OCTOBER 1, 2024

PROJECT NO: 2712-7169

SENT VIA: EMAIL
AQUISHA.KHAN@OAKVILLE.CA

Town of Oakville
1225 Trafalgar Road
Oakville, ON L6H 0H3

Attention: **Aquisha Khan, P.Eng.,**
Transportation Engineer, Transportation and Engineering

RE: **TRANSPORTATION BRIEF**
BLOCK 154, LOYALIST TRAIL AND SIXTH LINE
TOWN OF OAKVILLE, REGION OF HALTON

Dear Aquisha,

In support of the Official Plan Amendment, Zoning By-Law Amendment and Site Plan Approval applications related to the proposed residential development for the site known as Block 154, located near the intersection of Loyalist Trail and Sixth Line in the Town of Oakville, C.F. Crozier & Associates Inc. (Crozier) has prepared the following Transportation Brief (TB).

1.0 Introduction

Crozier was retained by Rowhedge Construction Limited to complete a TB for a proposed residential townhouse development at Block 154 located at Loyalist Trail and Sixth Line in the Town of Oakville.

The purpose of this brief is to analyze the impacts of the proposed development on the surrounding road network and recommend transportation mitigation measures, if warranted.

A Terms of Reference (ToR) encompassing the scope of the TB was circulated to the Town of Oakville on July 17, 2024, and comments were received from the Town on August 12, 2024. Correspondence from the Town of Oakville is included in **Appendix A.**

1.1 Development Lands

The subject lands cover an area of approximately 0.65 ha and currently consists of undeveloped lands. The site, located on rural lands zoned as Service Area Employment, is bounded by the future Fire Hall and Sixth Line to the west, green spaces to the north and east, and Loyalist Trail to the south. The location of the proposed development is shown in **Figure 1.**

1.2 Development Proposal

Per the most recent concept plan prepared by Hunt Design Associates Inc., received on August 2, 2024, and attached in **Appendix B**, the elements envisioned for the full buildout of this development include approximately:

- Five (5) blocks of stacked townhomes, with a total of 40 units.
- 83 parking spaces.
- A private Condo Road.
- Pedestrian and resident sidewalks throughout.
- Six (6) bicycle stalls.
- A parkette.
- A community garbage disposal building.
- A full-moves access via Loyalist Trail.

The most recent concept plan is attached in **Appendix B.**

1.3 Scope of Study

Developments of this size do not typically require a full Transportation Impact Study, as minor traffic impacts are assumed due to the relatively low number of trips. Therefore, a smaller scale Transportation Brief was prepared.

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

- The existing road network and record information relating to road jurisdiction, road classification, posted speed limit, lane configuration, cross-section elements.
- Forecast the trip generation characteristics of the proposed development using the Institute of Transportation Engineers Manual (11th edition).
- Determine the mode split and multi-modal trip generation based on Transportation Tomorrow Survey (TTS) data.
- Evaluate the proposed site access from a sight distance and geometry perspective.
- Assess Transportation Demand Management (TDM) opportunities for the proposed development to reduce single-occupancy vehicle (SOV) trips.

2.0 Existing Conditions

The following section provides a description of the study area from a transportation context.

2.1 Study Roadways

Table 1 summarizes the characteristics of the study area road network. The information was obtained from the Regional Municipality of Halton Regional Road Network and Google Maps.

Table 1: Study Area Road Network Characteristics

Roadway	Loyalist Trail	Sixth Line
Direction	East/West	North/South
Jurisdiction	Town of Oakville	Town of Oakville
Classification	Local Road	Arterial
Posted Speed Limit	50 km/h[1]	60 km/h
Number of Lanes Per Direction	1	1
Pedestrian Facilities	Pedestrian sidewalks on both sides of road	None
Cycling Facilities	None	None

Note 1: A jurisdictional speed limit of 50 km/h is assumed on the roadways with no posted speed limit.

It is important to note that there are no pedestrian or cycling facilities along the study roadways at this time. However, there is an existing trail running north-south along the east side of the proposed development. Relevant maps can be found in **Appendix C**.

2.2 Transit Operations

Based on a review of the transit operations within the study area, there are currently no transit stops within walking distance from the subject development. However, the Town of Oakville provides three on-demand transit services.

Ride On-Demand is a shared-ride service that allows users to request a ride in designated zones outlined in the Ride On-Demand Service Map. The service is provided by fully accessible transit vehicles and runs between Monday and Friday from 6:00 a.m. to 9:00 p.m. Standard Oakville Transit fares apply to this service.

Ride On-Demand Late Night Service is an on-demand, drop-off only bus service that drops people home from the Oakville GO station only. The service departs the Oakville GO station at 11:40 p.m. Trips must be booked before or at the departure time using the Oakville Transit On-Demand app.

Care-A-Van is a door-to-door specialized transit service that provides mobility to anyone who is unable to use conventional transit due to their disability. The services are provided via fully

accessible transit vehicles as well as local taxi providers and runs Monday to Friday from 6:00 a.m. to midnight, Saturday from 7:00 a.m. to midnight, and Sunday from 8:00 a.m. to 8:00 p.m.

3.0 Site Generated Traffic

The proposed development will result in additional vehicles on the boundary road network that would otherwise not exist. The development will also result in additional turning movements at the intersections.

3.1 ITE Trip Generation

Trip generation for the proposed development was forecasted using the ITE Trip Generation Manual, 11th Edition. Multifamily Housing (Low-Rise) (Land Use Code 220) was used to calculate the trips.

Table 2: Trip Generation

Land Use (Units/GFA)	Trip Type	AM				PM			
		Equation/ Rate	Trips Generated			Equation/ Rate	Trips Generated		
			Inbound	Outbound	Total		Inbound	Outbound	Total
220 - Multifamily Housing (Low-Rise) (40 units)	**Total Trips**	T = 0.31(X) + 22.85	8	27	**35**	T = 0.43 (X) + 20.55	24	14	**38**

Overall, the development is expected to generate 35 two-way trips (8 inbound and 27 outbound) during the weekday A.M. peak hour and 38 two-way trips (24 inbound and 14 outbound) during the weekday P.M. peak hour. Due to the low volume of site-generated trips, the proposed development is not expected to significantly affect traffic operations at the proposed site access. Therefore, the impact on the transportation operations of the nearby intersections are projected to be minor. Relevant excerpts from the ITE Trip Generation Manual, 11th Edition have been included in **Appendix D.**

3.2 Multi-Modal Trip Generation

As per the agreed upon Terms of Reference, multi-modal trip generation is reviewed for the Subject Development herein.

Given that the study area is undergoing significant growth and emerging developments, the mode splits indicated by the 2016 Transportation Tomorrow Survey (TTS) data found within TTS Zones 4048 (the zone in which the subject development is found) may not accurately reflect future trends upon buildout of the area. Thus, TTS zones located south of Burnhamthorpe Road were considered for the mode split. The mode splits were determined using the 2016 Transportation Tomorrow Survey data for the TTS Zones 4182, 4183, 4035 and 4037, and are shown in **Table 3**.

Table 3: TTS Mode Split

Mode	TTS Mode Split[1]
Auto	82%
Transit	9%
Cycle	1%
Walk	5%
School Bus	3%
Total	**100%**

Note 1: Per the 2006 TTS Traffic Zones 4182, 4183, 4035 and 4037

Based on the TTS mode split outlined in **Table 3**, the multi-modal trip generation was determined. It is important to note that ITE Trip Generation Manual, 11th Edition was also reviewed to determine the mode split and multi-modal trip generation. However, there was no ITE data associated with bicycle and transit trips, and the walking trips were found to be negligible. The multi-modal trip generation is shown in **Table 4**.

Table 4: Multi-Modal Trip Generation

Travel Mode	AM Peak Hour			PM Peak Hour		
	In	Out	Total	In	Out	Total
Driving	7	22	29	20	12	32
Transit	1	2	3	2	1	3
Cycle	0	0	0	0	0	0
Walk	0	1	1	1	1	2
School Bus	0	1	1	1	0	1
Total[1]	**8**	**27**	**35**	**24**	**14**	**38**

*Note 1: Per ITE Trip Generation Manual, 11th Edition and as outlined in **Table 2.***

The Subject Development is expected to generate 35 and 38 two-way person trips for the weekday a.m. and p.m. peak hours, respectively. Furthermore, the development is expected to generate 29 and 32 two-way vehicle trips for the weekday a.m. and p.m. peak hours, respectively.

Based on the study roadways and transit operations reviews in **Section 2.1** and **Section 2.2**, there are no transit stops within walking distance of the Subject Development, and no pedestrian/cycling facilities along the study roadways. Thus, the trip generation associated with active transportation and transit is expected to result in minimal reductions in vehicle trip generation. However, the vehicle trip generation is relatively low, and is not expected to result in operational or safety concerns. Multi-modal split data from the Transportation Tomorrow Survey results can be found in **Appendix E**.

3.3 Trip Distribution and Assignment

Data from Transportation Tomorrow Surveys (TTS) was used to estimate the peak hour trip distribution at the site. **Table 5** outlines the trip distribution for the proposed development divided into time and direction of travel.

Table 5: Trip Distribution

Distribution	A.M.		P.M.	
	Inbound	Outbound	Inbound	Outbound
North via Sixth Line	100%	75%	0%	100%
South via Sixth Line	0%	25%	100%	0%
Total	**100%**	**100%**	**100%**	**100%**

Based on a qualitative review of the distribution of site-generated trips along the boundary road network, minimal impacts to traffic operations are expected. No operational or safety concerns are anticipated. The trip assignment of site-generated trips can be seen in **Figure 2**. Trip distribution data from Transportation Tomorrow Survey results can be found in **Appendix E**.

4.0 Site Access Review

The development proposal includes a full-moves access along Loyalist Trail that will provide access/egress to and from the site. This section evaluates the suitability of the site access from a transportation safety perspective and recommends mitigation measures, if warranted. The safety review of the access includes an assessment of whether turning maneuvers can be made safely at the site access without issues related to sight lines and road geometry.

4.1 Intersection Sight Distance

Section 9.9 of the TAC GDGCR provides intersection sight distance for different intersection control types. The calculated and design sight distances are further summarized in TAC GDGCR Tables 9.9.4, 9.9.6 and 9.9.12 for vehicles turning left from stop, turning right from stop, or turning left from the major road, respectively.

Case B1 (Left Turn from the Minor Road) and Case B2/B3 (Right Turn / Crossing Maneuver from the Minor Road) were used to evaluate sight line adequacy for the site access. **Table 6** outlines the sight distance requirements and compares them to the available sight distance, which was measured during a site visit.

Table 6: Intersection Sight Distance Assessment

Site Access and Loyalist Trail Posted Speed = 50 km/h Design Speed = 70 km/h		
Formula (TAC	**ISD = 0.278 * V_{major} * t_g**	
Feature	**Case B1 – Left Turn**	**Case B2/B3 – Right Turn**
Time Gap[2]	Left Turn: 7.5s + 0.0s = **7.5s**	Right Turn: 6.5s + 0.0s = **6.5s**
Required Sight Distance	150 m (looking west)	130 m (looking east)
Available Sight Distance	~131 m	~204 m

Note 1: To calculate Time Gap, base time gap is required. This default parameter is based on particular turning cases (such as Case B1 and Case B2/B3) and particular design vehicles. Roadways with more than one lane per direction require additions of 0.5s and 0.7s per addition lane for passenger car and truck design vehicles, respectively. For minor street approach upgrades that exceed 3%, additions of 0.2s and 0.1s for Case B1 and Case B2/B3, respectively, are required per percent grade. Refer to Section 9.9 of TAC-GDGCR for additional details.

The available sight distance for the site access along Loyalist Trail meets the minimum sight distance requirements for Case B2/B3 (Right Turn / Crossing Maneuver from the Minor Road).

For Case B1 (Left Turn from the Minor Road), the sight distance extends to the end of Loyalist Trail at Sixth Line (approximately 131 metres looking west), which does not meet the recommended intersection sight distance to and from the west. However, this location is supportable as vehicles turning onto Loyalist Trail from Sixth Line are expected to be travelling below the design speed to complete the turning maneuver. Further, as minimal, or no obstructions are expected between the site access and Sixth Line, vehicles exiting the site and travelling to the east will be able to see vehicles turning onto Loyalist Trail from Sixth Line. Therefore, the proposed development can be supported from a sight distance perspective.

4.2 Corner Clearance

Corner clearance is the minimum distance between the proposed driveway and the adjacent intersection. The required corner clearances per Figure 8.8.2 in the TAC GDGCR are summarized in **Table 7**.

Table 7: Minimum Corner Clearance Requirement

Site Access	Corner Clearance Requirements			Corner Clearance Measurement	
	Corner Clearance from	**Corner Clearance To**	**TAC Figure 8.8.2 Corner Clearance**	**Corner Clearance Measurement**	**Requirement Met?**
Loyalist Trail Site Access	Cross Road (to the west)	Local Road	15 m	9.2 m	No

The available corner clearance for the site access along Loyalist Trail does not meet the minimum requirements as set out in **Table 7**. However, based on the low volumes of traffic volumes observed during weekday peak hours, minimal impacts to traffic operations and no operational and safety concerns are expected based on the proposed intersection alignment.

4.3 Intersection Spacing

The minimum intersection spacing between three-legged intersections along local roads is shown in section 9.4.2.3 of the TAC GDGCR.

Table 8: Intersection Spacing Requirement

Site Access	Roadway Type	Intersection Type (Adjacent Intersection)	Intersection Spacing Requirements	Intersection Spacing Measurement	Intersection Spacing Requirement Met?
Loyalist Trail Site Access	Local	Three-Legged	40 m	9.2 m	No

The proposed site access does not meet the intersection spacing requirements outlined in the TAC GDGCR. However, as stated in **Section 4.2**, due to the low traffic volumes observed during weekday peak hours, the proposed intersection alignment is acceptable from an operational and safety perspective.

4.4 Access Width

Access widths were measured against the standards in Table 8.9.1: Typical Driveway Dimensions in the TAC GDGCR, the Town of Oakville Standard Drawing 10-2: Driveway Entrance Criteria, the Halton Region Access Management Guidelines Table 2 – Driveway Dimensions (Width) and the Ontario Building Code. The results are summarized in **Table 9**.

Table 9: Access Width Requirements

Land Use	TAC Manual	Ontario Building Code	Town of Oakville Standard Drawing 10-2[1]	Halton Region Access Management Guidelines[2]	Loyalist Trail Site Access Width
Residential	2.0 - 7.3 m	6.0 m	7.5 m	3.5 m – 7.5 m	7.5 m

Note 1: Requirement is based on Land Use "Multiple Residential", Road Type "Minor"
Note 2: Requirement is based on Urban Residential roadway

The proposed site access is in compliance with the access width requirements outlined in the TAC GDGCR, the Town of Oakville Standard Drawings, the Halton Region Access Management Guidelines and the Ontario Building Code.

4.5 Throat length

Clear throat lengths were measured against the specifications outlined in the TAC GDGCR and are summarized in **Table 10**. The throat lengths for the proposed development as well as for the existing roadways was measured for comparison. Based on the land uses available in Table 8.9.3: Suggested Minimum Clear Throat Lengths for Major Driveways, the throat length requirement was determined based on the land use labelled "Apartments" with less than 100 units and the "Collector" roadway type.

Table 10: Clear Throat Length Requirements

Site Access	Land Use	Development Size	Roadway Type	Clear Throat Length Requirements	Measured Clear Throat Length
Loyalist Trail Site Access (Proposed Development)	Apartments	< 100 Units	Collector	8.0 m	3.2 m
Lane 176	Apartments	< 100 Units	Collector	8.0 m	2.7 m
Hillsborough Crescent (West)	Apartments	< 100 Units	Collector	8.0 m	5.3 m
Hillsborough Crescent (East)	Apartments	< 100 Units	Collector	8.0 m	3.9 m

The proposed site access does not meet the clear throat length requirements outlined in the TAC GDGCR. However, based on a review of the existing roadways along Loyalist Trail, they do not meet the recommended throat length requirements either, with Lane 176 having a clear throat length that is less than the proposed development. Thus, the proposed throat length is similar to the design and layout of its surrounding area.

Appendix F contains relevant TAC GDGCR excerpts.

5.0 Town of Oakville Zoning By-Law Requirements

This section reviews the minimum vehicle, accessible, and bicycle parking requirements, as well as the loading requirements for the proposed development based on the Town of Oakville Zoning By-Law (ZBL). The requirements are based on the North Oakville ZBL 2009-189, the comprehensive ZBL applying to all properties north of Dundas Street and south of Highway 407, also referred to as "North Oakville ZBL" throughout the rest of this document.

Appendix G Contains ZBL Requirements.

5.1 Vehicle Parking Assessment

The proposed parking supply was assessed against table 5.1A of the North Oakville ZBL. The minimum and maximum parking requirements per the North Oakville ZBL are outlined below in **Table 11**.

Table 11: North Oakville Zoning By-law Parking Requirements

Building (By-Law Land Use)	Units / GFA	Minimum Parking Space Rate	Maximum Parking Space Rate	Required Minimum Vehicle Parking Spaces	Required Maximum Vehicle Parking Spaces
Townhouse dwellings including back-to-back townhouse dwellings and stacked townhouses	40 Units	1 space per dwelling unit	3 spaces per dwelling unit	40	120
Total Required Parking Spaces				**40**	**120**
Total Proposed Parking Spaces				**83**	
Surplus/Deficit				**+43 on Minimum**	**Within Maximum**

As outlined above, the North Oakville ZBL requires the townhouse development to provide a minimum and maximum parking supply of 40 and 120 parking spaces respectively. As the Site Plan proposes 83 parking spaces, the development meets the ZBL's parking requirements.

5.2 Accessible Parking Requirements

According to Section 5.2.1 of the North Oakville ZBL, there are no accessible parking requirements for residential uses. Accordingly, no accessible parking spaces are proposed in the site plan.

5.3 Bicycle Parking Assessment

According to Section 5.7.1.1 of the North Oakville Zoning By-law, there are no bicycle parking requirements for townhouse dwellings. It is expected that residents and visitors will be parking bicycles within the individual garage spaces.

5.4 Loading Spaces Assessment

According to Section 5.6.1 of the North Oakville Zoning By-law, there are no loading dock requirements for residential uses. Accordingly, no loading docks are proposed in the site plan.

6.0 Transportation Plans

6.1 Traffic Control Plan

The Traffic Control Plan provides insight on the recommended traffic control during construction operations to help ensure that traffic moves safely while the development is being constructed. The recommended Traffic Control Plan is included in **Appendix H.**

6.2 Bicycle and Pedestrian Connectivity Plan

A Bicycle and Pedestrian Connectivity Plan shows the possible connections from the development to the surrounding area via bicycle and pedestrian paths. The proposed Bicycle and Pedestrian Connectivity Plan based on the Site Plan is included in **Appendix I**.

6.3 Vehicle Maneuvering Diagrams

The Vehicle Maneuvering Diagrams use the AutoTURN software to analyze the predicted movements of the vehicles that are expected to utilize the site's internal road network. An AutoTURN analysis was undertaken to confirm the turning radii that a firetruck can maneuver throughout the site. **Appendix J** illustrates the vehicle maneuvering diagrams.

7.0 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.

7.1 Existing TDM Measures

As stated in **Section 2.1**, there are no pedestrian or cycling facilities along the study roadways.

Furthermore, as stated in **Section 2.2**, there are currently no transit stops within walking distance from the subject development. However, as the study area is located in the North Oakville On-Demand Zone, the Town of Oakville provides three on-demand transit services in the area.

7.2 Future TDM Measures

According to the Town of Oakville Active Transportation Master Plan (2017), the boundary road network is part of the Primary Spine Route and Secondary Neighborhood Route in the Proposed Active Transportation Route Hierarchy Map. Sixth Line is proposed to be part of the Primary Spine Route, which is expected to provide direct connections between and through urban centres, with the goal of connecting to major commercial, residential and employment destinations throughout the Town. Moreover, a bike lane is proposed along Sixth Line. Loyalist Trail is made up of the Secondary Neighborhood Route, which is expected to be made up of more localized

neighborhood connections that feed into the primary route, providing links to schools, community centers, residential areas, parks and recreational areas. Furthermore, an off-road trail along Loyalist Trail is proposed.

