

**FEBRUARY 12, 2025**

**PROJECT NO: 2780-7271**

**SENT VIA: EMAIL  
CHRIS.TOEWS@MILTON.CA**

Town of Milton  
150 Mary Street,  
Milton, ON L9T 6Z5

**Attention: Chris Toews,  
Transportation Planning Technologist, Town of Milton**

**RE: TRANSPORTATION BRIEF  
475 HARROP DRIVE  
TOWN OF MILTON**

Dear Chris,

C.F. Crozier and Consulting Engineers (Crozier) has been retained by Wheel King Transhaul Inc. to prepare a Transportation Brief (TB) for a proposed change in land use of a portion of the existing industrial/commercial development at 475 Harrop Drive in the Town of Milton. The proposed change involves operating a Motor Vehicle Repair Garage within the existing building located on the southern half of the site, with no changes to the existing building structures.

The purpose of this Transportation Brief is to assess the potential impacts of the proposed land use change on the surrounding road network and to recommend appropriate transportation mitigation measures, if necessary.

A Terms of Reference (ToR) encompassing the scope of the Transportation Brief was sent to the Town of Milton on January 15, 2025, and comments were received from the Town on the proposed scope of work on January 27, 2025. Correspondence from the Town of Milton is included in **Attachment A**.

## 1.0 Introduction

### 1.1 Development Lands

The subject lands cover an area of approximately 1.3 ha and currently consists of an existing industrial/commercial trucking development. The site, located in a mixed-use industrial and residential neighborhood, is bounded by existing industrial development to the north, east and south, Harrop Drive to the west. The subject lands have two access points; however, the western access is locked and not operational. The location of the development is shown in **Attachment B**.

### 1.2 Development Proposal

Per the most recent concept plan prepared by Y. Zhang Surveying Limited, received on February 9, 2025, and included as **Attachment C**, the development undergoing a land use change measures 2052.2 m<sup>2</sup>. Additionally, an office building on-site will remain unchanged and measures 280.0 m<sup>2</sup>.

### 1.3 Scope of Study

Given that this is a change in land use with no proposed changes to the building limits, we do not anticipate significant impacts on existing transportation infrastructure based on the change in use.

As a result, a full Transportation Impact Study (TIS) is not considered necessary, and a Transportation Brief was considered appropriate to support the planning application.

The purpose of this brief is to analyze the following aspects of the proposed redevelopment from a transportation operations perspective:

- Forecast the change in trip generation characteristics of the proposed redevelopment using the Institute of Transportation Engineers Manual (11<sup>th</sup> edition).
- Evaluate the existing site access from a sight distance and geometry perspective.
- Prepare vehicle turning analysis to ensure critical design vehicles accessing the development can enter and exit without issues.
- Verify that the current parking supply aligns with the Town's standards.
- Assess potential Transportation Demand Management (TDM) opportunities for the proposed redevelopment to reduce single-occupancy vehicle (SOV) trips.

## 2.0 Site Generated Traffic

### 2.1 ITE Trip Generation for Existing Land use

The trip generation for the site was forecasted using published data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11<sup>th</sup> Edition. The ITE Trip Generation Manual is a compendium of industry collected trip generation data across North America for a variety of land uses and is used industry wide as a source for trip generation forecasts.

The existing land serves as a truck rental service (Tyson trucking group) with a Gross Floor Area (GFA) of 2052.2 m<sup>2</sup>. For this land use, Land Use Category (LUC) 841: *Automobile Sales* was applied. Average trip generation rates for a General Urban/Suburban setting were used. The forecasted weekday a.m. and p.m. trip generation for the site is outlined in **Table 1** below:

**Table 1: Trip Generation for the Existing Land Use**

ITE Land Use Category	GFA	Peak Hour	Trips Generated		
			Inbound	Outbound	Total
LUC 841 "Automobile Sales"	2052.2 m <sup>2</sup>	A.M.	36	11	47
		P.M.	39	44	83

Based on the ITE Trip Generation estimates, the existing land use is forecasted to generate 47 and 83 total two-way vehicle trips during the weekday a.m. and p.m. peak hours, respectively.

## 2.2 ITE Trip Generation for Proposed Land use

The proposed change in land use will accommodate a motor vehicle repair garage with the same Gross Floor Area (GFA) as the existing use, 2052.2 m<sup>2</sup>. For the proposed land use, Land Use Category (LUC) 942: *Automobile Care Center* was applied. Average trip generation rates for a General Urban/Suburban setting were used. The forecasted weekday a.m. and p.m. trip generation for the site is outlines in **Table 2** below

**Table 2: Trip Generation for the Proposed Land Use**

ITE Land Use Category	GFA	Peak Hour	Trips Generated		
			Inbound	Outbound	Total
LUC 942 "Automobile Care Center"	2052.2 m <sup>2</sup>	A.M.	33	17	50
		P.M.	33	36	69

Based on the ITE Trip Generation estimates, the proposed land use is forecasted to generate 50 and 69 total two-way vehicle trips during the weekday a.m. and p.m. peak hours, respectively.

## 2.3 Net Trip Generation

A net trip generation explains the change in the number of trips generated by comparing the trips from the proposed land use to those of the existing land use during the weekday a.m. and p.m. peak hours. The proposed change in land use is expected to generate a total of 50 and 69 two-way trips during the weekday a.m. and p.m. peak hours, respectively. In comparison, the existing land use generates a total of 47 and 83 two-way trips during the a.m. and p.m. peak hours, respectively. The details of the net trip generation are summarized in **Table 3** below:

**Table 3: Net Trip Generation**

Land Use	ITE Land Use Category	GFA	Total Trips Generated		
			A.M.	P.M.	Total
Proposed Land Use	LUC 942 "Automobile Care Center"	2052.2 m²	50	69	119
Existing Land Use	LUC 841 "Automobile Sales"		47	83	130
Net Trip Generation			+3	-14	-11

Based on the comparison, the proposed land use is expected to generate 3 more trips during the a.m. peak period and 14 fewer trips during the p.m. peak period, resulting in an overall reduction of 11 trips. The forecasted trip generation for the proposed land use is minimal from a traffic operations perspective and is not typically associated with operational issues. This further supports the conclusion that the proposed land use will have no significant impact on traffic within the surrounding road network. As such, a detailed traffic capacity analysis has not been conducted for this assessment. Relevant excerpts from the ITE Trip Generation Manual, 11th Edition have been included in **Attachment D**.

### 3.0 Site Access Review

The available sightlines at the proposed site access on Harrop Drive were measured and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR). Section 9.9 of TAC GDGCR provides intersection sight distance for different intersection control types. The applicable cases are as follows:

- Case B – Intersections with stop control on the minor road
  - Case B1 – Left turn from the minor road
  - Case B2 – Right turn from the minor road

Intersection sight distance is calculated using equation 9.9.1 from the TAC GDGCR as outlined below:

$$ISD = 0.278 * V_{major} * t_g$$

Where:

- ISD = Intersection Sight Distance
- $V_{major}$  = design speed of roadway (km/h)
- $t_g$  = assumed time gap for vehicles to turn from stop onto roadway (s)

Sight distance was measured from the site accesses using the following assumptions:

- A standard driver eye height of 1.08 metres for a passenger car, and
- A 4.4 metre setback from the approximate extension of the outer curb to represent a vehicle waiting to exit the site.



The site has two access points; however, the western access is currently locked and unavailable for use.

The design speed of a roadway in an urban environment is typically 10 km/h greater than the posted speed limit. Harrop Drive has a speed limit of 50 km/h. Accordingly, a design speed of 60 km/h was assumed for the analysis. Also, since semi-trailer truck will be accessing the site, a base time gap of 10.5 s for right turn and 11.5 s for left turn was applied. **Table 4** summarizes the sight distance analysis for the proposed site access.

**Table 4: Intersection Sight Distance Assessment**

Feature	Sight Access
Access Type	Full moves
Assumed Design Speed	60 km/h
Base Time Gap (right turn)	Right Turn: 10.5 s Left turn: 11.5 s
Additional Time Gap	None
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway	Straight
Required Sight Distance	Right turn: 180 m Left Turn: 195 m
Available Sight Distance	Right turn: 180 m+ Left Turn <sup>1</sup> : 195 m+

As outlined in **Table 4**, the minimum sight distance requirements are satisfied at the proposed site access to Harrop Drive. A visual representation has been shown in **Attachment E**.

## 4.0 Site Circulation

A maneuvering assessment was conducted to ensure the proposed site access design can accommodate the expected design vehicles and their expected movements.

The following vehicles were tested for ingress and egress the site:

- WB-20 Standard Tractor Trailer (20.0 m in length).
- Halton Pumper Fire Truck (12.2 m in length).
- Halton Garbage Truck (9.7 m in length).
- Standard Medium Single Unit Truck (10.0 m in length).
- Standard Passenger Vehicle (5.6 m in length).

All tested vehicles can successfully enter and exit the site without issues. Detailed vehicle maneuvering diagrams are provided in **Attachment F**.

## 5.0 Town of Milton Zoning By-Law Requirements

The Town of Milton Urban Zoning By-Law (ZBL) 016-2014 parking requirements have been reviewed in the following sections. **Attachment G** contains the relevant ZBL requirements.

### 5.1 Vehicle Parking Assessment

According to Section 5.8.2, Table 5G of ZBL 016-2014, the subject site is classified as a motor vehicle repair garage. **Table 5** below summarizes the minimum parking requirements applicable to the proposed developments on the site.

**Table 5: Town of Milton Zoning By-law Parking Requirements**

Building (By-Law Land Use)	Units / GFA	Minimum Parking Space Rate	Available No of Service Bay	Required Minimum Vehicle Parking Spaces
Motor Vehicle Repair Garage	2052.2 m <sup>2</sup>	3 parking spaces per service bay	4 service bays	12
Office	280.0 m <sup>2</sup>	1 parking space per 30 m <sup>2</sup>	-----	10
<b>Total Required Parking Spaces</b>				<b>22 spaces</b>
<b>Total Available Parking Spaces</b>				<b>148 spaces</b>
<b>Surplus/Deficit</b>				<b>+126 spaces</b>

As outlined above, the Town of Milton Zoning By-Law (ZBL) requires the developments to provide a minimum of 22 parking spaces. With a total of 148 parking spaces available on-site, the development adheres to the Town's ZBL.

### 5.2 Accessible Parking Requirements

Section 5.19 of the Town of Milton Zoning By-Law 016-2014 was reviewed to determine the accessible parking space requirements of the proposed redevelopment. A summary of the proposed parking and required parking can be found in **Table 6**.

**Table 6: Zoning By-Law Accessible Parking Spaces Review**

Zoning By-Law Accessible Parking Spaces Rate	Total Required Parking Space	Required Accessible Parking Spaces
4% of required parking spaces.	22	2 spaces (1 Type A and 1 Type B) <sup>1</sup>
<b>Total Accessible Parking Spaces Proposed (Surplus/Deficit)</b>		<b>0 (2)</b>

*Note 1: Where the minimum number of accessible parking spaces is odd, an equal number of Type A and Type B accessible parking spaces shall be provided but the last accessible parking space may be a Type B.*

As shown in **Table 6**, the required number of accessible parking spaces is deficient. However, given the surplus of 126 parking spaces, it is recommended that some of these surplus spaces be converted to accessible parking spaces to meet the by-law requirements.

## 6.0 Transportation Demand Management

Transportation Demand Management (TDM) refers to various strategies to reduce traffic congestion, minimize the number of single-occupant vehicles, encourage non-auto modes of travel, and reduce vehicle dependency to create a sustainable transportation system.

TDM strategies have multiple benefits, including the following:

- Reduced auto-related emissions to improve air quality.
- Decreased traffic congestion to reduce travel time.
- Increased travel options for residents and commuters.
- Reduced personal transportation costs and energy consumption.
- Support Provincial Smart Growth Objectives.

### 6.1 Existing TDM Measures

Currently, there are no designated pedestrian or cycling facilities along Harrop Drive, limiting active transportation options for site users where it would be expected that any pedestrians walk in the boulevard and cycling occur on-street.

Additionally, the site is not well serviced by transit with the nearest bus stop is approximately a 15-minute walk from the site. This bus stop provides connections to the Milton GO Station, facilitating broader transit access for commuters.

### 6.2 Site Specific TDM Opportunities

There are several opportunities for the development to promote TDM measures to support reduced automobile use. The following are recommended initiative to reduce the use of single occupant vehicles to and from the site:

**Carpooling:** Employers should encourage employees who typically use single-occupancy vehicles to consider carpooling as a cost-effective and environmentally friendly commuting option. One car share parking space located near the building entrance could be provided on site for employees of the site who choose to carpool.

## 7.0 Conclusions

Wheel King Transhaul Inc. has proposed a change in land use of a portion of the existing commercial development at 475 Harrop Drive in the Town of Milton. As the portion of the building proposed to have a change in land use is relatively small, vehicle trip generation to and from the site is not expected to materially change.

The analysis within this report can be summarized with the following key findings:

- The net trip generation analysis shows that the proposed land use will generate 7 fewer trips during the a.m. peak and 10 fewer trips during the p.m. peak compared to the existing use. This minimal change is not expected to impact traffic operations, and as such, a detailed traffic capacity analysis is not required.

- A review of sight lines for the existing site access at Harrop Drive indicates that there is sufficient sight distance for vehicles accessing the subject property. It is noted that the northern curb cut that exists on Harrop Drive is not currently or expected to be in use.
- A vehicle maneuvering assessment was conducted at the site access using critical design vehicles that are expected to access the site, and no issues were noted.
- Parking requirements for both vehicles and accessible spaces were reviewed in accordance with the Town of Milton Urban Zoning By-Law (ZBL) 016-2014. The assessment shows that the requirement for vehicle parking is met, but the requirement for accessible parking is not met. However, it is recommended that some of the surplus parking spaces be converted to accessible parking spaces to meet the requirement.
- An evaluation of existing non-auto transportation facilities at the site was conducted and site specific TDM measures were proposed as the following:
  - Consideration for the provision of one carpool space on site located in a priority location near the existing building entrance to encourage carpooling for employees.

We trust that this Transportation Brief addresses the transportation impacts associated with the proposed change of use at the site. Should you have any questions or require any further information, please feel free to contact the undersigned.

Sincerely,

**C.F. CROZIER & ASSOCIATES INC.**



Idris Afolabi  
Engineering Intern, Transportation

BB/IA

**C.F. CROZIER & ASSOCIATES INC.**



Brandon Bradt, M.Eng.CEM, P.Eng  
Manager, Transportation Planning

**Enclosed Attachments**

Attachment A: Correspondence  
Attachment B: Site Location  
Attachment C: Site Plan  
Attachment D: Trip Generation Excerpts  
Attachment E: Sight Distance Analysis  
Attachment F: Vehicle Maneuvering Diagrams  
Attachment G: Town of Milton Urban Zoning By-Law (ZBL) 016-2014 Excerpts

J:\2700\2780 - Wheel King Transhaul Inc\7271 - 475 Harrop Drive\Reports

# **ATTACHMENT A**

## Correspondence

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**From:** [Chris.Toews@milton.ca](mailto:Chris.Toews@milton.ca) <[Chris.Toews@milton.ca](mailto:Chris.Toews@milton.ca)>  
**Sent:** Monday, January 27, 2025 10:52 AM  
**To:** Idris Afolabi <[iafolabi@cfcrozier.ca](mailto:iafolabi@cfcrozier.ca)>  
**Cc:** Brandon Bradt <[bbradt@cfcrozier.ca](mailto:bbradt@cfcrozier.ca)>; Aarzoo Dhanani <[adhanani@cfcrozier.ca](mailto:adhanani@cfcrozier.ca)>  
**Subject:** RE: Terms Of Reference- 475 Harrop Drive

Good morning Idris,

My name is Chris Toews, I am a Transportation Planning Technologist with the Town of Milton, and I will be reviewing the TIS submitted for this development application.

Thanks for providing the Terms of Reference below. Given the scope of this development application, a Transportation Brief is acceptable. However, we have a few comments to add, see below **in red**.

Let me know if there are any questions.

Kind regards,  
Chris



**Chris Toews**  
Transportation Planning Technologist  
150 Mary Street., Milton ON, L9T 6Z5  
905-878-7252 ext. 2502  
[www.milton.ca](http://www.milton.ca)

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**From:** Idris Afolabi <[iafolabi@cfcrozier.ca](mailto:iafolabi@cfcrozier.ca)>  
**Sent:** Wednesday, January 15, 2025 10:42 AM  
**To:** Sian Younan <[Sian.Younan@milton.ca](mailto:Sian.Younan@milton.ca)>  
**Cc:** Brandon Bradt <[bbradt@cfcrozier.ca](mailto:bbradt@cfcrozier.ca)>; Aarzoo Dhanani <[adhanani@cfcrozier.ca](mailto:adhanani@cfcrozier.ca)>  
**Subject:** Terms Of Reference- 475 Harrop Drive

Hello Sian,

C.F. Crozier and Consulting Engineers (Crozier) has been retained by Wheel King Transhaul Inc. to prepare a Traffic Brief (TB) for a proposed change in land use of a portion of the existing industrial/commercial development at 475 Harrop Drive in the Town of Milton. The proposed land use change involves operating a Motor Vehicle Repair Garage within the existing building located on the southern half of the site, with no additional structures being proposed. The Site Plan is attached to this email for your review.

This email and its attachment are intended to serve as the Terms of Reference (ToR) for the TB to support the development application. We are kindly requesting that you review the ToR and provide feedback regarding our scope of work and request for data. Should you not be the appropriate person for correspondence, it would be appreciated to be directed to the appropriate contact.

#### **Study Methodology for the Transportation brief**

Given that this is a change in land use rather than a redevelopment, we do not anticipate significant impacts on existing transportation infrastructure. Therefore, a full Transportation Impact Study (TIS) is not deemed necessary. Instead, we propose preparing a Transportation Brief with a reduced scope of work. **Please confirm this is acceptable. – Acceptable, however please ensure that any assumptions are thoroughly documented, and justified in the report.**

#### **Trip Generation**

To assess the potential traffic impact of the proposed Motor Vehicle Repair Garage at 475 Harrop Drive, we will conduct a trip generation forecast using data from the Institute of Transportation Engineers (ITE) Trip Generation Manual, 11th Edition, under Land Use Code 942: Automobile Care Center. Based on this forecast, we will evaluate whether the development is likely to have a significant effect on traffic operations. **Please confirm this is acceptable. - Acceptable**

#### **Site Access Review**

The site access will be assessed with regards to sight distance availability and geometry and compared to the standards set out in the Transportation Association of Canada (TAC) Geometric Design Guide for Canadian Roads (GDGCR), and the Town/Region standards as required. **Please confirm this is acceptable. - Acceptable**

#### **Site Circulation**

A vehicle maneuvering test will be conducted on the site accesses using emergency, waste collection, semi-trailer trucks and passenger vehicles to assess maneuverability. **Please confirm this is acceptable. - Acceptable**

#### **Transportation Demand Management (TDM) Review**

Existing and future TDM opportunities will be assessed for the proposed development to reduce single-occupancy vehicle (SOV) trips and promote sustainable transportation. **Please confirm this is acceptable. – Please note this component would only be necessary if the site proposes a reduced parking supply (which does not comply with the Parking Requirements set out in the Town's Zoning By-law).**

### **Parking Review**

Include a review of the site's parking supply, comparing what is proposed to the Town of Milton's Zoning By-law requirements. If a reduced parking supply is proposed, a Parking Justification section needs to be incorporated into the TIS. Refer to the Town of Milton's Terms of Reference: Section B (Parking Justification Guidelines) for preparation of the Parking Justification section (link below for reference):

<https://www.milton.ca/en/business-and-development/resources/Development/Terms-of-Reference---Traffic-Impact-Study.pdf>

### **Summary**

We request confirmation of the following information for inclusion in the study, along with any comments that arise with regards to the above Terms of Reference.

- Confirmation that the study methodology is correct.
- Confirmation that the trip generation and analysis procedures are acceptable.
- Confirmation that the site access and site circulation review is sufficient.
- Confirmation that the TDM review is sufficient.

We hope that the contents outlined in this email are acceptable. Should you have any questions or require any further information, please feel free to contact us.

Regards,  
Idris Afolabi

### **Idris Afolabi**

Engineering Intern, Transportation  
Office: 437.290.8991

Collingwood | Milton | Toronto | Bradford | Guelph

Celebrating 20 years and another year as  
one of Canada's Top Growing Companies.





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# **ATTACHMENT B**

## Site Location





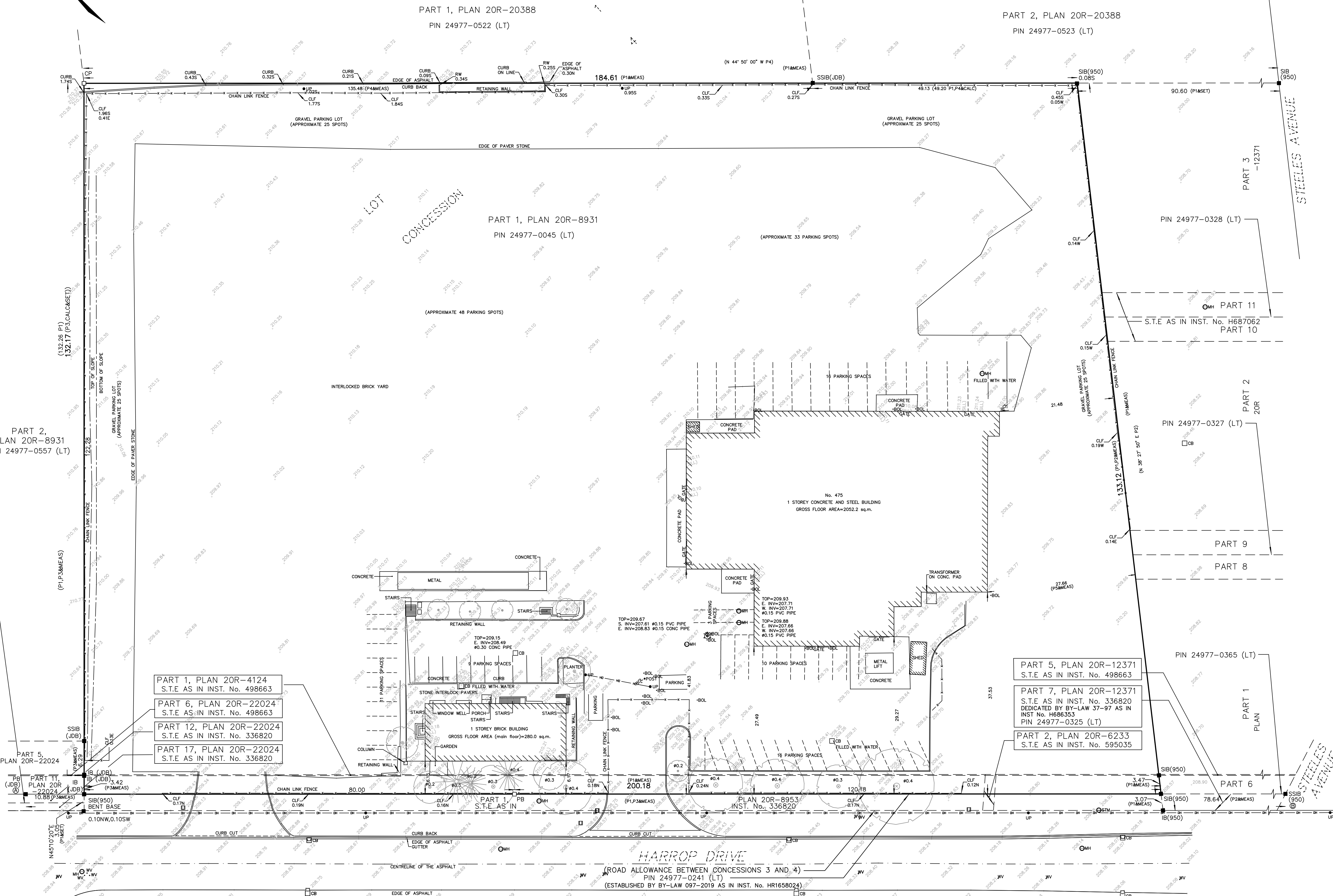
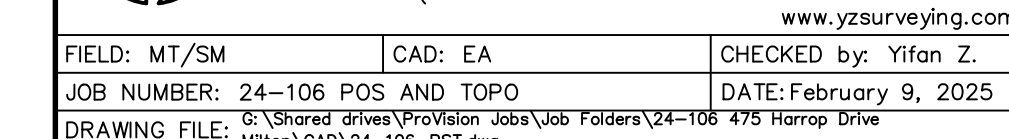
FOR REVIEW  
NOT TO BE USED FOR CONSTRUCTION

Project		475 HARROP DRIVE CITY OF MILTON	
Drawing		SITE LOCATION	
		211 YONGE STREET SUITE 600 TORONTO, ON, M5B 1M4 416-477-3392 T WWW.CFCROZIER.CA INFO@CFCROZIER.CA	
Drawn By	I.A.	Design By	Project 2780-7271
Check By	B.B.	Check By	Scale 1:750 Drawing B



# ATTACHMENT C

## Site Plan



# **ATTACHMENT D**

## ITE TRIP GENERATION EXCERPTS

# Land Use: 841

## Automobile Sales (Used)

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### Description

A used automobile sales dealership is typically located along a major arterial street characterized by abundant commercial development. The sale or lease of used cars is the primary business at these facilities. Automobile servicing and parts sales may also be available. The dealerships may also provide truck sales and servicing. Automobile sales (new) (Land Use 840) and recreational vehicle sales (Land Use 842) are related uses.

