	0	0	146	3	65	19	0	0	87	35	84	51	0	0	170	607	2292
15:30:00	72	86	73	0	0	231	31	69	9	0	0	109	2	26	10	0	0	38	29	78	55	0	0	162	540	2301
15:45:00	68	128	65	0	0	261	34	93	12	0	0	139	7	50	21	0	0	78	35	70	37	0	0	142	620	2333
16:00:00	69	120	73	1	0	263	40	68	12	0	0	120	12	5	8	0	0	25	32	86	57	0	0	175	583	2350
16:15:00	71	117	68	0	0	256	41	100	10	0	0	151	42	76	28	0	0	146	20	81	60	1	0	162	715	2458
16:30:00	69	104	61	0	1	234	54	79	12	0	0	145	11	71	22	0	0	104	37	93	55	0	0	185	668	2586
16:45:00	87	112	81	0	0	280	34	95	10	0	0	139	8	56	19	0	0	83	40	88	49	0	0	177	679	2645
17:00:00	71	132	61	1	0	265	55	95	16	0	0	166	10	61	26	0	0	97	37	103	77	0	0	217	745	2807
17:15:00	68	140	84	0	0	292	51	106	20	0	0	177	14	52	29	0	0	95	36	96	53	0	0	185	749	2841
17:30:00	59	113	65	0	1	237	47	89	15	0	0	151	10	60	29	0	0	99	34	66	59	0	0	159	646	2819
17:45:00	55	129	63	0	0	247	24	75	17	0	0	116	11	70	25	0	1	106	24	68	49	0	0	141	610	2750
18:00:00	63	90	48	0	0	201	39	58	13	0	0	110	2	55	24	0	0	81	20	59	47	0	0	126	518	2523
18:15:00	55	84	53	0	0	192	26	65	7	0	0	98	12	59	17	0	0	88	20	47	44	0	0	111	489	2263
18:30:00	46	82	49	0	0	177	21	62	8	0	0	91	10	45	22	0	0	77	23	61	56	0	0	140	485	2102
18:45:00	47	113	64	0	0	224	32	41	8	0	0	81	13	45	22	0	0	80	22	65	55	0	0	142	527	2019
19:00:00	59	77	52	0	0	188	28	45	15	0	0	88	6	49	20	0	0	75	27	44	52	0	0	123	474	1975
19:15:00	62	88	40	1	0	191	23	47	13	0	0	83	7	46	20	0	0	73	24	53	39	0	0	116	463	1949
19:30:00	50	63	40	1	0	154	36	39	10	0	0	85	4	41	23	0	0	68	26	48	34	0	0	108	415	1879
19:45:00	50	51	27	0	1	128	35	75	10	0	0	120	5	32	11	0	0	48	29	24	39	0	0	92	388	1740
20:00:00	41	73	27	3	0	144	21	48	8	0	0	77	6	32	15	0	0	53	23	36	49	0	0	108	382	1648
20:15:00	35	42	24	0	0	101	9	23	9	1	0	42	1	29	6	0	0	36	20	24	40	0	0	84	263	1448
20:30:00	31	43	18	3	0	95	15	19	4	0	0	38	1	28	8	0	0	37	12	31	37	0	0	80	250	1283
20:45:00	25	41	24	0	0	90	9	24	4	0	0	37	1	29	13	0	0	43	12	26	32	0	2	70	240	1135
21:00:00	30	40	21	0	0	91	9	16	2	0	0	27	2	17	7	0	0	26	11	11	25	0	0	47	191	944
21:15:00	25	40	10	0	0	75	12	21	4	0	0	37	4	21	7	0	0	32	11	27	30	0	0	68	212	893
21:30:00	18	38	20	0	0	76	9	10	1	0	0	20	0	17	1	0	0	18	14	20	21	0	0	55	169	812
21:45:00	15	31	11	0	0	57	13	10	6	0	0	29	2	11	8	0	1	21	14	14	19	0	0	47	154	726
22:00:00	14	24	10	0	0	48	12	15	9	0	0	36	1	14	5	0	0	20	13	15	16	0	0	44	148	683
22:15:00	19	33	16	0	0	68	10	4	2	0	0	16	0	11	4	0	0	15	7	8	13	0	0	28	127	598
22:30:00	10	15	14	0	0	39	11	19	1	0	0	31	0	12	4	0	0	16	10	16	10	0	0	36	122	551
22:45:00	15	13	6	1	0	35	4	9	2	0	0	15	0	18	6	0	0	24	8	8	11	0	0	27	101	498
23:00:00	9	21	4	0	0	34	2	7	3	0	0	12	1	10	3	0	0	14	3	2	7	0	0	12	72	422

23:15:00	9	19	8	0	0	36	5	4	0	0	0	9	0	1	0	0	0	1	3	6	12	0	0	21	67	362
23:30:00	1	11	3	0	0	15	2	3	0	0	0	5	0	5	3	0	0	8	2	6	5	0	0	13	41	281
23:45:00	7	11	6	0	0	24	1	2	1	0	0	4	1	5	0	0	0	6	3	3	6	0	0	12	46	226
Grand Total	3161	4556	2758	20	5	10495	2321	4156	566	2	1	7045	424	3970	1376	0	3	5770	1540	3369	2975	7	3	7891	**31201**	-
Approach%	30.1%	43.4%	26.3%	0.2%		-	32.9%	59%	8%	0%		-	7.3%	68.8%	23.8%	0%		-	19.5%	42.7%	37.7%	0.1%		-	**-**	-
Totals %	10.1%	14.6%	8.8%	0.1%		33.6%	7.4%	13.3%	1.8%	0%		22.6%	1.4%	12.7%	4.4%	0%		18.5%	4.9%	10.8%	9.5%	0%		25.3%	**-**	-
Heavy	162	274	220	0		-	218	238	28	0		-	26	290	98	0		-	122	200	151	0		-	**-**	-
Heavy %	5.1%	6%	8%	0%		-	9.4%	5.7%	4.9%	0%		-	6.1%	7.3%	7.1%	0%		-	7.9%	5.9%	5.1%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & UPPER CENTENNIAL PARKWAY
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather:

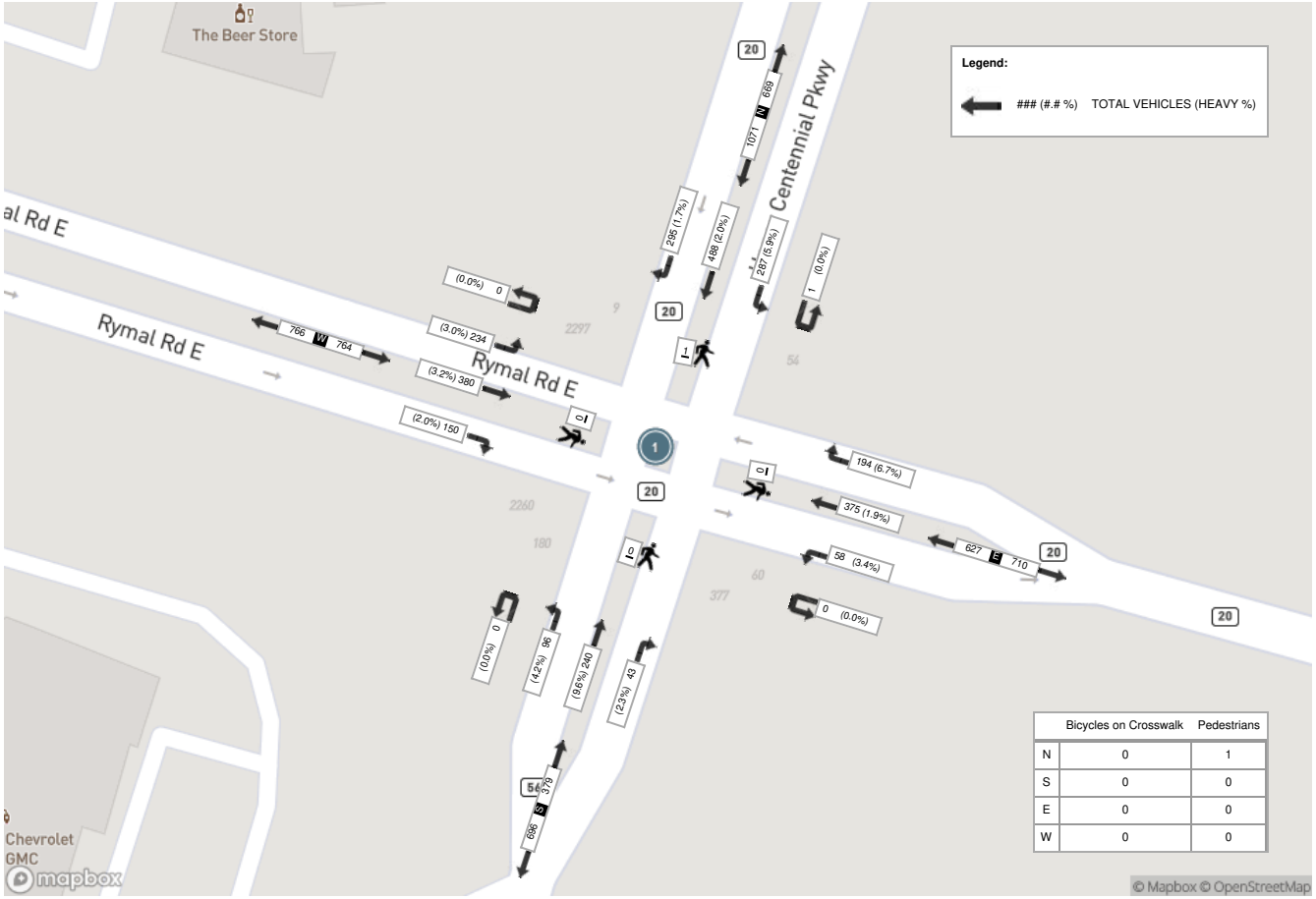
Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach RYMAL RD						S Approach UPPER CENTENNIAL PKWY						W Approach RYMAL RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	69	104	61	0	1	234	54	79	12	0	0	145	11	71	22	0	0	104	37	93	55	0	0	185	668
16:45:00	87	112	81	0	0	280	34	95	10	0	0	139	8	56	19	0	0	83	40	88	49	0	0	177	679
17:00:00	71	132	61	1	0	265	55	95	16	0	0	166	10	61	26	0	0	97	37	103	77	0	0	217	745
17:15:00	68	140	84	0	0	292	51	106	20	0	0	177	14	52	29	0	0	95	36	96	53	0	0	185	749
Grand Total	295	488	287	1	1	1071	194	375	58	0	0	627	43	240	96	0	0	379	150	380	234	0	0	764	**2841**
Approach%	27.5%	45.6%	26.8%	0.1%		-	30.9%	59.8%	9.3%	0%		-	11.3%	63.3%	25.3%	0%		-	19.6%	49.7%	30.6%	0%		-	**-**
Totals %	10.4%	17.2%	10.1%	0%		37.7%	6.8%	13.2%	2%	0%		22.1%	1.5%	8.4%	3.4%	0%		13.3%	5.3%	13.4%	8.2%	0%		26.9%	**-**
PHF	0.85	0.87	0.85	0.25		0.92	0.88	0.88	0.73	0		0.89	0.77	0.85	0.83	0		0.91	0.94	0.92	0.76	0		0.88	**-**
Heavy	5	10	17	0		32	13	7	2	0		22	1	23	4	0		28	3	12	7	0		22	**-**
Heavy %	1.7%	2%	5.9%	0%		3%	6.7%	1.9%	3.4%	0%		3.5%	2.3%	9.6%	4.2%	0%		7.4%	2%	3.2%	3%	0%		2.9%	**-**
Lights	290	478	270	1		1039	181	368	56	0		605	42	217	92	0		351	147	368	227	0		742	**-**
Lights %	98.3%	98%	94.1%	100%		97%	93.3%	98.1%	96.6%	0%		96.5%	97.7%	90.4%	95.8%	0%		92.6%	98%	96.8%	97%	0%		97.1%	**-**
Single-Unit Trucks	1	6	11	0		18	4	4	2	0		10	0	9	1	0		10	2	6	2	0		10	**-**
Single-Unit Trucks %	0.3%	1.2%	3.8%	0%		1.7%	2.1%	1.1%	3.4%	0%		1.6%	0%	3.8%	1%	0%		2.6%	1.3%	1.6%	0.9%	0%		1.3%	**-**
Buses	4	1	0	0		5	1	1	0	0		2	1	0	1	0		2	1	2	5	0		8	**-**
Buses %	1.4%	0.2%	0%	0%		0.5%	0.5%	0.3%	0%	0%		0.3%	2.3%	0%	1%	0%		0.5%	0.7%	0.5%	2.1%	0%		1%	**-**
Articulated Trucks	0	3	6	0		9	8	2	0	0		10	0	14	2	0		16	0	4	0	0		4	**-**
Articulated Trucks %	0%	0.6%	2.1%	0%		0.8%	4.1%	0.5%	0%	0%		1.6%	0%	5.8%	2.1%	0%		4.2%	0%	1.1%	0%	0%		0.5%	**-**
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	-	100%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: RYMAL ROAD EAST & UPPER CENTENNIAL PARKWAY
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather:



	Bicycles on Crosswalk	Pedestrians
N	0	1
S	0	0
E	0	0
W	0	0

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (4 . RYMAL ROAD EAST & UPPER RED HILL VALLEY PARKWAY)

Start Time	N Approach UPPER RED HILL VALLEY PARKWAY					E Approach RYMAL RD E					W Approach RYMAL RD E					Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	UTurn E:E	Peds E:	Approach Total	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
00:00:00	3	28	0	0	31	10	12	0	0	22	18	4	0	0	22	75	
00:15:00	5	29	0	0	34	7	12	0	0	19	10	15	0	0	25	78	
00:30:00	1	10	0	0	11	7	7	0	0	14	13	2	0	0	15	40	
00:45:00	2	17	0	0	19	6	13	0	0	19	7	3	0	0	10	48	241
01:00:00	4	7	0	0	11	8	3	0	0	11	14	0	0	0	14	36	202
01:15:00	4	9	0	0	13	4	7	0	0	11	7	5	0	0	12	36	160
01:30:00	1	9	0	0	10	6	15	0	0	21	7	1	0	0	8	39	159
01:45:00	0	11	0	0	11	10	7	0	0	17	7	3	0	0	10	38	149
02:00:00	2	8	0	0	10	9	3	0	0	12	4	1	0	0	5	27	140
02:15:00	2	7	0	0	9	4	1	0	0	5	11	8	0	0	19	33	137
02:30:00	2	11	0	0	13	5	5	0	0	10	4	6	0	0	10	33	131
02:45:00	3	5	0	0	8	4	4	0	0	8	2	2	0	0	4	20	113
03:00:00	3	4	0	0	7	5	3	0	0	8	11	1	0	0	12	27	113
03:15:00	2	8	1	0	11	7	7	0	0	14	2	0	0	0	2	27	107
03:30:00	4	8	0	1	12	6	8	0	0	14	9	0	0	0	9	35	109
03:45:00	2	6	0	0	8	9	7	0	0	16	4	1	0	0	5	29	118
04:00:00	4	4	0	0	8	18	8	0	0	26	2	0	0	0	2	36	127
04:15:00	4	5	0	0	9	20	7	0	0	27	4	1	0	0	5	41	141
04:30:00	18	7	0	0	25	35	23	0	0	58	10	1	0	0	11	94	200
04:45:00	15	8	0	0	23	60	23	0	0	83	12	6	0	0	18	124	295
05:00:00	11	14	0	0	25	72	24	0	0	96	18	5	0	0	23	144	403
05:15:00	9	12	0	2	21	100	38	0	0	138	24	4	0	0	28	187	549
05:30:00	11	34	0	0	45	115	46	0	0	161	14	6	0	0	20	226	681
05:45:00	17	24	0	0	41	148	57	0	0	205	27	10	0	0	37	283	840
06:00:00	11	41	0	0	52	129	77	0	0	206	35	6	0	0	41	299	995
06:15:00	11	37	0	1	48	165	101	0	0	266	38	9	0	0	47	361	1169
06:30:00	17	53	0	2	70	161	124	0	0	285	41	5	0	0	46	401	1344
06:45:00	31	90	0	0	121	147	125	0	0	272	63	13	0	0	76	469	1530
07:00:00	16	88	0	2	104	191	135	0	0	326	55	7	0	0	62	492	1723
07:15:00	23	98	0	0	121	175	165	0	0	340	87	16	0	0	103	564	1926
07:30:00	31	124	0	0	155	202	200	0	0	402	102	15	0	0	117	674	2199
07:45:00	36	157	0	0	193	251	224	0	0	475	101	10	0	0	111	779	2509
08:00:00	27	111	0	0	138	210	270	0	0	480	111	16	0	0	127	745	2762
08:15:00	33	85	0	1	118	129	248	0	0	377	106	19	0	0	125	620	2818

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

08:30:00	39	106	0	0	145	188	269	0	0	457	117	20	0	0	137	739	2883
08:45:00	33	120	0	0	153	137	211	0	0	348	105	18	0	0	123	624	2728
09:00:00	28	132	1	1	161	125	190	0	0	315	99	21	0	0	120	596	2579
09:15:00	29	82	0	1	111	161	198	0	0	359	106	17	0	0	123	593	2552
09:30:00	24	93	0	2	117	154	204	0	0	358	111	19	0	1	130	605	2418
09:45:00	35	88	0	0	123	128	160	0	0	288	90	21	0	0	111	522	2316
10:00:00	27	99	0	2	126	124	158	0	0	282	102	19	0	0	121	529	2249
10:15:00	20	112	0	1	132	126	149	0	0	275	115	20	0	0	135	542	2198
10:30:00	20	104	0	0	124	126	163	0	0	289	109	23	0	0	132	545	2138
10:45:00	35	93	0	3	128	115	149	0	0	264	109	24	0	0	133	525	2141
11:00:00	24	93	0	8	117	97	163	0	2	260	144	25	0	0	169	546	2158
11:15:00	24	95	0	5	119	98	156	0	0	254	127	31	0	0	158	531	2147
11:30:00	28	108	0	7	136	121	146	0	0	267	143	17	0	0	160	563	2165
11:45:00	20	116	0	2	136	109	164	0	0	273	146	30	1	0	177	586	2226
12:00:00	20	124	0	1	144	110	195	0	0	305	131	47	0	0	178	627	2307
12:15:00	23	121	0	2	144	136	166	0	0	302	127	20	0	0	147	593	2369
12:30:00	35	133	0	0	168	112	194	0	0	306	143	42	0	0	185	659	2465
12:45:00	31	137	0	1	168	99	163	0	0	262	152	40	0	0	192	622	2501
13:00:00	36	138	0	0	174	115	143	0	0	258	153	35	0	0	188	620	2494
13:15:00	37	117	0	1	154	121	163	0	0	284	145	29	0	0	174	612	2513
13:30:00	35	140	0	0	175	118	154	0	0	272	118	27	0	0	145	592	2446
13:45:00	38	133	1	0	172	108	187	0	0	295	163	36	0	0	199	666	2490
14:00:00	33	149	0	0	182	89	142	0	0	231	123	46	0	0	169	582	2452
14:15:00	39	161	0	0	200	134	169	0	0	303	165	40	0	0	205	708	2548
14:30:00	33	179	0	3	212	134	197	0	0	331	169	33	0	0	202	745	2701
14:45:00	42	187	0	0	229	113	160	0	0	273	177	36	0	0	213	715	2750
15:00:00	40	172	0	0	212	110	218	0	0	328	201	43	0	0	244	784	2952
15:15:00	36	169	0	1	205	138	173	0	0	311	181	29	0	0	210	726	2970
15:30:00	27	165	0	0	192	128	179	0	0	307	192	36	0	0	228	727	2952
15:45:00	39	172	0	0	211	117	193	0	0	310	190	36	0	0	226	747	2984
16:00:00	35	173	0	0	208	137	191	0	0	328	205	60	0	0	265	801	3001
16:15:00	32	192	0	2	224	142	232	0	0	374	185	43	0	0	228	826	3101
16:30:00	38	207	0	0	245	141	206	0	0	347	198	52	0	0	250	842	3216
16:45:00	38	208	0	1	246	128	186	0	0	314	235	43	0	0	278	838	3307
17:00:00	27	195	0	1	222	181	206	0	0	387	240	46	0	0	286	895	3401
17:15:00	27	189	0	0	216	136	213	0	0	349	208	32	0	0	240	805	3380
17:30:00	29	161	0	0	190	137	248	0	0	385	187	32	0	0	219	794	3332

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

17:45:00	29	167	0	0	196	144	213	0	0	357	171	26	0	0	197	750	3244
18:00:00	22	163	0	1	185	139	166	0	0	305	165	29	0	0	194	684	3033
18:15:00	27	171	0	1	198	126	169	0	0	295	158	39	0	0	197	690	2918
18:30:00	29	187	0	1	216	122	168	0	0	290	137	18	0	0	155	661	2785
18:45:00	20	208	0	0	228	107	142	0	0	249	149	24	0	0	173	650	2685
19:00:00	27	185	0	0	212	120	114	0	0	234	132	28	0	0	160	606	2607
19:15:00	17	168	0	0	185	104	132	0	0	236	131	23	0	0	154	575	2492
19:30:00	21	165	0	1	186	93	124	0	0	217	115	25	0	0	140	543	2374
19:45:00	17	176	0	0	193	72	103	0	0	175	92	26	0	0	118	486	2210
20:00:00	18	133	0	0	151	90	100	0	0	190	128	26	0	0	154	495	2099
20:15:00	19	134	0	0	153	66	78	0	0	144	100	14	0	0	114	411	1935
20:30:00	15	132	0	0	147	66	76	0	0	142	88	15	0	0	103	392	1784
20:45:00	15	93	0	0	108	35	63	0	0	98	74	13	0	0	87	293	1591
21:00:00	16	117	0	0	133	61	68	0	0	129	74	18	0	0	92	354	1450
21:15:00	11	128	0	0	139	71	75	0	0	146	69	10	0	0	79	364	1403
21:30:00	12	105	0	0	117	28	54	0	0	82	55	9	0	0	64	263	1274
21:45:00	7	72	0	0	79	48	53	0	0	101	47	8	0	0	55	235	1216
22:00:00	12	61	0	0	73	30	46	0	0	76	62	10	0	0	72	221	1083
22:15:00	13	79	0	0	92	22	37	1	0	60	40	6	0	0	46	198	917
22:30:00	11	64	0	0	75	31	43	0	0	74	26	5	0	0	31	180	834
22:45:00	12	64	0	0	76	28	31	0	0	59	34	11	0	0	45	180	779
23:00:00	9	49	0	0	58	17	28	0	0	45	29	7	0	0	36	139	697
23:15:00	6	48	0	0	54	9	24	0	0	33	27	2	0	0	29	116	615
23:30:00	7	33	0	0	40	13	14	0	0	27	27	7	0	0	34	101	536
23:45:00	4	40	0	0	44	9	10	0	0	19	16	5	0	0	21	84	440
Grand Total	1917	9274	3	58	11194	8779	10898	1	2	19678	8737	1793	1	1	10531	**41403**	-
Approach%	17.1%	82.8%	0%		-	44.6%	55.4%	0%		-	83%	17%	0%		-	**-**	-
Totals %	4.6%	22.4%	0%		27%	21.2%	26.3%	0%		47.5%	21.1%	4.3%	0%		25.4%	**-**	-
Heavy	203	250	0		-	230	425	0		-	375	184	0		-	**-**	-
Heavy %	10.6%	2.7%	0%		-	2.6%	3.9%	0%		-	4.3%	10.3%	0%		-	**-**	-
Bicycles	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-
Bicycle %	-	-	-		-	-	-	-		-	-	-	-		-	**-**	-

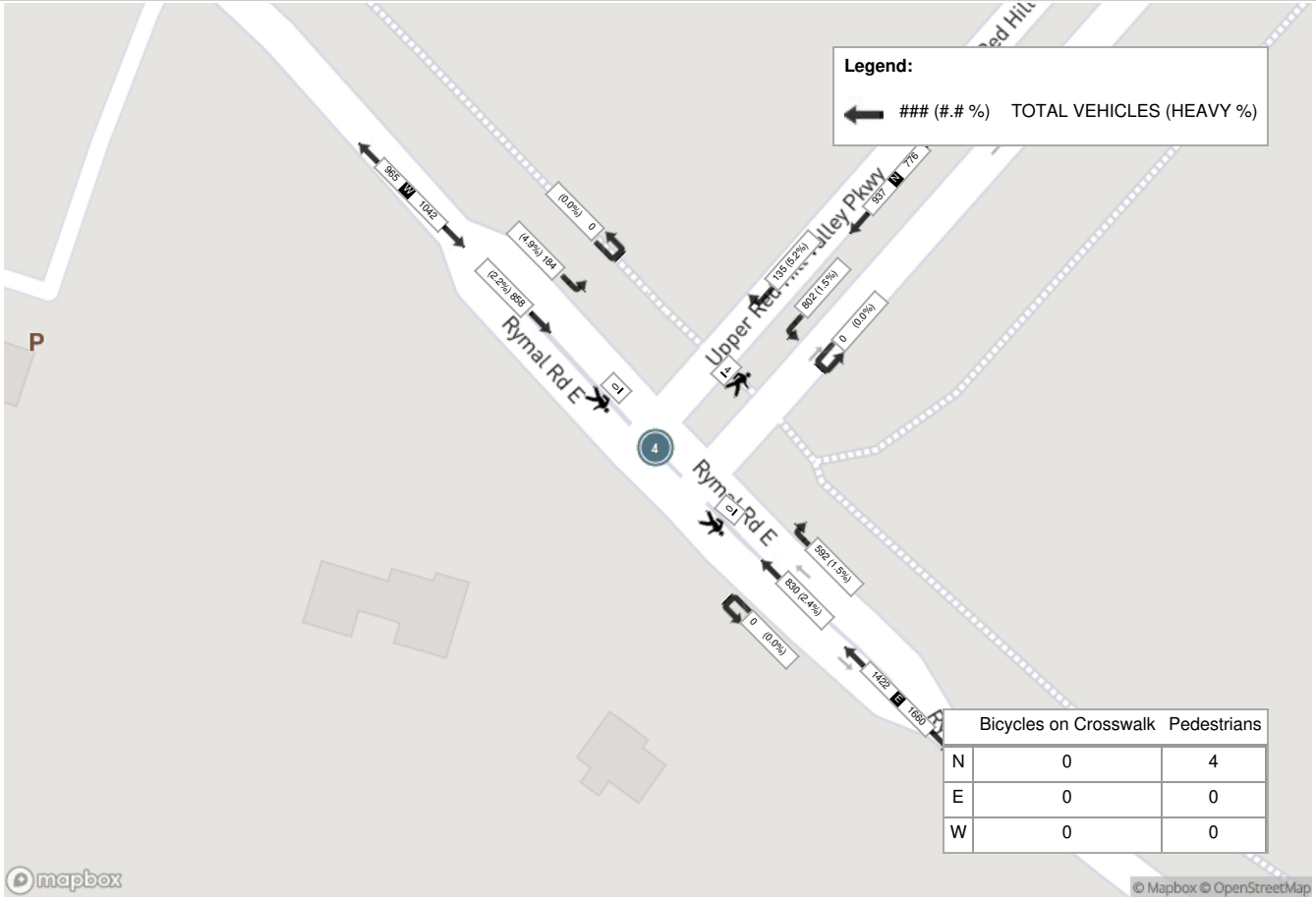
Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather:

Start Time	N Approach UPPER RED HILL VALLEY PARKWAY					E Approach RYMAL RD E					W Approach RYMAL RD E					Int. Total (15 min)
	Right	Left	UTurn	Peds	Approach Total	Right	Thru	UTurn	Peds	Approach Total	Thru	Left	UTurn	Peds	Approach Total	
16:15:00	32	192	0	2	224	142	232	0	0	374	185	43	0	0	228	826
16:30:00	38	207	0	0	245	141	206	0	0	347	198	52	0	0	250	842
16:45:00	38	208	0	1	246	128	186	0	0	314	235	43	0	0	278	838
17:00:00	27	195	0	1	222	181	206	0	0	387	240	46	0	0	286	895
Grand Total	135	802	0	4	937	592	830	0	0	1422	858	184	0	0	1042	**3401**
Approach%	14.4%	85.6%	0%		-	41.6%	58.4%	0%		-	82.3%	17.7%	0%		-	**-**
Totals %	4%	23.6%	0%		27.6%	17.4%	24.4%	0%		41.8%	25.2%	5.4%	0%		30.6%	**-**
PHF	0.89	0.96	0		0.95	0.82	0.89	0		0.92	0.89	0.88	0		0.91	**-**
Heavy	7	12	0		19	9	20	0		29	19	9	0		28	**-**
Heavy %	5.2%	1.5%	0%		2%	1.5%	2.4%	0%		2%	2.2%	4.9%	0%		2.7%	**-**
Lights	128	790	0		918	583	810	0		1393	839	175	0		1014	**-**
Lights %	94.8%	98.5%	0%		98%	98.5%	97.6%	0%		98%	97.8%	95.1%	0%		97.3%	**-**
Single-Unit Trucks	2	4	0		6	4	12	0		16	11	3	0		14	**-**
Single-Unit Trucks %	1.5%	0.5%	0%		0.6%	0.7%	1.4%	0%		1.1%	1.3%	1.6%	0%		1.3%	**-**
Buses	4	7	0		11	4	6	0		10	5	4	0		9	**-**
Buses %	3%	0.9%	0%		1.2%	0.7%	0.7%	0%		0.7%	0.6%	2.2%	0%		0.9%	**-**
Articulated Trucks	1	1	0		2	1	2	0		3	3	2	0		5	**-**
Articulated Trucks %	0.7%	0.1%	0%		0.2%	0.2%	0.2%	0%		0.2%	0.3%	1.1%	0%		0.5%	**-**
Bicycles on Road	0	0	0		0	0	0	0		0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%		0%	0%	0%	0%		0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	4	-	-	-	-	0	-	-	-	-	0	-	**-**
Pedestrians%	-	-	-	100%		-	-	-	0%		-	-	-	0%		**-**
Bicycles on Crosswalk	-	-	-	0	-	-	-	-	0	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	0%		-	-	-	0%		-	-	-	0%		**-**

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:15 PM - 05:15 PM Weather:



	Bicycles on Crosswalk	Pedestrians
N	0	4
E	0	0
W	0	0

Spectrum

Turning Movement Count
Location Name: UPPER CENTENNIAL PARKWAY & HIGHLAND ROAD WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (6 . UPPER CENTENNIAL PARKWAY & HIGHLAND ROAD WEST)

Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach HIGHLAND RD						S Approach UPPER CENTENNIAL PKWY						W Approach HIGHLAND RD						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
00:00:00	4	24	1	0	0	29	1	0	0	0	0	1	0	11	1	0	0	12	3	0	4	0	0	7	49	
00:15:00	4	14	1	0	0	19	1	0	0	0	0	1	0	14	0	0	0	14	2	0	6	0	0	8	42	
00:30:00	8	16	0	0	0	24	0	2	0	0	0	2	0	11	2	0	1	13	0	0	1	0	1	1	40	
00:45:00	3	12	0	0	0	15	1	2	0	0	0	3	0	6	2	0	0	8	1	0	1	0	0	2	28	159
01:00:00	4	12	0	0	0	16	0	1	0	0	0	1	0	3	0	0	0	3	0	0	3	0	0	3	23	133
01:15:00	2	8	0	0	0	10	0	1	0	0	0	1	0	6	2	0	0	8	0	0	1	0	0	1	20	111
01:30:00	0	15	0	0	0	15	0	0	0	0	0	0	0	8	1	0	0	9	2	0	0	0	0	2	26	97
01:45:00	1	8	1	0	0	10	0	1	0	0	0	1	0	10	1	0	0	11	0	0	1	0	0	1	23	92
02:00:00	0	10	0	0	0	10	0	0	0	0	0	0	0	4	1	0	0	5	1	0	1	0	0	2	17	86
02:15:00	1	5	0	0	0	6	0	1	0	0	0	1	0	11	1	0	0	12	0	0	0	0	0	0	19	85
02:30:00	1	7	1	0	0	9	0	0	0	0	0	0	0	7	0	0	0	7	0	0	0	0	0	0	16	75
02:45:00	1	6	0	0	0	7	0	1	0	0	0	1	0	3	0	0	0	3	0	1	2	0	0	3	14	66
03:00:00	0	7	0	0	0	7	0	0	1	0	0	1	0	7	1	0	1	8	1	0	1	0	0	2	18	67
03:15:00	3	6	0	0	0	9	0	1	0	0	0	1	0	5	0	0	0	5	0	1	1	0	0	2	17	65
03:30:00	1	6	3	0	0	10	0	0	0	0	0	0	1	8	1	0	0	10	0	0	1	0	0	1	21	70
03:45:00	1	3	1	0	0	5	0	1	0	0	0	1	0	6	0	0	0	6	0	1	1	0	0	2	14	70
04:00:00	0	6	1	0	0	7	2	0	0	0	0	2	2	13	0	0	0	15	0	0	1	0	0	1	25	77
04:15:00	0	9	1	0	0	10	0	0	0	0	0	0	0	17	0	0	0	17	4	1	3	0	0	8	35	95
04:30:00	0	10	5	0	0	15	1	0	1	0	0	2	2	18	2	0	2	22	1	0	2	0	0	3	42	116
04:45:00	2	18	4	0	0	24	2	0	1	0	0	3	2	41	0	0	0	43	1	1	4	0	0	6	76	178
05:00:00	2	17	4	0	0	23	2	1	0	0	0	3	0	51	3	0	0	54	0	0	10	0	0	10	90	243
05:15:00	1	28	4	0	0	33	1	2	0	0	0	3	1	87	5	0	0	93	1	3	15	0	0	19	148	356
05:30:00	1	41	5	0	0	47	2	1	0	0	0	3	1	95	5	0	0	101	2	0	10	0	0	12	163	477
05:45:00	4	50	7	0	0	61	4	4	1	0	0	9	0	112	3	0	5	115	4	1	10	0	1	15	200	601
06:00:00	3	39	2	0	0	44	4	3	2	0	0	9	1	116	8	0	5	125	2	4	20	0	0	26	204	715
06:15:00	5	53	5	0	0	63	3	2	0	0	0	5	2	130	4	0	2	136	6	5	19	0	0	30	234	801
06:30:00	4	82	2	0	0	88	10	6	0	0	0	16	1	161	4	0	0	166	9	7	25	0	1	41	311	949
06:45:00	11	76	4	0	0	91	4	3	2	0	0	9	1	119	2	0	3	122	5	10	30	0	0	45	267	1016
07:00:00	2	86	3	0	0	91	6	8	3	0	0	17	0	125	20	0	4	145	17	13	32	0	4	62	315	1127
07:15:00	15	106	6	0	0	127	2	7	4	0	0	13	3	159	14	0	0	176	15	10	26	0	1	51	367	1260
07:30:00	34	109	0	0	0	143	2	20	3	0	1	25	2	182	16	0	3	200	13	17	30	0	0	60	428	1377
07:45:00	17	93	11	0	0	121	4	24	7	0	0	35	2	201	33	0	1	236	23	18	51	0	0	92	484	1594
08:00:00	16	87	3	0	0	106	2	15	9	0	0	26	4	202	28	0	2	234	21	20	39	0	0	80	446	1725
08:15:00	17	111	0	0	0	128	6	15	7	0	0	28	4	152	12	0	2	168	22	26	41	0	0	89	413	1771
08:30:00	12	105	5	0	0	122	5	11	5	0	0	21	3	156	17	0	1	176	28	15	22	0	1	65	384	1727
08:45:00	18	119	5	0	0	142	9	17	10	0	0	36	3	157	13	0	0	173	17	21	38	0	0	76	427	1670
09:00:00	16	137	2	0	0	155	3	20	8	0	0	31	5	151	32	0	1	188	24	13	25	0	0	62	436	1660
09:15:00	20	115	7	0	0	142	7	11	4	0	0	22	4	125	17	0	4	146	25	13	25	0	3	63	373	1620
09:30:00	23	143	2	0	2	168	8	5	5	0	2	18	2	143	19	0	3	164	23	9	16	0	0	48	398	1634
09:45:00	17	118	3	0	0	138	4	8	2	0	0	14	3	143	17	0	4	163	25	10	25	0	2	60	375	1582
10:00:00	14	127	4	0	0	145	3	16	5	0	0	24	4	139	19	0	3	162	20	6	23	0	0	49	380	1526
10:15:00	13	118	7	1	0	139	1	5	4	0	0	10	5	147	9	0	2	161	17	9	26	0	0	52	362	1515
10:30:00	7	111	5	0	0	123	7	4	2	0	0	13	7	125	16	0	1	148	13	12	10	0	2	35	319	1436
10:45:00	17	127	2	1	2	147	6	7	7	0	1	20	1	123	24	0	1	148	20	3	21	0	1	44	359	1420
11:00:00	10	127	10	0	0	147	4	9	7	0	0	20	2	117	14	0	1	133	21	10	21	0	3	52	352	1392

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

11:15:00	13	131	6	0	0	150	4	13	4	0	0	21	5	108	12	0	5	125	26	9	17	0	12	52	348	1378
11:30:00	19	120	7	0	2	146	5	10	8	0	2	23	2	128	15	0	1	145	20	7	19	0	1	46	360	1419
11:45:00	16	122	6	0	0	144	5	8	1	0	0	14	4	132	17	0	2	153	18	10	22	0	0	50	361	1421
12:00:00	13	132	6	0	0	151	9	9	4	0	1	22	3	120	14	1	0	138	40	9	22	0	0	71	382	1451
12:15:00	19	145	7	0	0	171	7	14	4	0	0	25	2	153	28	0	1	183	24	7	23	0	0	54	433	1536
12:30:00	23	144	3	0	0	170	4	15	6	0	0	25	5	131	19	0	0	155	31	10	25	0	0	66	416	1592
12:45:00	24	110	5	0	0	139	5	11	8	0	0	24	3	122	24	0	0	149	18	10	16	0	2	44	356	1587
13:00:00	24	154	6	0	0	184	8	10	6	0	0	24	2	141	22	0	0	165	30	13	27	0	0	70	443	1648
13:15:00	20	140	4	0	1	164	4	16	8	0	1	28	4	120	17	0	2	141	26	6	25	0	2	57	390	1605
13:30:00	21	140	10	0	0	171	2	11	4	0	0	17	3	126	10	0	0	139	13	6	23	0	3	42	369	1558
13:45:00	17	148	3	0	0	168	4	10	6	0	0	20	4	126	20	0	0	150	19	7	14	0	0	40	378	1580
14:00:00	20	147	8	0	0	175	5	9	2	0	0	16	3	130	24	0	0	157	27	5	20	0	0	52	400	1537
14:15:00	24	135	3	0	1	162	0	10	6	0	1	16	7	132	29	0	1	168	27	10	23	0	1	60	406	1553
14:30:00	19	151	9	0	0	179	8	19	5	0	1	32	3	133	27	0	3	163	48	14	22	0	0	84	458	1642
14:45:00	29	176	10	0	2	215	3	15	10	0	2	28	1	161	25	0	2	187	34	23	24	0	2	81	511	1775
15:00:00	30	174	8	0	0	212	10	14	12	0	0	36	4	153	14	1	0	172	31	8	18	0	5	57	477	1852
15:15:00	27	193	6	0	0	226	9	28	9	0	0	46	8	130	27	0	0	165	24	16	16	0	0	56	493	1939
15:30:00	31	220	6	0	0	257	3	23	8	0	0	34	7	112	27	0	2	146	30	16	29	0	2	75	512	1993
15:45:00	37	218	4	0	0	259	4	25	11	0	0	40	6	126	20	0	0	152	44	20	25	0	2	89	540	2022
16:00:00	37	235	11	0	4	283	6	33	11	0	4	50	3	100	13	0	1	116	37	8	29	0	0	74	523	2068
16:15:00	26	255	9	0	0	290	11	26	10	0	1	47	11	133	21	0	1	165	31	12	19	0	1	62	564	2139
16:30:00	48	227	8	0	1	283	3	25	8	0	1	36	7	176	41	0	1	224	35	22	21	0	3	78	621	2248
16:45:00	46	260	7	0	0	313	6	34	14	0	0	54	8	147	29	0	1	184	21	12	23	0	1	56	607	2315
17:00:00	43	257	8	0	0	308	5	30	10	0	0	45	7	181	35	0	3	223	39	24	25	0	3	88	664	2456
17:15:00	42	262	9	0	1	313	2	30	20	0	1	52	5	146	23	0	1	174	33	21	25	0	1	79	618	2510
17:30:00	37	200	3	0	1	240	3	32	8	0	0	43	4	161	31	0	4	196	30	18	24	0	1	72	551	2440
17:45:00	41	229	4	0	0	274	10	23	8	0	1	41	3	139	36	0	0	178	30	21	21	0	0	72	565	2398
18:00:00	30	193	4	0	0	227	2	12	7	0	0	21	4	132	29	0	0	165	22	13	25	0	2	60	473	2207
18:15:00	26	158	3	0	0	187	9	17	6	0	0	32	3	118	21	0	2	142	36	22	28	0	2	86	447	2036
18:30:00	26	168	14	0	0	208	2	20	5	0	0	27	3	132	24	0	0	159	24	15	23	0	1	62	456	1941
18:45:00	25	204	4	0	0	233	3	7	4	0	0	14	6	122	25	0	0	153	27	15	18	0	0	60	460	1836
19:00:00	34	164	3	0	1	201	1	13	4	0	0	18	4	126	23	0	0	153	34	8	22	0	0	64	436	1799
19:15:00	29	180	3	0	0	212	2	16	6	0	0	24	4	116	27	0	0	147	22	11	16	0	0	49	432	1784
19:30:00	27	124	1	1	0	153	0	6	5	0	0	11	3	84	24	0	1	111	22	3	15	0	1	40	315	1643
19:45:00	18	116	3	0	0	137	1	11	3	0	0	15	4	103	19	0	0	126	13	10	14	0	1	37	315	1498
20:00:00	29	116	4	0	0	149	1	9	4	0	0	14	2	101	21	0	0	124	23	0	21	0	0	44	331	1393
20:15:00	24	84	2	0	0	110	0	10	2	0	0	12	3	77	24	0	1	104	22	3	9	0	0	34	260	1221
20:30:00	18	88	3	0	0	109	0	15	3	0	0	18	2	71	13	0	1	86	13	3	9	0	1	25	238	1144
20:45:00	13	83	1	0	1	97	2	14	2	0	1	18	4	73	18	0	2	95	15	4	17	0	0	36	246	1075
21:00:00	16	77	4	0	0	97	1	9	6	0	0	16	2	45	20	0	0	67	8	2	12	0	3	22	202	946
21:15:00	17	74	2	0	0	93	3	15	4	0	0	22	1	57	6	0	0	64	8	0	11	0	1	19	198	884
21:30:00	14	66	4	0	0	84	1	6	0	0	0	7	1	50	10	0	1	61	14	1	7	0	0	22	174	820
21:45:00	11	60	1	0	0	72	1	0	2	0	0	3	0	35	8	0	0	43	8	3	11	0	0	22	140	714
22:00:00	12	41	0	0	0	53	5	4	1	0	0	10	0	42	7	0	0	49	12	1	14	0	0	27	139	651
22:15:00	15	59	2	0	0	76	2	4	0	0	0	6	0	35	8	0	2	43	7	2	11	0	2	20	145	598
22:30:00	14	42	3	0	0	59	1	2	0	0	0	3	0	32	6	0	0	38	4	1	8	0	0	13	113	537
22:45:00	8	35	1	0	0	44	1	2	0	0	0	3	0	26	7	0	0	33	8	1	7	0	0	16	96	493
23:00:00	11	23	2	0	0	36	1	4	1	0	0	6	2	25	4	0	0	31	6	2	7	0	1	15	88	442

23:15:00	6	39	2	0	0	47	0	2	1	0	0	3	0	19	2	0	0	21	1	0	4	0	1	5	76	373
23:30:00	8	19	0	0	0	27	0	2	0	0	0	2	0	15	1	0	0	16	1	1	4	0	0	6	51	311
23:45:00	5	22	0	0	0	27	0	0	1	0	0	1	0	11	1	0	0	12	1	3	2	0	1	6	46	261
Grand Total	1517	9587	369	3	19	11476	301	938	378	0	21	1617	240	8941	1337	2	93	10520	1526	728	1556	0	79	3810	**27423**	-
Approach%	13.2%	83.5%	3.2%	0%		-	18.6%	58%	23.4%	0%		-	2.3%	85%	12.7%	0%		-	40.1%	19.1%	40.8%	0%		-	**-**	-
Totals %	5.5%	35%	1.3%	0%		41.8%	1.1%	3.4%	1.4%	0%		5.9%	0.9%	32.6%	4.9%	0%		38.4%	5.6%	2.7%	5.7%	0%		13.9%	**-**	-
Heavy	27	640	15	0		-	14	8	7	0		-	5	667	23	0		-	32	7	13	0		-	**-**	-
Heavy %	1.8%	6.7%	4.1%	0%		-	4.7%	0.9%	1.9%	0%		-	2.1%	7.5%	1.7%	0%		-	2.1%	1%	0.8%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: UPPER CENTENNIAL PARKWAY & HIGHLAND ROAD WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