The Town of Oakville is soon to commence a 5-year transit plan from 2025 to 2029, to prepare for a new era of growth. The objective of the Five-Year Business Plan is to "develop plans and policies to guide Oakville Transit in overcoming the residual impacts of the pandemic, accommodate growth, address changing needs, and align with key plans and studies over the 2025 to 2029 period". The plan will be based on design principles including more direct routes, less duplication, and a focus on key destinations. Following feedback from internal review and public consultation, the Future Proposed Oakville Transit Network will be finalized. With that, a Ridership Growth Plan will be made to identify initiatives including education, training and marketing to increase ridership between 2024 and 2029. Although no transit routes are currently proposed on the boundary road network, there is opportunity to establish routes as neighboring developments continue to emerge, as well as through input from the public consultations.

8.0 Conclusions

This study has analyzed potential traffic impact on the boundary road network in relation to the proposed residential townhouse development situated at Loyalist Trail & Sixth Line, in the Town of Oakville. The analyses contained within this report may be summarized with the following key findings:

- The proposed development is expected to generate 35 and 38 two-way person trips for the weekday a.m. and p.m. peak hours, respectively. Furthermore, the development is expected to generate 29 and 32 two-way vehicle trips for the weekday a.m. and p.m. peak hours, respectively. Due to the low volume of site generated trips, the proposed development is not expected to affect traffic operations at the proposed site access. Therefore, the traffic impacts are projected to be minor.

- Based on a review of the multi-modal trip generation, the trip generated associated with active transportation and transit is expected to result in minimal reductions in vehicle trip generation. However, the vehicle trip generation is relatively low, and is not expected to result in operational or safety concerns.

- The available sight distance for the site access along Loyalist Trail meets the minimum sight distance requirements for Case B2/B3 (Right Turn / Crossing Maneuver from the Minor Road). For Case B1 (Left Turn from the Minor Road), the sight distance extends to the end of Loyalist Trail at Sixth Line (approximately 131 metres looking west), which does not meet the recommended intersection sight distance to and from the west. However, this location is supportable as vehicles turning onto Loyalist Trail from Sixth Line are expected to be travelling below the design speed to complete the turning maneuver.

- The available corner clearance and intersection spacing for the site access along Loyalist Trail do not meet the minimum requirements as set out in the TAC GDGCR. However, due to the low volumes of traffic volumes observed during weekday peak hours, minimal impacts to traffic operations and no operational and safety concerns are expected based on the proposed intersection alignment.

- The proposed site access is in compliance with the access width requirements outlined in the TAC GDGCR, the Town of Oakville Standard Drawings, the Halton Region Access Management Guidelines and the Ontario Building Code.

- The proposed site access does not meet the clear throat length requirements outlined in the TAC GDGCR. However, based on a review of the existing roadways along Loyalist Trail, they do not meet the recommended throat length requirements either. Thus, the proposed throat length was found to be in accordance with the designs in the surrounding area.

We trust that this review satisfies any access and transportation concerns associated with the site plan for this development. Should you have any questions or require any further information, please do not hesitate to contact the undersigned.

Sincerely,

C.F. CROZIER & ASSOCIATES INC.

Aiman Khan
Engineering Intern, Transportation

C.F. CROZIER & ASSOCIATES INC.

R. Aaron Wignall, Associate
Senior Project Manager, Transportation

RAW/MC/IL/ak;rl

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APPENDIX A

Correspondence

Aiman Khan

From: Aquisha Khan <aquisha.khan@oakville.ca>
Sent: August 12, 2024 9:00 AM
To: Aiman Khan
Cc: Aaron Wignall; Martin Chan
Subject: RE: [EXTERNAL] FW: Terms of Reference - North Oakville (Loyalist Trail and Sixth Line) - 2712-7169

Hi Aiman,

Forgive the delayed response. Please see my comments below.

If you have any questions or concerns, please do not hesitate to contact me.

Regards
Aquisha

Aquisha Khan, (She/Her/Hers), P. Eng.
Transportation Engineer
Transportation and Engineering
Town of Oakville | 905-845-6601, ext. 3236 | www.oakville.ca

Vision: A vibrant and livable community for all

From: Aiman Khan <aiman.khan@cfcrozier.ca>
Sent: Wednesday, July 31, 2024 10:49 AM
To: Aquisha Khan <aquisha.khan@oakville.ca>
Cc: Aaron Wignall <awignall@cfcrozier.ca>; Martin Chan <mchan@cfcrozier.ca>
Subject: [EXTERNAL] FW: Terms of Reference - North Oakville (Loyalist Trail and Sixth Line) - 2712-7169

Hi Aquisha,

We have received the attached pre-con comment from Town of Oakville's Planning staff for 15 Loyalist Trail . Please see the Terms of Reference originally sent to Syed. We will also include vehicle turning diagrams, a traffic control plan and a bicycle/pedestrian connectivity plan as per the pre-con comments.

Please reach out if you have any questions or concerns.

Thank you,

Aiman Khan
Aiman Khan
Engineering Intern, Transportation Planning, Transportation
Office: 905.876.5063
Collingwood | Milton | Toronto | Bradford | Guelph

From: Aiman Khan <aiman.khan@cfcrozier.ca>
Sent: Wednesday, July 17, 2024 2:49 PM
To: syed.rizvi@oakville.ca
Cc: Aaron Wignall <awignall@cfcrozier.ca>
Subject: Terms of Reference - North Oakville (Loyalist Trail and Sixth Line) - 2712-7169

Hello,

C.F. Crozier and Associates (Crozier) has been retained by Rowhedge Construction Limited to prepare a Transportation Brief (TB) for a proposed residential development for the site Block 154 located at Loyalist Trail and Sixth Line in the Town of Oakville, in support of the Official Plan Amendment, Zoning By-Law Amendment and Site Plan Approval applications.

Based on the information provided, the elements envisioned for this development include:

- Five (5) blocks of stacked townhomes, with a total of 40 units.
- 80 parking spaces.
- An inner Condo Road.
- Pedestrian and resident sidewalks throughout.
- Six (6) bicycle stalls.
- A parkette.
- A community garbage disposal building.

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

Developments of this size do not typically require a full Transportation Impact Study, as minor traffic impacts are assumed. Therefore, a smaller scale Transportation Brief will be sought. **Please confirm if this is acceptable.** ***[AK]*** **- yes**

Trip Generation and Distribution

Trip generation for the proposed development will be forecasted using the Institute of Transportation Engineers' (ITE) Trip Generation Manual, 11th Edition. Multifamily Housing (Low-Rise) (Land Use Code 220) will be used to calculate trips. **Please confirm if this is acceptable.** ***[AK]*** **- yes**

The trip generation for each mode (vehicle, transit, pedestrian, and cyclist) will be determined in order to determine active transportation demands. Calculation of the trip generation of each mode will be based on Transportation Tomorrow Survey (TTS) data. **Please confirm if this is acceptable.*[AK] - yes***

The site-generated trips will be distributed to and from the boundary road network based on the Transportation Tomorrow Survey (TTS) data or existing travel patterns. A qualitative analysis of the site-generated trips and their impacts on the site will be provided. **Please confirm if this is acceptable.*[AK]* please ensure that the travel patterns make sense.**

[AK] Please include capacity and queue analysis for the following intersections for the existing horizon and the full-build-out horizon (5-years) at a calculated growth rate:

- **Site Access and Loyalist Trail**
- **Loyalist Trail and Sixth Line**

Site Access Review

The proposed 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 if this is acceptable.*[AK]* - yes**

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 if this is acceptable.** ***[AK]* - yes**

[AK] Please include the following:

- **Turning Movement Plan**
- **Parking Demand Section**
- **Pedestrian/Bicycle Circulation Plan**

Summary

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

In summary, please provide:

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

[AK] As a separate document, please provide a preliminary construction management plan for the site. This is to include a memo with details on the operations before construction, during construction and after construction. A preliminary detour/traffic control plan should also be provided as per OTM book 7.

We hope the contents outlined in this email are acceptable. Again, if you are not the appropriate contact, we would appreciate being directed to the appropriate contact.

Should you have any questions or require any further information, please feel free to contact us.

Regards,

Aiman Khan

Engineering Intern, Transportation Planning, Transportation
Office: 905.876.5063
Collingwood | Milton | Toronto | Bradford | Guelph

Proudly named one of Canada's Top Small & Medium Employers for 2024. Read more here.

CROZIER

APPENDIX B

Concept Plan

PROPOSED DEVELOPMENT
0.6511 ha = 1.609 ac

FIRE HALL LANDS
0.6147 ha = 1.519 ac

BLOCK 154

BLOCK 1 STACKED TOWNS (8 UNITS)
BLOCK 2 STACKED TOWNS (8 UNITS)
BLOCK 3 STACKED TOWNS (8 UNITS)
BLOCK 4 STACKED TOWNS (8 UNITS)
BLOCK 5 STACKED TOWNS (8 UNITS)

7.5m CONDO ROAD
FIRE ROUTE
1.8m SIDEWALK
PARKETTE
6 BIKE STALLS
COMMUNITY GARBAGE DISPOSAL
CHAIN LINK FENCE
FENCE ON LINE
END OF FENCE 0.06 NORTH ON LINE EAST/WEST
SIXTH LINE
PUBLIC SIDEWALK
2.0 CONC. SIDEWALK
1.50 CONC. SIDEWALK
LOYALIST TRAIL
CSP
GLB

2. UNIT COUNT	
6.48m STACKED TOWNHOUSES (2 UNITS PER MODULE)	40

4. PARKING
PROPOSED UNIT PARKING: 2 SPACES / UNIT
40 UNITS x 2 = 80 SPACES PROVIDED
ADDITIONAL SURFACE PARKING = 3 SPACES

THE UNDERSIGNED HAS REVIEWED AND TAKES RESPONSIBILITY FOR THIS DESIGN AND HAS THE QUALIFICATIONS AND MEETS THE REQUIREMENTS SET OUT IN THE ONTARIO BUILDING CODE TO BE A DESIGNER.
QUALIFICATION INFORMATION

NAME	SIGNATURE	BCIN
-		-

REGISTRATION INFORMATION

HUNT DESIGN ASSOCIATES INC.	19695

HUNT DESIGN ASSOCIATES INC.
www.huntdesign.ca
8966 Woodbine Ave, Markham, ON L3R 0J7
T 905.737.5133 email: hdai@huntdesign.ca

Title: SITE PLAN
Street Name: LOYALIST TRAIL, OAKVILLE, ON.
Plan No.: -

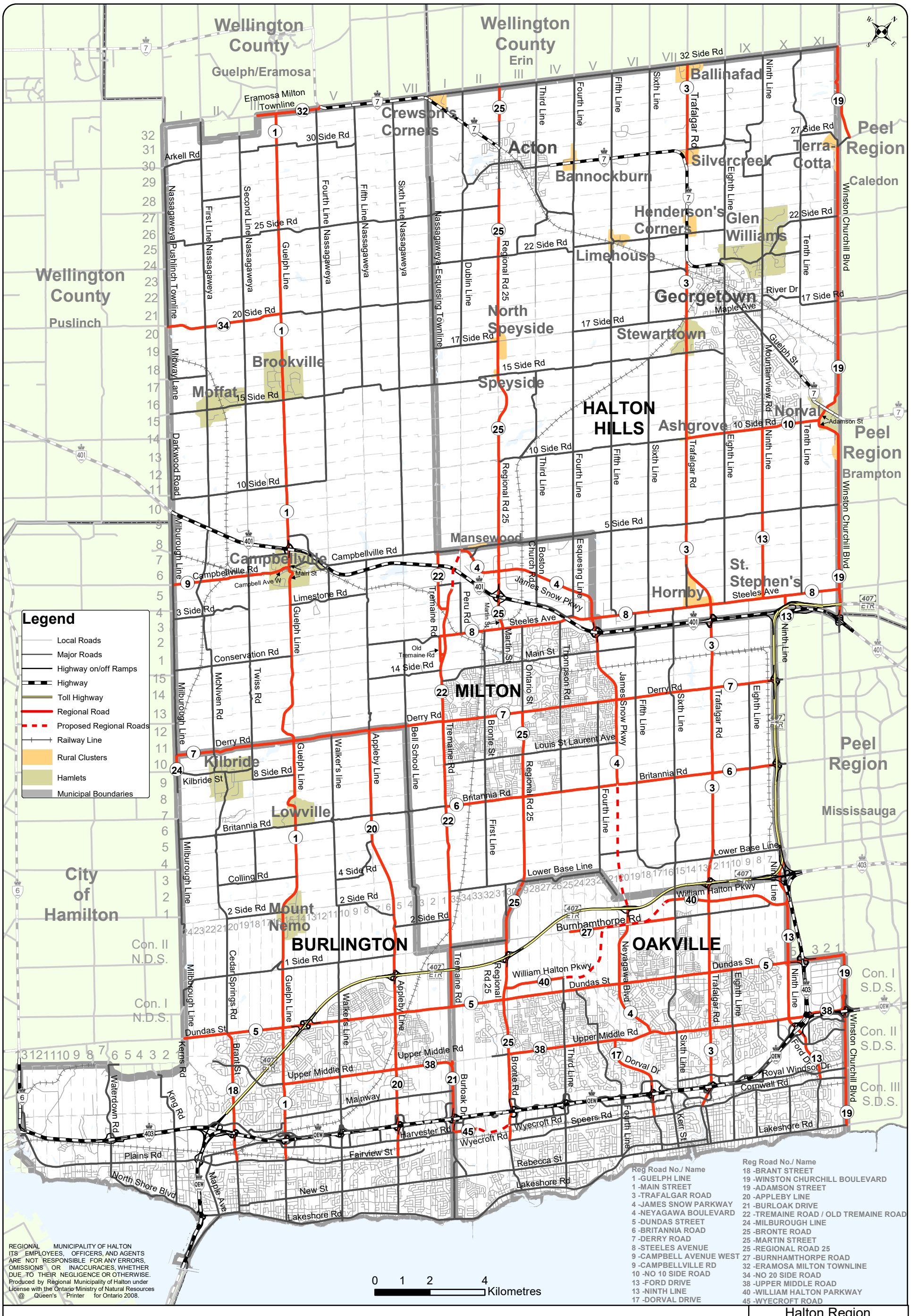
ROSEHAVEN HOMES - 219014
BLOCK 154

Drawn By	Checked By	Scale	Lot / Page Number
DC	-	1:400	A1

File Number: 219014DSP-01

APPENDIX C

Transit Maps



Regional Municipality of Halton
Regional Road Network

Halton Region
Public Works

Dec 1, 2021

RegionalRoads_NetworkMapNew120121.mxd

APPENDIX D

ITE Trip Generation Manual, 11th Edition

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)

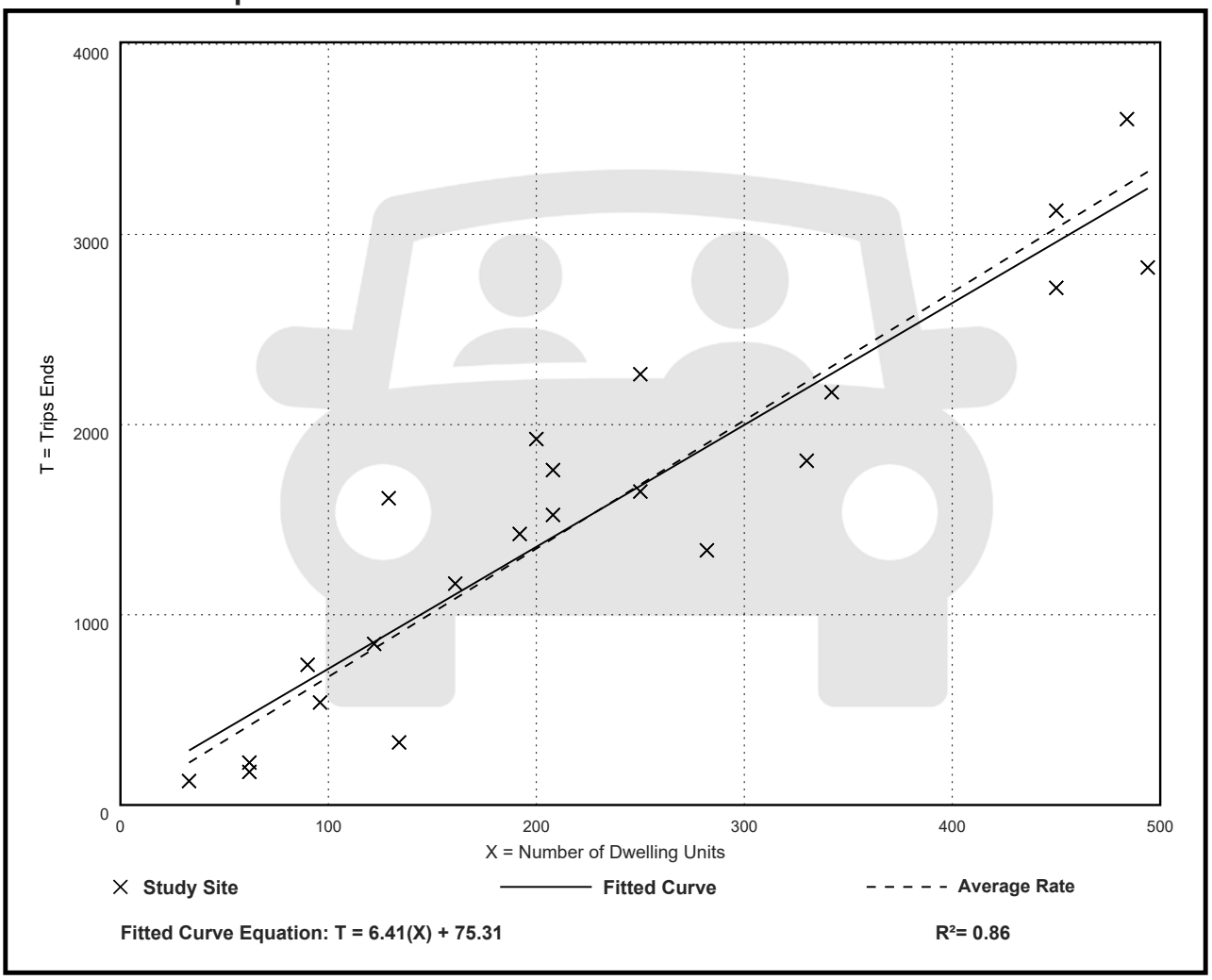
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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

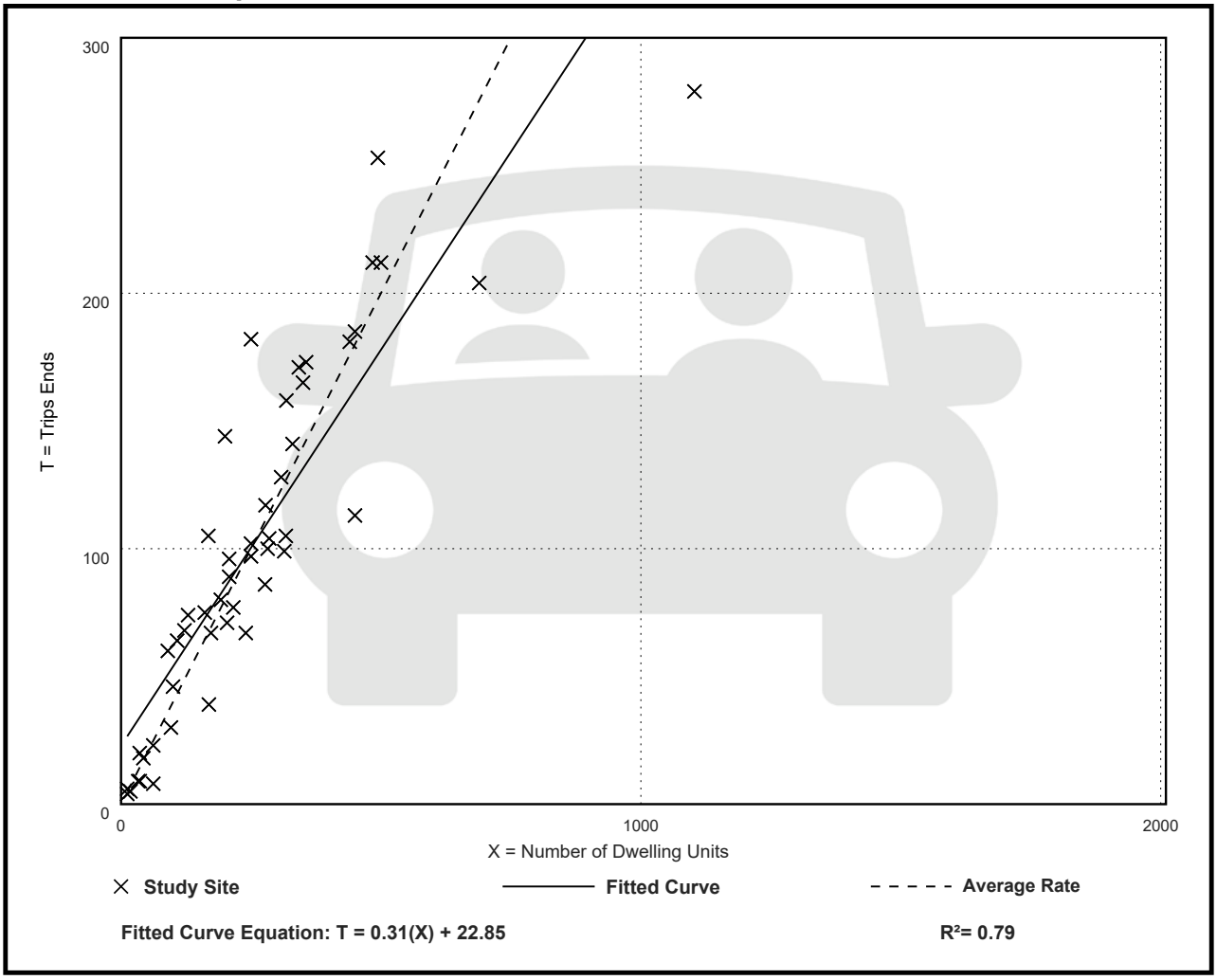
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