### Additional Data

The technical appendices provide supporting information on time-of-day distributions for this land use. The appendices can be accessed through either the ITETripGen web app or the trip generation resource page on the ITE website (<https://www.ite.org/technical-resources/topics/trip-and-parking-generation/>).

The sites were surveyed in the 2010s in Texas.

### Source Numbers

880, 881

# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 14

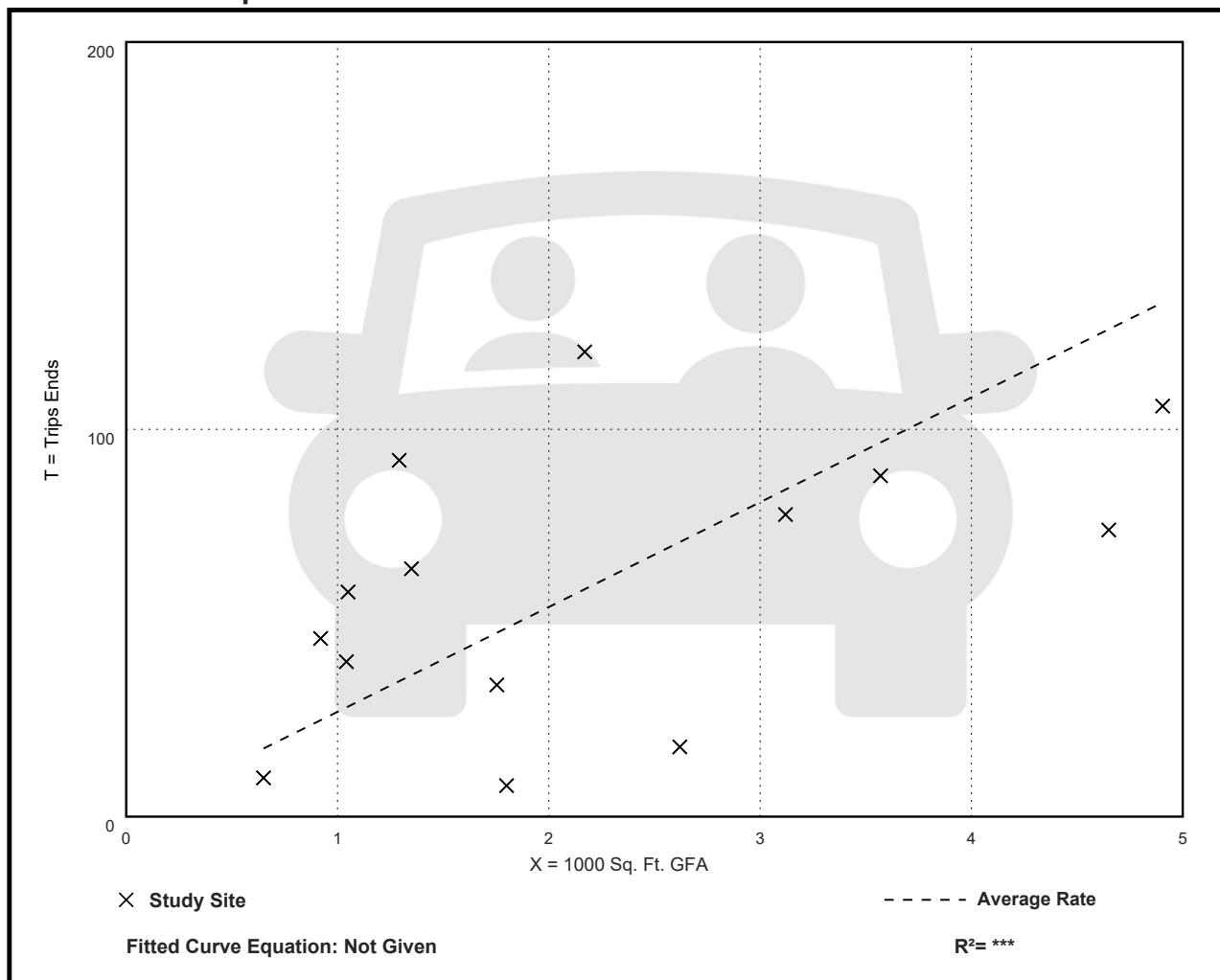
Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
27.06	4.44 - 71.21	17.91

## Data Plot and Equation





# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

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

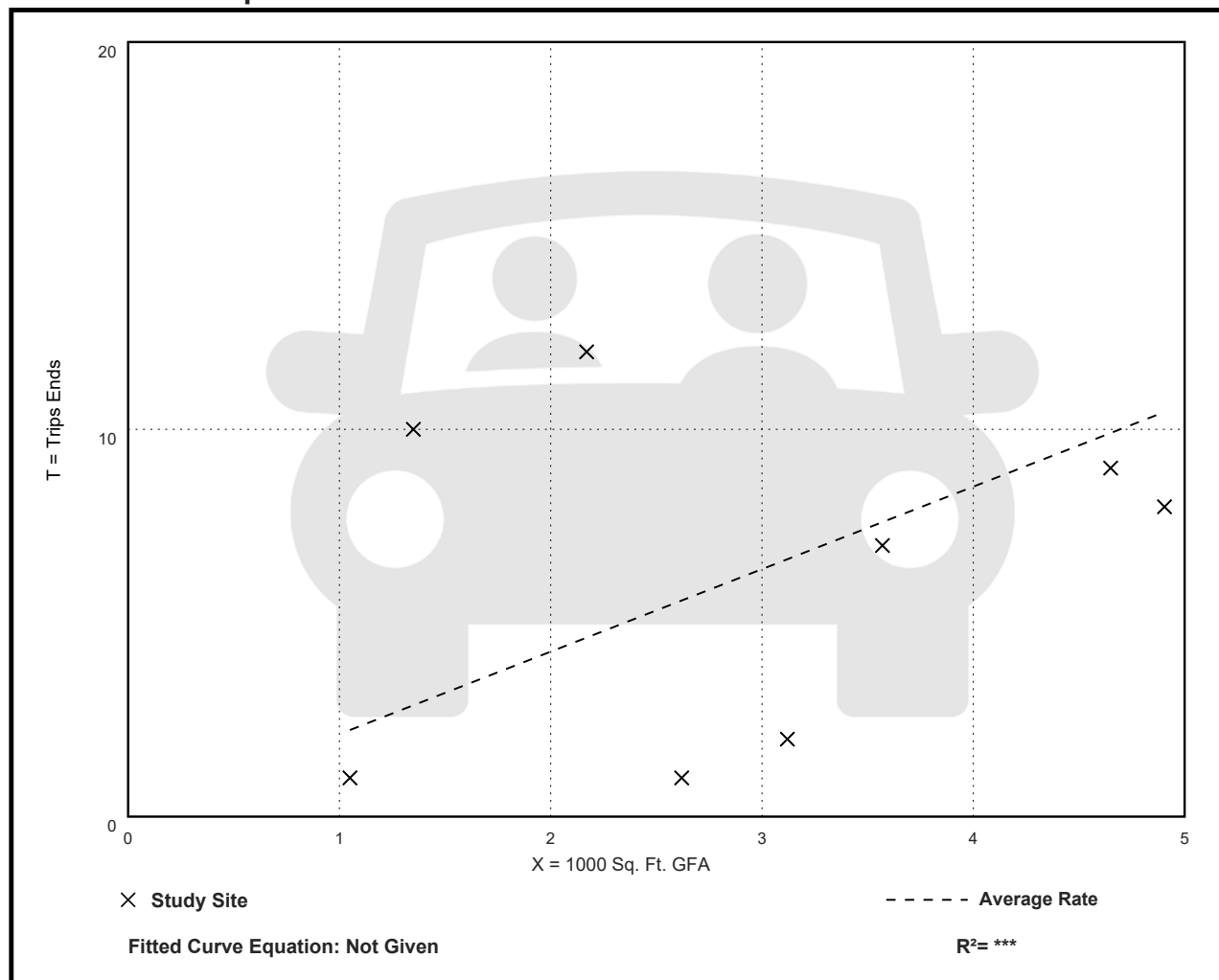
Avg. 1000 Sq. Ft. GFA: 3

Directional Distribution: 76% entering, 24% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.13	0.38 - 7.41	1.98

## Data Plot and Equation



# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

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: 14

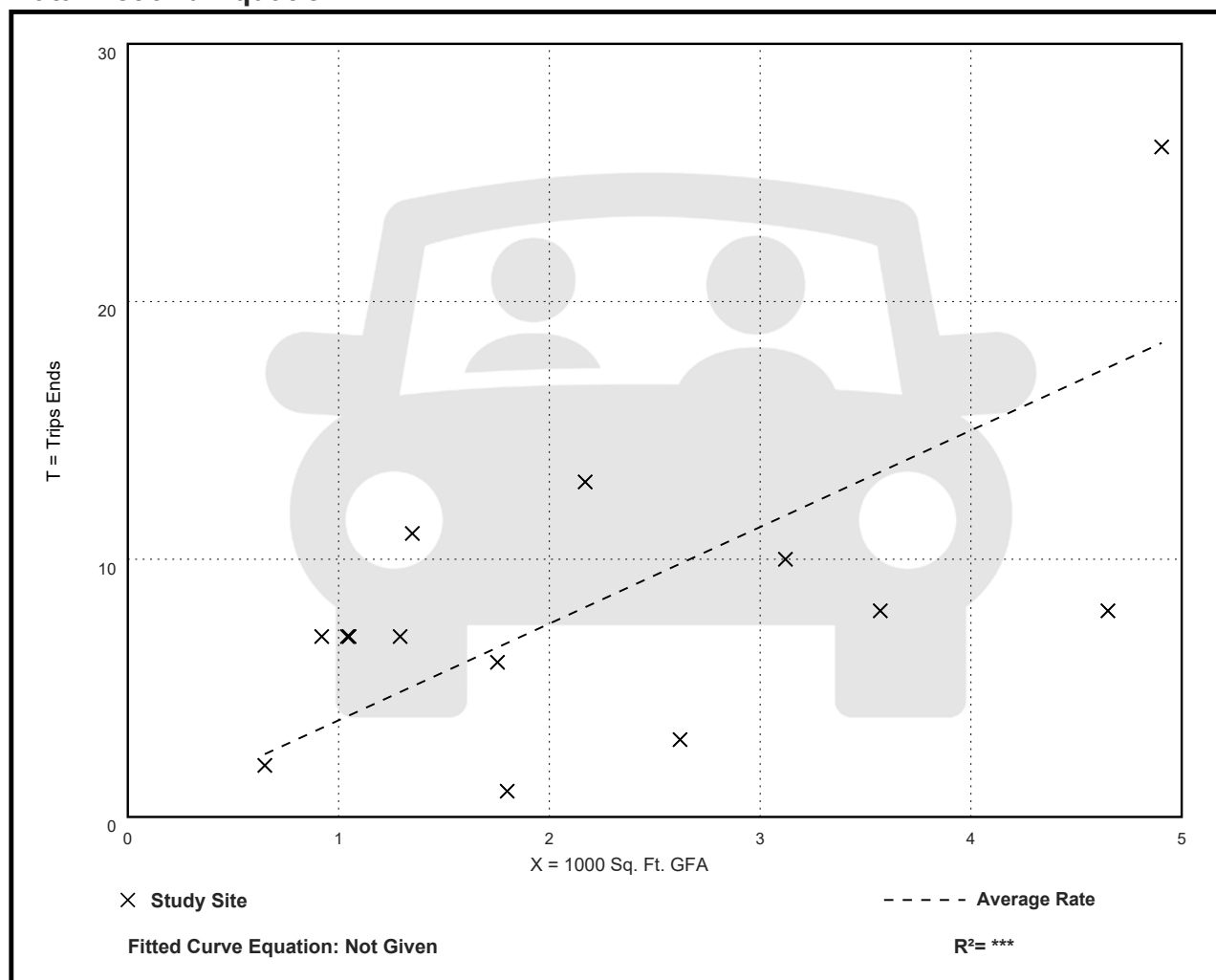
Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 47% entering, 53% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.75	0.56 - 8.15	2.28

## Data Plot and Equation



# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 14

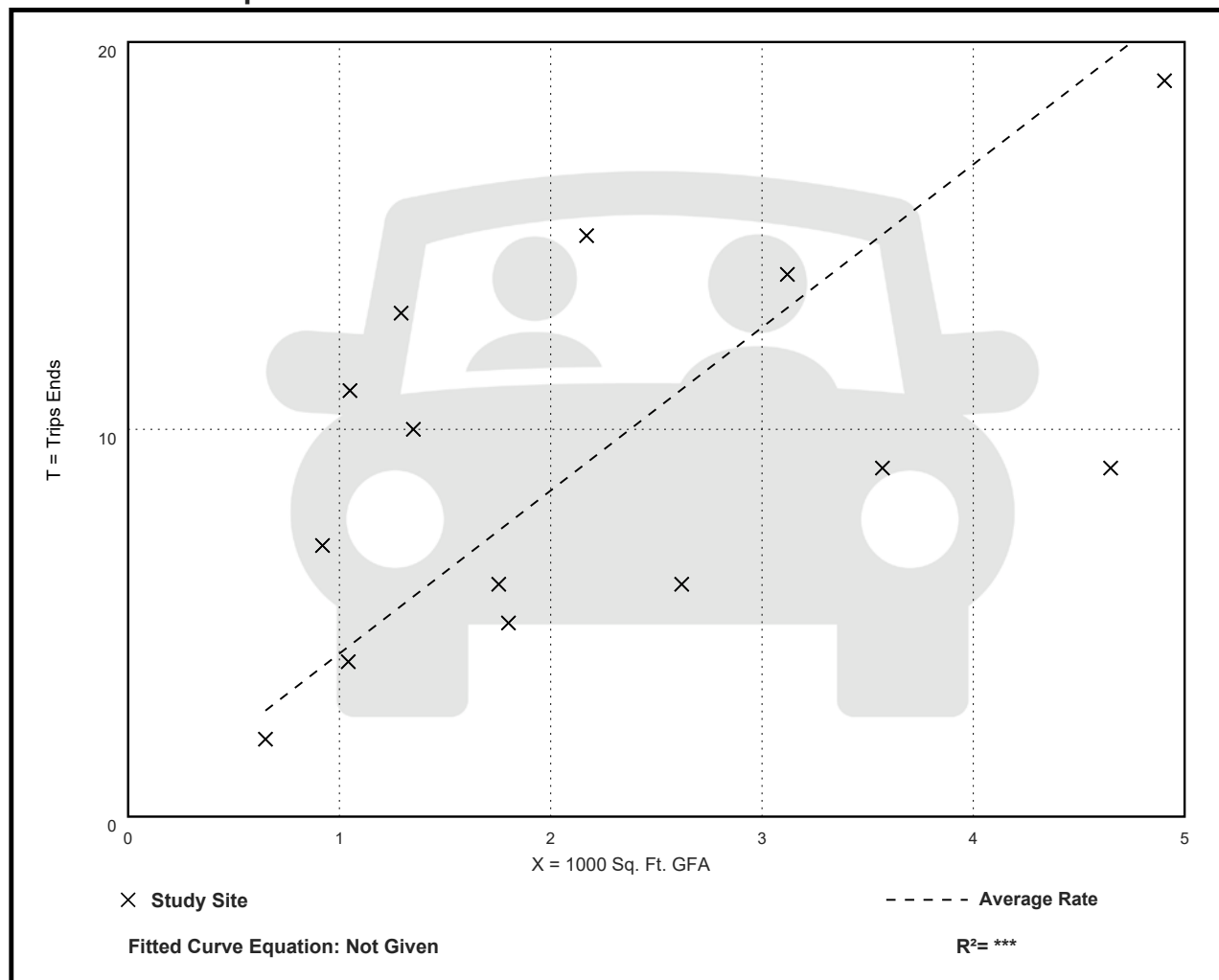
Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 58% entering, 42% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.21	1.94 - 10.48	2.48