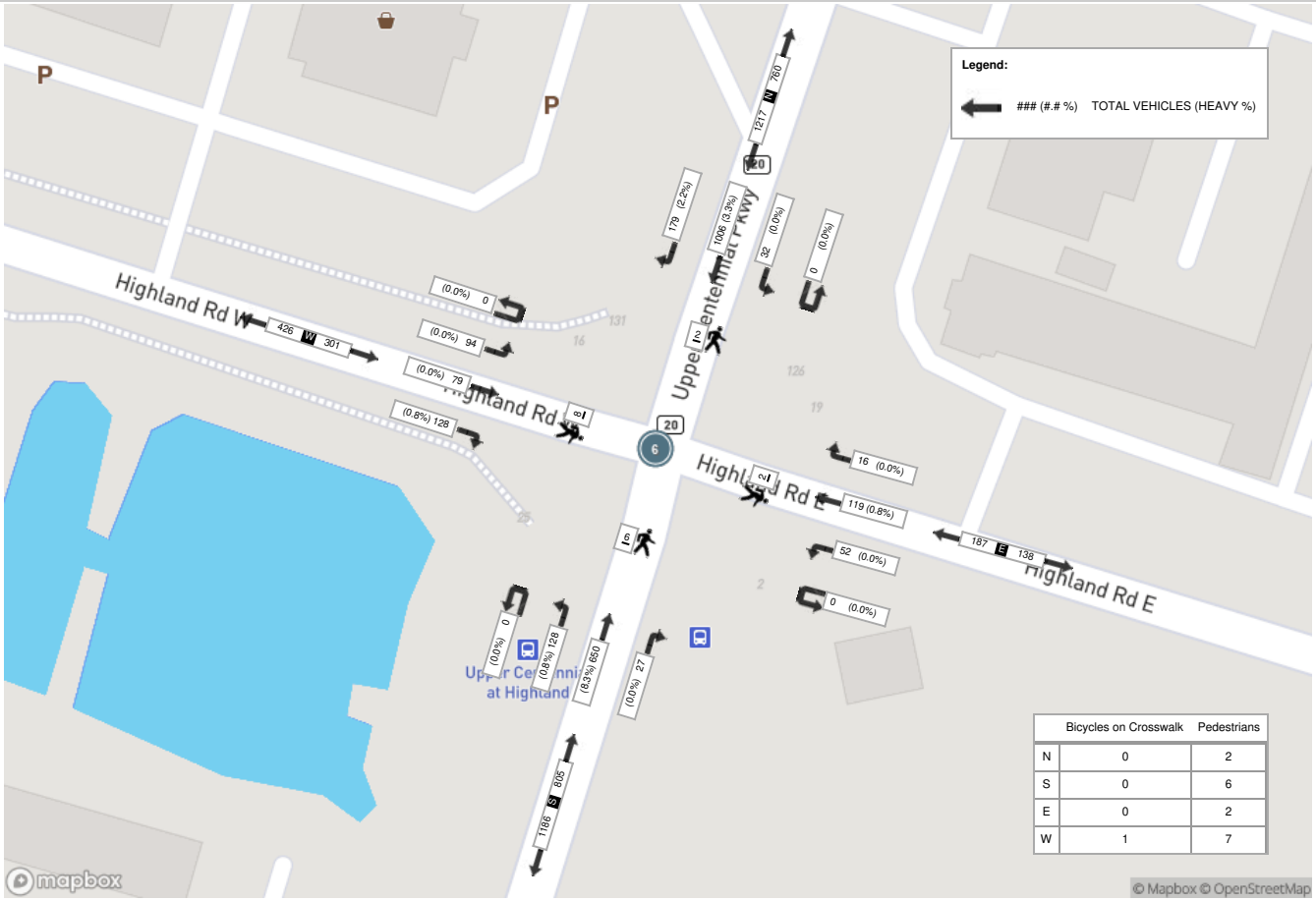
Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM **Weather:**

Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach HIGHLAND RD						S Approach UPPER CENTENNIAL PKWY						W Approach HIGHLAND RD						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	48	227	8	0	1	283	3	25	8	0	1	36	7	176	41	0	1	224	35	22	21	0	3	78	621
16:45:00	46	260	7	0	0	313	6	34	14	0	0	54	8	147	29	0	1	184	21	12	23	0	1	56	607
17:00:00	43	257	8	0	0	308	5	30	10	0	0	45	7	181	35	0	3	223	39	24	25	0	3	88	664
17:15:00	42	262	9	0	1	313	2	30	20	0	1	52	5	146	23	0	1	174	33	21	25	0	1	79	618
Grand Total	179	1006	32	0	2	1217	16	119	52	0	2	187	27	650	128	0	6	805	128	79	94	0	8	301	**2510**
Approach%	14.7%	82.7%	2.6%	0%		-	8.6%	63.6%	27.8%	0%		-	3.4%	80.7%	15.9%	0%		-	42.5%	26.2%	31.2%	0%		-	**-**
Totals %	7.1%	40.1%	1.3%	0%		48.5%	0.6%	4.7%	2.1%	0%		7.5%	1.1%	25.9%	5.1%	0%		32.1%	5.1%	3.1%	3.7%	0%		12%	**-**
PHF	0.93	0.96	0.89	0		0.97	0.67	0.88	0.65	0		0.87	0.84	0.9	0.78	0		0.9	0.82	0.82	0.94	0		0.86	**-**
Heavy	4	33	0	0		37	0	1	0	0		1	0	54	1	0		55	1	0	0	0		1	**-**
Heavy %	2.2%	3.3%	0%	0%		3%	0%	0.8%	0%	0%		0.5%	0%	8.3%	0.8%	0%		6.8%	0.8%	0%	0%	0%		0.3%	**-**
Lights	175	973	32	0		1180	16	118	52	0		186	27	596	127	0		750	127	79	94	0		300	**-**
Lights %	97.8%	96.7%	100%	0%		97%	100%	99.2%	100%	0%		99.5%	100%	91.7%	99.2%	0%		93.2%	99.2%	100%	100%	0%		99.7%	**-**
Single-Unit Trucks	4	19	0	0		23	0	0	0	0		0	0	15	1	0		16	0	0	0	0		0	**-**
Single-Unit Trucks %	2.2%	1.9%	0%	0%		1.9%	0%	0%	0%	0%		0%	0%	2.3%	0.8%	0%		2%	0%	0%	0%	0%		0%	**-**
Buses	0	4	0	0		4	0	1	0	0		1	0	11	0	0		11	1	0	0	0		1	**-**
Buses %	0%	0.4%	0%	0%		0.3%	0%	0.8%	0%	0%		0.5%	0%	1.7%	0%	0%		1.4%	0.8%	0%	0%	0%		0.3%	**-**
Articulated Trucks	0	10	0	0		10	0	0	0	0		0	0	28	0	0		28	0	0	0	0		0	**-**
Articulated Trucks %	0%	1%	0%	0%		0.8%	0%	0%	0%	0%		0%	0%	4.3%	0%	0%		3.5%	0%	0%	0%	0%		0%	**-**
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	2	-	-	-	-	-	2	-	-	-	-	-	6	-	-	-	-	-	7	-	**-**
Pedestrians%	-	-	-	-	11.1%		-	-	-	-	11.1%		-	-	-	-	33.3%		-	-	-	-	38.9%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	1	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	5.6%		**-**

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather:



Spectrum

Turning Movement Count
Location Name: UPPER CENTENNIAL PARKWAY & MUD STREET WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Turning Movement Count (5 . UPPER CENTENNIAL PARKWAY & MUD STREET WEST)

Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach MUD ST						S Approach UPPER CENTENNIAL PKWY						W Approach MUD ST						Int. Total (15 min)	Int. Total (1 hr)
	Right N:W	Thru N:S	Left N:E	UTurn N:N	Peds N:	Approach Total	Right E:N	Thru E:W	Left E:S	UTurn E:E	Peds E:	Approach Total	Right S:E	Thru S:N	Left S:W	UTurn S:S	Peds S:	Approach Total	Right W:S	Thru W:E	Left W:N	UTurn W:W	Peds W:	Approach Total		
00:00:00	2	18	1	0	0	21	4	3	1	0	0	8	2	11	2	0	0	15	5	4	6	0	0	15	59	
00:15:00	6	16	1	0	0	23	1	1	1	0	0	3	2	14	8	0	0	24	1	3	4	0	0	8	58	
00:30:00	4	14	0	0	0	18	1	2	0	0	0	3	1	9	3	0	0	13	3	1	3	1	0	8	42	
00:45:00	2	12	1	0	0	15	1	0	1	0	0	2	0	6	2	0	0	8	2	2	5	0	0	9	34	193
01:00:00	5	12	0	0	0	17	0	3	1	0	0	4	0	4	0	0	0	4	2	1	8	0	0	11	36	170
01:15:00	6	12	1	0	0	19	0	2	1	0	0	3	0	8	1	0	0	9	2	1	2	0	0	5	36	148
01:30:00	3	7	0	0	0	10	1	0	0	0	0	1	0	6	2	1	0	9	5	2	3	0	0	10	30	136
01:45:00	3	10	1	0	0	14	1	0	0	0	0	1	0	11	2	0	0	13	1	0	2	0	0	3	31	133
02:00:00	3	5	1	0	0	9	0	0	0	0	0	0	0	6	1	0	0	7	4	0	0	0	0	4	20	117
02:15:00	4	7	0	0	0	11	0	0	0	0	0	0	0	9	1	0	0	10	2	1	2	0	0	5	26	107
02:30:00	1	7	0	0	0	8	1	1	1	0	0	3	1	4	0	0	0	5	0	0	2	0	0	2	18	95
02:45:00	0	4	0	0	0	4	0	2	0	0	0	2	0	4	1	1	0	6	3	0	2	0	0	5	17	81
03:00:00	2	8	0	0	0	10	0	0	0	0	0	0	1	6	1	0	0	8	2	1	1	0	0	4	22	83
03:15:00	3	5	0	0	0	8	0	0	1	0	0	1	0	4	3	0	0	7	0	0	1	0	0	1	17	74
03:30:00	0	9	0	0	0	9	0	0	0	0	0	0	0	5	1	0	0	6	2	1	2	0	0	5	20	76
03:45:00	0	1	1	0	0	2	3	0	0	0	0	3	0	5	1	0	0	6	2	1	2	1	0	6	17	76
04:00:00	4	2	2	0	0	8	3	2	2	0	0	7	0	14	2	0	0	16	3	2	2	0	0	7	38	92
04:15:00	1	10	0	0	0	11	2	1	0	0	0	3	0	18	2	0	0	20	5	2	1	0	0	8	42	117
04:30:00	1	12	2	0	0	15	2	2	0	0	0	4	1	15	3	0	0	19	4	7	2	0	0	13	51	148
04:45:00	2	16	4	0	0	22	5	4	2	0	0	11	0	35	6	0	0	41	4	9	5	0	0	18	92	223
05:00:00	7	21	6	0	0	34	10	6	1	0	0	17	0	60	12	0	0	72	4	7	5	0	0	16	139	324
05:15:00	0	25	2	0	0	27	3	9	2	0	0	14	1	77	14	0	0	92	12	9	9	1	0	31	164	446
05:30:00	6	42	5	0	0	53	10	10	3	0	0	23	0	102	9	0	2	111	16	13	17	0	0	46	233	628
05:45:00	8	26	4	0	0	38	13	11	0	0	0	24	1	92	18	0	1	111	21	25	21	0	0	67	240	776
06:00:00	6	27	4	0	0	37	12	25	2	0	0	39	0	120	25	0	0	145	19	13	23	1	0	56	277	914
06:15:00	10	57	2	0	0	69	15	20	3	0	0	38	1	109	28	0	0	138	15	20	11	1	0	47	292	1042
06:30:00	3	52	6	0	0	61	12	21	5	0	0	38	0	149	28	0	0	177	23	33	22	0	0	78	354	1163
06:45:00	8	63	10	0	0	81	12	22	4	0	0	38	2	133	23	0	0	158	24	18	23	0	0	65	342	1265
07:00:00	15	61	5	0	0	81	20	23	5	0	0	48	4	119	26	0	1	149	24	29	32	0	0	85	363	1351
07:15:00	14	80	8	0	0	102	9	48	9	0	0	66	1	149	24	0	3	174	31	33	33	0	0	97	439	1498
07:30:00	22	93	8	0	0	123	19	67	8	0	0	94	2	168	36	0	0	206	38	38	44	0	0	120	543	1687
07:45:00	34	77	12	0	0	123	19	84	7	0	0	110	3	185	42	0	4	230	31	40	40	0	0	111	574	1919
08:00:00	24	75	6	0	0	105	15	73	8	0	0	96	2	201	36	0	0	239	27	46	39	0	0	112	552	2108
08:15:00	39	66	9	0	0	114	13	85	5	0	0	103	4	153	30	1	0	188	40	57	50	0	0	147	552	2221
08:30:00	34	79	4	0	1	117	16	84	1	0	1	101	6	144	25	0	0	175	46	41	56	0	0	143	536	2214
08:45:00	28	111	6	1	0	146	24	48	7	0	0	79	1	164	34	0	0	199	35	44	47	0	0	126	550	2190
09:00:00	37	81	12	0	0	130	12	54	9	0	0	75	5	124	41	0	1	170	45	35	48	0	0	128	503	2141
09:15:00	18	100	6	0	0	124	24	55	14	0	0	93	3	117	26	0	2	146	34	44	53	1	1	132	495	2084
09:30:00	27	110	8	0	0	145	14	36	8	0	0	58	3	138	36	0	2	177	47	36	34	0	1	117	497	2045
09:45:00	24	105	10	0	0	139	19	42	8	0	0	69	4	109	45	0	1	158	42	37	32	0	0	111	477	1972
10:00:00	27	70	13	0	0	110	15	28	4	0	0	47	3	119	38	0	2	160	46	34	38	0	0	118	435	1904
10:15:00	34	103	10	0	0	147	17	39	9	0	0	65	3	120	39	0	0	162	31	37	29	0	0	97	471	1880
10:30:00	35	85	16	0	0	136	10	28	8	0	0	46	5	98	50	0	1	153	37	45	46	0	0	128	463	1846
10:45:00	25	124	8	0	0	157	22	28	6	0	0	56	6	115	26	0	1	147	41	40	28	1	4	110	470	1839
11:00:00	35	77	13	0	0	125	21	42	5	0	0	68	2	95	37	0	0	134	39	39	38	0	6	116	443	1847

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

11:15:00	34	121	12	0	0	167	12	54	19	0	0	85	2	91	35	0	1	128	51	34	29	1	3	115	495	1871
11:30:00	20	88	9	0	0	117	26	58	6	0	0	90	4	101	30	0	0	135	46	41	27	0	2	114	456	1864
11:45:00	40	77	7	1	0	125	9	37	9	0	0	55	10	111	42	0	0	163	44	43	36	1	0	124	467	1861
12:00:00	30	114	14	0	1	158	14	40	9	0	1	63	2	92	34	0	1	128	39	47	44	1	0	131	480	1898
12:15:00	31	145	9	0	1	185	12	42	7	0	1	61	3	130	62	0	1	195	44	29	41	1	7	115	556	1959
12:30:00	34	101	11	0	0	146	17	44	11	0	0	72	5	111	40	0	0	156	43	41	29	0	7	113	487	1990
12:45:00	44	93	16	0	0	153	18	41	10	0	0	69	0	104	27	0	0	131	57	42	26	0	2	125	478	2001
13:00:00	47	122	10	1	0	180	11	41	7	0	0	59	4	124	52	0	1	180	43	34	28	0	0	105	524	2045
13:15:00	33	126	9	0	1	168	20	49	6	0	1	75	3	102	44	1	2	150	54	36	35	0	1	125	518	2007
13:30:00	31	125	16	0	0	172	19	45	6	0	0	70	1	108	38	0	0	147	35	37	37	0	0	109	498	2018
13:45:00	44	111	16	0	0	171	17	49	6	0	0	72	4	105	40	0	0	149	39	53	31	0	0	123	515	2055
14:00:00	26	142	10	0	0	178	10	32	5	0	0	47	1	111	40	0	0	152	45	35	34	0	0	114	491	2022
14:15:00	39	106	9	0	0	154	21	46	7	0	0	74	3	104	41	1	1	149	51	40	38	0	0	129	506	2010
14:30:00	41	142	10	0	0	193	20	62	8	0	0	90	0	115	42	0	1	157	44	45	35	0	1	124	564	2076
14:45:00	54	133	13	0	0	200	14	48	9	0	0	71	4	130	48	1	0	183	59	41	45	0	0	145	599	2160
15:00:00	47	157	17	0	0	221	14	45	8	0	0	67	3	117	44	0	3	164	51	49	30	1	2	131	583	2252
15:15:00	67	188	11	0	2	266	10	87	10	0	1	107	2	116	33	0	0	151	48	63	36	1	0	148	672	2418
15:30:00	55	179	13	0	0	247	11	83	11	0	0	105	3	113	32	0	0	148	53	70	33	0	0	156	656	2510
15:45:00	57	205	13	0	0	275	18	83	11	0	0	112	2	105	44	0	0	151	53	49	29	0	0	131	669	2580
16:00:00	65	233	18	0	0	316	6	106	11	0	0	123	2	95	39	0	0	136	67	52	52	0	1	171	746	2743
16:15:00	88	216	11	0	0	315	16	97	16	0	0	129	4	109	39	0	0	152	68	56	35	1	1	160	756	2827
16:30:00	79	221	18	0	1	318	4	80	8	0	1	92	2	141	50	2	3	195	57	53	48	0	2	158	763	2934
16:45:00	73	253	15	0	0	341	10	96	9	0	0	115	6	116	58	1	0	181	55	51	51	0	0	157	794	3059
17:00:00	84	215	16	0	0	315	12	72	8	0	0	92	6	149	52	1	1	208	58	58	46	0	1	162	777	3090
17:15:00	66	270	18	0	0	354	8	120	16	0	0	144	2	120	44	0	0	166	40	65	52	1	1	158	822	3156
17:30:00	67	218	11	0	0	296	5	75	8	0	0	88	4	125	56	0	2	185	45	72	50	0	4	167	736	3129
17:45:00	71	197	10	0	0	278	9	73	3	0	0	85	3	115	42	0	0	160	45	58	46	0	0	149	672	3007
18:00:00	66	158	16	1	0	241	16	63	3	0	0	82	4	108	42	0	0	154	56	47	46	2	0	151	628	2858
18:15:00	73	158	10	1	2	242	10	72	9	0	2	91	2	120	34	0	2	156	47	45	44	0	4	136	625	2661
18:30:00	67	160	19	0	0	246	17	49	5	0	0	71	3	110	40	0	0	153	41	30	31	0	2	102	572	2497
18:45:00	48	148	7	0	0	203	9	49	6	0	0	64	2	98	46	0	1	146	59	41	45	0	3	145	558	2383
19:00:00	40	141	7	0	0	188	8	45	5	0	0	58	3	89	47	0	0	139	47	34	46	0	1	127	512	2267
19:15:00	43	150	6	0	0	199	9	46	8	0	0	63	1	97	36	0	0	134	48	28	32	0	0	108	504	2146
19:30:00	42	133	5	0	0	180	3	36	5	0	0	44	4	77	26	0	0	107	26	31	33	0	0	90	421	1995
19:45:00	42	94	4	0	0	140	4	46	6	0	0	56	3	71	42	1	0	117	36	31	22	1	0	90	403	1840
20:00:00	45	108	6	0	0	159	2	27	3	0	0	32	6	76	36	0	0	118	24	28	29	1	1	82	391	1719
20:15:00	46	82	5	0	0	133	5	25	7	0	0	37	2	52	24	3	0	81	21	19	29	1	4	70	321	1536
20:30:00	33	76	2	2	0	113	5	19	3	0	0	27	1	58	19	1	0	79	20	16	24	0	0	60	279	1394
20:45:00	14	59	3	1	0	77	2	22	3	0	0	27	3	66	20	0	0	89	24	12	18	0	0	54	247	1238
21:00:00	22	77	6	0	0	105	4	24	4	0	0	32	1	42	17	0	0	60	19	15	22	0	0	56	253	1100
21:15:00	33	74	2	1	0	110	2	25	3	0	0	30	2	63	13	0	0	78	16	15	12	1	0	44	262	1041
21:30:00	20	61	4	0	0	85	4	15	0	0	0	19	1	36	15	0	0	52	20	16	18	0	1	54	210	972
21:45:00	17	49	4	0	0	70	3	21	3	0	0	27	2	28	15	1	0	46	16	9	7	0	1	32	175	900
22:00:00	20	41	4	0	0	65	4	21	2	0	0	27	2	37	22	0	0	61	14	8	10	3	0	35	188	835
22:15:00	16	60	1	1	0	78	0	12	3	0	0	15	2	40	10	0	0	52	15	8	18	1	0	42	187	760
22:30:00	12	38	5	0	0	55	1	4	0	0	0	5	1	31	16	0	0	48	12	7	11	0	0	30	138	688
22:45:00	8	31	0	0	0	39	0	5	0	0	0	5	1	30	4	0	1	35	8	6	8	0	0	22	101	614
23:00:00	5	32	1	0	0	38	0	6	0	0	0	6	0	24	5	0	1	29	6	6	6	1	1	19	92	518

23:15:00	11	37	4	0	0	52	2	9	2	0	0	13	0	19	8	0	0	27	4	6	7	0	1	17	109	440
23:30:00	10	22	1	0	0	33	1	6	1	0	0	8	0	16	2	0	0	18	3	4	5	0	0	12	71	373
23:45:00	6	22	1	2	0	31	1	2	2	0	0	5	0	9	2	0	0	11	2	4	4	0	0	10	57	329
Grand Total	2678	8306	673	12	9	11669	876	3365	479	0	8	4720	201	7811	2479	16	43	10507	2738	2611	2423	26	66	7798	**34694**	-
Approach%	22.9%	71.2%	5.8%	0.1%		-	18.6%	71.3%	10.1%	0%		-	1.9%	74.3%	23.6%	0.2%		-	35.1%	33.5%	31.1%	0.3%		-	**-**	-
Totals %	7.7%	23.9%	1.9%	0%		33.6%	2.5%	9.7%	1.4%	0%		13.6%	0.6%	22.5%	7.1%	0%		30.3%	7.9%	7.5%	7%	0.1%		22.5%	**-**	-
Heavy	47	423	96	0		-	236	167	14	0		-	18	445	246	0		-	245	246	204	0		-	**-**	-
Heavy %	1.8%	5.1%	14.3%	0%		-	26.9%	5%	2.9%	0%		-	9%	5.7%	9.9%	0%		-	8.9%	9.4%	8.4%	0%		-	**-**	-
Bicycles	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-
Bicycle %	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	-	-	-	-		-	**-**	-

Spectrum

Turning Movement Count
Location Name: UPPER CENTENNIAL PARKWAY & MUD STREET WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM Weather:

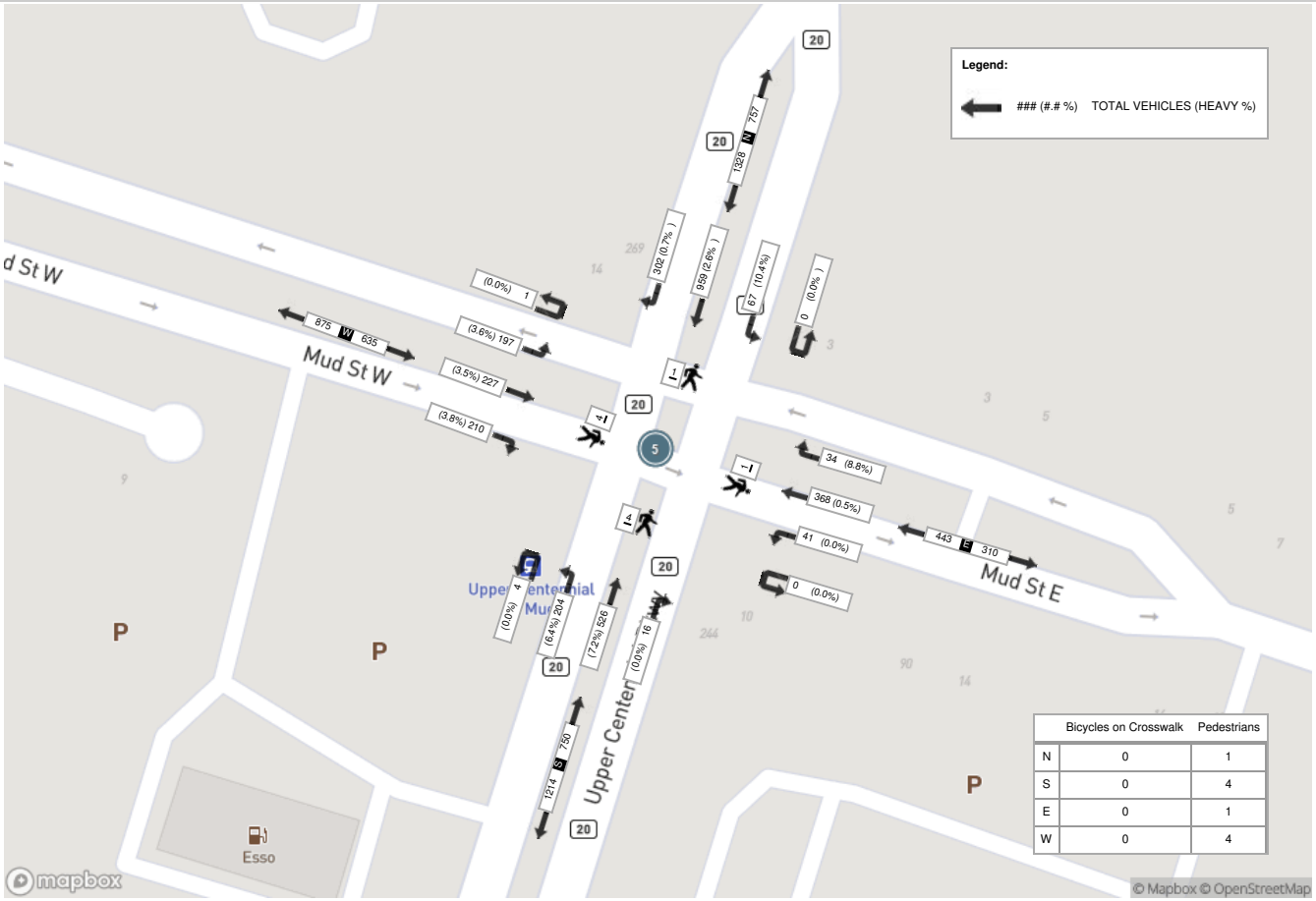
Start Time	N Approach UPPER CENTENNIAL PKWY						E Approach MUD ST						S Approach UPPER CENTENNIAL PKWY						W Approach MUD ST						Int. Total (15 min)
	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	Right	Thru	Left	UTurn	Peds	Approach Total	
16:30:00	79	221	18	0	1	318	4	80	8	0	1	92	2	141	50	2	3	195	57	53	48	0	2	158	763
16:45:00	73	253	15	0	0	341	10	96	9	0	0	115	6	116	58	1	0	181	55	51	51	0	0	157	794
17:00:00	84	215	16	0	0	315	12	72	8	0	0	92	6	149	52	1	1	208	58	58	46	0	1	162	777
17:15:00	66	270	18	0	0	354	8	120	16	0	0	144	2	120	44	0	0	166	40	65	52	1	1	158	822
Grand Total	302	959	67	0	1	1328	34	368	41	0	1	443	16	526	204	4	4	750	210	227	197	1	4	635	**3156**
Approach%	22.7%	72.2%	5%	0%		-	7.7%	83.1%	9.3%	0%		-	2.1%	70.1%	27.2%	0.5%		-	33.1%	35.7%	31%	0.2%		-	**-**
Totals %	9.6%	30.4%	2.1%	0%		42.1%	1.1%	11.7%	1.3%	0%		14%	0.5%	16.7%	6.5%	0.1%		23.8%	6.7%	7.2%	6.2%	0%		20.1%	**-**
PHF	0.9	0.89	0.93	0		0.94	0.71	0.77	0.64	0		0.77	0.67	0.88	0.88	0.5		0.9	0.91	0.87	0.95	0.25		0.98	**-**
Heavy	2	25	7	0		34	3	2	0	0		5	0	38	13	0		51	8	8	7	0		23	**-**
Heavy %	0.7%	2.6%	10.4%	0%		2.6%	8.8%	0.5%	0%	0%		1.1%	0%	7.2%	6.4%	0%		6.8%	3.8%	3.5%	3.6%	0%		3.6%	**-**
Lights	300	934	60	0		1294	31	366	41	0		438	16	488	191	4		699	202	219	190	1		612	**-**
Lights %	99.3%	97.4%	89.6%	0%		97.4%	91.2%	99.5%	100%	0%		98.9%	100%	92.8%	93.6%	100%		93.2%	96.2%	96.5%	96.4%	100%		96.4%	**-**
Single-Unit Trucks	2	16	6	0		24	1	0	0	0		1	0	13	5	0		18	4	5	1	0		10	**-**
Single-Unit Trucks %	0.7%	1.7%	9%	0%		1.8%	2.9%	0%	0%	0%		0.2%	0%	2.5%	2.5%	0%		2.4%	1.9%	2.2%	0.5%	0%		1.6%	**-**
Buses	0	5	0	0		5	0	1	0	0		1	0	7	0	0		7	0	0	6	0		6	**-**
Buses %	0%	0.5%	0%	0%		0.4%	0%	0.3%	0%	0%		0.2%	0%	1.3%	0%	0%		0.9%	0%	0%	3%	0%		0.9%	**-**
Articulated Trucks	0	4	1	0		5	2	1	0	0		3	0	18	8	0		26	4	3	0	0		7	**-**
Articulated Trucks %	0%	0.4%	1.5%	0%		0.4%	5.9%	0.3%	0%	0%		0.7%	0%	3.4%	3.9%	0%		3.5%	1.9%	1.3%	0%	0%		1.1%	**-**
Bicycles on Road	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	0	0	0	0		0	**-**
Bicycles on Road %	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	0%	0%	0%	0%		0%	**-**
Pedestrians	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	4	-	-	-	-	-	4	-	**-**
Pedestrians%	-	-	-	-	10%		-	-	-	-	10%		-	-	-	-	40%		-	-	-	-	40%		**-**
Bicycles on Crosswalk	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	-	-	-	-	0	-	**-**
Bicycles on Crosswalk%	-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		-	-	-	-	0%		**-**

Spectrum

Turning Movement Count
Location Name: UPPER CENTENNIAL PARKWAY & MUD STREET WEST
Date: Tue, Oct 08, 2024 Deployment Lead: Rey Fernandez

Crozier & Associates
SUITE 301 211 YONGE
STREET
TORONTO ONTARIO, M5B 1M4
CANADA

Peak Hour: 04:30 PM - 05:30 PM **Weather:**



Appendix B
TTS Results

Project Details

Project Name:	1470 Williamsport Drive
Project Number:	2719-7179
Created By:	AD
Date Started:	Friday, November 15, 2024
Client:	1470

Site Information

Summary of Development	Two 12-storey apartment building connected by six storey podium
Site Type	Residential
Subject Zones	3669, 3670, 3674, 3675

TTS Query Results	
Distribution:	**AM IN**

Field	Selection	Value
Row variable:	**2006 GTA zone of origin**	**-**
Column variable:	**2006 GTA zone of destination**	**-**
Filter 1:	**2006 GTA zone of destination**	**5032, 5041, 5245, 5044, 5041, 5037, 5244**
Filter 2:	**Start time of trip**	**0630-0930**
Filter 3:	**Trip purpose of destination**	**Home (H)**

AM IN	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	206	0	43	0	0	0	0	0	50	122	71	0	0	0	0	0	145	637
%	32.34%	0.00%	6.75%	0.00%	0.00%	0.00%	0.00%	0.00%	7.85%	19.15%	11.15%	0.00%	0.00%	0.00%	0.00%	0.00%	22.76%	100.00%
% w/o trips in subject TAZ	0.00%	0.00%	9.98%	0.00%	0.00%	0.00%	0.00%	0.00%	11.60%	28.31%	16.47%	0.00%	0.00%	0.00%	0.00%	0.00%	33.64%	100.00%

Paste Query

Thu Nov 07 2024 13:42:59 GMT-0500 (Eastern Standard Time) - Run Time: 2747ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 5032,5041,5245,5044,5041,5037,5244
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of destination - purp_dest In H
and
Primary travel mode of trip - mode_prime In D, P,

undefined
Table:

,5032,5041,5044,5244
4057,106,0,0,0
5032,0,23,0,0
5034,0,0,0,50
5037,0,16,0,0
5041,90,15,0,0
5053,43,0,0,0
5107,0,0,71,0
5121,0,33,0,0
5140,62,0,50,0
5192,0,0,0,16
5244,0,22,0,0
5245,0,0,0,40

TTS Query Results	
Distribution:	**AM OUT**

Field	Selection	Value
Row variable:	**2006 GTA zone of destination**	**-**
Column variable:	**2006 GTA zone of origin**	**-**
Filter 1:	**2006 GTA zone of origin**	**5032, 5041, 5245, 5044, 5041, 5037, 5244**
Filter 2:	**Start time of trip**	**0630-0930**
Filter 3:	**Trip purpose of origin**	**Home (H)**

AM OUT	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	**I**	**NW**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**Totals**
Trips	784	0	60	607	122	0	117	26	92	1668	1899	95	356	0	0	0	1504	7330
%	10.70%	0.00%	0.82%	8.28%	1.66%	0.00%	1.60%	0.35%	1.26%	22.76%	25.91%	1.30%	4.86%	0.00%	0.00%	0.00%	20.52%	100.00%
% w/o trips in subject TAZ	0.00%	0.00%	0.92%	9.27%	1.86%	0.00%	1.79%	0.40%	1.41%	25.48%	29.01%	1.45%	5.44%	0.00%	0.00%	0.00%	22.98%	100.00%

Paste Query

Thu Nov 07 2024 09:53:41 GMT-0500 (Eastern Standard Time) - Run Time: 3975ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 5032,5041,5245,5044,5041,5037,5244
and
Start time of trip - start_time In 0630-0930
and
Trip purpose of origin - purp_orig In H,
and
Trip purpose of destination - purp_dest Not In S,
and
Primary travel mode of trip - mode_prime In D, P,

undefined
Table:

,5032,5037,5041,5044,5244,5245
51,0,0,0,90,0,0
73,38,0,0,0,0,0
181,0,0,0,0,0,7
359,40,0,0,0,0,0
3479,0,0,0,0,0,44
3635,0,0,0,0,27,0
3641,67,0,0,0,0,0
3835,0,0,0,0,63,0
4009,0,0,23,0,0,7
4022,75,0,114,0,28,0
4024,0,0,0,0,0,63
4055,0,0,18,0,0,0
4056,0,0,21,0,0,0
4057,212,0,0,0,0,0
4060,0,0,0,0,45,63
4063,0,0,43,0,122,0
4068,0,0,14,0,39,0
4069,0,0,18,0,0,0
4077,0,93,0,0,0,0
4078,0,0,0,113,63,0
4081,0,0,0,0,69,0
4082,0,0,54,0,0,0
4085,0,46,0,0,0,0
4087,19,0,0,0,0,0
4091,0,0,0,166,0,0
4189,9,0,0,0,0,0
5005,81,0,0,0,0,36
5020,0,0,0,26,0,0

TTS Query Results	
Distribution:	**PM IN**

Field	Selection	Value
Row variable:	**2006 GTA zone of origin**	**-**
Column variable:	**2006 GTA zone of destination**	**-**
Filter 1:	**2006 GTA zone of destination**	**5032, 5041, 5245, 5044, 5041, 5037, 5244**
Filter 2:	**Start time of trip**	**1530-1830**
Filter 3:	**Trip purpose of destination**	**Home (H)**

PM IN	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	I	NW	N	NE	E	SE	S	SW	W	NW	N	NE	E	SE	S	SW	W	Totals
Trips	853	0	155	368	122	45	36	26	27	1491	1785	95	328	0	0	0	1668	6999
%	12.19%	0.00%	2.21%	5.26%	1.74%	0.64%	0.51%	0.37%	0.39%	21.30%	25.50%	1.36%	4.69%	0.00%	0.00%	0.00%	23.83%	100.00%
% w/o trips in subject TAZ	0.00%	0.00%	2.52%	5.99%	1.99%	0.73%	0.59%	0.42%	0.44%	24.26%	29.04%	1.55%	5.34%	0.00%	0.00%	0.00%	27.14%	100.00%

Paste Query

Thu Nov 07 2024 13:50:21 GMT-0500 (Eastern Standard Time) - Run Time: 2728ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of origin - gta06_orig
Column: 2006 GTA zone of destination - gta06_dest

Filters:
2006 GTA zone of destination - gta06_dest In 5032,5041,5245,5044,5041,5037,5244
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of destination - purp_dest In H
and
Primary travel mode of trip - mode_prime In D, P,

undefined
Table:

,5032,5037,5041,5044,5244,5245
73,38,0,0,0,0,0
181,0,0,0,0,0,7
355,0,0,75,0,0,0
3330,0,0,0,32,0,0
3479,0,0,0,0,0,44
3635,0,0,0,0,27,0
4009,0,0,23,0,0,0
4022,75,0,0,0,0,0
4024,0,0,0,0,0,63
4052,0,0,43,0,0,0
4055,0,0,18,0,0,0
4056,0,0,21,0,0,0
4060,0,0,0,0,45,63
4063,0,0,58,0,0,0
4068,0,0,14,0,0,0
4069,0,0,18,0,0,0
4077,0,93,35,0,0,0
4078,0,0,0,184,78,0
4081,0,0,0,0,69,0
4082,0,0,70,0,0,0
4085,0,46,0,0,0,0
4091,0,0,0,166,0,0
4092,19,0,0,0,0,0
4159,0,0,24,0,0,0
4189,9,0,0,0,0,0
5005,0,0,0,0,0,36
5007,0,0,0,0,45,0
5020,0,0,0,26,0,0
5026,0,0,0,0,122,0
5032,351,0,18,15,16,7

TTS Query Results	
Distribution:	**PM OUT**

Field	Selection	Value
Row variable:	**2006 GTA zone of destination**	**-**
Column variable:	**2006 GTA zone of origin**	**-**
Filter 1:	**2006 GTA zone of origin**	**5032, 5041, 5245, 5044, 5041, 5037, 5244**
Filter 2:	**Start time of trip**	**1530-1830**
Filter 3:	**Trip purpose of origin**	**Home (H)**

PM OUT	Internal									External								
	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	Internal	External	External	External	External	External	External	External	External	
Direction	**I**	**NW**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**NW**	**N**	**NE**	**E**	**SE**	**S**	**SW**	**W**	**Totals**
Trips	143	0	224	256	0	275	56	0	0	627	494	0	31	0	0	0	435	2541
%	5.63%	0.00%	8.82%	10.07%	0.00%	10.82%	2.20%	0.00%	0.00%	24.68%	19.44%	0.00%	1.22%	0.00%	0.00%	0.00%	17.12%	100.00%
% w/o trips in subject TAZ	0.00%	0.00%	9.34%	10.68%	0.00%	11.47%	2.34%	0.00%	0.00%	26.15%	20.60%	0.00%	1.29%	0.00%	0.00%	0.00%	18.14%	100.00%

Paste Query

Thu Nov 07 2024 14:00:33 GMT-0500 (Eastern Standard Time) - Run Time: 2604ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of destination - gta06_dest
Column: 2006 GTA zone of origin - gta06_orig

Filters:
2006 GTA zone of origin - gta06_orig In 5032,5041,5245,5044,5041,5037,5244
and
Start time of trip - start_time In 1530-1830
and
Trip purpose of origin - purp_orig In H
and
Primary travel mode of trip - mode_prime In D, P,
and
Trip purpose of destination - purp_dest Not In S,

undefined
Table:

,5032,5037,5041,5044,5244,5245
4051,0,0,67,0,0,0
4052,0,0,0,0,81,0
4057,106,0,0,0,0,0
4078,72,0,0,0,0,0
4089,0,0,0,0,27,0
4126,106,0,0,0,0,0
5003,0,0,0,185,0,0
5007,0,0,0,0,90,0
5010,0,0,0,0,56,0
5032,48,0,28,0,16,7
5037,0,0,16,0,0,0
5050,0,0,0,0,173,0
5051,0,0,0,18,0,0
5053,86,0,0,16,0,0
5054,0,0,0,0,47,0
5058,0,0,16,0,0,0
5080,60,0,0,0,0,0
5081,0,0,0,0,0,36
5082,0,0,108,0,0,0
5088,60,0,0,0,0,0
5093,29,0,0,0,0,0
5094,0,0,70,0,0,0
5099,0,0,15,0,47,0
5111,0,0,174,0,0,0
5113,0,84,0,0,0,0
5116,0,0,51,0,0,0
5120,0,0,0,90,0,0
5127,0,0,30,0,0,0

Appendix C
Transit Map

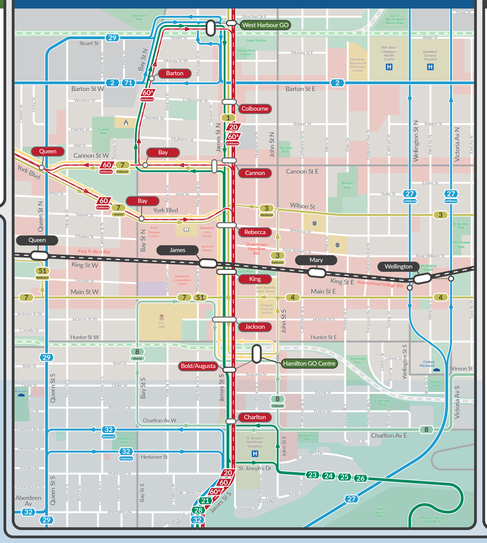
Downtown Dundas

McMaster University

Mohawk College

West Harbour GO

Downtown Hamilton



LRT ↔ HSR Bus Connections

McMaster University	50 6 32 51 71 Dundas
Longwood	7 32 71
Dundurn	2 51 51 71
Queen	29 51
James	20 60 60' 1 7 8 3 21 23 24 25 26 28
Mary	4
Wellington	4 27 27
Wentworth	8
Sherman	3 8
Scott Park	8 9
Gage Park	4 5
Ottawa	3 4 5 22
Kenilworth	60 60' 5 9
Queenston	5
Parkdale	30 1 4 5 9 32 41
Nash	3 5 11
Eastgate Square	10 40 2 3 5 12 13 14 15 34 61

(##) Direct LRT ↔ HSR Connection (##) Indirect LRT ↔ HSR Connection

Meadowlands

CF Lime Ridge

Heritage Greene

Eastgate Square

Concept (Re)envision Transit Network - Rail Ready

LRT Opening Day Planning Horizon - For Public Consultation

Route Type	Goes Downtown	Does Not Go Downtown
Rapid (Limited Stop)	LRT	LRT
Rapid (All Stop)	LRT	LRT
Core	##	##
Feeder	##	##
Local	##	##
Hamilton LRT		

	Flexible Trip Options	Limited Trip Options
myRide On-Demand	.....	.....

Flexible Trip Options: Customers beginning their trips on these corridors may travel between any two stops within their myRide On-Demand Transit zone.

Limited Trip Options: Customers beginning their trips on these corridors may only travel between select stops within their myRide On-Demand Transit zone, as fixed route options may exist.