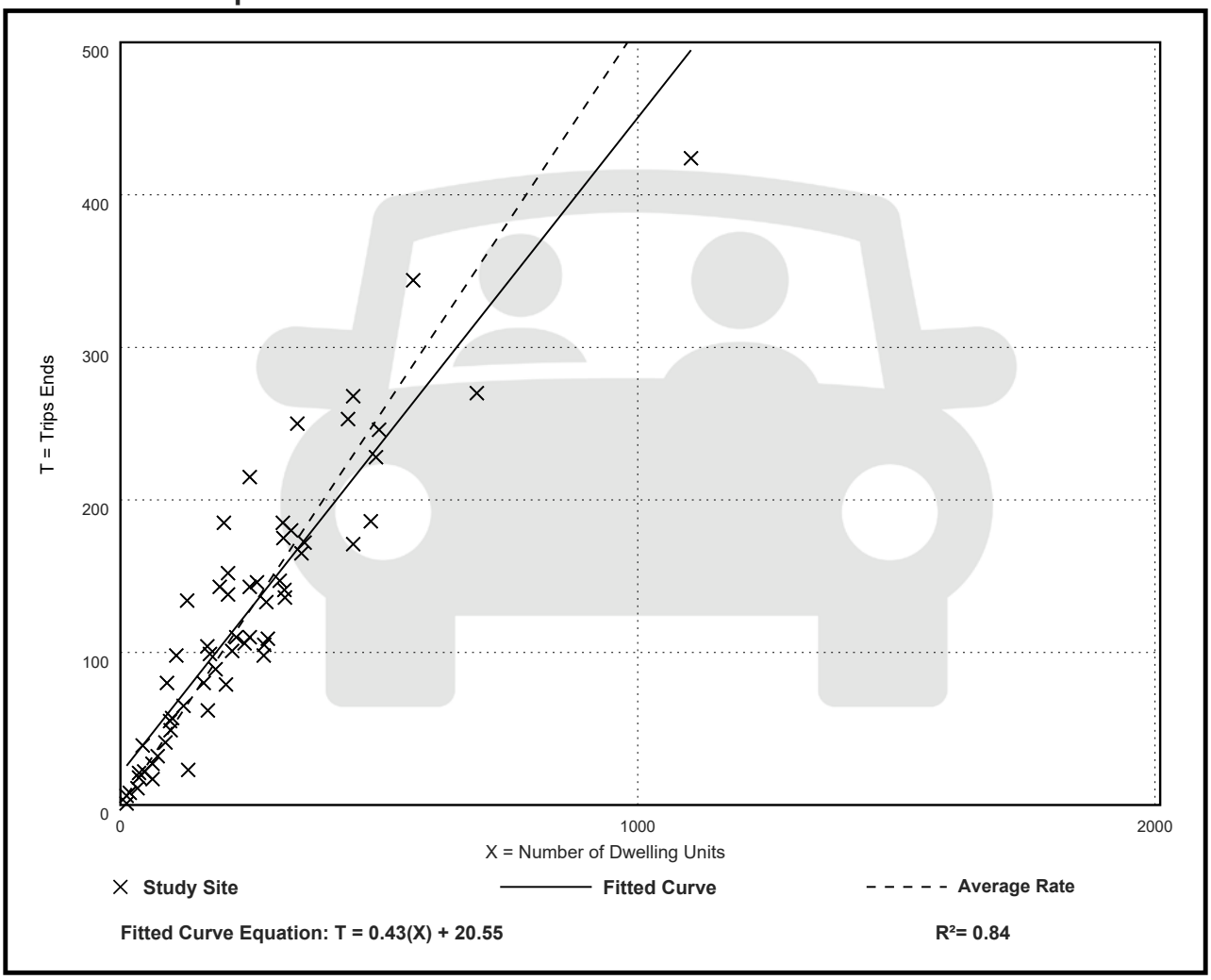
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



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

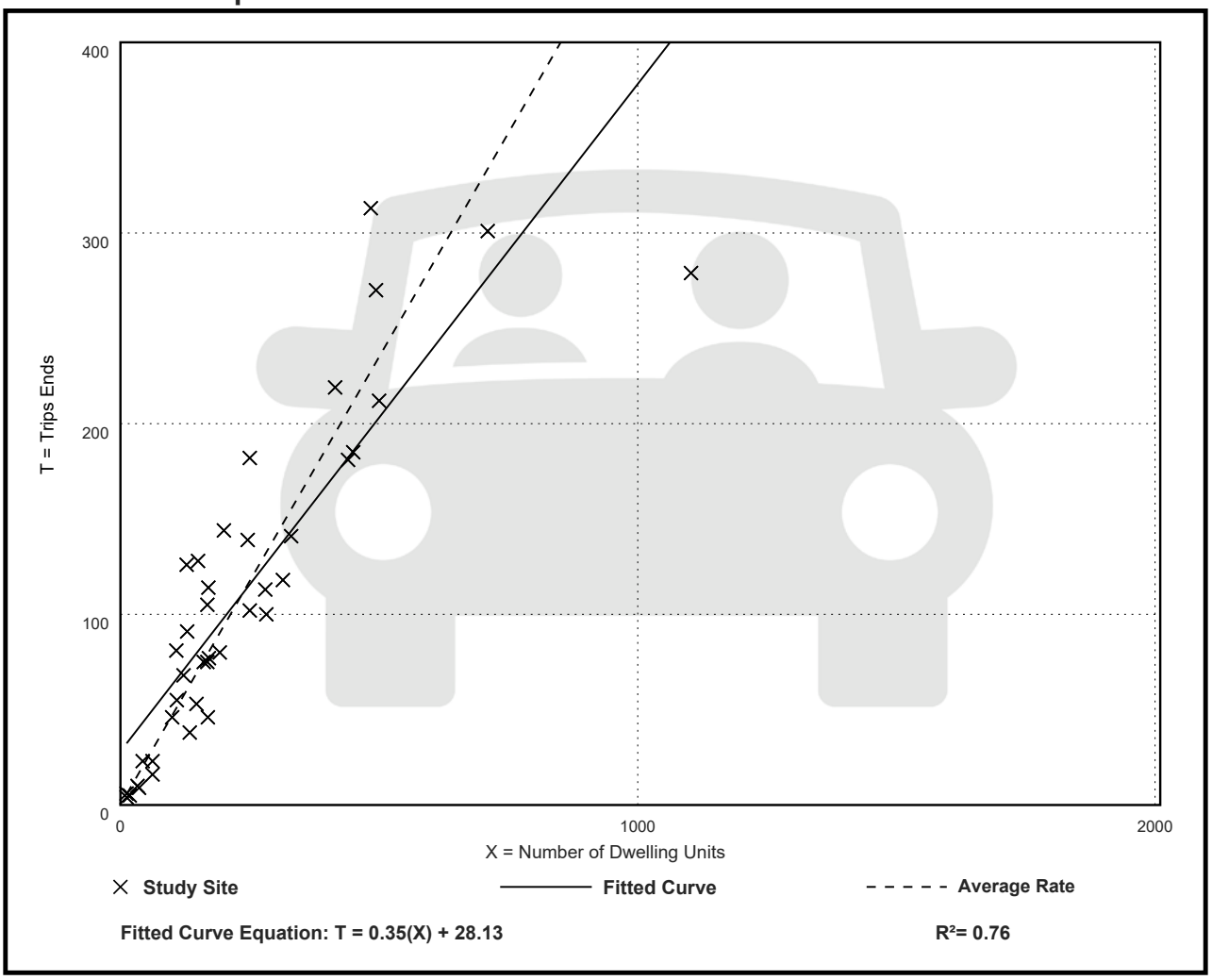
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
AM Peak Hour of Generator

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



Fitted Curve Equation: T = 0.35(X) + 28.13

R^2= 0.76

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

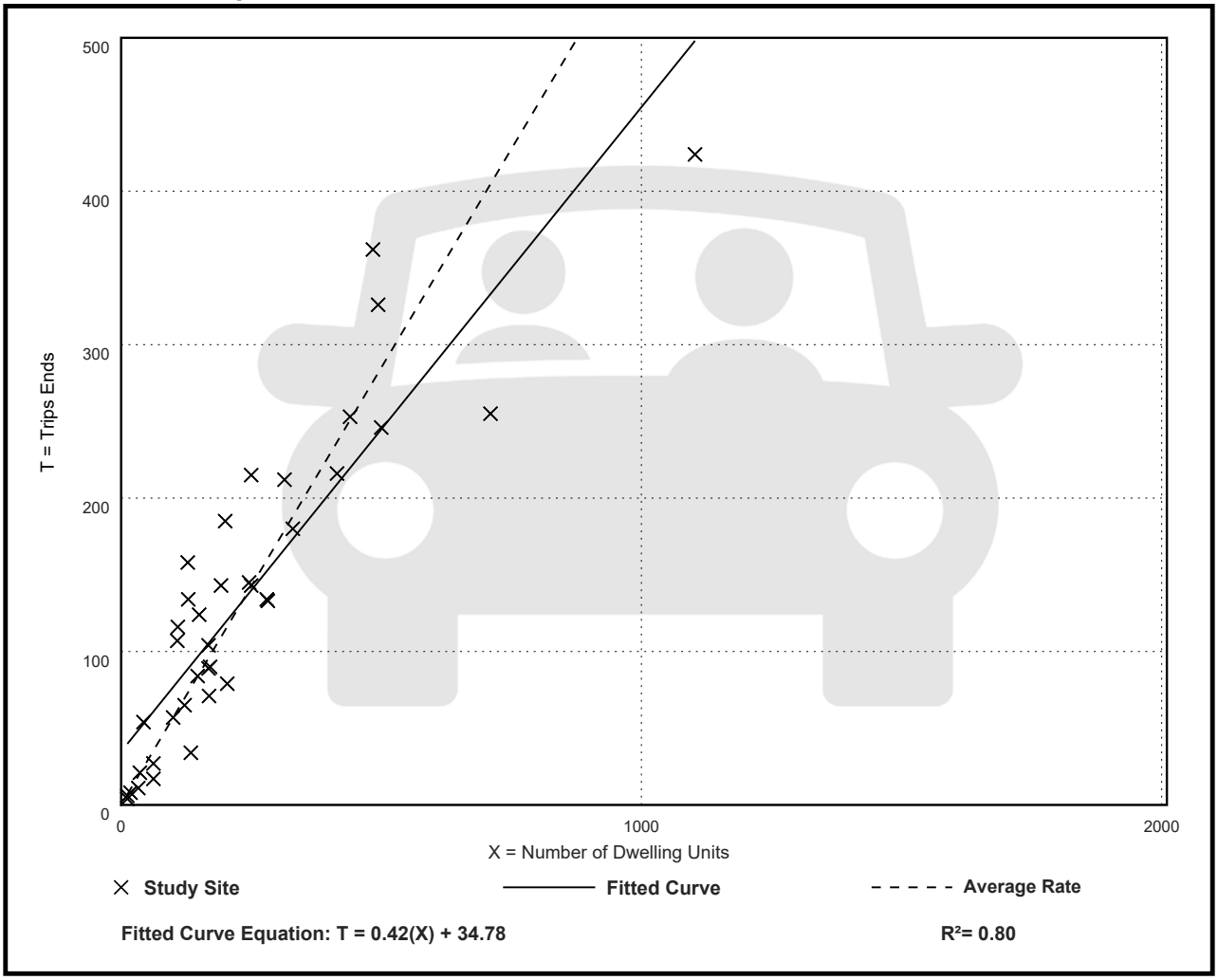
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
PM Peak Hour of Generator

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



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

Vehicle Trip Ends vs: Dwelling Units
On a: Saturday

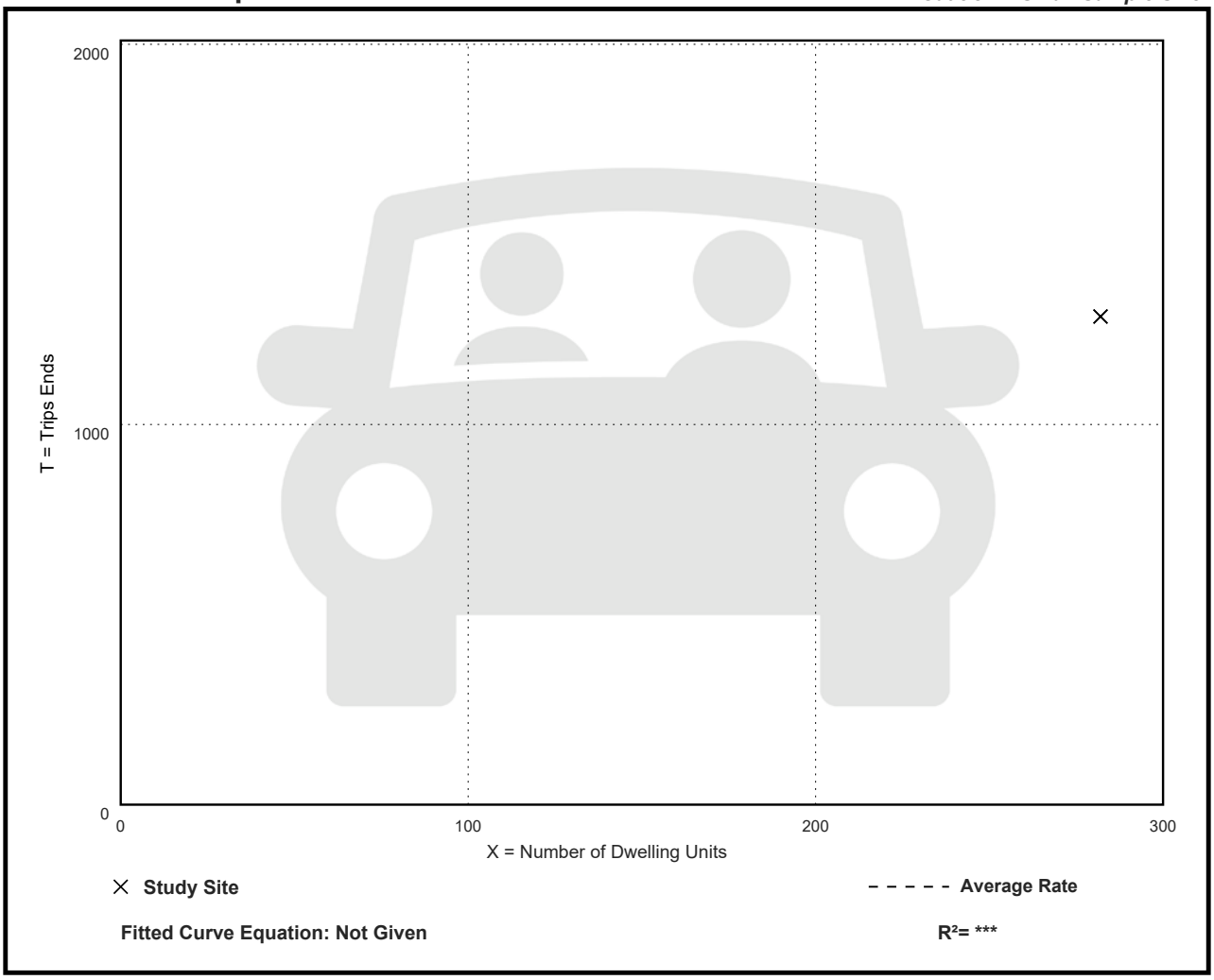
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

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



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

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

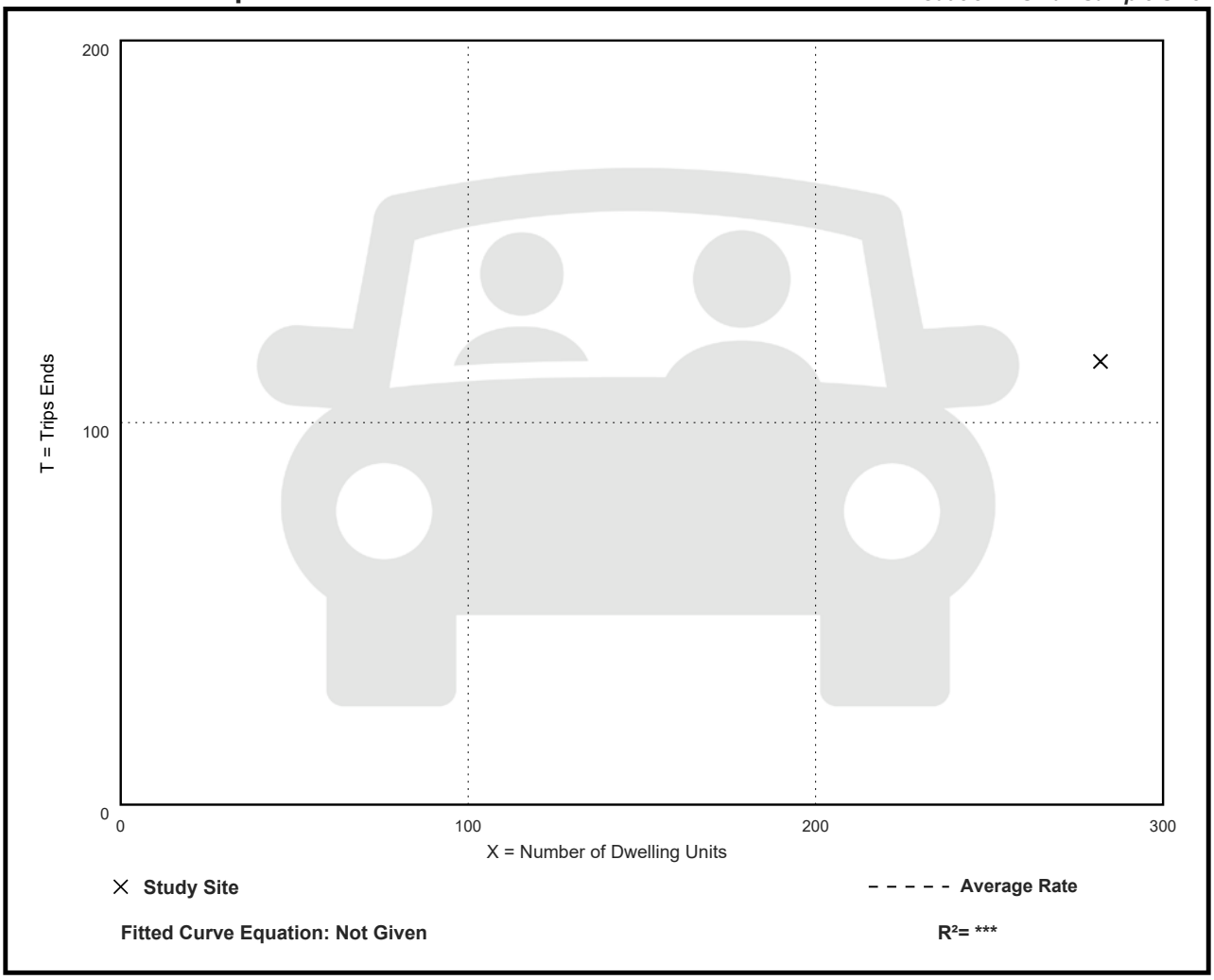
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

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



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

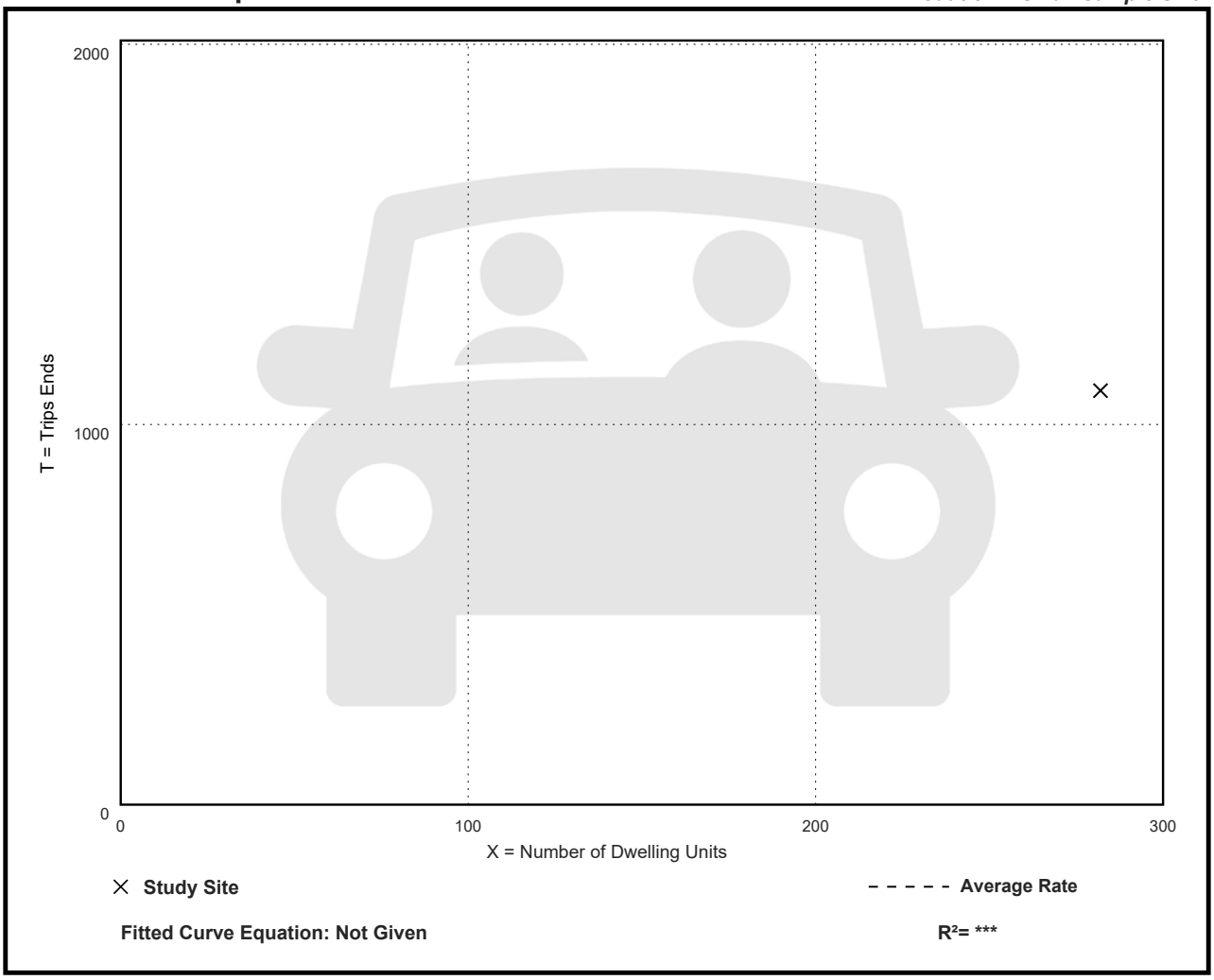
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: 50% entering, 50% exiting

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



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

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

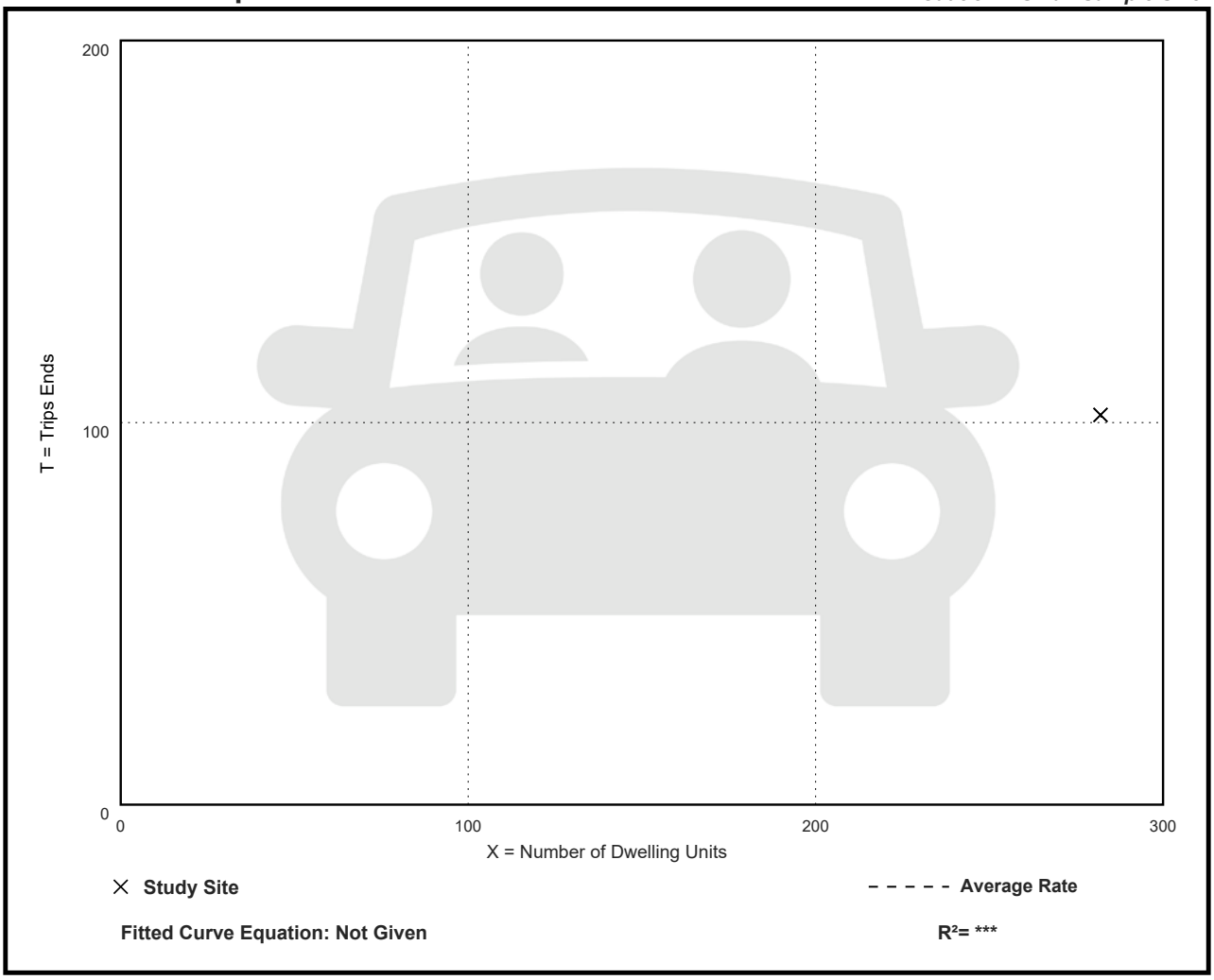
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 282
Directional Distribution: Not Available

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

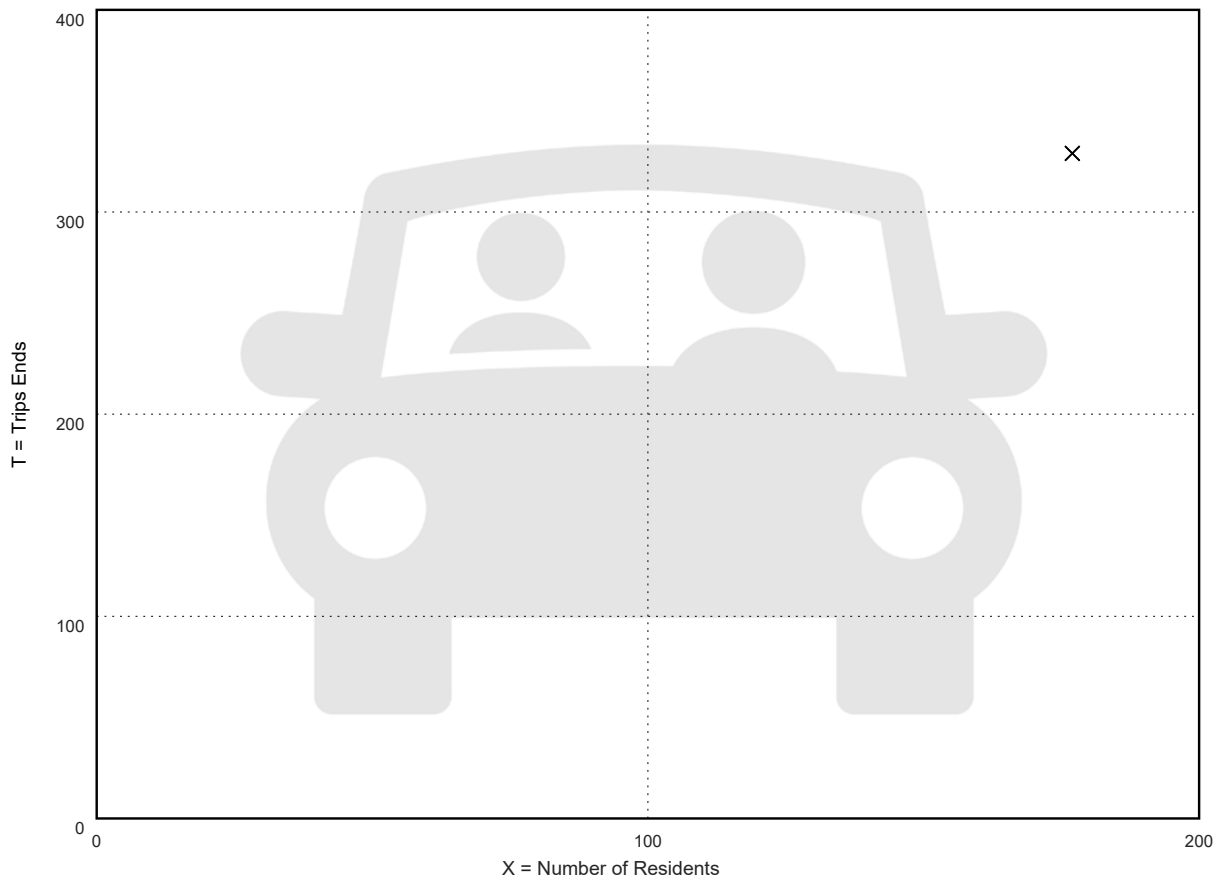
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Residents: 177
Directional Distribution: 50% entering, 50% exiting

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)

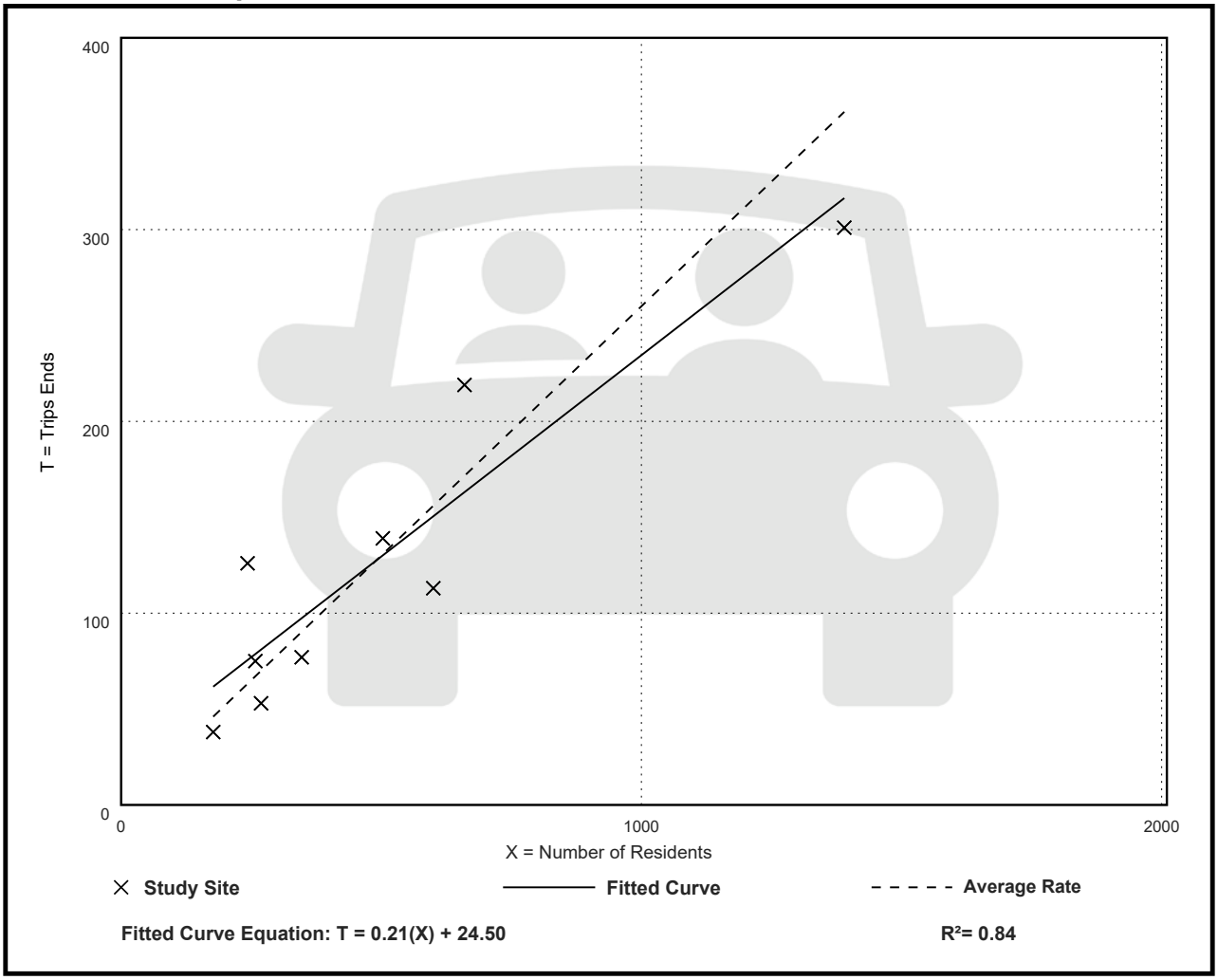
Vehicle Trip Ends vs: Residents
On a: Weekday,
AM Peak Hour of Generator

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)

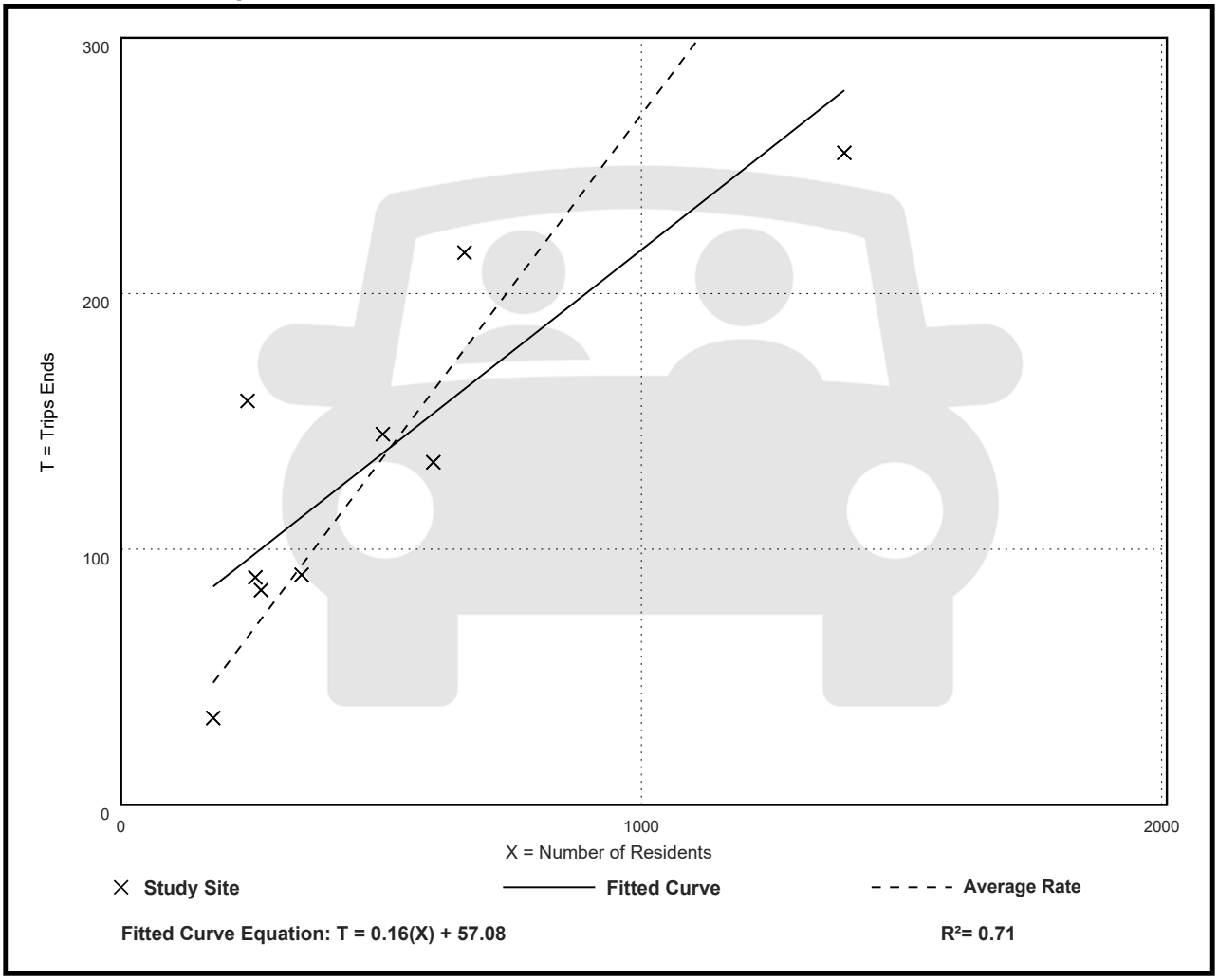
Vehicle Trip Ends vs: Residents
On a: Weekday,
PM Peak Hour of Generator

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

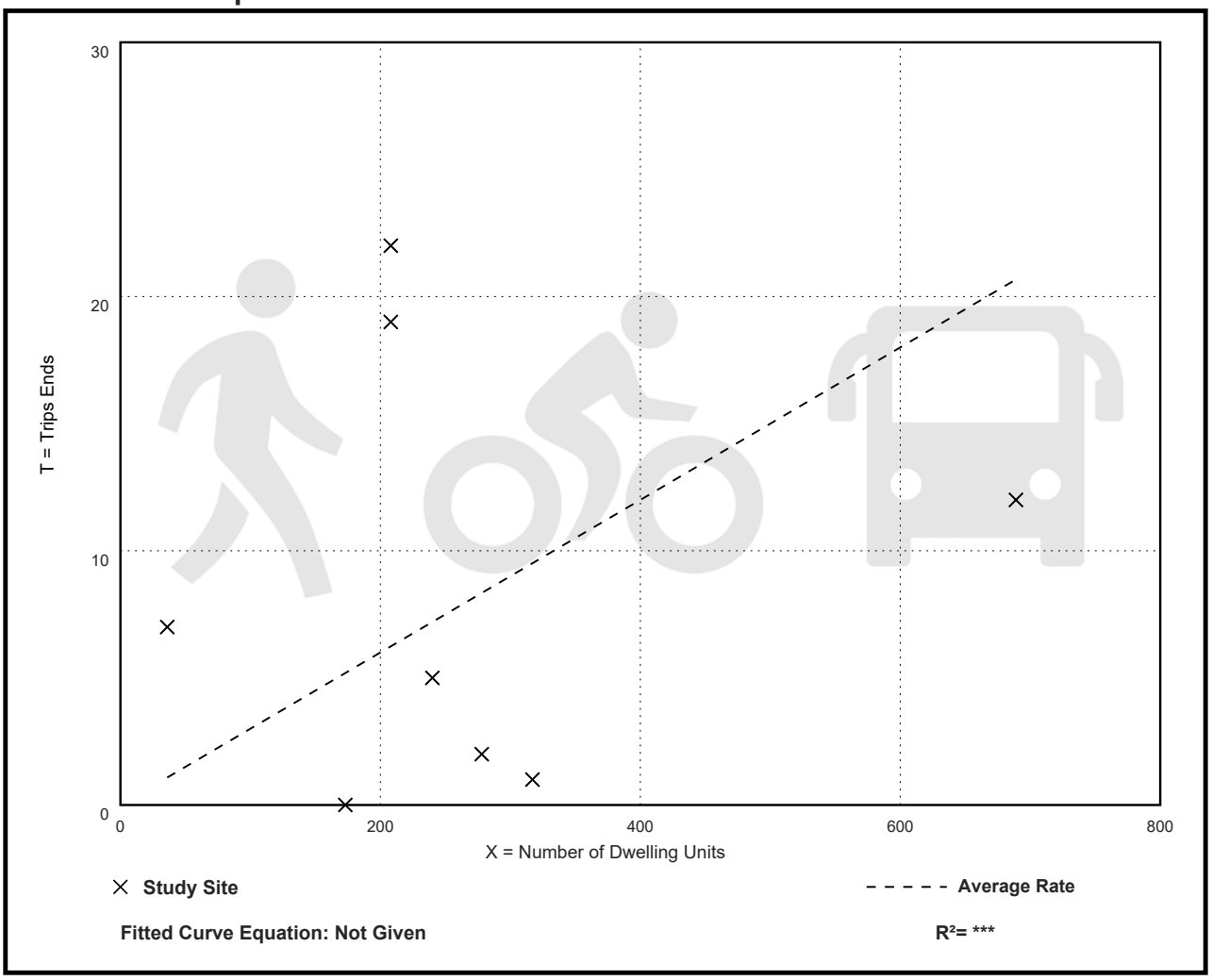
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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



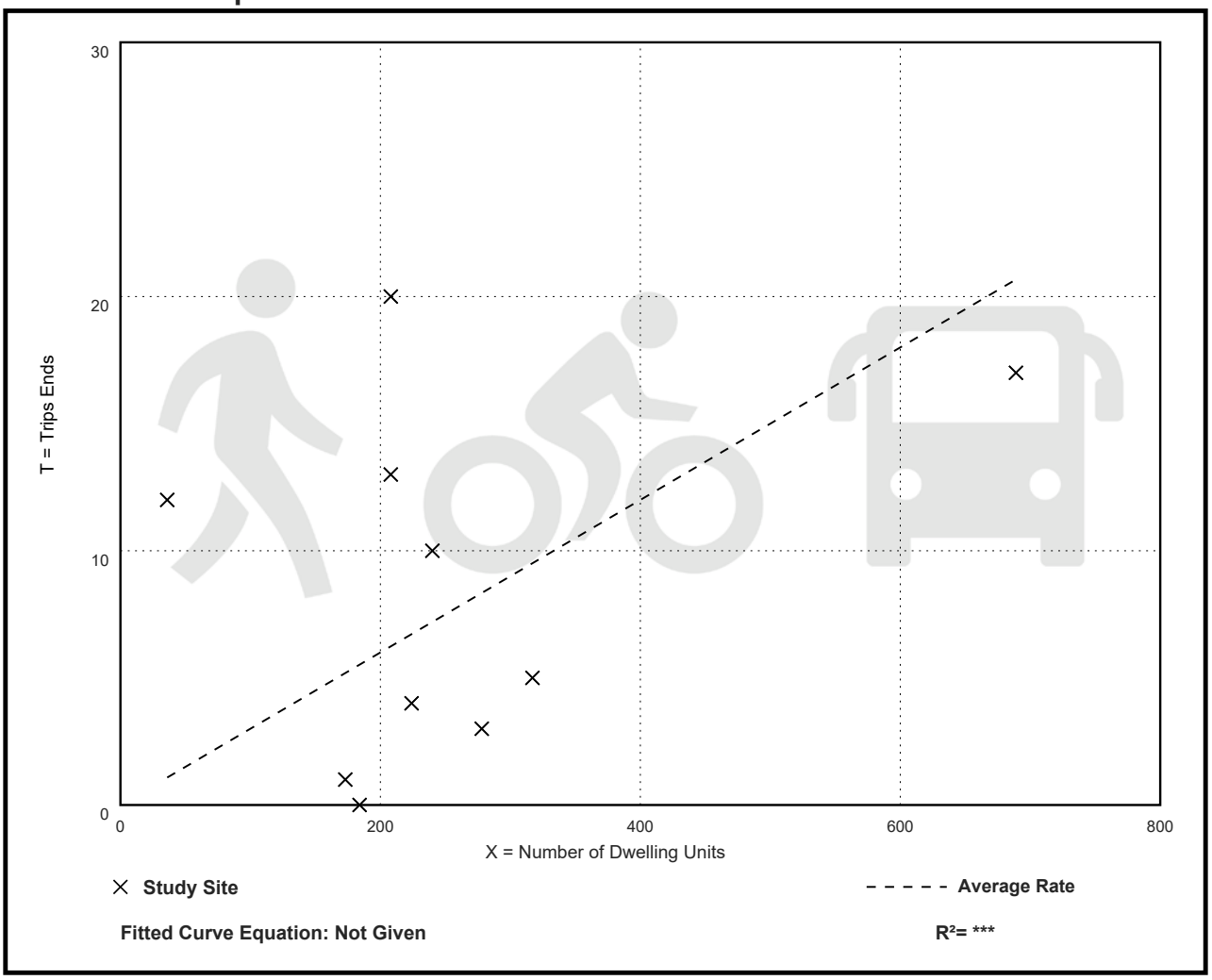
Multifamily Housing (Low-Rise)
Not Close to Rail Transit (220)

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)

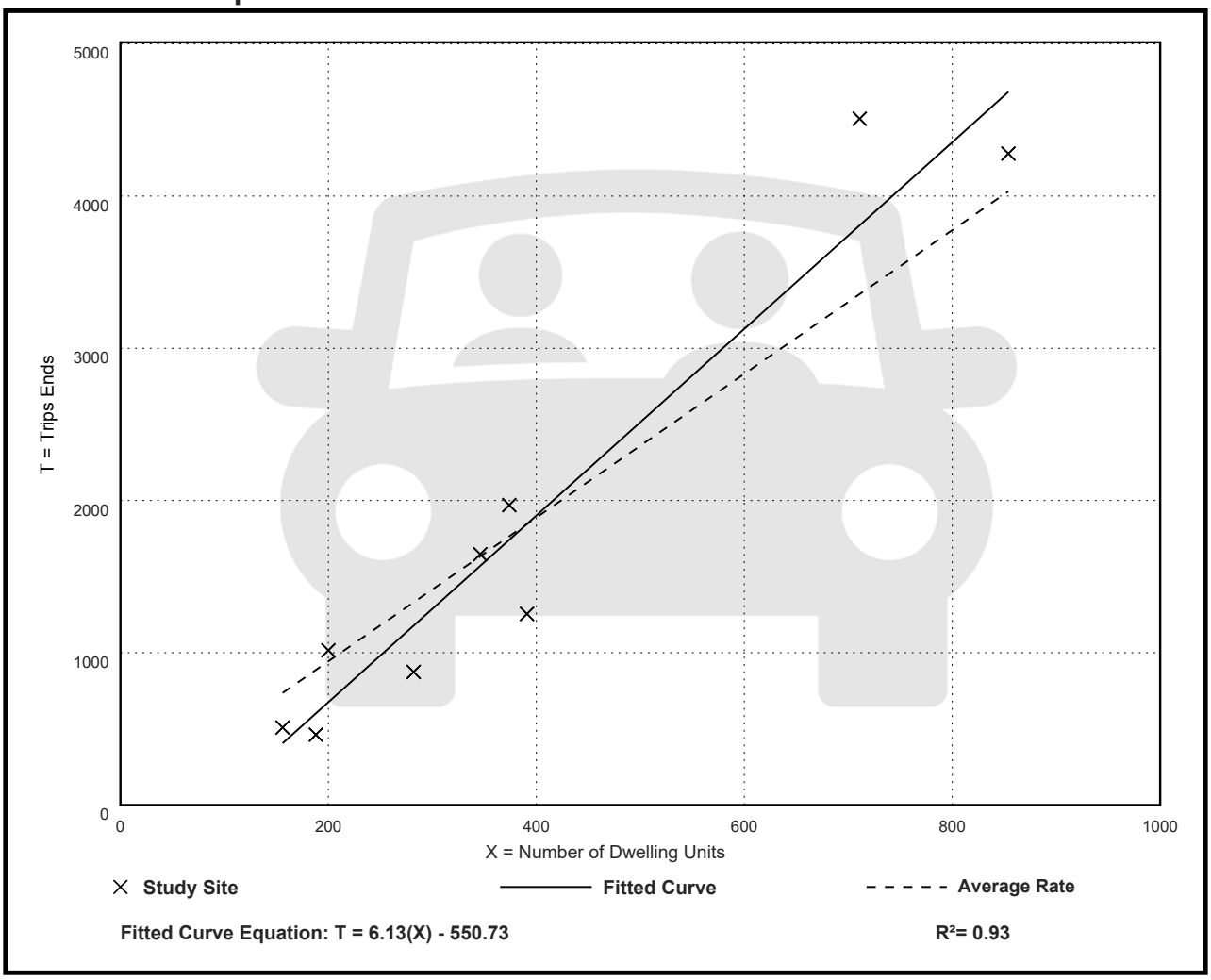
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday

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)

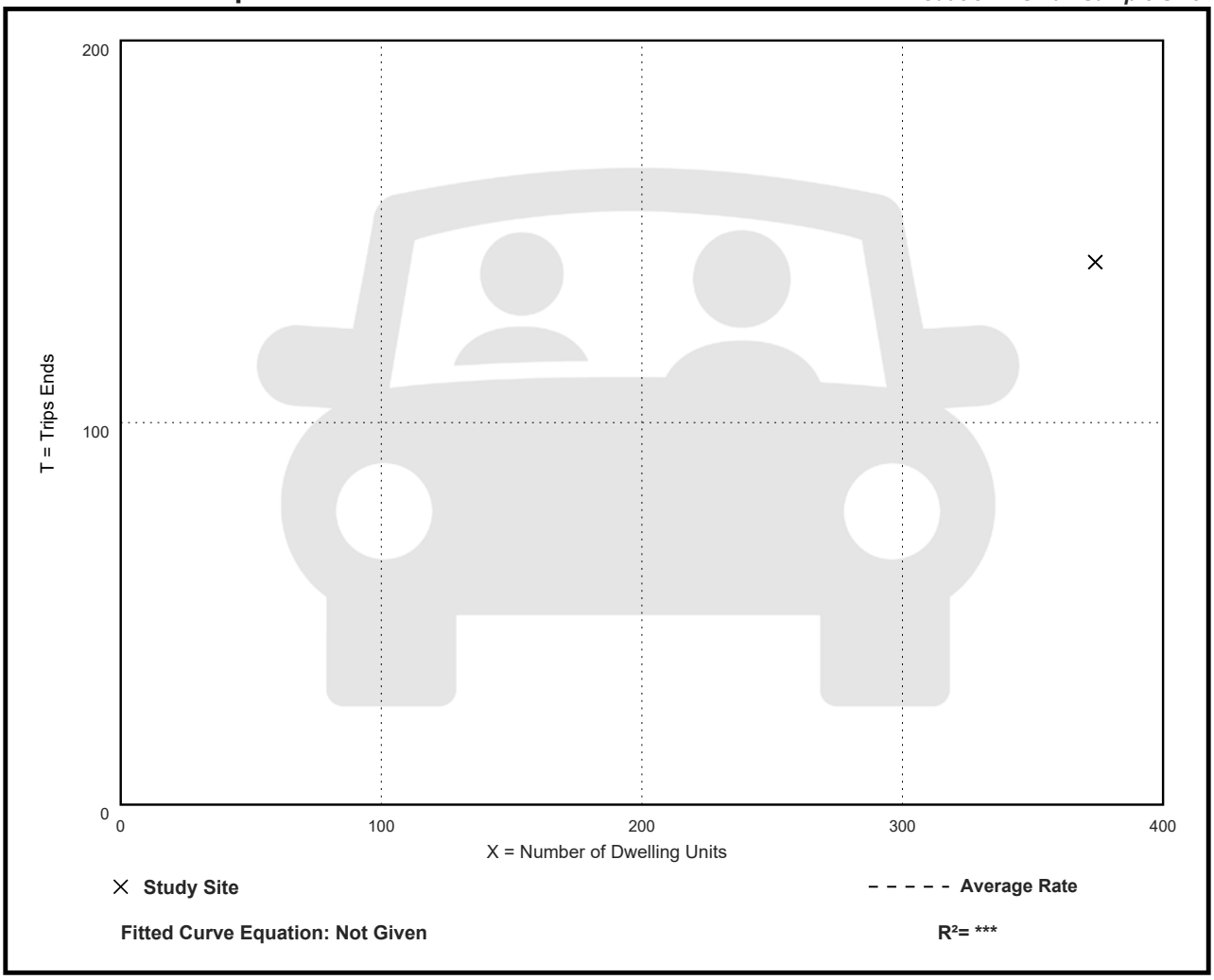
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 29% entering, 71% exiting

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)

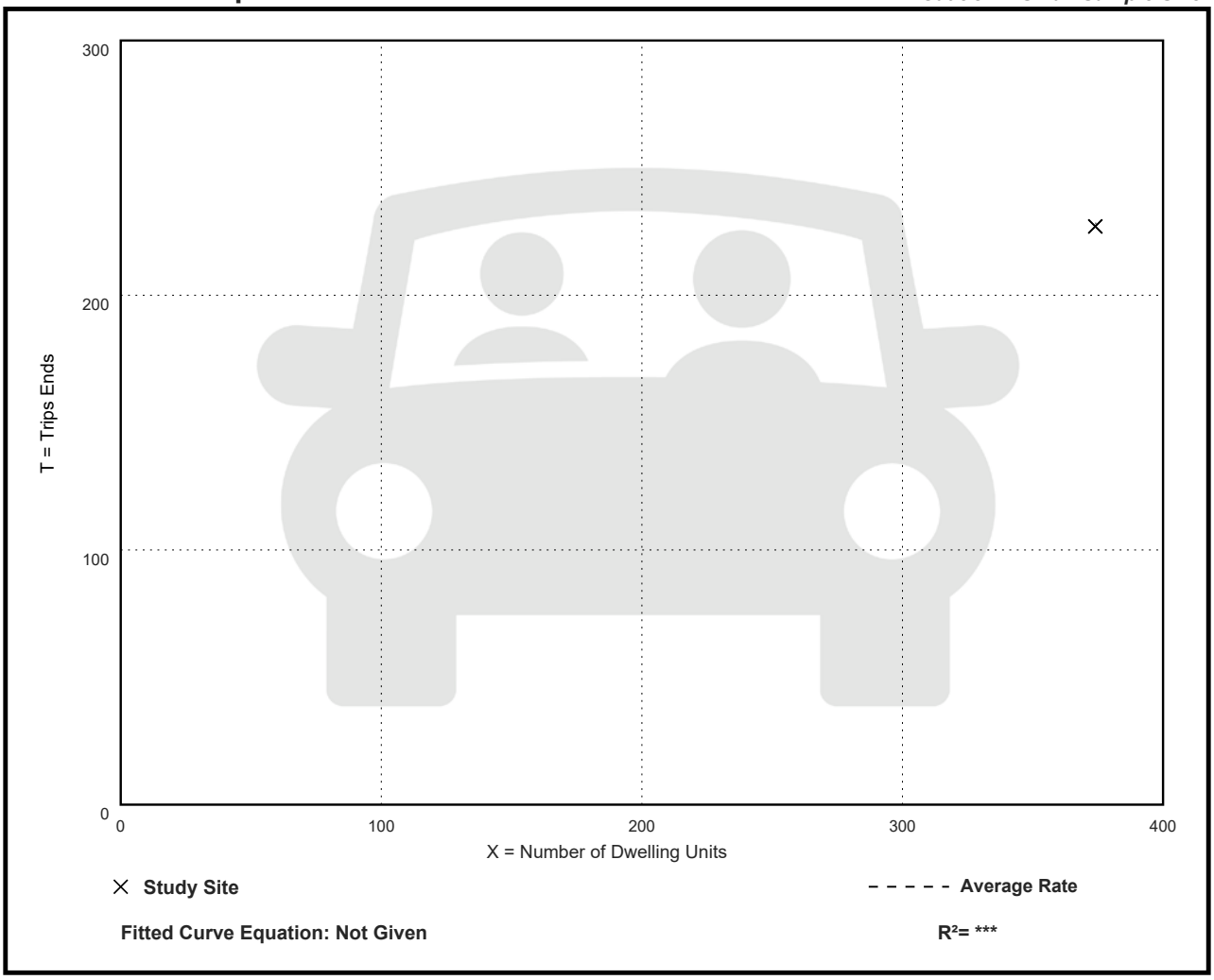
Vehicle Trip Ends vs: Dwelling Units
On a: Weekday,
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 60% entering, 40% exiting

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

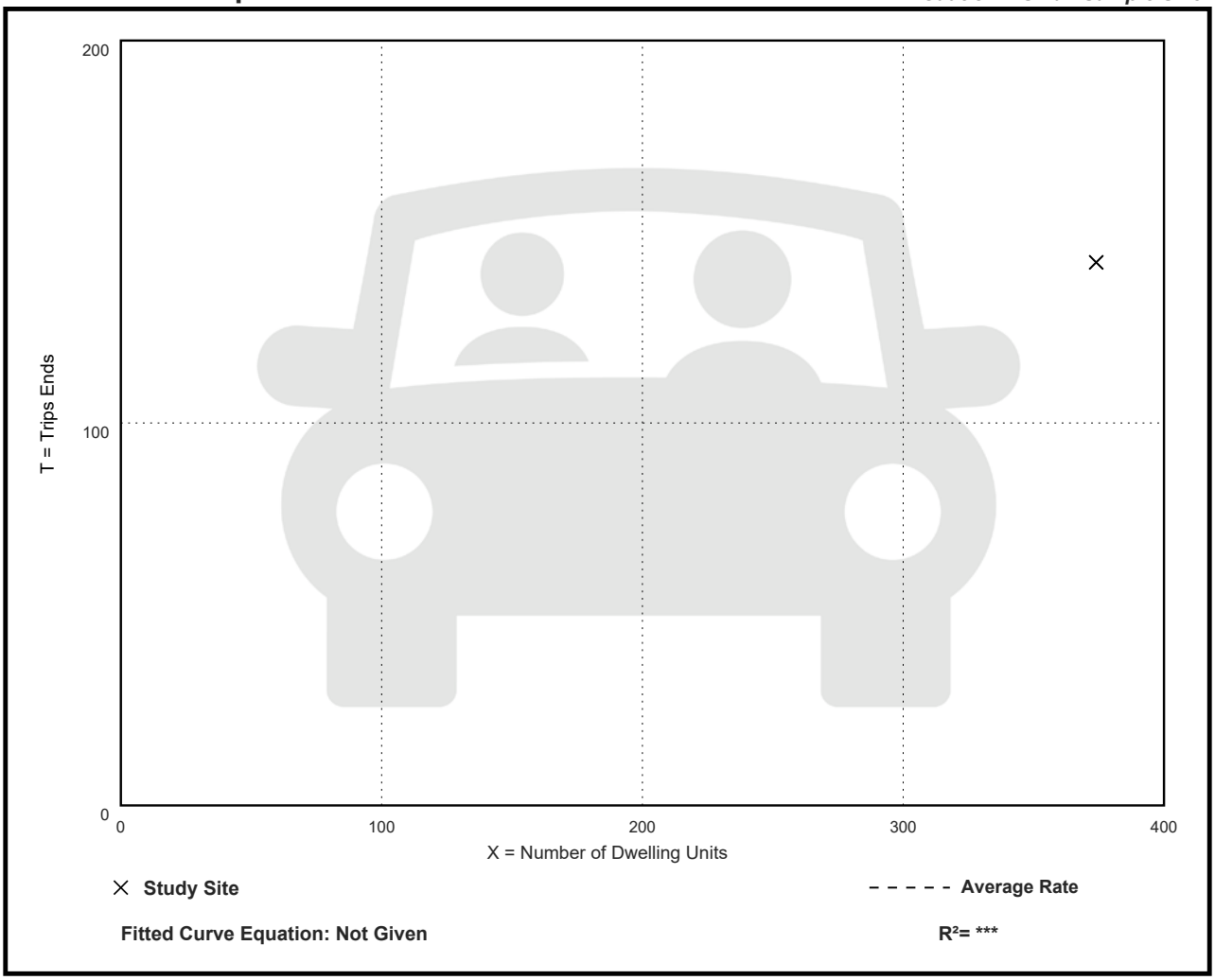
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 29% entering, 71% exiting

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

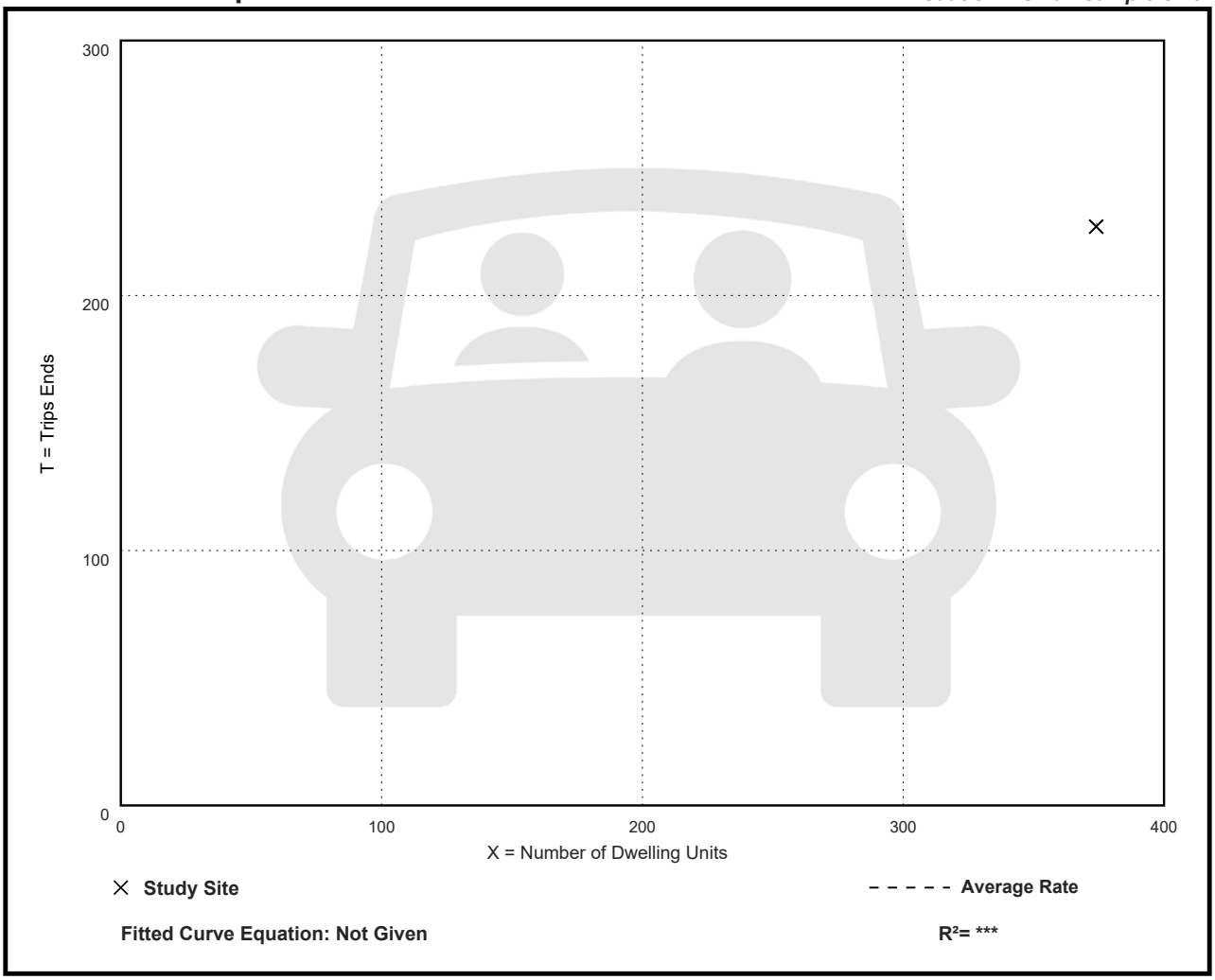
Setting/Location: General Urban/Suburban
Number of Studies: 1
Avg. Num. of Dwelling Units: 374
Directional Distribution: 60% entering, 40% exiting

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= *

APPENDIX E

TTS Data

Mon Jul 22 2024 16:10:45 GMT-0400 (Eastern Daylight Time) - Run Time: 2003ms

Cross Tabulation Query Form - Trip - 2016

Row: 2006 GTA zone of household - gta06_hhld
Column: Primary travel mode of trip - mode_prime

Filters:
(2006 GTA zone of household - gta06_hhld In 4182,4183,4035,4037)

Trip 2016
Table:

,Transit excluding GO rail,Cycle,Auto driver,GO rail only,Joint GO rail and local transit,Auto passenger,School bus,Taxi passenger,Walk
4035,296,35,5573,134,40,1103,80,0,212
4037,232,517,12730,789,539,2454,215,82,1182
4183,500,0,10546,974,67,1737,871,37,662

Mon Jul 22 2024 08:56:05 GMT-0400 (Eastern Daylight Time) - Run Time: 2850ms

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 4048

and

Start time of trip - start_time In 0630-1100

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,4048

3631,20

Mon Jul 22 2024 09:04:39 GMT-0400 (Eastern Daylight Time) - Run Time: 3069ms

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 4048

and

Start time of trip - start_time In 0630-1100

and

Trip purpose of origin - purp_orig In H,)

Trip 2016

Table:

,4048

3631,40

4012,20

5198,20

Mon Jul 22 2024 09:02:39 GMT-0400 (Eastern Daylight Time) - Run Time: 3188ms

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 4048

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of destination - purp_dest In H,)

Trip 2016

Table:

,4048

4012,20

Mon Jul 22 2024 09:05:04 GMT-0400 (Eastern Daylight Time) - Run Time: 2957ms

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 4048

and

Start time of trip - start_time In 1530-1830

and

Trip purpose of origin - purp_orig In H,)

Trip 2016

Table:

,4048

3721,40

APPENDIX F

TAC GDGCR Excerpts

Stopping sight distance is the sum of the distance travelled during the perception and reaction time and the braking distance.

$$SSD = 0.278Vt + 0.039 \frac{V^2}{a} \quad (2.5.2)$$

Where:

SSD = Stopping sight distance (m)
t = Brake reaction time, 2.5 s
V = Design speed (km/h)
a = Deceleration rate (m/s^2)

Table 2.5.2 gives the minimum stopping sight distances on level grade, on wet pavement, for a range of design speeds. These values are used for vertical curve design, intersection geometry and the placement of traffic control devices. The stopping sight distances quoted in **Table 2.5.2** may need to be increased for a variety of reasons related to grade and vehicle type as noted below.

Table 2.5.2: Stopping Sight Distance on level roadways for Automobiles[54]

Design speed (km/h)	Brake reaction distance (m)	Braking distance on level (m)	Stopping sight distance	
			Calculated (m)	Design (m)
20	13.9	4.6	18.5	20
30	20.9	10.3	31.2	35
40	27.8	18.4	46.2	50
50	34.8	28.7	63.5	65
60	41.7	41.3	83.0	85
70	48.7	56.2	104.9	105
80	55.6	73.4	129.0	130
90	62.6	92.9	155.5	160
100	69.5	114.7	184.2	185
110	76.5	138.8	215.3	220
120	83.4	165.2	248.6	250
130	90.4	193.8	284.2	285

Note: Brake reaction distance predicated on a time of 2.5 s; deceleration rate of 3.4 m/s^2 used to determine calculated sight distance.

Table 9.9.3: Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck (WB 19 and WB 20)	11.5
Longer truck	To be established by road authority

Notes: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.2 s for each percent grade for left turns.
- Some road authorities use higher values for certain specialized vehicles (e.g., Alberta uses 22 s for very long log trucks).

The intersection sight distance along the major road (distance b in **Figure 9.9.2**) is determined by:

$$ISD = 0.278\ V_{major}\ t_g \qquad (9.9.1)$$

Where:

ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)
V_{major} = design speed of the major road (km/h)
t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 100 km/h, this corresponds to a sight distance of 0.278(100)(7.5) = 208.5 or 210 m, rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 223 m. If the minor-road approach to such an intersection is located on a 4% upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in **Table 9.9.4**. **Figure 9.9.4** includes design values, based on the time gaps for the design vehicles included in **Table 9.9.3**.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3%, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9.9.4: Design Intersection Sight Distance – Case B1, Left Turn From Stop

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	41.7	45
30	35	62.6	65
40	50	83.4	85
50	65	104.3	105
60	85	125.1	130
70	105	146.0	150
80	130	166.8	170
90	160	187.7	190
100	185	208.5	210
110	220	229.4	230
120	250	250.2	255
130	285	271.1	275

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at divided-highway intersections should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for a divided-highway intersection is larger than a passenger car, then sight distance for left turns will need to be checked for that selected design vehicle and for smaller design vehicles as well. If the divided-highway median is wide enough to store the design vehicle with a clearance to the through lanes of approximately 1 m at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of case B3.

The time gaps in **Table 9.9.3** can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in **Table 9.9.5**. Design values based on these adjusted time gaps are shown in **Table 9.9.6** for passenger cars. **Figure 9.9.5** includes the design values for the design vehicles for each of the time gaps in **Table 9.9.5**.

Table 9.9.5: Time Gap for Case B2—Right Turn from Stop and Case B3—Crossing Maneuver

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck (WB 19 and WB 20)	10.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with grades of 3% or less. The table values should be adjusted as follows:

- For multi-lane highways: For left turns onto two-lane highways with more than two lanes, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle.
- For minor approach grades: If the approach grade is an upgrade that exceeds 3%, add 0.1 s for each percent grade for left turns.

Table 9.9.6: Design Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane highway with no median and with grades of 3% or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

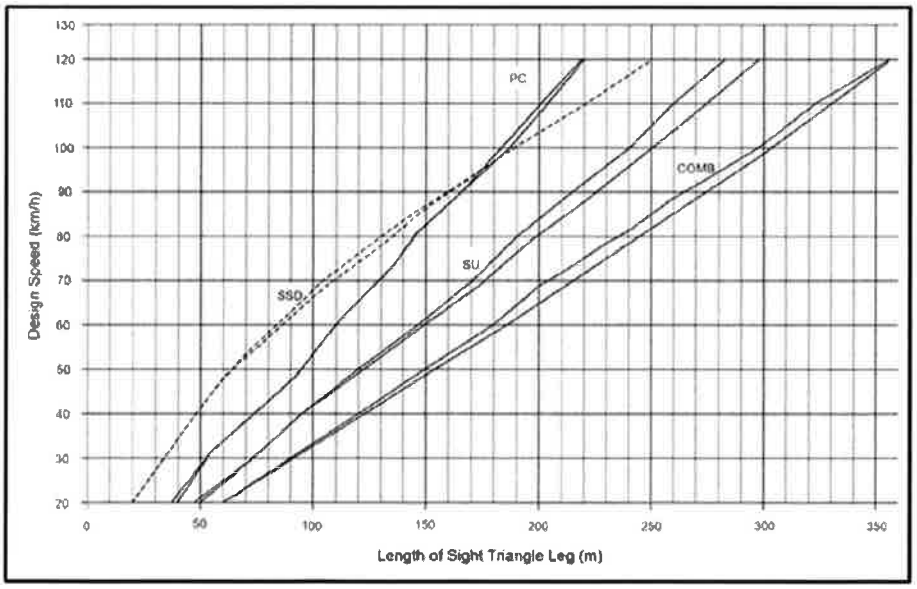


Figure 9.9.5: Intersection Sight Distance – Case B2, Right Turn from Stop, and Case B3, Crossing Maneuver (Calculated and Design Values Plotted)

Case F – Left Turns from the Major Road

All locations along a major highway from which vehicles are permitted to turn left across opposing traffic, including intersections and driveways, should have sufficient sight distance to accommodate the left-turn maneuver. Left-turning drivers need sufficient sight distance to decide when to turn left across the lane(s) used by opposing traffic. Sight distance design should be based on a left turn by a stopped vehicle, since a vehicle that turns left without stopping would need less sight distance. The sight distance along the major road to accommodate left turns is the distance traversed at the design speed of the major road in the travel time for the design vehicle given in **Table 9.9.11**.

Table 9.9.11: Time Gap for Case F, Left Turns from the Major Road

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	5.5
Single-unit truck	6.5
Combination truck (WB 19 and WB 20)	7.5

Note: Adjustment for multi-lane highways: For turning vehicles that cross more than one opposing lane, add 0.5 s for passenger cars and 0.7 s for trucks for each additional lane to be crossed.

The table also contains appropriate adjustment factors for the number of major-road lanes to be crossed by the turning vehicle. The unadjusted time gap in **Table 9.9.11** for passenger cars was used to develop the sight distances in **Table 9.9.12** and is illustrated in **Figure 9.9.8.**

Table 9.9.12: Intersection Sight Distance – Case F, Left Turn from the Major Road

Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance	
		Passenger Cars	
		Calculated (m)	Design (m)
20	20	30.6	35
30	35	45.9	50
40	50	61.2	65
50	65	76.5	80
60	85	91.7	95
70	105	107.0	110
80	130	122.3	125
90	160	137.6	140
100	185	152.9	155
110	220	168.2	170
120	250	183.5	185
130	285	198.8	200

Note: Intersection sight distance shown is for a passenger car making a left turn from an undivided highway. For other conditions and design vehicles, the time gap should be adjusted and the sight distance recalculated.

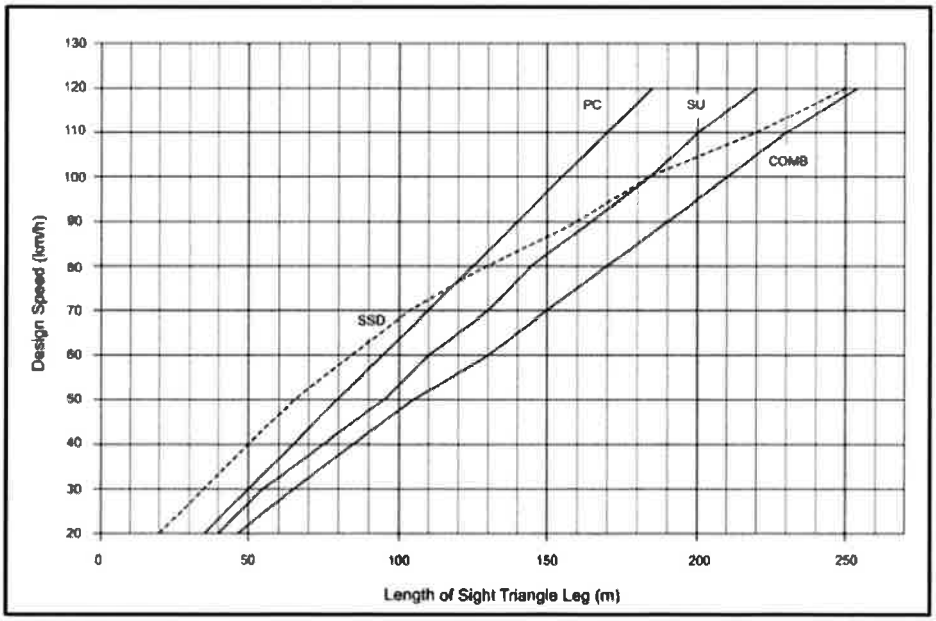
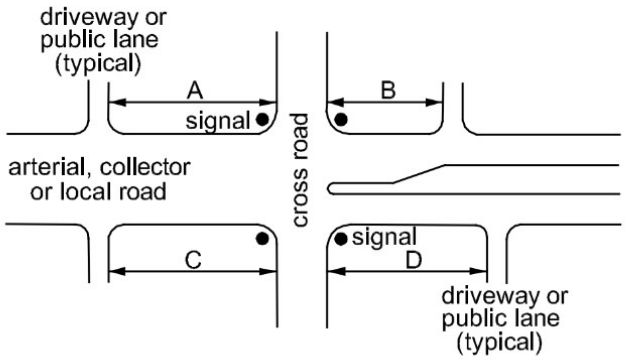


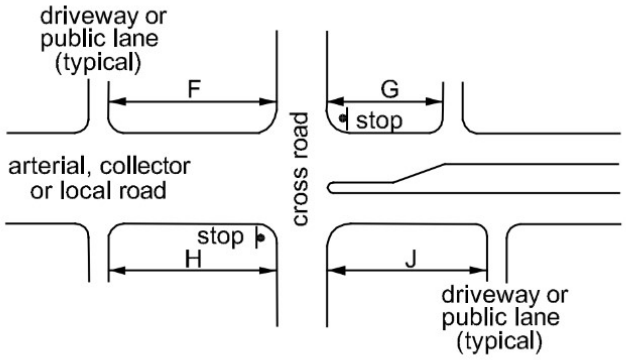
Figure 9.9.8: Intersection Sight Distance – Case F, Left Turn from the Major Road



item	min. clearance, m		
	arterial	collector [b]	local [d]
A	70 [c]	55	15
B	# [a]	25	15
C	70	55	15
D	70 [c]	55	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.
c. Reduced distances feasible if auxiliary lane implemented, see Section 8.5
d. Values based on operating speed of 50km/h, higher values desirable for higher speeds or may be warranted by traffic conditions.

signals at the cross road



item	min. clearance, m		
	arterial	collector [b]	local [b]
F	35	20	15
G	# [a]	25	15
H	25	25	15
J	35	20	15

Notes: a. Distance (#) positions driveway or public lane in advance of the left turn storage length (min.) plus bay taper (des.).
b. Lesser values reflect lower volumes and reduces level of service on collectors and locals.

stop control at the cross road

Figure 8.8.2: Suggested Minimum Corner Clearances to Accesses or Public Lanes at Major Intersections

Inadequate corner clearance between accesses and signalized intersections along a major road, such as a major arterial, can create serious operational problems including:

9.4.2.1 Arterials

Along signalized arterial roads, vehicular traffic volumes are generally high. It is therefore desirable to provide spacing between signalized intersections that is consistent with the desired vehicular traffic progression speed and signal cycle lengths. By spacing the intersections uniformly, based on known or assumed running speeds and appropriate cycle lengths, signal progression in both directions can be achieved. Progression allows platoons of vehicles to travel through successive intersections without stopping. For a progression speed of about 50 km/h and a cycle length of 60 s, the corresponding desired spacing between signalized intersections is approximately 400 m. As speeds increase, the optimal intersection spacing increases proportionately.

Where an arterial corridor must accommodate a variety of road users (e.g., vehicles, cyclists, and pedestrians), vehicle operations and the consequent intersection designs must balance the various needs while recognizing that the priority of arterial roadways is generally servicing vehicular traffic movement.

A typical minimum intersection spacing along arterial roadways is 200 m, generally only applicable in areas of intense existing development or restrictive physical controls where feasible alternatives do not exist. The 200 m spacing allows for minimum lengths of back to back storage for left turning vehicles at the adjacent intersections.

The close spacing does not permit signal progression; therefore, it is normally preferable not to signalize the intersection that interferes with progression along a major arterial. Intersection spacing at or near the 200 m minimum is normally only acceptable along minor arterials, where optimizing traffic mobility is not as important as along major arterials.

Where intersection spacing along an arterial does not permit an adequate level of traffic service, many alternatives can be considered to improve traffic flow. These include, but are not limited to:

- Converting two-way to one-way operation
- Implementing cul-de-sacs for minor connecting roads
- Introducing channelization to restrict turning movements at selected intersections to right turns only.

The designer's options may be substantially limited by the policies of the local jurisdiction.

On divided arterial roads, a right-in, right-out intersection without a median opening may be permitted at least 100 m from an adjacent all-directional intersection. The distance is measured between the closest edges of pavement of the adjacent intersecting roads.

In retrofit situations, the desired spacing of intersections along an arterial is sometimes compromised in consideration of other design controls, such as the nature of existing adjacent development and the associated access needs.

9.4.2.2 Collectors

The typical minimum spacing between adjacent intersections along a collector road is 60 m.

9.4.2.3 Locals

Along local roads, the minimum spacing between four-legged intersections is normally 60 m. Where the adjacent intersections are three-legged, a minimum spacing of 40 m is acceptable.

contrasting construction materials across the driveway assists in defining a pedestrian crossing zone to the driver.

The radius of the curb return style or the flare required to accommodate an equivalent turning radius is meaningful only when considered in combination with the width of the driveway throat.

8.9.5 WIDTH

The width of a two-way driveway is measured parallel to the road since turns are generally oriented at right angles. The dimension is typically measured beyond any entrance flare. The width of one-way driveways, which are normally skewed, is measured perpendicular to the driveway.

It is desirable to state suitable driveway widths as a design domain. Dimensions at the lower end of the domain are intended to define the minimum spatial and operational requirements. The maximum dimensions assist in preventing driveways from becoming unwieldy with large paved areas and poorly defined travel paths. The most appropriate width of a driveway is determined in combination with the radius of the curb return (or the design vehicle turning radius and flare dimensions, if a straight flared design is adopted), the desired operating characteristics such as turning speed, and physical limitations which may exist at the site.

Table 8.9.1 provides a typical design domain for driveway throat widths and radii for both two-way and one-way operation. In locations where special vehicles such as long combination vehicles or similar vehicles are present, wider driveway throat dimensions or larger radii may be required.

Table 8.9.1: Typical Driveway[c] Dimensions

Dimension (m)	Land Use		
	Residential	Commercial	Industrial
Width (W)			
- One way	3.0[a] – 4.3	4.5[a] – 7.5	5.0 – 9.0
- Two way	2.0[a] – 7.3	7.2[a] – 12.0[b]	9.0[a] – 15.0[b]
Right turn radius (R)	3.0 – 4.5	4.5 – 12.0	9.0 – 15.0

Notes:

a. Minimum widths are normally used with radii at or near the upper end of the specified range
b. Increased widths may be considered for capacity purposes; where up to 3 exit lanes and 2 entry lanes are employed, 17.0 m is the maximum width exclusive of any median
c. Applicable to driveways only, not road intersections

8.9.6 ANGLE OF DRIVEWAY

Two-way driveways normally intersect the roadway curb at or near 90°. However, a minimum acute angle of 70°, as measured from the roadway curb line, normally operates in an acceptable manner.

For one-way driveways, where a skewed intersection assists in efficient traffic operation, skews in the range of 45° to 60° are appropriate in industrial areas where pedestrians are infrequent. For commercial and residential land uses, where pedestrian volumes are normally moderate to high, minimum skew angles in the range of 60° to 70° are preferred to improve the driver's visibility of the pedestrian, and vice versa, and to encourage lower turning speeds.

8.9.10 CLEAR THROAT LENGTHS

In order for major driveways to operate efficiently, both from the road side and internally, it is desirable to provide a no conflict and storage zone within the driveway. This zone is commonly referred to as the clear throat length or set-back distance and is measured from the ends of the driveway curb return radii at the roadway and the point of first conflict on-site. **Figure 8.5.2** illustrates how a throat length is measured. Failure to provide sufficient throat distance results in frequent blocking of on-site circulation roads which can in turn create queues of entering vehicles. The provision of appropriate clear throat length or storage space is particularly important for drive-in service developments where the customers remain in their vehicles while waiting to be served. These types of developments include drive-in restaurants and banks, automatic car washes, and parking facilities with entry control. For large developments, the appropriate throat length is best determined by a detailed traffic analysis based on the traffic control provided at the road and the anticipated volumes and types of traffic. **Table 8.9.3** is a guideline for suggested minimum clear throat lengths for various types of developments.

Table 8.9.3: Suggested Minimum Clear Throat Lengths for Major Driveways[14]

Land Use	Development Size	Minimum Clear Throat Length (m)	
		Collector	Arterial
Light Industrial	<10,000 m^2	8	15
	10,000 – 45,000 m^2	15	30
	>45,000 m^2	15	60
Discount Store	>3,000 m^2	8	15-25
Shopping Centre	<25,000 m^2	8	15
	25,000 – 45,000 m^2	15	25
	45,001 – 70,000 m^2	25	60
	>70,000 m^2	40	75
Supermarket	<2,000 m^2	15	25
	>2,000 m^2	25	40
Apartments	<100 units	8	15
	100 – 200 units	15	25
	>200 units	25	40
Quality restaurant	<1,500 m^2	8	15
	>1,500 m^2	8	25
Fast food restaurant	<200 m^2	8	25
	>200 m^2	15	40
General office	<5,000 m^2	8	15
	5,000 – 10,000 m^2	8	25
	10,001 – 20,000 m^2	15	30
	20,001 – 45,000 m^2	30	45
	>40,000 m^2	40	75
Motel	<150 rooms	8	25
	>150 rooms	8	30

Notes
1. Refer to Figure 8.5.2 for method of measurement
2. For major developments, it is desirable to determine throat lengths and queue on the basis of a site-specific traffic study

APPENDIX G

North Oakville Zoning By-Law 2009-189

OAKVILLE

North Oakville Zoning By-law 2009-189

Passed by Council on November 23, 2009
O.M.B. approved on April 15, 2010, July 14, 2010, and October 25, 2010
Consolidation dated January 30, 2024

Disclaimer:

This document is updated on a regular basis, but may not reflect all amendments that have been passed by Council or approved at the Ontario Land Tribunal. This consolidation of the By-law is provided for convenience and reference should be made to the original passed documents for confirmation.

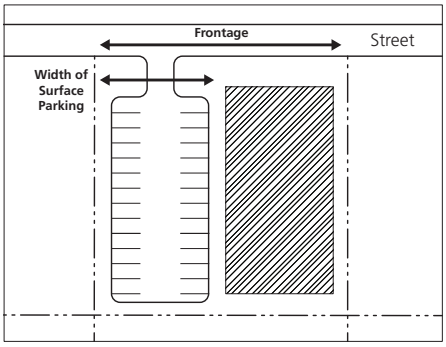
Parking and Loading Regulations

5.1.6 Surface Parking Area Location

Where *surface parking areas* are permitted on *lots* which abut Trafalgar Road, the maximum *lot frontage* or *flankage* on Trafalgar Road occupied by *surface parking area* shall be:

Office building	50%
Mixed use and *apartment buildings*	20%
Commercial buildings	20%
Parking garage	5%
Institutional building	5%
Hotel	5%
Commercial/Residential buildings	5%

This shall be measured as the maximum percentage of *lot frontage* or *flankage* occupied by *surface parking area* where no *building* edge is located within 6 metres of the Trafalgar Road *lot frontage* or *flankage*. The only exception shall be where the By-law permits a greater *front yard* or *flankage setback*, in which case that setback shall apply.



Surface Parking Frontage.

5.1.7 Hardscape Surface Treatment *(2022-007)*

All *parking spaces*, *tandem parking spaces*, *parking pad*, *loading dock*, aisles and *driveways* in any Zone other than a Natural Heritage Zone shall be surface treated with asphalt, concrete, interlocking brick, similar hardscaped surface, or other material sufficient to provide stability, prevent erosion, be usable in all seasons, and allow infiltration of surface water.

Table 5.1A - Parking Requirements For Residential Uses

(1)	*Single* and *Semi-detached dwellings*, foster homes, and shared accommodation for five or fewer residents licensed or approved under Provincial statute, including any *dwelling* where a maximum of 3 *lodgers* reside	Outside the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core Zones 2 *parking spaces* per *dwelling unit* minimum.
(2)	*Duplex and, triplex*	1 *parking space* per *dwelling unit* minimum.
(3)	*Apartment* - 4 storeys or less	Up to 1.25 *parking spaces* per *dwelling unit*, plus 0.2 *parking spaces* per *dwelling unit* for visitors. Additional *parking spaces* shall not be permitted.
(4)	*Apartment* - More than 4 storeys	Up to 1.25 *parking spaces* per *dwelling unit*, plus 0.2 *parking spaces* per *dwelling unit* for visitors. Additional *parking spaces* shall not be permitted. In the Trafalgar Urban Core Zone, no *parking spaces* shall be permitted in a *surface parking area*, with the exception of visitor *parking spaces* which may be located underground, in a *parking garage* or in a *surface parking area.*
(5)	*Townhouse dwellings* including *back-to-back townhouse dwellings* and *stacked townhouses*	Outside the Trafalgar Urban Core Zone 1 *parking spaces* per *dwelling unit* minimum; For lands within the Trafalgar Urban Core Zone, 1 *parking spaces* per *dwelling unit* minimum and only 2 *parking spaces* per *dwelling unit* maximum shall be permitted for *back-to-back townhouse dwelling units* and in all other zones 3 *parking spaces* per *back-to-back townhouse dwelling unit* maximum shall be permitted.

Parking and Loading Regulations

Table 5.1A - Parking Requirements For Residential Uses		
(6)	*Nursing Home* *Retirement home*	Outside the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core Zones 0.5 *parking spaces* minimum per *dwelling unit* or *suite*. For lands in the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core Zones 0.5 *parking spaces* minimum per *dwelling unit* or *suite*. In the Trafalgar Urban Core Zone a maximum of 50% of the required *parking spaces* may be permitted in a *surface parking area*.
(7)	*Bed and breakfast establishment* *Group Home*	The *parking spaces* required for a *single detached dwelling* plus 1 *parking space* per *suite* minimum. No additional *parking spaces* shall be permitted other than the required spaces.
(8)	*Short-Term Accommodation (2018-038)*	The *parking spaces* required for the *dwelling unit* plus 1 *parking space*. An additional *parking space* is not required when the additional parking can be accommodated in an existing visitor *parking space*.
(9)	*Accessory dwelling unit/Home occupation (2023-025)*	No additional *parking spaces* required.
(10)	Other *residential uses* not specified above in this Table	1 *parking space* per *dwelling unit* minimum.

Table 5.1B - Parking Requirements For Non-Residential Uses		
(1)	Arena; Stadium; or, Theatre	Outside the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core *Zones* 1 *parking space* per 6 seats minimum and 1 *parking space* per 5 seats maximum. For lands in the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core *Zones* 1 *parking space* per 7 seats minimum and 1 *parking space* per 6 seats maximum. In the Trafalgar Urban Core *Zone* a maximum of 50% of the required *parking spaces* may be permitted at *grade*. For the purposes of this By-law, where the seating is provided by open benches, every 50 centimetres of bench length shall be considered as one seat.
(2)	*Art gallery*; *Museum*; or, *Library*	Outside the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core *Zones* 1 *parking space* per 30 square metres of *leasable floor area* minimum and 1 *parking space* per 25 square metres maximum. For lands in the Trafalgar, Dundas, Neyagawa and Palermo Village North Urban Core Zones 1 *parking space* per 93 square metres of *leasable floor area* minimum and 1 *parking space* per 30 square metres maximum.
(3)	*Vehicle Dealership;* and/or *Vehicle Repair Use*	4 *parking spaces* for each repair bay minimum plus 2 parking spaces minimum for each 100 square metres of *leasable floor area* exclusive of repair bays, and a maximum area equal to 10 parking spaces for outside display areas. However, a maximum of 30 surface *parking spaces* shall be permitted, in addition to the permitted outside display areas.

or *rear yard*, however if located within a *flankage yard* it must be screened from public view from the *street* by a fence, wall or hedge with a minimum *height* of 2m.

b. Any *trailer* or *recreational vehicle*, which exceeds a *height* of 2m, may be parked or stored in any *side* or *rear yard* between May 1st and October 31st provided it is located in any *interior side* or *rear yard*, however it shall not be permitted within 10.5 metres of a *flankage*.

5.6 Loading Dock Requirements

5.6.1 Number of Loading Docks Required

Loading docks may be permitted, but shall not be required for any *uses*, with the exception of industrial uses. *Loading docks* shall be provided for all industrial *uses* in accordance with the standards below:

i. If the *use*, or a combination of *uses*, has a *leasable floor area* of less than 1,000 square metres, no *loading docks* are required.

ii. If the *use*, or a combination of *uses*, has a *leasable floor area* of between 1,000 and 2,300 square metres, one *loading dock* is required.

iii. If the use, or a combination of uses, has a *leasable floor area* greater than 2,300 square metres, a minimum of two *loading docks* are required.

5.6.2 Loading Dock Regulations

A *loading dock*, when required or provided, shall satisfy the following requirements:

i. Each *loading dock* shall have a minimum length of 9 metres;

ii. Unobstructed access to a *loading dock* must be provided from an aisle, *driveway*, or lane that leads directly to a *street*.

5.6.3 Permitted Location for Loading Docks

Loading docks when required or provided, shall be located only in an *interior side yard, flankage* or *rear yard* and on the same *lot* as the *use*, or combination of *uses*, for which the *loading docks* are required or are being provided. However, where *loading docks* are located in any *yard* abutting a *residential zone* or a *street*, they must be screened from view by an opaque screen with a minimum height of 1.5 metres.

Parking and Loading Regulations

5.7 Bicycle Parking and End-of-Trip Requirements

i. The number of *bicycle parking spaces* required shall be calculated in accordance with the standards set out in Tables 5.7A and 5.7B. Tables 5.7A and 5.7B establish the minimum amount of bicycle parking required for *residential uses* and non-residential *uses* respectively.

ii. Where a *building* contains *residential* and non-residential *uses*, *bicycle parking spaces* must be provided for that *building* in accordance with the proportion of the *building* occupied by each use based on the rates set out in Tables 5.7A and 5.7B.

iii. *Bicycle parking spaces* must be located on the same *lot* as the use or *building* for which it is provided.

iv. Notwithstanding Sections i. and ii., a maximum of 200 *bicycle parking spaces* shall be required.

v. Where the application of ratios results in a fraction of a *bicycle parking space*, the required number of spaces shall be increased to the next highest whole number.

5.7.1 Bicycle Parking Ratios

Table 5.7A - Minimum Number of Bicycle Parking Spaces Required

Land Use	Bicycle Parking Spaces—Occupant	Bicycle Parking Spaces—Visitor
Residential uses	0.75 per *dwelling unit*	0.25 per *dwelling unit*
Nursing Homes and *Retirement Homes*	N/A	0.25 per *dwelling unit* or *suite* to a maximum of 30 spaces required

5.7.1.1 Residential Use Exemptions

No bicycle parking requirement applies to residential *buildings* with 20 or less *suites* or *dwelling units*, *townhouse dwelling units*, or *group homes*.

Table 5.7B - Non-residential Uses: Minimum Requirements

Land Use	Minimum Requirement
Non-*Residential uses* that require 15 or more non-residential *parking spaces*, as specified in the Zoning By-Law	*Bicycle Parking Spaces* required at a rate of 7% of automobile *parking spaces*, as required by the Zoning Bylaw, including a minimum of 5 *Bicycle Parking Spaces-Visitor*
An *office building* or hospital where the combined *leasable floor area*, excluding the uses listed in 5.7.1.4, is equal to or greater than 20,000 square metres.	1 shower-change facility for each gender

5.7.1.2 Non-residential Use Exemptions

No bicycle parking requirement applies for the following *uses* specified in the Zoning By-law:

APPENDIX H

Traffic Control Plan

10 0m 10 20
SCALE: 1:300

TRAFFIC MANAGEMENT NOTES:

1. STAGING TO BE READ IN CONJUNCTION WITH ONTARIO TRAFFIC MANUAL (OTM) BOOK 7 (TEMPORARY CONDITIONS).
2. ANY ADJUSTMENTS TO TRAFFIC MANAGEMENT PLAN TO ADHERE TO OTM BOOK 7 (TEMPORARY CONDITIONS).
3. THE TRAFFIC MANAGEMENT PLAN IMPLEMENTED WILL FULLY REMAIN THE RESPONSIBILITY OF THE CONTRACTOR. THIS PLAN SHOULD BE CONSIDERED A GUIDELINE ONLY.
4. THERE WILL BE NO IMPACT TO THE TRAVEL LANES OF LOYALIST TRAIL.
5. MUD-MAT INSTALLATION IS THE RESPONSIBILITY OF THE CONTRACTOR.

LEGEND

- PROPERTY LINE
- TEMPORARY TRAFFIC SIGN OTM BOOK 7
- MUD-MAT; SEE ESC PLAN FOR DETAILS

Town

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	2024/08/30

Engineer

FOR REVIEW
NOT TO BE USED FOR CONSTRUCTION

Engineer

Project
BLOCK 154
TOWN OF OAKVILLE

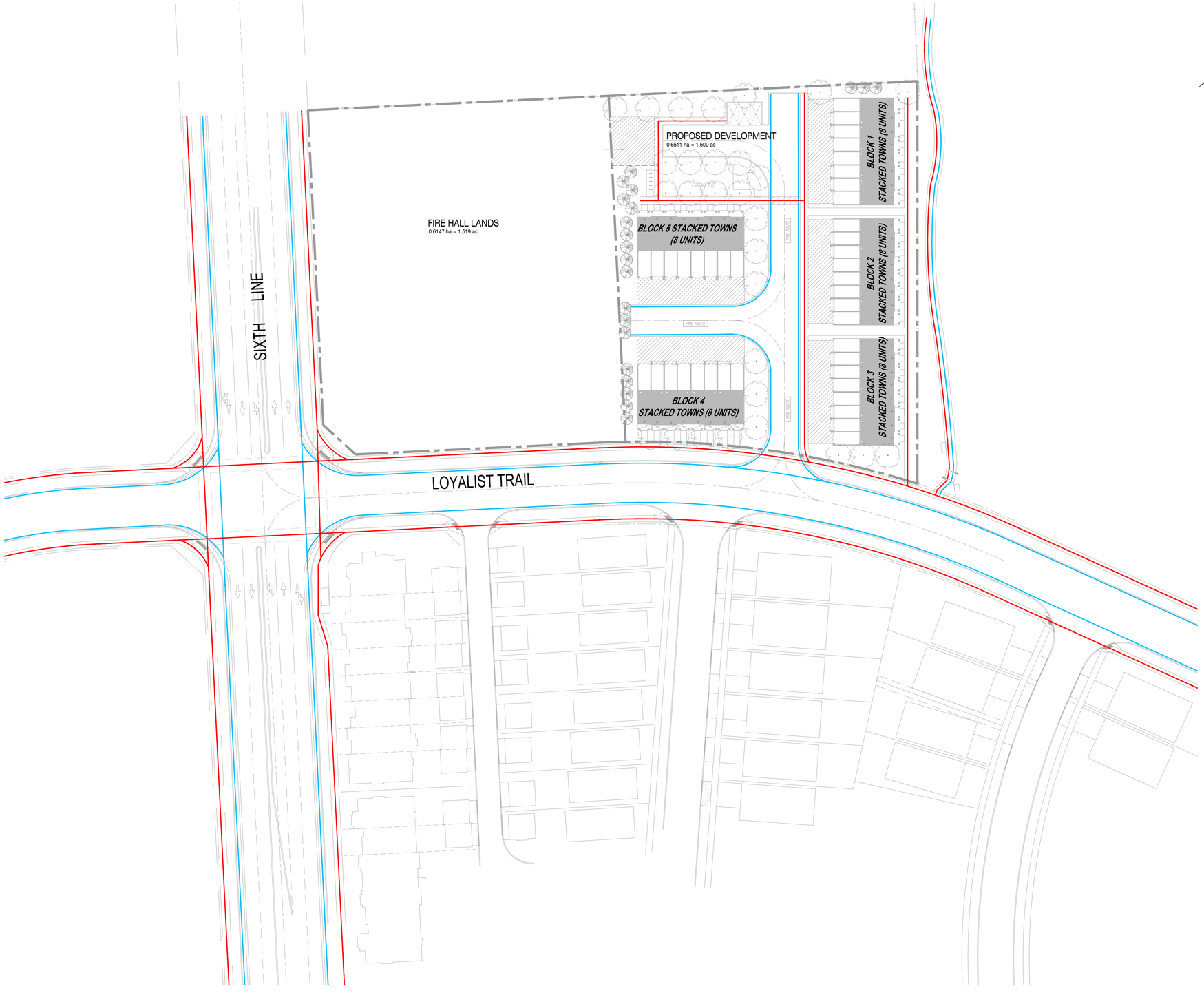
Drawing
TRAFFIC MANAGEMENT PLAN
STAGE 1 – CONSTRUCTION ACCESS

CROZIER
CONSULTING ENGINEERS

Drawn By	Design By	Project
I.M.	S.S.	2712-7619
Check By	Check By	Scale / Drawing
S.S.	S.R.S.	1:300 / T101

APPENDIX I

Bicycle and Pedestrian Connectivity Plan



FOR REVIEW

NOT TO BE USED FOR CONSTRUCTION

LEGEND

- PROPOSED BIKE CIRCULATION
- PROPOSED PEDESTRIAN CIRCULATION

10 0m 10 20 30 40

SCALE: 1:500

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR REVIEW	08/08/2024

Project

1225 TRAFALGER ROAD,
TOWN OF OAKVILLE.

Drawing

BICYCLE AND PEDESTRIAN CONNECTIVITY PLAN

CROZIER
CONSULTING ENGINEERS

2800 High Point Drive
Suite 100
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905-875-0026 T
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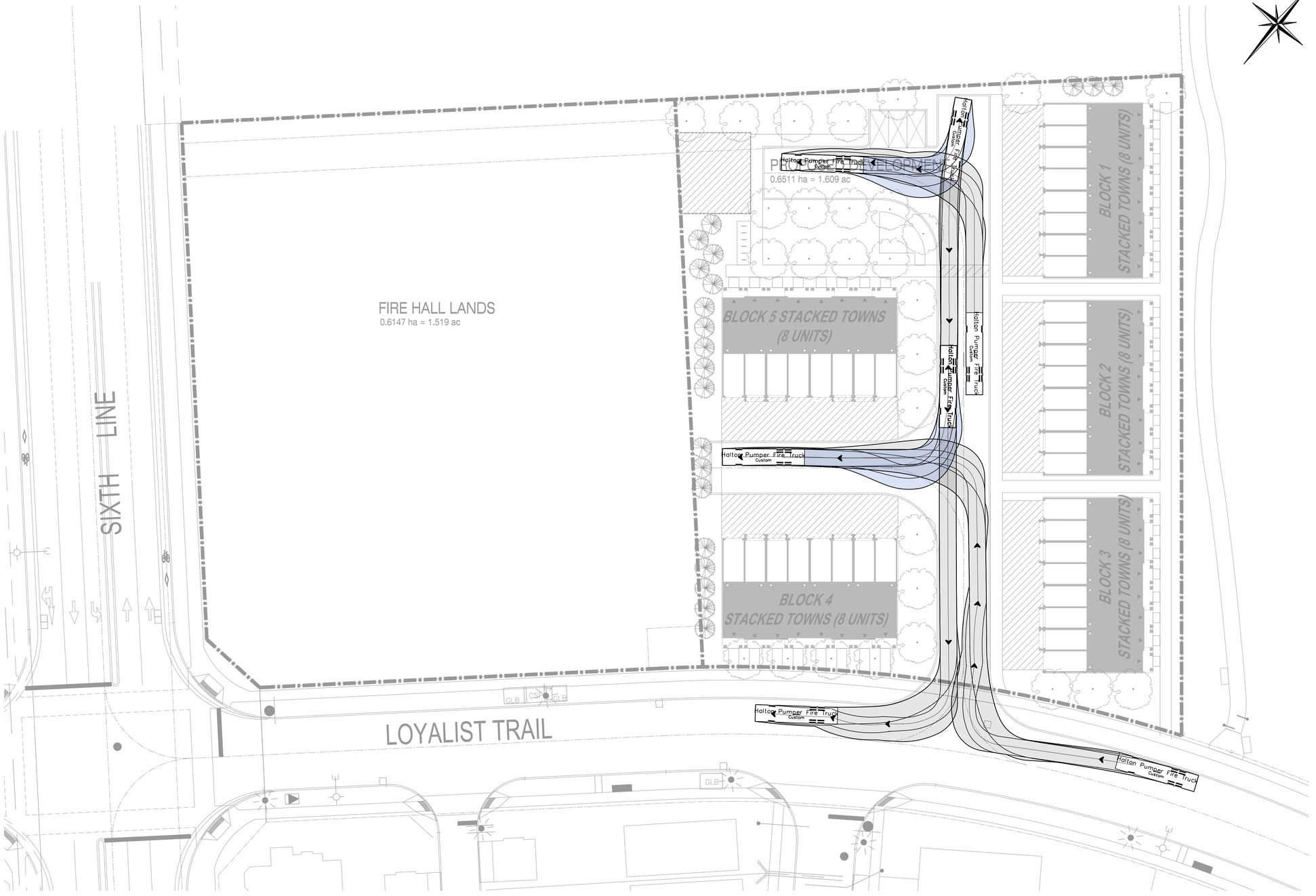
Drawn By	Design By	Project	2712-7169
I.A.			
Check By	Check By	Scale	Drawing
A.K.	I.L.	1:500	T100

APPENDIX J

Vehicle Maneuvering Diagrams



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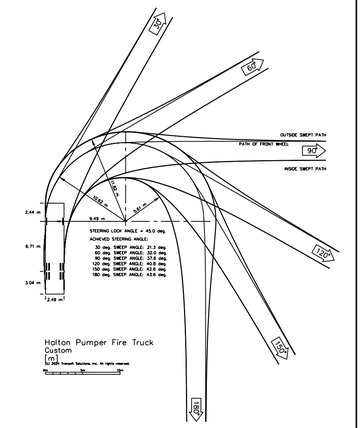
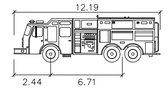


VEHICLE PROFILE



Halton Pumper Fire Truck

	meters
Width	: 2.49
Track	: 2.50
Lock to Lock Time	: 6.0
Steering Angle	: 45.0

No.	ISSUE	DATE: MM/DD/YYYY
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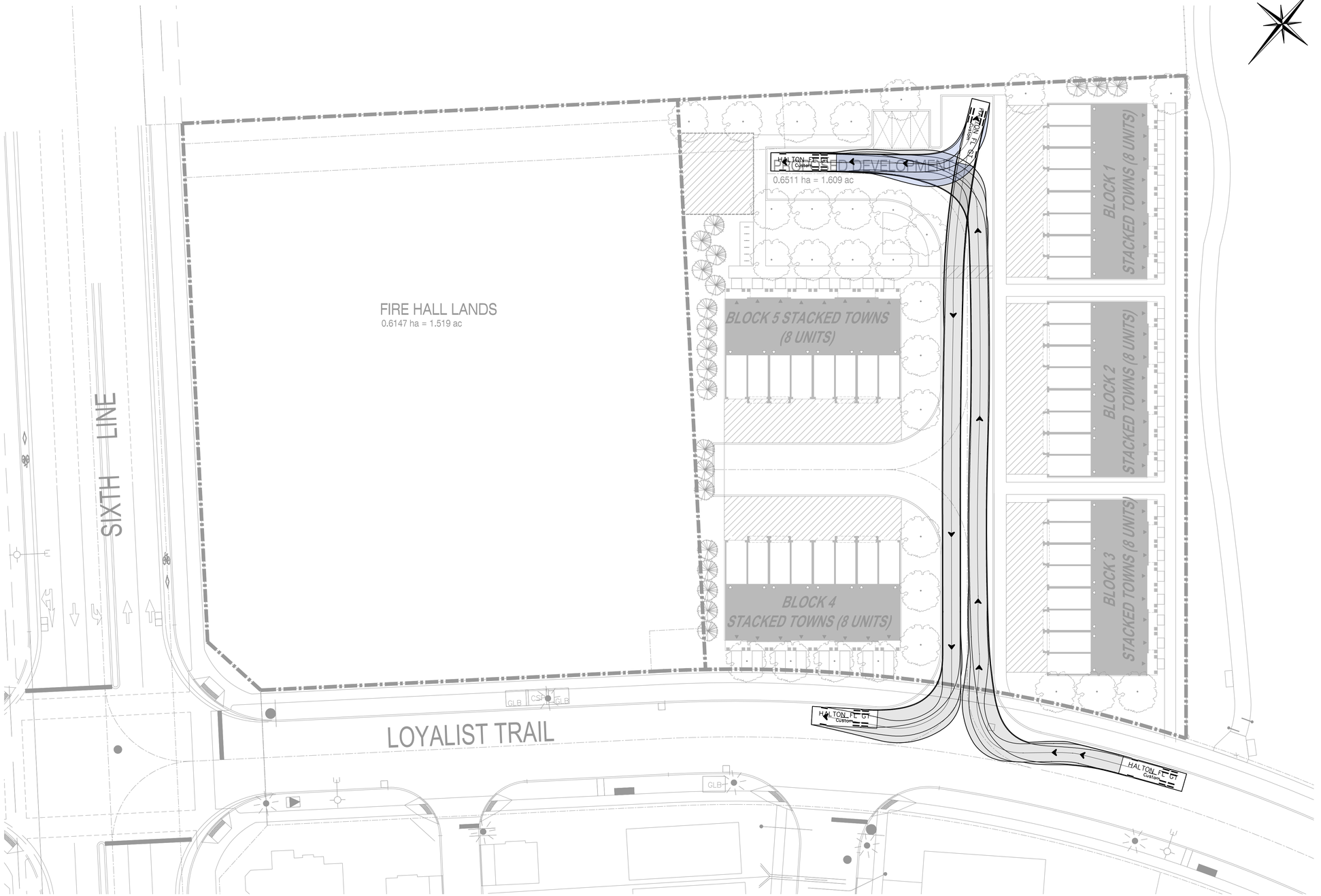
Project
BLOCK 154 NORTH OAKVILLE
TOWN OF OAKVILLE

Drawing
VEHICLE MANEUVERING ANALYSIS
HALTON PUMPER FIRE TRUCK

CROZIER
CONSULTING ENGINEERS

Drawn By I.M.	Design By I.M.	Project	2712-7169
Check By S.S.	Sheet 1 of 3	Scale 1:300	Drawing T-001



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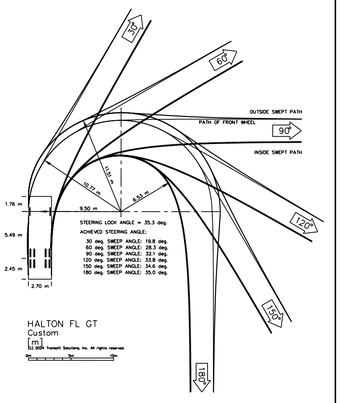

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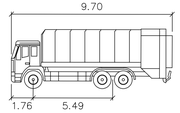

HALTON FL GT

	meters
Width	: 2.70
Track	: 2.70
Lock to Lock Time	: 6.0
Steering Angle	: 35.3

No.	ISSUE	DATE: MM/DD/YYYY
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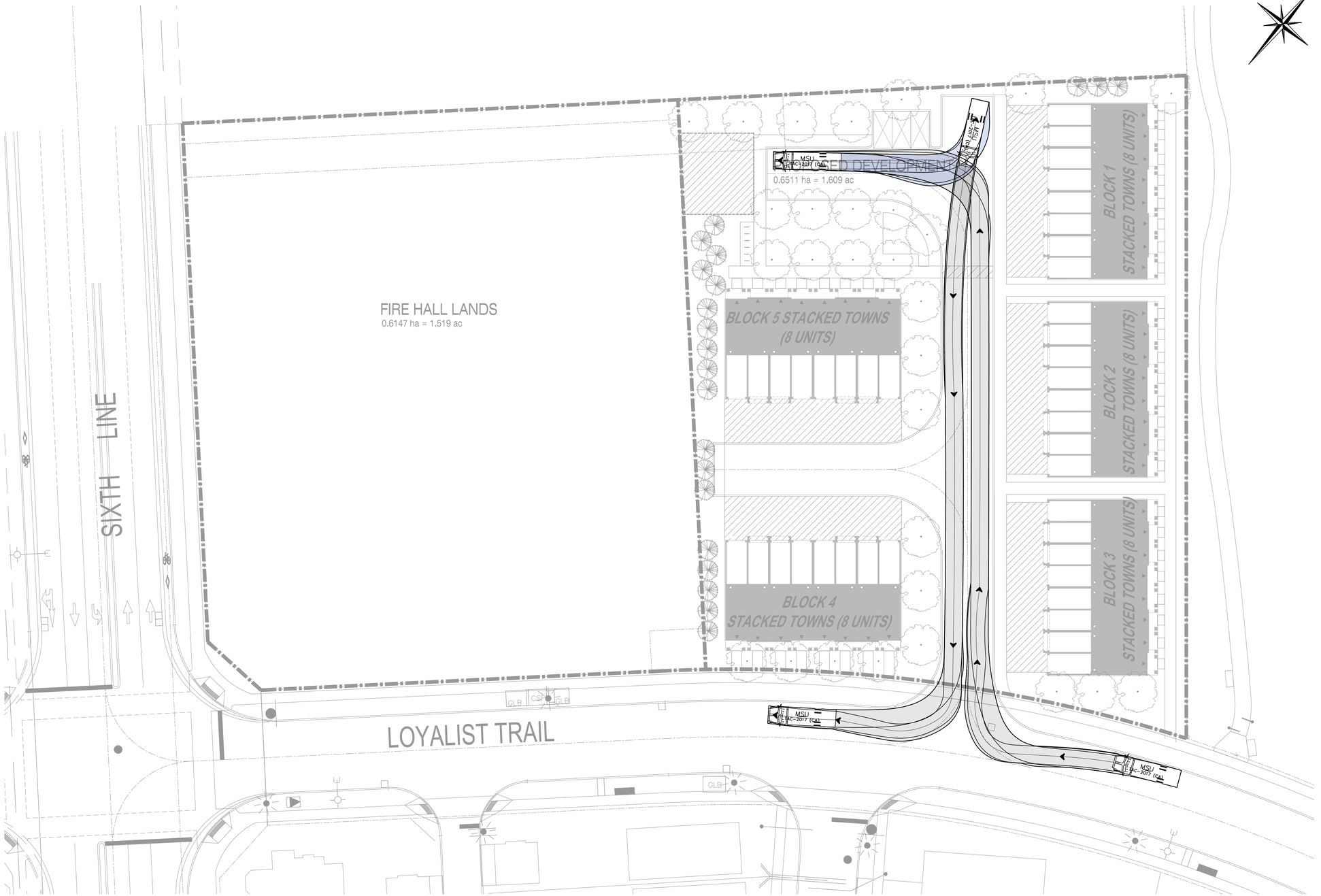
NOT TO BE USED FOR CONSTRUCTION

Project
BLOCK 154 NORTH OAKVILLE
TOWN OF OAKVILLE

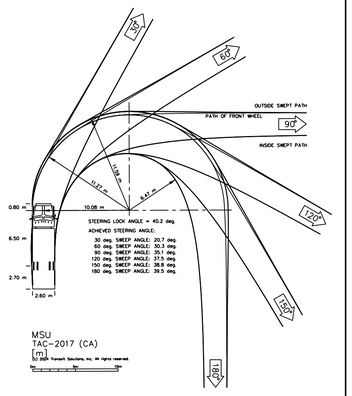
Drawing
VEHICLE MANEUVERING ANALYSIS
HALTON GARBAGE TRUCK

CROZIER
CONSULTING ENGINEERS

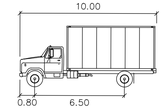
Drawn By	Design By	Project
I.M.	I.M.	2712-7169
Check By	Sheet	Scale / Drawing
S.S.	2 of 3	1:300 / T-002



SWEEP PATH



VEHICLE PROFILE



	meters
Width	: 2.60
Track	: 2.60
Lock to Lock Time	: 6.0
Steering Angle	: 40.2

No.	ISSUE	DATE: MM/DD/YYYY
1	ISSUED FOR 1st SUBMISSION	2024/08/30

Project

BLOCK 154 NORTH OAKVILLE
TOWN OF OAKVILLE

Drawing

VEHICLE MANEUVERING ANALYSIS
MSU

CROZIER
CONSULTING ENGINEERS

Drawn By: I.M.	Design By: I.M.	Project: 2712-7169	
Check By: S.S.	Sheet: 3 of 3	Scale: 1:300	Drawing: T-003

10 0m 10 20
SCALE: 1:300

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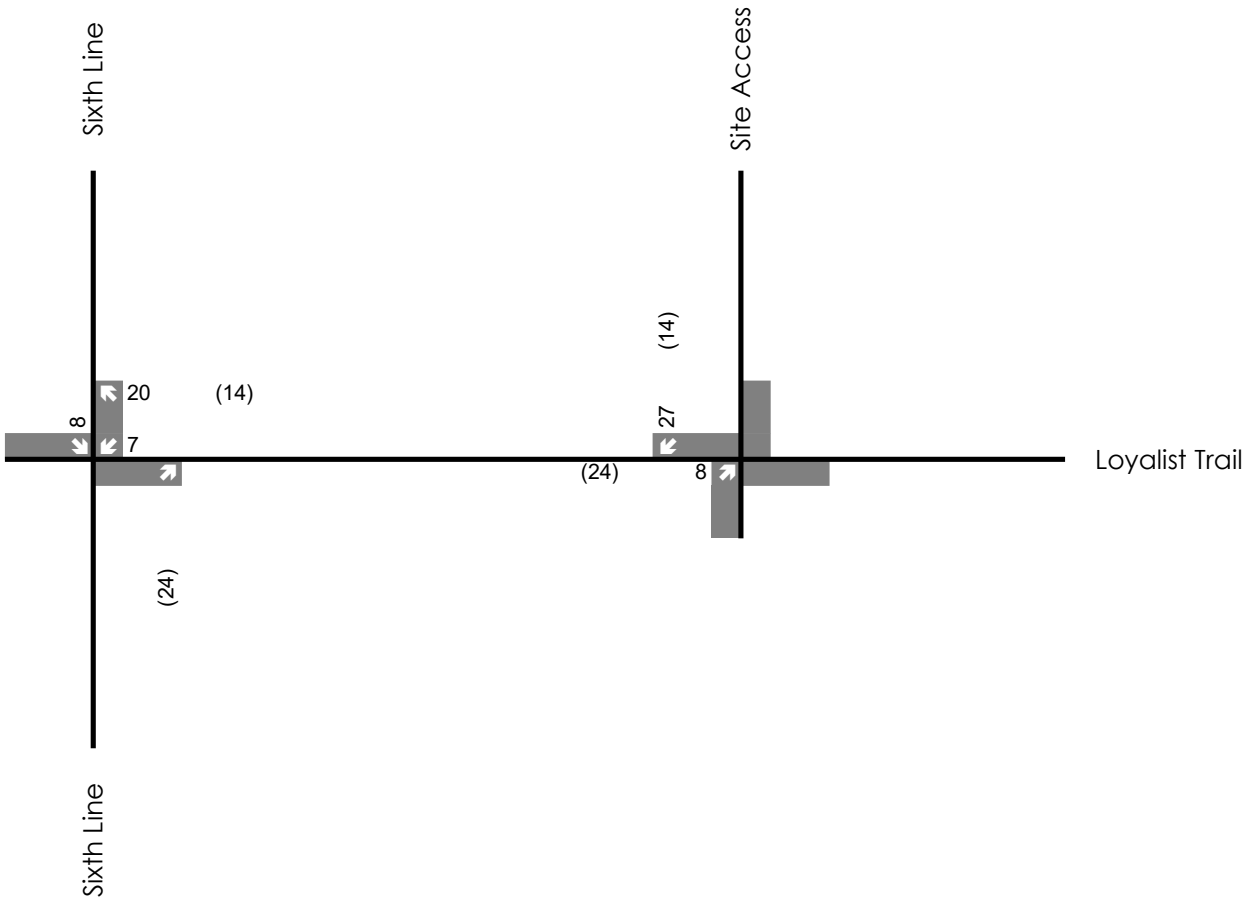
FIGURES

Legend Approximate Boundary	**North Oakville** **Site Location**	CROZIER CONSULTING ENGINEERS	**Figure 1** Project No. 2712-7169 Date. 2024-08-12 Analyst. AK



Legend	North Oakville	CROZIER CONSULTING ENGINEERS	Figure 2
xx A.M. Peak Hour Traffic Volumes (xx) P.M. Peak Hour Traffic Volumes	Site-Generated Traffic Volumes		Project No. 2712-7169 Date. 2024-08-12 Analyst. AK