## Data Plot and Equation



# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 14

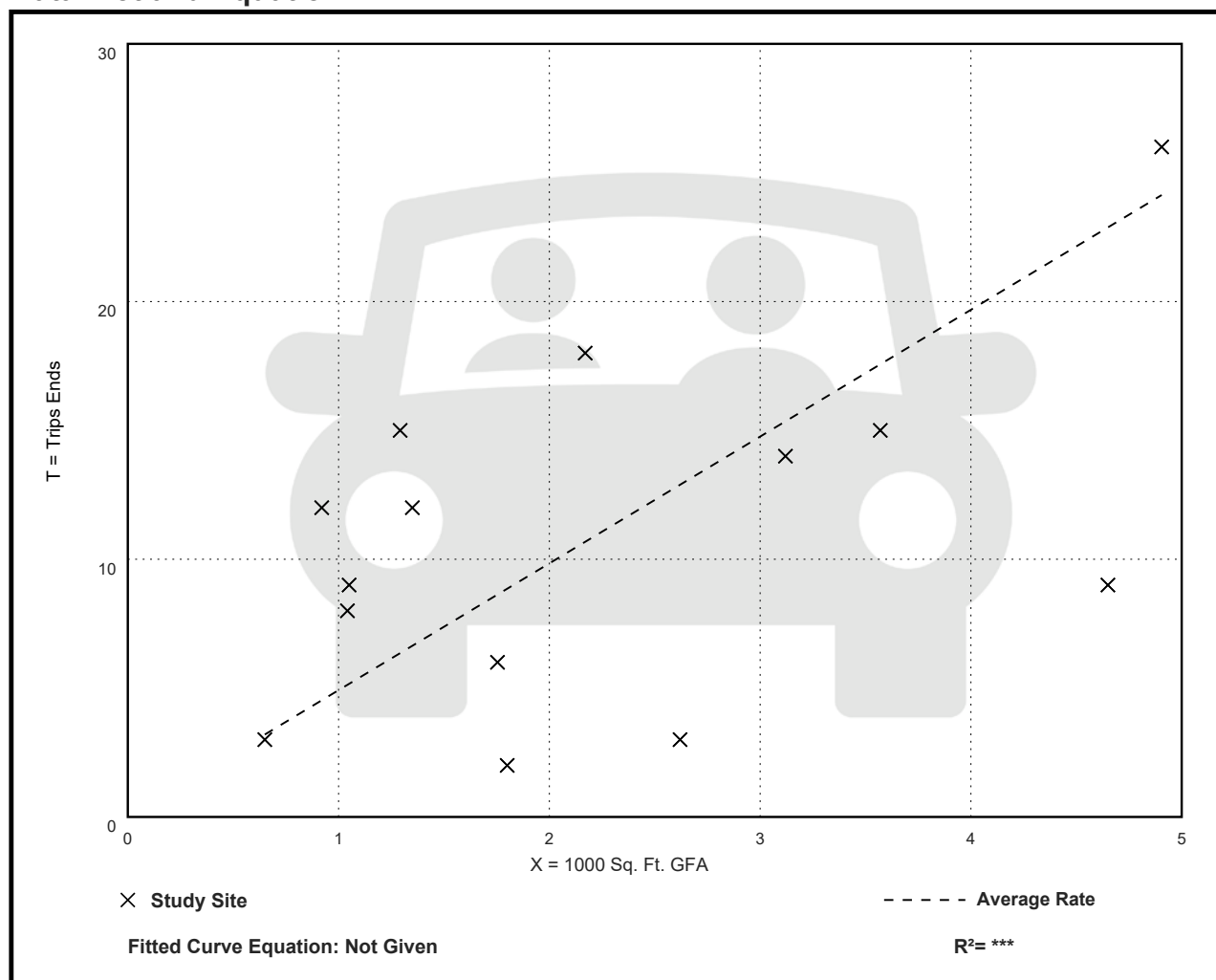
Avg. 1000 Sq. Ft. GFA: 2

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
4.92	1.11 - 13.04	3.23

## Data Plot and Equation



# Automobile Sales (Used) (841)

Vehicle Trip Ends vs: Employees  
On a: Weekday

Setting/Location: General Urban/Suburban

Number of Studies: 14

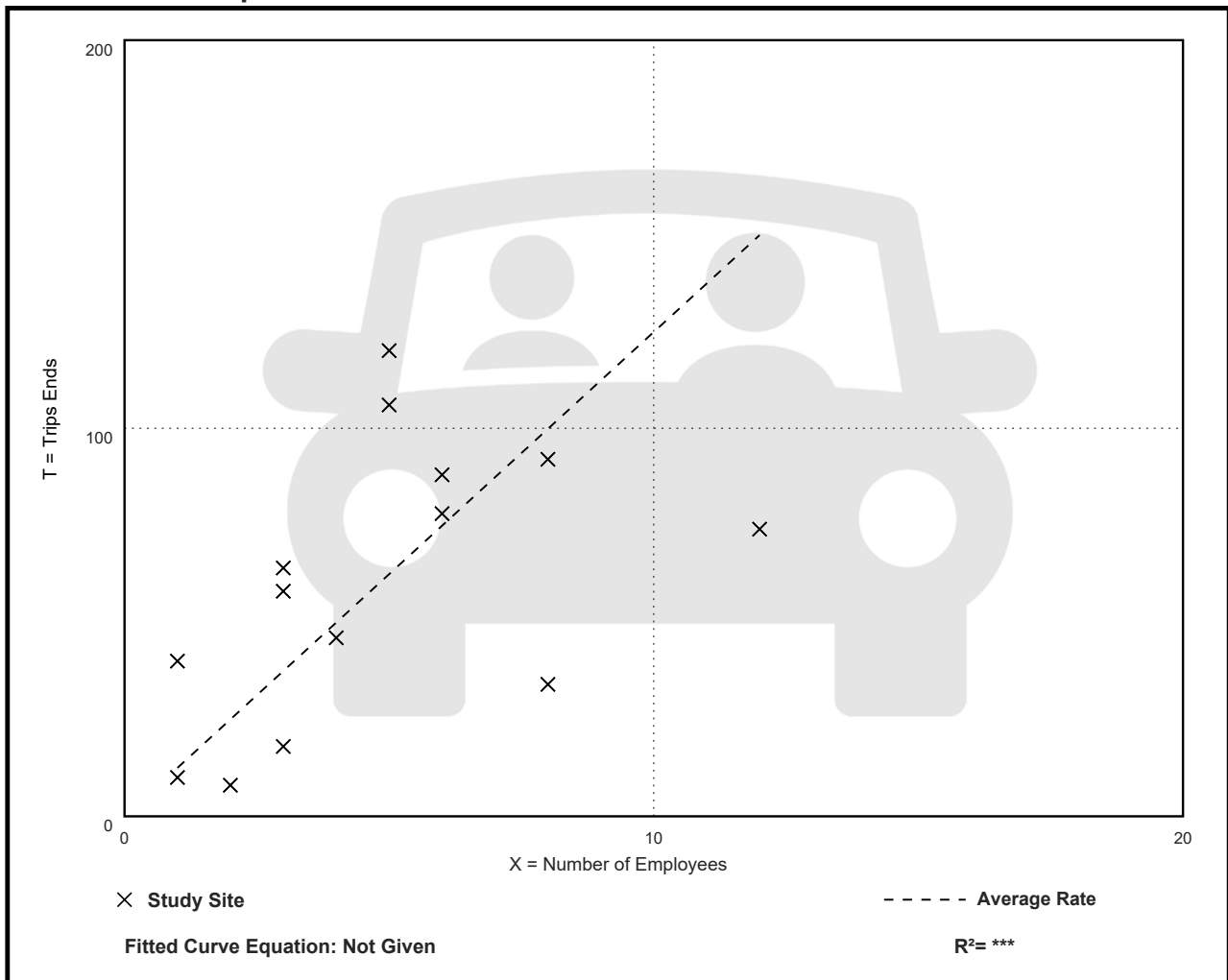
Avg. Num. of Employees: 5

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
12.48	4.00 - 40.00	7.52

## Data Plot and Equation



# Automobile Sales (Used) (841)

## 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: 8

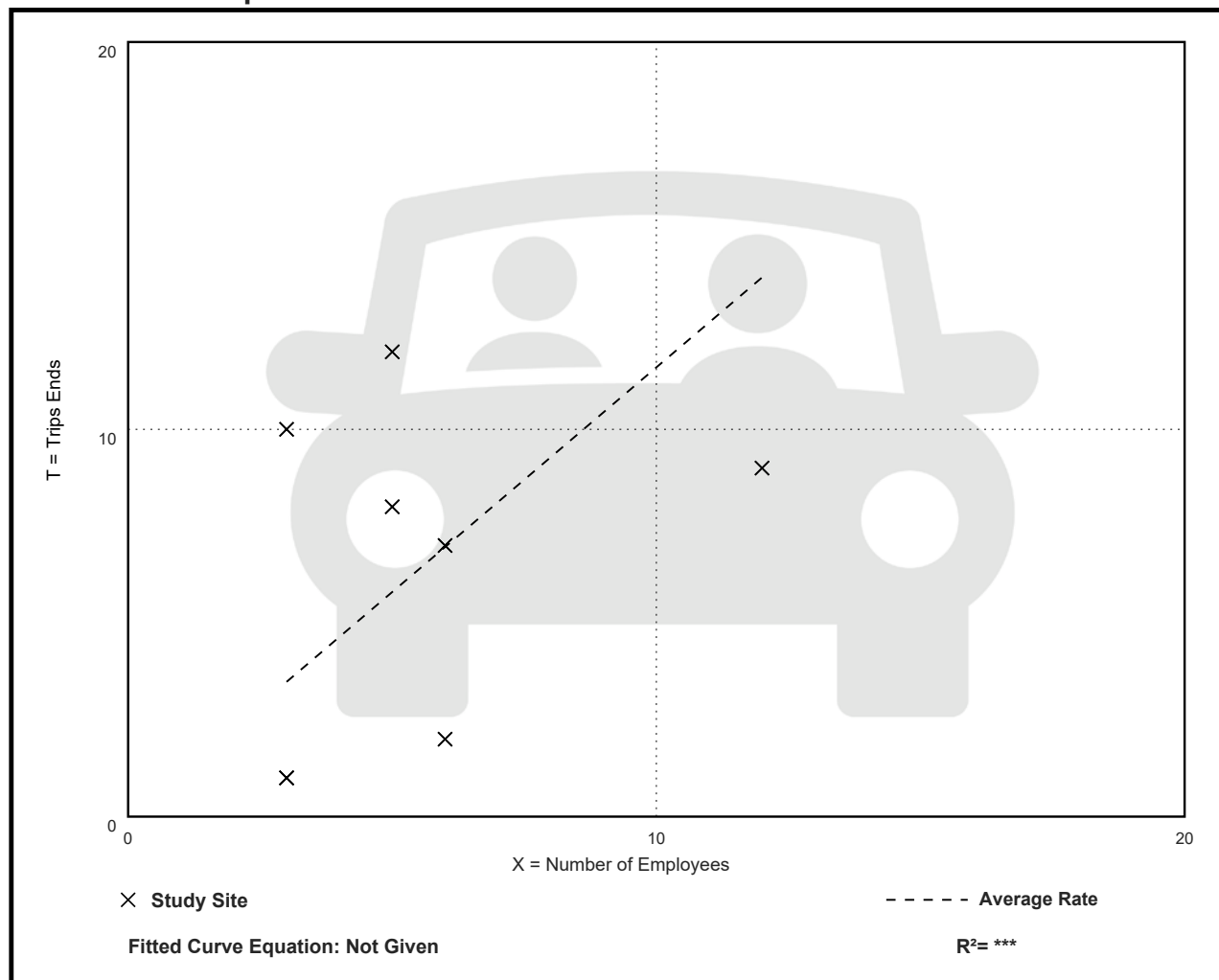
Avg. Num. of Employees: 5

Directional Distribution: 76% entering, 24% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.16	0.33 - 3.33	0.94

## Data Plot and Equation



# Automobile Sales (Used) (841)

## 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: 14

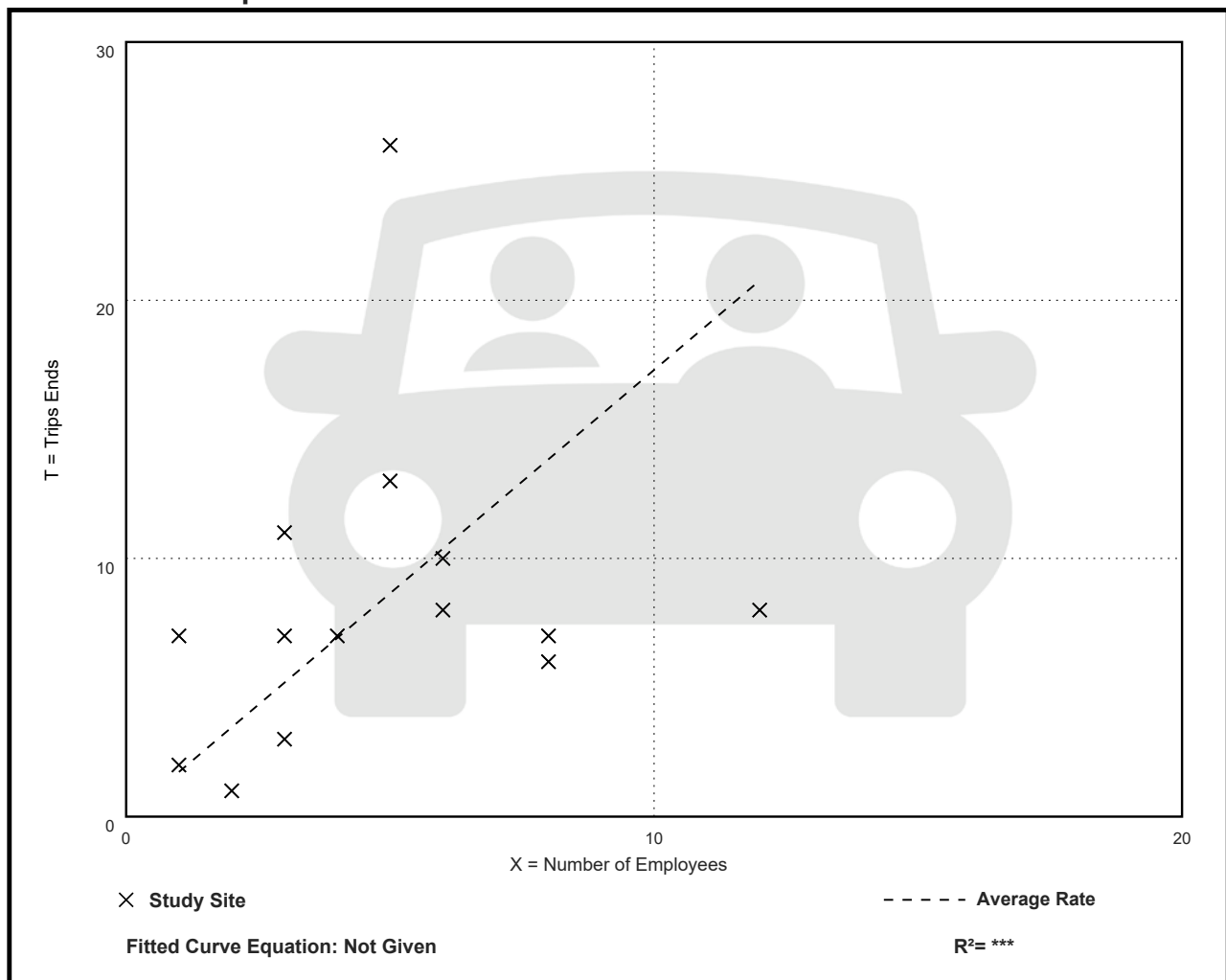
Avg. Num. of Employees: 5

Directional Distribution: 47% entering, 53% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.73	0.50 - 7.00	1.48

## Data Plot and Equation



# Automobile Sales (Used) (841)

## Vehicle Trip Ends vs: Employees

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 14

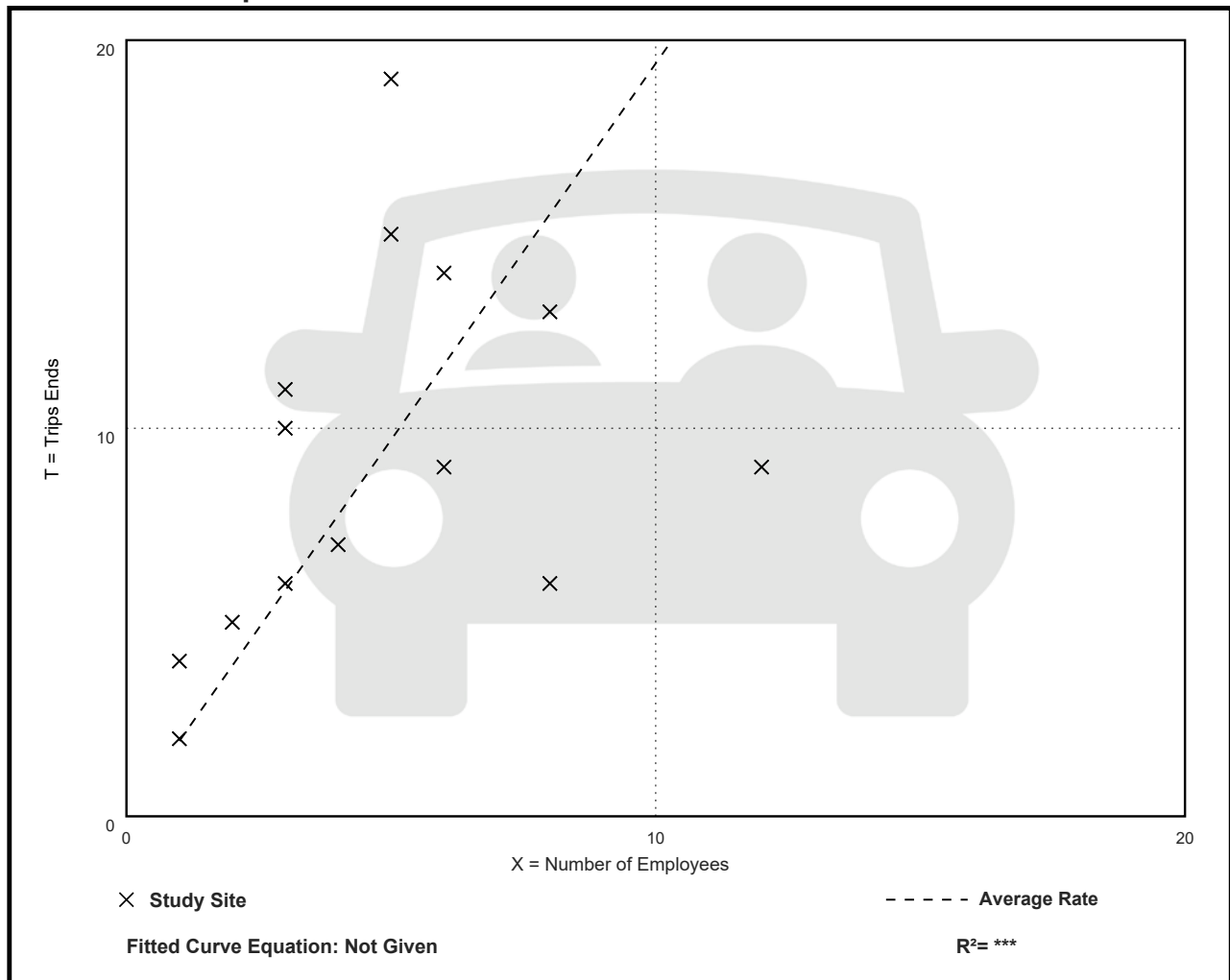
Avg. Num. of Employees: 5

Directional Distribution: 58% entering, 42% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.94	0.75 - 4.00	1.09

## Data Plot and Equation





# Automobile Sales (Used) (841)

## Vehicle Trip Ends vs: Employees

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 14

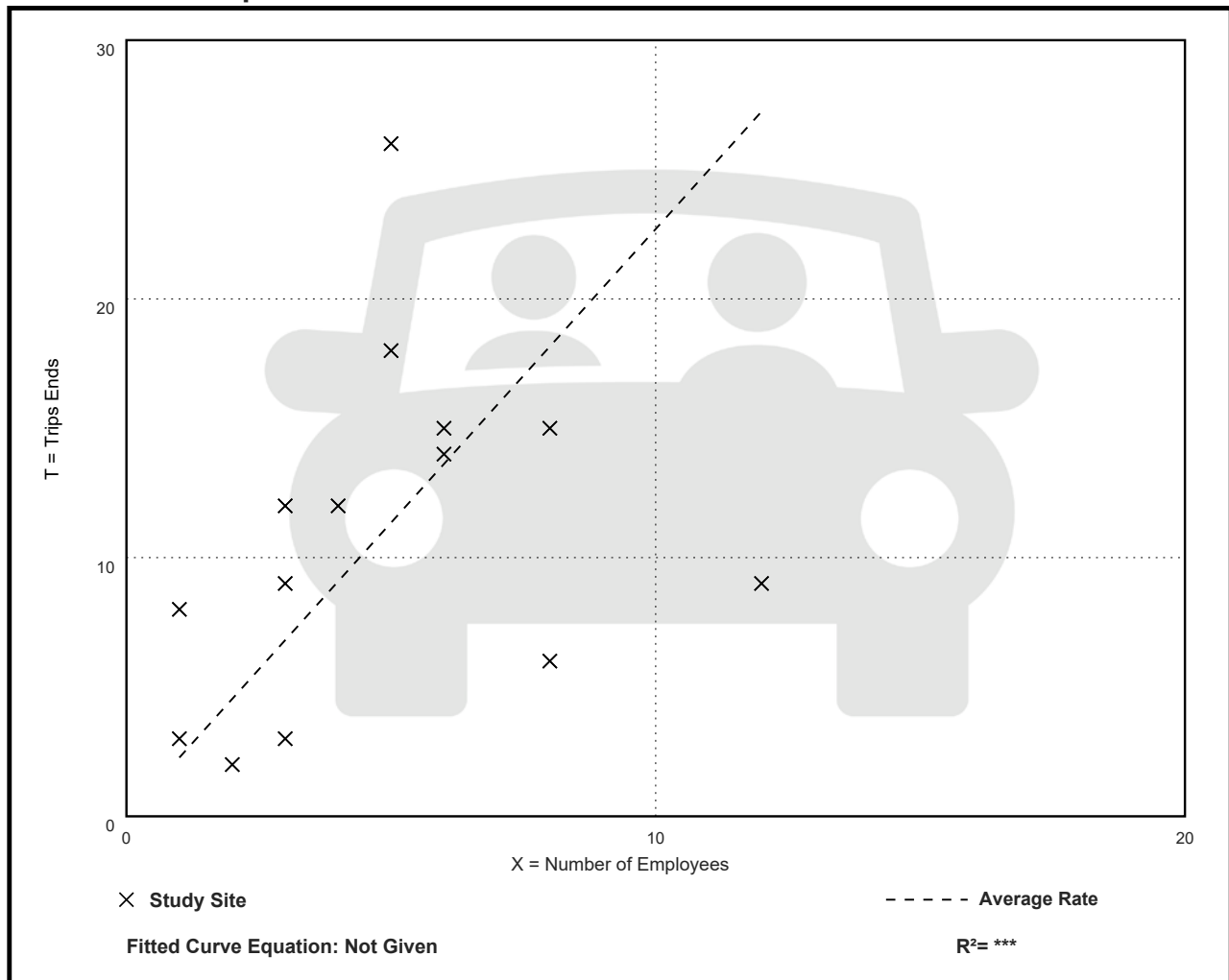
Avg. Num. of Employees: 5

Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
2.27	0.75 - 8.00	1.57

## Data Plot and Equation



# Land Use: 942

## Automobile Care Center

---

### Description

An automobile care center houses numerous businesses that provide automobile-related services, such as repair and servicing, stereo installation, and seat cover upholstery. Quick lubrication vehicle shop (Land Use 941) and automobile parts and service center (Land Use 943) are related uses.

### Additional Data

The sites were surveyed in the 1980s and the 1990s in California and Florida.

### Source Numbers

267, 273, 439, 715

# Automobile Care Center (942)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

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: 6

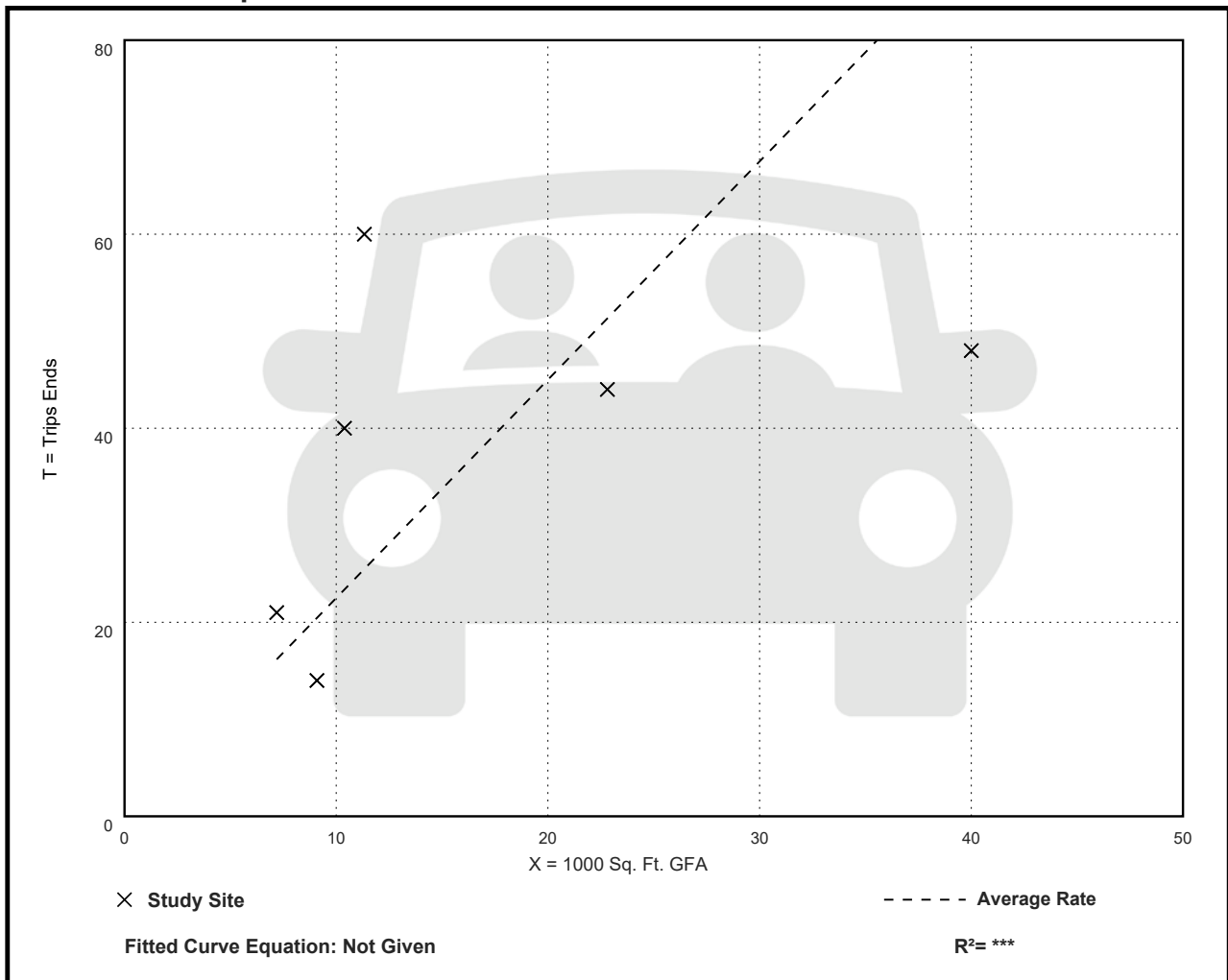
Avg. 1000 Sq. Ft. GFA: 17

Directional Distribution: 66% entering, 34% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.25	1.20 - 5.30	1.49

## Data Plot and Equation



# Automobile Care Center (942)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

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: 6

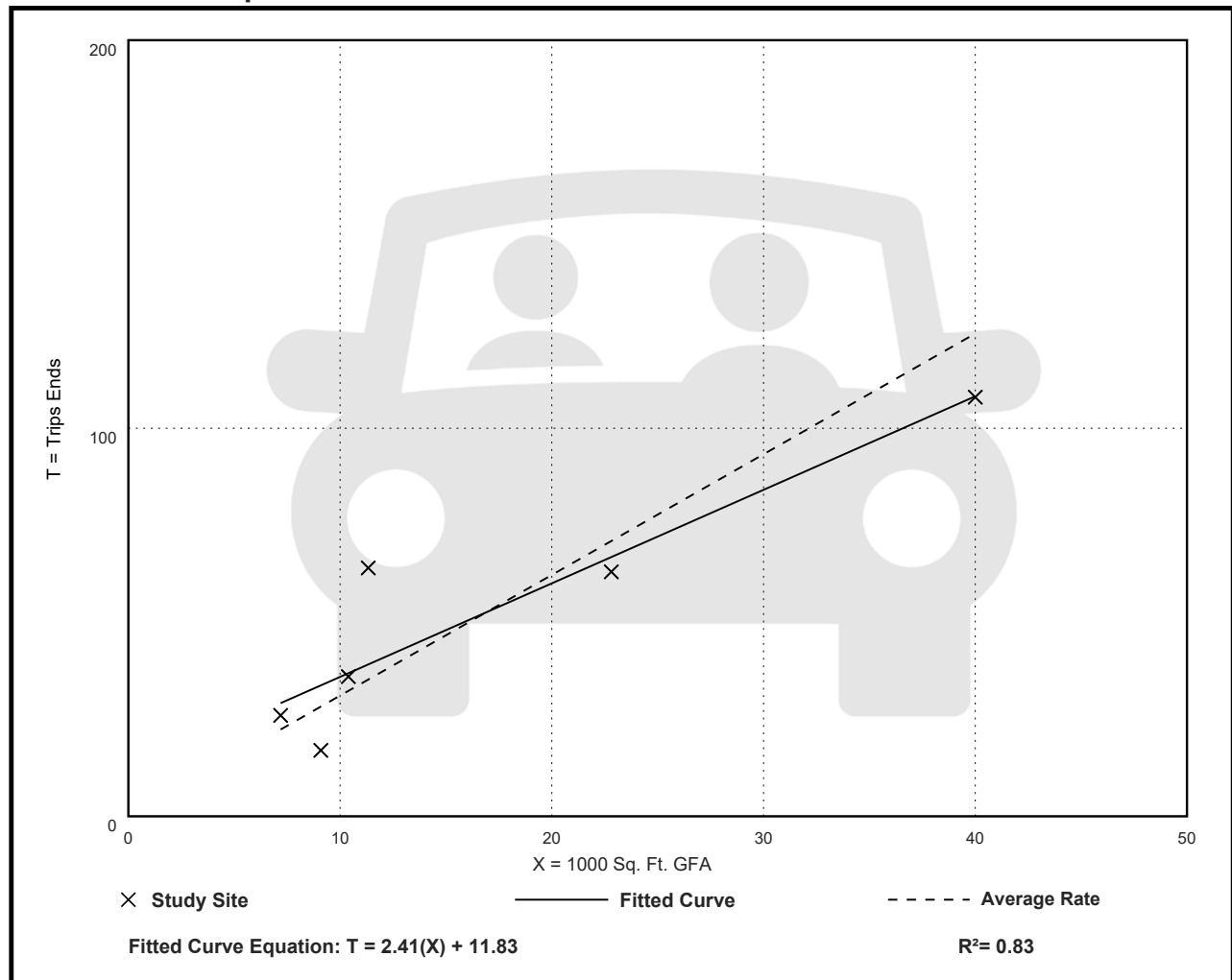
Avg. 1000 Sq. Ft. GFA: 17

Directional Distribution: 48% entering, 52% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.11	1.87 - 5.65	1.09