Frequency (Peak Periods)

<10 Minutes	
10 Minutes	
15 Minutes	
20 Minutes	

Peak Periods: Weekdays 7:00-10:00 AM, 3:00-8:00 PM
Frequencies at other times may differ

Other Transit

Terminal	
Rapid Stop	
MyRide += Fixed Route Connection Point	
GO Transit	
Other Rail	
Burlington Transit (Routing to be Determined)	
One-Way Service	
Dundas BRT (Operator to be Determined)	

Symbology

- Residential
- Commercial
- Industrial
- Agricultural
- Parks & Recreation
- Open Space
- Municipal
- Post-Secondary Institution
- Municipal Service Centre
- Police Station
- Fire Station
- Hospital
- Community or Recreation Centre
- Public Library
- High School (Public or Catholic)

1 Bayfront — Hamilton GO Centre to Heritage Greene via Burlington St, Parkdale, Red Hill Valley Pkwy
2 Barton — Hillcrest Loop to Eastgate Station via Dundurn, Barton St W, West Harbour GO, Barton St E
3 Wilson — Hamilton GO Centre to Mount Albion Loop via Wilson, King, Eastgate, Greenhill
4 Main — Hamilton GO Centre to Parkdale Station via Main, Cannon, & Roxborough
5 Queenston — Gage Park to Stoney Creek Gateway via Main, Queenston, Highway 8
6 Longwood — West Hamilton Loop to Princess Point Loop via McMaster University, King
7 Locke — Princess Point Loop to Strathcona Loop via Longwood, Locke, Downtown, York Blvd
8 Fennell — Hamilton GO Centre to Scott Park Station via Cheriton, Wentworth, Sherman, Cumberland, & Gage
9 Rosedale — Scott Park Station to Parkdale Station via Gage, Burlington, Kenilworth, Cochrane, & Parkdale
10 B Line East — Eastgate Station to Winona Crossing via Highway 8, Jones, & Barton
11 Nash — Mount Albion Loop to Parkdale at Mead via Quigley, Nash, Confederation GO, Barton, Woodward
12 Barton East — Eastgate Station to Stoney Creek Gateway via Centennial, Confederation Walmart, Barton, Jones
13 Lake — Eastgate Station to McNally via Lake, Confederation Walmart, South Service, Arvin
14 Stoney Creek Gray — Eastgate Station to South Service at Green via Nash, King, Grey, South Service
15 Stoney Creek Green — Eastgate Station to South Service at Green via Nash, King, Green, Arvin, Millen, South Service
20 A Line — Pier 8 to Hamilton Airport via West Harbour GO, Downtown, Mohawk College
21 Upper Paradise — West Harbour GO to Meadowlands via Downtown, West 5th Access, Mohawk College
22 Upper Ottawa — Industrial at Depew to Upper Ottawa at Rymal via Ottawa, Kenilworth Access, Upper Ottawa, Niko
25 Upper Gage — West Harbour GO to Upper Sherman Loop via Downtown, Jolley Cut, Concession, Upper Gage, Rymal
24 Upper Sherman — West Harbour GO to Upper Sherman Loop via Downtown, Jolley Cut, Upper Sherman, CF Lime Ridge
29 Upper Wentworth — West Harbour GO to Upper Sherman Loop via Downtown, Jolley Cut, Upper Wentworth, CF Lime Ridge
26 Upper Wellington — West Harbour GO to Mountain Transit Centre via Downtown, Jolley Cut, Upper Wellington, Upper James
27 Upper James — Pier 8 to Mountain Transit Centre via Wellington (SB) & Victoria (NB), Claremont Access, Aerospark
28 West 5th — West Harbour GO to Mountain Transit Centre via Downtown, Mohawk College, West 5th, Garth, Twenty Rd
27 Garth — West Harbour GO to Glancaster Loop via Queen, Garth, Twenty Rd, Glancaster
5 S Line — Ancaster Gateway to Parkdale Station via Ancaster Business Park, Garner, Rymal, Heritage Greene
5 Concession — Mohawk College to Limeridge at Lennox via Innermost, Concession, Fennell, Upper Kenilworth
37 Central — McMaster University to Parkdale Station via Cheriton, West 5th, Mohawk College, Fennell, King
33 Sanatorium — Meadowlands to Mohawk College via Mohawk, Magnolia, Scenic, Sanatorium, West 5th
30 Mohawk — Meadowlands to Eastgate Station via Mohawk College, CF Lime Ridge, Heritage Greene
35 Stone Church — Meadowlands to Valley Park Lay-By via Cloverleaf, Stone Church, CF Lime Ridge, Paramount
30 Rymal — Meadowlands to Elfrida Gateway via Redeemer University, Heritage Greene, Highland
40 E Line — Confederation GO to Heritage Greene via Eastgate, Upper Centennial, Elfrida Gateway, Rymal
41 Red Hill — Parkdale Station to Upper Ottawa at Rymal via Red Hill Valley Pkwy, Heritage Greene, Red Hill Business Park
50 T Line — Downtown Dundas to Heritage Greene via McMaster University, Wilson, Meadowlands, CF Lime Ridge
51 University — Pier 8 Governors to Hamilton GO Centre via Governors, Whitney, McMaster University, King, Main
60 L Line — Waterdown Gateway to Centre on Barton via Highway 6, Downtown, Mohawk College, CF Lime Ridge
60 L Line — West Harbour GO to Centre on Barton via Downtown, Mohawk College, CF Lime Ridge
61 Beach — Burlington GO to Eastgate Station via Downtown Burlington, Beach Blvd, Confederation GO
71 Ancaster Wilson — Ancaster Gateway to West Harbour GO via Wilson, Main, McMaster University, Dundurn, Barton

Appendix D
Trip Generation Summary

Stats

Land Use	Statistic	Units	Notes
Major Commercial	112	GLA	Commercial spaces = Assume 40% coverage of High intensification
Low Density Residential	18,939	units	detached & semi-detached
Medium Density Residential	7,444	units	townhouses
High Density Residential	13,248	units	stacked townhouses, apartment
Elementary School	18	schools	.2 students per house, approximately 450 students per school
Secondary School	3	schools	0.04 students per house, approximately 1050 students per school

Stats

Land Use	Statistic	Units
Major Commercial	12,109,232	Sqft
Low Density Residential	18,939	units
Medium Density Residential	7,444	units
High Density Residential	13,248	units
Elementary School	900	employees
Secondary School	300	employees

Baseline Vehicle Trips

Land Use	Statistic	AM								PM								Notes
		Rate			In %	Out %	In	Out	Total	Rate			In %	Out %	In	Out	Total	
LUC 820 - Strip Retail Plaza	12,109	T = 0.59X+133.55	0.59	133.55	62%	38%	4,512	2,766	7,278	ln(T) = 0.72ln(x)+3.02	0.72	3.02	48%	52%	8,564	9,277	17,841	
LUC 220 - Multifamily Housing (Low-Rise)	18,939	T = 0.31X + 22.85	0.31	22.85	24%	76%	1,415	4,479	5,894	T = 0.43X + 20.55	0.43	20.55	63%	37%	5,143	3,021	8,164	medium density
LUC 221 - Multifamily Housing (Mid-Rise)	7,444	T = 0.44X - 11.61	0.44	-11.61	23%	77%	751	2,513	3,264	T = 0.39X + 0.34	0.39	0.34	61%	39%	1,771	1,133	2,904	medium-high density + mixed use
LUC 221 - Multifamily Housing (Mid-Rise)	13,248	T = 0.44X - 11.61	0.44	-11.61	23%	77%	1,338	4,480	5,818	T = 0.39X + 0.34	0.39	0.34	61%	39%	3,152	2,015	5,167	medium-high density + mixed use
LUC 520 - Elementary School	900	7.27/employee	7.27		53%	47%	3,468	3,075	6,543	1.78/employee	1.78		48%	52%	769	833	1,602	elementary school
LUC 525 - High School	300	5.34/employee	5.34		69%	31%	1,105	497	1,602	1.61/employee	1.61		53%	47%	256	227	483	secondary school
Total		**N/A**					**12,589**	**17,810**	**30,399**	**N/A**					**19,655**	**16,506**	**36,161**	

Baseline Vehicle Trips Summary

Land Use	*AM*			*PM*		
	In	*Out*	*Total*	*In*	*Out*	*Total*
Commercial	*4,512*	*2,766*	*7,278*	*8,564*	*9,277*	*17,841*
Residential	*3,504*	*11,472*	*14,976*	*10,066*	*6,169*	*16,235*
School	*4,573*	*3,572*	*8,145*	*1,025*	*1,060*	*2,085*
Total	***12,589***	***17,810***	***30,399***	***19,655***	***16,506***	***36,161***

Statistic By Land Use

Category	*Statistic*	*Land Use*	*Statistic*	*%*
Commercial	*12,109,232*	*Commercial*	*12,109,232*	*100%*
Residential	*39,631*	*Low Density*	*18,939*	*48%*
		Medium Density	*7,444*	*19%*
		High Density	*13,248*	*33%*
School	*21*	*Elementary*	*18*	*86%*
		Secondary	*3*	*14%*

Baseline Vehicle Trips Summary

Land Use	*AM*			*PM*		
	In	*Out*	*Total*	*In*	*Out*	*Total*
Commercial	*4,512*	*2,766*	*7,278*	*8,564*	*9,277*	*17,841*
Residential	*3,504*	*11,472*	*14,976*	*10,066*	*6,169*	*16,235*
School	*4,573*	*3,572*	*8,145*	*1,025*	*1,060*	*2,085*
Total	***12,589***	***17,810***	***30,399***	***19,655***	***16,506***	***36,161***

Baseline Trips

Land Use	Statistic	Rate		AM			PM		
				In	Out	Total	In	Out	Total
Commercial	12,109,232	100% of commercial	100%	4,512	2,766	7,278	8,564	9,277	17,841
Low Desity	18,939	48% of residential	48%	1,674	5,480	7,154	4,808	2,947	7,755
Medium Density	7,444	19% of residential	19%	658	2,154	2,812	1,890	1,158	3,048
High Density	13,248	33% of residential	33%	1,171	3,833	5,004	3,363	2,061	5,425
Elementary School	900	86% of school	86%	3,920	3,062	6,981	879	909	1,787
Secondary School	300	14% of school	14%	653	510	1,164	146	151	298
Total				**12,588**	**17,805**	**30,393**	**19,650**	**16,503**	**36,154**

Mode Split Adjustment Factors

Land Use	*Target*	*Base*	*Adj.*	*Notes*
Commercial	*78%*	*95%*	*90%*	
Low Desity	*78%*	*95%*	*90%*	
Medium Density	*78%*	*95%*	*90%*	
High Density	*78%*	*95%*	*90%*	
Elementary School	*34%*	*78%*	*95%*	
Secondary School	*34%*	*78%*	*95%*	*based on elementary*

Vehicle Trips

Land Use	Statistic	Rate		AM			PM		
				In	Out	Total	In	Out	Total
Commercial	12,109,232	90% of trips	90%	4,061	2,489	6,550	7,708	8,349	16,057
Low Desity	18,939	90% of trips	90%	1,507	4,932	6,439	4,327	2,652	6,980
Medium Density	7,444	90% of trips	90%	592	1,939	2,531	1,701	1,042	2,743
High Density	13,248	90% of trips	90%	1,054	3,450	4,504	3,027	1,855	4,883

Elementary School	900	95% of trips	95%	3,724	2,909	6,632	835	864	1,698
Secondary School	300	95% of trips	95%	620	485	1,106	139	143	283
Total				**11,558**	**16,204**	**27,762**	**17,737**	**14,905**	**32,644**

Pass by

Land Use	Statistic	AM					PM				
		Rate		In	Out	Total	Rate		In	Out	Total
Land Use	12,109,232	0% of trips	0%	0	0	0	22% of trips	22%	-1,696	-1,837	-3,533
Commercial	18,939	0% of trips	0%	0	0	0	0% of trips	0%	0	0	0
Low Desity	7,444	0% of trips	0%	0	0	0	0% of trips	0%	0	0	0
Medium Density	13,248	0% of trips	0%	0	0	0	0% of trips	0%	0	0	0
High Density	900	0% of trips	0%	0	0	0	0% of trips	0%	0	0	0
Elementary School	300	0% of trips	0%	0	0	0	0% of trips	0%	0	0	0

Internal Trip Reduction

Land Use	Statistic	AM					PM				
		Rate		In	Out	Total	Rate		In	Out	Total
Commercial	12,109,232	60% of trips	60%	2,437	1,493	3,930	53% of trips	53%	-4,085	-4,425	-8,510
Low Desity	18,939	25% of trips	25%	377	1,233	1,610	37% of trips	37%	-1,601	-981	-2,583
Medium Density	7,444	25% of trips	25%	148	485	633	37% of trips	37%	-629	-386	-1,015
High Density	13,248	25% of trips	25%	264	863	1,126	37% of trips	37%	-1,120	-686	-1,807
Elementary School	900	100% of trips	100%	3,724	2,909	6,632	100% of trips	100%	-835	-864	-1,698
Secondary School	300	100% of trips	100%	620	485	1,106	100% of trips	100%	-139	-143	-283

Trip Capture

Land Use	Statistic	Rate		AM			PM		
				In	Out	Total	In	Out	Total
Commercial	12,109,232	6% of trips	6%	-244	-149	-393	-462	-501	-963
Low Desity	18,939	2% of trips	2%	-30	-99	-129	-87	-53	-140
Medium Density	7,444	2% of trips	2%	-12	-39	-51	-34	-21	-55
High Density	13,248	2% of trips	2%	-21	-69	-90	-61	-37	-98
Elementary School	900	0% of trips	0%	0	0	0	0	0	0
Secondary School	300	0% of trips	0%	0	0	0	0	0	0

Primary Vehicle Trips

Land Use	Statistic	AM			PM		
		In	Out	Total	In	Out	Total
Commercial	12,109,232	1,380	847	2,227	1,465	1,586	3,051
Low Desity	18,939	1,100	3,600	4,700	2,639	1,618	4,257
Medium Density	7,444	432	1,415	1,847	1,038	635	1,673
High Density	13,248	769	2,518	3,288	1,846	1,132	2,978
Elementary School	900	0	0	0	0	0	0
Secondary School	300	0	0	0	0	0	0
Total		**3,681**	**8,380**	**12,062**	**6,988**	**4,971**	**11,959**

Primary Trips Summary

Land Use	Statistic	AM					
		In	Out	Total	In	Out	Total
Commercial	12,109,232	1,380	847	2,227	1,465	1,586	3,051
Low Desity	18,939	1,100	3,600	4,700	2,639	1,618	4,257
Medium Density	7,444	432	1,415	1,847	1,038	635	1,673
High Density	13,248	769	2,518	3,288	1,846	1,132	2,978
Elementary School	900						
Secondary School	300						
Total		**3,681**	**8,380**	**12,062**	**6,988**	**4,971**	**11,959**

Appendix **E**
ITE TripGen Excerpts

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)

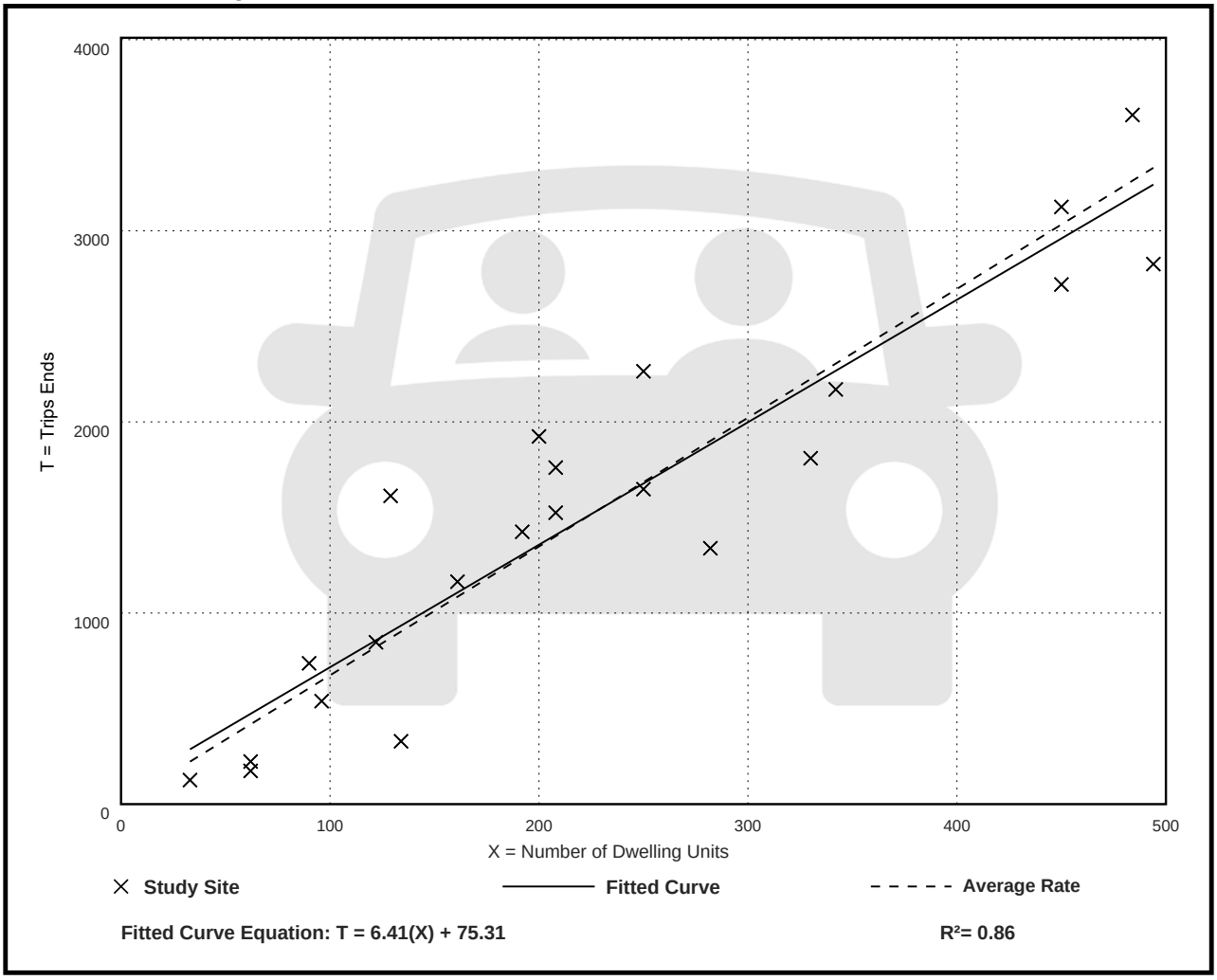
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



Fitted Curve Equation: T = 6.41(X) + 75.31

R^2= 0.86

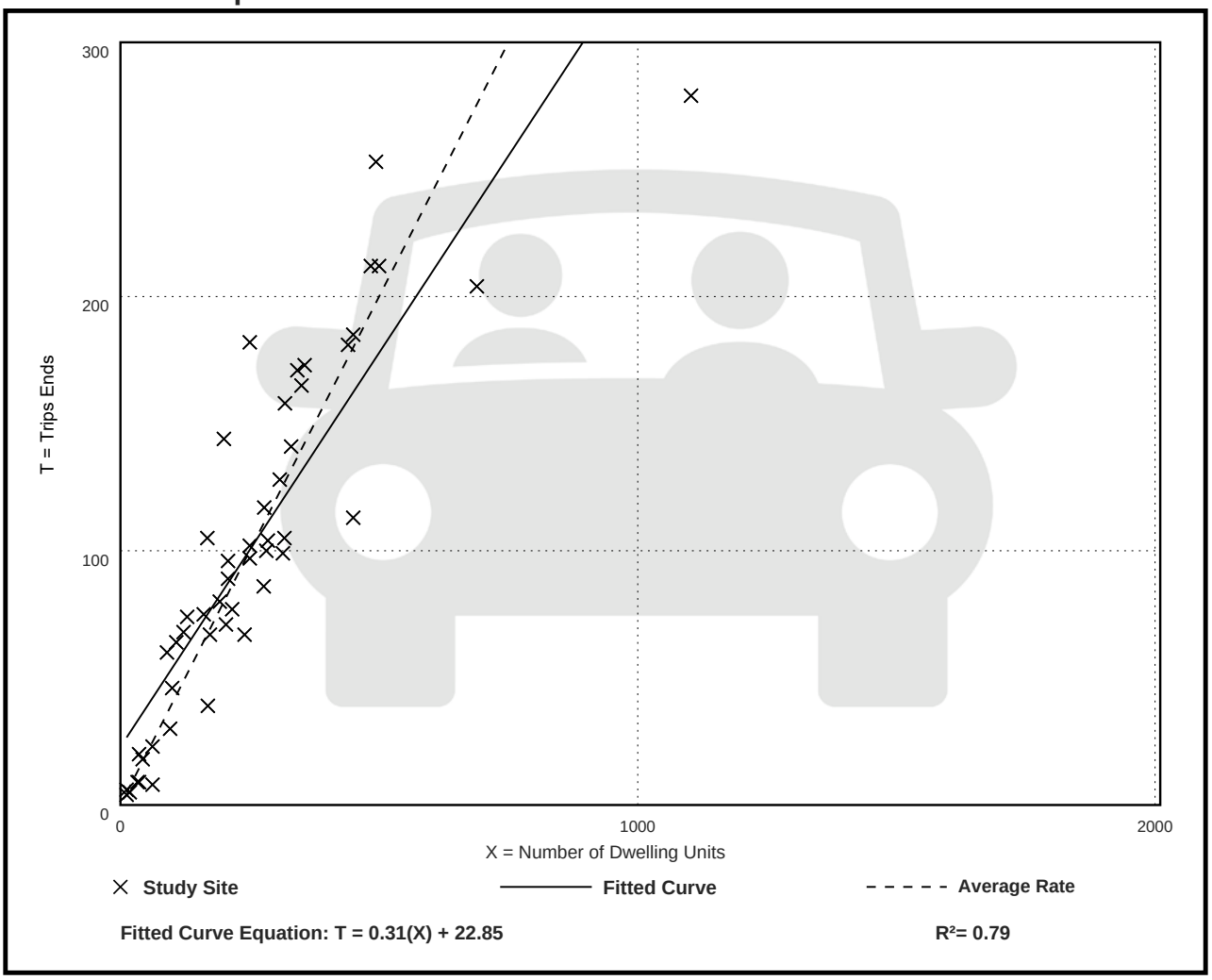
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



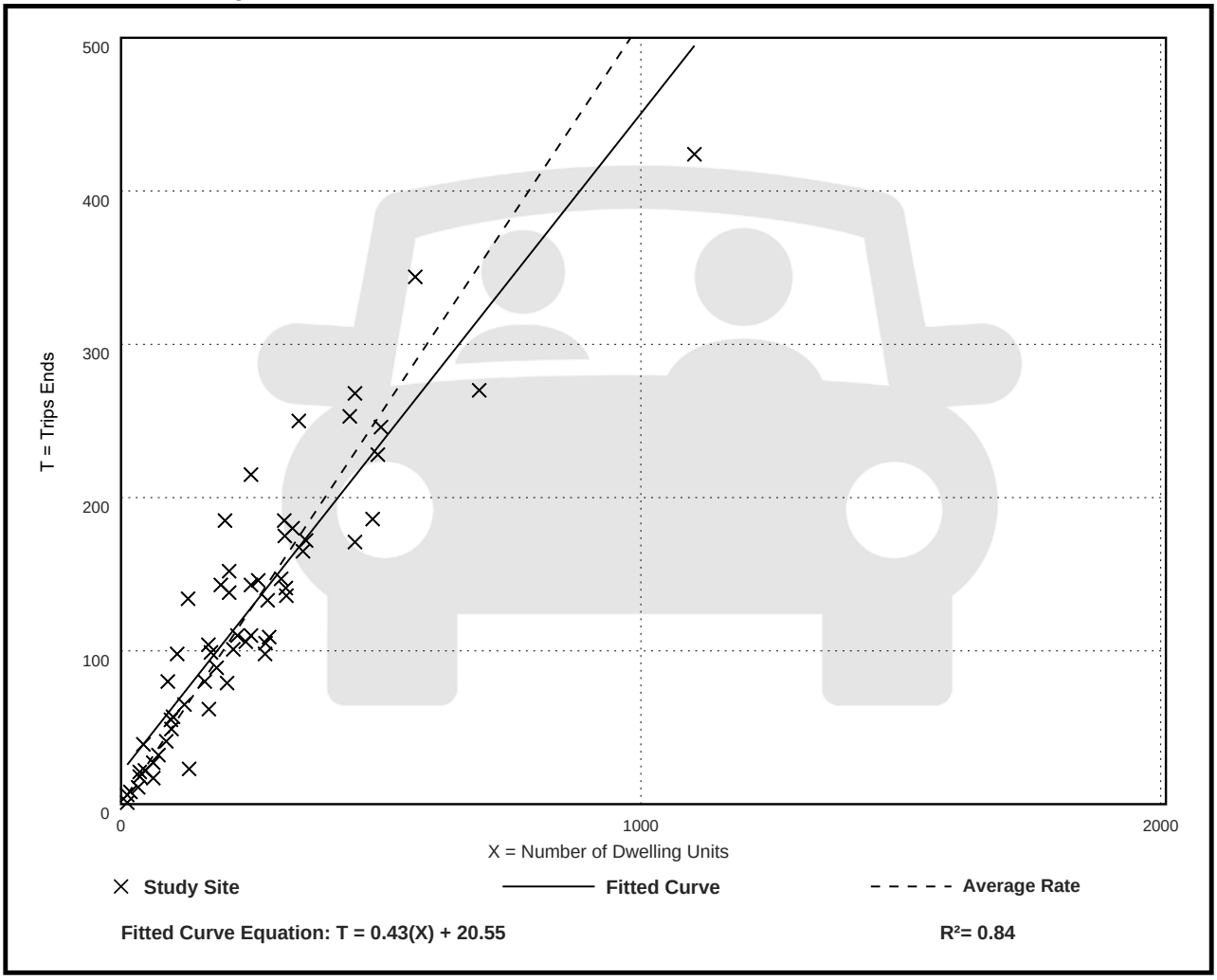
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



Fitted Curve Equation: T = 0.43(X) + 20.55

R^2= 0.84

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

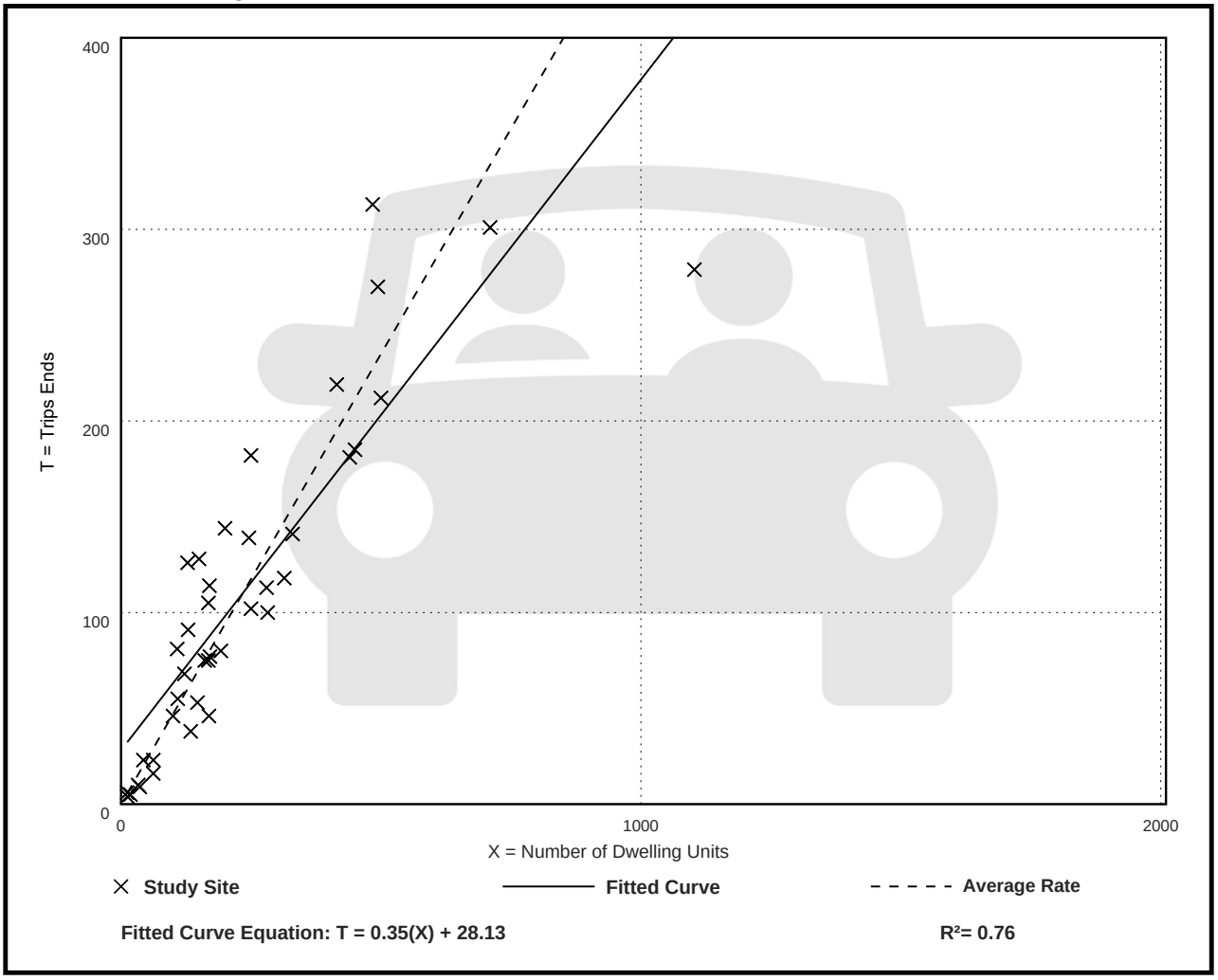
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

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)

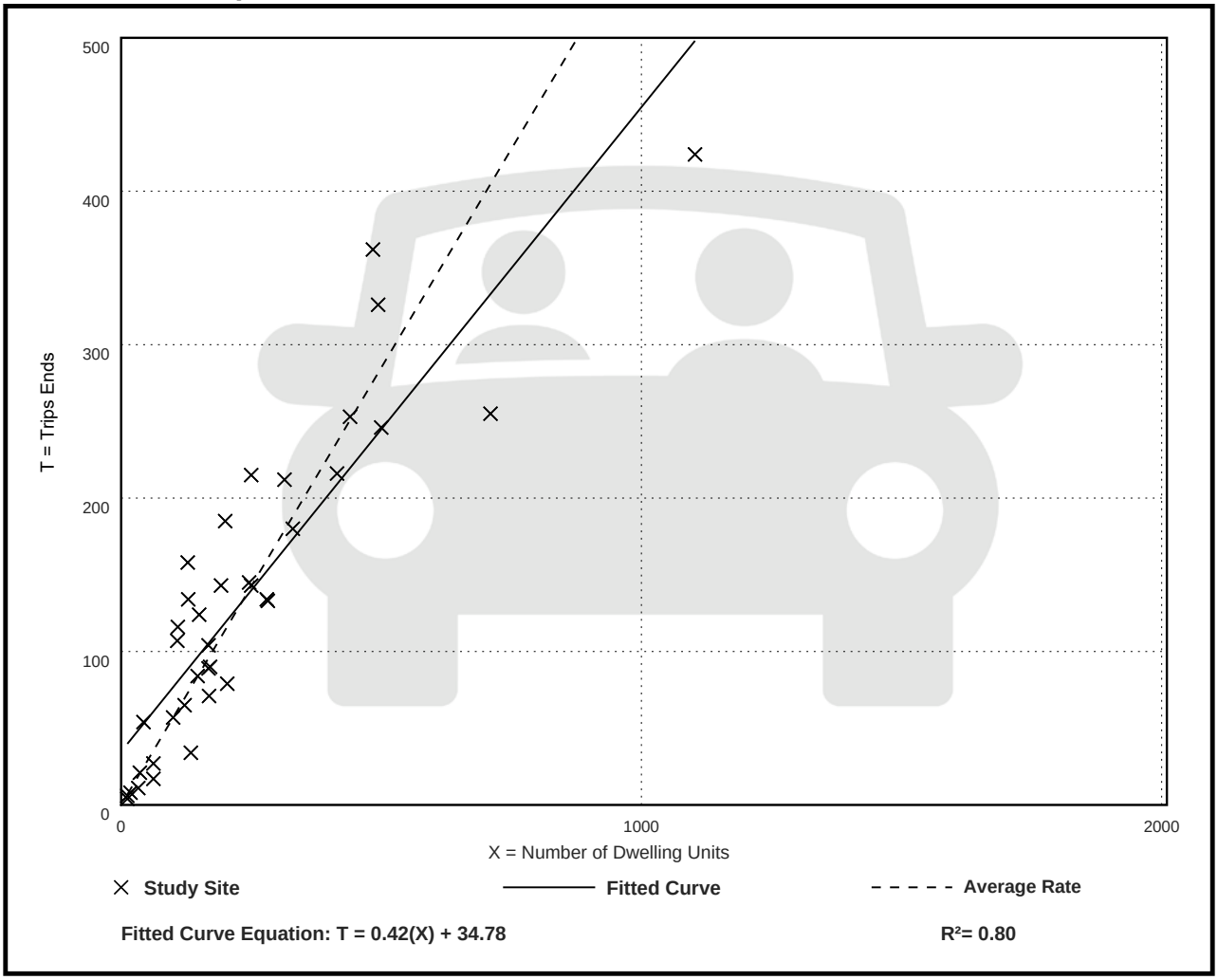
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

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



Fitted Curve Equation: T = 0.42(X) + 34.78

R^2= 0.80

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

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

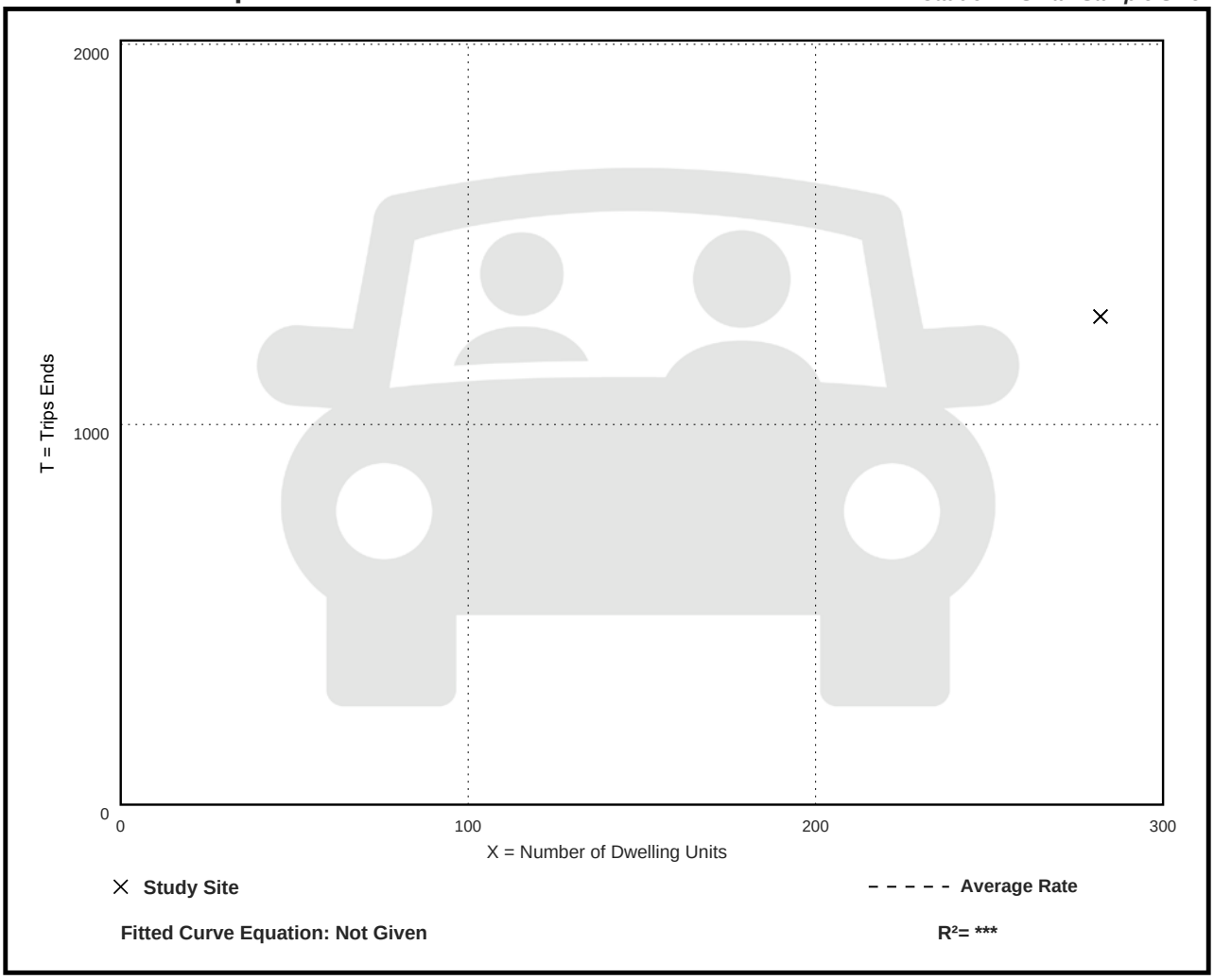
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

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



Fitted Curve Equation: Not Given

R^2= *

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

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

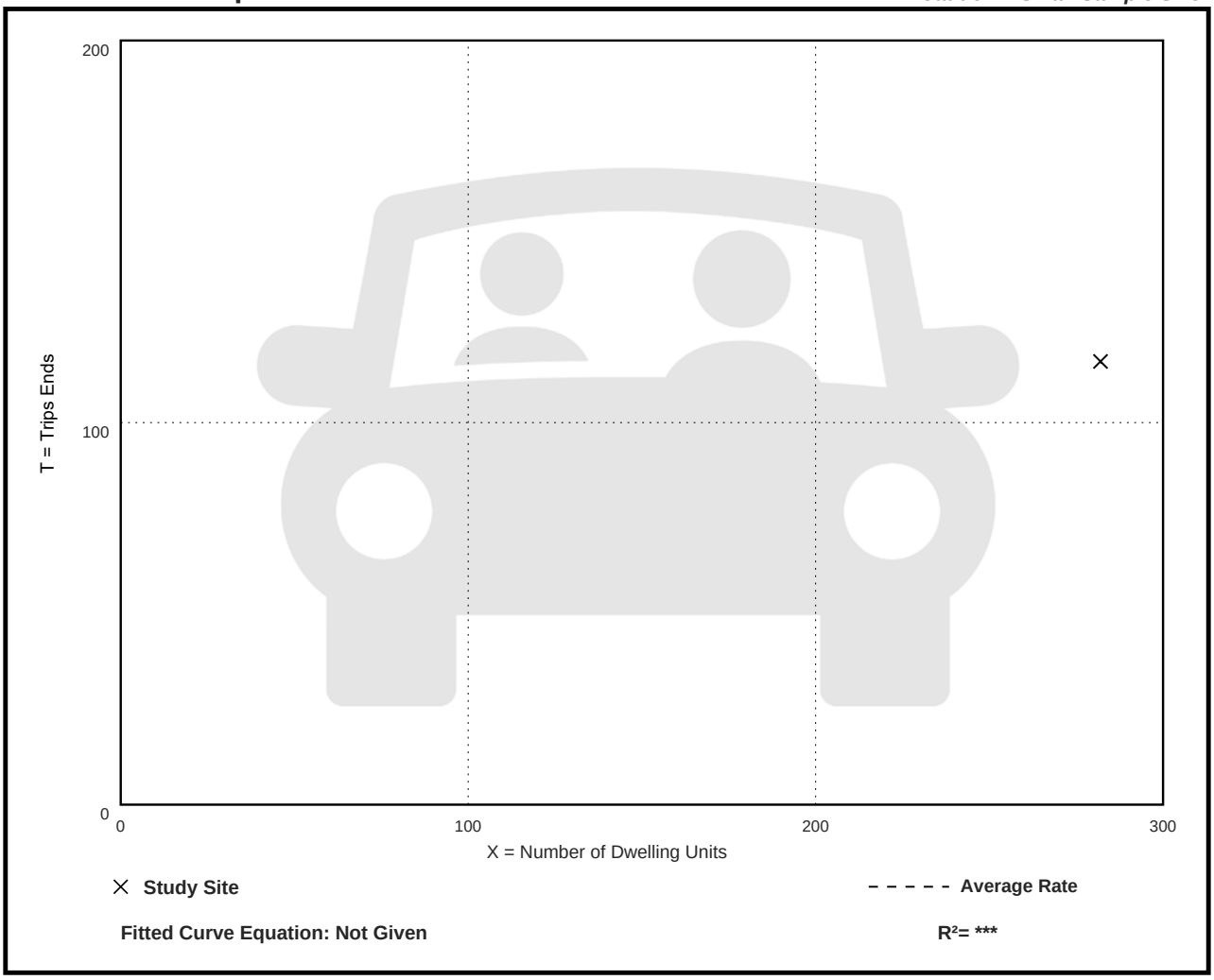
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

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

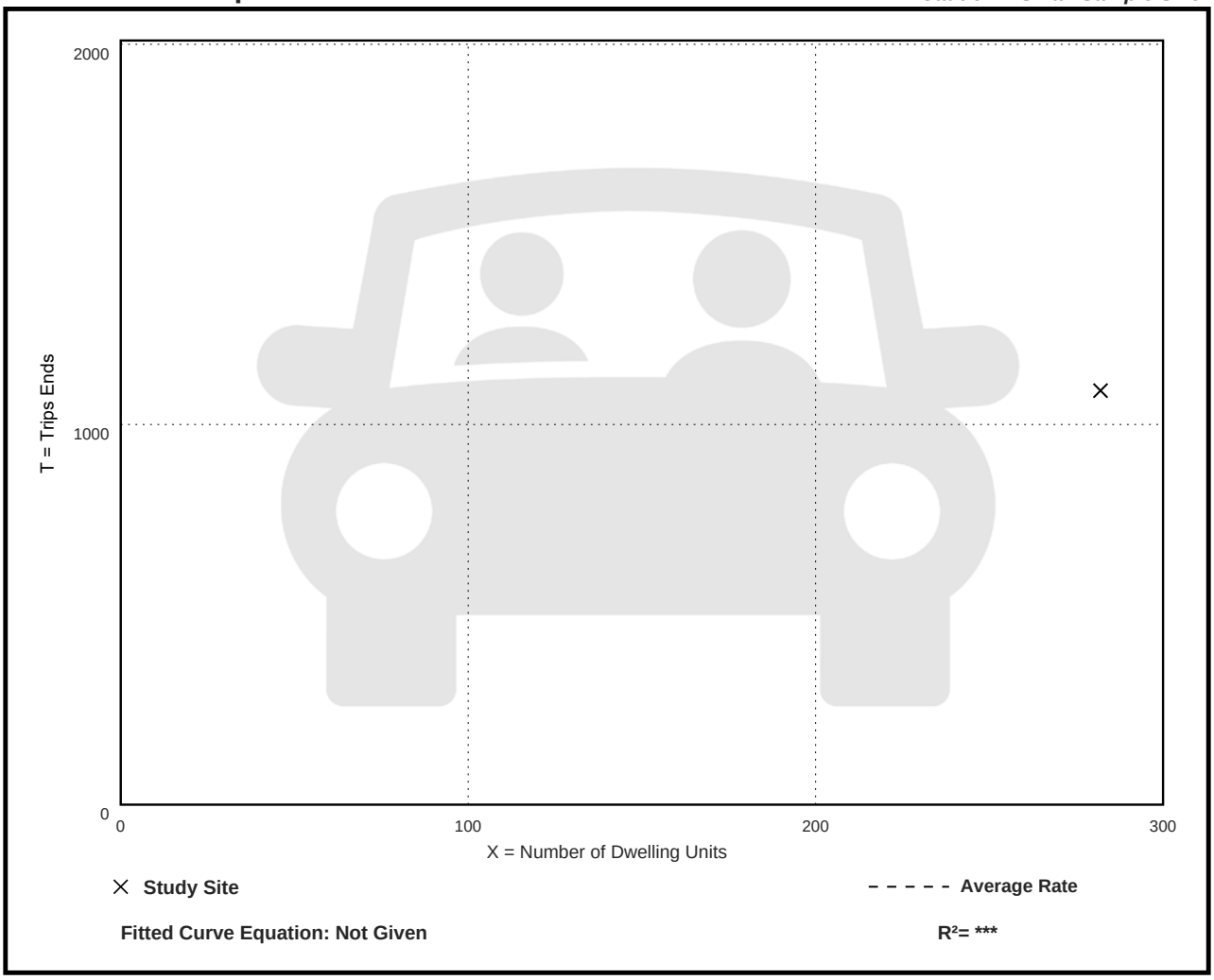
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

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



Fitted Curve Equation: Not Given

R^2= *

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

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

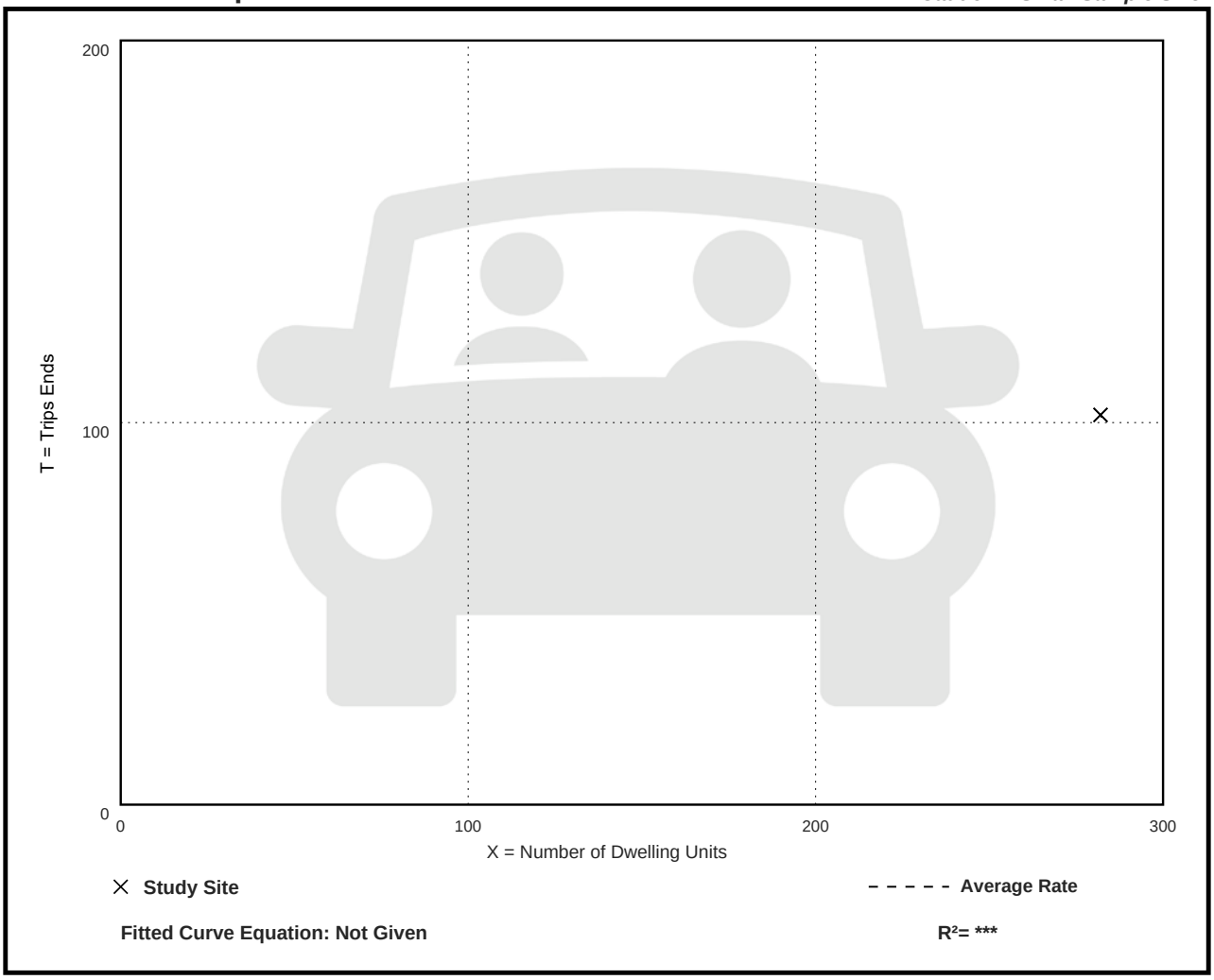
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

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



Fitted Curve Equation: Not Given

R^2= *

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

Vehicle Trip Ends vs: Residents
On a: Weekday

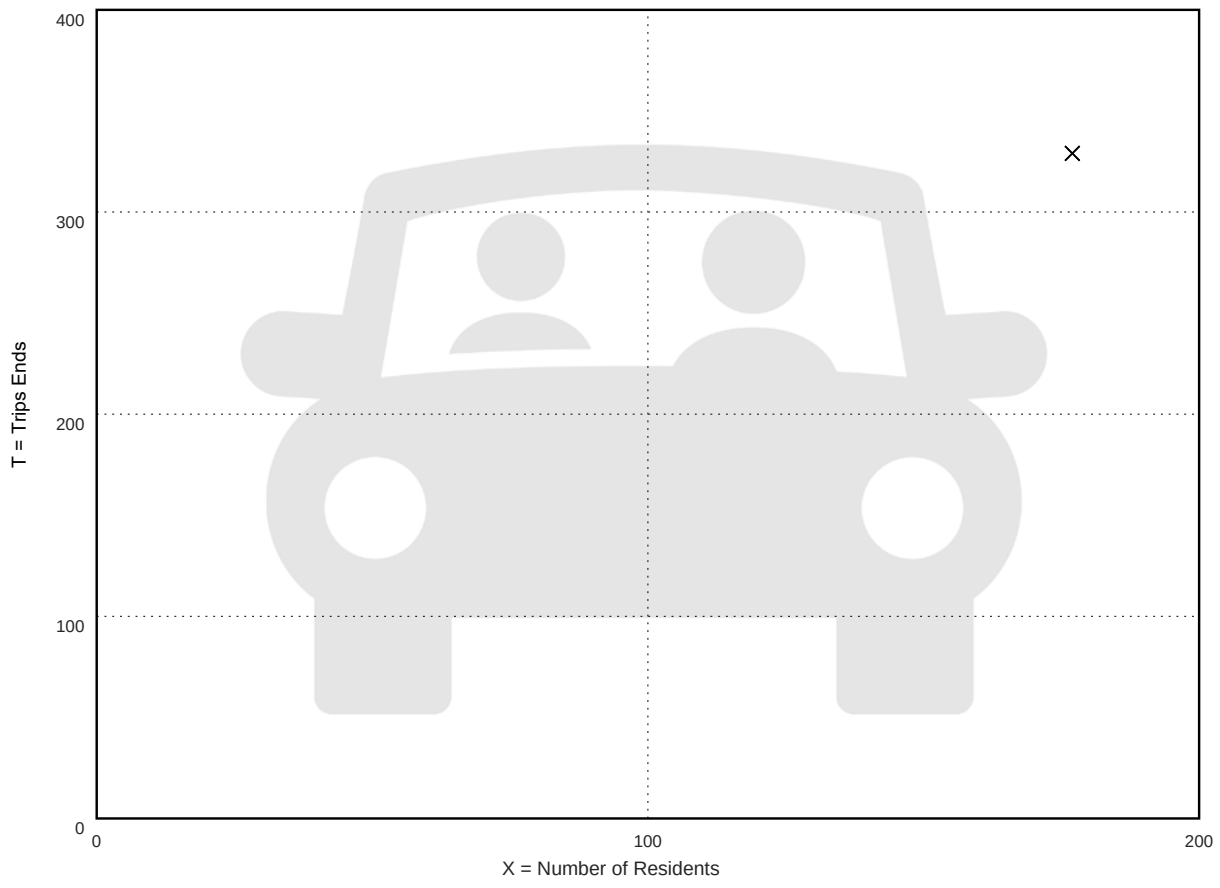
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 177
Directional Distribution: 50% entering, 50% exiting

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



Fitted Curve Equation: Not Given

R^2= ***

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

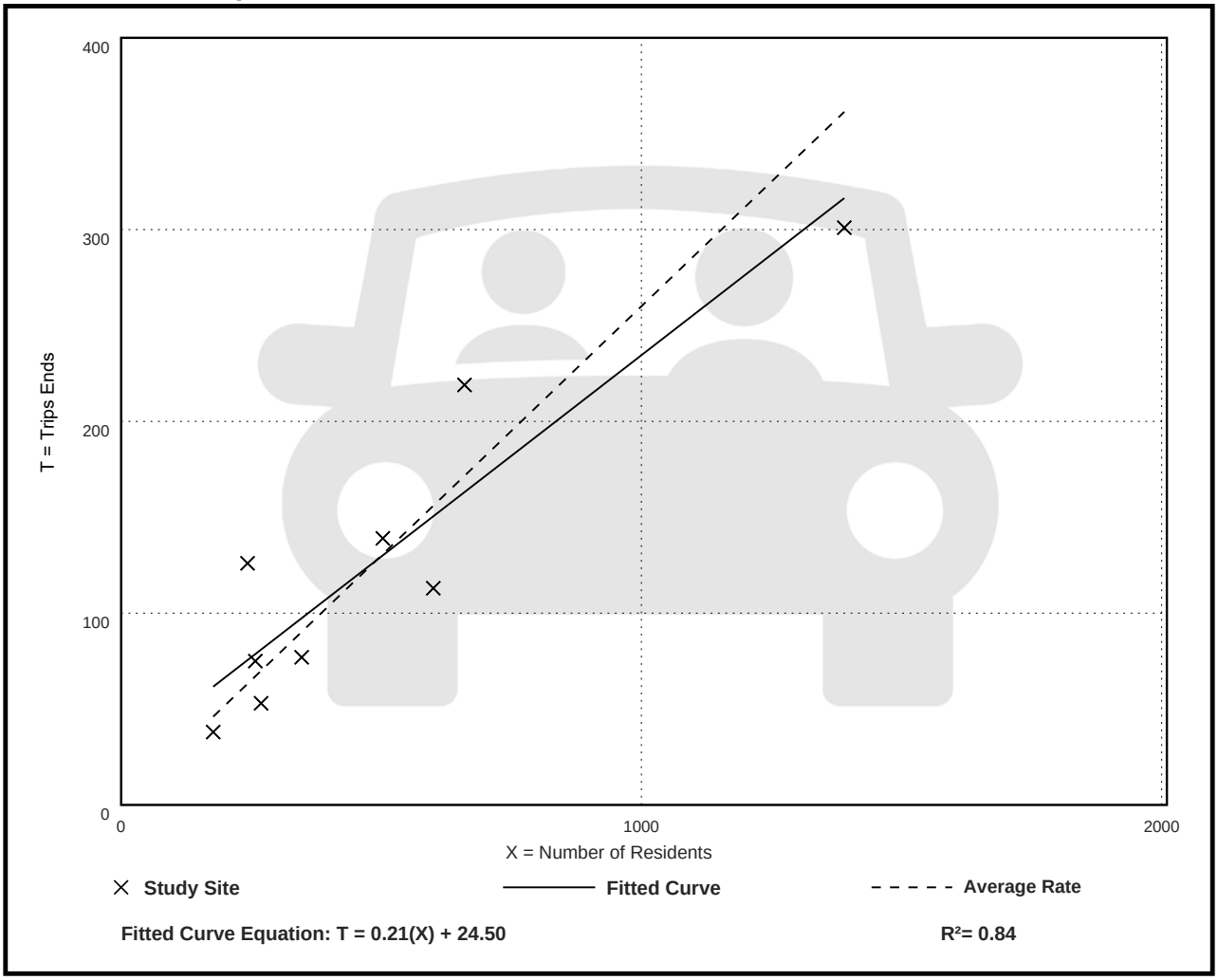
Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

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



Fitted Curve Equation: T = 0.21(X) + 24.50

R^2= 0.84

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

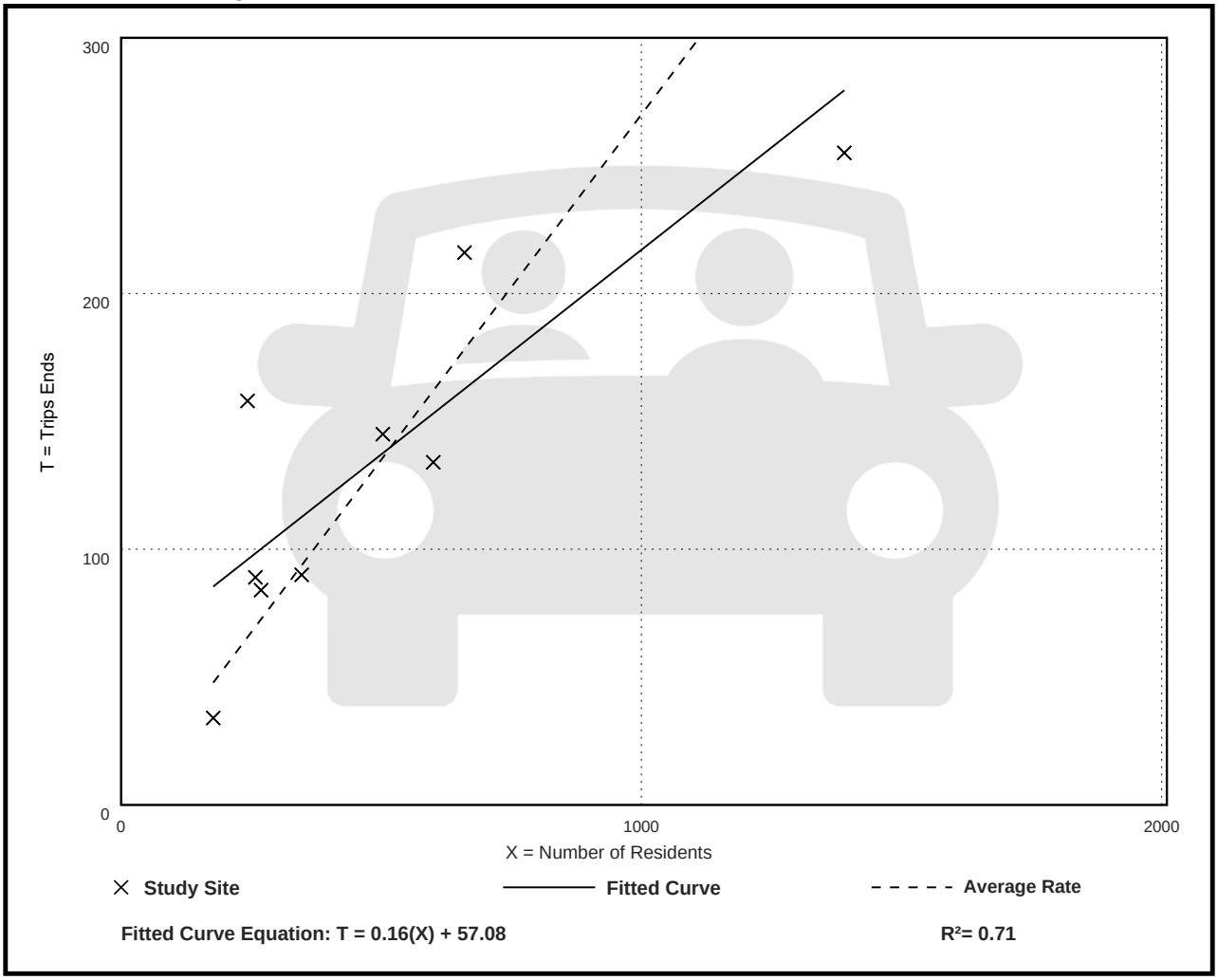
Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

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



Fitted Curve Equation: T = 0.16(X) + 57.08

R^2= 0.71

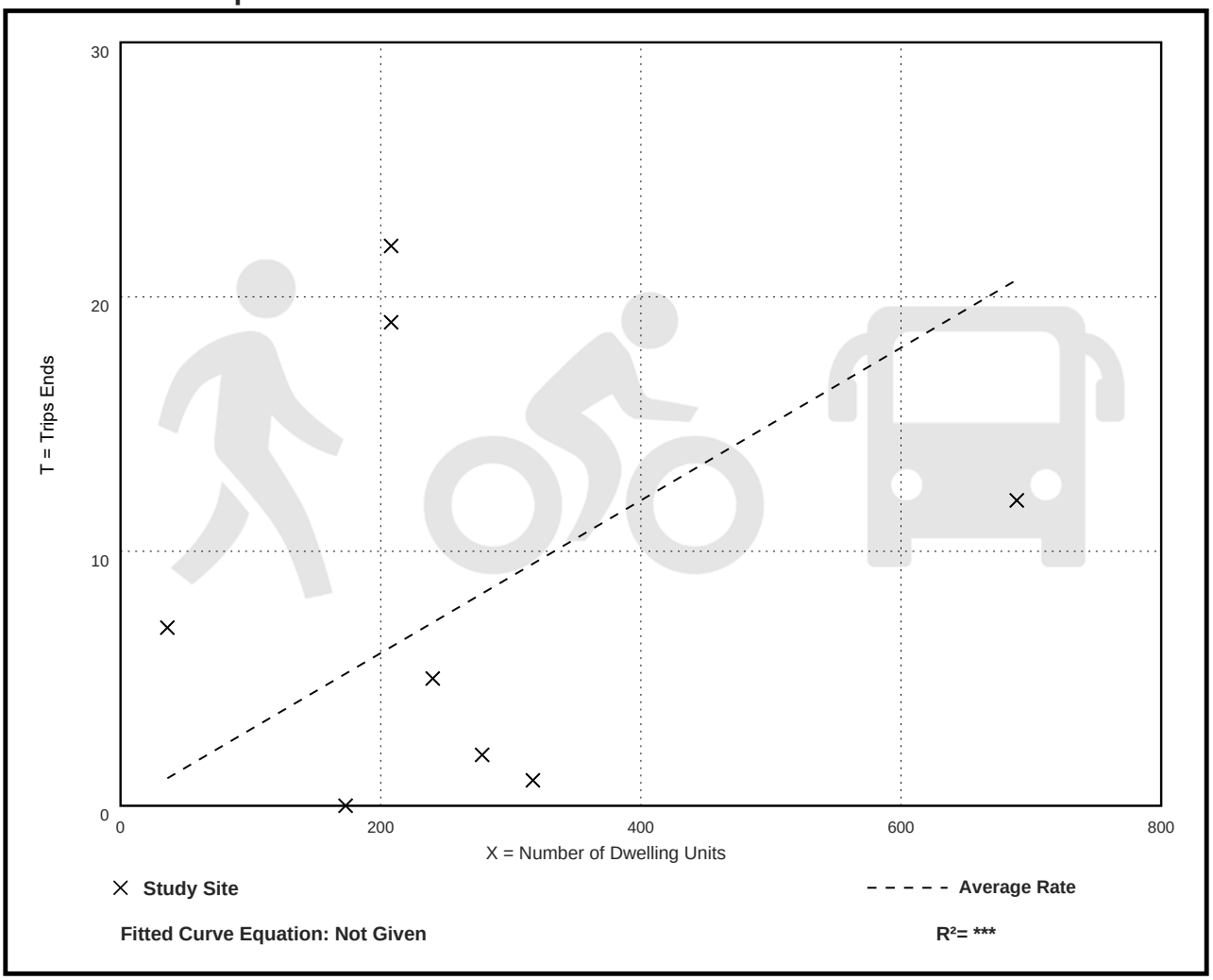
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



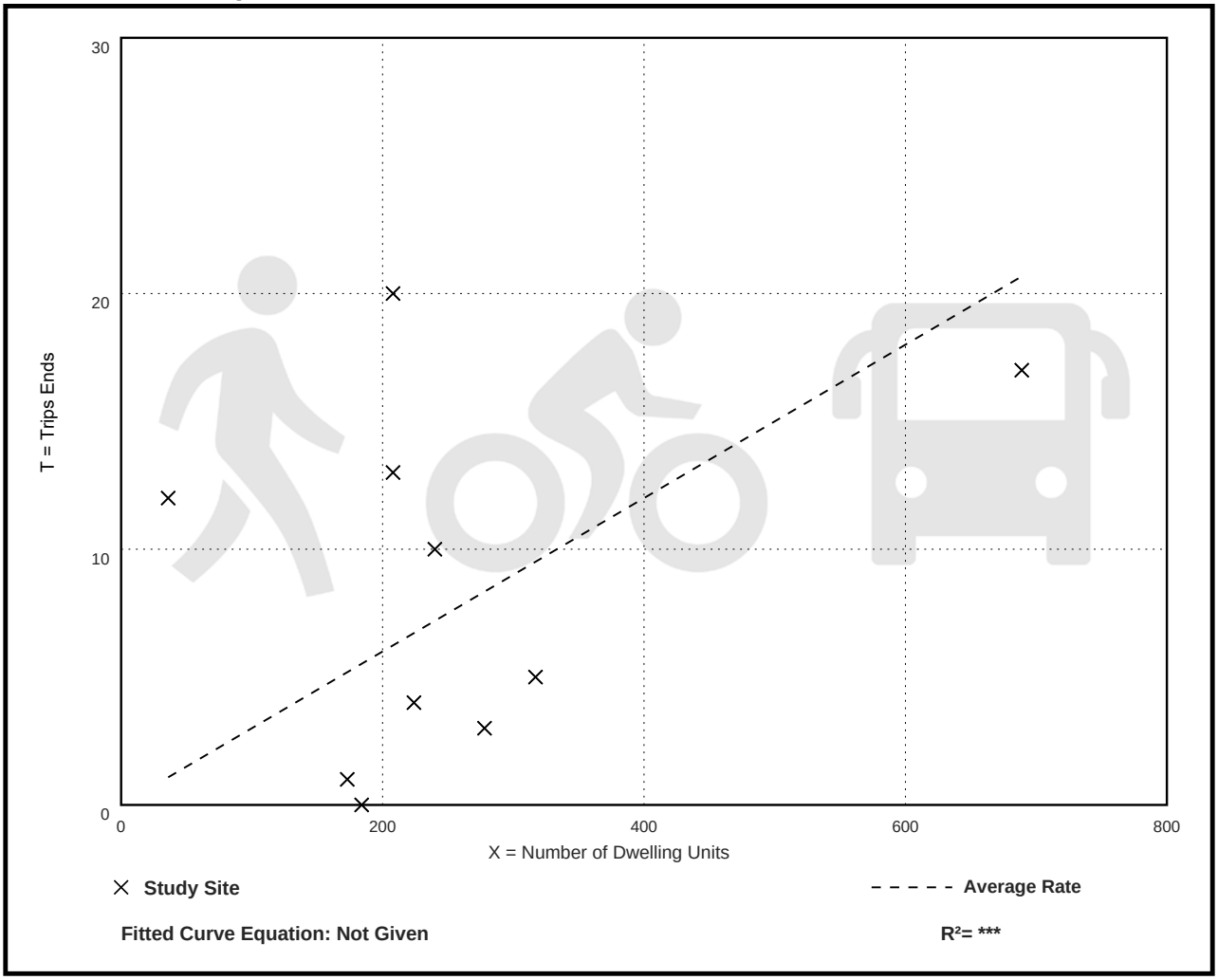
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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)

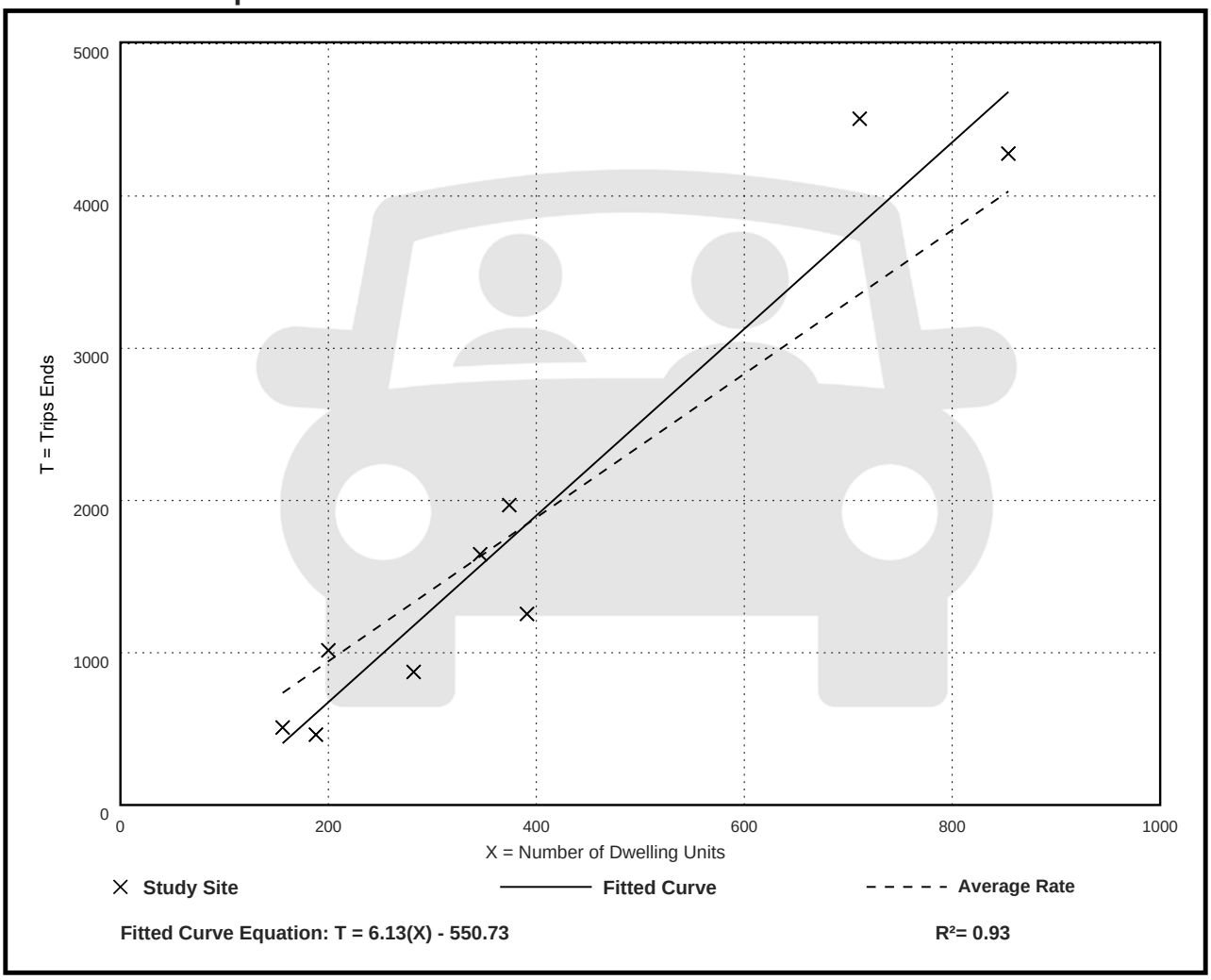
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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



Fitted Curve Equation: T = 6.13(X) - 550.73

R^2= 0.93

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

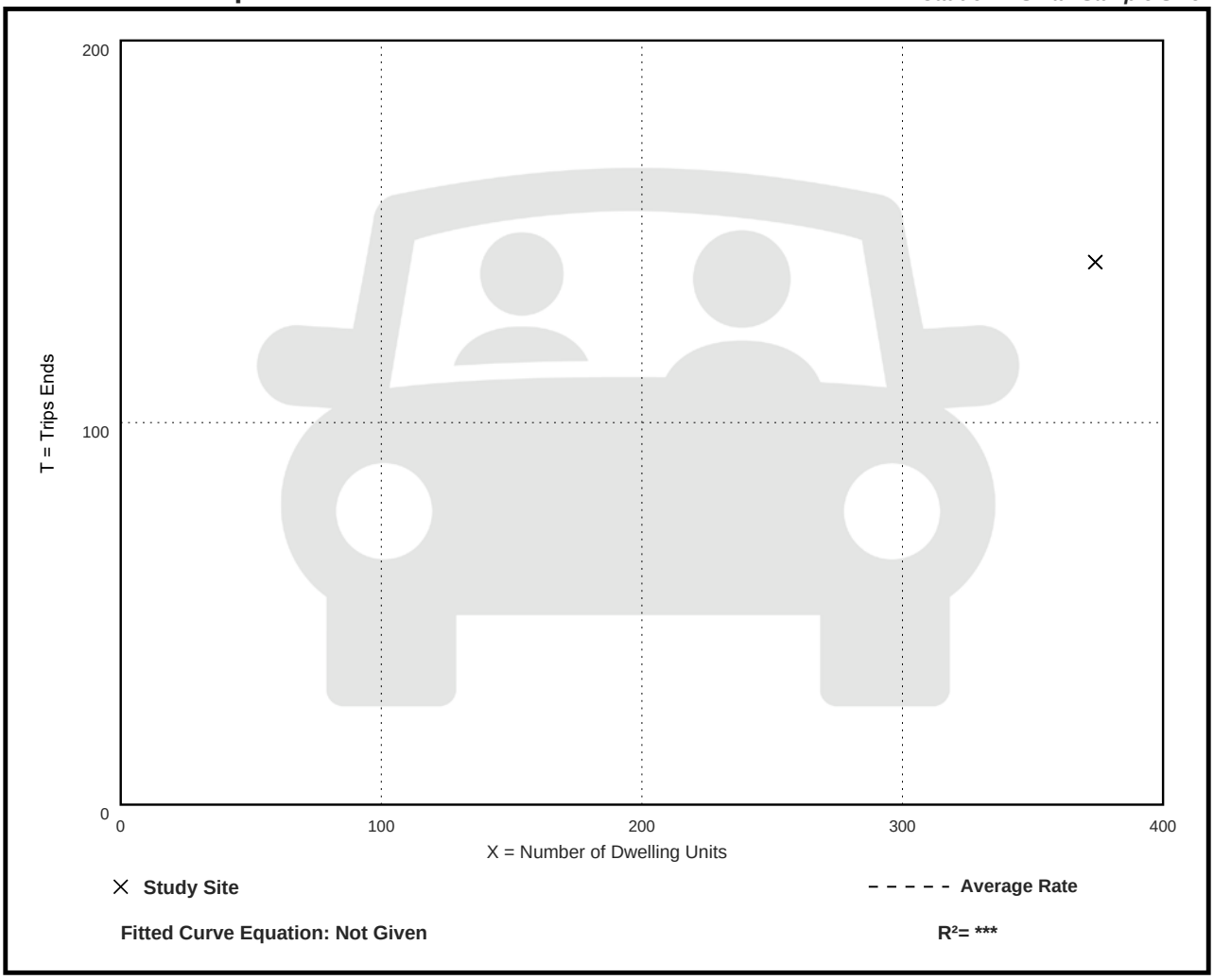
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 29% entering, 71% exiting

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



Fitted Curve Equation: Not Given

R^2= *

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

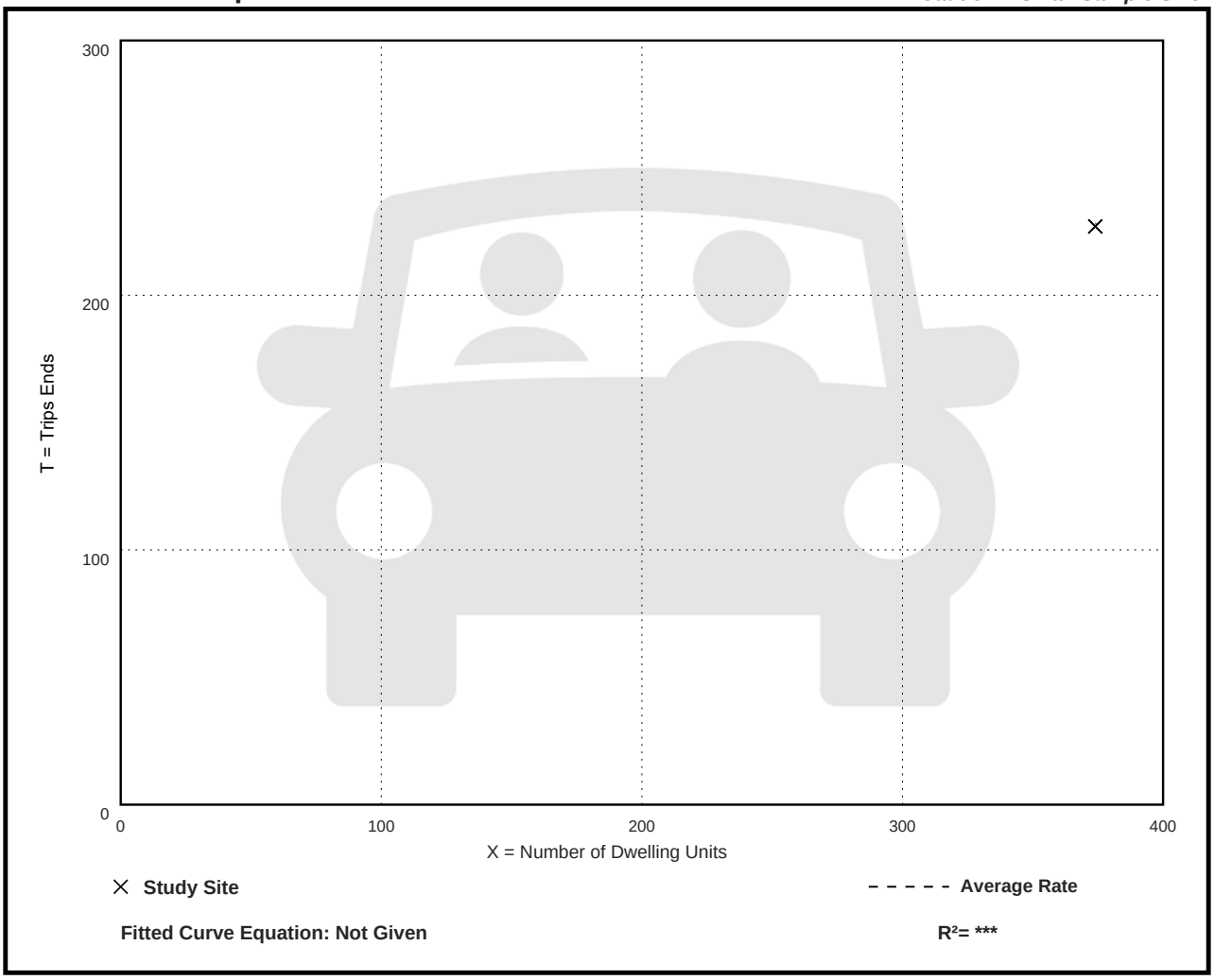
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 60% entering, 40% exiting

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



Fitted Curve Equation: Not Given

R^2= *

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

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

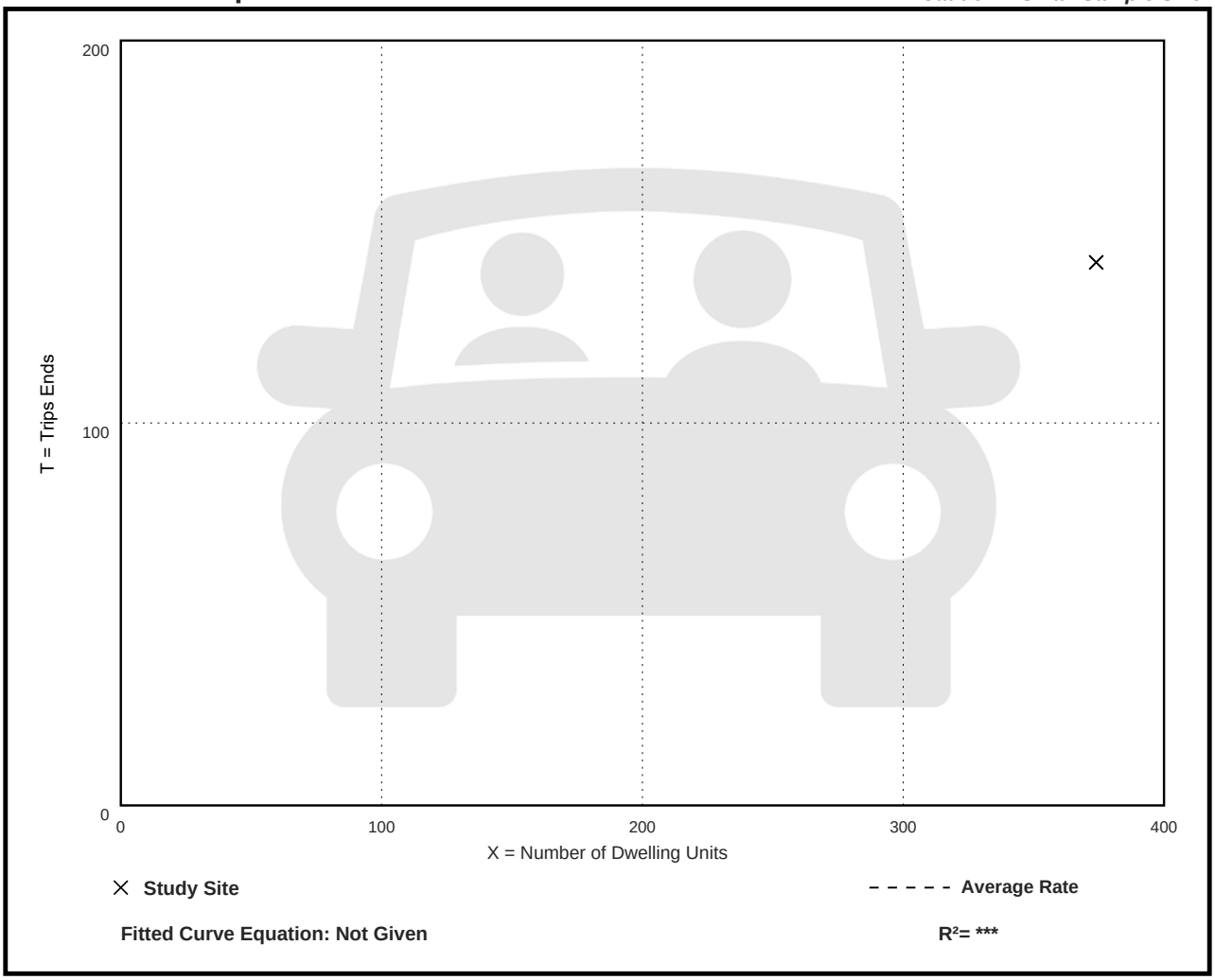
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 29% entering, 71% exiting

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



Fitted Curve Equation: Not Given

R^2= *

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

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

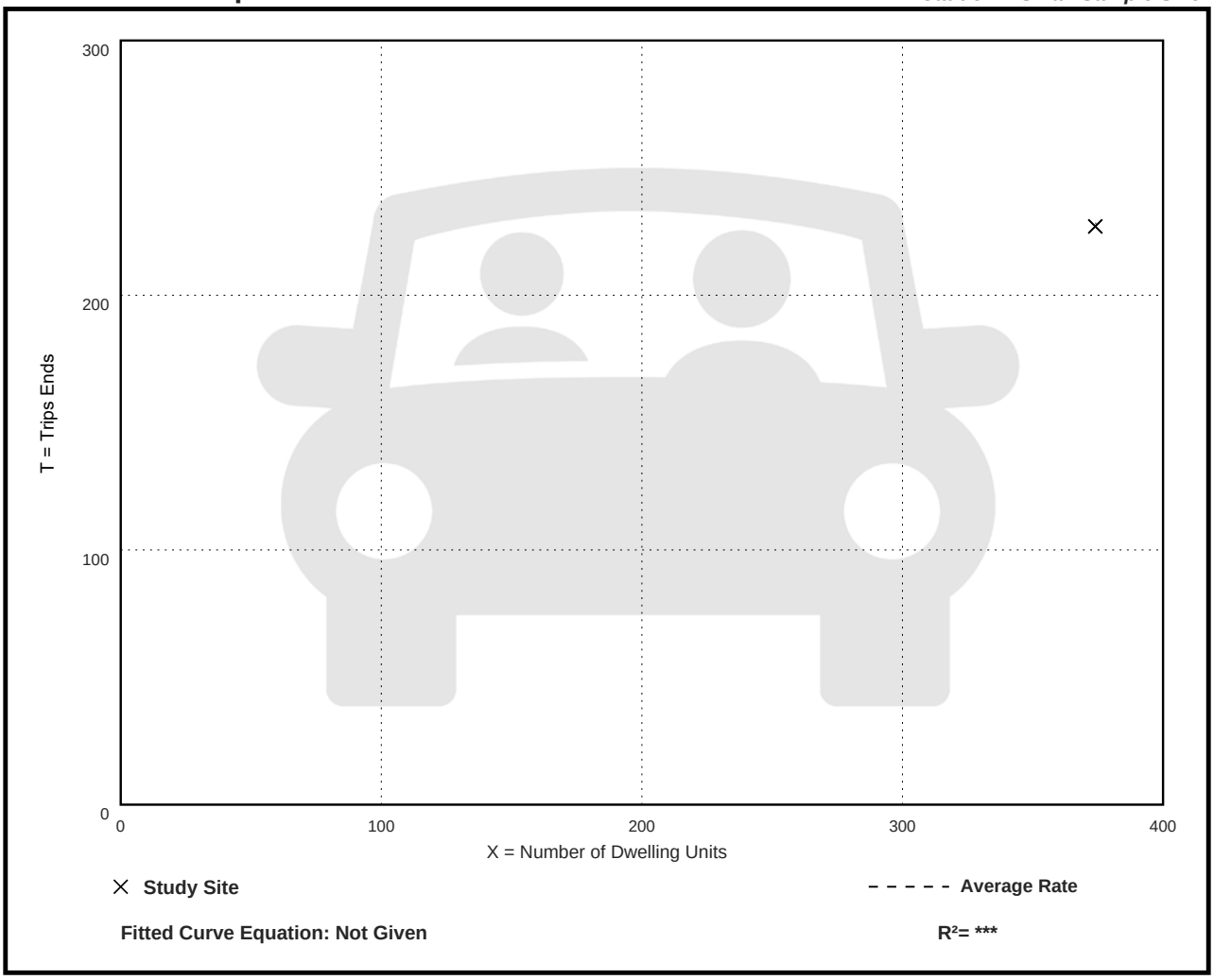
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 60% entering, 40% exiting

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



Fitted Curve Equation: Not Given

R^2= *

Land Use: 221
Multifamily Housing (Mid-Rise)

Description

Mid-rise multifamily housing includes apartments and condominiums located in a building that has between four and 10 floors of living space. Access to individual dwelling units is through an outside building entrance, a lobby, elevator, and a set of hallways.

Multifamily housing (low-rise) (Land Use 220), multifamily housing (high-rise) (Land Use 222), off-campus student apartment (mid-rise) (Land Use 226), and mid-rise residential with ground-floor commercial (Land Use 231) 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 six sites for which both the number of residents and the number of occupied dwelling units were available, there were an average of 2.5 residents per occupied dwelling unit.

For the five sites for which the numbers of both total dwelling units and occupied dwelling units were available, an average of 96 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/).

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 1990s, the 2000s, the 2010s, and the 2020s in Alberta (CAN), California, District of Columbia, Florida, Georgia, Illinois, Maryland, Massachusetts, Minnesota, Montana, New Jersey, New York, Ontario (CAN), Oregon, Utah, and Virginia.

Source Numbers

168, 188, 204, 305, 306, 321, 818, 857, 862, 866, 901, 904, 910, 949, 951, 959, 963, 964, 966, 967, 969, 970, 1004, 1014, 1022, 1023, 1025, 1031, 1032, 1035, 1047, 1056, 1057, 1058, 1071, 1076

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

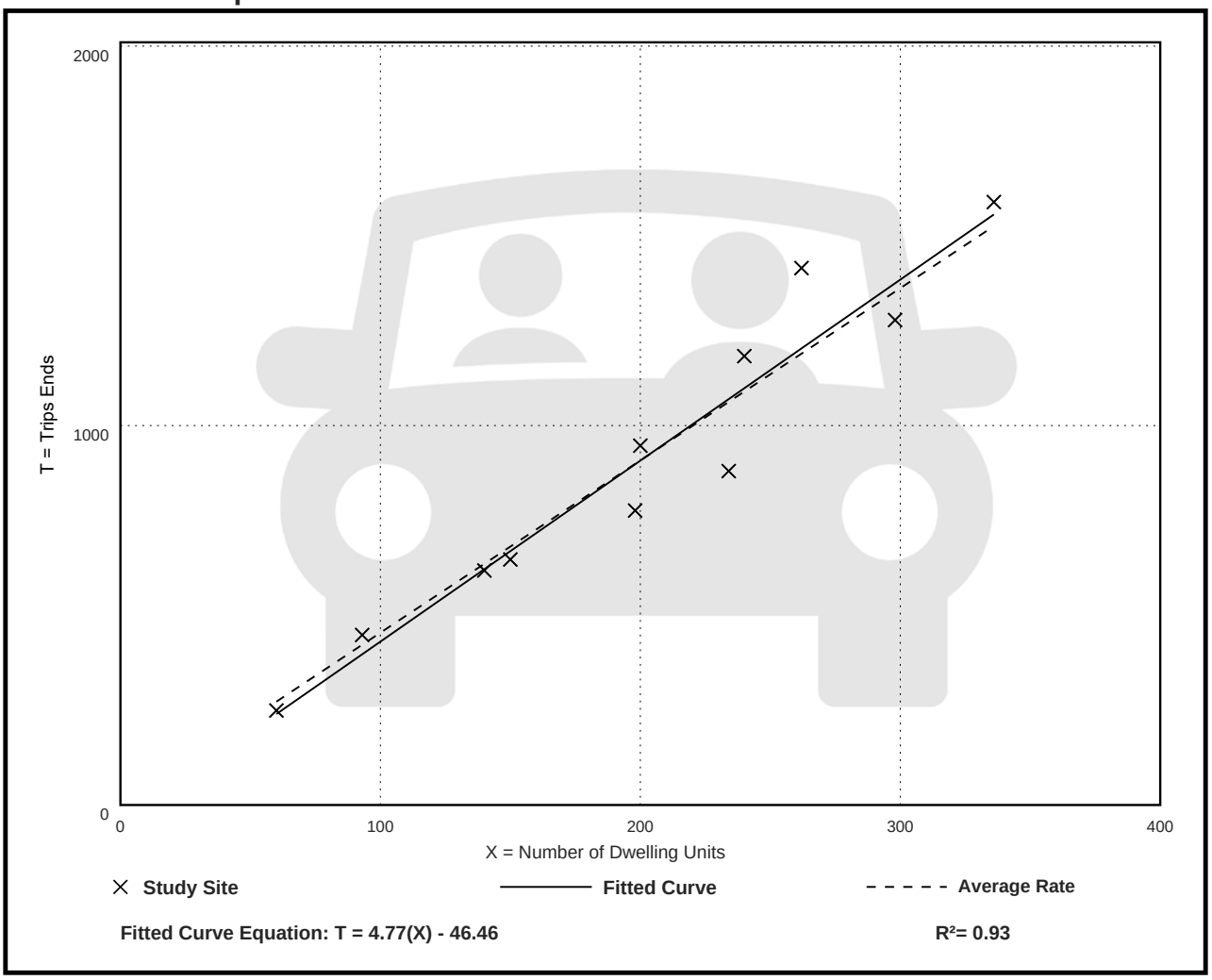
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 11
Avg. Num. of Dwelling Units: 201
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.54	3.76 - 5.40	0.51

Data Plot and Equation



Fitted Curve Equation: T = 4.77(X) - 46.46

R^2= 0.93

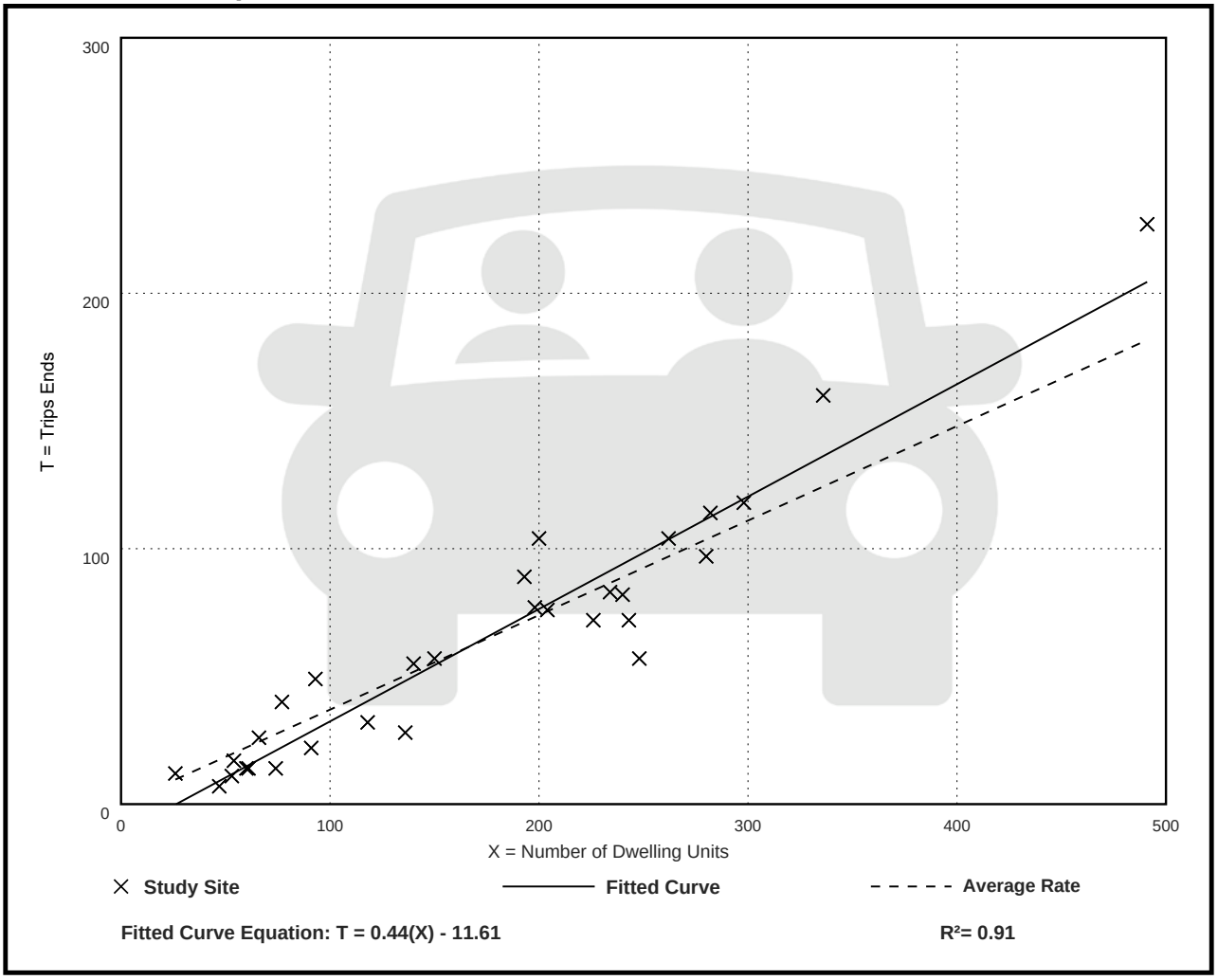
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.37	0.15 - 0.53	0.09

Data Plot and Equation



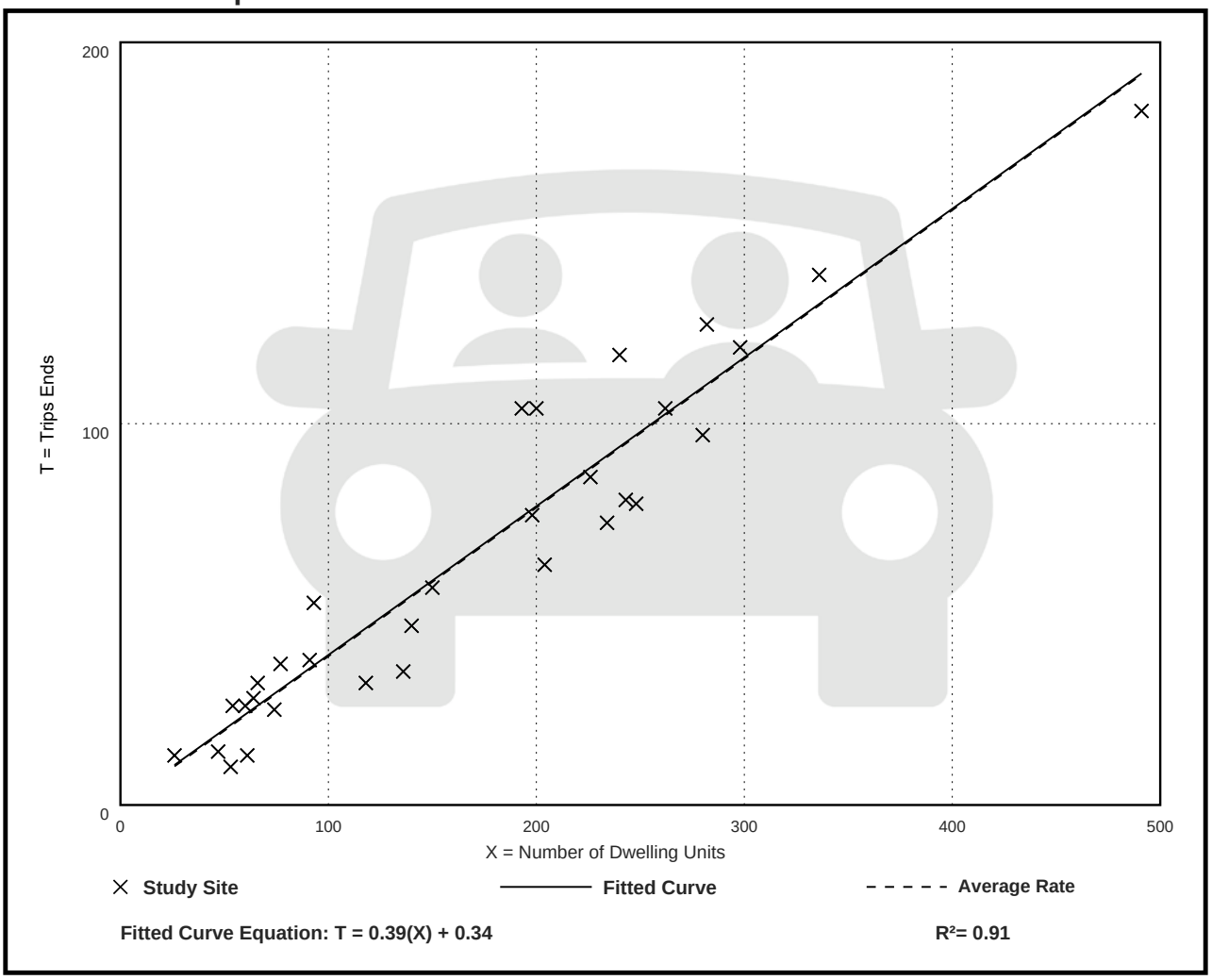
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.57	0.08