## Data Plot and Equation



# Automobile Care Center (942)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 6

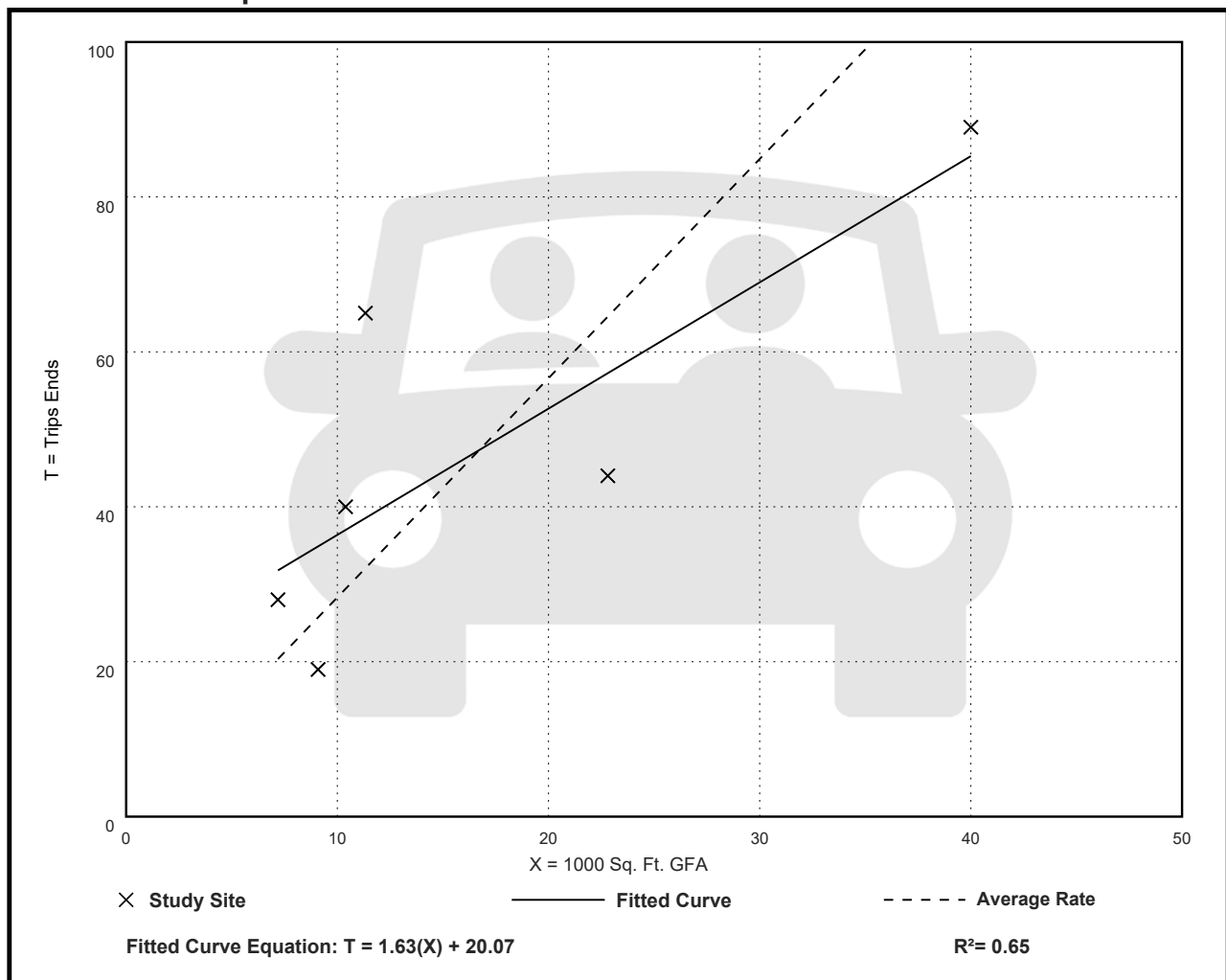
Avg. 1000 Sq. Ft. GFA: 17

Directional Distribution: 56% entering, 44% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.83	1.93 - 5.74	1.35

## Data Plot and Equation



# Automobile Care Center (942)

Vehicle Trip Ends vs: 1000 Sq. Ft. GFA

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 6

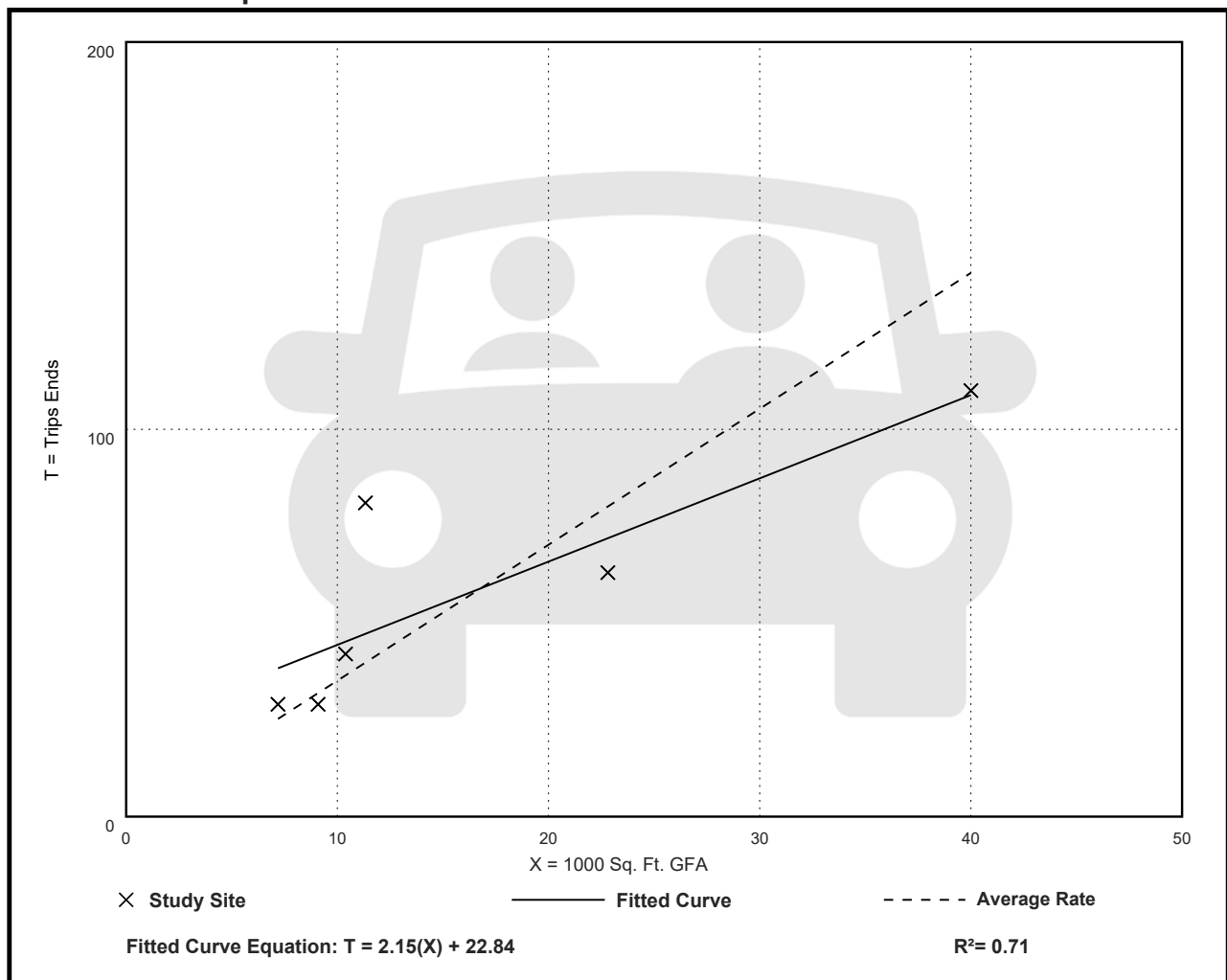
Avg. 1000 Sq. Ft. GFA: 17

Directional Distribution: 49% entering, 51% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.51	2.75 - 7.15	1.51

## Data Plot and Equation



# Automobile Care Center (942)

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

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 31

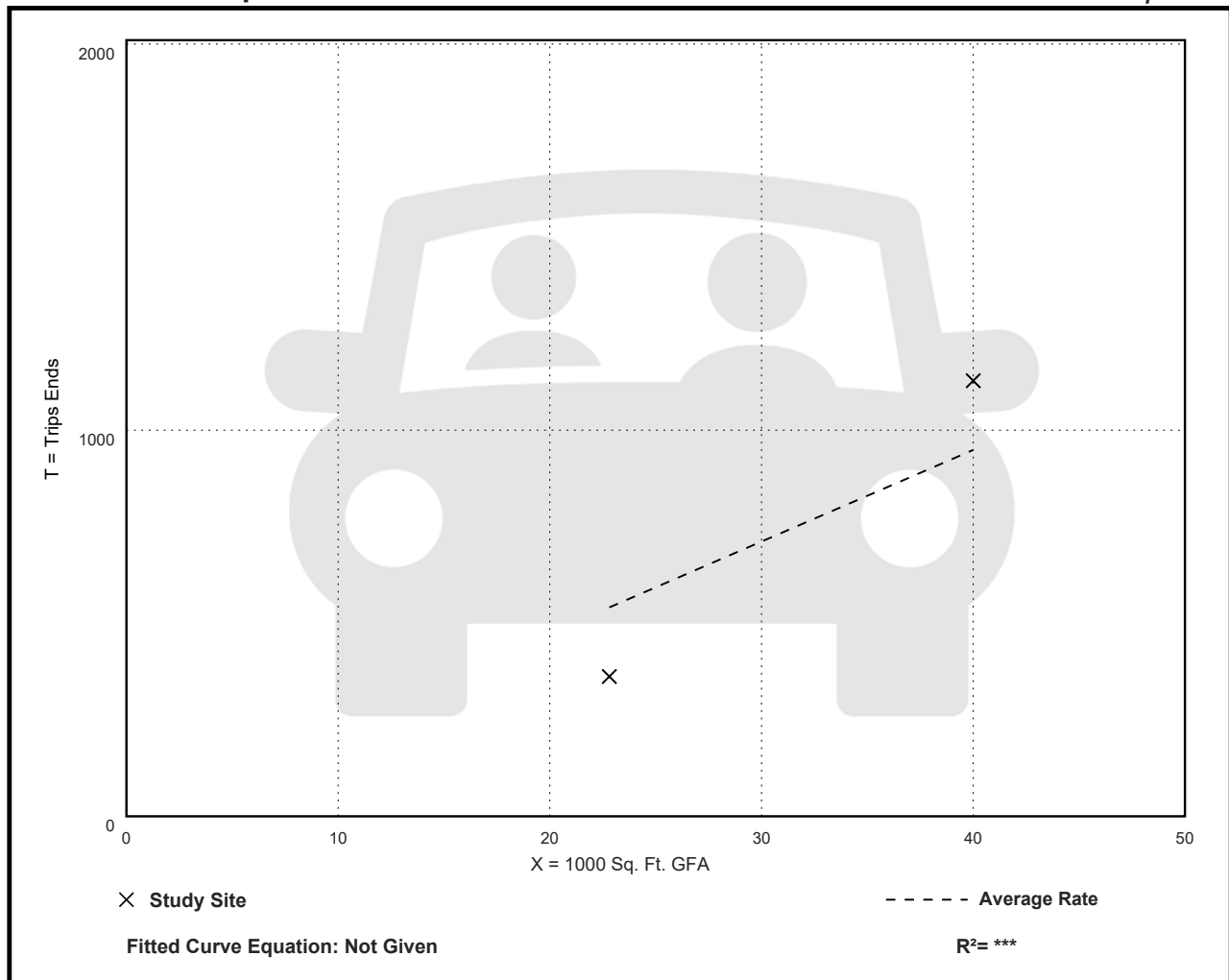
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
23.72	15.87 - 28.20	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

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

Setting/Location: General Urban/Suburban

Number of Studies: 2

Avg. 1000 Sq. Ft. GFA: 31

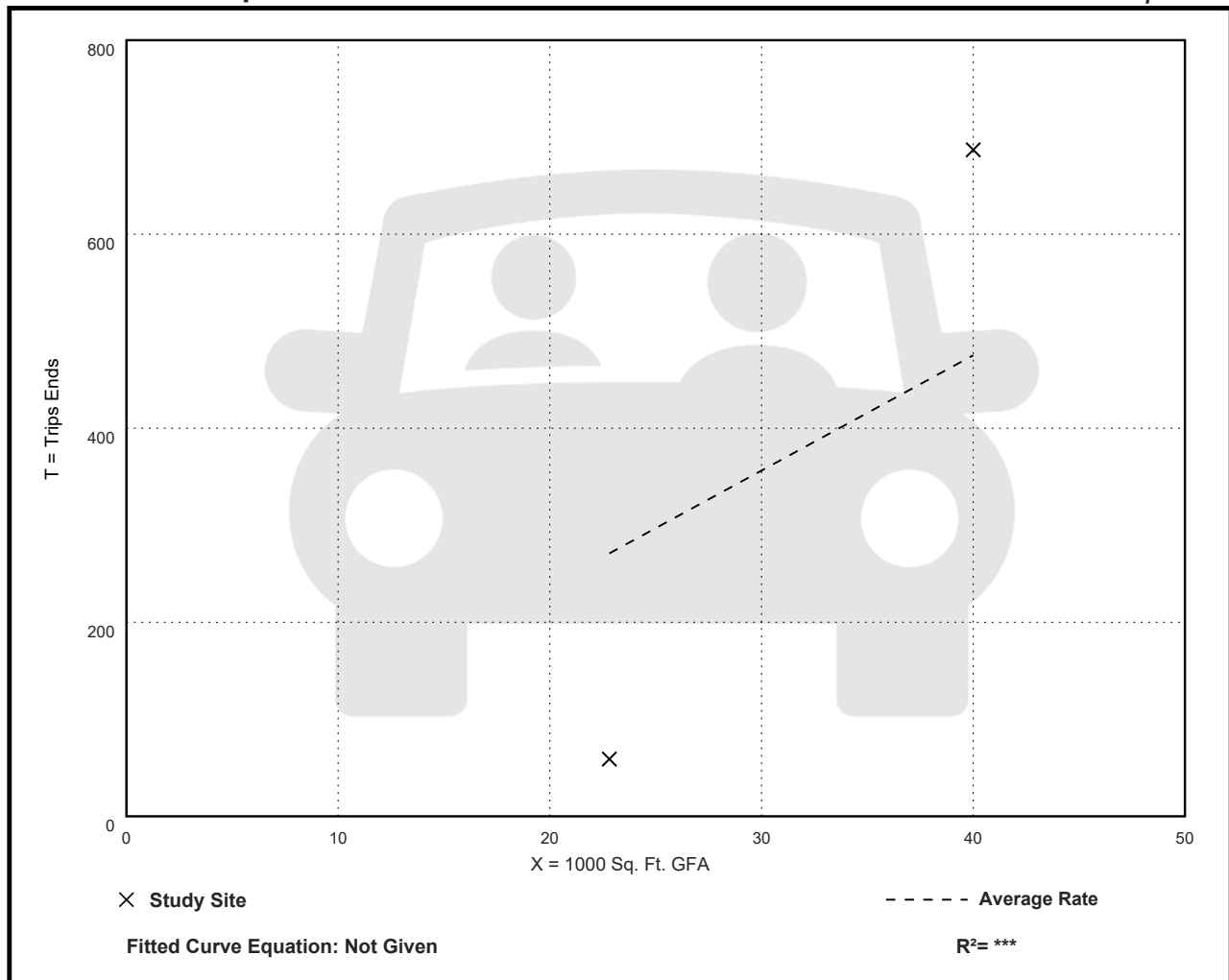
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
11.88	2.59 - 17.18	***

## Data Plot and Equation

Caution – Small Sample Size





# Automobile Care Center (942)

## Vehicle Trip Ends vs: Service Bays

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 Service Bays: 29

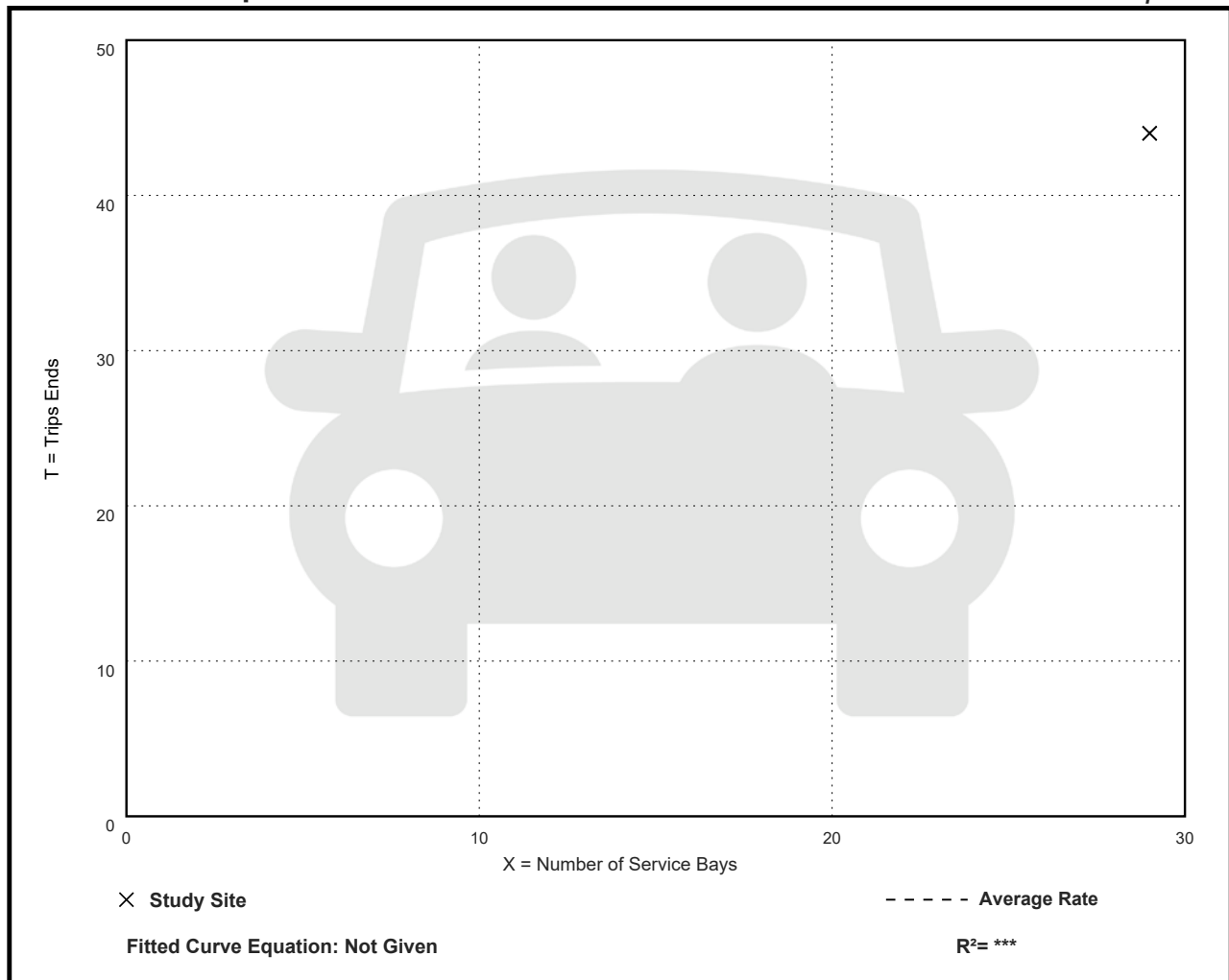
Directional Distribution: 68% entering, 32% exiting

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
1.52	1.52 - 1.52	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

## Vehicle Trip Ends vs: Service Bays

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 Service Bays: 29

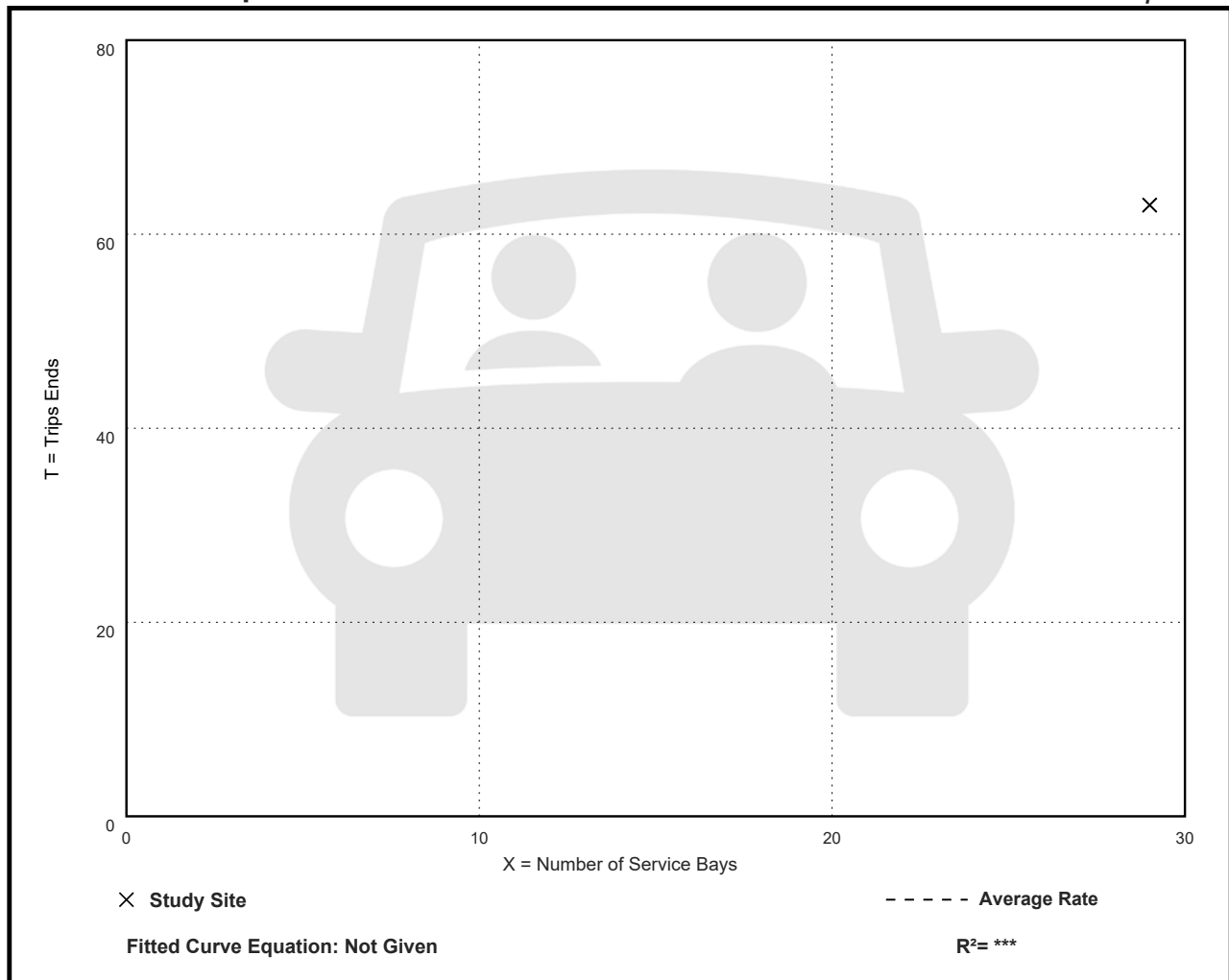
Directional Distribution: Not Available

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
2.17	2.17 - 2.17	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