Data Plot and Equation



Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

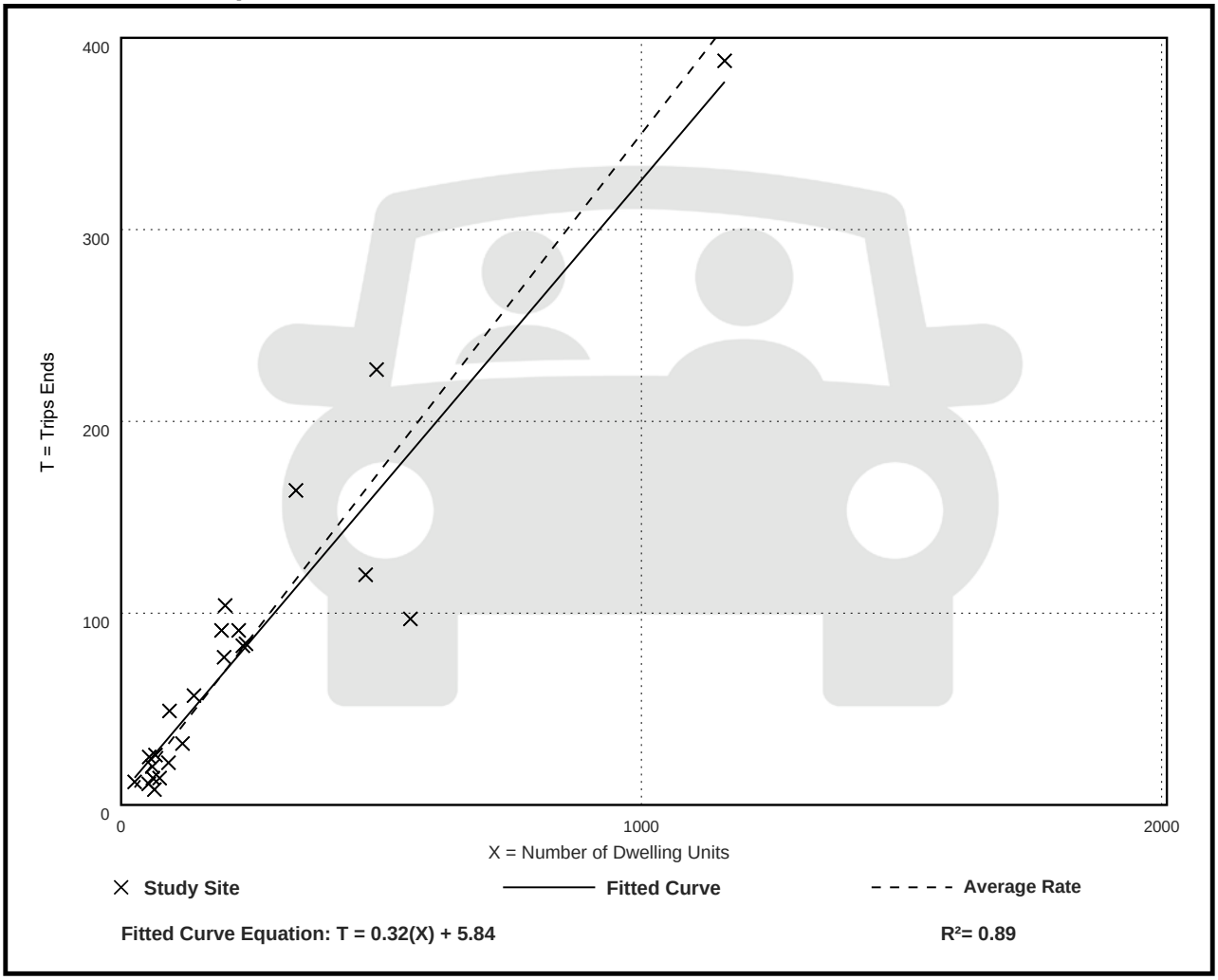
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 23
Avg. Num. of Dwelling Units: 226
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.35	0.13 - 0.53	0.11

Data Plot and Equation



Fitted Curve Equation: T = 0.32(X) + 5.84

R^2= 0.89

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

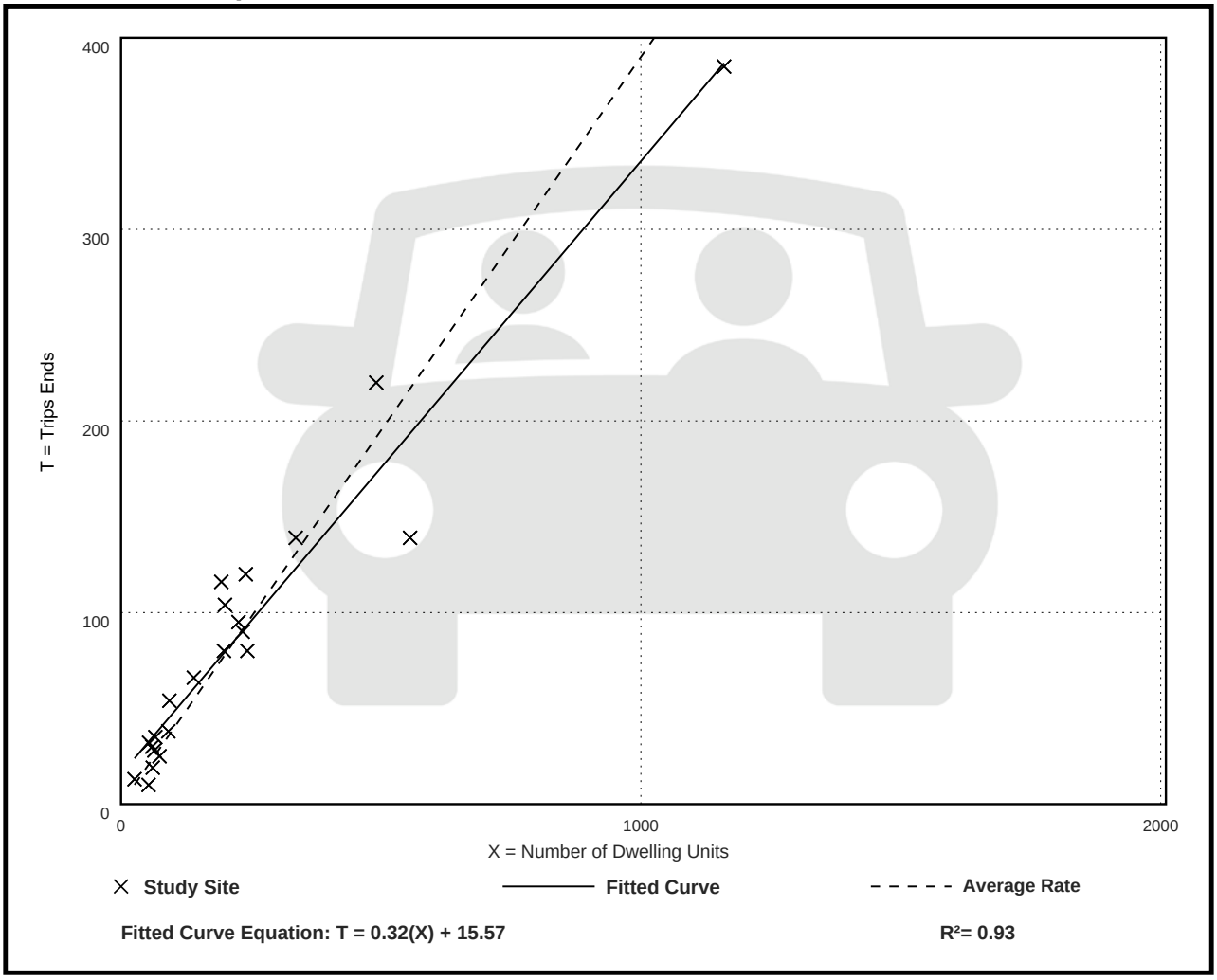
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 22
Avg. Num. of Dwelling Units: 221
Directional Distribution: 60% entering, 40% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.19 - 0.60	0.10

Data Plot and Equation



Fitted Curve Equation: T = 0.32(X) + 15.57

R^2= 0.93

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

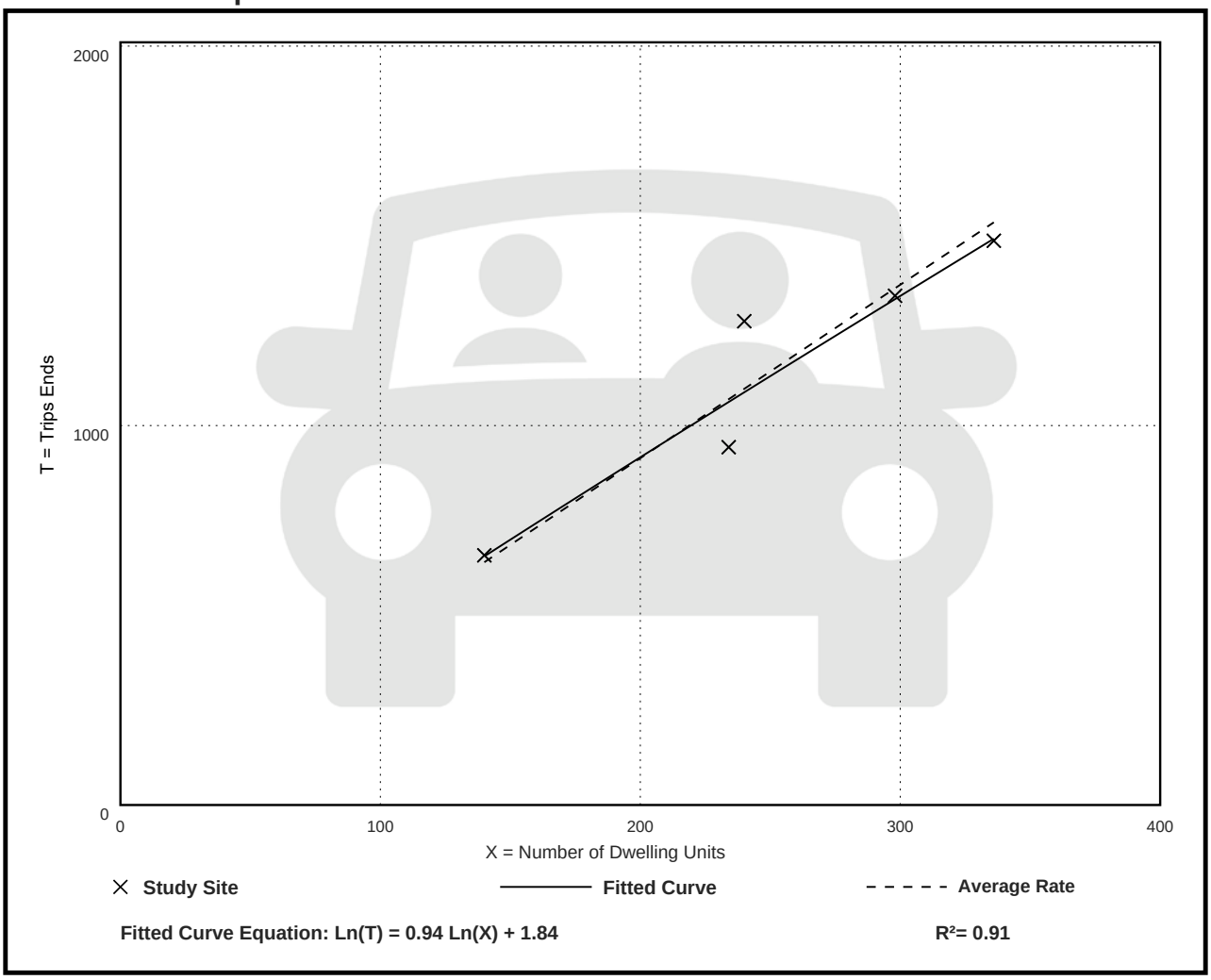
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.57	4.03 - 5.31	0.46

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.94 Ln(X) + 1.84

R^2= 0.91

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

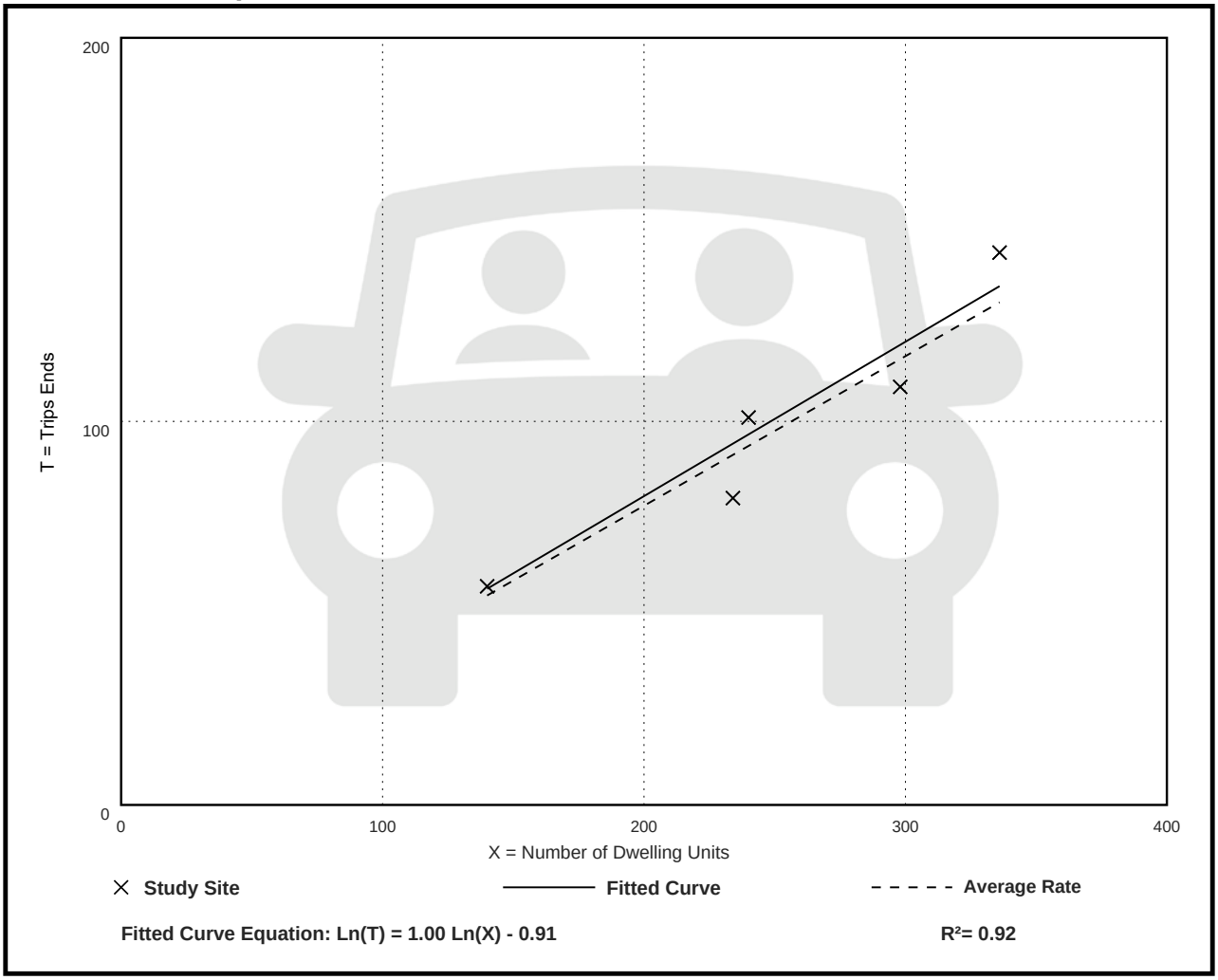
Vehicle Trip Ends vs: Dwelling Units
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.39	0.34 - 0.43	0.04

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 1.00 Ln(X) - 0.91

R^2= 0.92

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

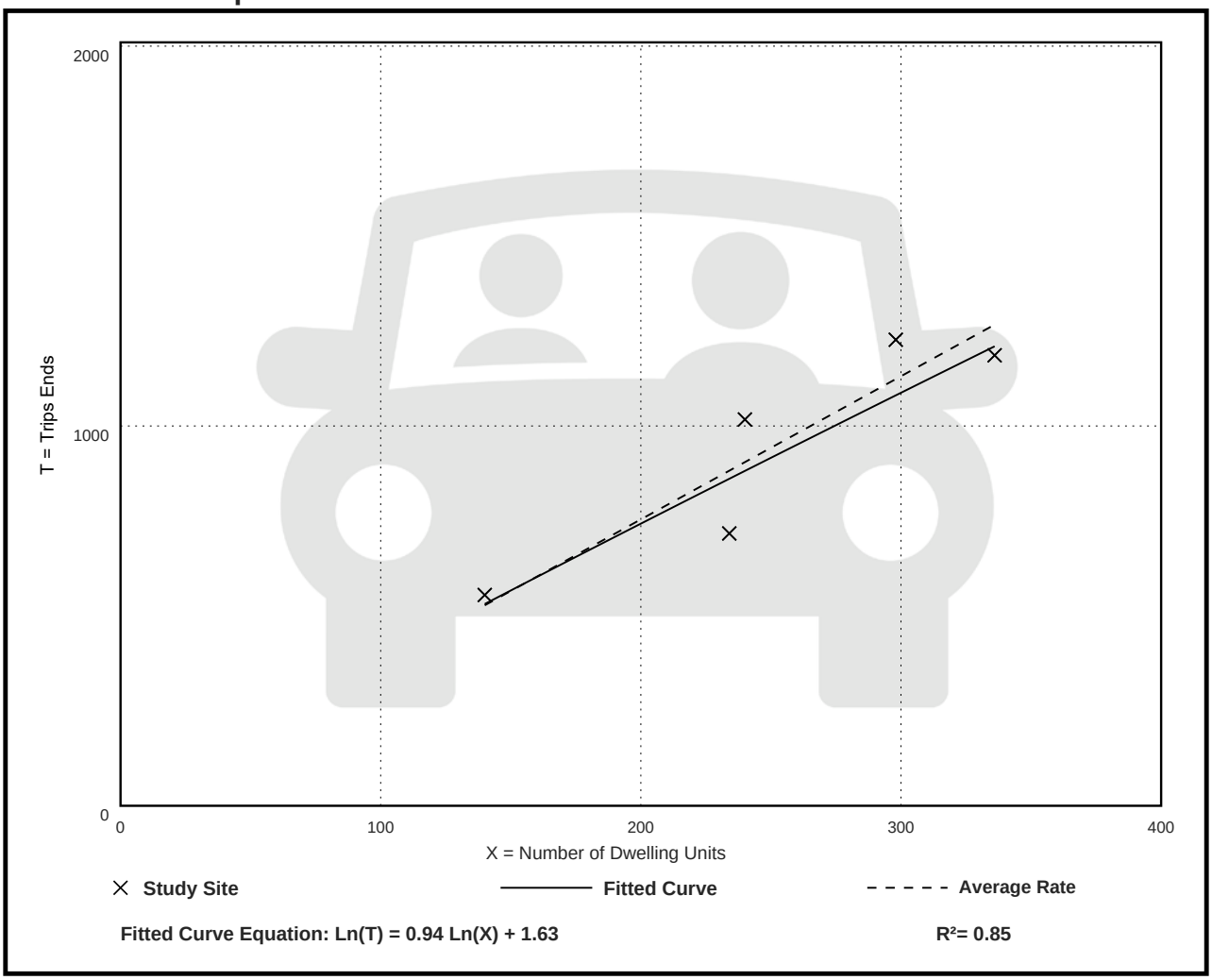
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
3.77	3.06 - 4.24	0.48

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.94 Ln(X) + 1.63

R^2= 0.85

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

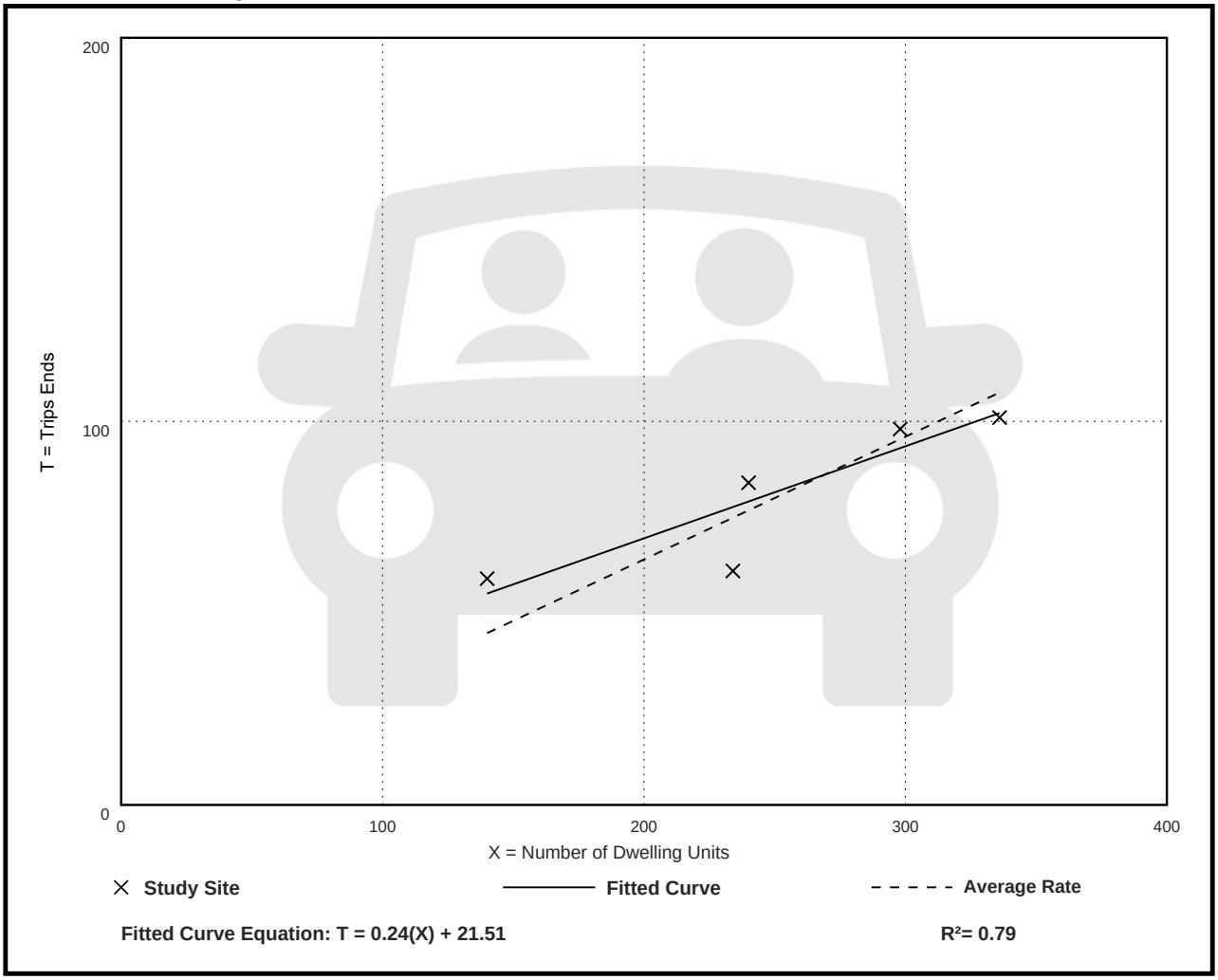
Vehicle Trip Ends vs: Dwelling Units
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 250
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.26 - 0.42	0.05

Data Plot and Equation



Fitted Curve Equation: T = 0.24(X) + 21.51

R^2= 0.79

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Residents
On a: Weekday

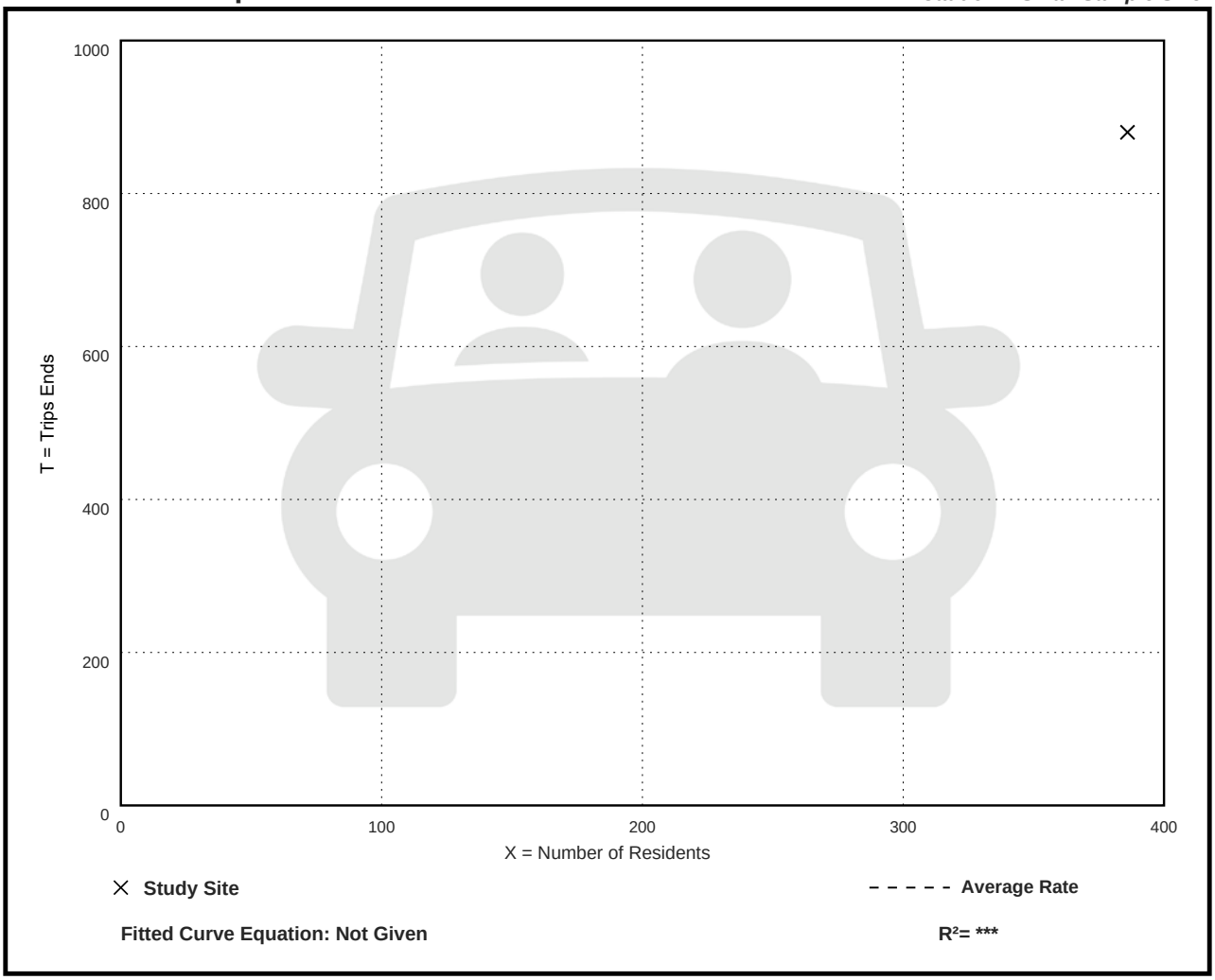
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
2.28	2.28 - 2.28	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

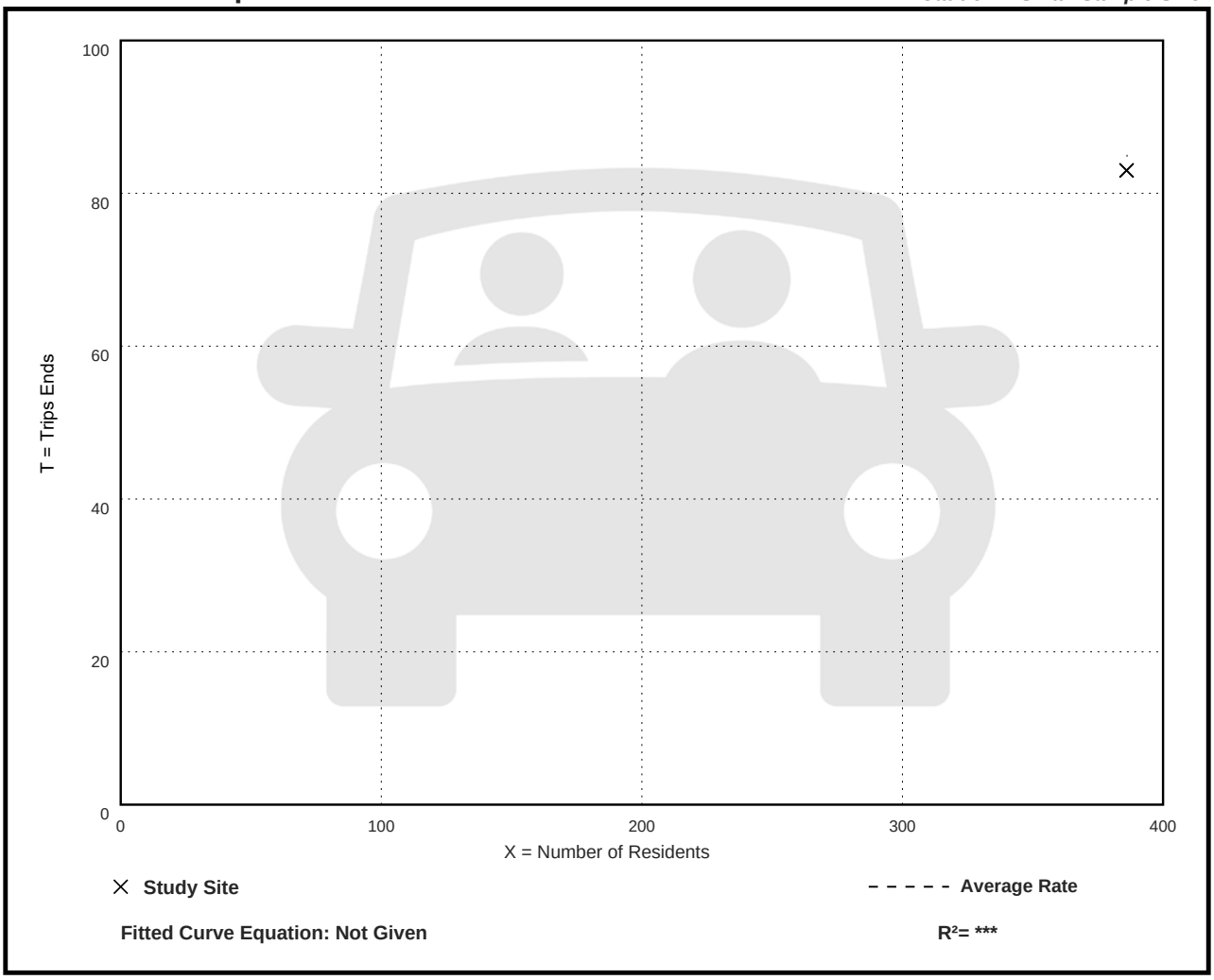
Vehicle Trip Ends vs: Residents
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 20% entering, 80% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.22	0.22 - 0.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

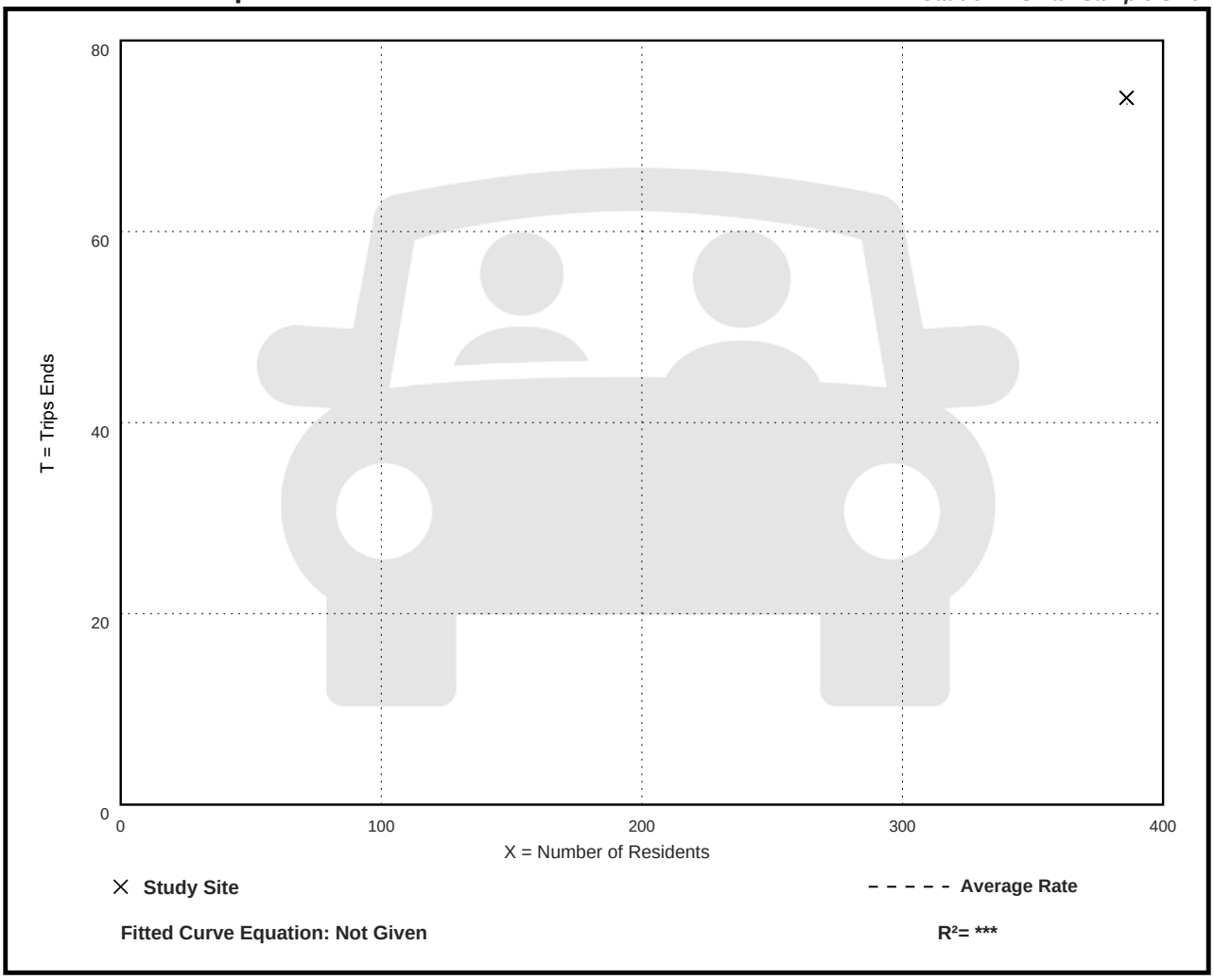
Vehicle Trip Ends vs: Residents
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.19	0.19 - 0.19	***

Data Plot and Equation

Caution – Small Sample Size



Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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

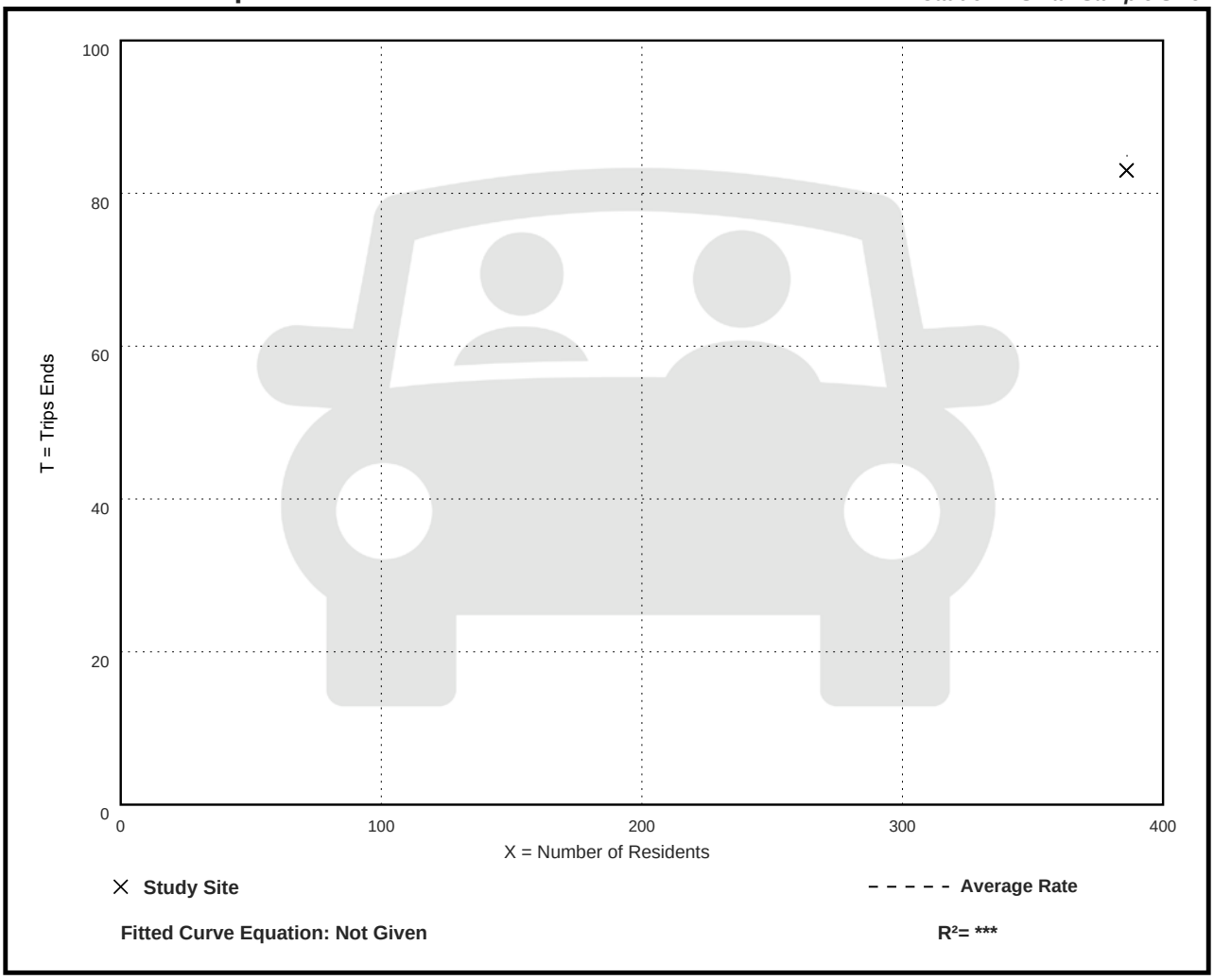
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 20% entering, 80% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.22	0.22 - 0.22	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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

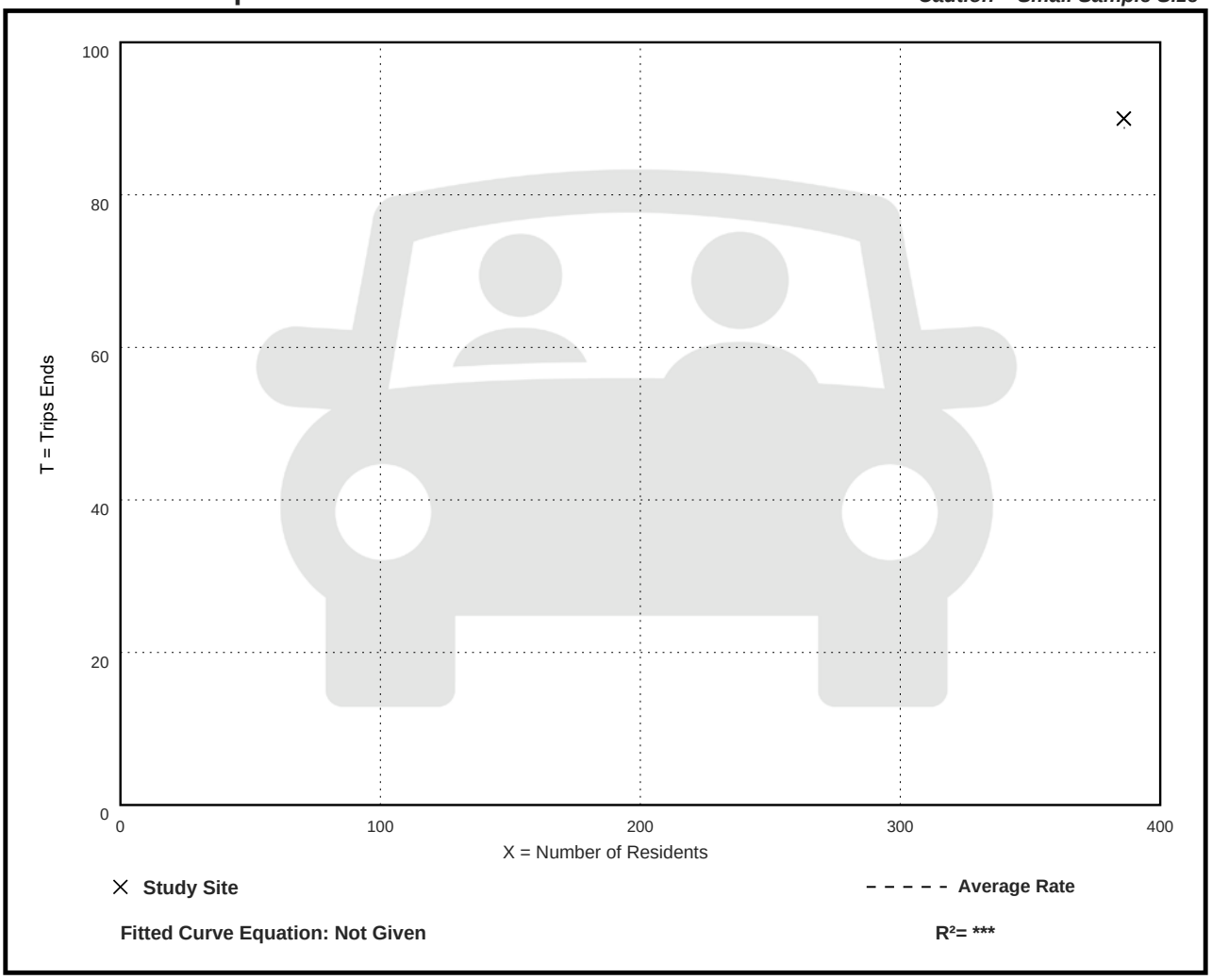
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.23	0.23 - 0.23	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Residents
On a: Saturday

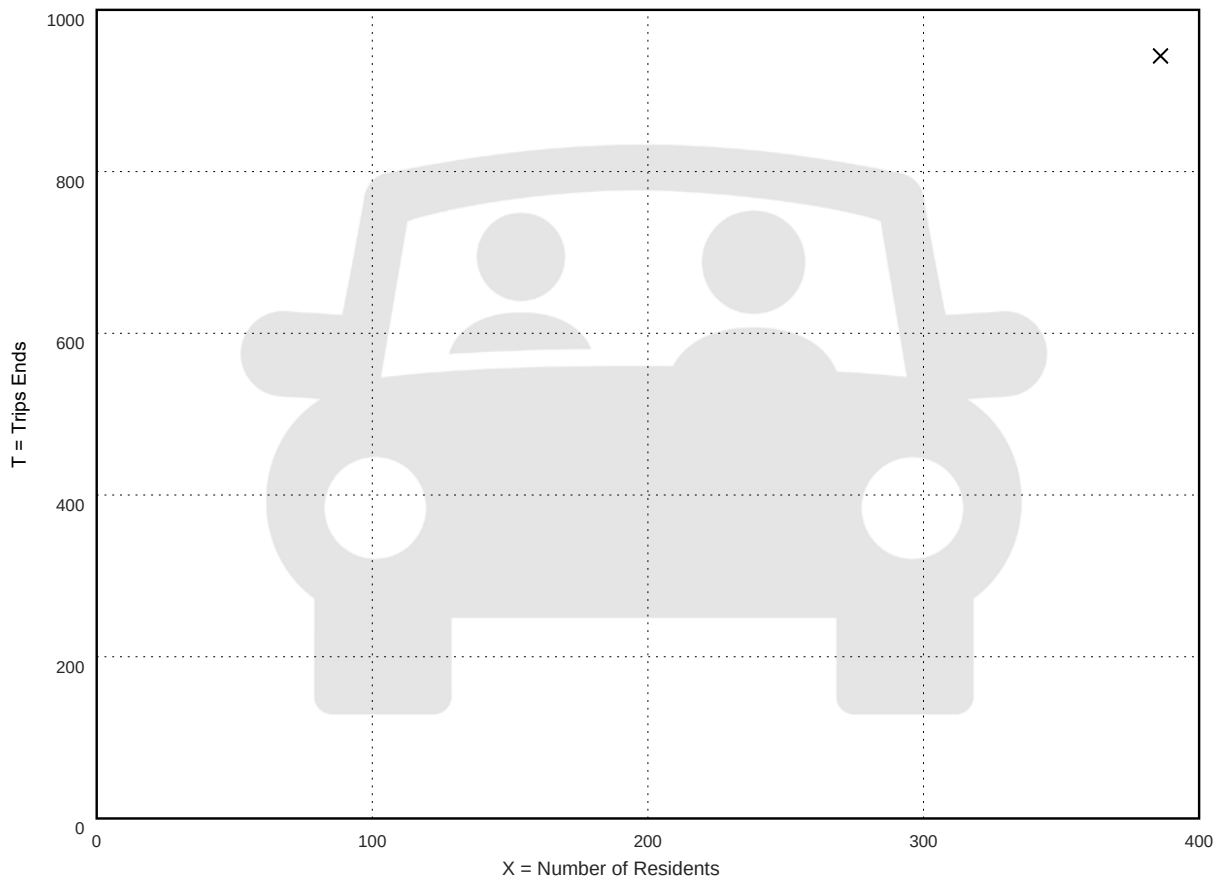
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
2.44	2.44 - 2.44	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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

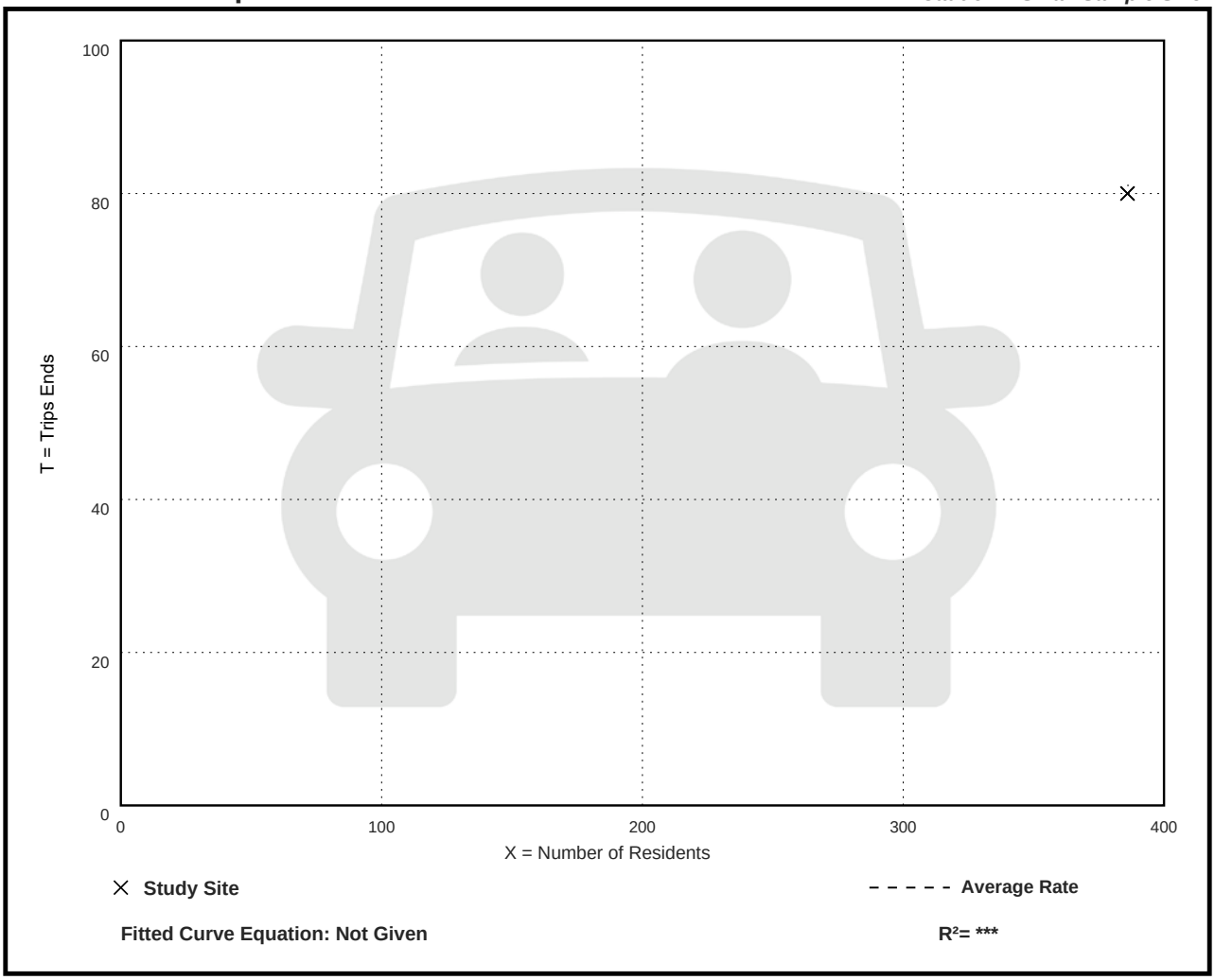
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.21	0.21 - 0.21	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Residents
On a: Sunday

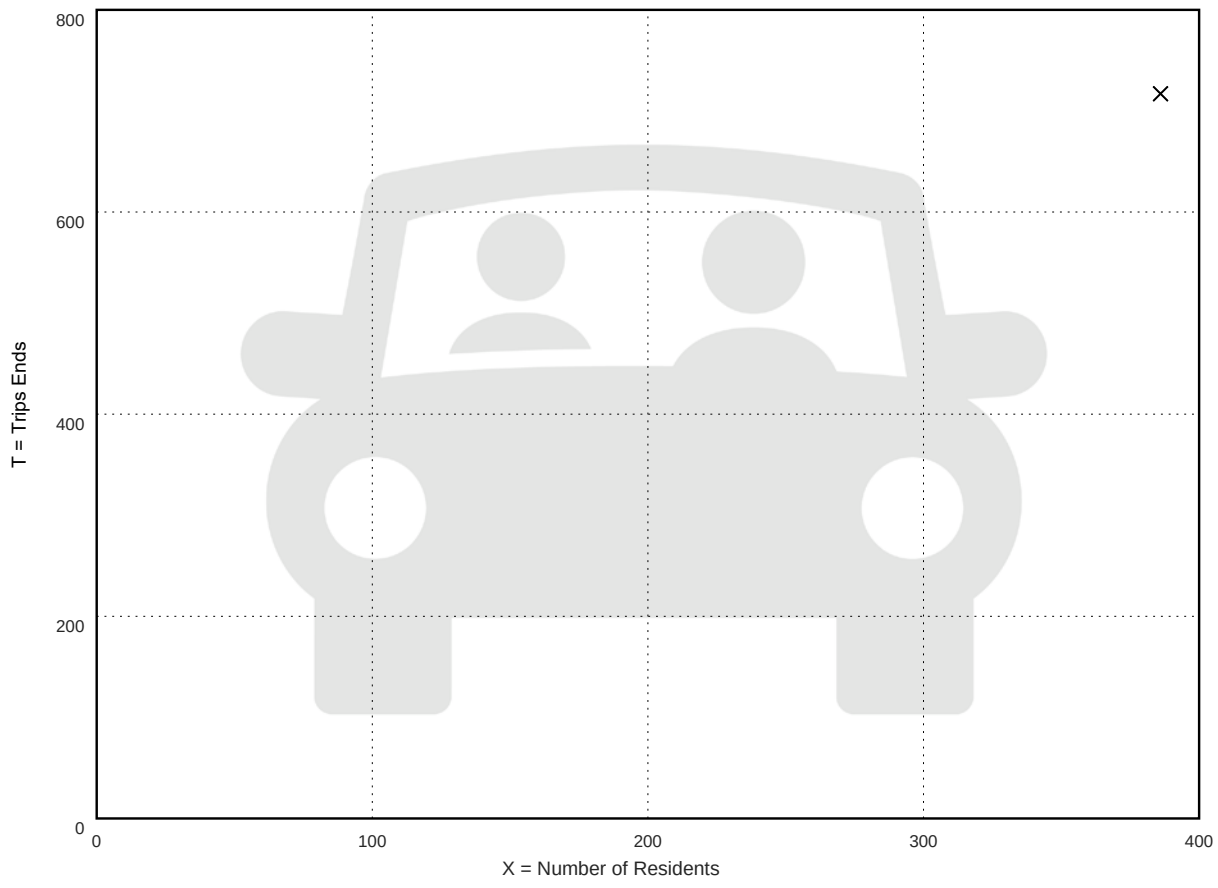
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 50% entering, 50% exiting

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



Fitted Curve Equation: Not Given

R^2= *

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: Residents
On a: Sunday, Peak Hour of Generator

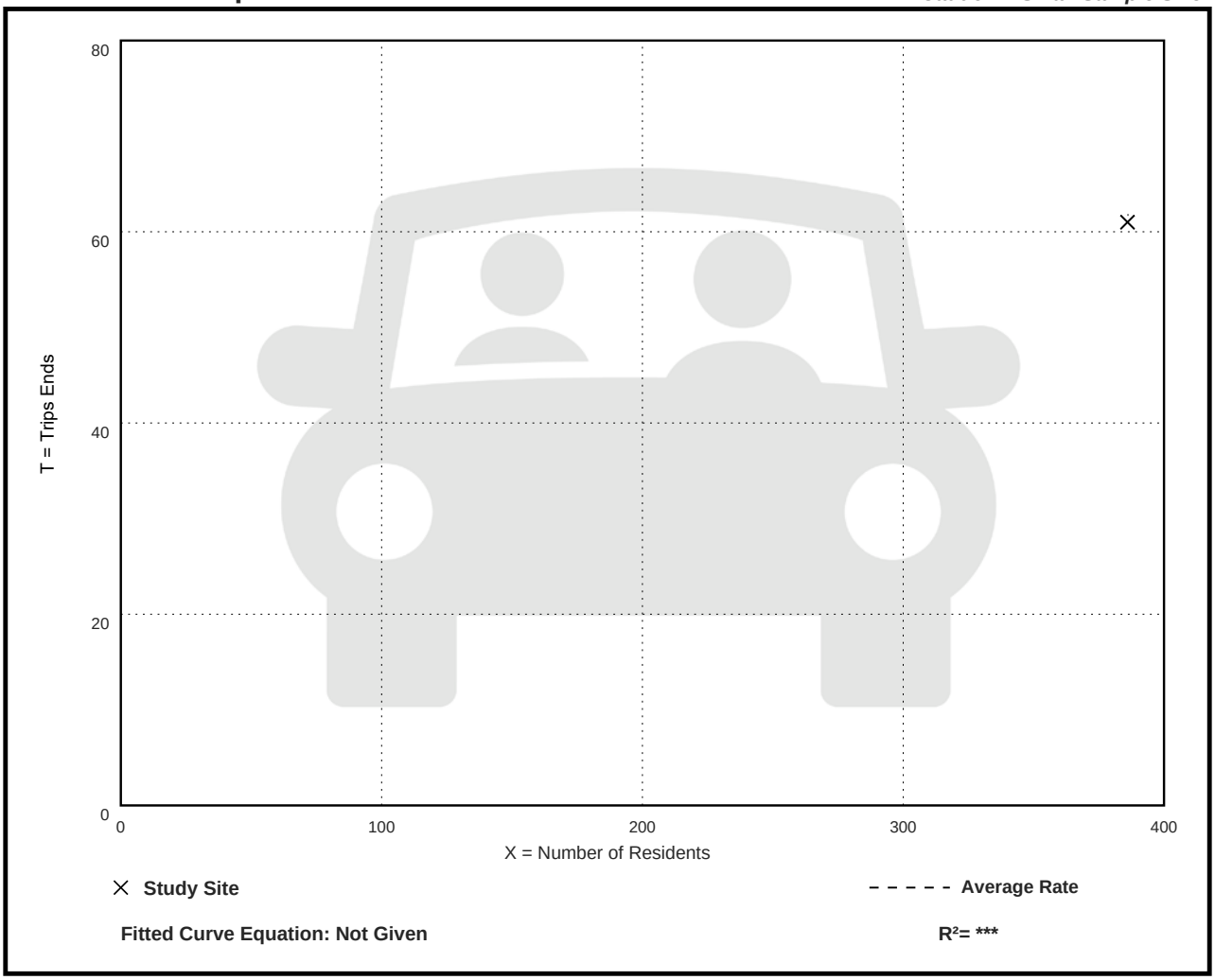
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 386
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Resident

Average Rate	Range of Rates	Standard Deviation
0.16	0.16 - 0.16	***

Data Plot and Equation

Caution – Small Sample Size



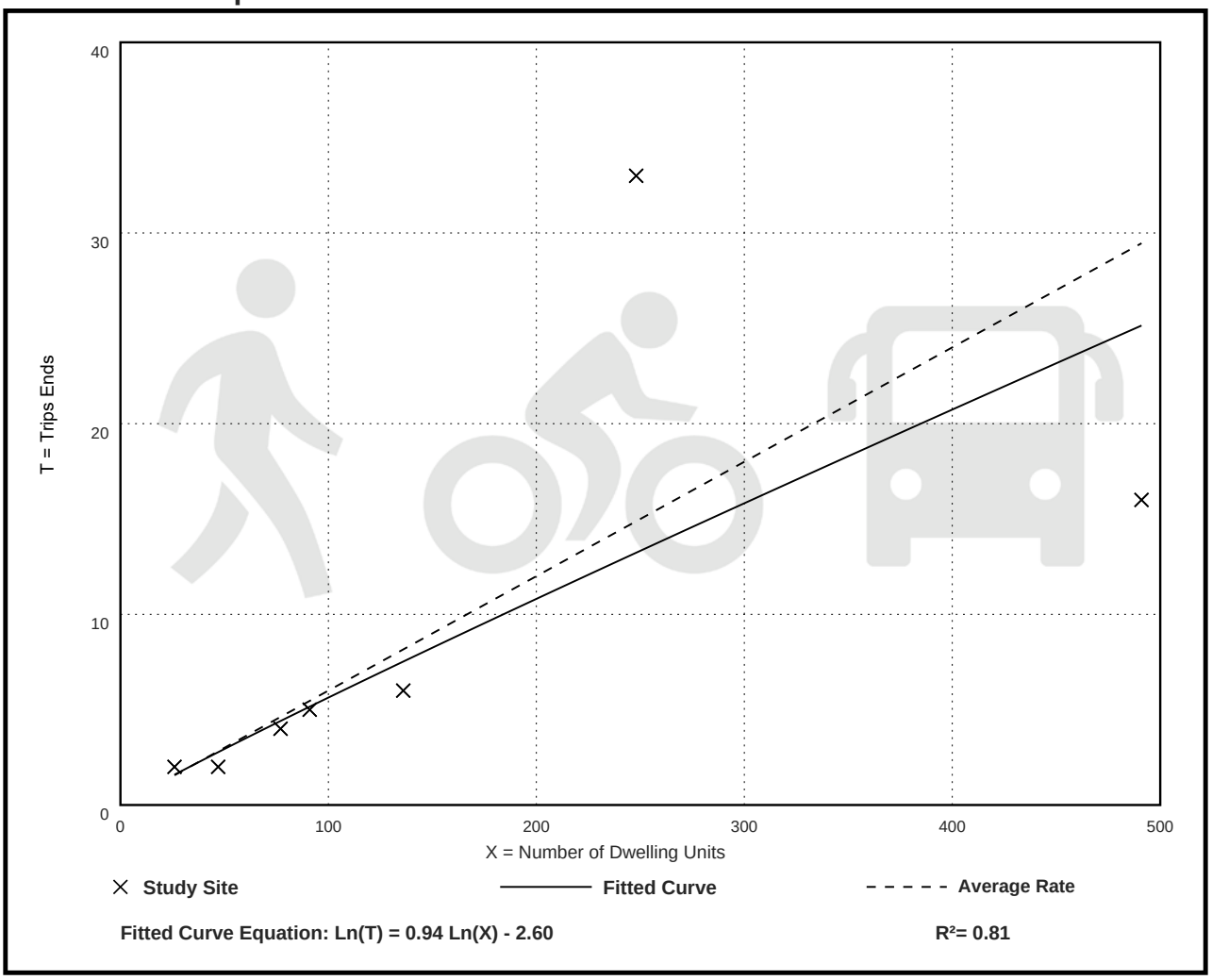
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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: 7
Avg. Num. of Dwelling Units: 159
Directional Distribution: 27% entering, 73% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.06	0.03 - 0.13	0.04

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.94 Ln(X) - 2.60

R^2= 0.81

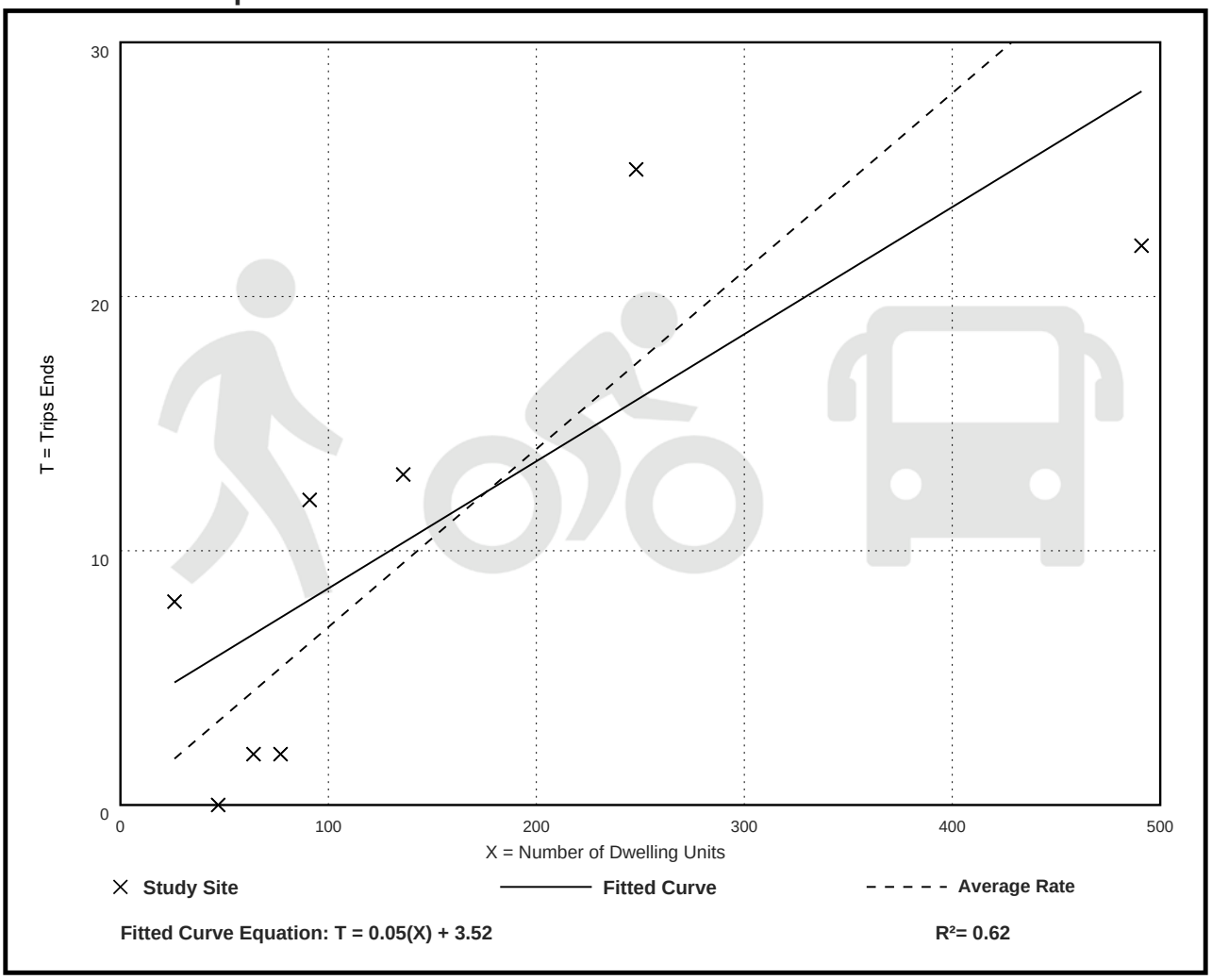
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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: 8
Avg. Num. of Dwelling Units: 148
Directional Distribution: 55% entering, 45% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.07	0.00 - 0.31	0.05

Data Plot and Equation



Fitted Curve Equation: T = 0.05(X) + 3.52

R^2= 0.62

Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

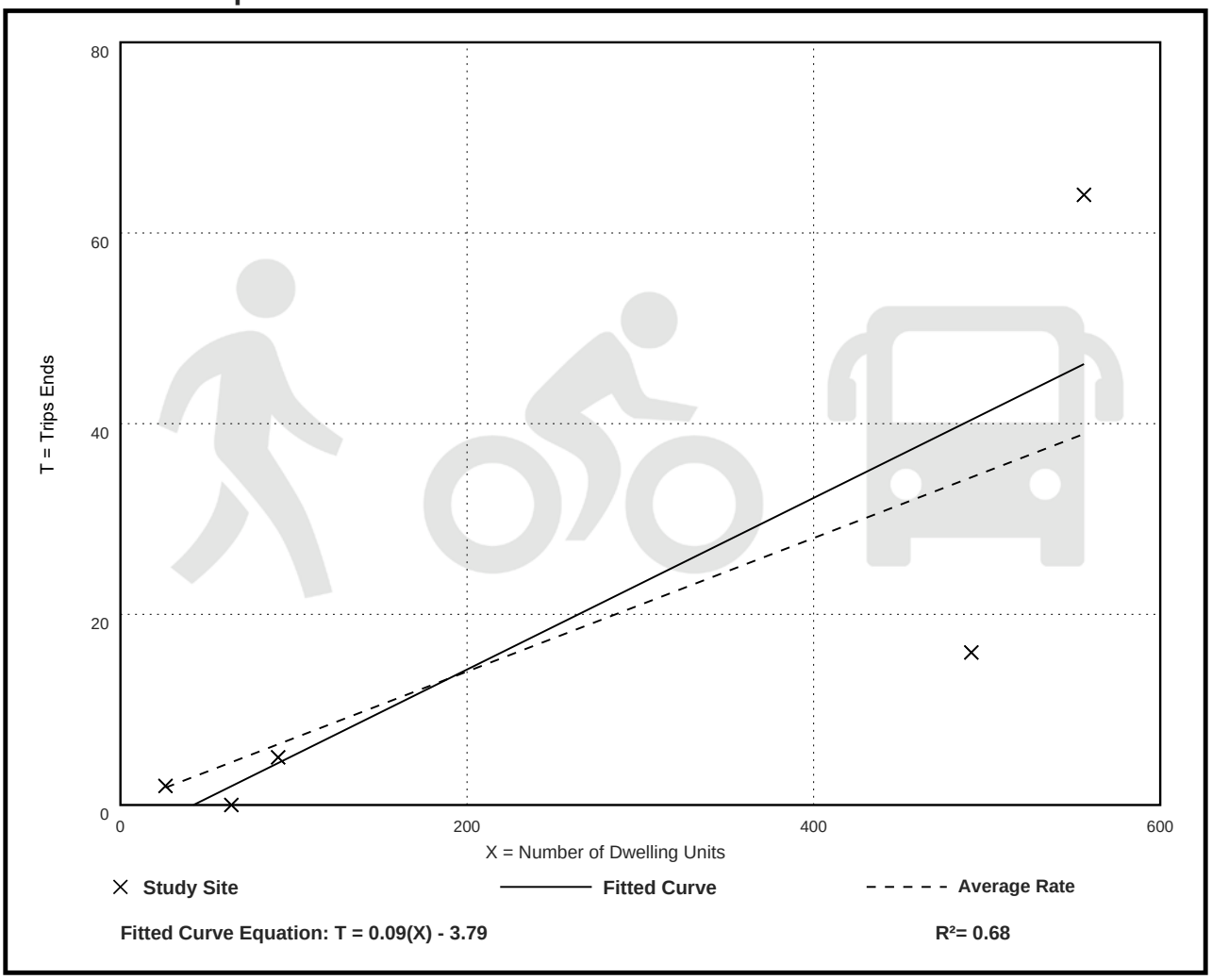
Walk+Bike+Transit Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 246
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.07	0.00 - 0.12	0.05

Data Plot and Equation



Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

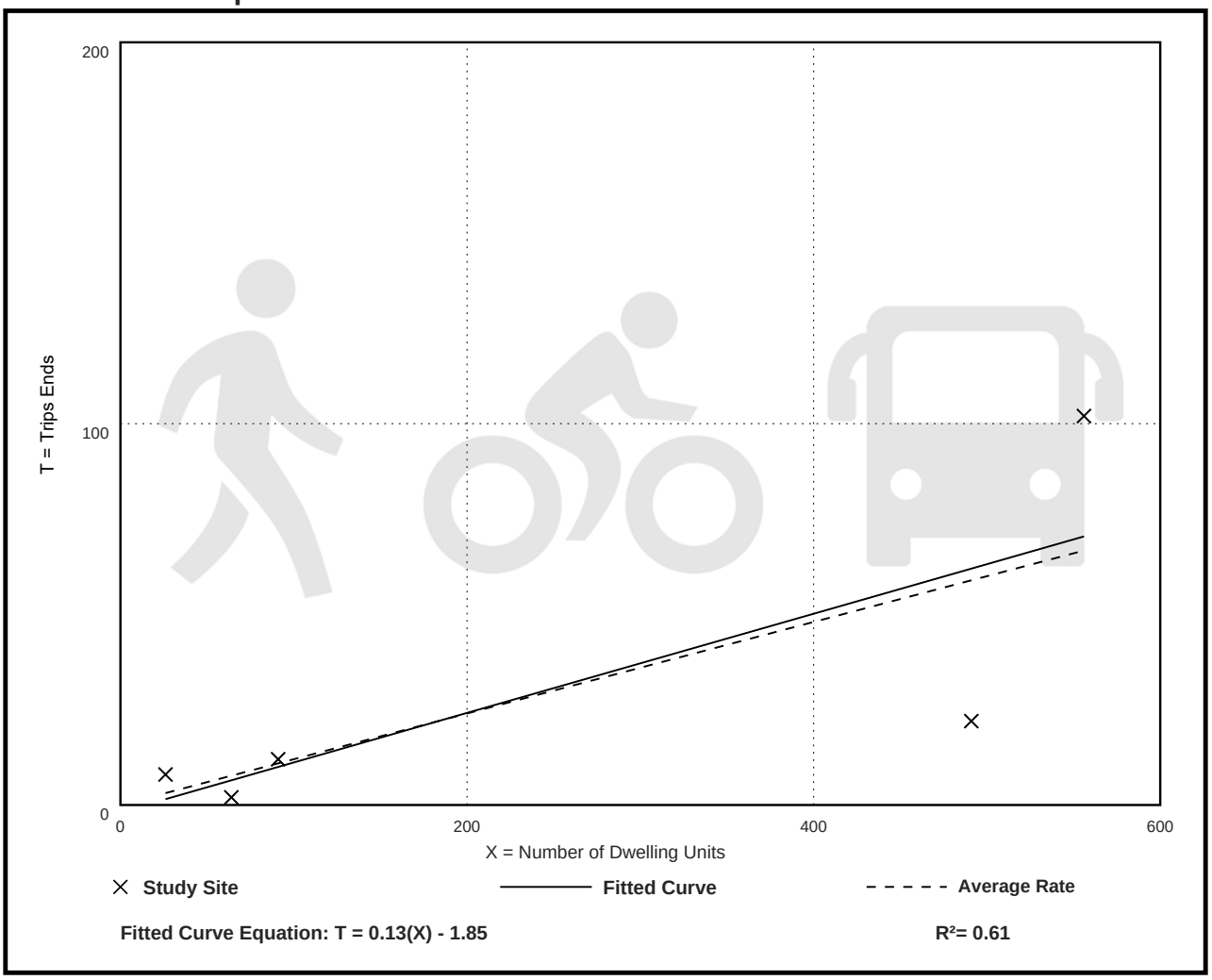
Walk+Bike+Transit Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 5
Avg. Num. of Dwelling Units: 246
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.12	0.03 - 0.31	0.08

Data Plot and Equation



Fitted Curve Equation: T = 0.13(X) - 1.85

R^2= 0.61

Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

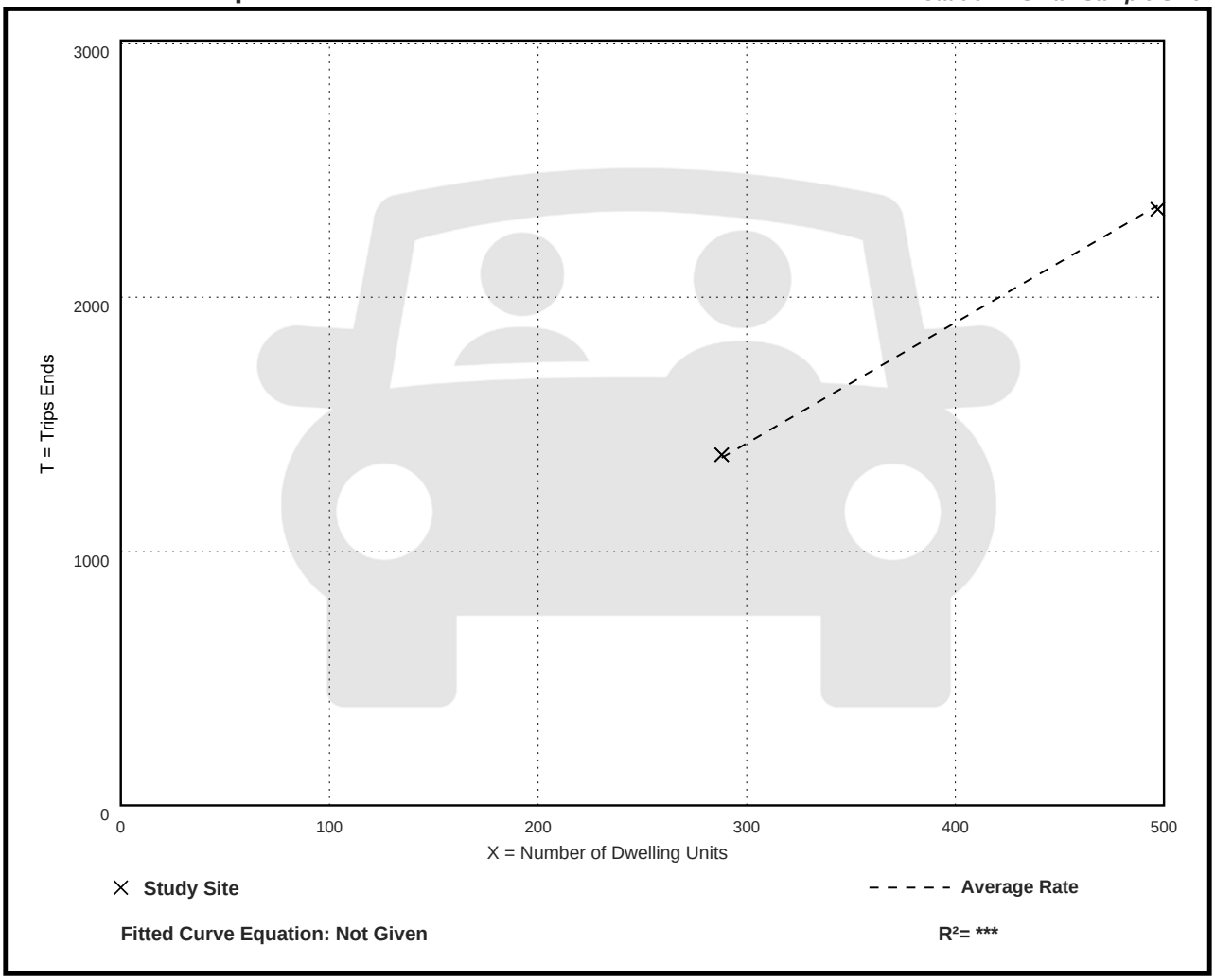
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Dwelling Units: 393
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
4.75	4.72 - 4.79	***

Data Plot and Equation

Caution – Small Sample Size



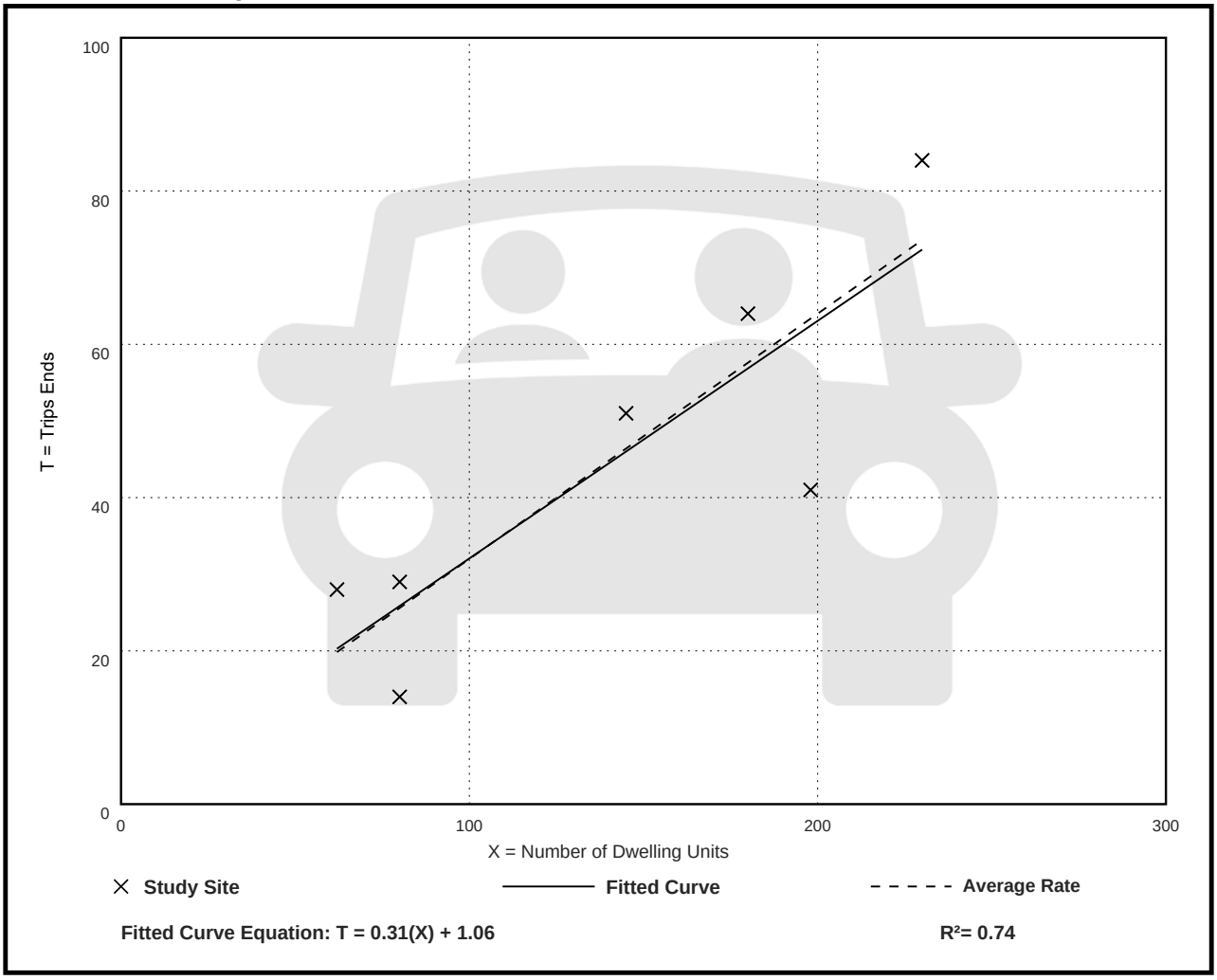
Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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: 7
Avg. Num. of Dwelling Units: 139
Directional Distribution: 56% entering, 44% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.18 - 0.45	0.09

Data Plot and Equation



Fitted Curve Equation: T = 0.31(X) + 1.06

R^2= 0.74

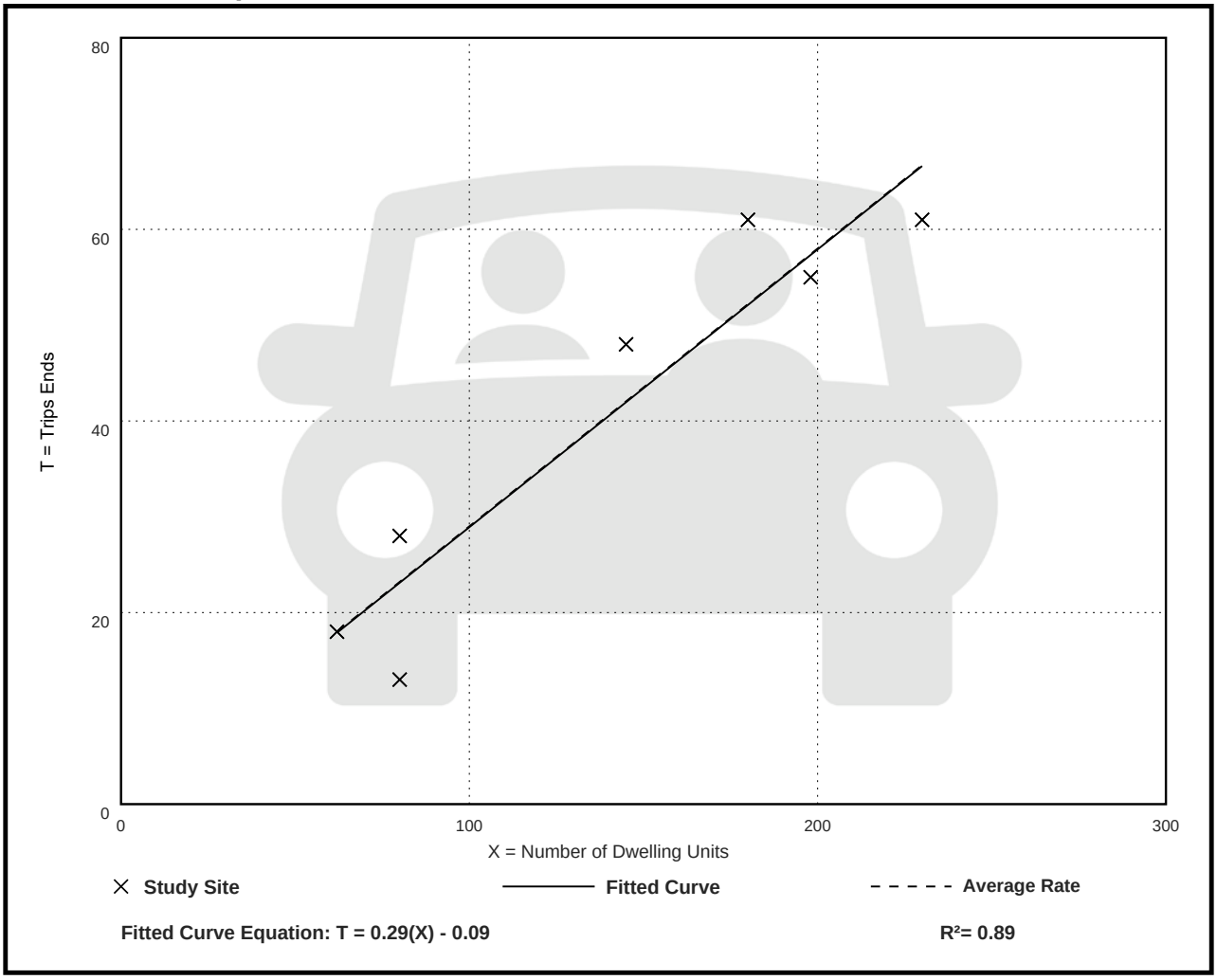
Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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: 7
Avg. Num. of Dwelling Units: 139
Directional Distribution: 43% entering, 57% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.29	0.16 - 0.35	0.05

Data Plot and Equation



Fitted Curve Equation: T = 0.29(X) - 0.09

R^2= 0.89

Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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

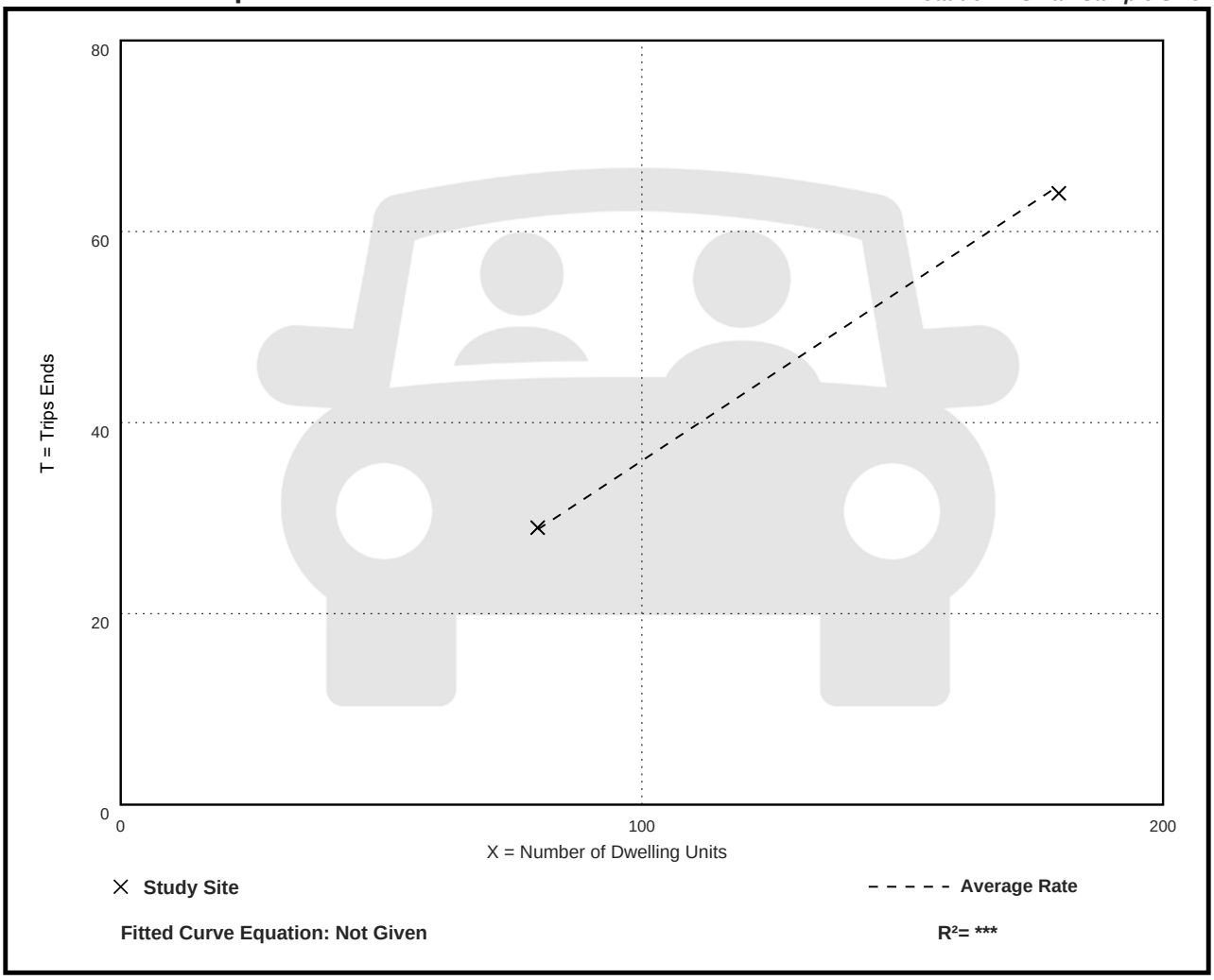
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Dwelling Units: 130
Directional Distribution: 38% entering, 62% exiting

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



Fitted Curve Equation: Not Given

R^2= ***

Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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

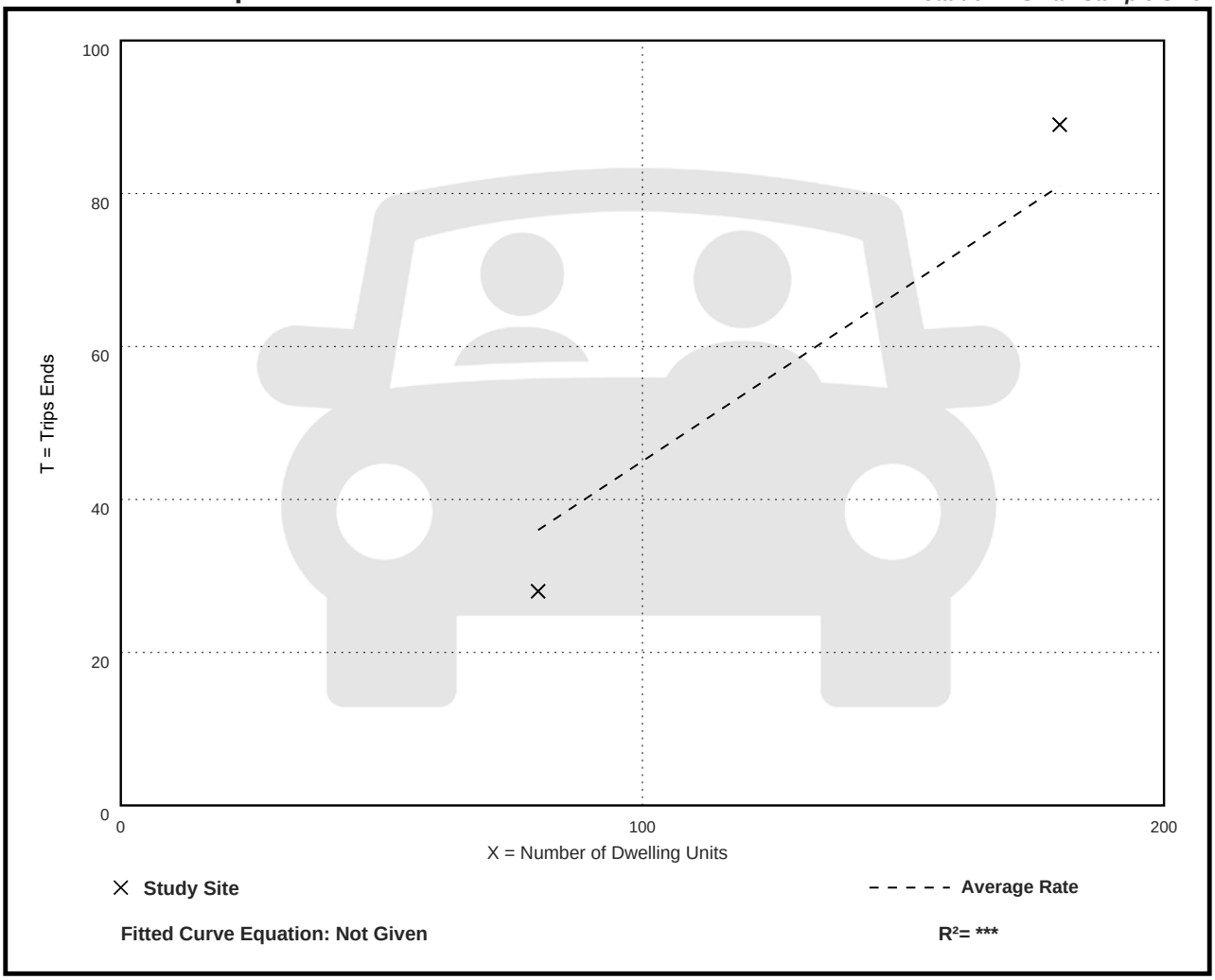
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. Num. of Dwelling Units: 130
Directional Distribution: 75% entering, 25% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.45	0.35 - 0.49	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

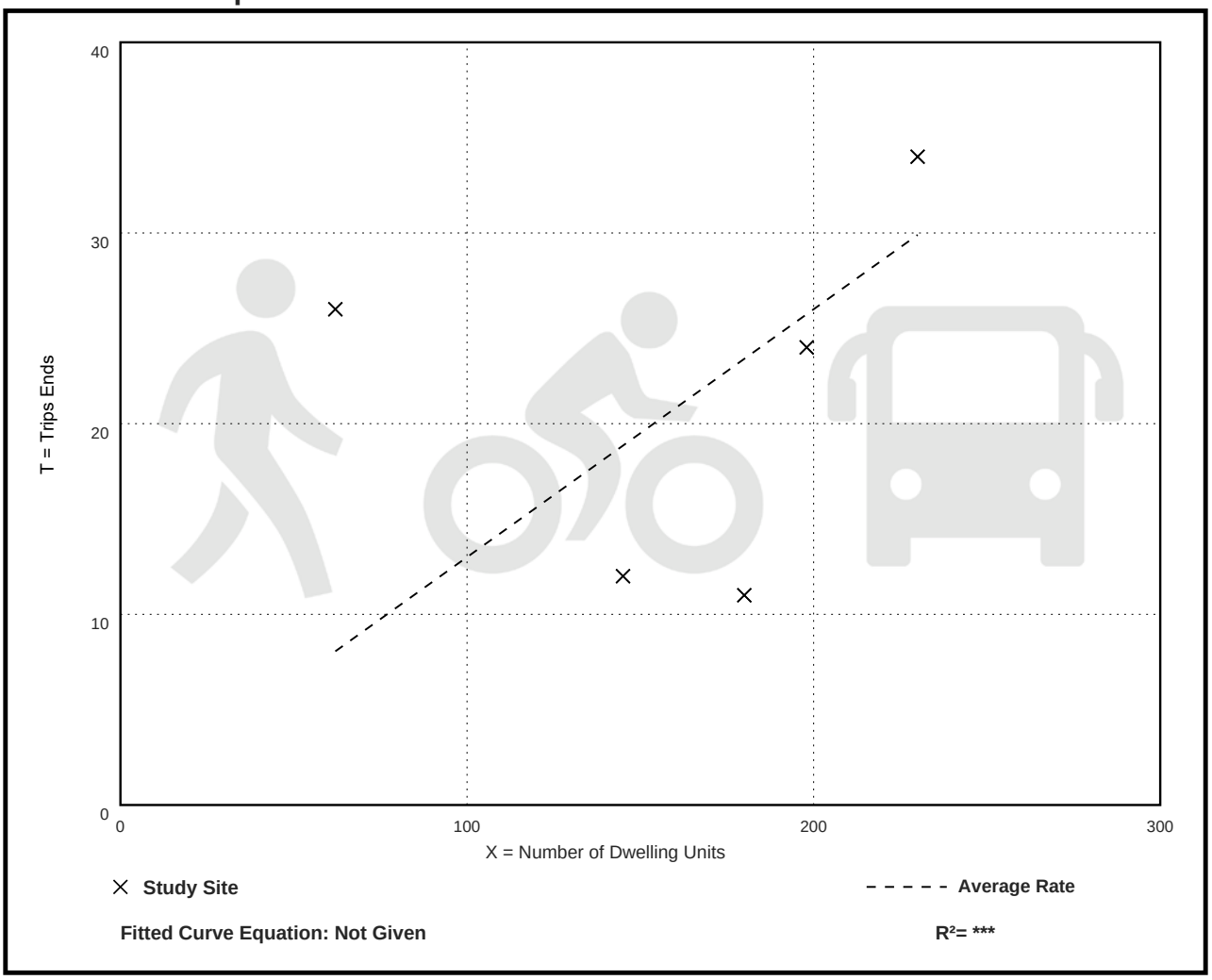
Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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: 5
Avg. Num. of Dwelling Units: 163
Directional Distribution: 57% entering, 43% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.13	0.06 - 0.42	0.10

Data Plot and Equation



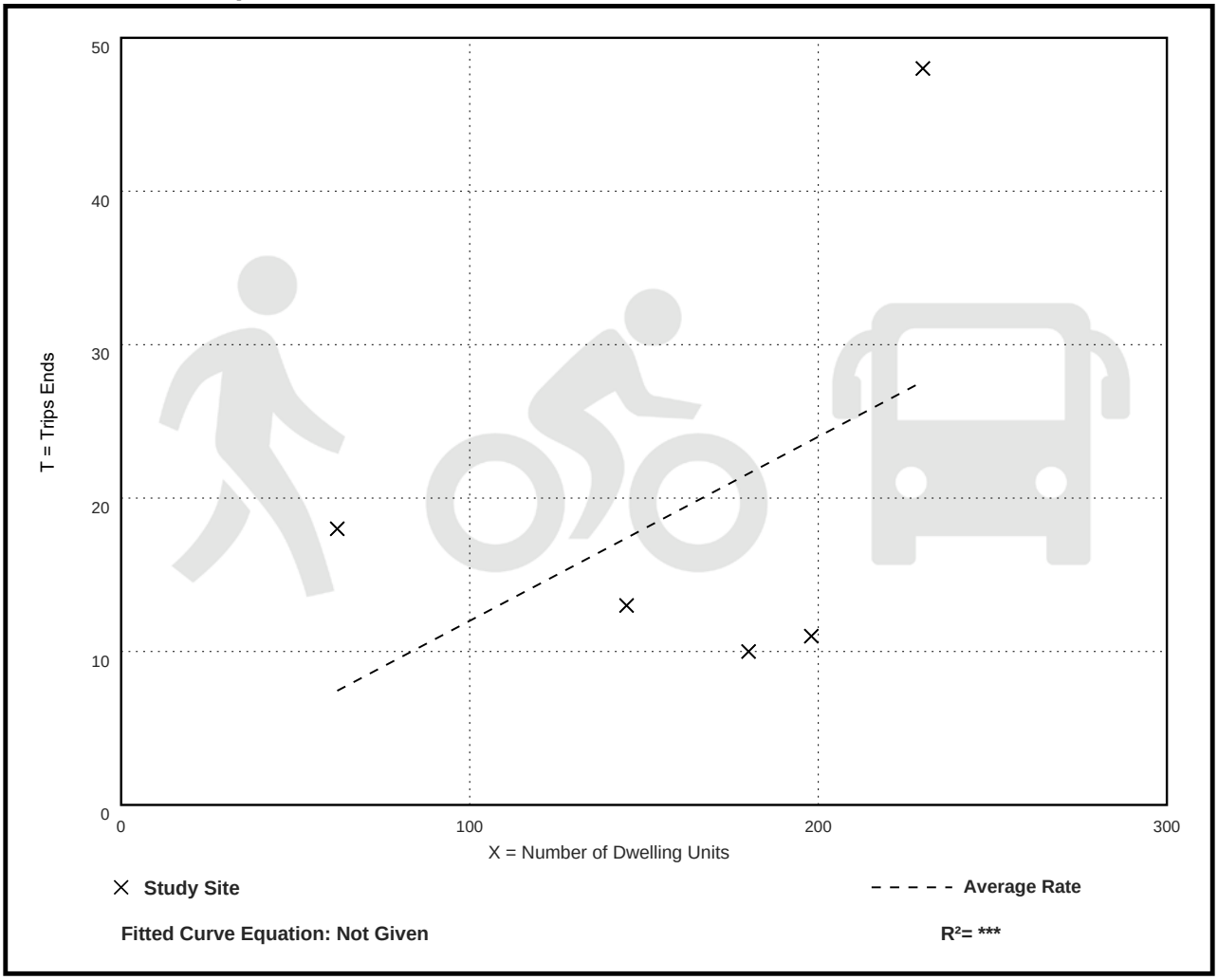
Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

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: 5
Avg. Num. of Dwelling Units: 163
Directional Distribution: 42% entering, 58% exiting

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.12	0.06 - 0.29	0.09

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

Walk+Bike+Transit Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

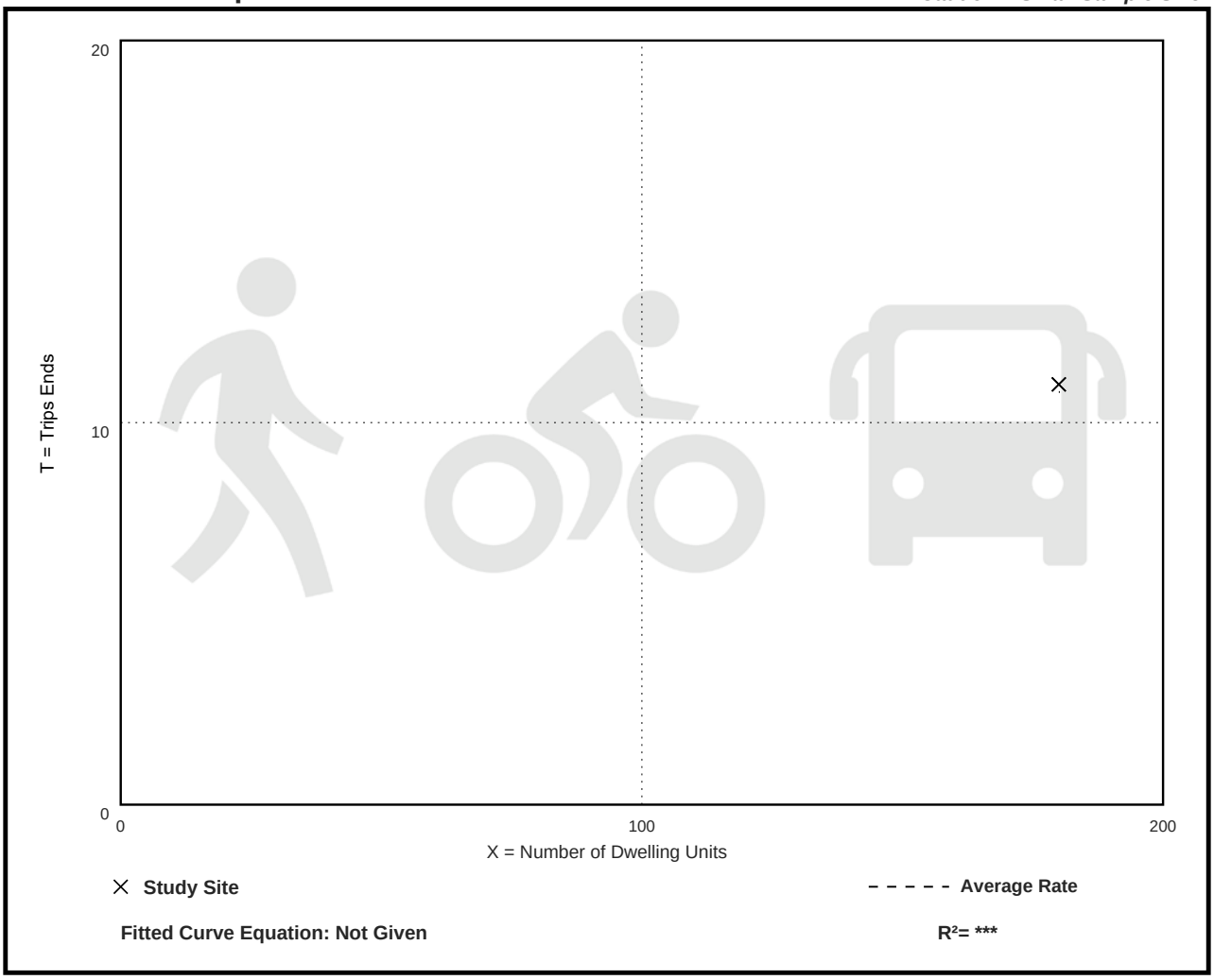
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 180
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.06	0.06 - 0.06	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= ***

Multifamily Housing (Mid-Rise)
Close to Rail Transit (221)

Walk+Bike+Transit Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

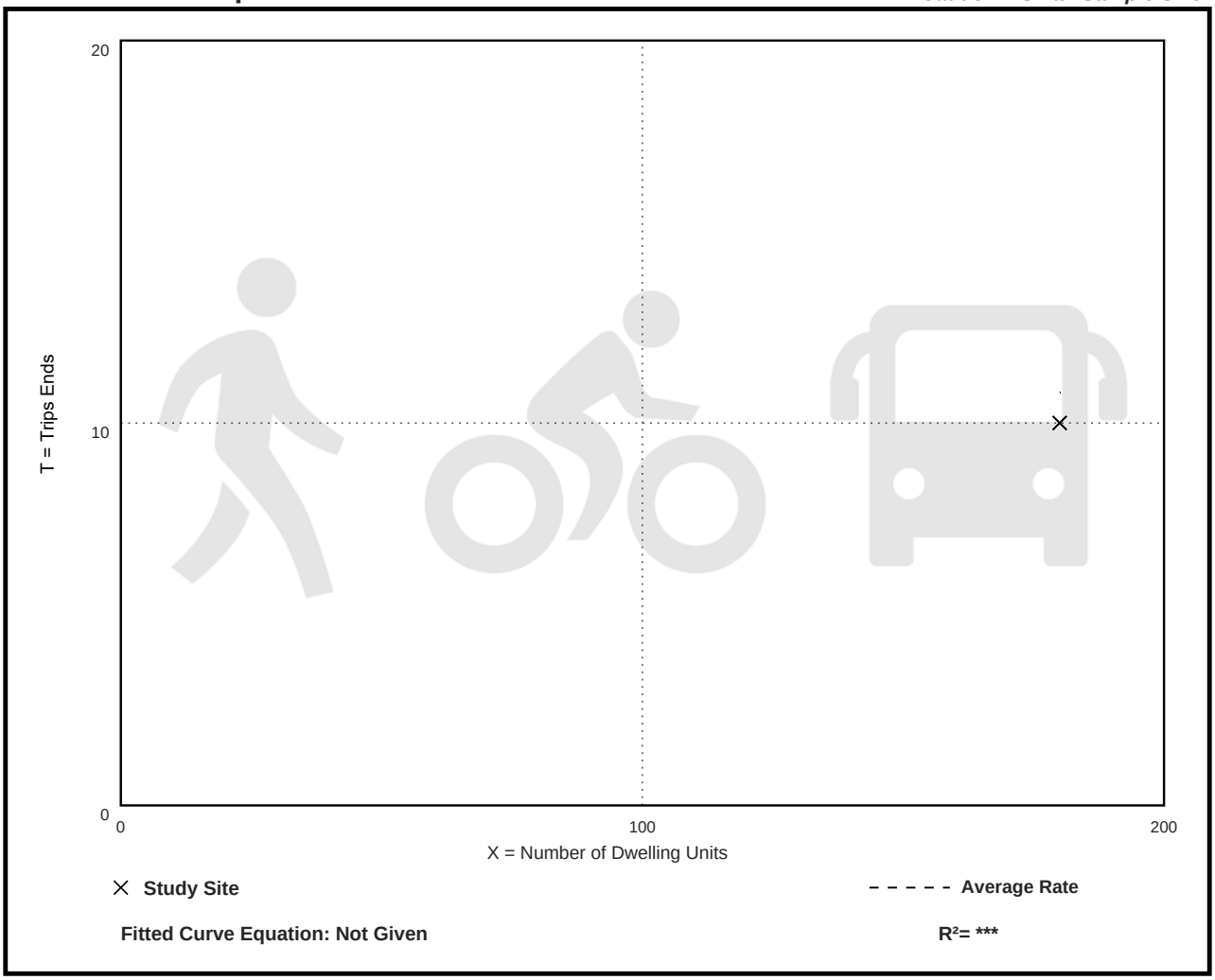
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 180
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.06	0.06 - 0.06	***

Data Plot and Equation

Caution – Small Sample Size



Land Use: 820
Shopping Center (>150k)

Description

A shopping center is an integrated group of commercial establishments that is planned, developed, owned, and managed as a unit. Each study site in this land use has at least 150,000 square feet of gross leasable area (GLA). It often has more than one anchor store. Various names can be assigned to a shopping center within this size range, depending on its specific size and tenants, such as community center, regional center, superregional center, fashion center, and power center.

A shopping center of this size typically contains more than retail merchandising facilities. Office space, a movie theater, restaurants, a post office, banks, a health club, and recreational facilities are common tenants.

A shopping center of this size can be enclosed or open-air. The vehicle trips generated at a shopping center are based upon the total GLA of the center. In the case of a smaller center without an enclosed mall or peripheral buildings, the GLA is the same as the gross floor area of the building.

The 150,000 square feet GLA threshold value between community/regional shopping center and shopping plaza (Land Use 821) is based on an examination of trip generation data. For a shopping plaza that is smaller than the threshold value, the presence or absence of a supermarket within the plaza has a measurable effect on site trip generation. For a shopping center that is larger than the threshold value, the trips generated by its other major tenants mask any effects of the presence or absence of an on-site supermarket.

Shopping plaza (40-150k) (Land Use 821), strip retail plaza (<40k) (Land Use 822), and factory outlet center (Land Use 823) are related uses.

Additional Data

Many shopping centers—in addition to the integrated unit of shops in one building or enclosed around a mall—include outparcels (peripheral buildings or pads located on the perimeter of the center adjacent to the streets and major access points). These buildings are typically drive-in banks, retail stores, restaurants, or small offices. Although the data herein do not indicate which of the centers studied include peripheral buildings, it can be assumed that some of the data show their effect.

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 Alberta (CAN), California, Colorado, Connecticut, Delaware, Florida, Georgia, Illinois, Indiana, Iowa, Kentucky,

Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Ohio, Oklahoma, Pennsylvania, Tennessee, Texas, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

Source Numbers

77, 110, 154, 156, 159, 190, 199, 202, 204, 213, 251, 269, 294, 295, 299, 304, 305, 307, 308, 309, 311, 314, 315, 316, 317, 319, 365, 385, 404, 414, 423, 442, 446, 562, 629, 702, 715, 728, 868, 871, 880, 899, 912, 926, 946, 962, 973, 974, 978, 1034, 1040, 1067

Shopping Center (>150k)
(820)

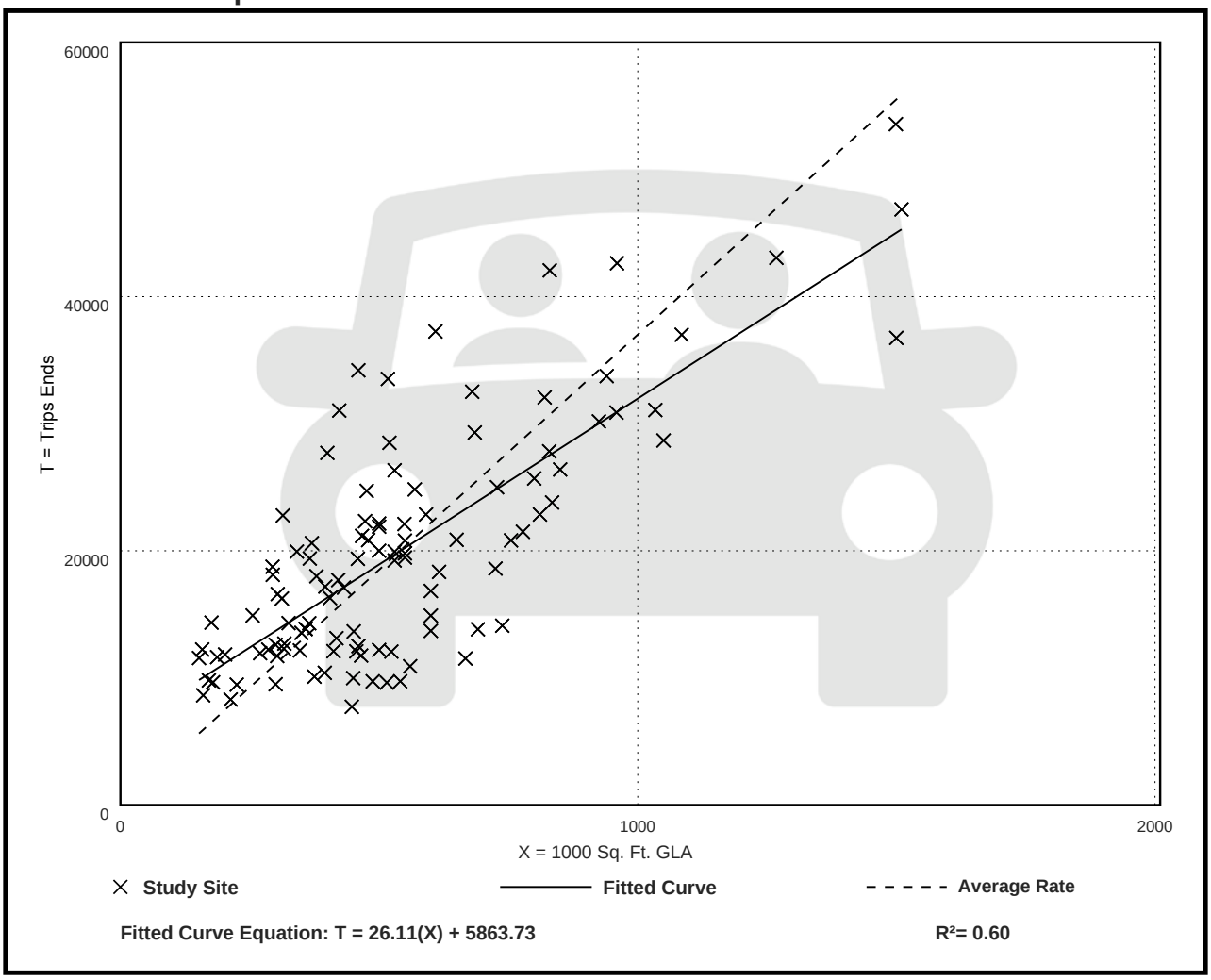
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 108
Avg. 1000 Sq. Ft. GLA: 538
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
37.01	17.27 - 81.53	12.79

Data Plot and Equation



Fitted Curve Equation: T = 26.11(X) + 5863.73

R^2= 0.60

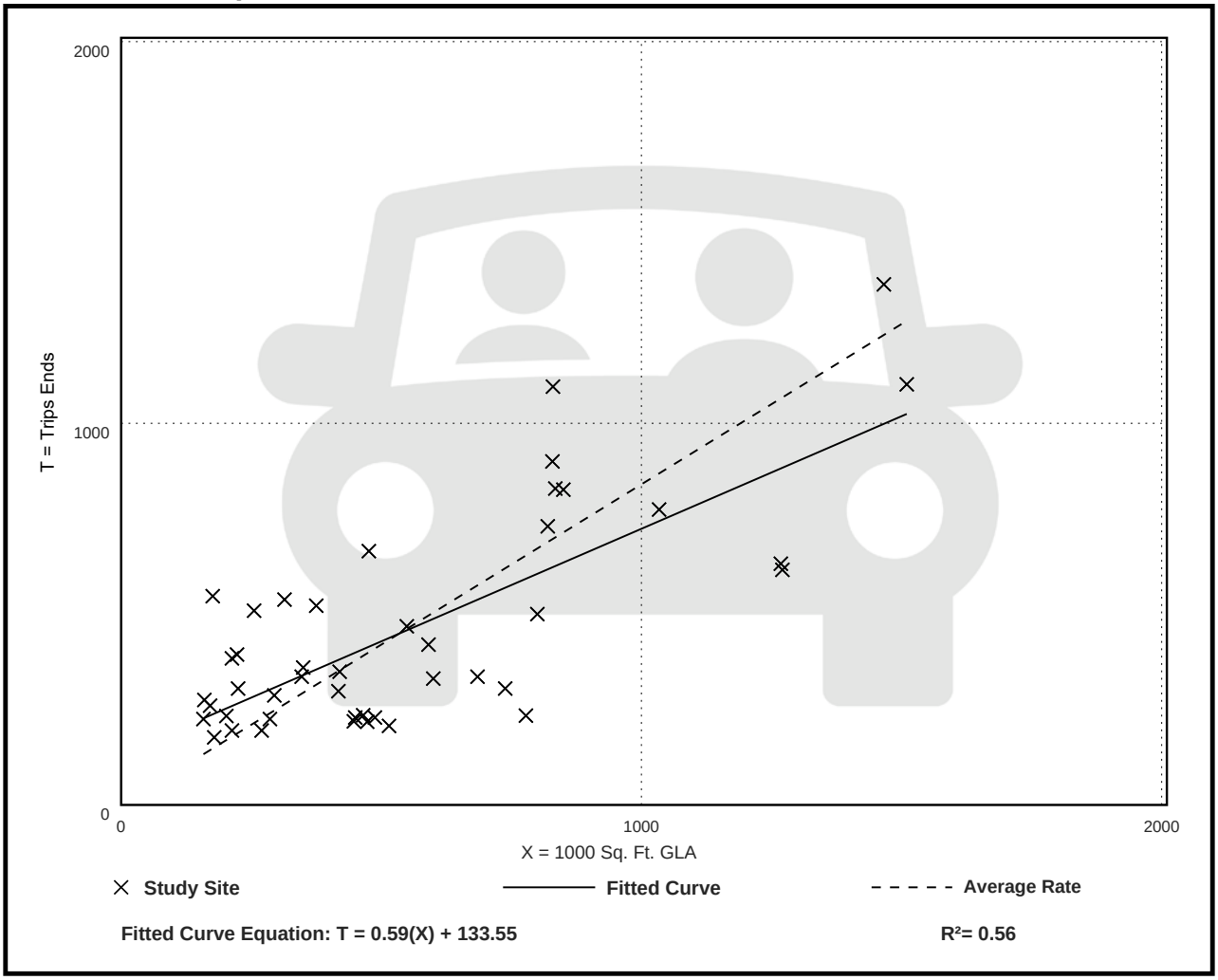
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
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: 44
Avg. 1000 Sq. Ft. GLA: 546
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.84	0.30 - 3.11	0.42

Data Plot and Equation



Fitted Curve Equation: T = 0.59(X) + 133.55

R^2= 0.56

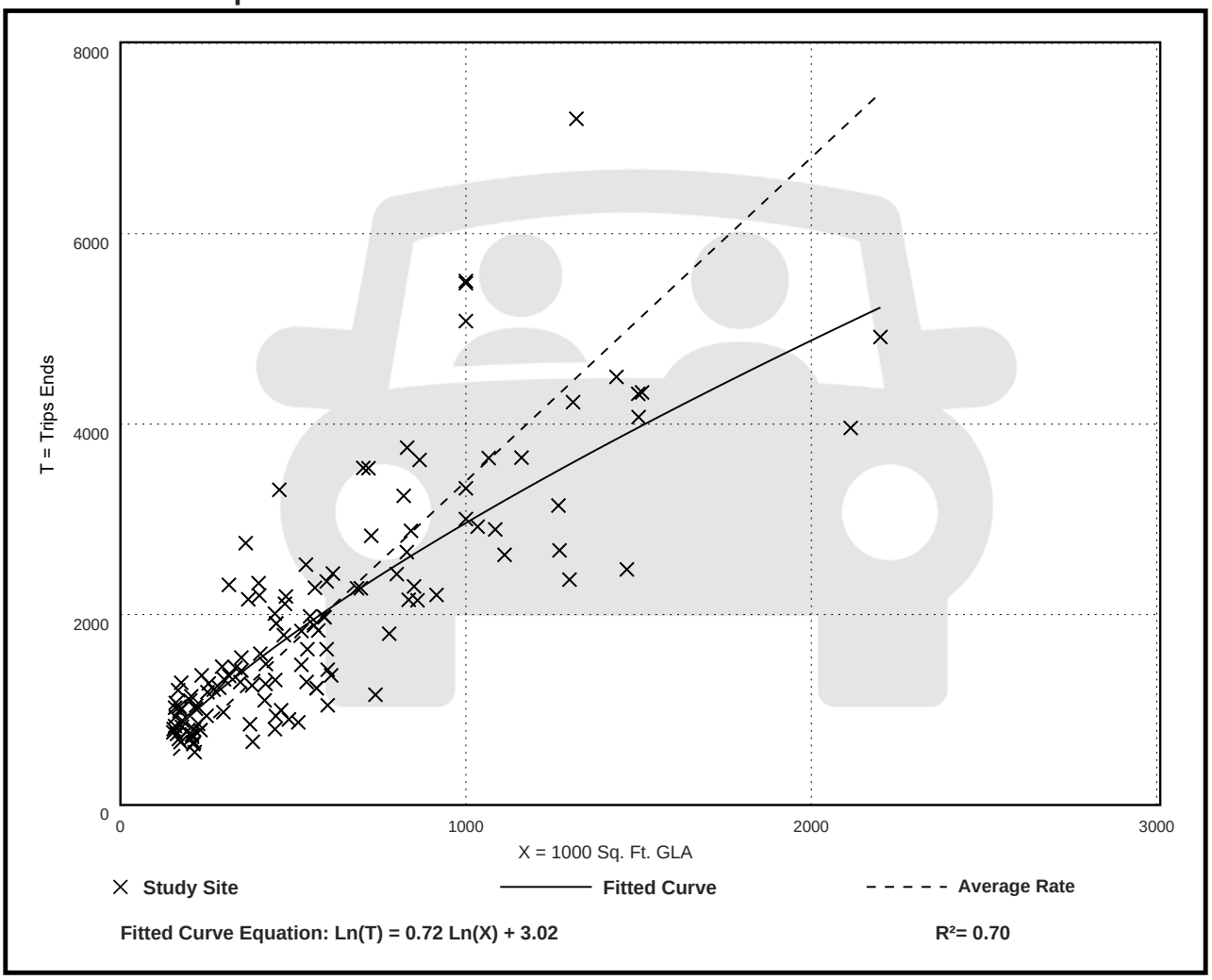
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
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: 126
Avg. 1000 Sq. Ft. GLA: 581
Directional Distribution: 48% entering, 52% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
3.40	1.57 - 7.58	1.26

Data Plot and Equation



Shopping Center (>150k)
(820)

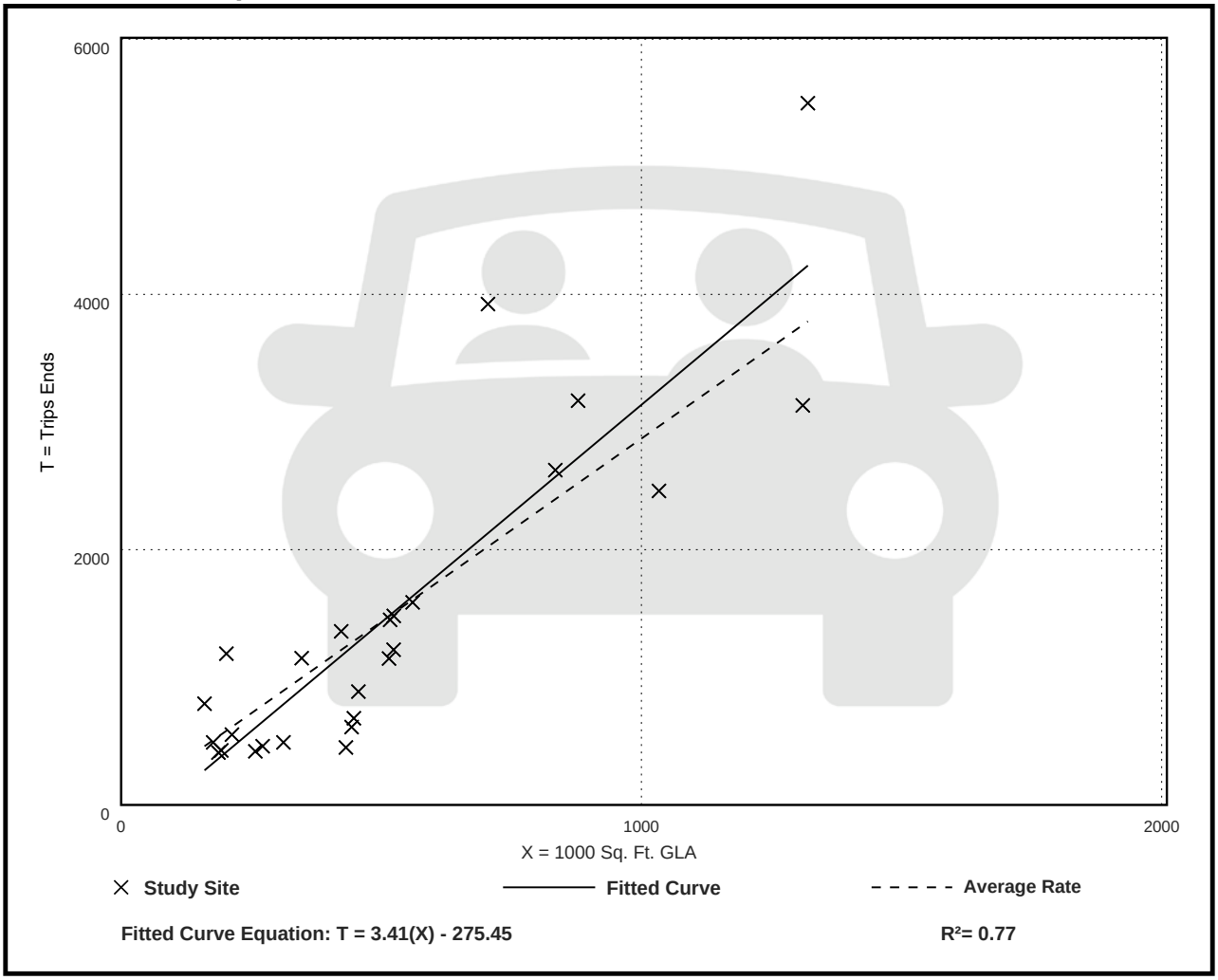
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 26
Avg. 1000 Sq. Ft. GLA: 509
Directional Distribution: 55% entering, 45% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.87	1.04 - 5.86	1.14

Data Plot and Equation



Fitted Curve Equation: T = 3.41(X) - 275.45

R^2= 0.77

Shopping Center (>150k)
(820)

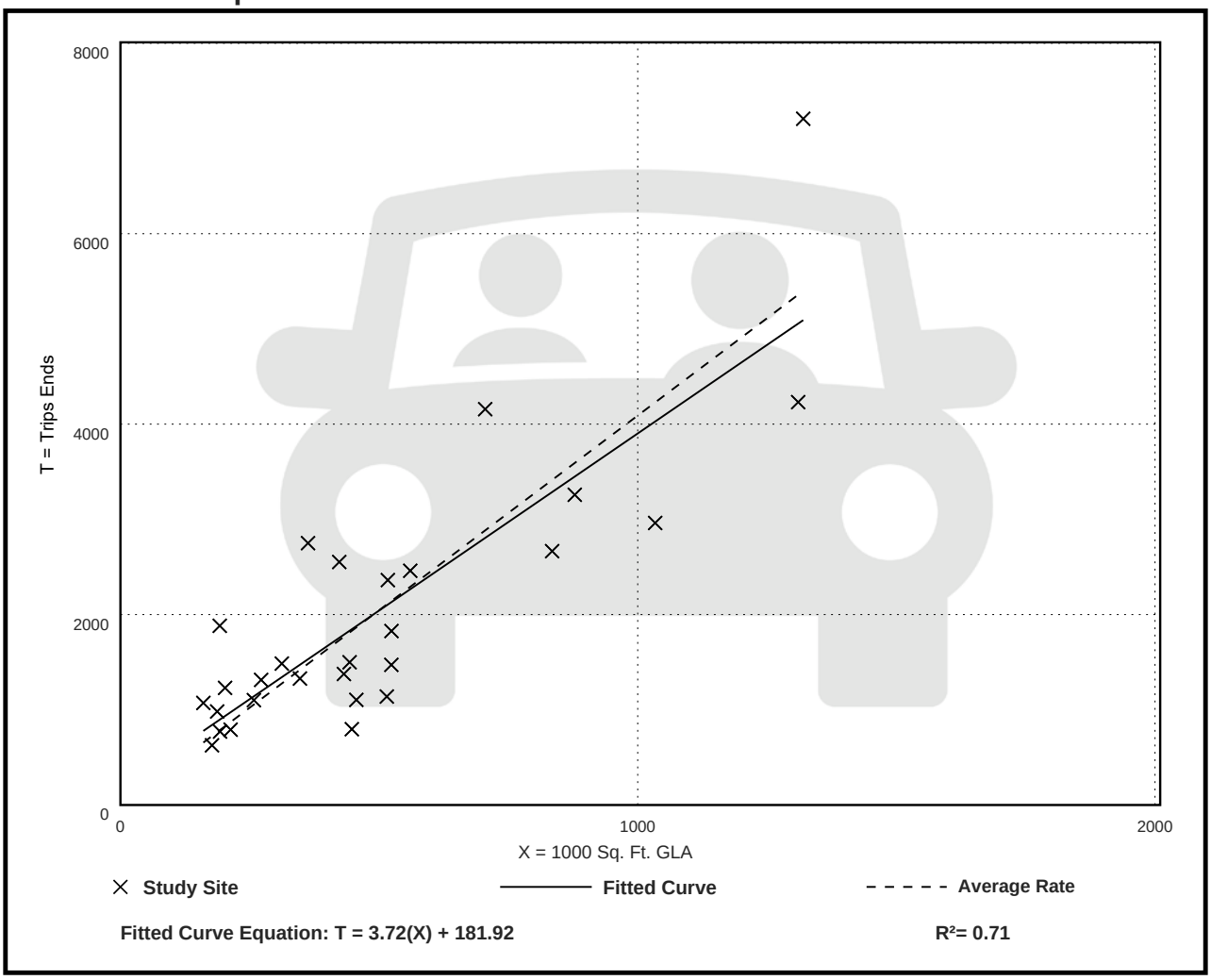
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 28
Avg. 1000 Sq. Ft. GLA: 493
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
4.09	1.78 - 9.80	1.51

Data Plot and Equation



Fitted Curve Equation: T = 3.72(X) + 181.92

R^2= 0.71

Shopping Center (>150k)
(820)

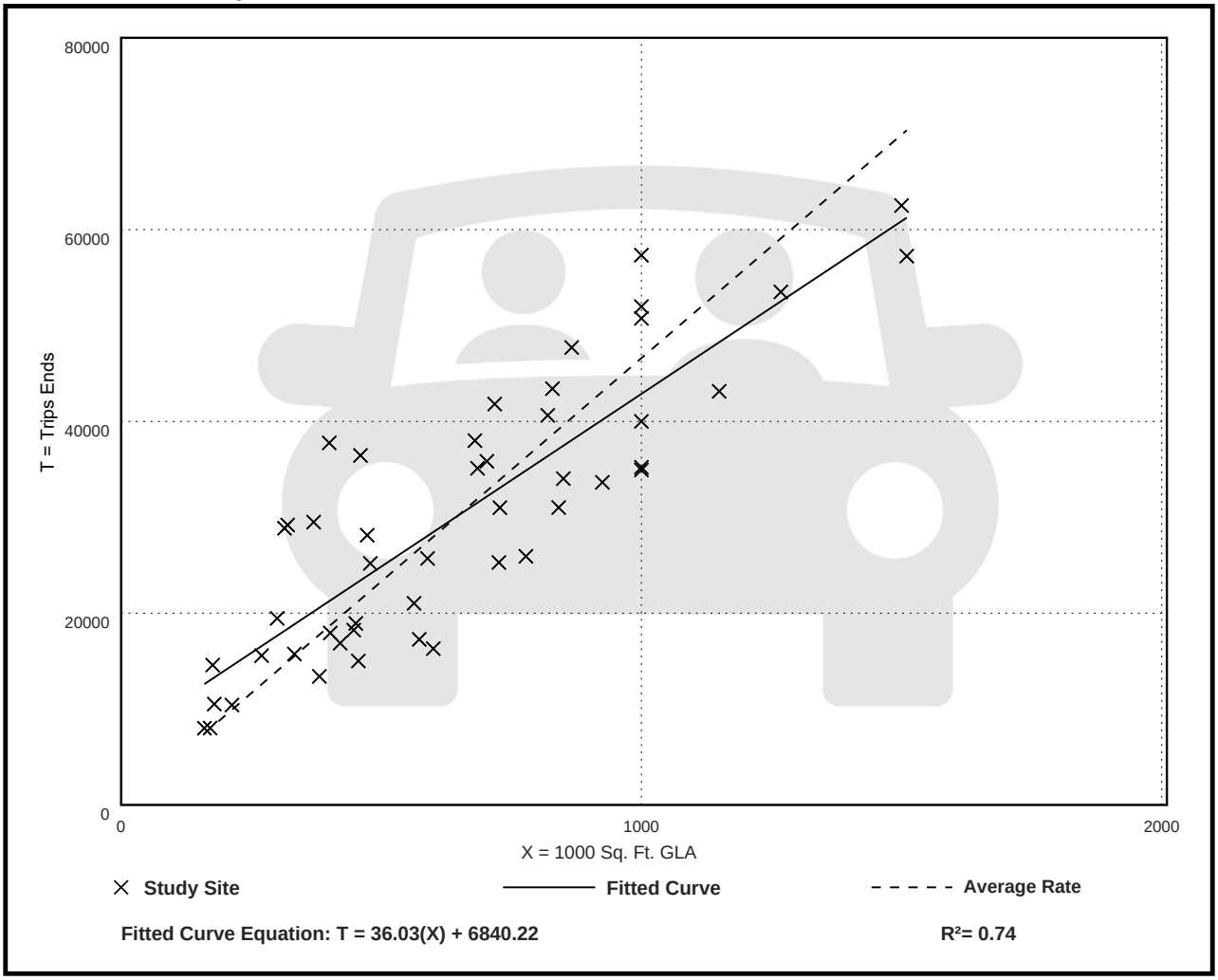
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Saturday

Setting/Location: General Urban/Suburban
Number of Studies: 48
Avg. 1000 Sq. Ft. GLA: 647
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
46.60	27.17 - 94.40	13.66

Data Plot and Equation



Fitted Curve Equation: T = 36.03(X) + 6840.22

R^2= 0.74

Shopping Center (>150k)
(820)

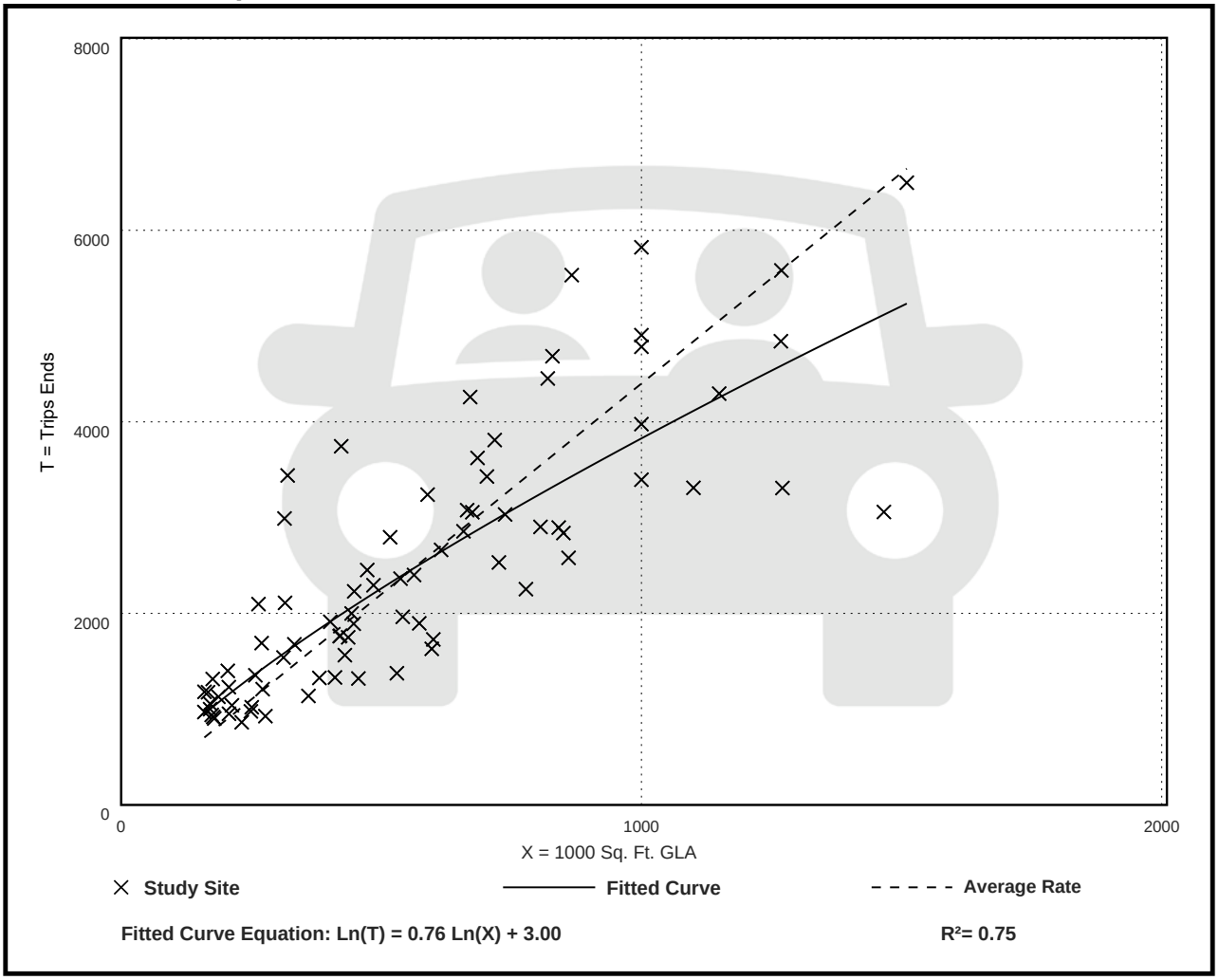
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 81
Avg. 1000 Sq. Ft. GLA: 559
Directional Distribution: 52% entering, 48% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
4.40	2.09 - 10.75	1.41