Vehicle Trip Ends vs: Service Bays

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Service Bays: 29

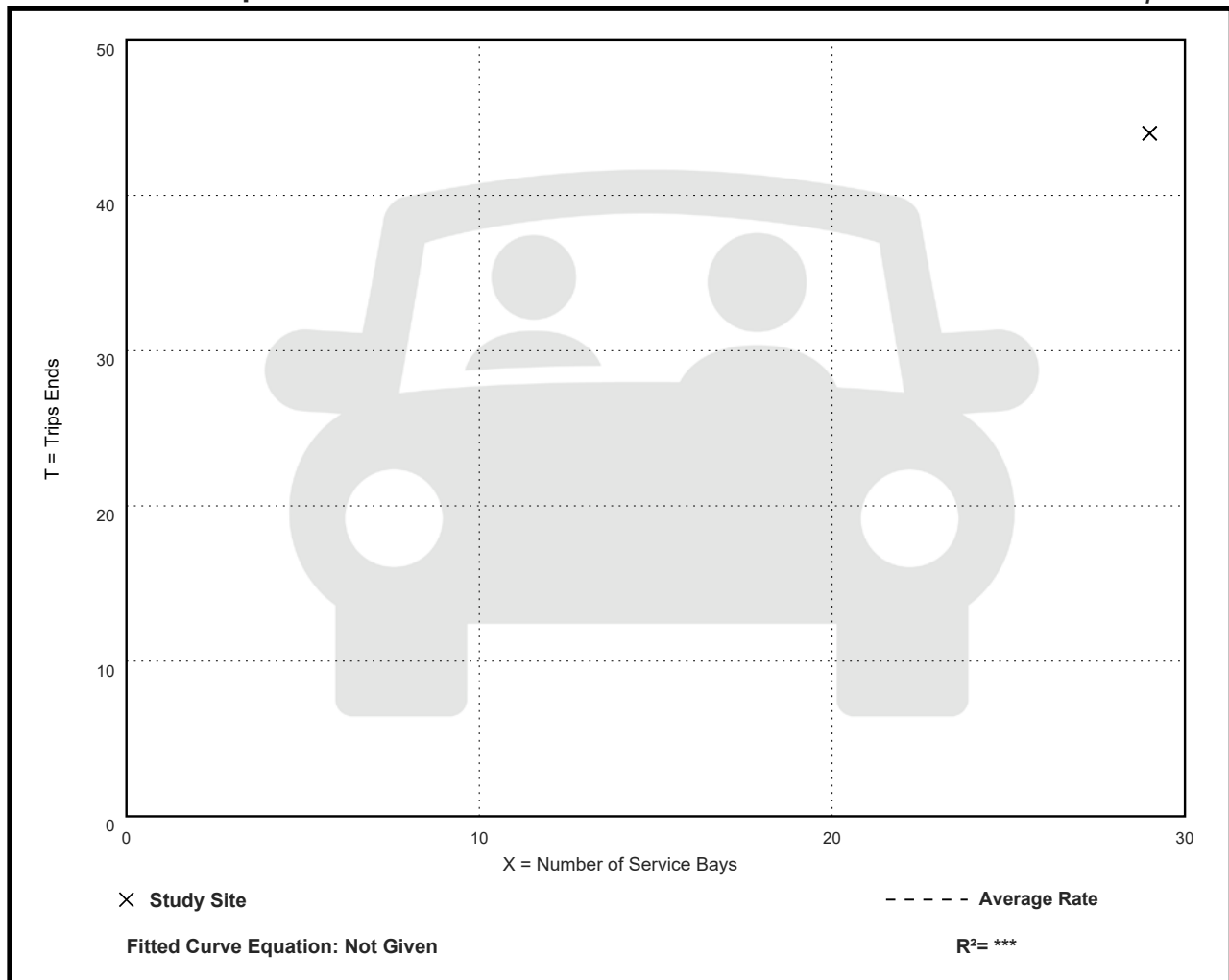
Directional Distribution: 68% entering, 32% exiting

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
1.52	1.52 - 1.52	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

## Vehicle Trip Ends vs: Service Bays

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Service Bays: 29

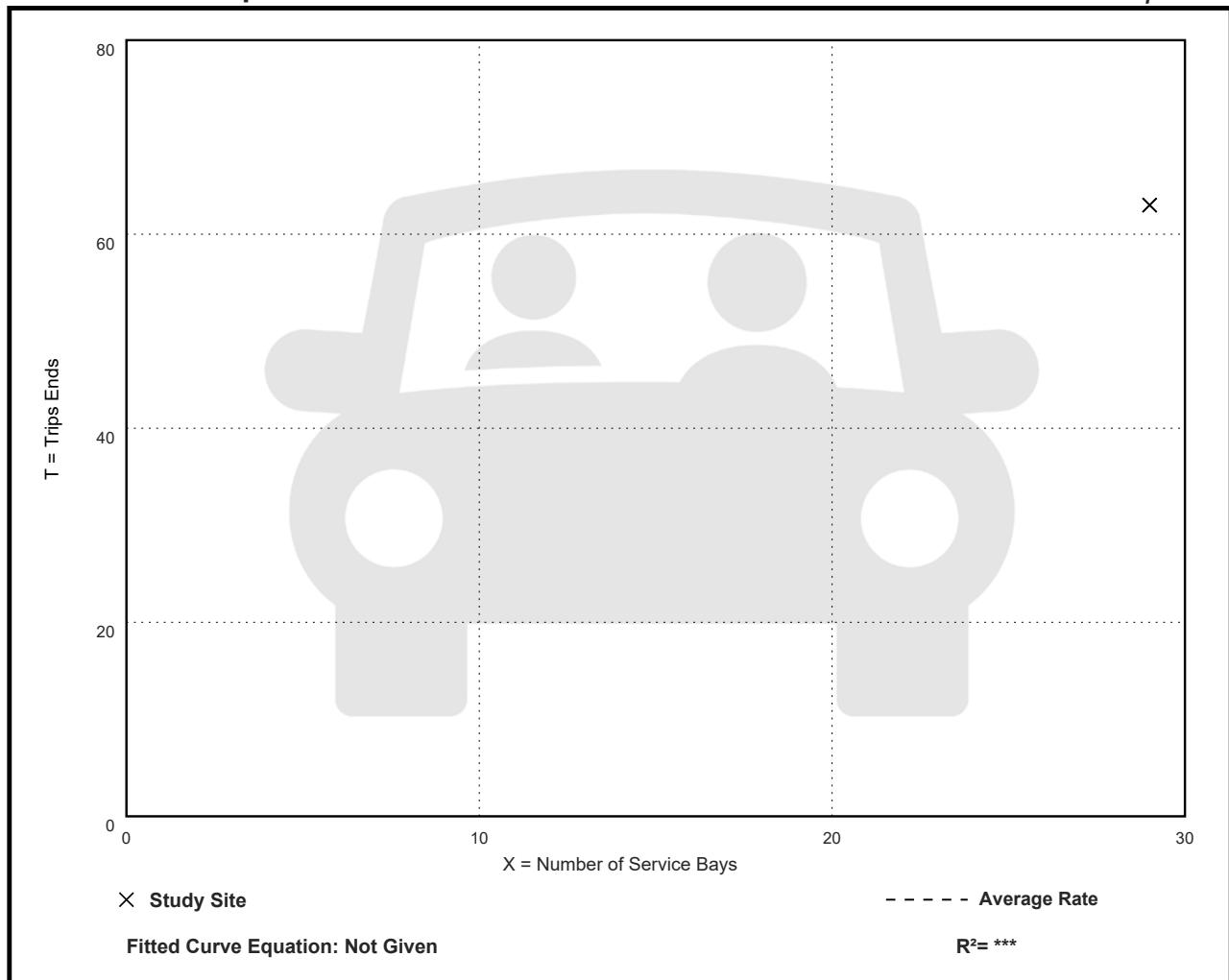
Directional Distribution: Not Available

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
2.17	2.17 - 2.17	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

Vehicle Trip Ends vs: Service Bays  
On a: Saturday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Service Bays: 29

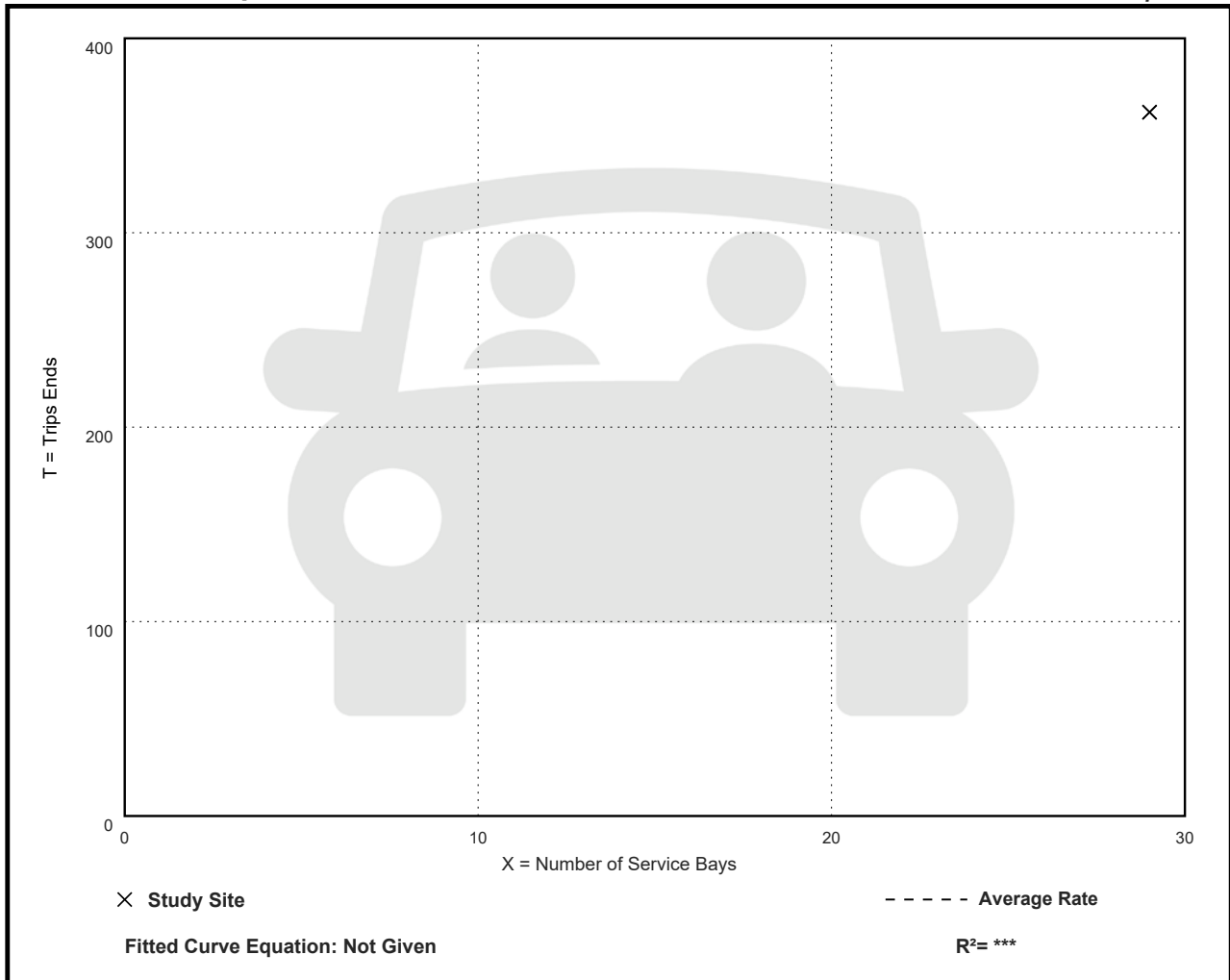
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
12.48	12.48 - 12.48	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

Vehicle Trip Ends vs: Service Bays  
On a: Sunday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Service Bays: 29

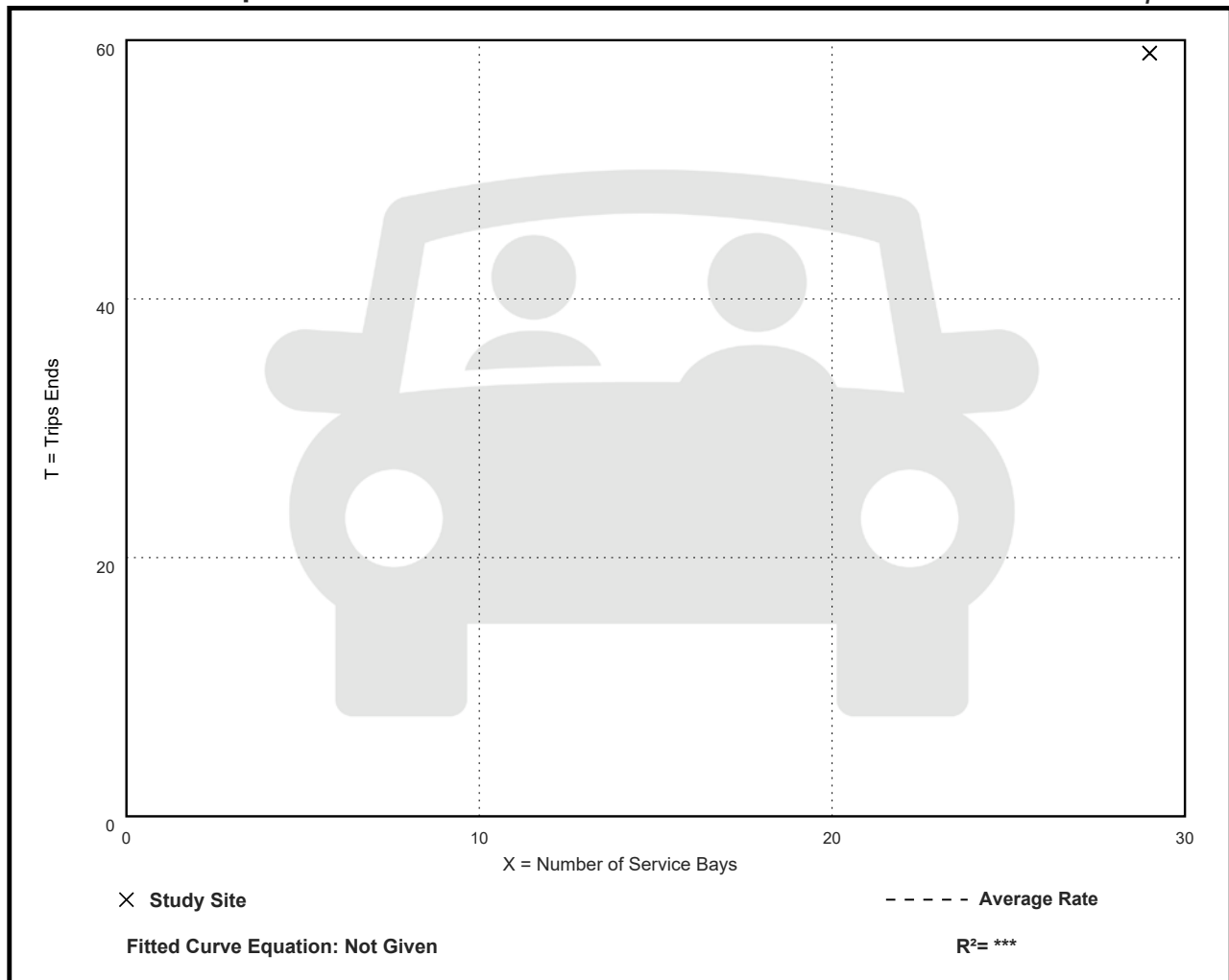
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Service Bay

Average Rate	Range of Rates	Standard Deviation
2.03	2.03 - 2.03	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

## 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: 1

Avg. Num. of Employees: 44

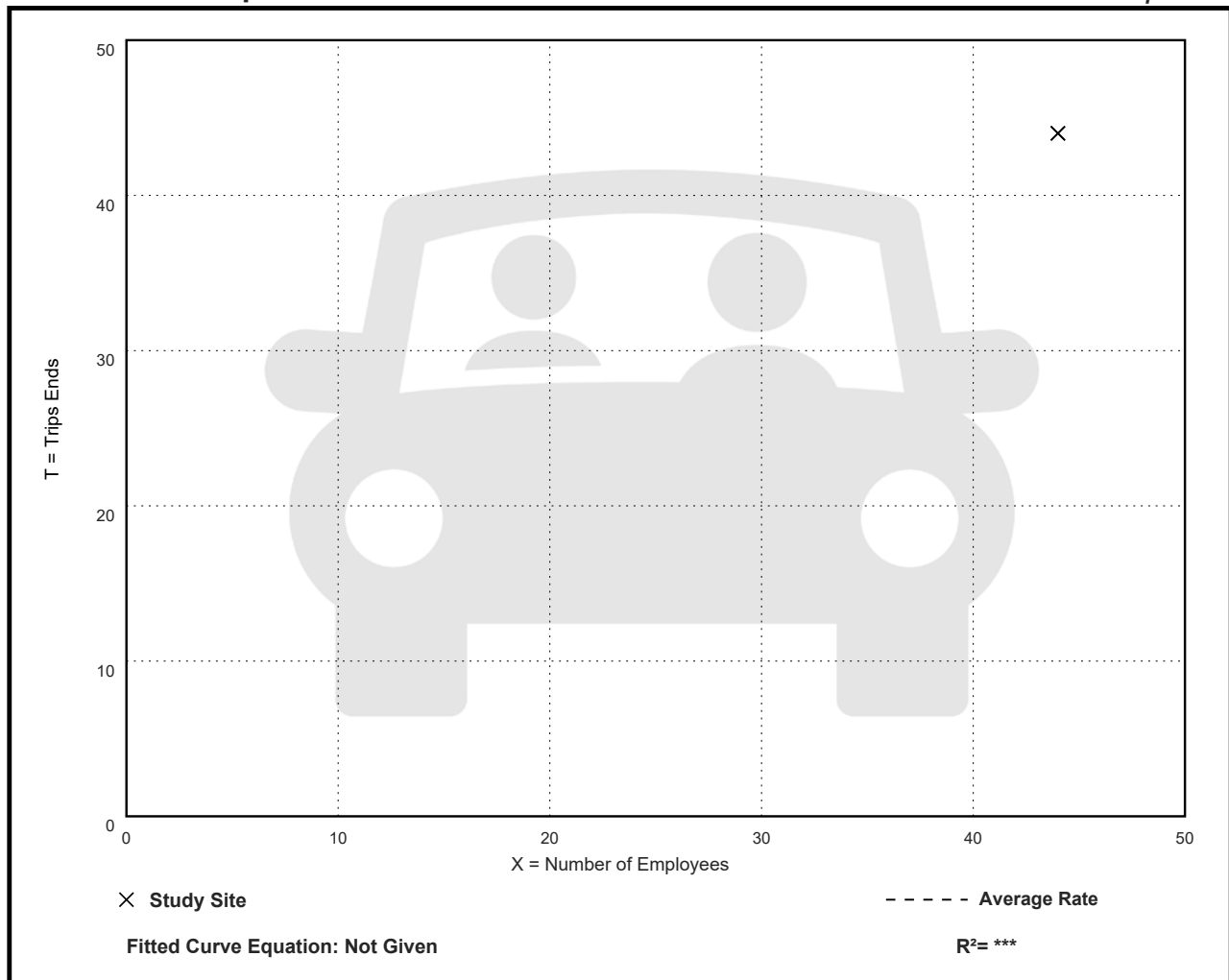
Directional Distribution: 68% entering, 32% exiting

## Vehicle Trip Generation per Employee

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

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

## 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: 1

Avg. Num. of Employees: 44

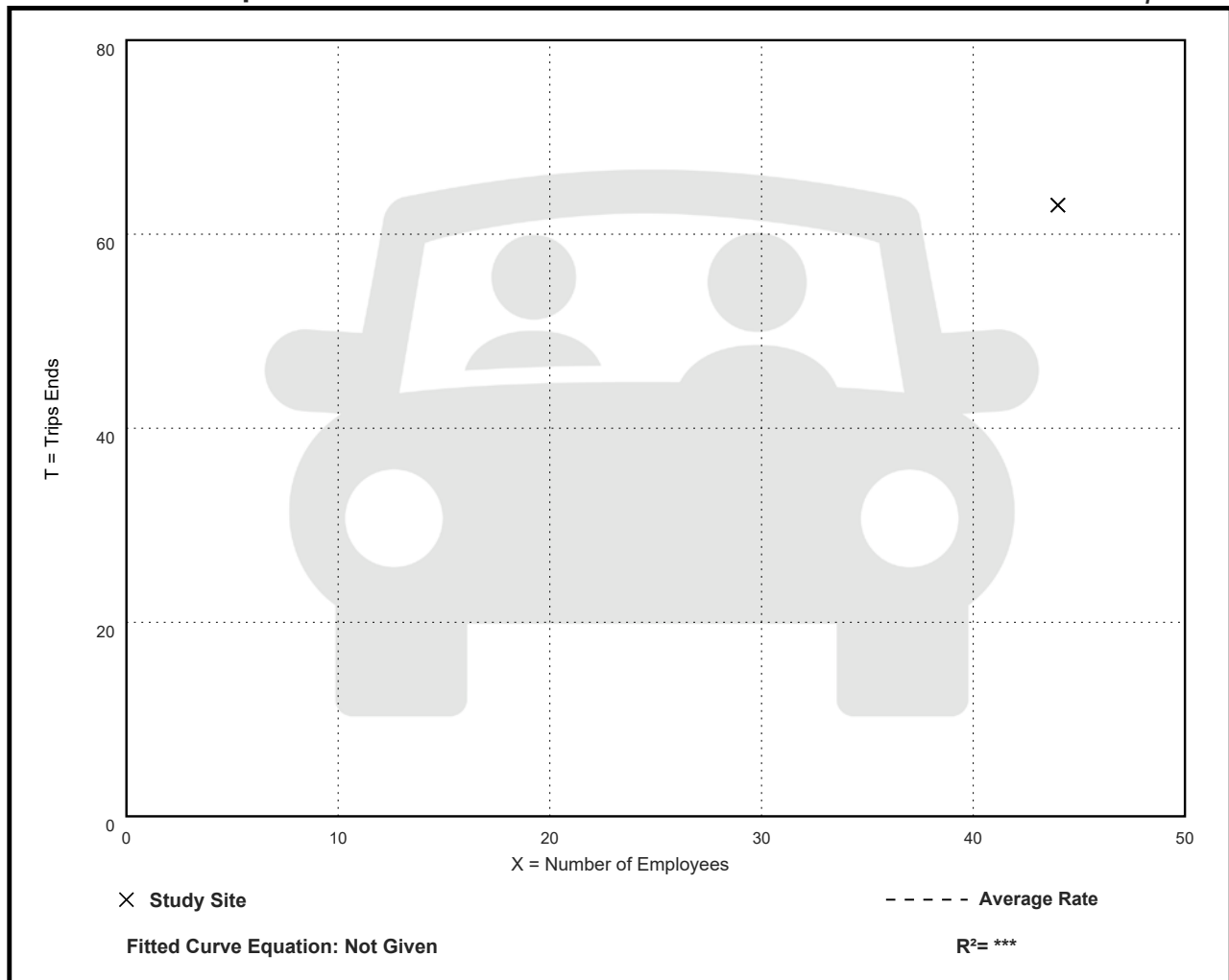
Directional Distribution: Not Available

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.43	1.43 - 1.43	***

## Data Plot and Equation

Caution – Small Sample Size





# Automobile Care Center (942)

## Vehicle Trip Ends vs: Employees

On a: Weekday,

AM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Employees: 44

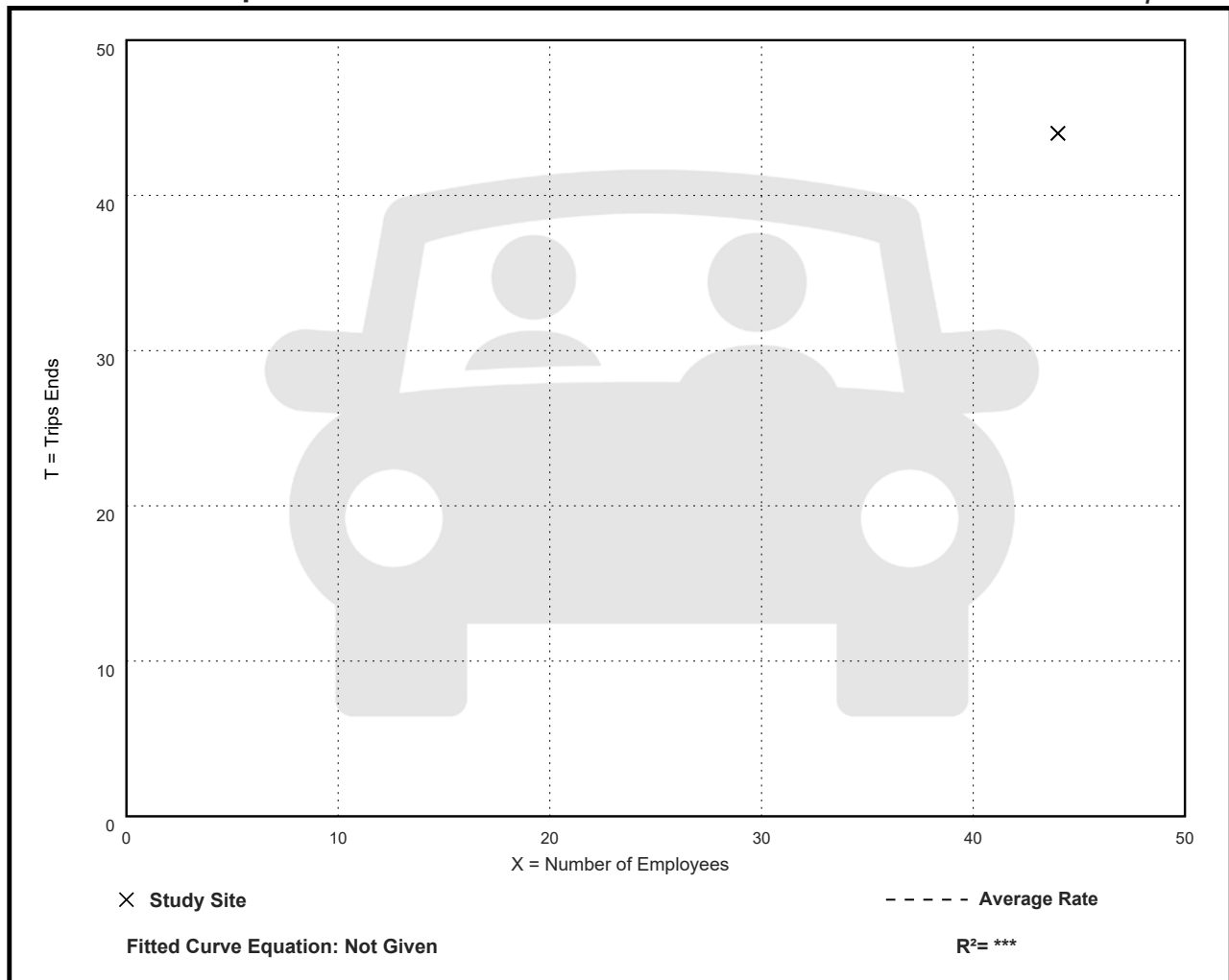
Directional Distribution: 68% entering, 32% exiting

## Vehicle Trip Generation per Employee

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

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

## Vehicle Trip Ends vs: Employees

On a: Weekday,

PM Peak Hour of Generator

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Employees: 44

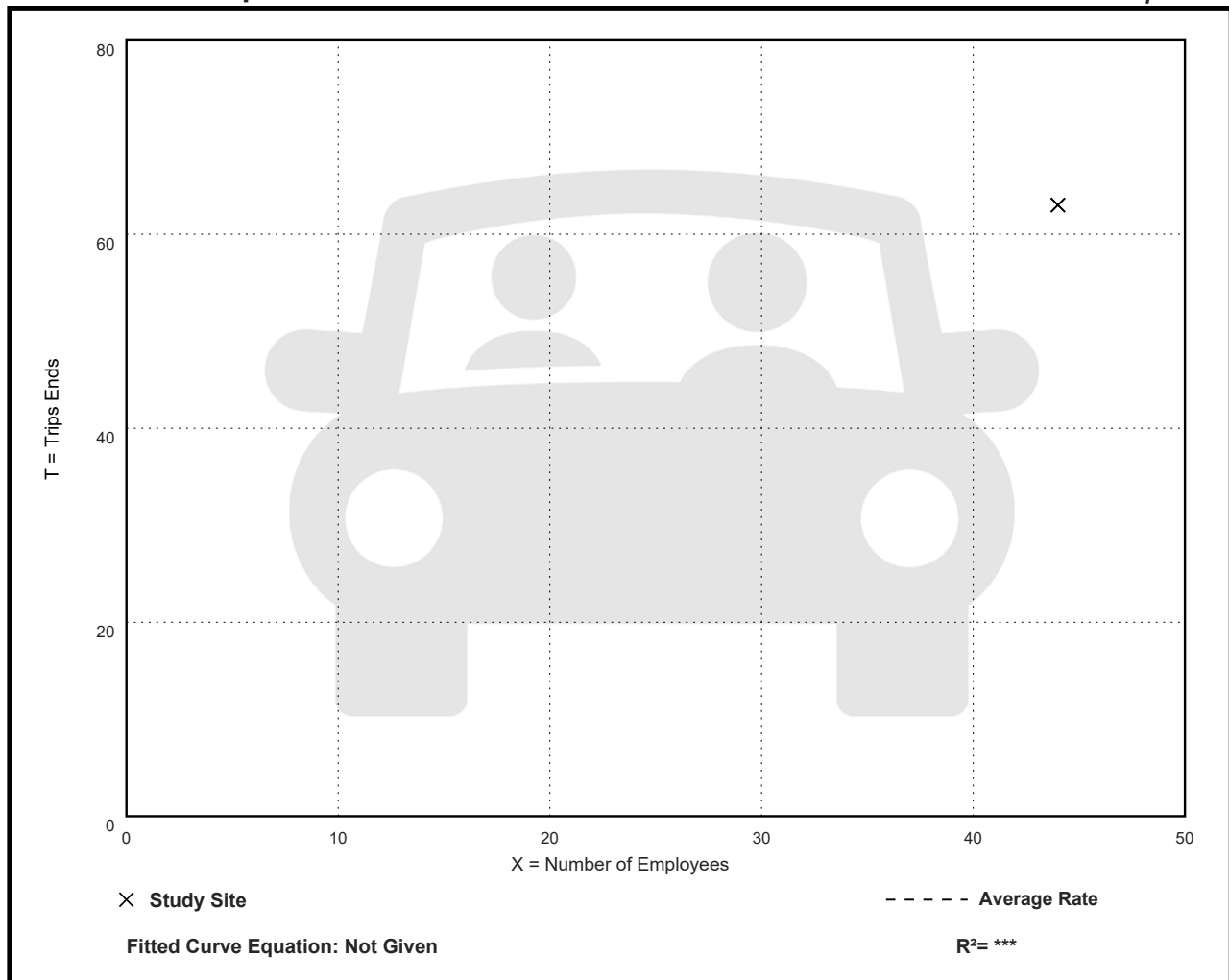
Directional Distribution: Not Available

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.43	1.43 - 1.43	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

Vehicle Trip Ends vs: Employees  
On a: Saturday

Setting/Location: General Urban/Suburban

Number of Studies: 1

Avg. Num. of Employees: 44

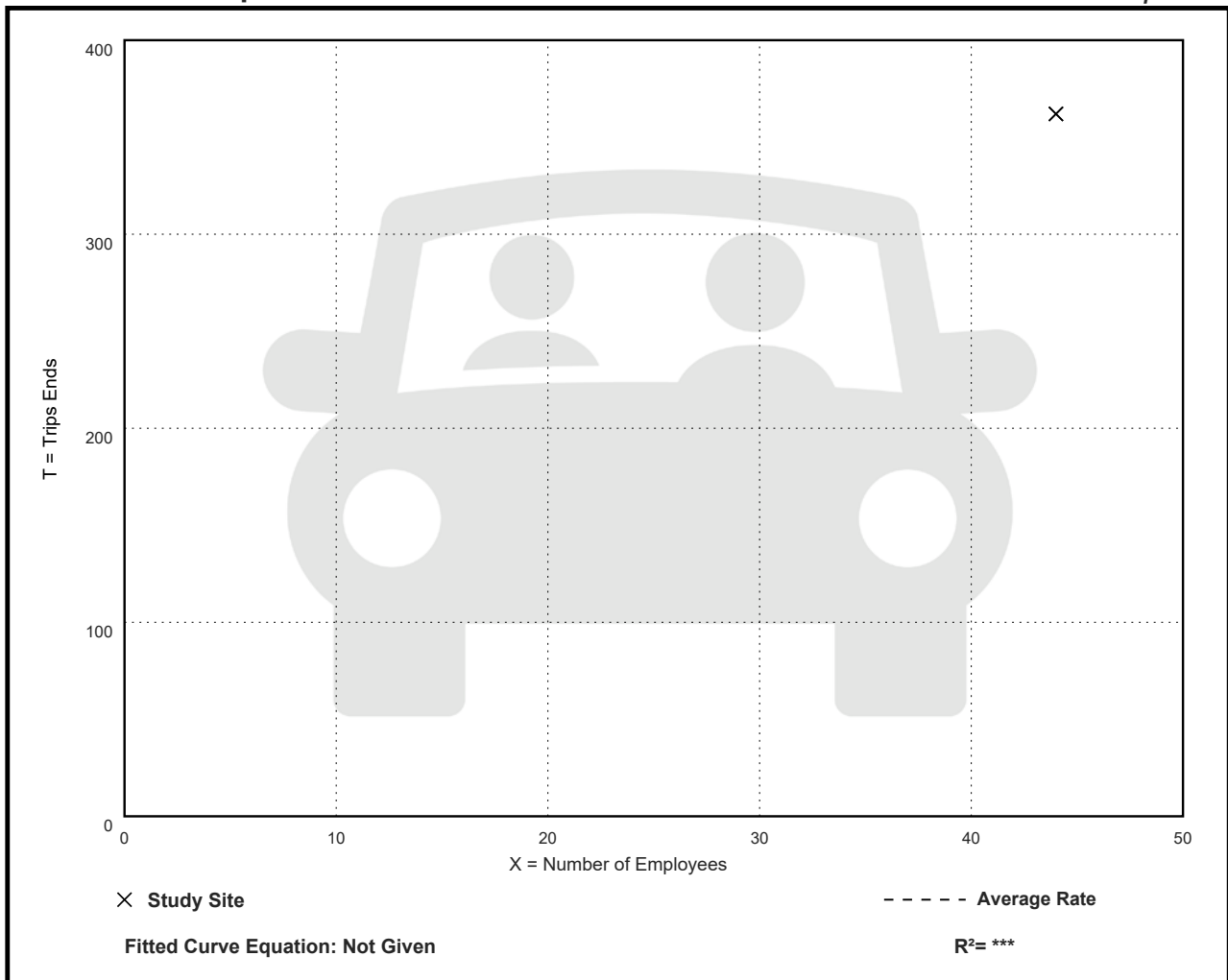
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
8.23	8.23 - 8.23	***

## Data Plot and Equation

Caution – Small Sample Size



# Automobile Care Center (942)

Vehicle Trip Ends vs: Employees  
On a: Sunday

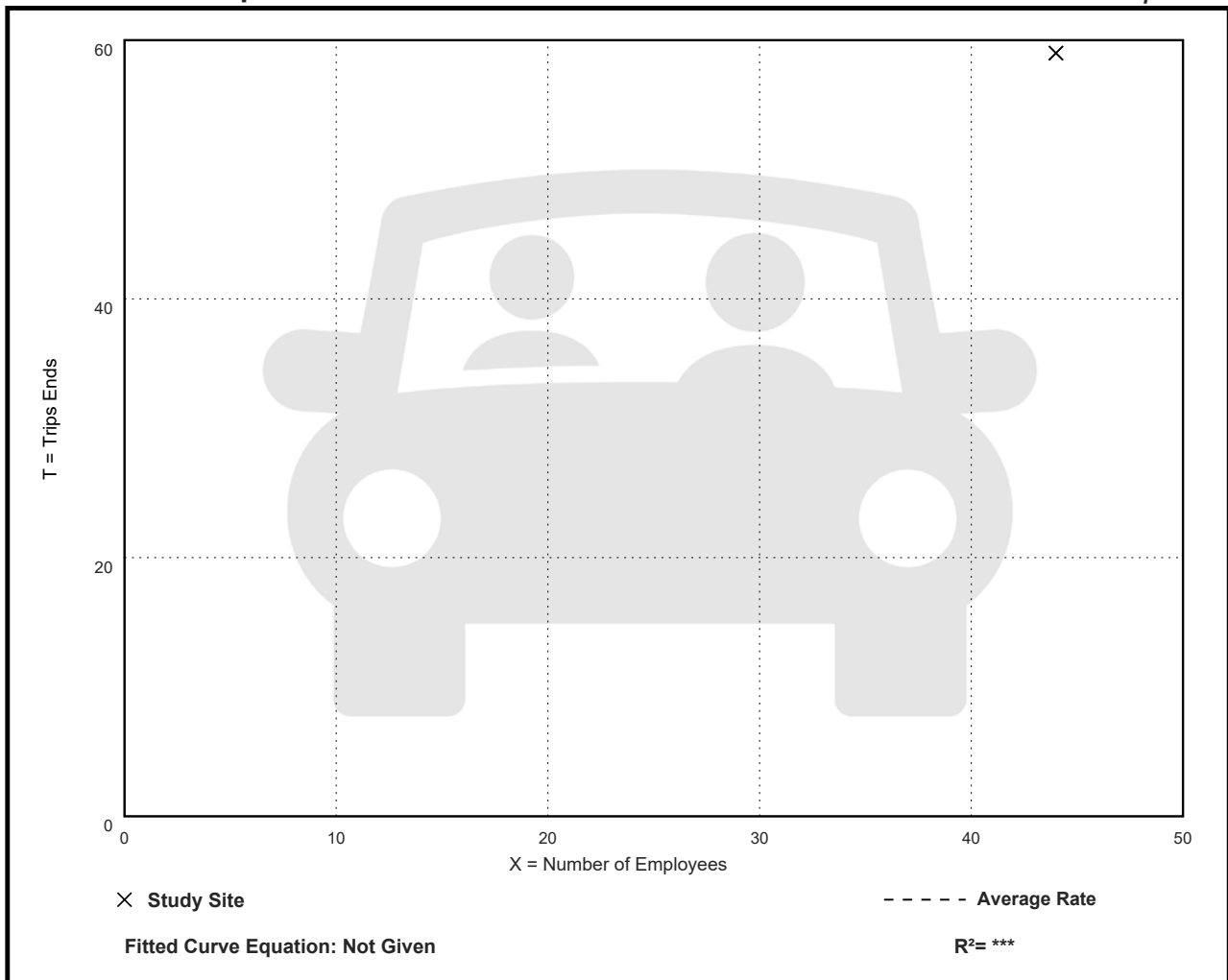
Setting/Location: General Urban/Suburban  
Number of Studies: 1  
Avg. Num. of Employees: 44  
Directional Distribution: 50% entering, 50% exiting

## Vehicle Trip Generation per Employee

Average Rate	Range of Rates	Standard Deviation
1.34	1.34 - 1.34	***

## Data Plot and Equation

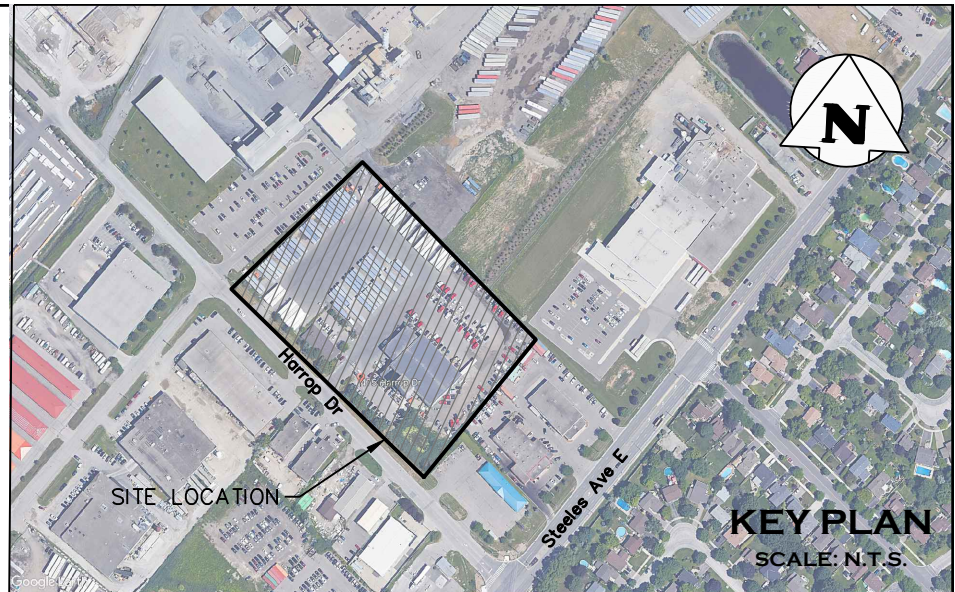
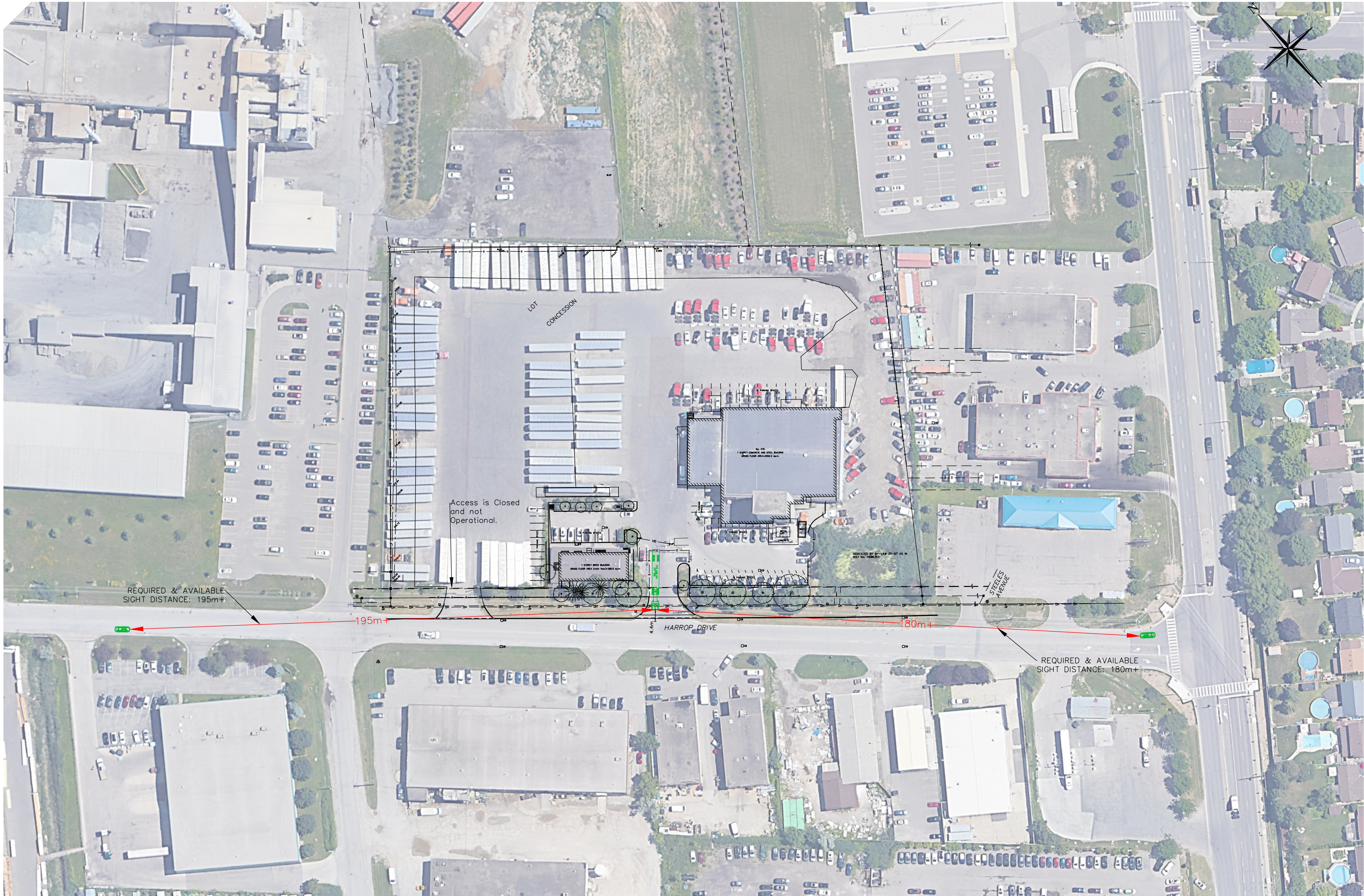
Caution – Small Sample Size



# **ATTACHMENT E**

## SIGHT DISTANCE ANALYSIS





**FOR REVIEW**  
NOT TO BE USED FOR CONSTRUCTION

Sight Distance Calculation

Feature	Site Access to Harrop Drive
Access Type	Full-Moves
Assumed Design Speed	60 km/h
Base Time Gap <sup>1</sup>	10.5s (right), 11.5s (left)
Grade of Roadway	Less than 3%
Horizontal Alignment of Roadway	Straight
Required Sight Distance (right turn) <sup>2</sup>	180 m
Required Sight Distance (left turn) <sup>2</sup>	195 m


Note 1: Time gap for left- and right-turning vehicles from a stop onto a two-lane highway with no median and with a grade less than 3%. Values from Table 9.9.3 and 9.9.5 in the TAC-GDGCR, respectively.

Note 2: Sight Distance values calculated from equation 9.9.1 in the GDGCR.