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.76 Ln(X) + 3.00

R^2= 0.75

Shopping Center (>150k)
(820)

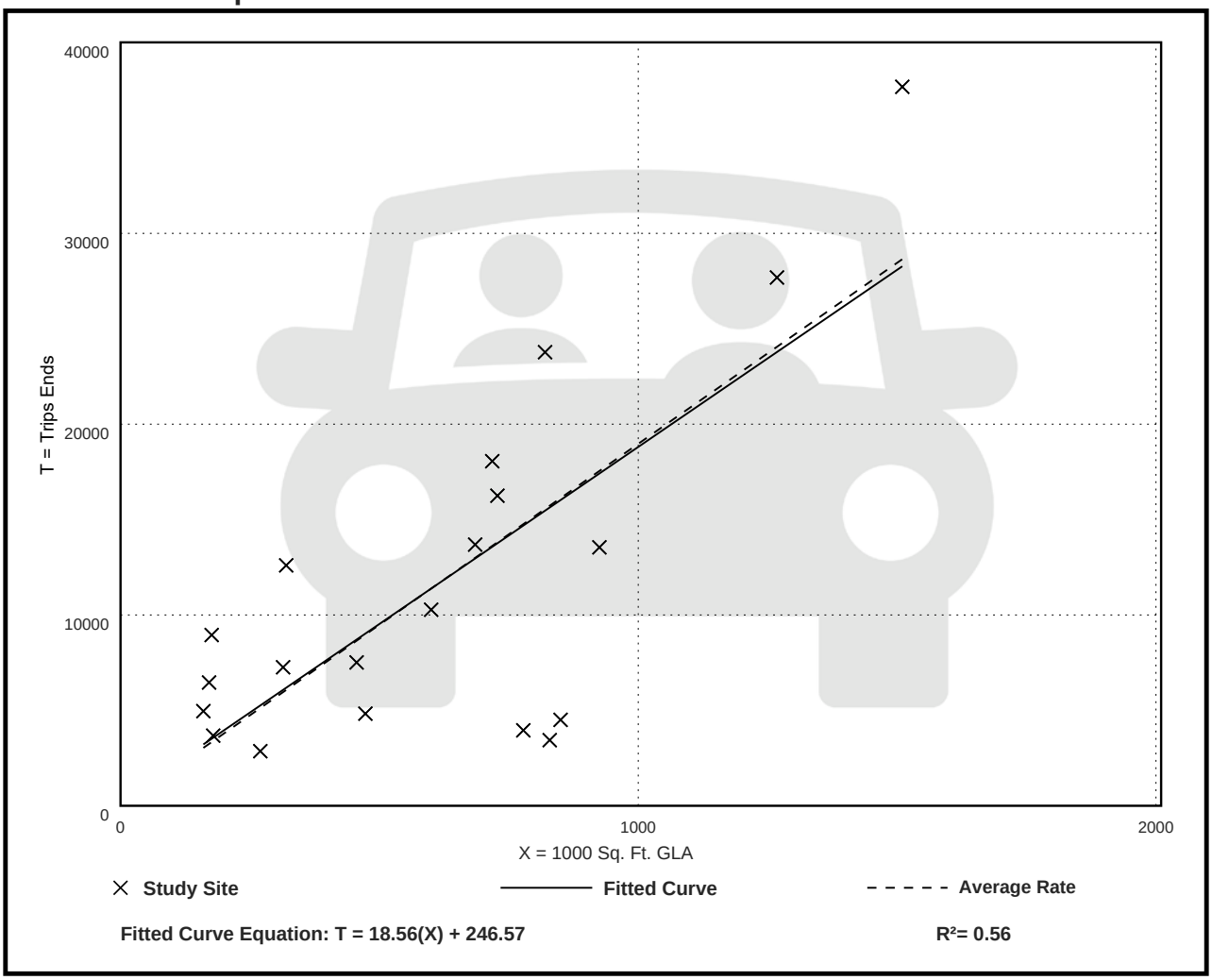
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Sunday

Setting/Location: General Urban/Suburban
Number of Studies: 20
Avg. 1000 Sq. Ft. GLA: 612
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
18.97	4.15 - 50.85	9.96

Data Plot and Equation



Fitted Curve Equation: T = 18.56(X) + 246.57

R^2= 0.56

Shopping Center (>150k)
(820)

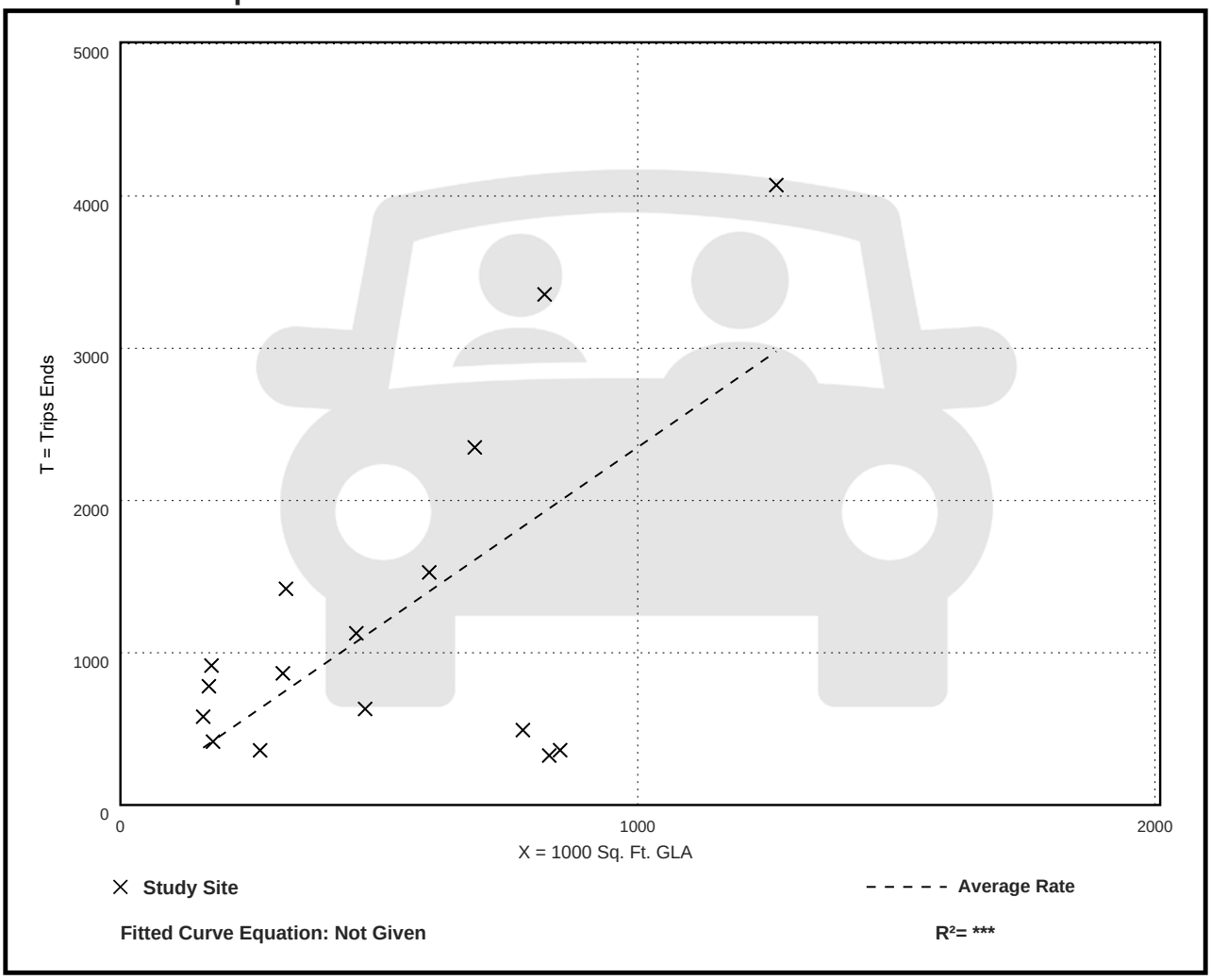
Vehicle Trip Ends vs: 1000 Sq. Ft. GLA
On a: Sunday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 16
Avg. 1000 Sq. Ft. GLA: 522
Directional Distribution: 49% entering, 51% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
2.35	0.39 - 5.20	1.50

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Shopping Center (>150k)
(820)

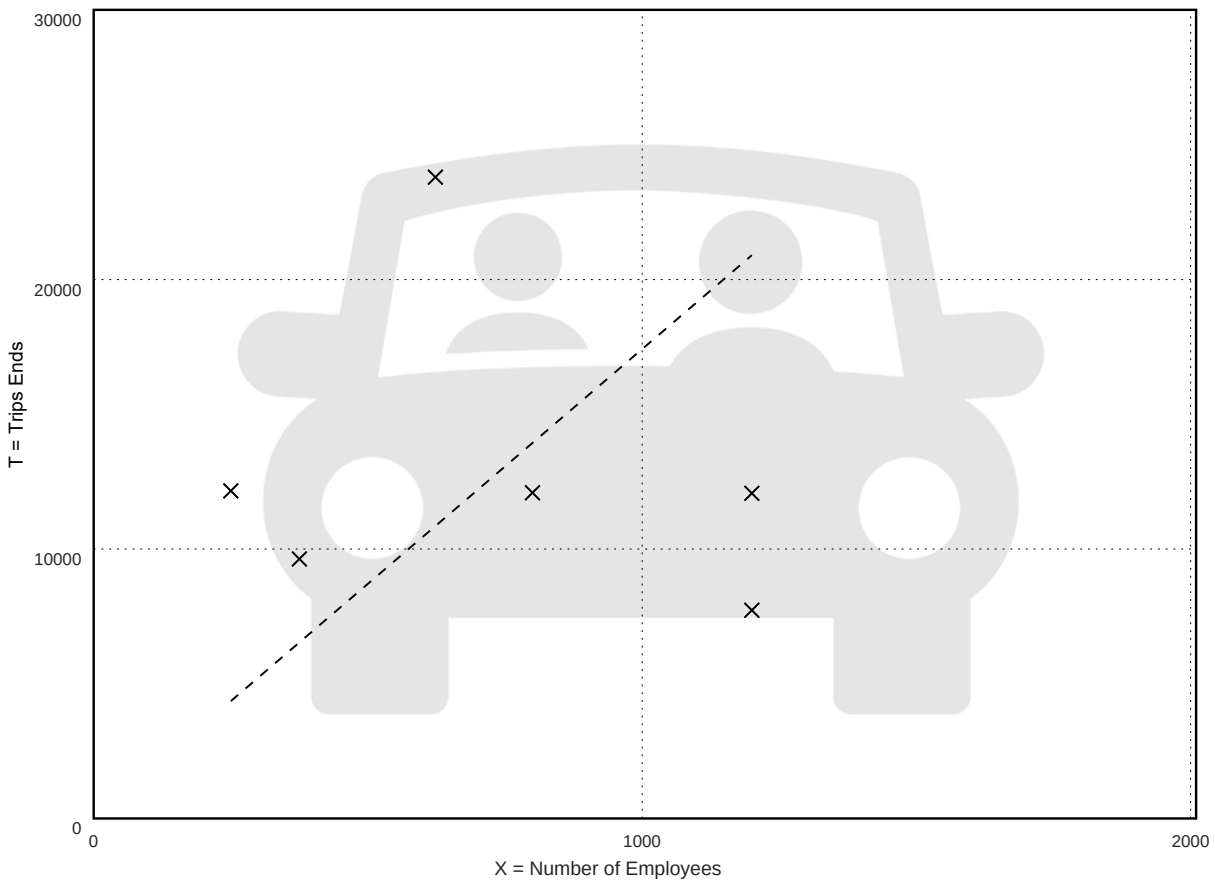
Vehicle Trip Ends vs: Employees
On a: Weekday

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Employees: 741
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
17.42	6.44 - 48.63	14.25

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= *

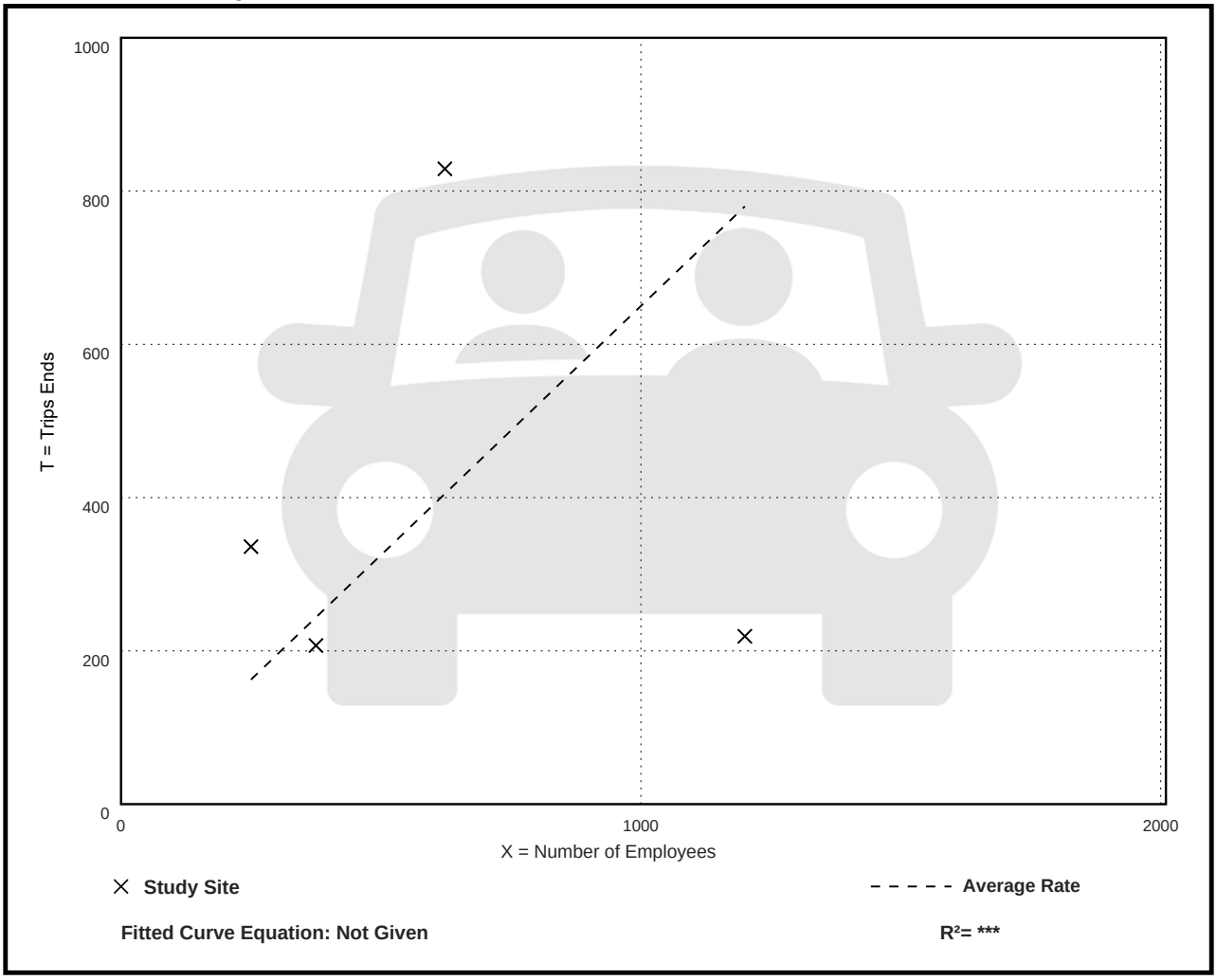
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: Employees
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: 4
Avg. Num. of Employees: 612
Directional Distribution: 64% entering, 36% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
0.65	0.18 - 1.34	0.61

Data Plot and Equation



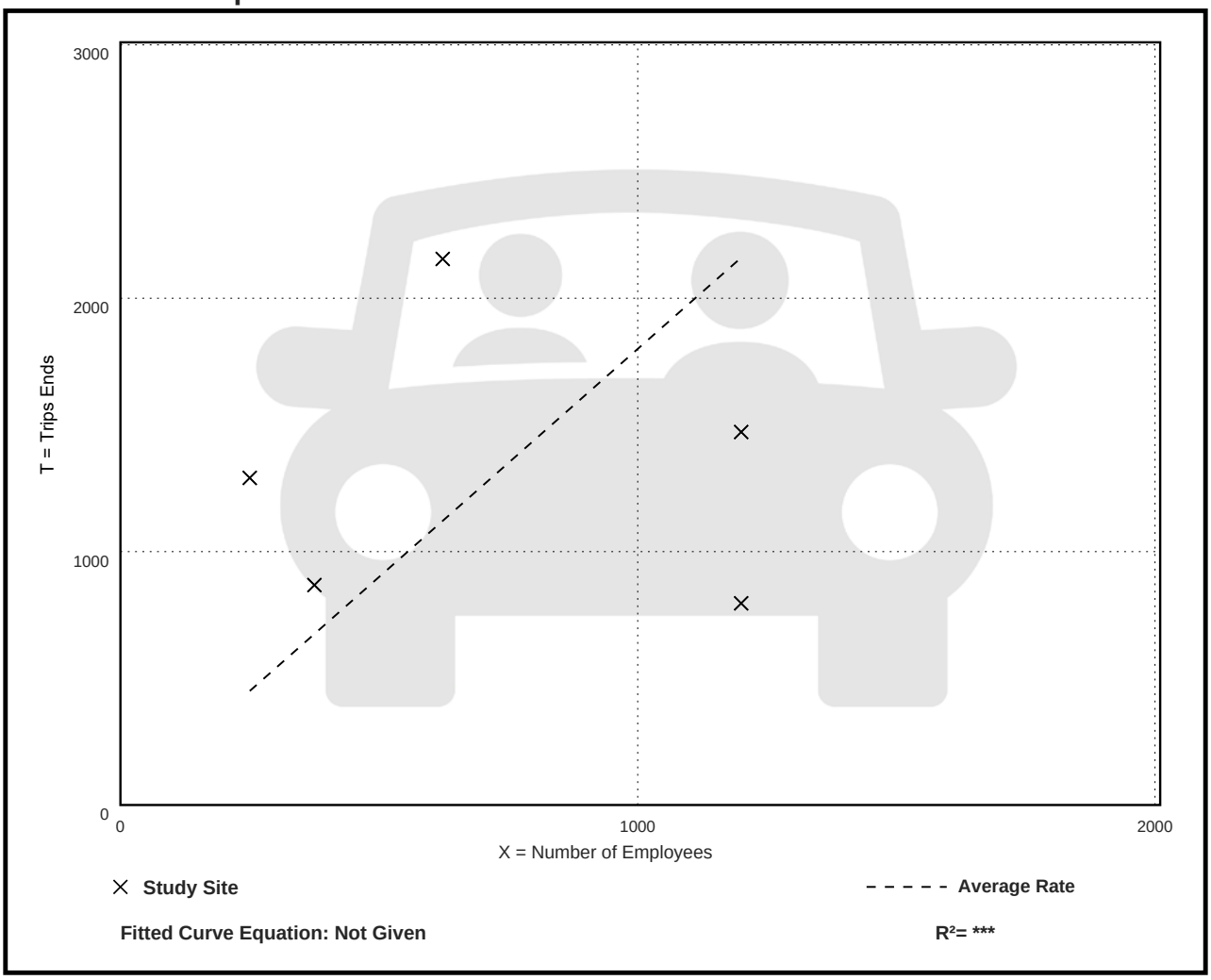
Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: Employees
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: 5
Avg. Num. of Employees: 730
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.80	0.66 - 5.16	1.50

Data Plot and Equation



Shopping Center (>150k)
(820)

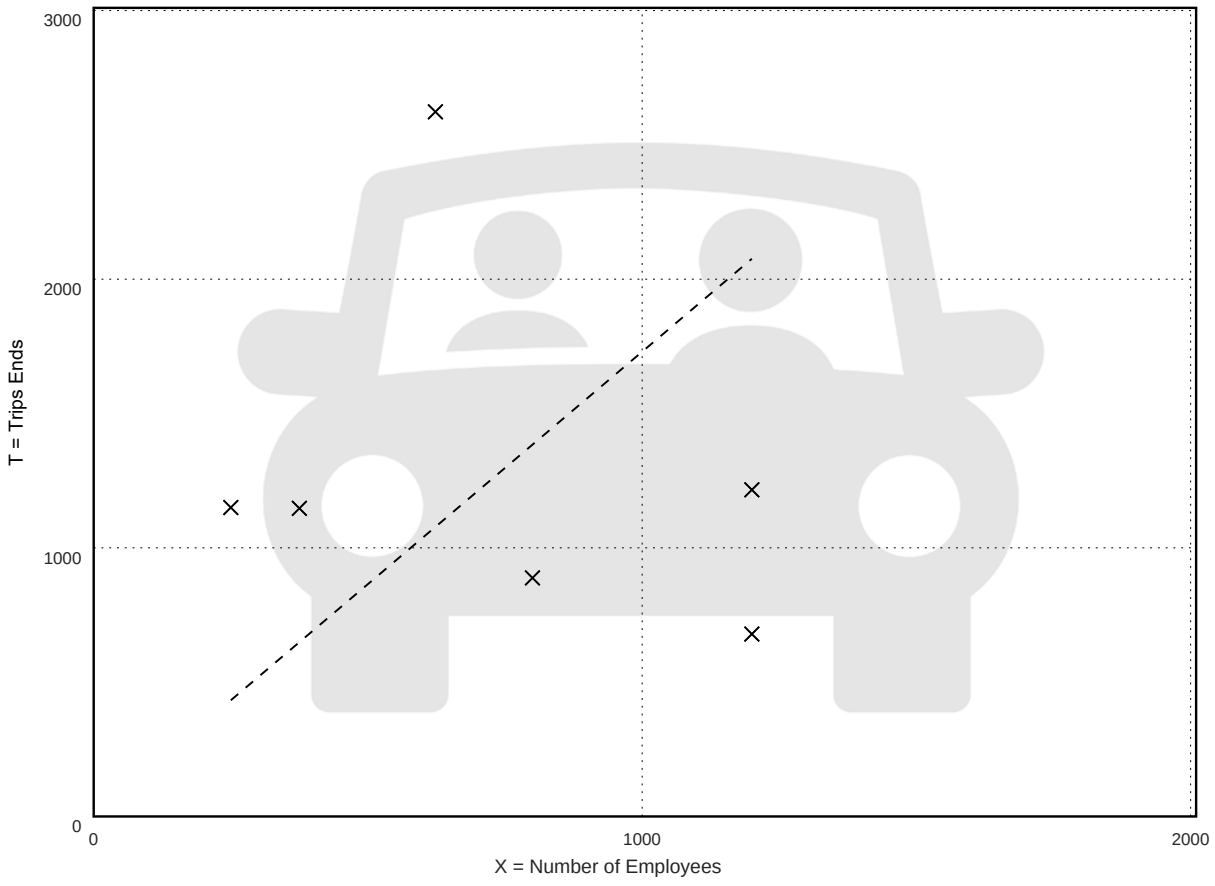
Vehicle Trip Ends vs: Employees
On a: Weekday,
AM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Employees: 741
Directional Distribution: 53% entering, 47% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.73	0.57 - 4.60	1.57

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Shopping Center (>150k)
(820)

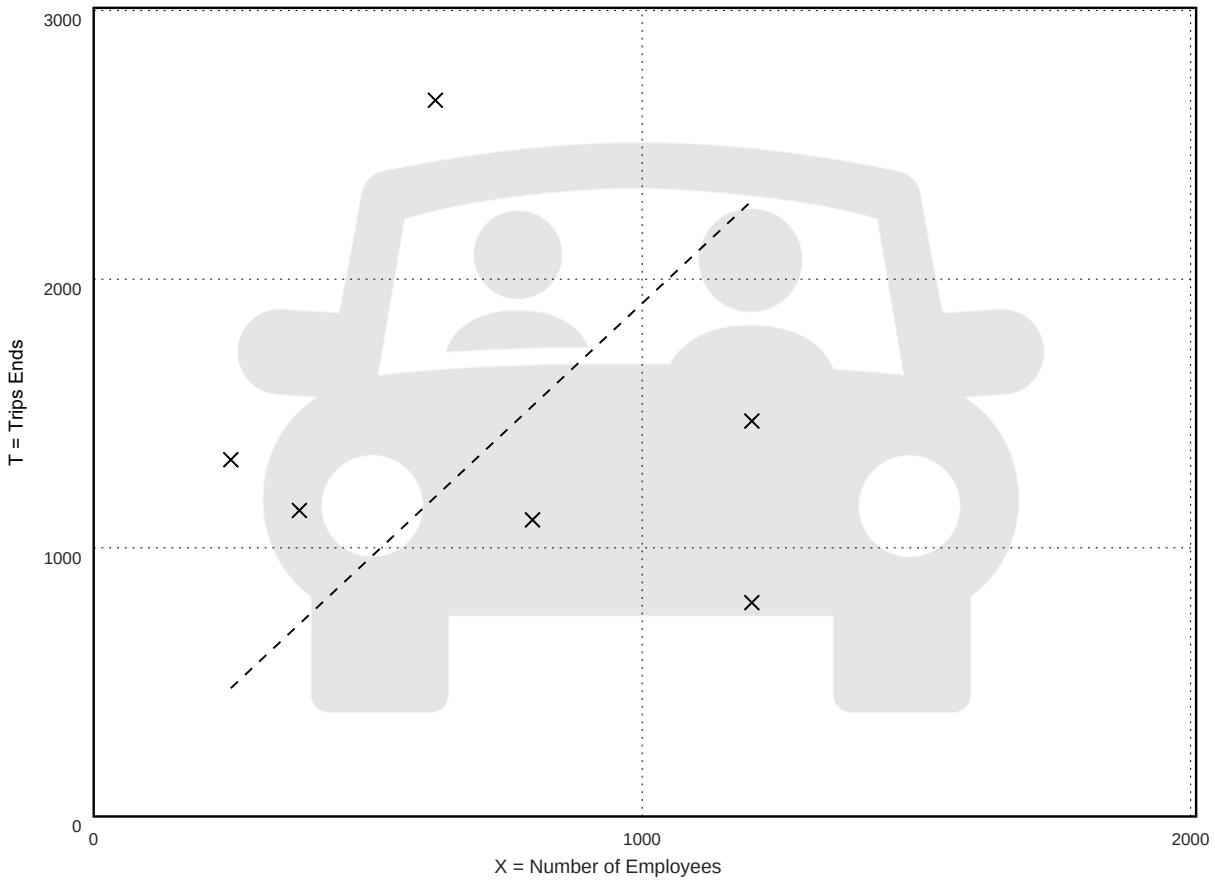
Vehicle Trip Ends vs: Employees
On a: Weekday,
PM Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 6
Avg. Num. of Employees: 741
Directional Distribution: 51% entering, 49% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.91	0.66 - 5.31	1.60

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= ***

Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: Employees
On a: Saturday

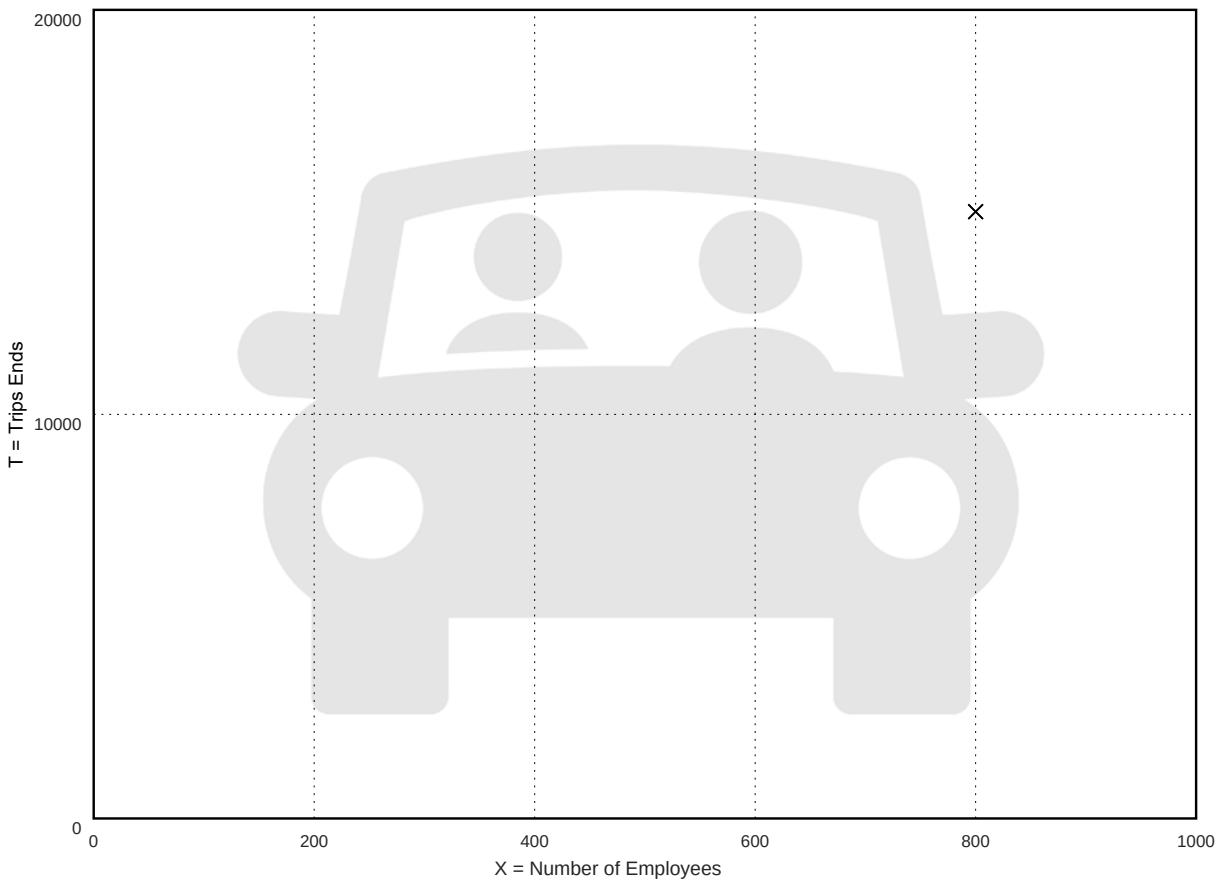
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 800
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
18.77	18.77 - 18.77	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Shopping Center (>150k)
(820)

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

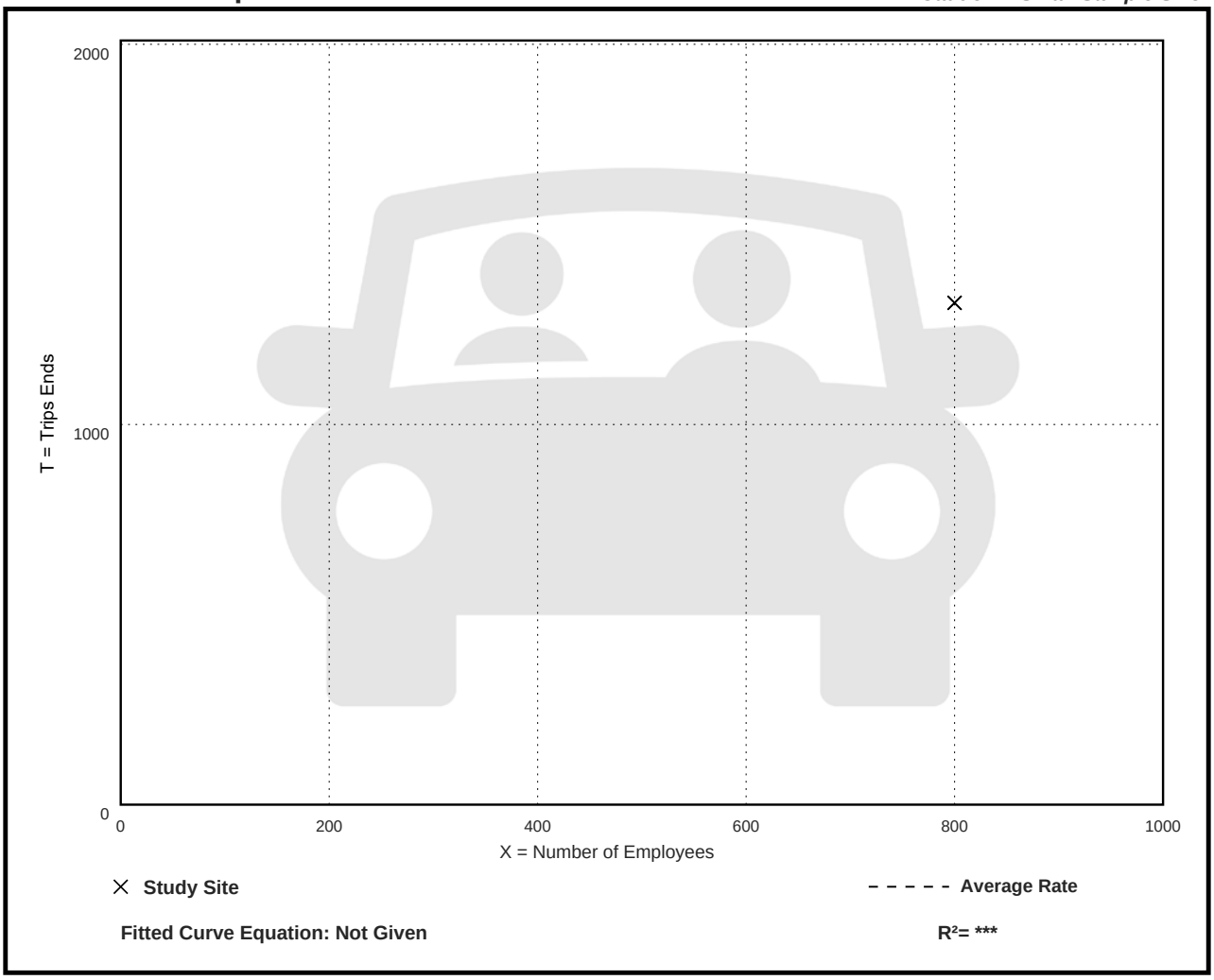
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 800
Directional Distribution: 50% entering, 50% exiting

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.65	1.65 - 1.65	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: Employees
On a: Sunday

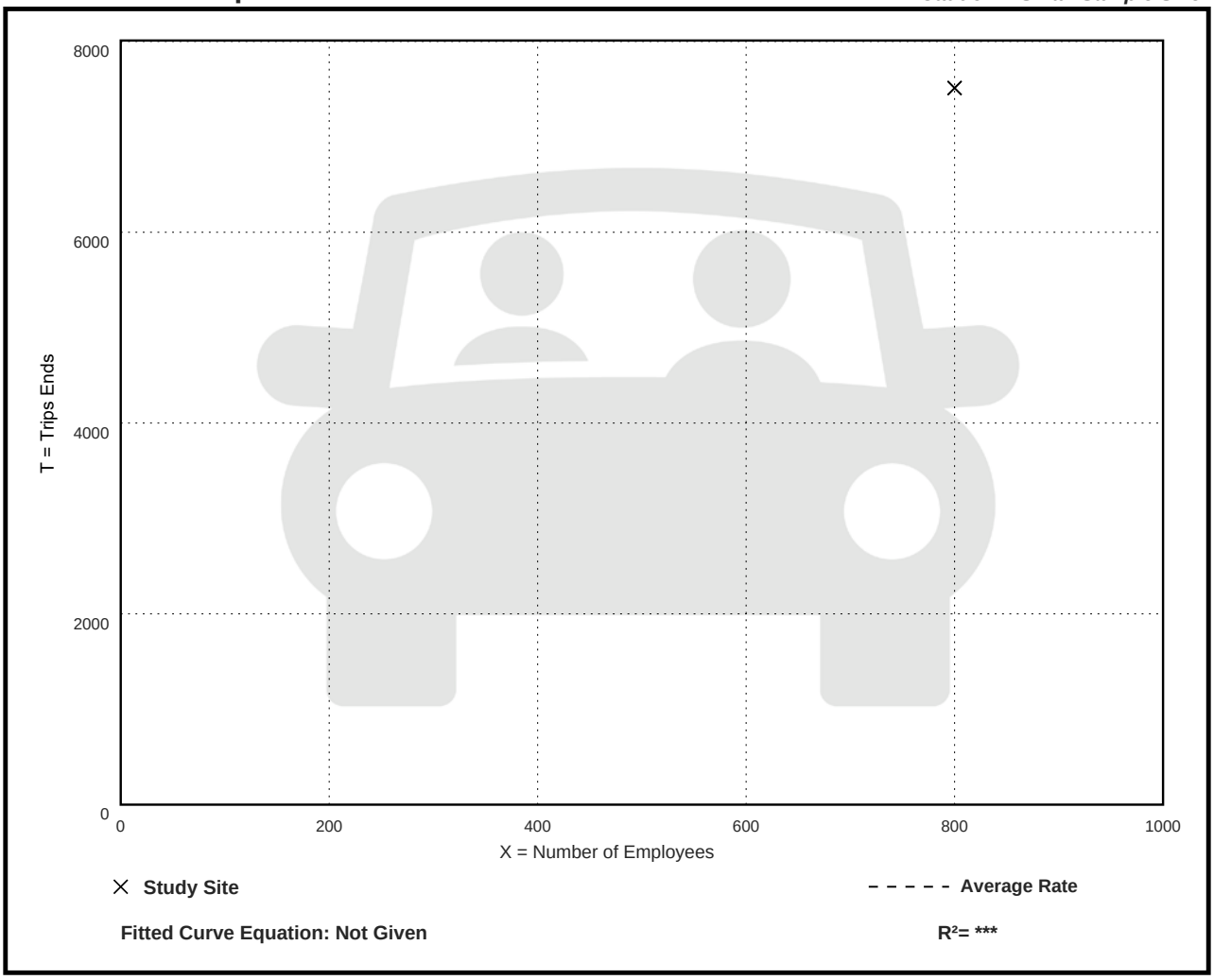
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 800
Directional Distribution: Not Available

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
9.39	9.39 - 9.39	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Shopping Center (>150k)
(820)

Vehicle Trip Ends vs: Employees
On a: Sunday, Peak Hour of Generator

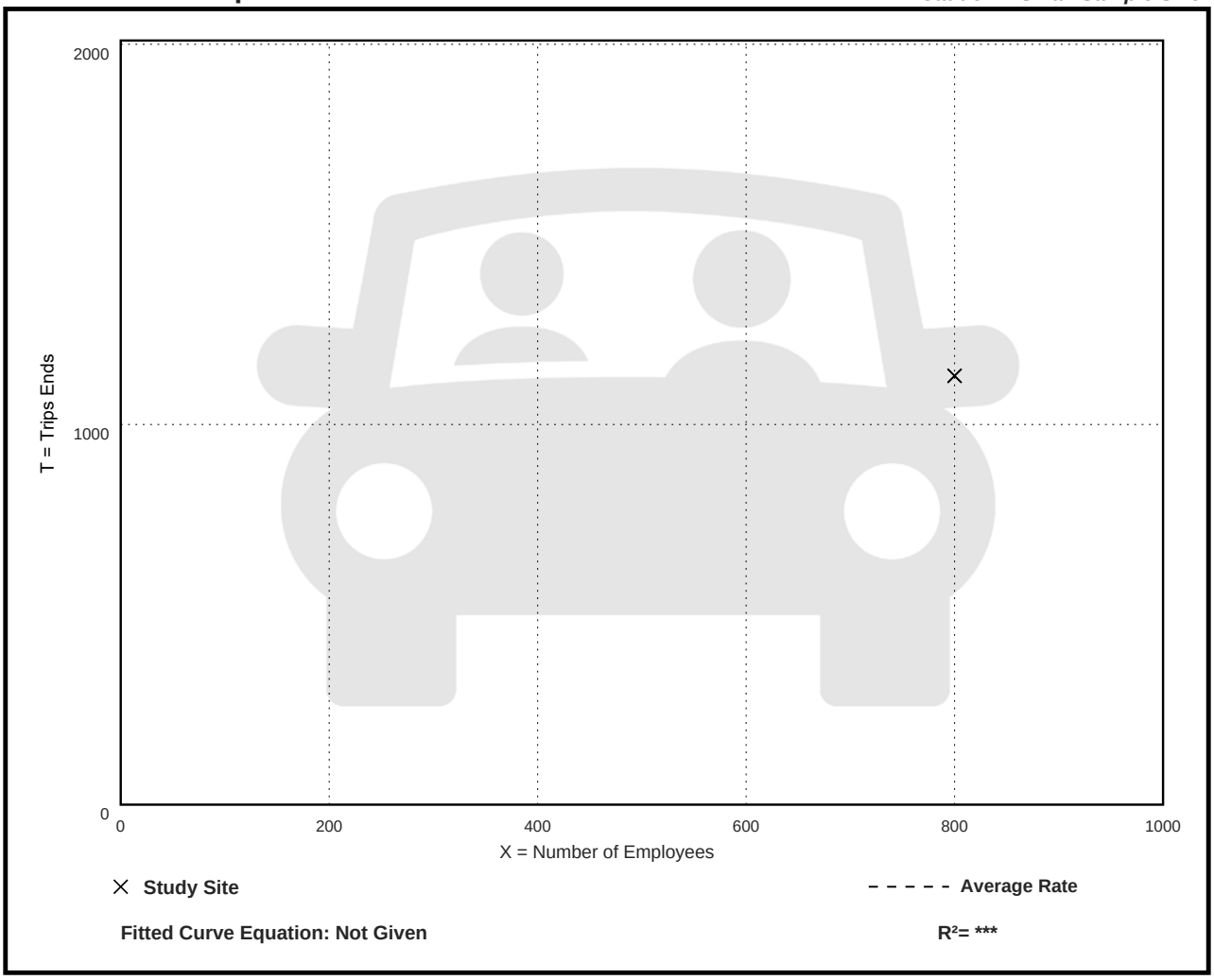
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Employees: 800
Directional Distribution: Not Available

Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.41	1.41 - 1.41	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Shopping Center (>150k)
(820)

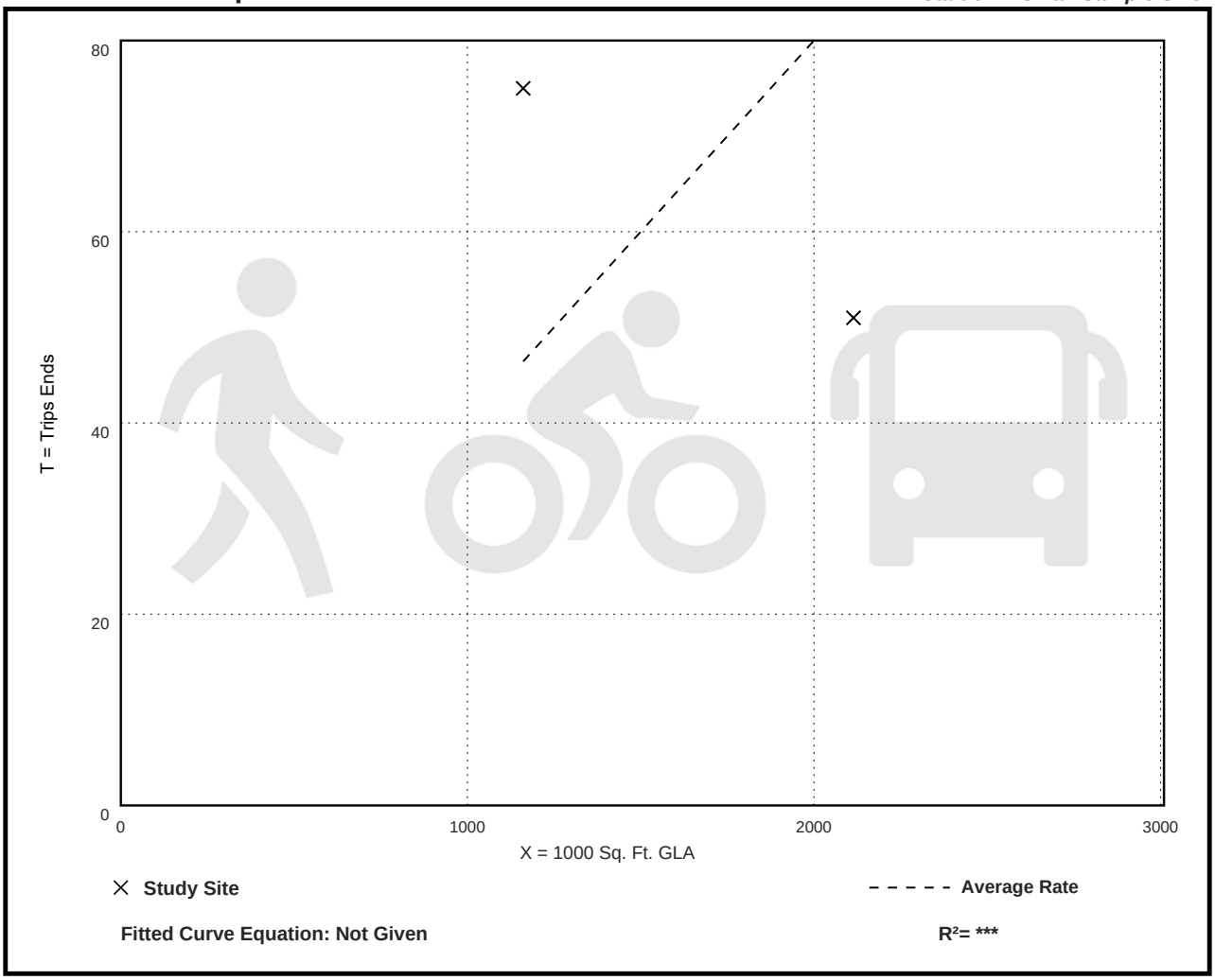
Walk+Bike+Transit Trip Ends vs: 1000 Sq. Ft. GLA
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 2
Avg. 1000 Sq. Ft. GLA: 1638
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
0.04	0.02 - 0.06	***

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: Not Given

R^2= *

Shopping Center (>150k)
(820)

Walk+Bike+Transit Trip Ends vs: 1000 Sq. Ft. GLA
On a: Saturday, Peak Hour of Generator

Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. 1000 Sq. Ft. GLA: 160
Directional Distribution: Not Available

Walk+Bike+Transit Trip Generation per 1000 Sq. Ft. GLA

Average Rate	Range of Rates	Standard Deviation
1.00	1.00 - 1.00	***

Data Plot and Equation

Caution – Small Sample Size