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Project  
475 HARROP DRIVE  
CITY OF MILTON

Drawing  
SIGHT DISTANCE ANALYSIS



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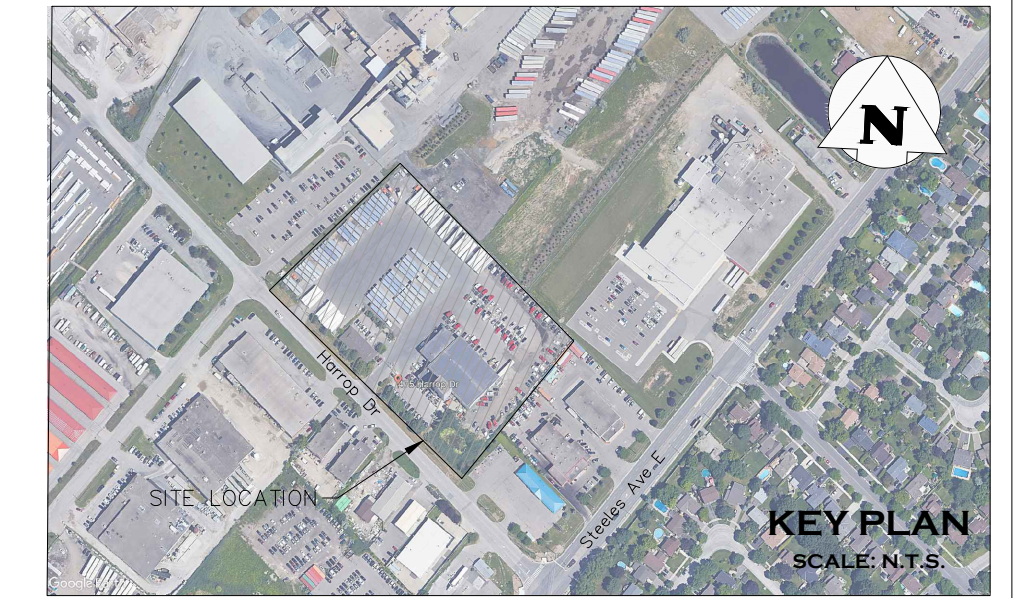
211 YONGE STREET  
SUITE 600  
TORONTO, ON, M5B 1M4  
416-477-3392 T  
WWW.CROZIER.CA  
INFO@CROZIER.CA

Drawn By	I.A.	Design By	Project	2780-7271
Check By	B.B.	Check By	Scale	1:750
		B.B.	Drawing	SL-1

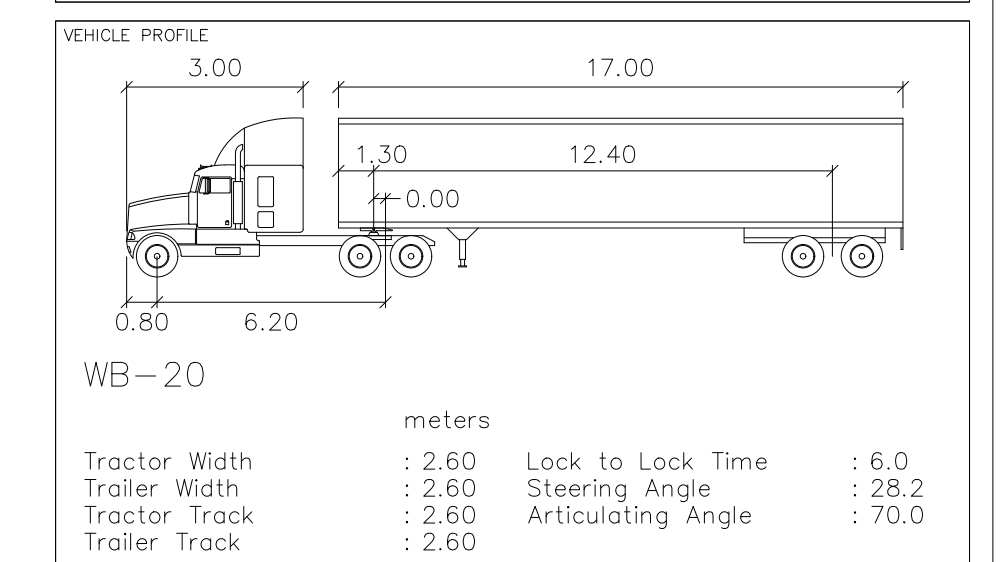
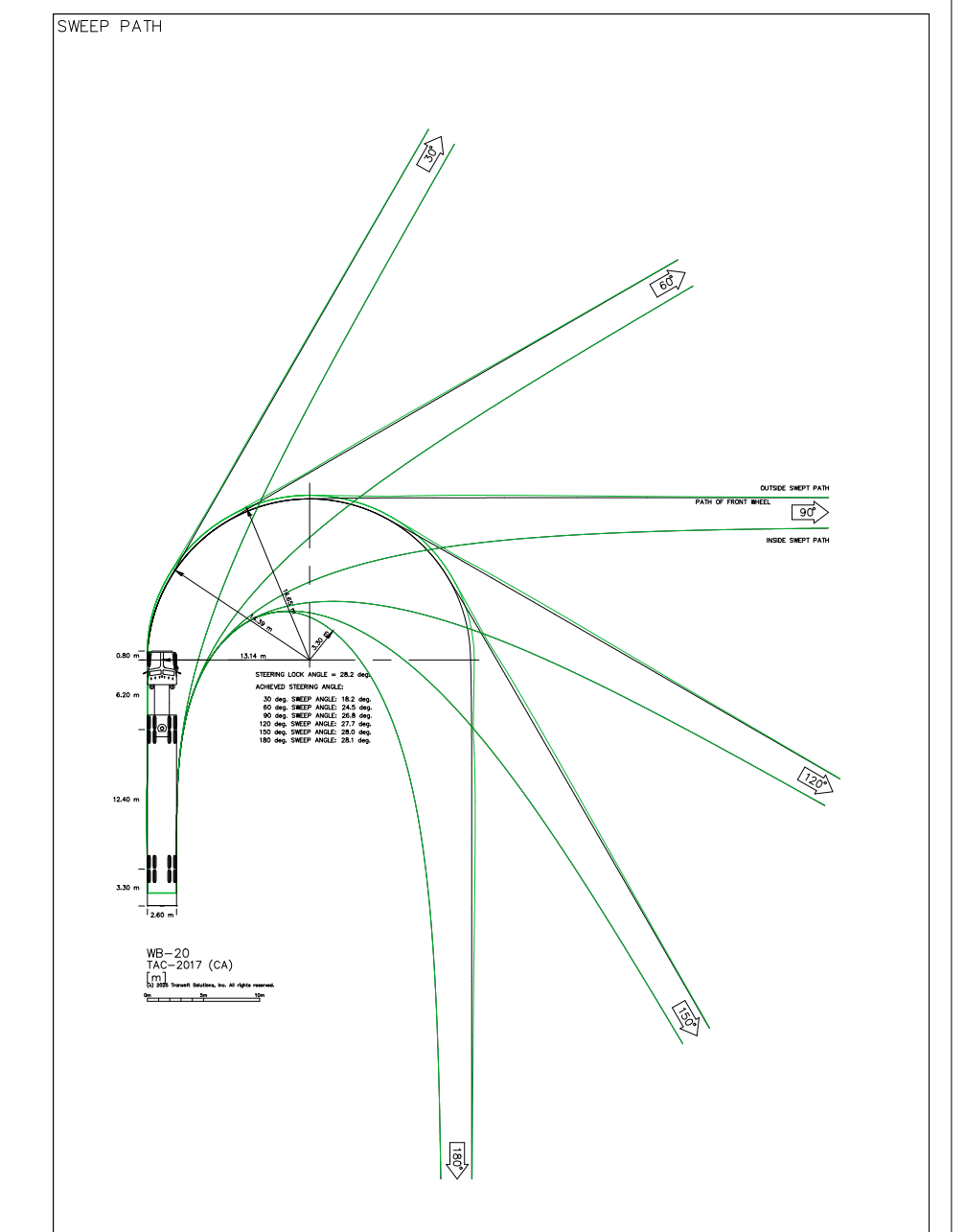


# **APPENDIX F**

## VEHICLE MANEUVERING DIAGRAMS



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VEHICLE MANEUVERING ANALYSIS

WB-20

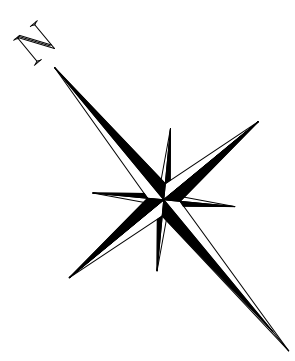
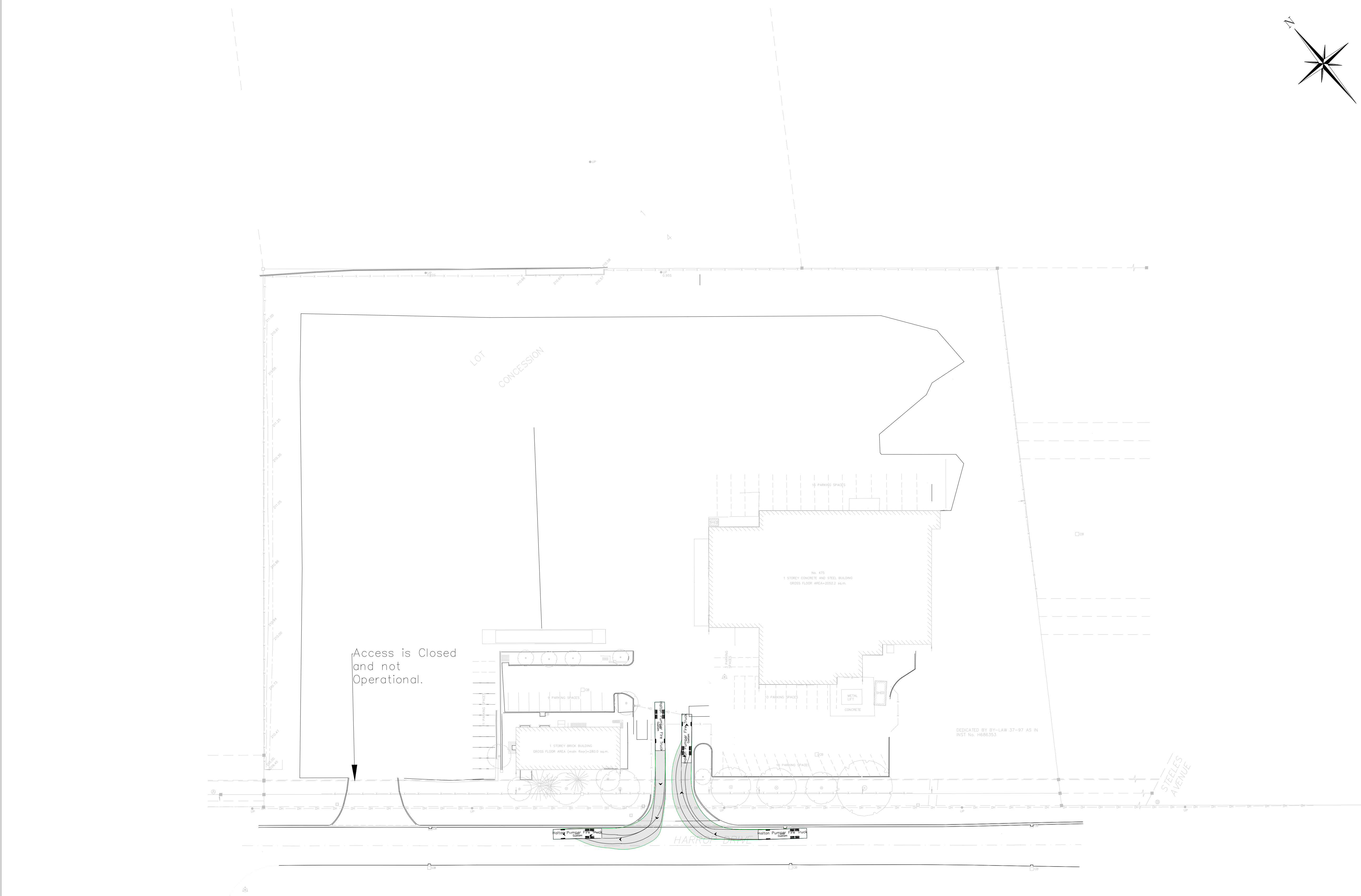


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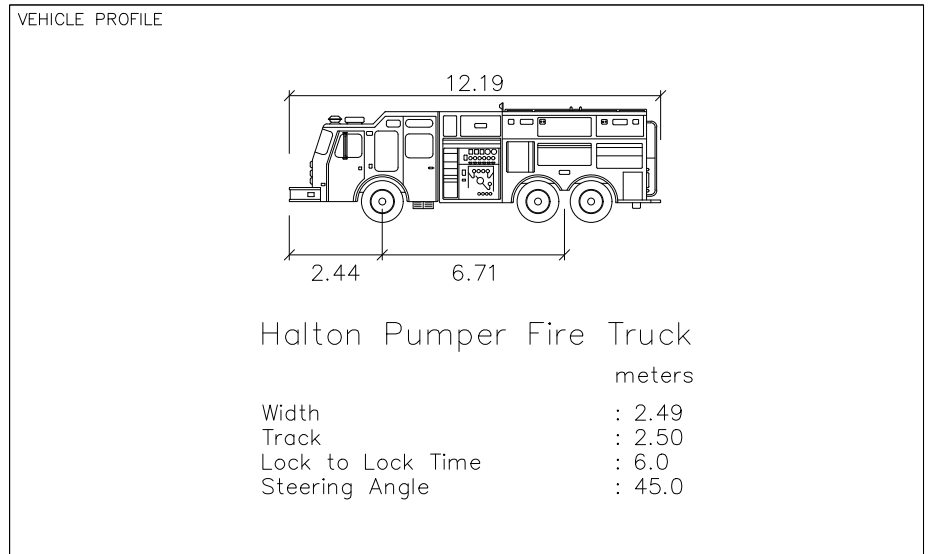
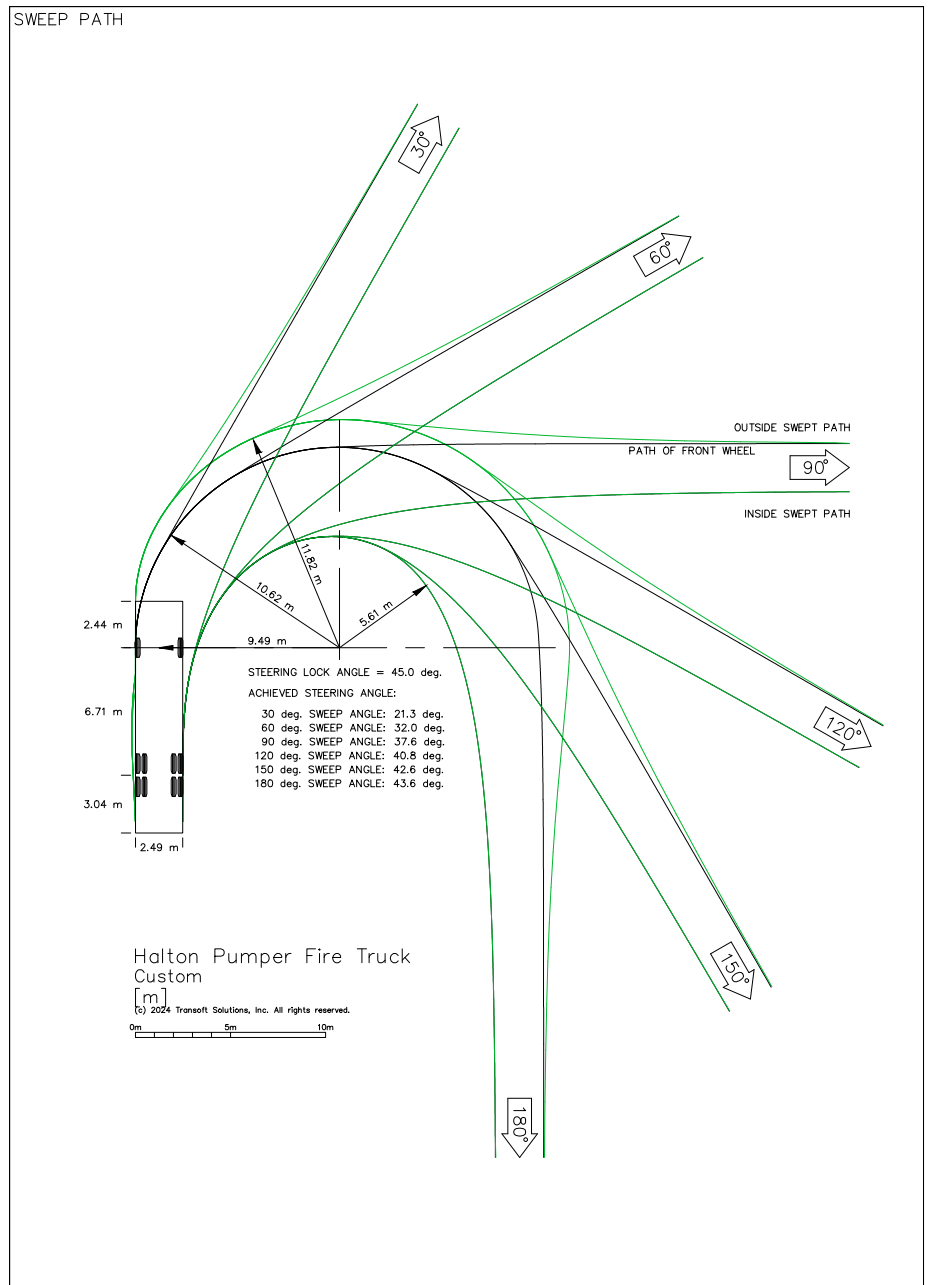
Drawn By	I.A.	Design By	Project	2780-7271
Check By	A.D.	Check By	B.B.	Scale 1:500 Drawing T300







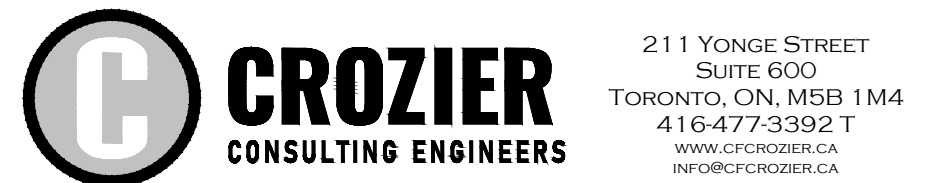
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Project  
475 HARROP DRIVE  
TOWN OF MILTON

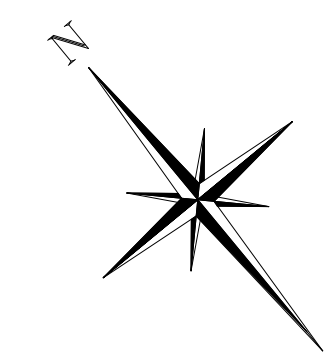
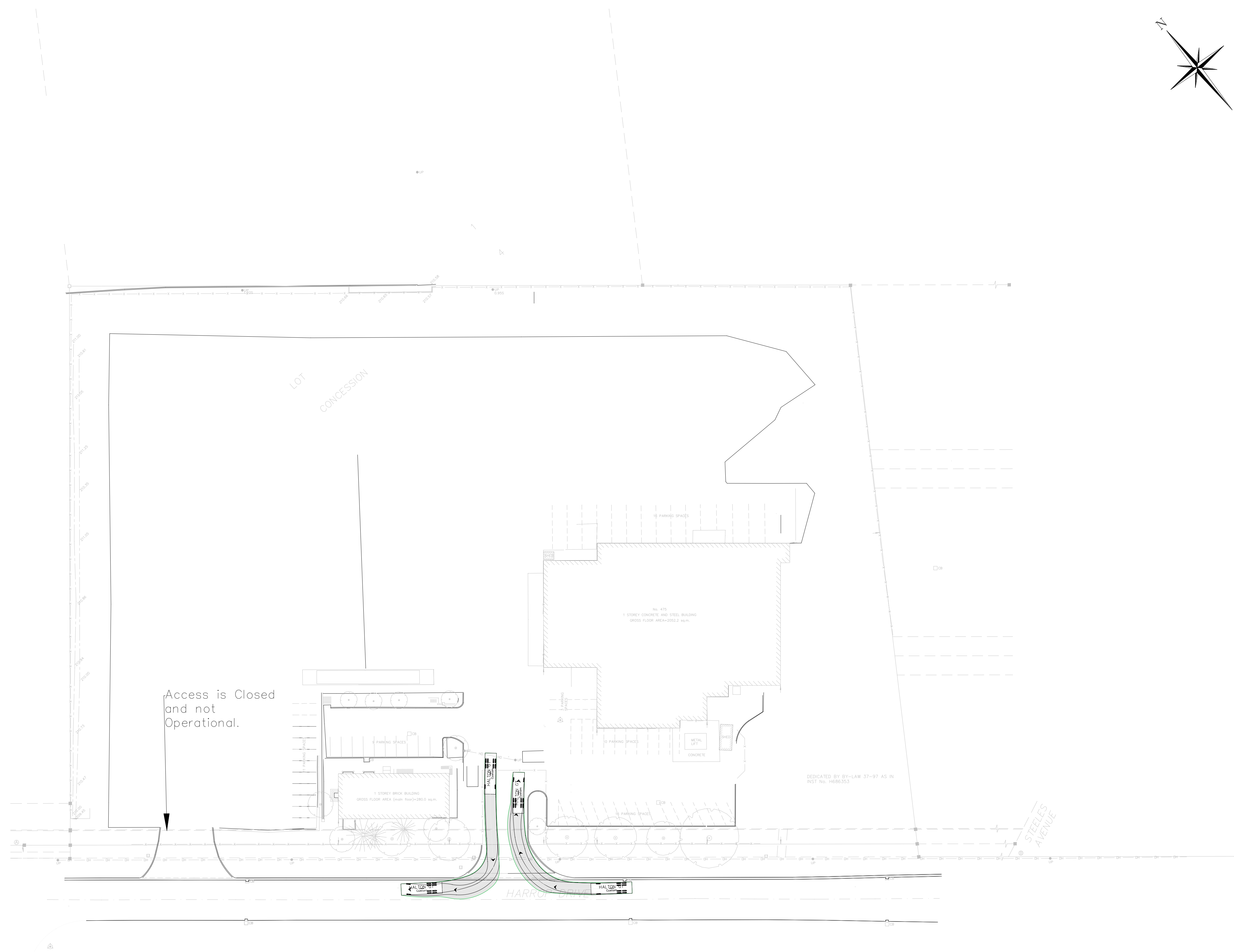
Drawing  
VEHICLE MANEUVERING ANALYSIS  
FIRE TRUCK



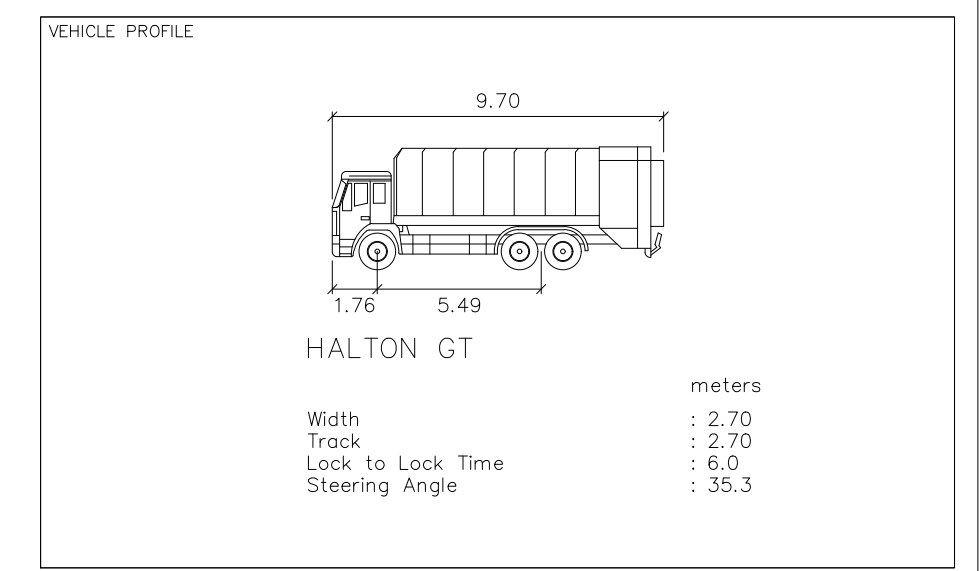
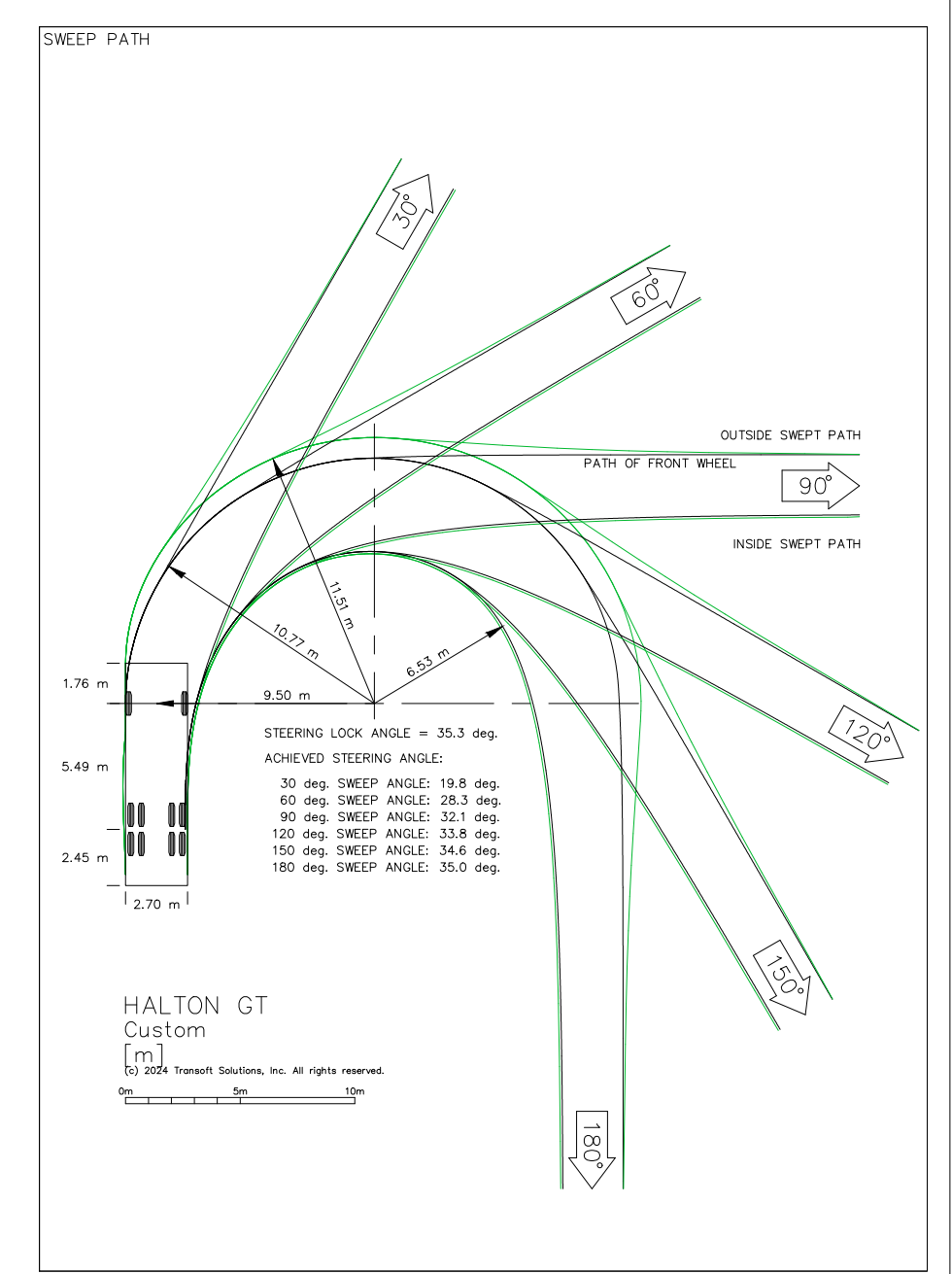
Drawn By	I.A.	Design By	Project	2780-7271
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		B.B.	Drawing	T301







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475 HARROP DRIVE  
TOWN OF MILTON

Drawing  
VEHICLE MANEUVERING ANALYSIS  
GARBAGE TRUCK

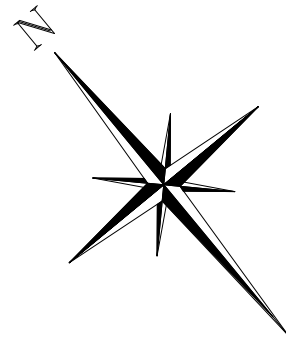
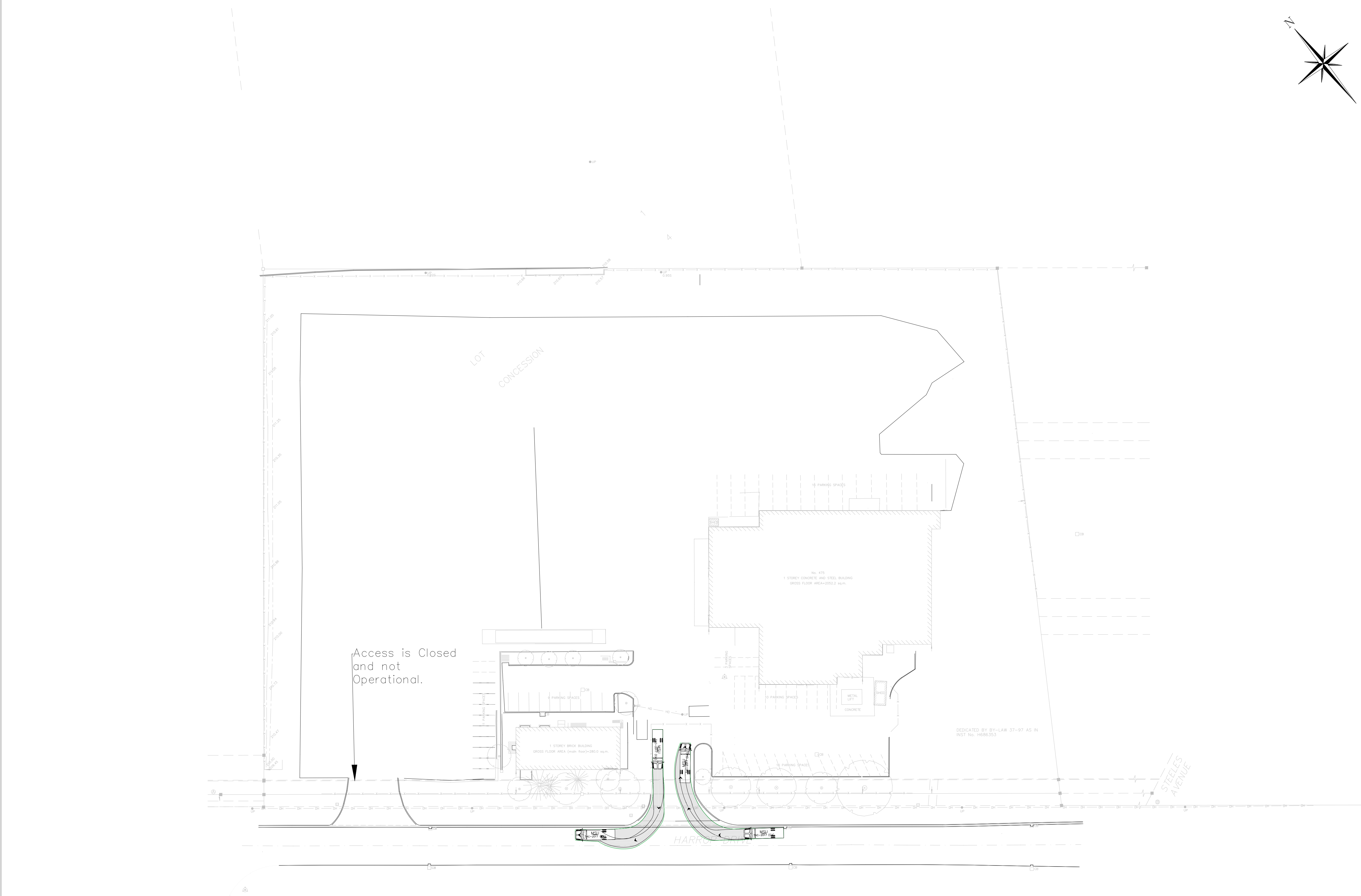
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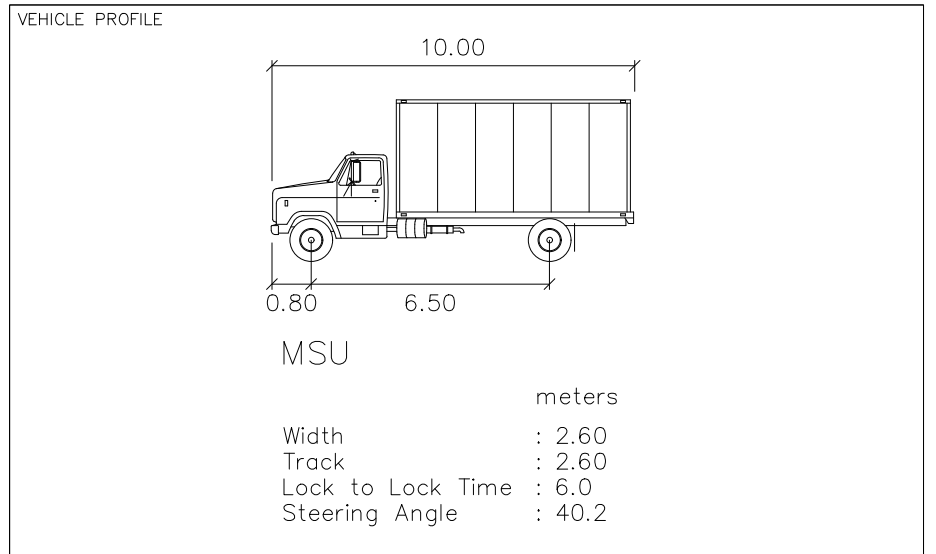
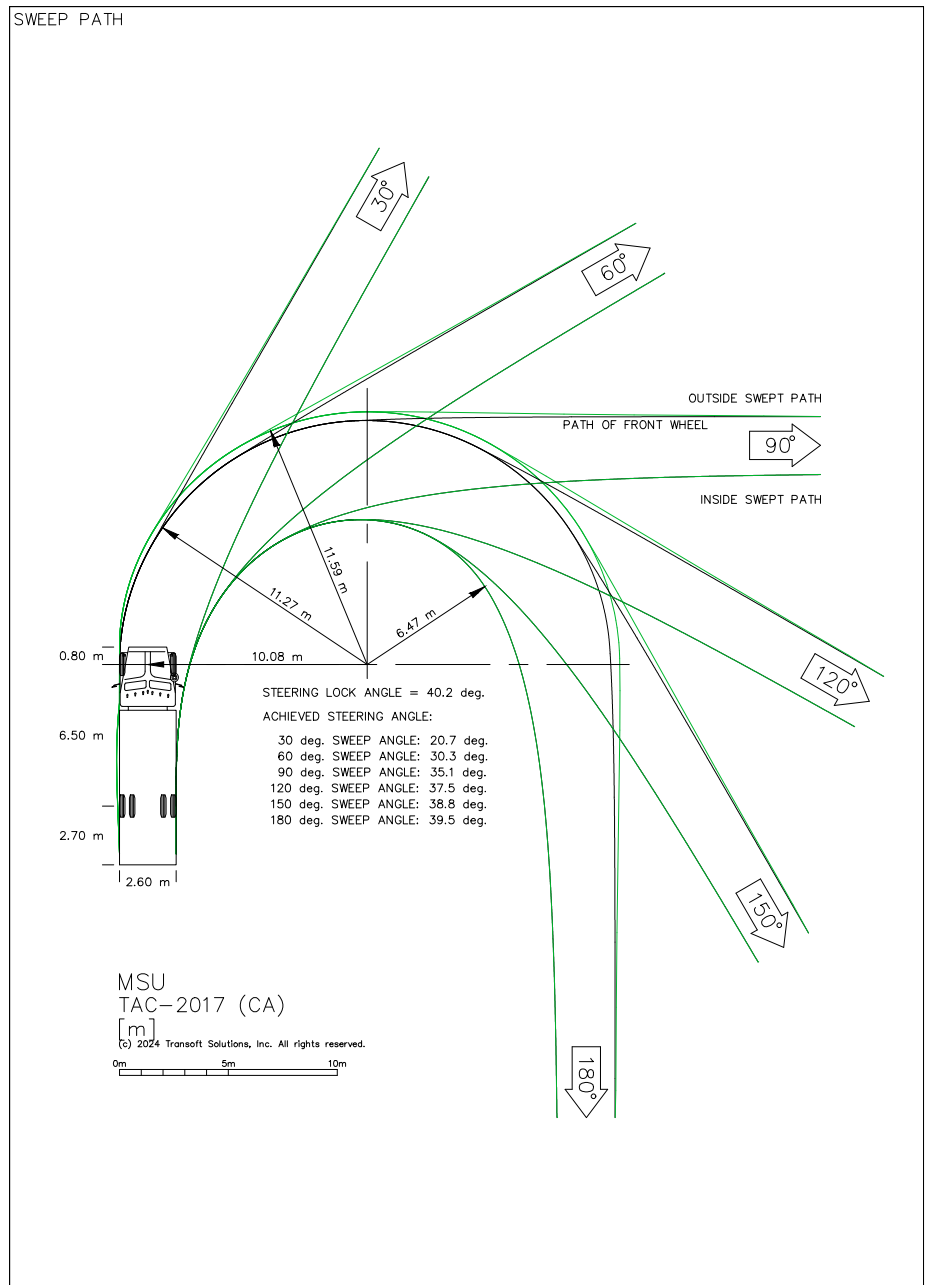
Drawn By	I.A.	Design By		Project	2780-7271
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				Drawing	T302







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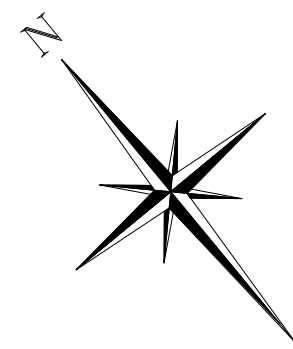
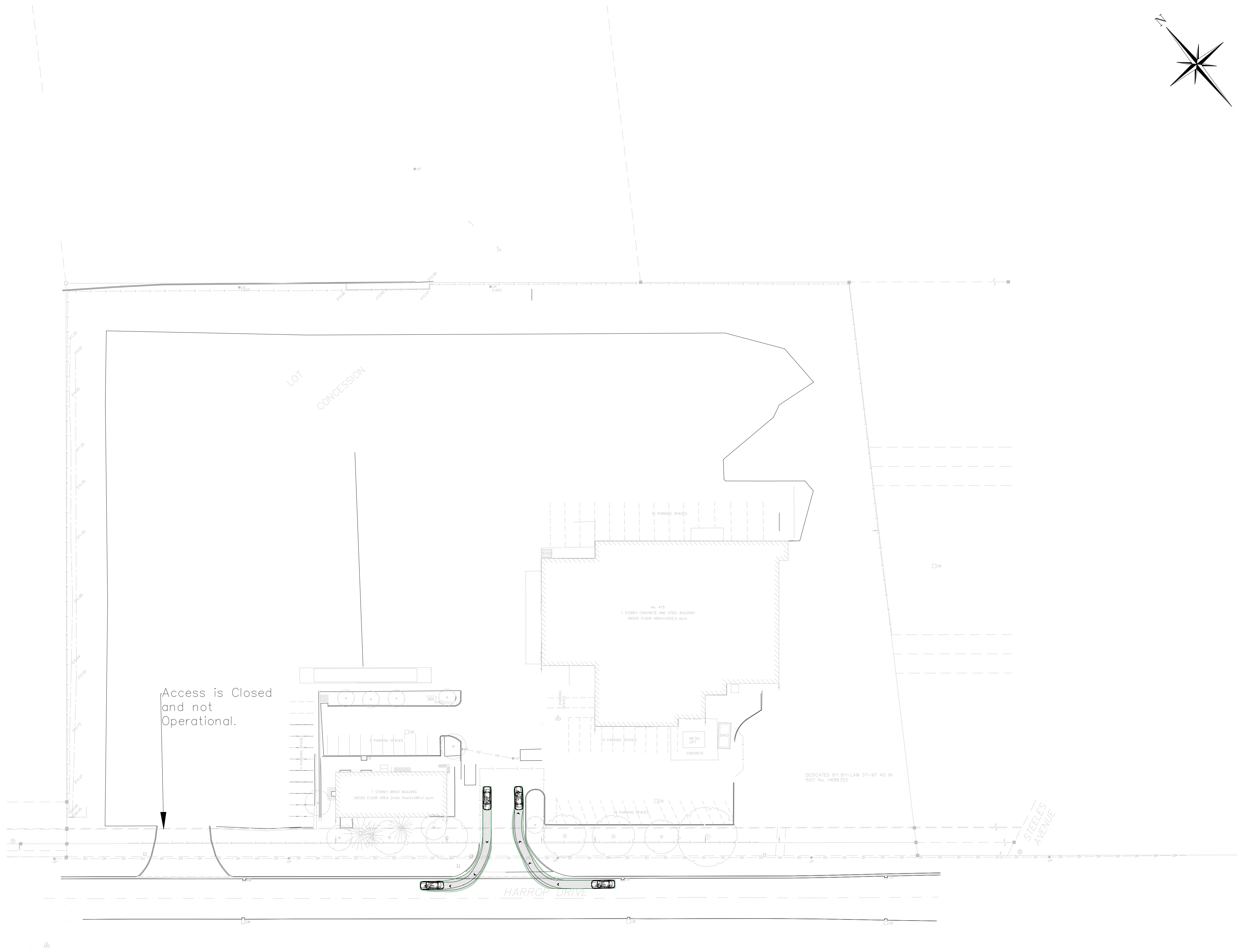
Project  
475 HARROP DRIVE  
TOWN OF MILTON

Drawing  
VEHICLE MANEUVERING ANALYSIS  
MEDIUM SINGLE UNIT TRUCK

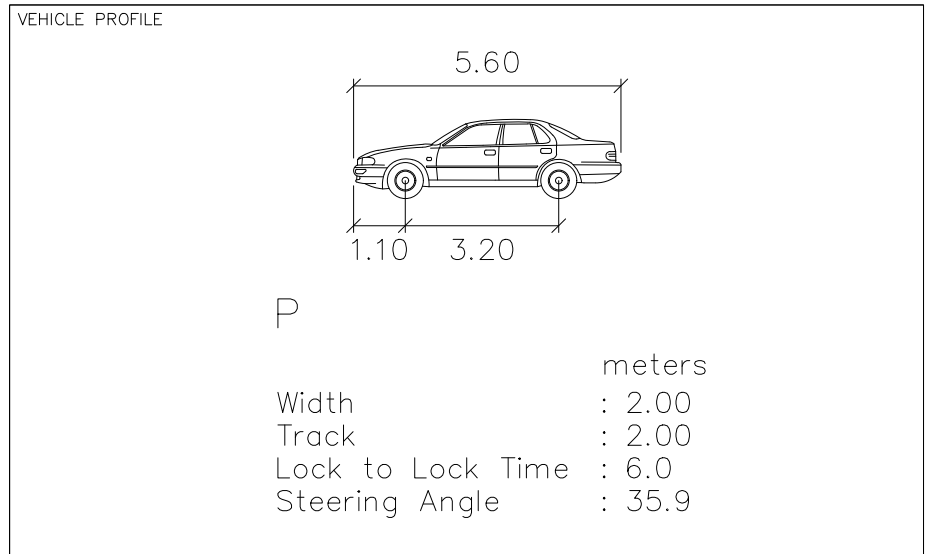
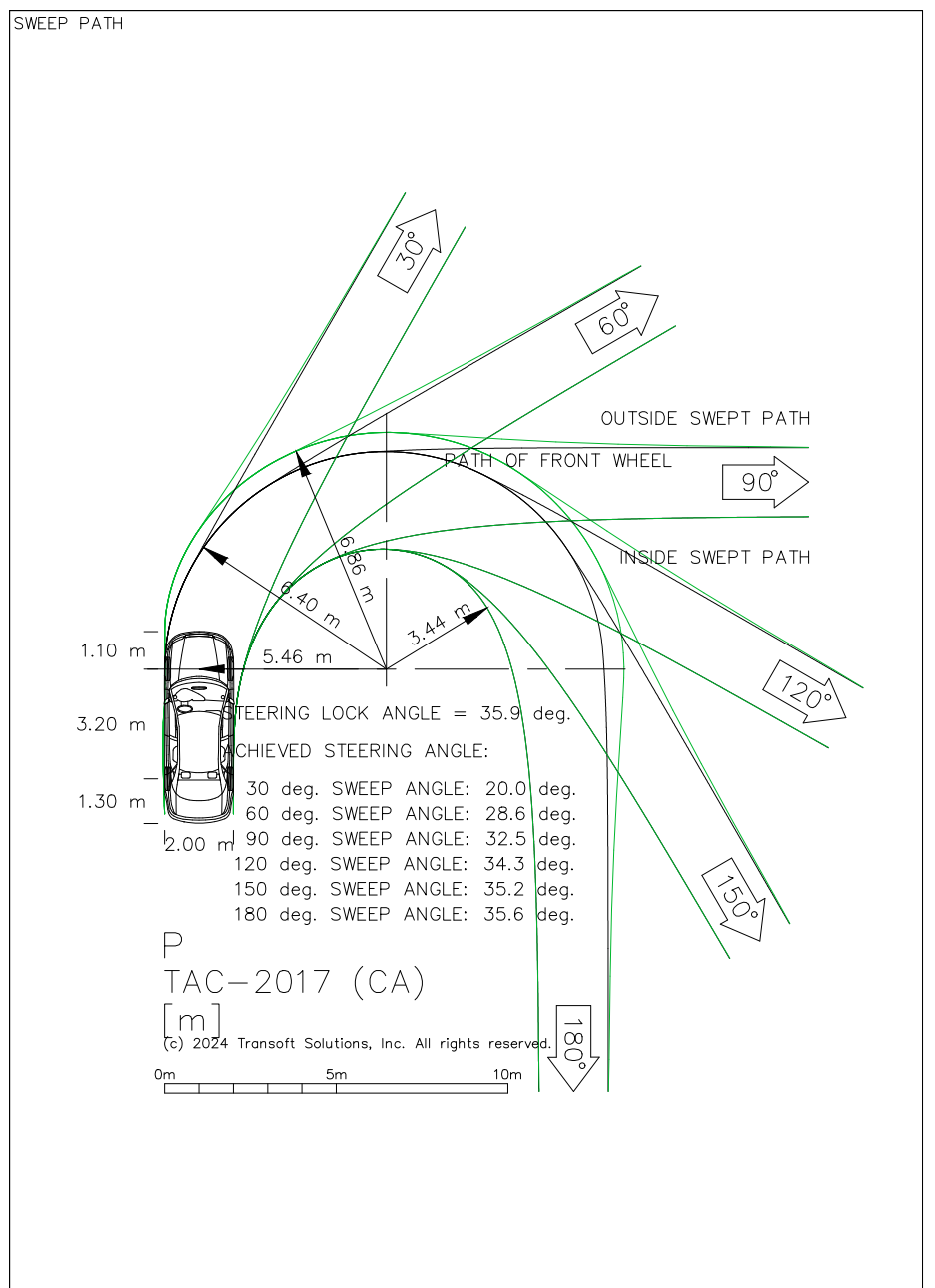
211 YONGE STREET  
SUITE 600  
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Check By	A.D.	Check By	Scale	Drawing
		B.B.	1:500	T303





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Project  
475 HARROP DRIVE  
TOWN OF MILTON

Drawing  
VEHICLE MANEUVERING ANALYSIS  
PASSENGER VEHICLE

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Check By	A.D.	Check By	Scale	1:500
		B.B.	Drawing	T304

# **Attachment G**

## Town of Milton Urban Zoning By-Law (ZBL) 016-2014 Excerpts

Type or Nature of Use	Minimum Off-Street <i>Parking</i> Requirements
<i>Motor vehicle body shop, Motor vehicle repair garage</i>	<ul style="list-style-type: none"> <li>3 <i>parking spaces</i> per service bay</li> </ul>
<i>Motor vehicle gas bar or Motor vehicle service station</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> for every 45m<sup>2</sup> of <i>floor space</i> dedicated to <i>accessory retail sales</i></li> </ul>
<i>Night Club</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 5 m<sup>2</sup> of <i>gross floor area</i> <u>PLUS</u></li> <li>1 <i>parking space</i> per 18 m<sup>2</sup> of <i>patio area</i></li> </ul>
<i>Offices</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 30 m<sup>2</sup> of <i>gross floor area</i></li> </ul>
<i>Place of assembly</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 9 m<sup>2</sup> of <i>gross floor area</i></li> </ul>
<i>Place of entertainment</i> Indoor Playgrounds All Other Entertainment Uses	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 20 m<sup>2</sup> of <i>gross floor area</i></li> <li>1 <i>parking space</i> per 9 m<sup>2</sup> of <i>gross floor area</i></li> </ul>
<i>Place of worship</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 5.5m<sup>2</sup> of <i>gross floor area</i> in the nave <u>PLUS</u></li> <li>1 <i>spaces</i> per 11m<sup>2</sup> of <i>gross floor area</i> for a public hall, <i>banquet hall</i> or community/multi-use hall if permitted and associated with or on the same site as the <i>Place of Worship</i>.</li> </ul>
<i>Police Station</i>	<ul style="list-style-type: none"> <li>1 <i>parking space</i> per 20 m<sup>2</sup>,</li> </ul>

## 5.9 ACCESSIBLE *PARKING* REQUIREMENTS (38-2019)

Designated accessible *parking spaces* for persons with a disability shall be provided in accordance with the provisions of this By-law and the Highway Traffic Act.

- i) The minimum required accessible *parking spaces* for persons with a disability shall be provided in accordance with the following:

TABLE 5H

No. of Required <i>Parking Spaces</i>	No. of Designated Accessible <i>Spaces</i>
1 to 12	1 Type A
13 to 100	4% (*1)
101 to 200	1 accessible parking space PLUS 3% (*1)
201 to 1000	2 accessible parking spaces PLUS 2% (*1)
More than 1000 spaces	11 accessible parking spaces PLUS 1% (*1)

Footnotes to Table 5H

(\*1) Where the minimum number of accessible *parking spaces* required is even, an equal number of Type A and Type B accessible *parking spaces* shall be provided. Where the minimum number of accessible *parking spaces* is odd, an equal number of Type A and Type B accessible *parking spaces* shall be provided but the last accessible *parking space* may be a Type B.

- ii) The total number of accessible *parking spaces* shall be included within the total required *parking* calculation for the *lot* or *use* and shall be rounded up to the nearest whole number;
- iii) Where required parking on a lot is calculated separately for a residential component, a visitor component, and/or a non-residential component and the parking is provided in a common parking area, the accessible parking required by this by-law shall also be calculated and provided separately for each of the individual components.
- iv) Accessible parking spaces shall be signed in accordance with the Town of Milton's Accessible Parking By-law and/or Highway Traffic Act; and,
- v) Accessible *parking spaces* shall be located in proximity to the primary entrance(s) to a *building* and shall have direct access to the entrance(s) by a minimum 2.2m wide unobstructed sidewalk or access route.

## 5.10 BICYCLE *PARKING SPACE* REQUIREMENTS (052-2018)(089-2022)

- i) The minimum *parking* requirements for bicycle *parking* shall be provided in accordance with the following: