10242 Glendon Drive, Komoka

Transportation Impact Assessment

Stantec

Prepared for:
Sifton Properties

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Table of Contents

Executive Summary ..... **iii**
1 Introduction **5**
1.1 Study Scope 6

2 Existing Transportation Environment **7**
2.1 Road Configuration 7
2.2 Transit Service 7
2.3 Existing Traffic Volumes 8

3 Future Transportation Environment **8**
3.1 Study Horizon Years 8
3.2 Planned Infrastructure Improvements 8
3.3 Future Background Traffic Growth 10
3.4 Site Traffic 14
3.4.1 Trip Generation 14
3.4.2 Trip Distribution 15
3.5 Future Total Traffic 17

4 Intersection Capacity Analysis **19**
4.1 Analysis Methodology 19
4.2 Analysis Results 20
4.2.1 Glendon Drive at Crestview Drive 20
4.2.2 Potential Block 20 Driveway on Glendon Drive 21
4.2.3 Potential Block 20 Driveway on Street “A” 22

5 Pedestrian Crossings and Traffic Calming on Street “B” **23**
5.1 Traffic Calming 25

6 Summary of Finding and Recommendations **26**
6.1 Summary of Findings 26
6.2 Recommendations 27

List of Tables

Table 3.1: List of Future Background Developments 10
Table 3.2: Land-use code (LUC) for proposed developments 14
Table 3.3: Trip Generation Estimates 14
Table 4.1: Characteristics of Level of Service at Intersection 19
Table 4.2: Intersection Capacity Analysis - Glendon Drive at Crestview Drive 21
Table 4.3: Intersection Capacity Analysis - Glendon Drive at Block 20 Western Access 22
Table 4.4: Intersection Capacity Analysis - Street "A" at Block 20 Access 22

List of Figures

Figure 1: Site Location 5
Figure 2: Glendon Drive at Crestview Drive – Existing Lane Configuration 7
Figure 3: Existing Traffic Volumes 8
Figure 4: Planned Infrastructure Improvements 9
Figure 5: Map of Future Background Developments 11
Figure 6: Background Development - Segway Residential Development 12
Figure 7: Background Development - Future Strategic Employment Lands (Industrial Park) 12
Figure 8: Background Development - 9763 Glendon Drive (Recreational Development) 13
Figure 9: 2035 Future Background Conditions 13
Figure 10: Site Generated Traffic 16
Figure 11: 2035 Future Total Traffic 18
Figure 12: Future Lane Configuration - Glendon Drive at Crestview Drive 20
Figure 13: Future Lane Configuration - Glendon Drive at Block 20 Western Access 22
Figure 14: Example of Level 2 Type D Intersection PXO 24
Figure 15: Potential PXO location 24

List of Appendices

Appendix A Draft Plan
Appendix B Traffic Data
Appendix C Trip Generation Rates
Appendix D Synchro Output Reports

Executive Summary

Stantec was retained by Sifton Properties to conduct a Transportation Impact Assessment ("TIA") for a Draft Plan of Subdivision (DPOS) for a proposed mixed-use development located at the municipal address of 10242 Glendon Drive, Komoka, in the Township of Middlesex Centre (Township), in the County of Middlesex (County). The subject property is located north of the Glendon Drive and Crestview Drive intersection. The site falls within the Komoka-Kilworth Urban Settlement Area, which is identified in the Middlesex Centre Official Plan as a primary area for residential and mixed-use growth. This area is planned to support the development of compact, complete communities with diverse housing options and supporting infrastructure

The proposed development is anticipated to consist of approximately 90 single family detached units, 78 single family attached units, 182 mid-rise multifamily units, 426 high-rise multifamily units, and 58,706 ft2 of commercial/office space.

The development is anticipated to generate approximately 397 two-way trips during the AM peak hour (166 entering and 231 exiting) and 468 trips during the PM peak hour (240 entering and 228 exiting).

The development is planned to include two initial vehicular access points upon build-out (a new north approach at the existing signalized intersection of Glendon Drive and Crestview Drive, and a full-movement private driveway for the Mixed-use Block on Glendon Drive, as well as other private driveways along the future municipal road network internal to the site), with ultimately future road connections to the east and west of the site as future developments surrounding the site are constructed.

The results of the intersection capacity analysis shows:

- The signalized intersection of Glendon Drive at Crestview Drive is currently not experiencing operational issues under existing conditions and is expected to maintain acceptable operations through to the 2035 horizon year with the planned road widening on Glendon Drive and new left-turn lanes supporting inbound and outbound traffic from the proposed development.
- The potential future driveway for Block 20 on Glendon Drive is expected to operate well with no traffic operational issues under future total conditions.

A **Level 2 Type D Pedestrian Crossover (PXO)** is recommended on the west leg of the intersection of Street "B" at Street "C" due to the anticipated pedestrian crossing demand between the residential and mixed-use blocks on the south side of Street "B" and the residential and parkland blocks on the north side. This PXO will represent one of two controlled crossing locations along Street "B", with a more easterly crossing option available at the future all-way stop-controlled intersection of Street "A" at Street "B". The Level 2 Type D PXO (roadside signage and painted crosswalk) is warranted based on the planned posted speed limit of 40 km/h, the two-lane cross-section of Street "B," and the projected traffic volumes, in accordance with Ontario Traffic Manual (OTM) Book 15 guidelines.

To provide enhanced traffic calming measures along Street “B”, given its generally straight and uninterrupted alignment, with anticipated pedestrian crossing activity, the following traffic calming measures have been proposed:

- Blanket posted 40 km/h speed limit within the community;
- Curb extensions at the PXO to reduce the pavement width and thus the crossing distance for pedestrians and improve visibility at the crossing;
- Park Warning signage along Street “B” per OTM guidelines; and
- All-way stop control at the intersection of Street “A” and Street “B” to interrupt east-west traffic flows along Street “B”.

Based on the findings of the traffic analysis, the following recommendations are provided to support safe and efficient transportation operations within and around the development site:

- Auxiliary left-turn lanes are recommended on the eastbound and southbound approaches at the signalized intersection of Glendon Drive and Crestview Drive.
- The intersection of Glendon Drive at Crestview Drive should be monitored by the County with signal timing optimizations implemented as necessary to accommodate changing traffic conditions and ensure continued operational efficiency as multiple developments in the area are built-out.
- A new full-movement driveway access is recommended on Glendon Drive to serve the mixed-use Block 20. This secondary access is not expected to result in any operational impact on the Glendon Drive corridor.
- A Level 2 Type D PXO is recommended on the west leg of the Street “B” at Street “C” intersection to accommodate north-south pedestrian crossing demand in the vicinity of the parkland and mixed-use blocks.
- Traffic calming measures—including curb extensions, a posted 40 km/h speed limit, Park Warning signage, and all-way stop control at the intersection of Street “A” at Street “B” be implemented and designed during detailed design of the road network when curb geometric are determined and pavement marking and signage plans prepared.

1 Introduction

Stantec was retained by Sifton Properties to conduct a Transportation Impact Assessment ("TIA") for a Draft Plan of Subdivision (DPOS) for a proposed mixed-use development located at the municipal address of 10242 Glendon Drive, Komoka, in the Township of Middlesex Centre (Township), in the County of Middlesex (County). As shown in **Figure 1**, the subject property is located north of the Glendon Drive and Crestview Drive intersection. The site falls within the Komoka-Kilworth Urban Settlement Area, which is identified in the Middlesex Centre Official Plan as a primary area for residential and mixed-use growth. This area is planned to support the development of compact, complete communities with diverse housing options and supporting infrastructure.

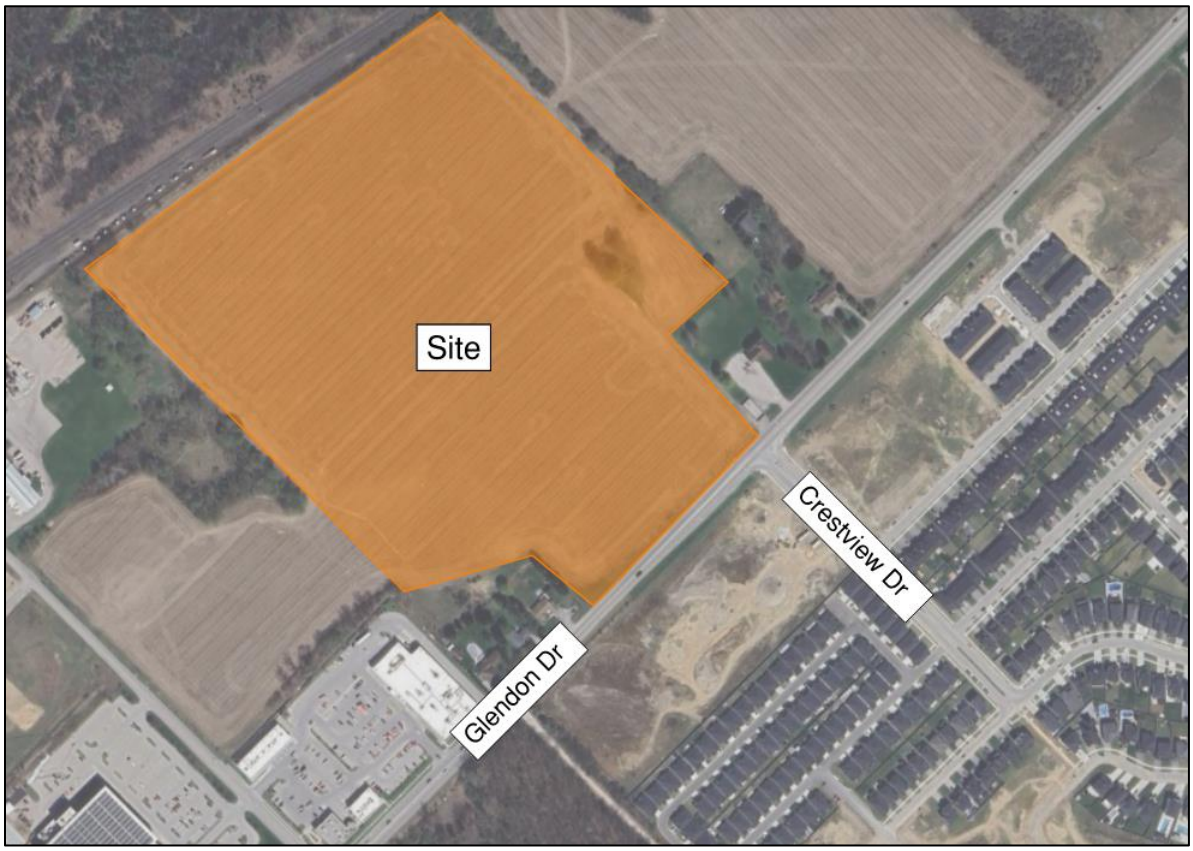


Figure 1: Site Location

The subject property has an overall site area of approximately 18.06 hectares, with the proposed development consisting of low, medium and high density residential, a mixed-use block, and parkland.

The development is planned to include two initial vehicular access points upon build-out (a new north approach at the existing signalized intersection of Glendon Drive and Crestview Drive, and a full-

movement private driveway for the Mixed-use Block on Glendon Drive), with future road connections to the east and west of the site as future developments surrounding the site are constructed.

Appendix A provides the draft plan for the proposed development.

1.1 Study Scope

As part of the DPOS application, a TIA is required to identify the traffic operational impacts of the proposed development on the surrounding road network and propose improvements (where required) to maintain an acceptable level of service.

The scope includes:

- Traffic operations assessment of the study area intersections:
    - Glendon Drive at Crestview Drive;
    - Potential future private driveway connection for Block 20 (mixed-use block) on Glendon Drive; and
    - Potential future private driveway connection for Block 20 (mixed-use block) on Street “A”.
- Estimate peak hour trip generation from the proposed development using the Institute of Transportation Engineer’s (ITE) Trip Generation Manual and distribute the site generated traffic to the surrounding road network based on expected commuter traffic patterns.
- The horizon years being analyzed are as follows:
    - **Existing Conditions;**
    - **2035 Background Conditions**: Existing traffic volumes grown to 2035 by application of an annualized growth rate and inclusion of traffic generated by surrounding background developments; and
    - **2035 Future Total Conditions**: Site-generated traffic combined with the 2035 background traffic.
- Intersection capacity analysis time periods include weekday AM and PM peak hours;
- Identifying the need for transportation network improvements and mitigation measures to maintain an acceptable level of service;
- A review of proposed internal multi-modal transportation network and site access management from traffic operational and safety standpoints.

2 Existing Transportation Environment

2.1 Road Configuration

Glendon Drive is a two-lane arterial roadway running east-west with a rural cross-section. Within the study area, it has a posted speed limit of 70 km/h. At its signalized intersection with Crestview Drive, Glendon Drive has an auxiliary eastbound right turn lane and a westbound left turn lane. There are no pedestrian or cycling facilities along this portion of Glendon Drive.

Crestview Drive is a two-lane collector road running north-south, providing access to the residential development on the south side of Glendon Drive. At its signalized intersection with Glendon Drive, Crestview Drive has auxiliary left and right turn lanes, with no through movement under existing conditions (given no north approach at the intersection). There is sidewalk on both sides of Crestview Drive that terminate at Glendon Drive.

The existing intersection Glendon Drive at Crestview Drive is signalized with the lane configuration presented in **Figure 2** below.

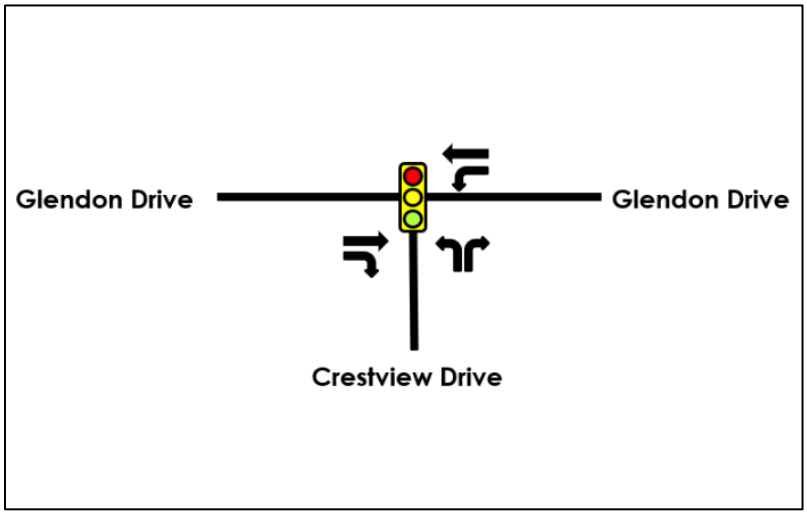


Figure 2: Glendon Drive at Crestview Drive – Existing Lane Configuration

2.2 Transit Service

Although the County does not currently have a dedicated municipal transit system, the area is served by the **Inter-Community Transit Service** connecting Sarnia, Strathroy, Mount Brydges, Komoka, and London. This service includes a stop at the Komoka Wellness Centre and provides limited, fixed-route bus service primarily intended for regional connectivity. However, no formal bus stops or transit-supportive infrastructure are present along Glendon Drive within the study area.

2.3 Existing Traffic Volumes

The TIA utilized traffic volume estimates from the Glendon Drive Environmental Study Report (ESR) as the baseline scenario for this study (representing existing volumes with development on the south side of Glendon Drive built-out)The existing weekday AM and PM peak hour traffic volumes are shown in **Figure 3**.

Referenced traffic data can be found in **Appendix B.**

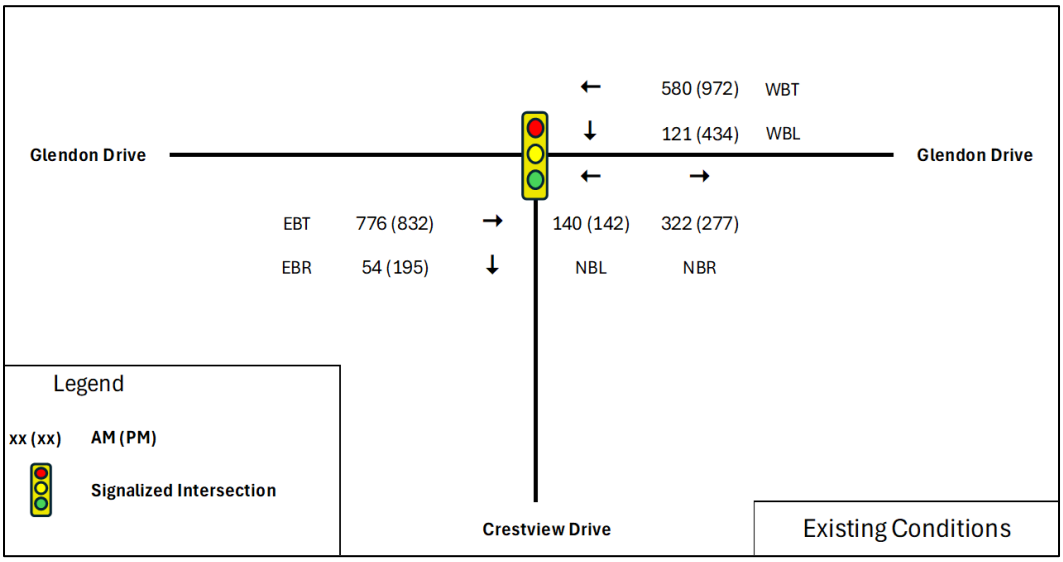


Figure 3: Existing Traffic Volumes

3 Future Transportation Environment

3.1 Study Horizon Years

The City of London's *Transportation Impact Assessment Guidelines (April 2012)* were referenced in developing the scope of this study, given neither the Township nor County have formal TIA Guidelines. In accordance with the Guidelines, the study evaluates a future horizon year of five years post build-out. With full build-out of this development anticipated to be in approximately 2030 (assumed five-year horizon from the current year), the study analyzes a 2035 future horizon year.

3.2 Planned Infrastructure Improvements

The County is planning several transportation infrastructure improvements in the study area as part of the broader Glendon Drive Improvements Environmental Assessment (EA) study.

The Glendon Drive widening initiative is a key component of Middlesex County's long-term transportation strategy to enhance mobility and safety along this critical east-west corridor. Within the study area, Glendon Drive is proposed to be upgraded from a two-lane rural cross-section to a four-lane urban cross-section. This expansion is intended to address increased traffic demands associated with the ongoing and planned residential and mixed-use developments in Komoka and Kilworth. Work in the study area is anticipated to be completed by 2029 per the ESR construction schedule.

The corridor improvement project includes a significant focus on active transportation. Boulevard-style multi-use paths (MUPs) are proposed along both sides of Glendon Drive, providing safe and continuous facilities for pedestrians and cyclists. These MUPs are designed to integrate with existing and future active transportation networks, including connections to local parks, schools, and the City of London's cycling and pedestrian infrastructure.

Figure 4 illustrates the future road network layout for Glendon Drive within the vicinity of the subject site.

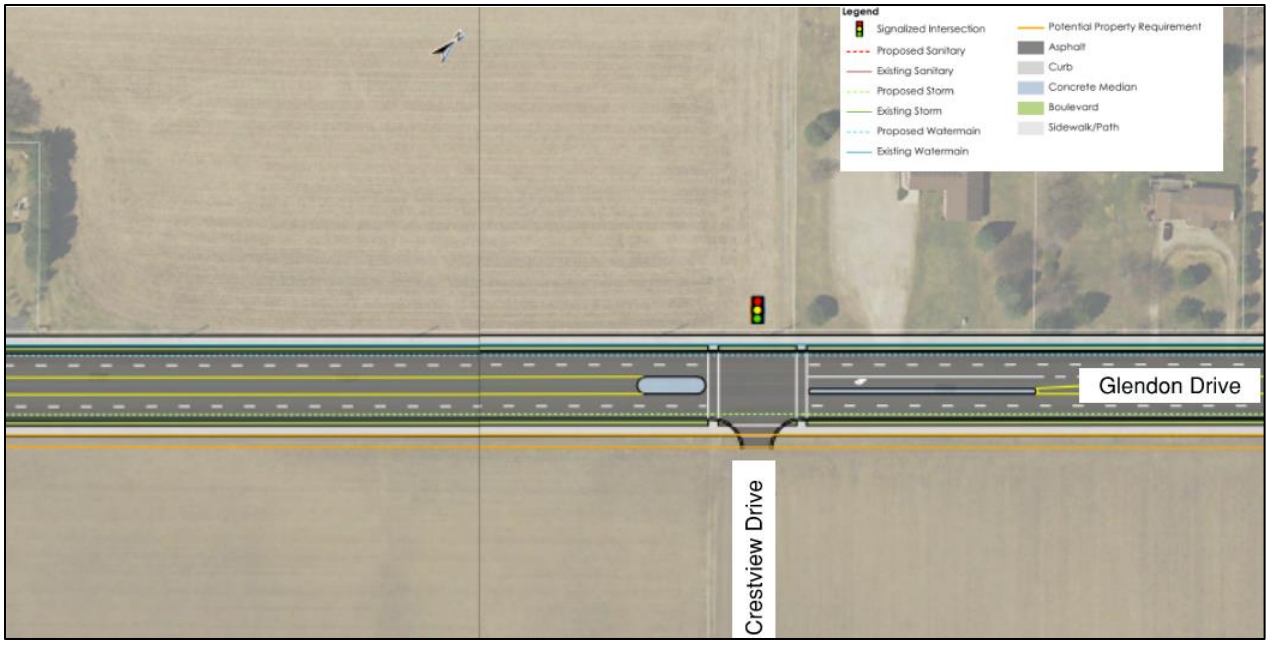


Figure 4: Planned Infrastructure Improvements

The Middlesex Centre Transportation Master Plan (TMP) has plans for extending London Transit Commission (LTC) routes to serve growing areas like Komoka-Kilworth, enhancing regional connectivity and offering increased mobility options for residents.

3.3 Future Background Traffic Growth

An annual background growth rate of 2% was applied to the through movements on Glendon Drive within the study area to account for anticipated traffic growth between the 2025 base year and the 2035 horizon years, in addition to traffic to be generated from the background developments in the immediate vicinity of the site.

Table 3.1 summarizes the background developments included in the analysis. Their locations relative to the subject site are illustrated in **Figure 5**. The Segway Residential Development is anticipated to generate approximately 132 two-way trips (38 entering and 94 exiting) during the AM peak hour and 190 two-way trips (128 entering and 62 exiting) during the PM peak hour, as shown in **Figure 6**. The development is anticipated to utilize Crestview Drive as the access.

Glendon Drive and Crestview Drive is anticipated to experience 159 two-way through trips (27 eastbound and 132 westbound) during the AM peak hour and 155 two-way trips (122 eastbound and 33 westbound) during the PM peak hour from the future industrial park development to the west of the subject site. The trip generation from the industrial park development on Glendon Drive and Crestview is shown in **Figure 7**.

The development at 9763 Glendon Drive is anticipated to generate 12 two-way through trips (6 eastbound and 6 westbound) during the AM peak hour and 28 two-way trips (12 eastbound and 16 westbound) during the PM peak hour on Glendon Drive and Crestview Drive, as shown in **Figure 8**.

Figure 9 presents the 2035 future background traffic volumes, which include both the identified background developments and the projected growth in traffic.

Table 3.1: List of Future Background Developments

Reference	Development	Description
1	Segway Residential Development	A Low-density residential development consisting of 525 single family dwelling units
2	Future Strategic Employment Lands	An Industrial Park consisting of two parcels of lands – a 41.3 ha west parcel and a 26.9 ha east parcel
3	9763 Glendon Drive	A recreational development with a 865 m^2 of GFA

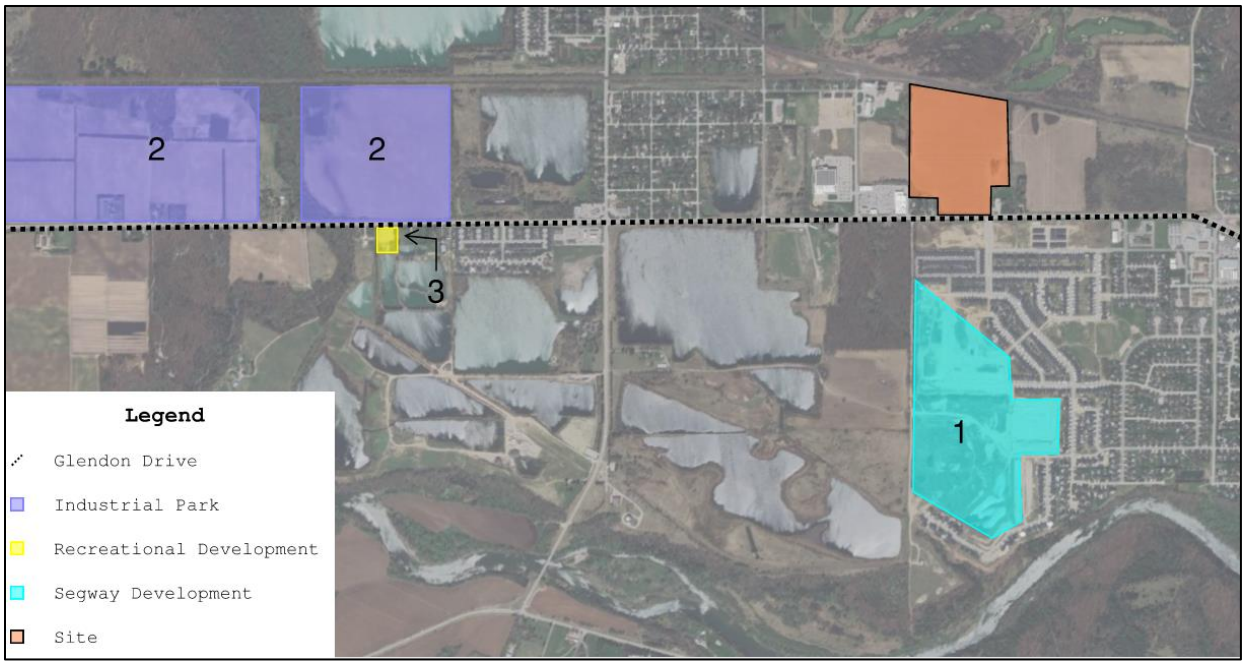


Figure 5: Map of Future Background Developments

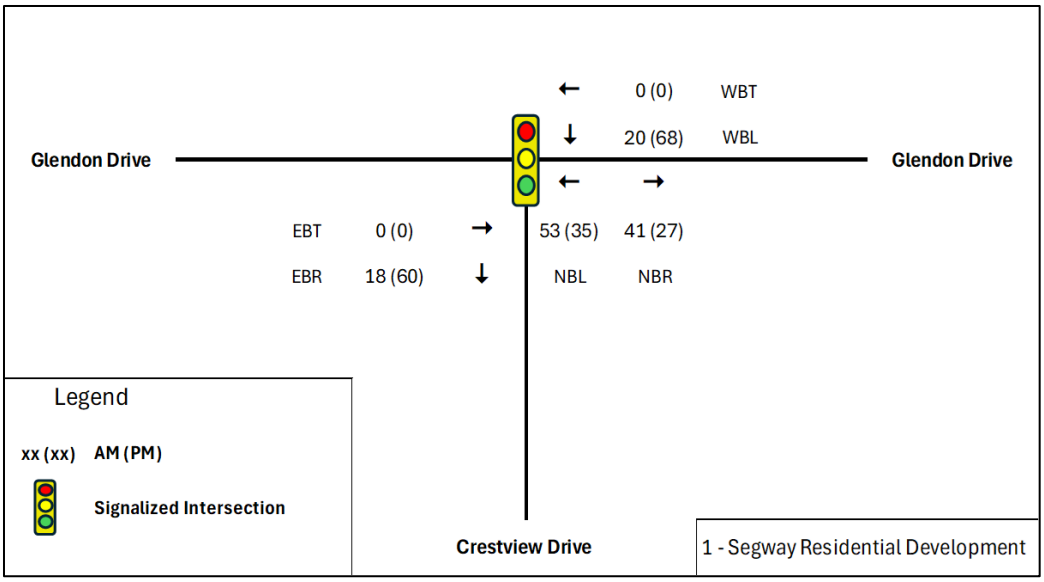


Figure 6: Background Development - Segway Residential Development

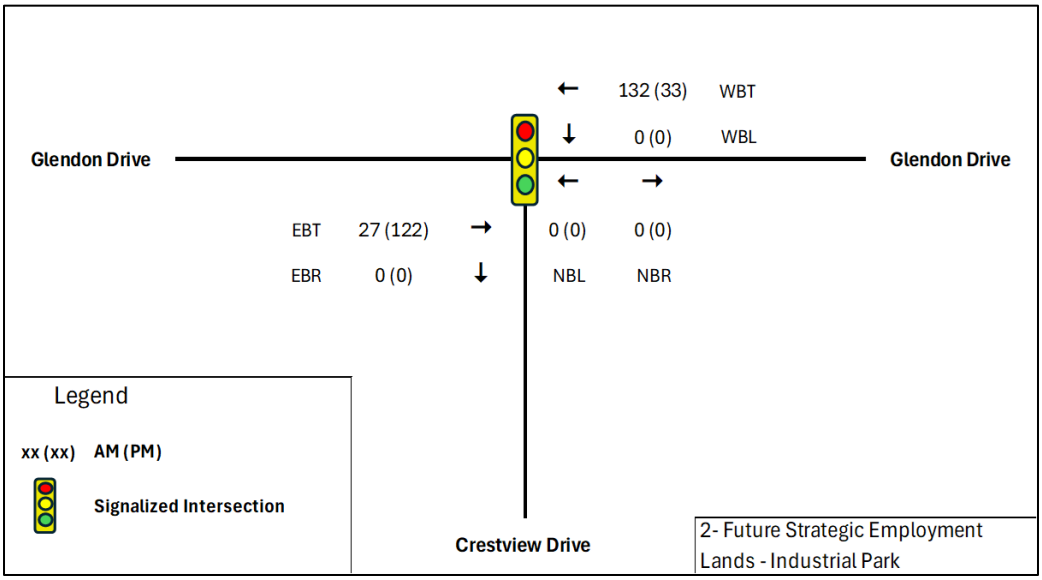


Figure 7: Background Development - Future Strategic Employment Lands (Industrial Park)

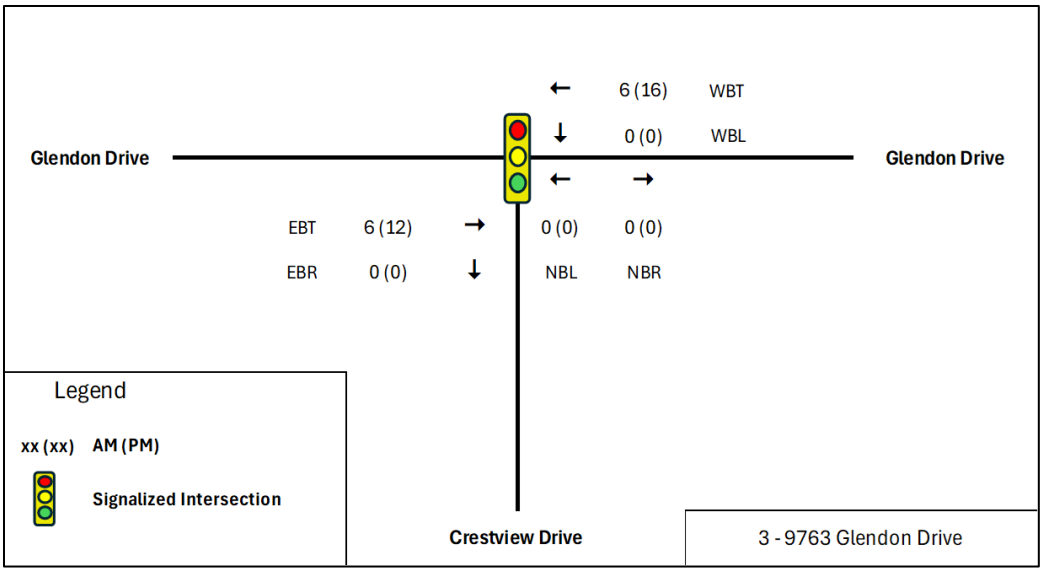


Figure 8: Background Development - 9763 Glendon Drive (Recreational Development)

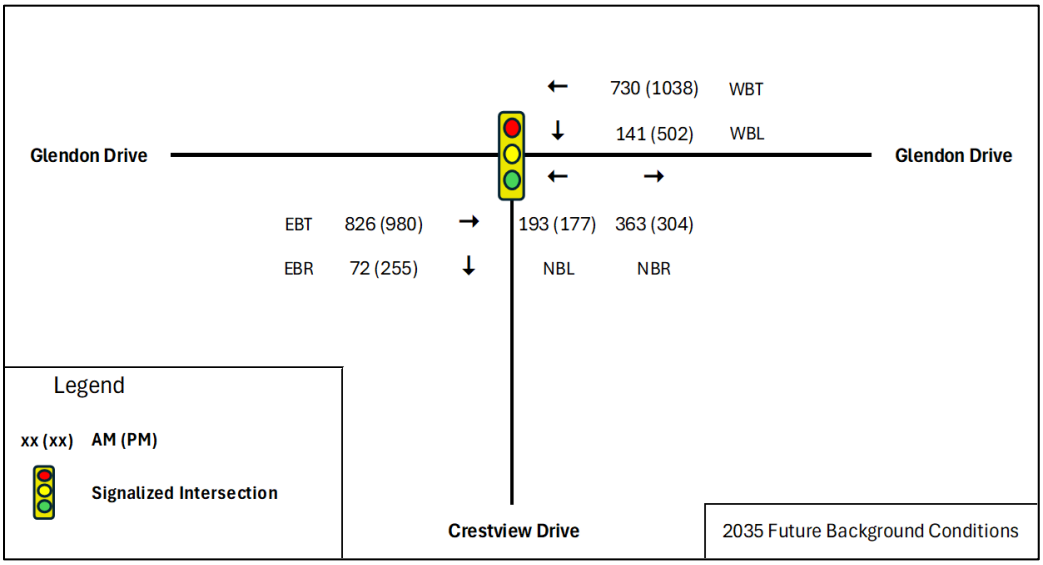


Figure 9: 2035 Future Background Conditions

3.4 Site Traffic

3.4.1 Trip Generation

The *Institute of Transportation (ITE) Trip Generation Manual* (11th edition) was used to forecast trip generation for the land uses within the proposed development. **Table 3.2** shows the ITE land-use codes (LUC) that were utilized to estimate the number of trips generated from the development.

Table 3.2: Land-use code (LUC) for proposed developments

Land-Use (ITE Land Use Code Name)	Land Use Code
Low-Density Residential (Single Family Detached Housing)	LUC-210
Street Townhouses (Single-Family Attached Housing)	LUC-215
Medium-Density Residential (Mid-Rise Multifamily Housing)	LUC-221
High-Density Residential (High-Rise Multifamily Housing)	LUC-222
Mixed-Use Residential (High-Rise Multifamily Housing)	LUC-222
Mixed-Use Commercial (General Office Building)	LUC-710

Table 3.3 presents the trip generation estimates for the subject site, applying the ITE trip generation rates and equations to the anticipated unit counts for the residential uses and to the gross floor area of the commercial office space in the mixed-use block. The development is anticipated to generate approximately 397 two-way trips during the AM peak hour (166 entering and 231 exiting) and 468 trips during the PM peak hour (240 entering and 228 exiting). **Appendix C** presents the trip generation rates used for the estimates below.

Table 3.3: Trip Generation Estimates

Land-Uses	Units	AM Peak Hour			PM Peak Hour		
		IN	OUT	TOTAL	IN	OUT	TOTAL
Low-Density Residential	90	17	51	68	57	33	90
Street Townhouses	78	9	26	35	25	18	43
Medium-Density Residential (B-18)	67	4	14	18	16	10	26
Medium-Density Residential (B-17)	115	9	30	39	27	18	45
High-Density Residential	114	11	33	44	33	20	53
Mixed-Use Residential	312	23	64	87	64	40	104
Mixed-Use Commercial	58706 ft^2 GFA	93	13	106	18	89	107
TOTAL		**166**	**231**	**397**	**240**	**228**	**468**

3.4.2 Trip Distribution

The trip distribution for the proposed development in Komoka is estimated at approximately 85% eastbound and 15% westbound along Glendon Drive. This directional split is supported by the surrounding regional context and established travel patterns. Komoka functions primarily as a commuter community located on the western edge of the City of London, which acts as the dominant urban center in the region. The City of London contains a high concentration of employment areas, post-secondary institutions (Western University, Fanshawe College), healthcare facilities (e.g., London Health Sciences Centre), and major commercial destinations, making it the primary trip attractor for residents of Komoka.

While Glendon Drive provides access to Highway 402 to the west—facilitating regional connectivity to Sarnia, Strathroy, and other western municipalities—the scale and frequency of trip attraction in those areas is expected to be significantly comparatively lower than what is offered in London. The 15% westbound distribution accounts for trips destined for Strathroy, regional employment uses west of Komoka, and traffic connecting to Highway 402. However, the predominance of eastbound travel reflects the higher volume of daily commuter, commercial, and institutional trips to the City of London. This distribution aligns with historic travel trends observed in the area and is consistent with the functional role of Komoka as a residential community oriented toward the City of London.

For Block 20 specifically, the distribution of site-generated trips to and from the block's anticipated driveways on Glendon Drive and Street "A" was based on the site layout and expected travel patterns. All westbound trips are expected to use the potential driveway on Glendon Drive. Of the eastbound trips to/from this block, 60% are anticipated to use the potential driveway on Glendon Drive while the remaining 40% are assumed to use the signalized intersection at Glendon Drive and Crestview Drive.

For Block 17 specifically, approximately 70% of westbound trips are expected to use the potential Block 20 driveway on Glendon Drive, with the remaining 30% using the signalized intersection of Glendon Drive and Crestview Drive. In the eastbound direction, 10% of trips from Block 17 are expected to use the potential Block 20 driveway on Glendon Drive, while 90% are assumed to use the signalized intersection.

All remaining site-generated traffic from other development blocks will access Glendon Drive through the signalized intersection.

It is important to note this trip distribution pattern reflects the initial full build-out scenario prior to completion of the developments to the east and west of the subject site, which will ultimately offer additional eastbound and westbound road network connections and reduce the complete reliance on the signalized intersection of Glendon Drive at Crestview Drive. Once those east-west road connections are made through the adjoining developments, it is expected a proportion of traffic generated by the subject development will use those alternative routes, and likewise a similar proportion of traffic from those comparatively smaller developments may travel through this site.

Figure 10 illustrates the estimated trip assignment for the subject site on the road network.

10242 Glendon Drive
Future Transportation Environment

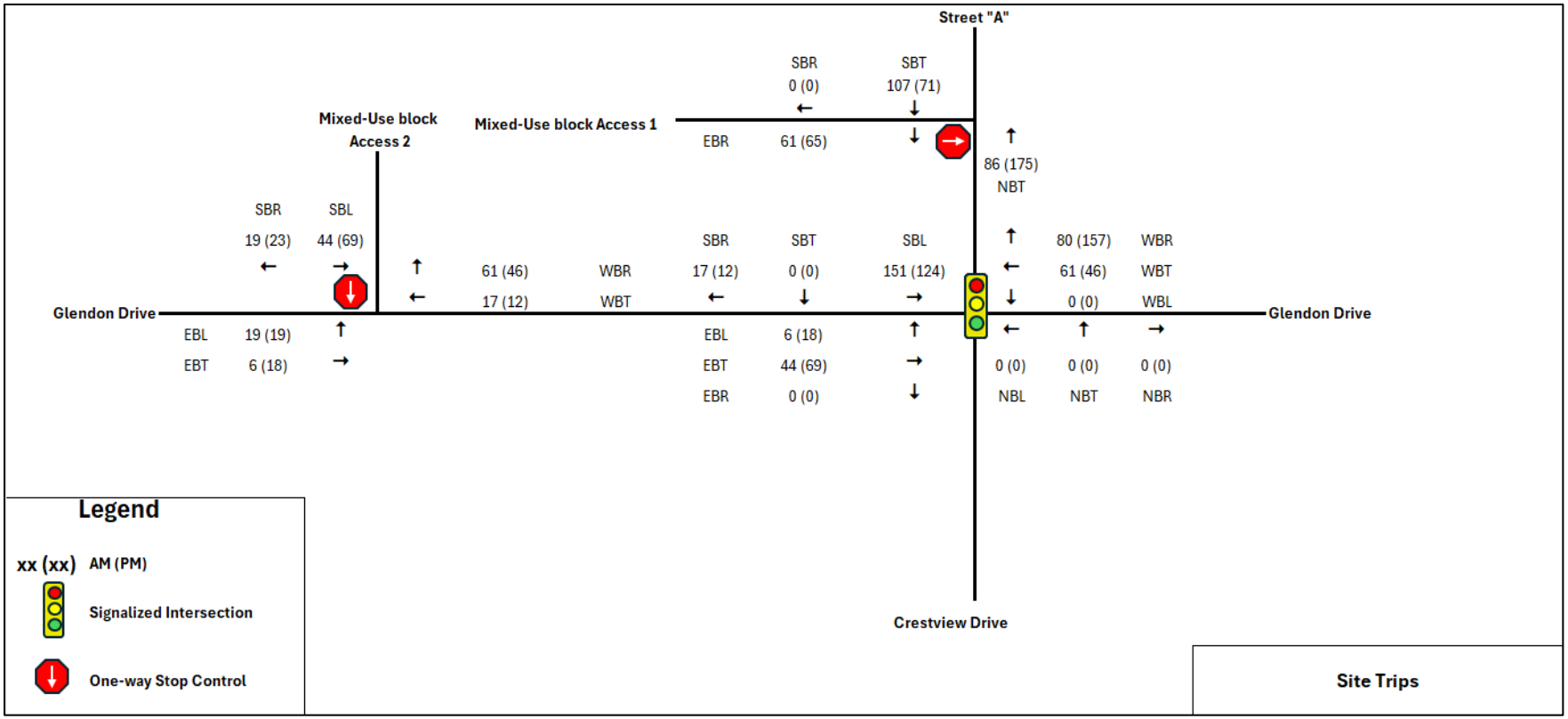


Figure 10: Site Generated Traffic

3.5 Future Total Traffic

The future total peak hour traffic volumes for 2035 were calculated by adding the projected site-generated trips to the 2035 future background traffic volumes. The resulting 2035 future total AM and PM peak hour traffic volumes are shown in **Figure 11**.

10242 Glendon Drive
Future Transportation Environment

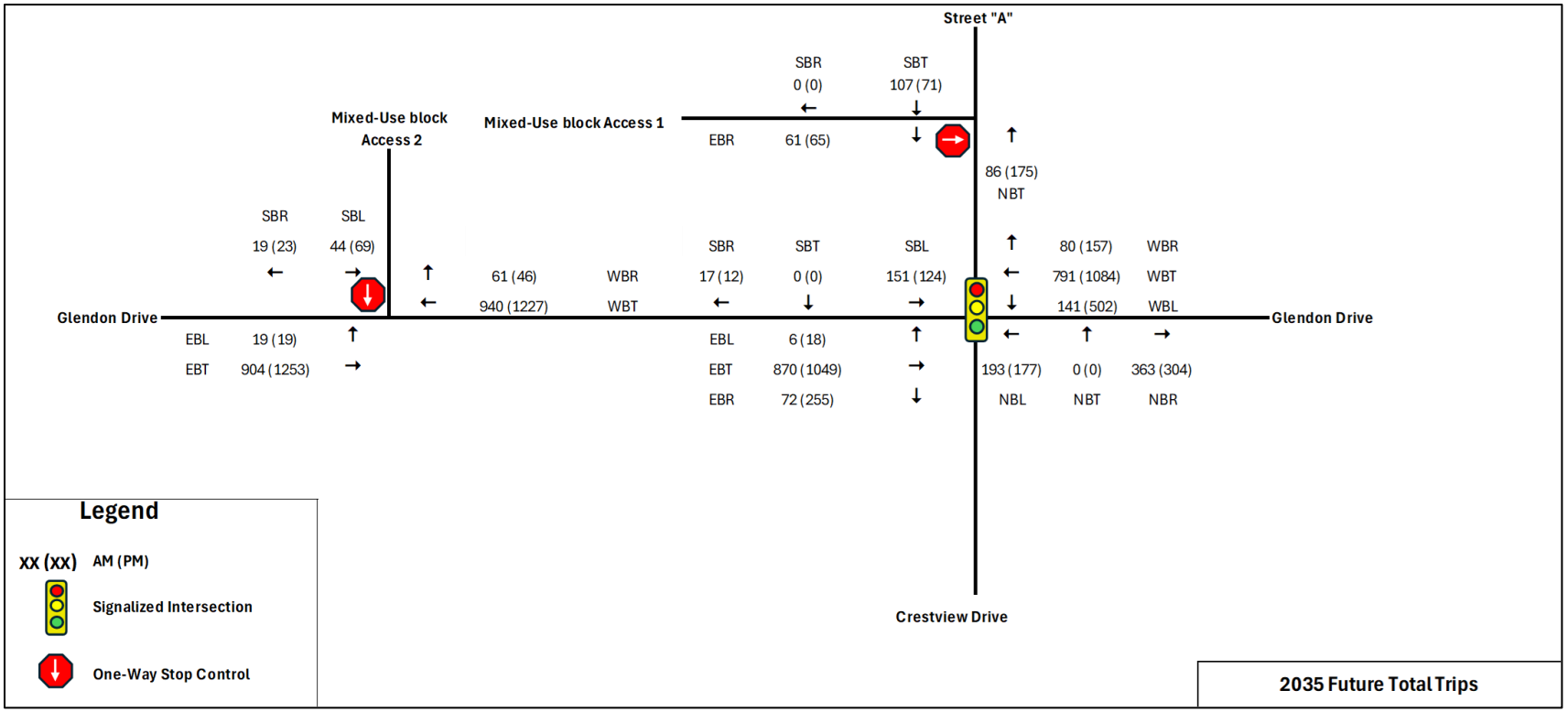


Figure 11: 2035 Future Total Traffic

4 Intersection Capacity Analysis

4.1 Analysis Methodology

The industry-standard microscopic traffic analysis software Synchro was utilized to evaluate key performance measures. These include Level of Service (LOS), volume-to-capacity (v/c) ratio, and 95th percentile queue lengths, which are defined below:

- **Average vehicle control delay** is used to characterize level of service (LOS) and quantifies the variations in vehicle travel time. This is also a surrogate measure of driver discomfort and fuel consumption.
- **V/c ratio** quantifies the degree to which the capacity of a lane group is utilized. Ratio of 0.85 or greater for through or shared/through movements and 0.95 or greater for exclusive turning movements represent a capacity concern.
- **95th percentile queue length** is the peak extent line of vehicles reaches during the lowest performing 5% of the analysis period. It is common practice to identify preferred storage length requirements for auxiliary turn lanes at signalized intersections based on estimated peak hour 95th percentile queue lengths.

Table 4.1 identifies the control delay thresholds (seconds of delay per vehicle) for each LOS based on the Highway Capacity Manual (HCM) methodology.

Table 4.1: Characteristics of Level of Service at Intersection

Level of Service	Signalized Intersection	Unsignalized Intersection
A	≤ 10 seconds	≤ 10 seconds
B	> 10 to 20 seconds	> 10 to 15 seconds
C	> 20 to 35 seconds	> 15 to 25 seconds
D	> 35 to 55 seconds	> 25 to 35 seconds
E	> 55 to 80 seconds	> 35 to 50 seconds
F	> 80 seconds	> 50 seconds

4.2 Analysis Results

The following sections present the findings from the capacity analysis for the study area intersections. Detailed output reports from Synchro are provided in **Appendix D**.

4.2.1 Glendon Drive at Crestview Drive

Table 4.2 presents the intersection capacity analysis for the signalized intersection Glendon Drive at Crestview Drive under both existing and future horizon year scenarios. The existing conditions were assessed based on the current lane configuration, which includes one through lane in each direction along Glendon Drive, along with auxiliary eastbound right-turn and westbound left-turn lanes. Under these conditions, all movements operate well within capacity, with acceptable levels of service (LOS) and moderate delays.

In accordance with the Glendon Drive ESR, the planned widening of Glendon Drive to a four-lane cross-section is expected to be implemented by 2029. As such, the 2035 future scenarios were analyzed assuming the upgraded road cross-section. Under the 2035 future background volumes, the intersection is anticipated to continue operating efficiently without capacity or delay concerns requiring mitigation.

Figure 12 illustrates the proposed lane configuration under the 2035 future total traffic conditions with introduction of the new north approach at the intersection (Street “A”). The widened cross-section of Glendon Drive, as outlined in the ESR, will provide sufficient median width within the study area to accommodate an eastbound auxiliary left-turn lane. As such, the implementation of this left-turn lane is recommended at the intersection. Additionally, a standard two-lane configuration (one left-turn lane and one shared through/right-turn lane) is recommended for the new north approach, with a raised centre median, mirroring the existing opposing south approach (Crestview Drive). With these improvements in place, the overall intersection is expected to perform well under 2035 future total volumes, without capacity or delay concerns..

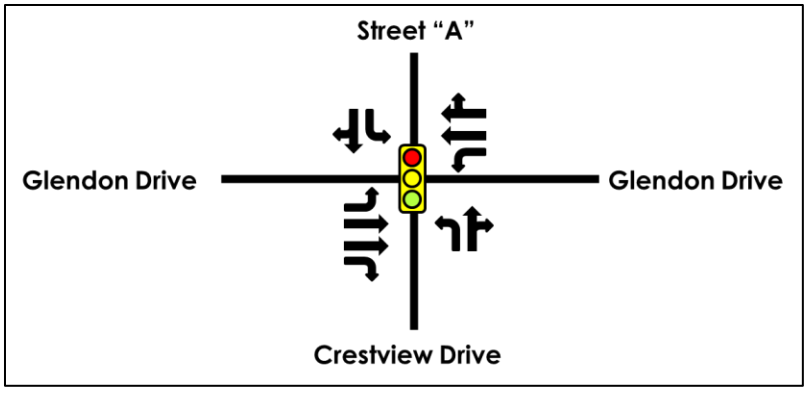


Figure 12: Future Lane Configuration - Glendon Drive at Crestview Drive

Table 4.2: Intersection Capacity Analysis - Glendon Drive at Crestview Drive

Scenario	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		Delay (s)	LOS	v/c Ratio	95%Q (m)	Delay (s)	LOS	v/c Ratio	95%Q (m)
Existing Conditions	EBT	15	B	0.73	159	24	C	0.83	183
	EBR	6	A	0.04	5	10	A	0.13	9
	WBL	9	A	0.31	7	50	D	0.93	112
	WBT	4	A	0.45	47	7	A	0.68	90
	NBL	49	D	0.64	44	64	E	0.78	57
	NBR	37	D	0.22	24	39	D	0.19	23
2035 Future Background Conditions	EBT	8	A	0.39	49	16	B	0.73	58
	EBR	6	A	0.05	5	10	B	0.17	10
	WBL	4	A	0.29	8	27	C	0.90	77
	WBT	3	A	0.29	22	4	A	0.45	23
	NBL	63	E	0.83	71	47	D	0.81	45
	NBR	38	D	0.28	28	22	C	0.21	24
2035 Future Total Conditions	EBL	8	A	0.03	3	22	C	0.13	8
	EBT	11	B	0.51	74	35	D	0.84	150
	EBR	8	A	0.05	7	23	C	0.28	36
	WBL	16	B	0.62	51	52	D	0.92	161
	WBTR	11	B	0.51	74	7	A	0.52	61
	NBL	20	C	0.48	41	44	D	0.62	73
	NBTR	26	C	0.71	69	49	D	0.21	-
	SBL	46	D	0.83	50	58	E	0.67	46
	SBTR	16	B	0.01	-	52	D	0.01	-

4.2.2 Potential Block 20 Driveway on Glendon Drive

Table 4.3 summarizes the intersection capacity analysis results for a potential private driveway on Glendon Drive serving Block 20 (mixed-use block). The anticipated lane configuration is shown in **Figure 13**. An auxiliary left-turn lane is recommended at this location on Glendon Drive, which can be accommodated within the planned future centre lane along this portion of Glendon Drive.

Under the 2035 future total traffic volumes and the proposed lane configuration, the driveway is expected to operate efficiently, with no operational issues anticipated.

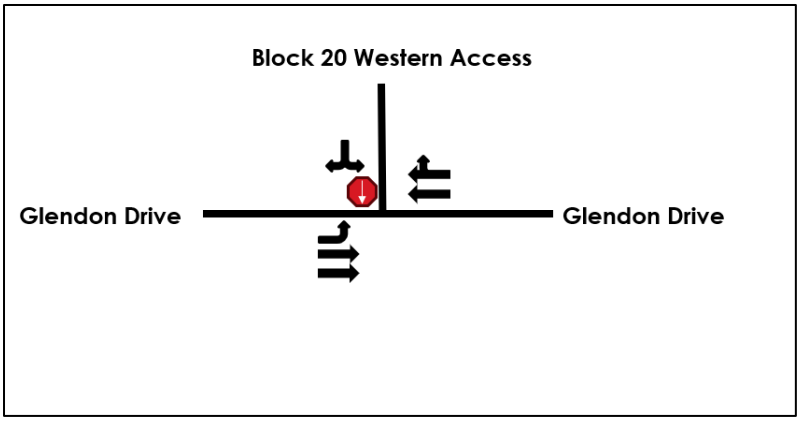


Figure 13: Future Lane Configuration - Glendon Drive at Block 20 Western Access

Table 4.3: Intersection Capacity Analysis - Glendon Drive at Block 20 Western Access

Scenario	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		Delay (s)	LOS	v/c Ratio	95%Q (m)	Delay (s)	LOS	v/c Ratio	95%Q (m)
2035 Future Total Conditions	EBL	10	B	0.03	-	12	B	0.04	-
	EBT	-	A	0.29	-	-	A	0.40	-
	WBTR	-	A	0.40	-	-	A	0.52	-
	SBLR	16	C	0.17	5	27	D	0.38	13

4.2.3 Potential Block 20 Driveway on Street “A”

Table 4.4 shows the intersection capacity analysis at Street “A” and Block 20 driveway access. With the presence of a centre median for the southern portion of Street “A” nearest Glendon Drive, and the expectation that the mixed-use block will desire to have a private driveway on Street “A” near the Glendon Drive corridor, it was assumed this driveway would be right-in/right-out only. It is expected a full-movements driveway for Block 20 would be located further north along Street “A” to accommodate inbound and outbound left-turns, in addition to multiple access points available along Street “B”. Under the 2035 future total traffic scenario, the driveway is expected to operate efficiently, with negligible delays and no anticipated capacity concerns.

Table 4.4: Intersection Capacity Analysis - Street "A" at Block 20 Access

Scenario	Movement	Weekday AM Peak Hour				Weekday PM Peak Hour			
		Delay (s)	LOS	v/c Ratio	95%Q (m)	Delay (s)	LOS	v/c Ratio	95%Q (m)
2035 Future Total Conditions	EBR	9	A	0.07	2	9	A	0.07	
	NBT	-	A	0.05	-	-	A	-	
	SBTR	-	A	0.07	-	-	A	0.05	

5 Pedestrian Crossings and Traffic Calming on Street “B”

The draft plan for the subject site was reviewed with a focus on accessibility and pedestrian safety. Sidewalks are proposed on both sides of Street “B” and throughout the internal street network, supporting continuous pedestrian connectivity between residential areas, commercial block, and parkland. This configuration is expected to generate a strong desire for pedestrians to cross Street “B” to access parkland on the north side from the residential and commercial block on the south side.

A controlled pedestrian crossing will be provided at the proposed all-way stop-controlled intersection at Street “A” and Street “B,” serving as a primary connection point. However, further west along Street “B,” additional pedestrian crossing demand is anticipated between the residential and mixed-use blocks on the south side of Street “B” and the residential and parkland blocks on the north side.

To accommodate this demand and enhance safety, a **Level 2 Type D Pedestrian Crossover (PXO)** is recommended on the west leg of the intersection at Street “B” and Street “C”, with a more easterly crossing option available at the future all-way stop-controlled intersection of Street “A” at Street “B”. The Level 2 Type D PXO (roadside signage and painted crosswalk) is warranted based on the planned operating speed of 40 km/h projected traffic volumes and the two-lane cross-section of Street “B,” in accordance with Ontario Traffic Manual (OTM) Book 15 guidelines.

The chosen location for the PXO is strategic for the following reasons:

- It will serve as a vital connection between developments on both sides of the road
- The implementation of the PXO here will enhance pedestrian safety and accessibility in an area experiencing growth and increased pedestrian activity

The PXO shall be equipped with the regulatory and warning signs, as well as pavement markings, as shown in **Figure 14**. The proposed PXO locations are shown in **Figure 15**.

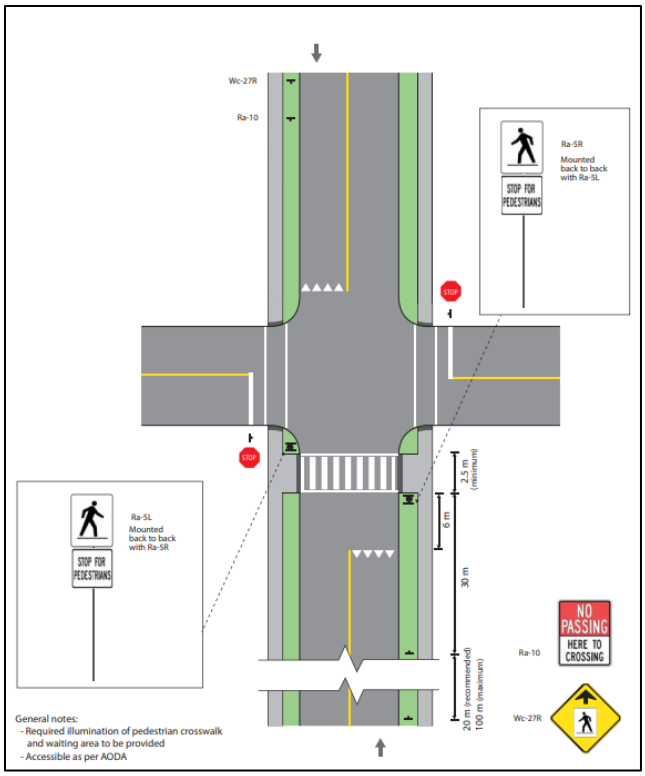


Figure 14: Example of Level 2 Type D Intersection PXO

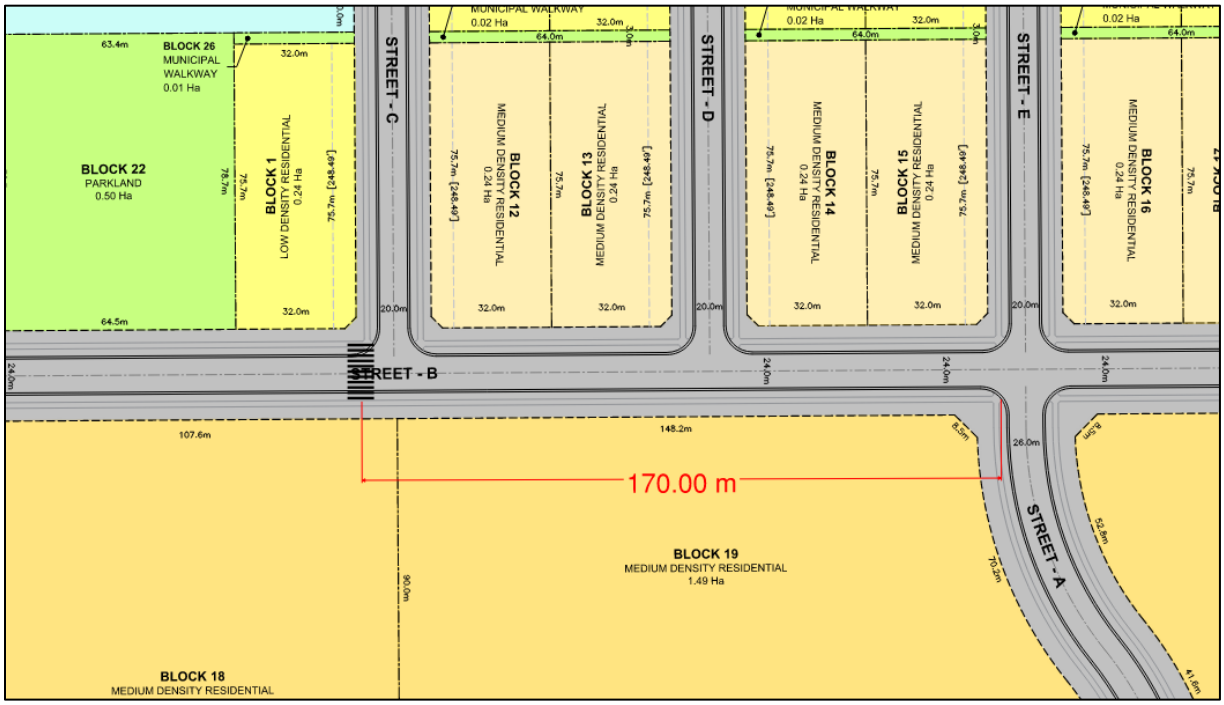


Figure 15: Potential PXO location

5.1 Traffic Calming

Given the straight and uninterrupted alignment of Street “B,” there is potential for vehicles to travel at higher-than-desired speeds through the development. This is particularly concerning given the proximity of residential uses, parkland, and expected pedestrian activity. To support a safe, walkable environment and discourage speeding, the following traffic calming measures are recommended:

- Blanket **posted speed limit of 40** km/h is proposed along Street “B” to reinforce a residential, low-speed character and improve safety for all users.
- **Curb extensions (bump-outs)** are recommended at the PXO on the west leg of the Street “B” and Street “C” intersection to reduce roadway width, reduce pedestrian crossing distances, and improve visibility for drivers and pedestrians at the crossing.
- **Park warning signage**, in accordance with the Ontario Traffic Manual (OTM), should be installed along Street “B” near parkland access points and pedestrian crossings to alert motorists to the presence of park users.
- The **all-way stop-controlled intersection at Street “A” and Street “B”** will serve as a natural traffic calming measure, to interrupt east-west traffic flows along Street “B” and encouraging lower speeds.

6 Summary of Finding and Recommendations

6.1 Summary of Findings

The following key findings were presented in this report:

- The proposed development is anticipated to consist of approximately 90 single family detached units, 78 single family attached units, 182 mid-rise multifamily units, 426 high-rise multifamily units, and 58,706 ft2 of commercial/office space.
- The development is anticipated to generate approximately 397 two-way trips during the AM peak hour (166 entering and 231 exiting) and 468 trips during the PM peak hour (240 entering and 228 exiting).
- The development is planned to include two initial vehicular access points upon build-out (a new north approach at the existing signalized intersection of Glendon Drive and Crestview Drive, and a full-movement private driveway for the Mixed-use Block on Glendon Drive, as well as other private driveways along the future municipal road network internal to the site), with ultimately future road connections to the east and west of the site as future developments surrounding the site are constructed.
- The results of the intersection capacity analysis shows:
    - The signalized intersection of Glendon Drive at Crestview Drive is currently not experiencing operational issues under existing conditions and is expected to maintain acceptable operations through to the 2035 horizon year with the planned road widening on Glendon Drive and new left-turn lanes supporting inbound and outbound traffic from the proposed development.
    - The potential future driveway for Block 20 on Glendon Drive is expected to operate well with no traffic operational issues under future total conditions.
- A **Level 2 Type D Pedestrian Crossover (PXO)** is recommended on the west leg of the intersection of Street “B” at Street “C” due to the anticipated pedestrian crossing demand between the residential and mixed-use blocks on the south side of Street “B” and the residential and parkland blocks on the north side. This PXO will represent one of two controlled crossing locations along Street “B”, with a more easterly crossing option available at the future all-way stop-controlled intersection of Street “A” at Street “B”. The Level 2 Type D PXO (roadside signage and painted crosswalk) is warranted based on the planned posted speed limit of 40 km/h, the two-lane cross-section of Street “B,” and the projected traffic volumes, in accordance with Ontario Traffic Manual (OTM) Book 15 guidelines.
- To provide enhanced traffic calming measures along Street “B”, given its generally straight and uninterrupted alignment, with anticipated pedestrian crossing activity, the following traffic calming measures have been proposed:

- Blanket posted 40 km/h speed limit within the community;
- Curb extensions at the PXO to reduce the pavement width and thus the crossing distance for pedestrians and improve visibility at the crossing;
- Park Warning signage along Street “B” per OTM guidelines; and
- All-way stop control at the intersection of Street “A” and Street “B” to interrupt east-west traffic flows along Street “B”.

6.2 Recommendations

Based on the findings of the traffic analysis, the following recommendations are provided to support safe and efficient transportation operations within and around the development site:

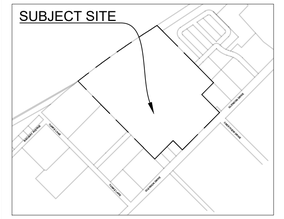
- Auxiliary left-turn lanes are recommended on the eastbound and southbound approaches at the signalized intersection of Glendon Drive and Crestview Drive.
- The intersection of Glendon Drive at Crestview Drive should be monitored by the County with signal timing optimizations implemented as necessary to accommodate changing traffic conditions and ensure continued operational efficiency as multiple developments in the area are built-out.
- A new full-movement driveway access is recommended on Glendon Drive to serve the mixed-use Block 20. This secondary access is not expected to result in any operational impact on the Glendon Drive corridor.
- A Level 2 Type D PXO is recommended on the west leg of the Street “B” at Street “C” intersection to accommodate north-south pedestrian crossing demand in the vicinity of the parkland and mixed-use blocks.
- Traffic calming measures—including curb extensions, a posted 40 km/h speed limit, Park Warning signage, and all-way stop control at the intersection of Street “A” at Street “B” be implemented and designed during detailed design of the road network when curb geometric are determined and pavement marking and signage plans prepared.

Appendices

Appendix A Draft Plan

DRAFT PLAN OF SUBDIVISION

CON 2 S PT LOT 7
10242 GLENDON DRIVE
KOMOKA, ONTARIO N0L 1R0



KEY PLAN – N.T.S.

OWNER'S CERTIFICATE

I hereby consent to the filing of this Plan in Draft Form.

Richard Sifton
President & CEO — Date

Phillip Masschelein
Senior Vice President
Neighbourhood Developments — Date

SURVEYOR'S CERTIFICATE

I hereby certify that the boundary of the lands to be subdivided as shown on this plan and their relationship to the adjacent lands are accurately and correctly shown.

O.L.S.
Surveyor — Date

REQUIREMENTS UNDER SECTION 51 (17) OF THE PLANNING ACT, 1990

a) as shown on plan
b) as shown on plan
c) as shown on key plan
d) as shown on land use schedule
e) as shown on plan
f) as shown on plan
g) as shown on plan
h) municipal water
i) clayey silt till
j) as shown on plan
k) municipal sewers
l) as shown on plan

LAND USE SCHEDULE

LAND USES	HECTARES	PERCENT
BLOCKS: 1 - 10 Low Density Residential	3.79	21.0
BLOCKS: 11 - 16 Medium Density Residential - Street Townhouses	1.75	9.7
BLOCKS: 17 & 18 Medium Density Residential	2.42	13.4
BLOCK: 19 Medium / High Density Residential	1.52	8.4
BLOCK: 20 Mixed Use Development	2.08	11.5
BLOCK: 21 - 23 Parkland	1.26	7.0
BLOCKS: 24 - 27 Municipal Walkways	0.07	0.4
BLOCKS: 28 & 29 Open Space	0.61	3.4
BLOCK: 30 Storm Water Management Pond	1.10	6.1
BLOCKS: 31 - 33 Future Development	0.06	0.4
BLOCKS: 34 - 36 0.3 Reserve	0.00	0.0
Proposed Roads and ROW	3.41	18.9
TOTAL SITE AREA	18.06	100

AREA CALCULATIONS:
Frontage (Low Density): 1,100.5 m / 3,610.5 feet ~ 90 Units
Frontage (Street Townhouses): 546.0 m / 1,791.3 feet ~ 78 Units
Medium & High Density Areas @ 75 Uph ~ 295 Units
Mixed Use Density Areas @ 150 Uph ~ 312 Units

- LOW DENSITY
- MEDIUM DENSITY
- STREET TOWNHOUSES
- HIGH DENSITY
- COMMERCIAL
- OFFICE / MIXED USE
- INSTITUTIONAL
- INDUSTRIAL
- OPEN & GREEN SPACES
- NATURAL HERITAGE
- STORM WATER POND
- FUTURE DEVELOPMENT
- ROADS & ROW

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1: 1,000
0 20 40 60 80m

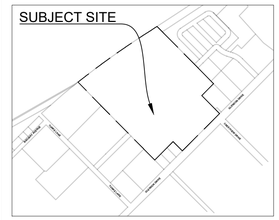
DRAFT PLAN OF SUBDIVISION
10242 GLENDON DRIVE
KOMOKA, ONTARIO, N0L1R0

DESIGNED BY:	APPROVED BY:	DATE:
AL	NO	May 2, 2025

DRAFT PLAN OF SUBDIVISION

CON 2 S PT LOT 7
10242 GLENDON DRIVE
KOMOKA, ONTARIO N0L 1R0

SUBJECT SITE



KEY PLAN – N.T.S.

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President & CEO — Date

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O.L.S.
Surveyor — Date

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b) as shown on plan
c) as shown on key plan
d) as shown on land use schedule
e) as shown on plan
f) as shown on plan
g) as shown on plan
h) municipal water
i) clayey silt till
j) as shown on plan
k) municipal sewers
l) as shown on plan

LAND USE SCHEDULE

LAND USES	HECTARES	PERCENT
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BLOCKS: 11 - 16 Medium Density Residential - Street Townhouses	1.75	9.7
BLOCKS: 17 & 18 Medium Density Residential	2.42	13.4
BLOCK: 19 Medium / High Density Residential	1.52	8.4
BLOCK: 20 Mixed Use Development	2.08	11.5
BLOCK: 21 - 23 Parkland	1.26	7.0
BLOCKS: 24 - 27 Municipal Walkways	0.07	0.4
BLOCKS: 28 & 29 Open Space	0.61	3.4
BLOCK: 30 Storm Water Management Pond	1.10	6.1
BLOCKS: 31 - 33 Future Development	0.06	0.4
BLOCKS: 34 - 36 0.3 Reserve	0.00	0.0
Proposed Roads and ROW	3.41	18.9
TOTAL SITE AREA	18.06	100

AREA CALCULATIONS:
Frontage (Low Density): 1,100.5 m / 3,610.5 feet ~ 90 Units
Frontage (Street Townhouses): 546.0 m / 1,791.3 feet ~ 78 Units
Medium & High Density Areas @ 75 Uph ~ 295 Units
Mixed Use Density Areas @ 150 Uph ~ 312 Units

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1: 1,000
0 20 40 60 80m

DRAFT PLAN OF SUBDIVISION
10242 GLENDON DRIVE
KOMOKA, ONTARIO, N0L1R0

DESIGNED BY:	APPROVED BY:	DATE:
AL	NO	May 2, 2025

GLENDON DRIVE

GLENDON DRIVE

Appendix B Traffic Data

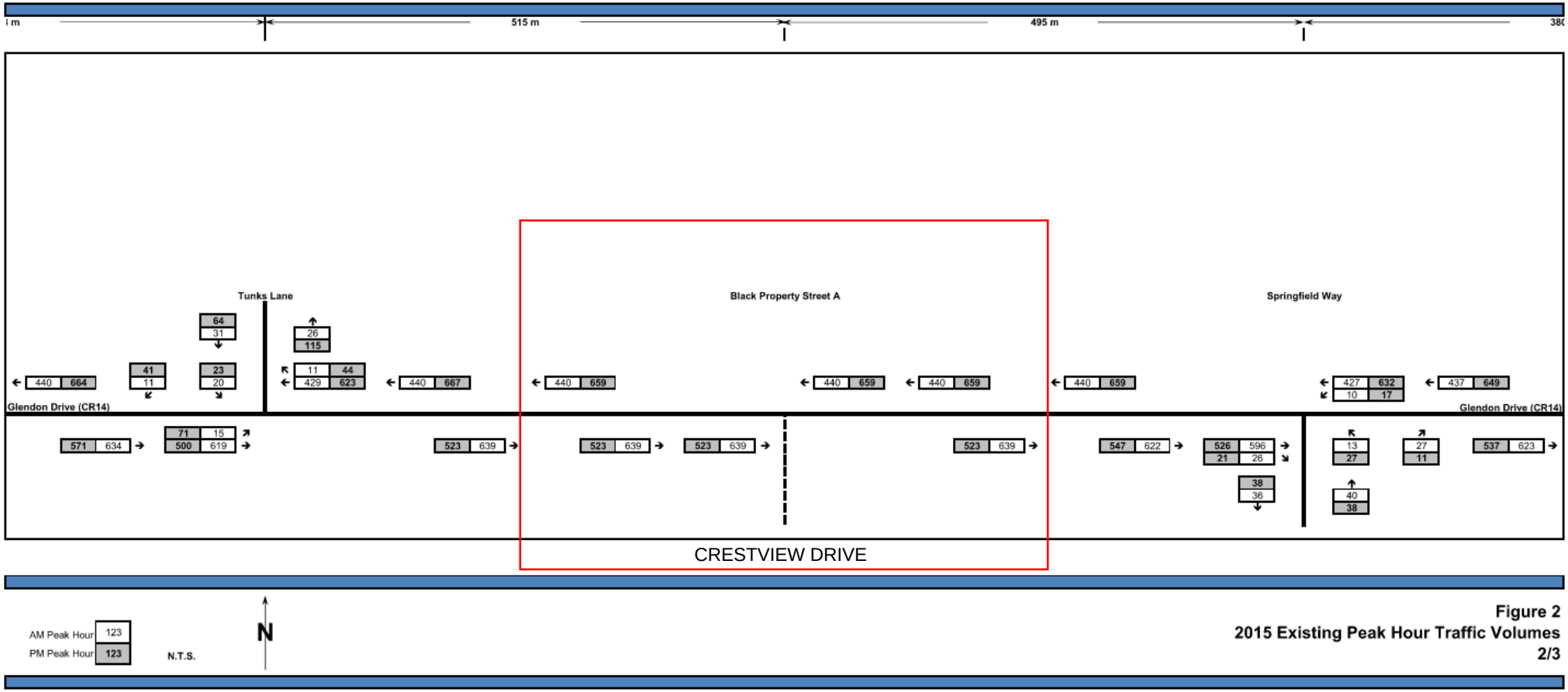
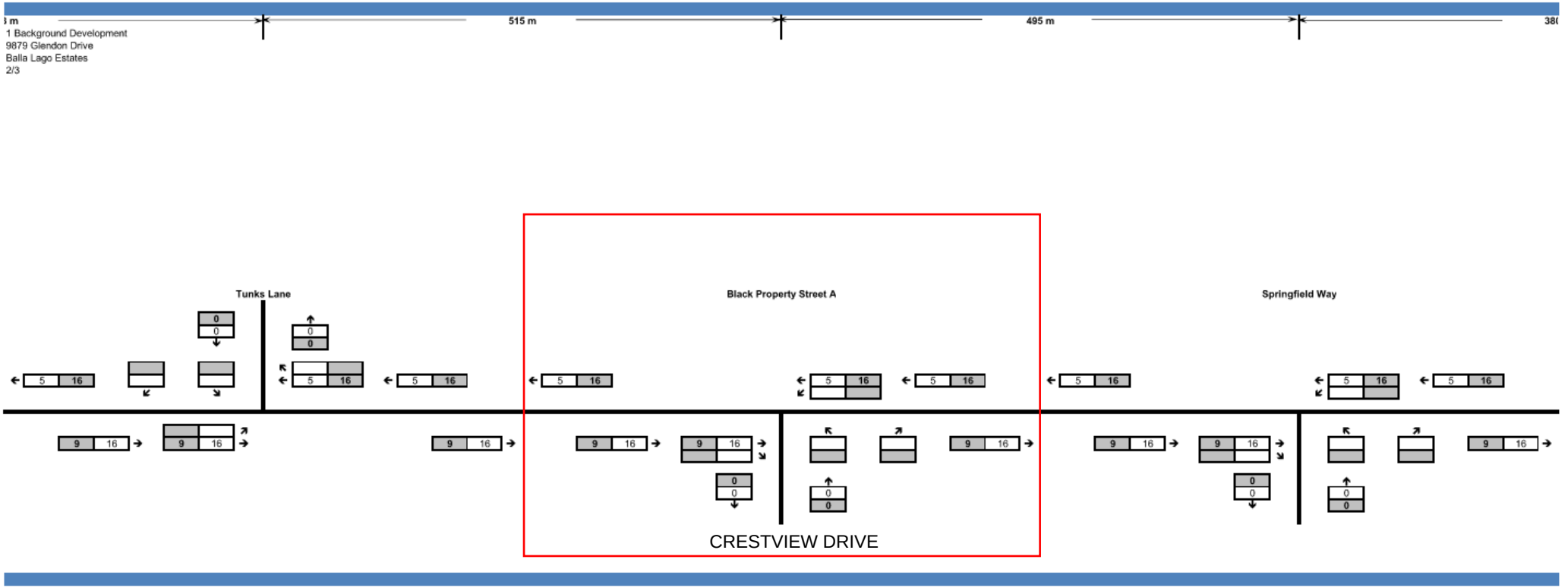
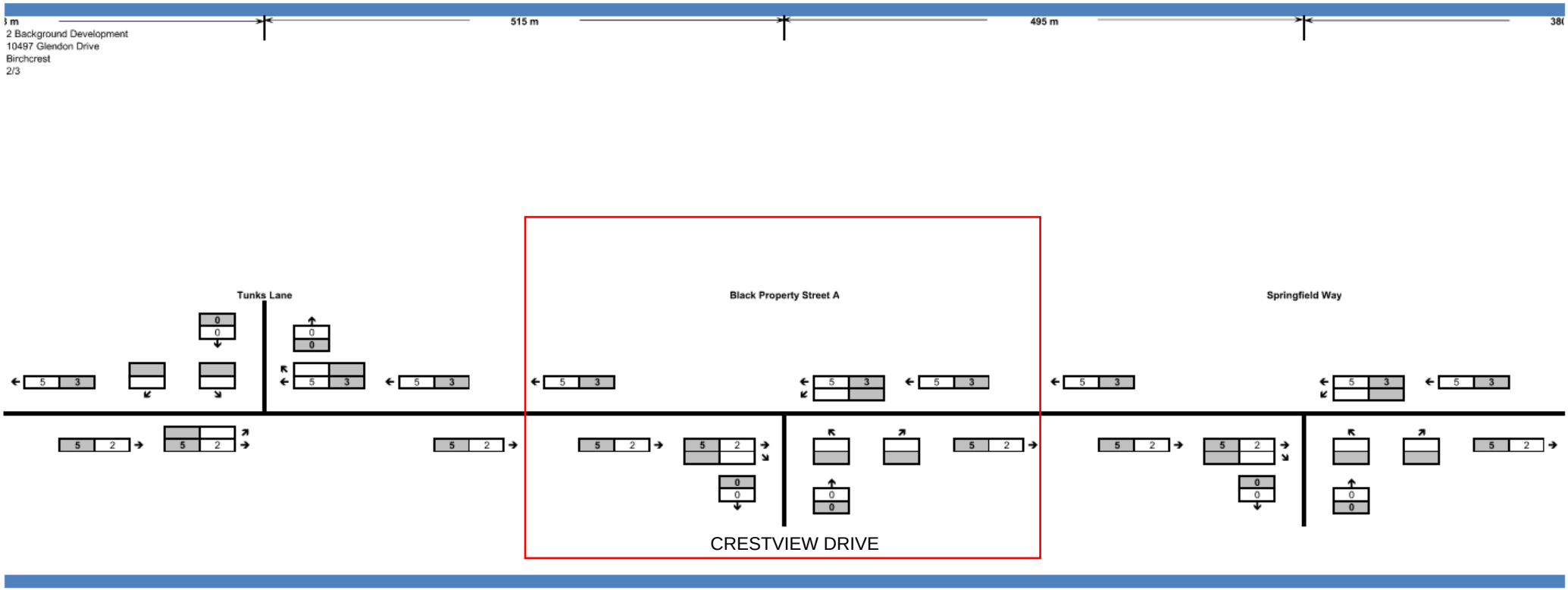


Figure 2
2015 Existing Peak Hour Traffic Volumes
2/3


m
515 m
495 m
38(
1 Background Development
9879 Glendon Drive
Balla Lago Estates
2/3
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


m
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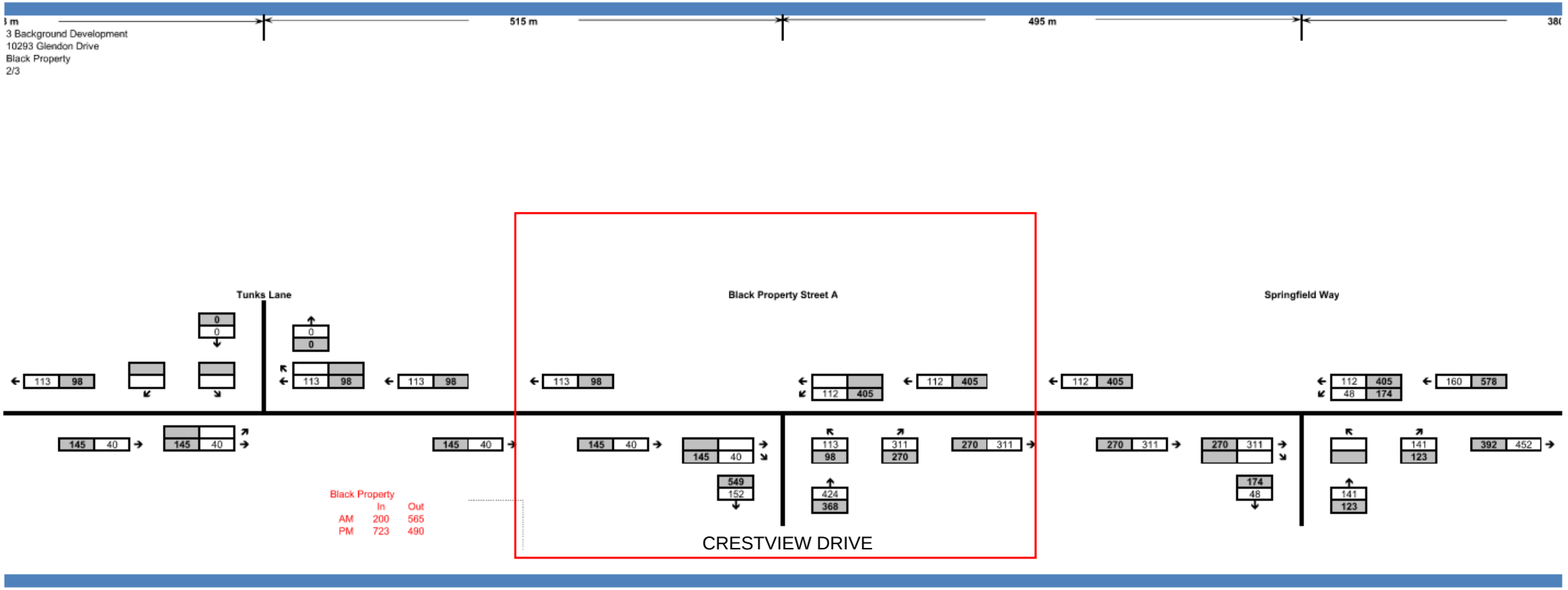
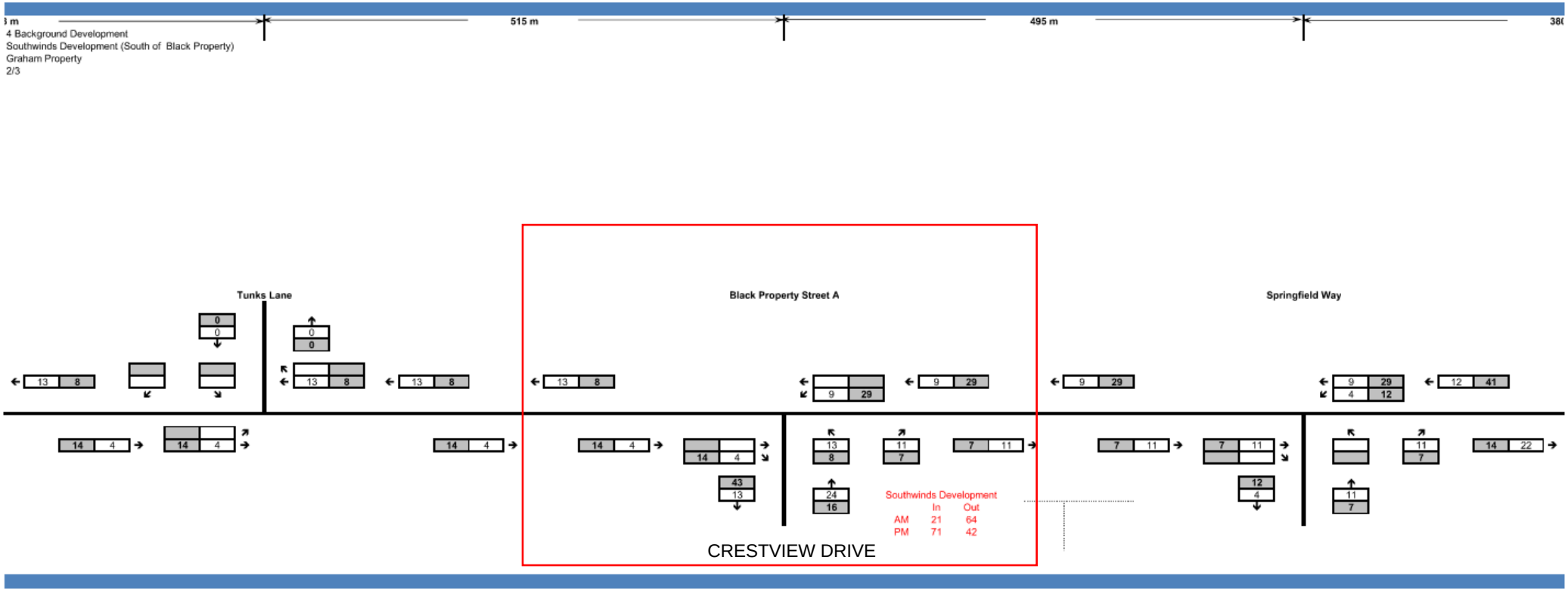
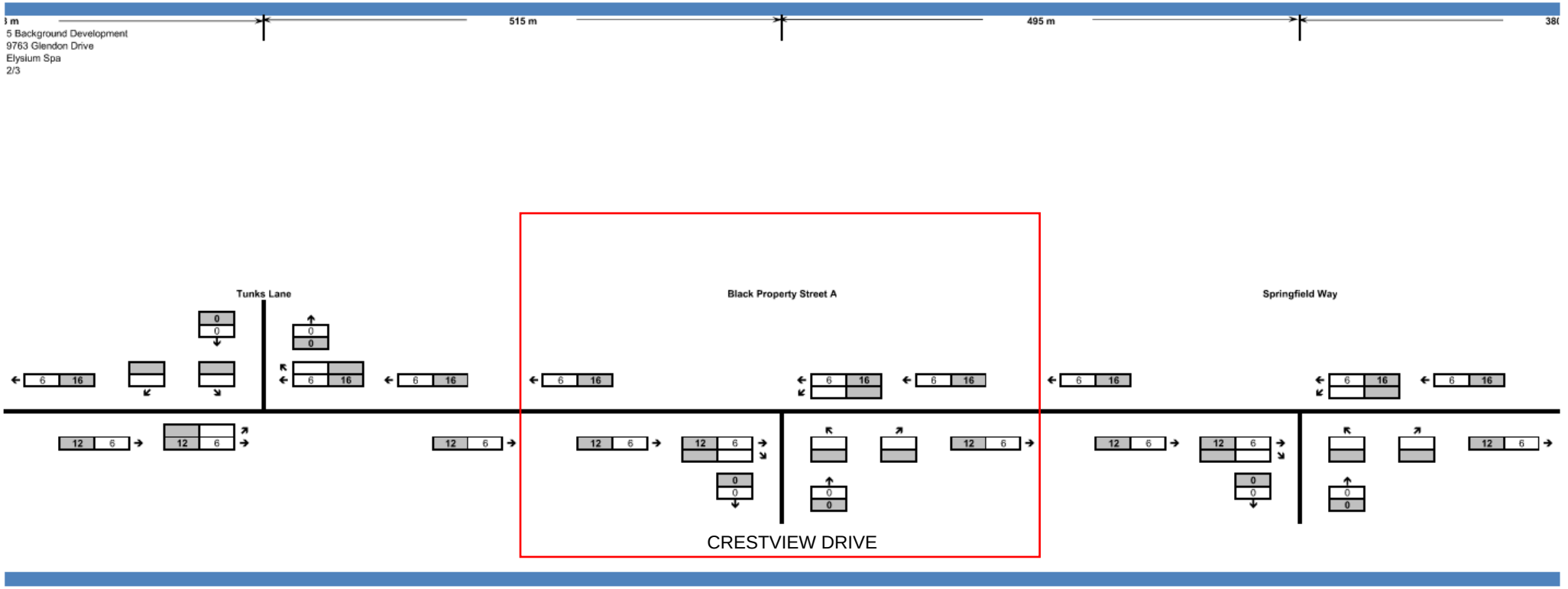
495 m
38(
2 Background Development
10497 Glendon Drive
Birchcrest
2/3
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


3 m
515 m
495 m
3 Background Development
10293 Glendon Drive
Black Property
2/3
Tunks Lane
Black Property Street A
Springfield Way
Black Property
In Out
AM 200 565
PM 723 490
CRESTVIEW DRIVE


m
515 m
495 m
380
4 Background Development
Southwinds Development (South of Black Property)
Graham Property
2/3
Tunks Lane
Black Property Street A
Springfield Way
Southwinds Development
In Out
AM 21 64
PM 71 42
CRESTVIEW DRIVE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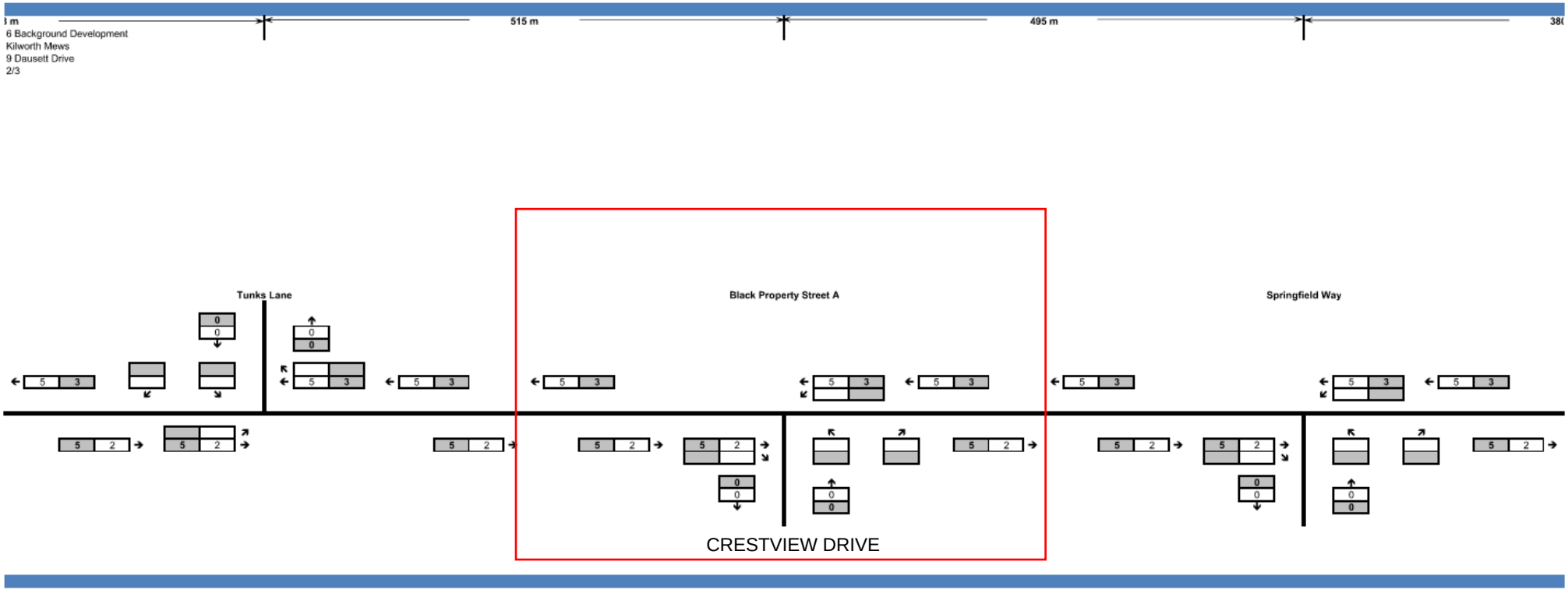
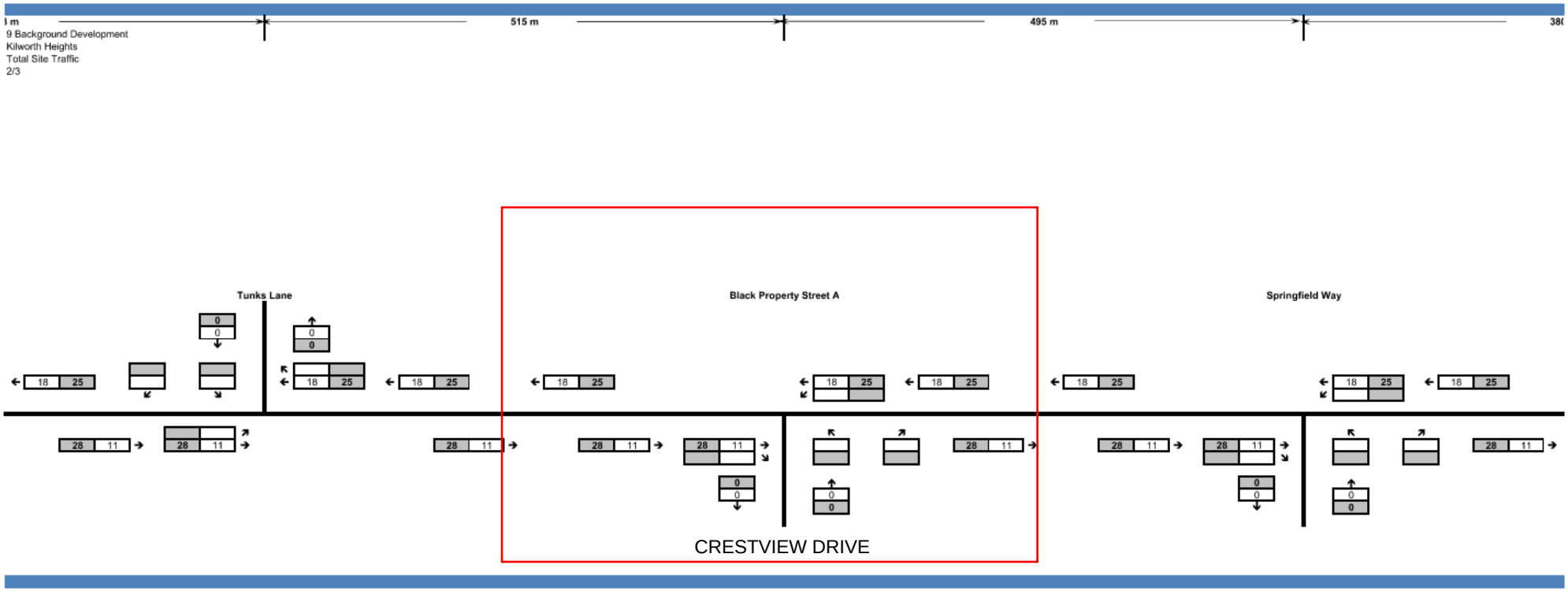
380
5 Background Development
9763 Glendon Drive
Elysium Spa
2/3
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


m
515 m
495 m
380
6 Background Development
Kilworth Mews
9 Dausett Drive
2/3
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


m
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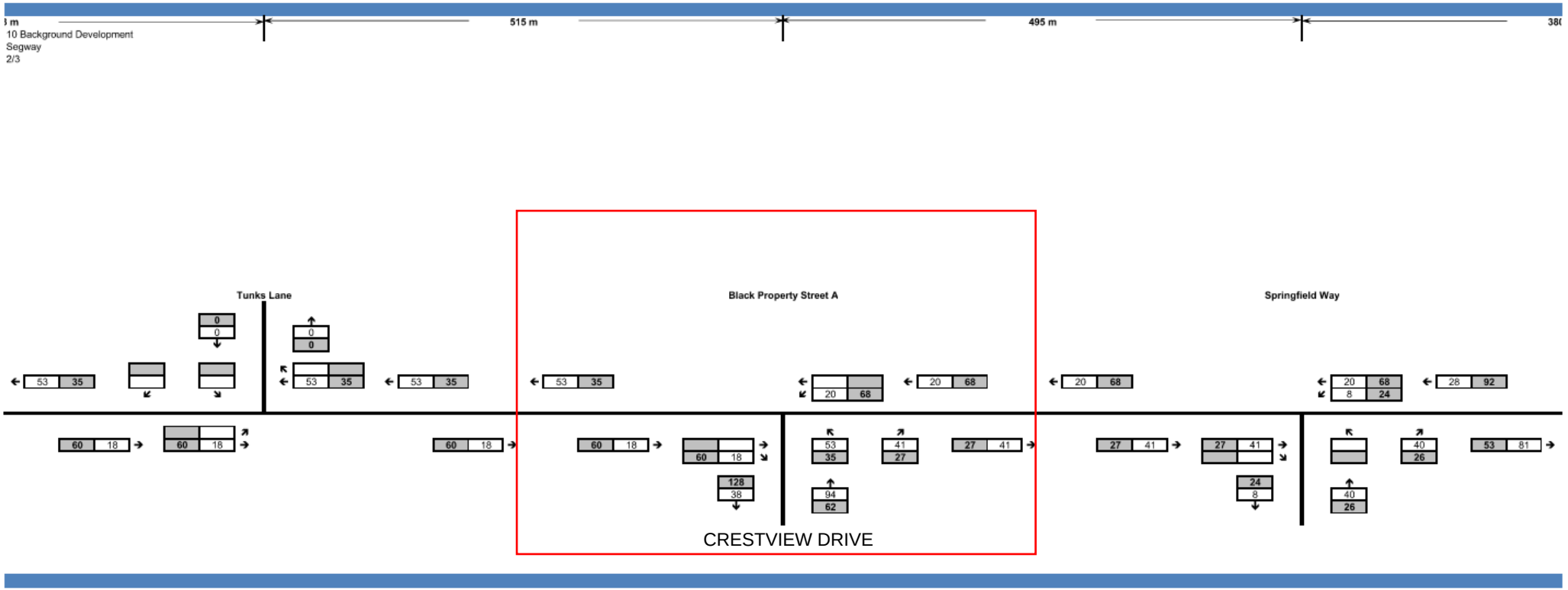
495 m
380
9 Background Development
Kilworth Heights
Total Site Traffic
2/3
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


m
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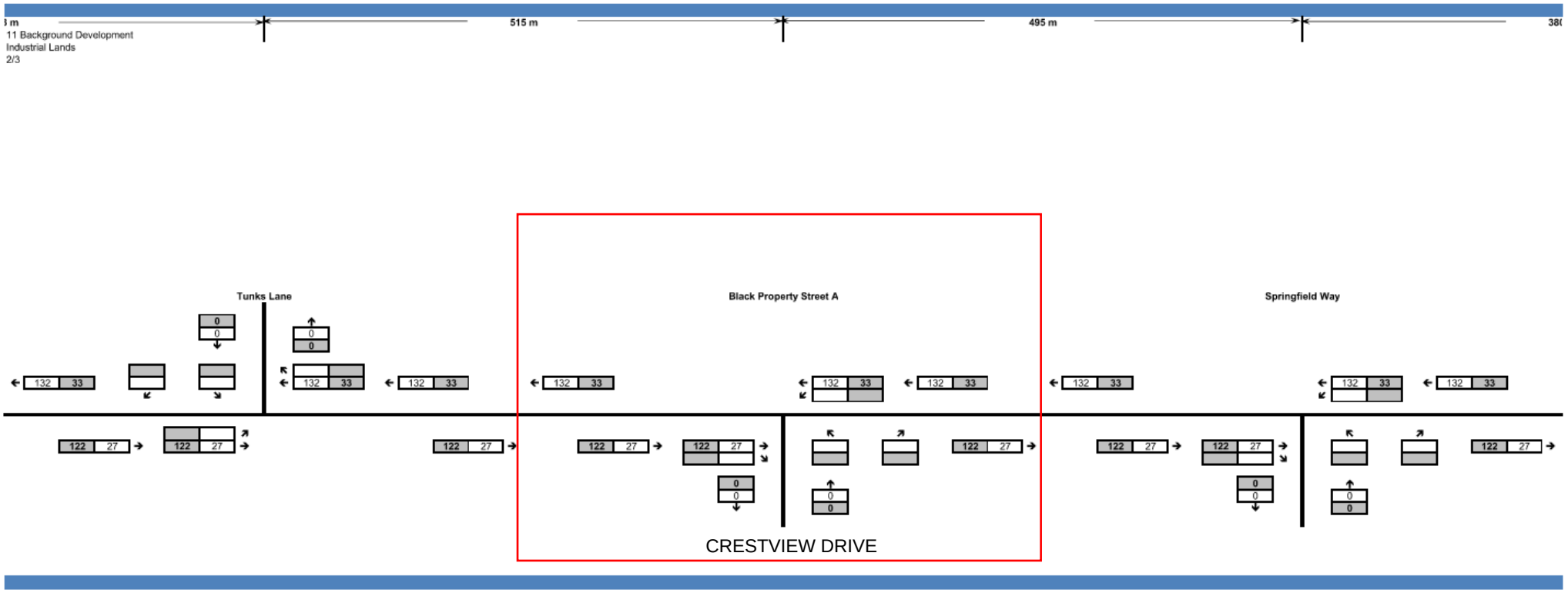
Segway
2/3
515 m
495 m
380
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE


m
11 Background Development
Industrial Lands
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495 m
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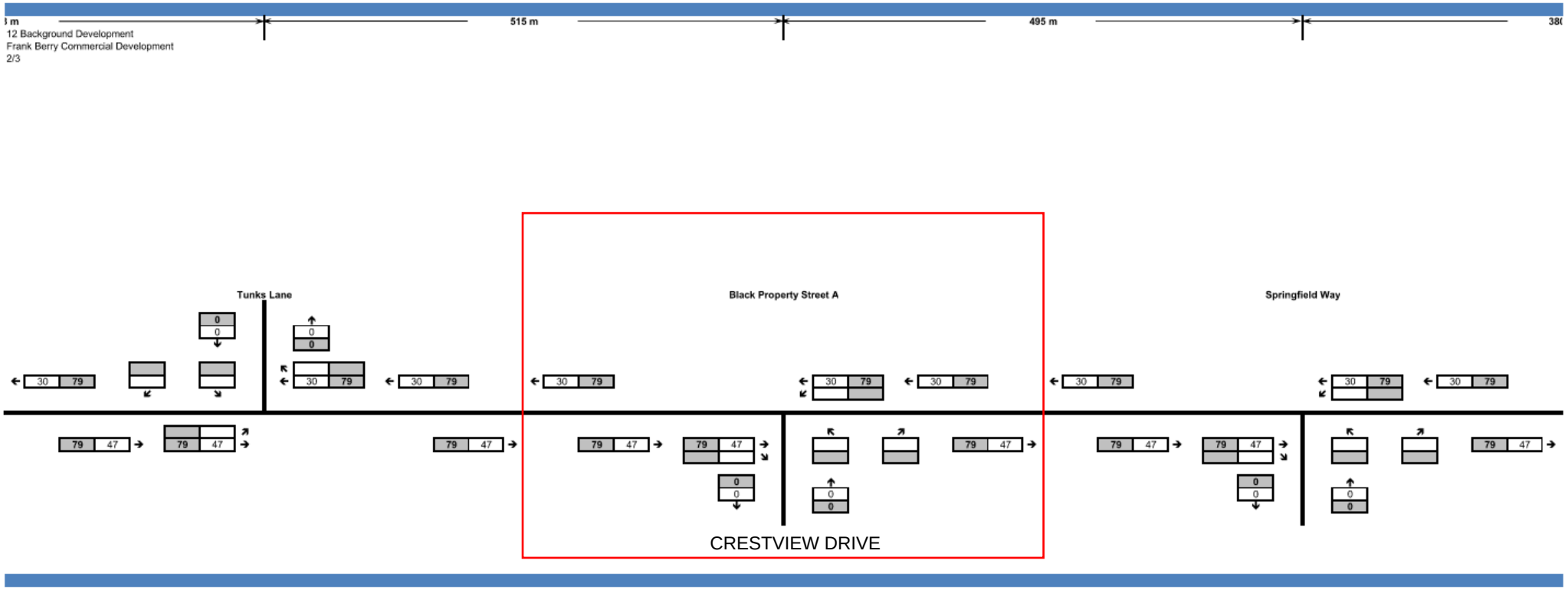
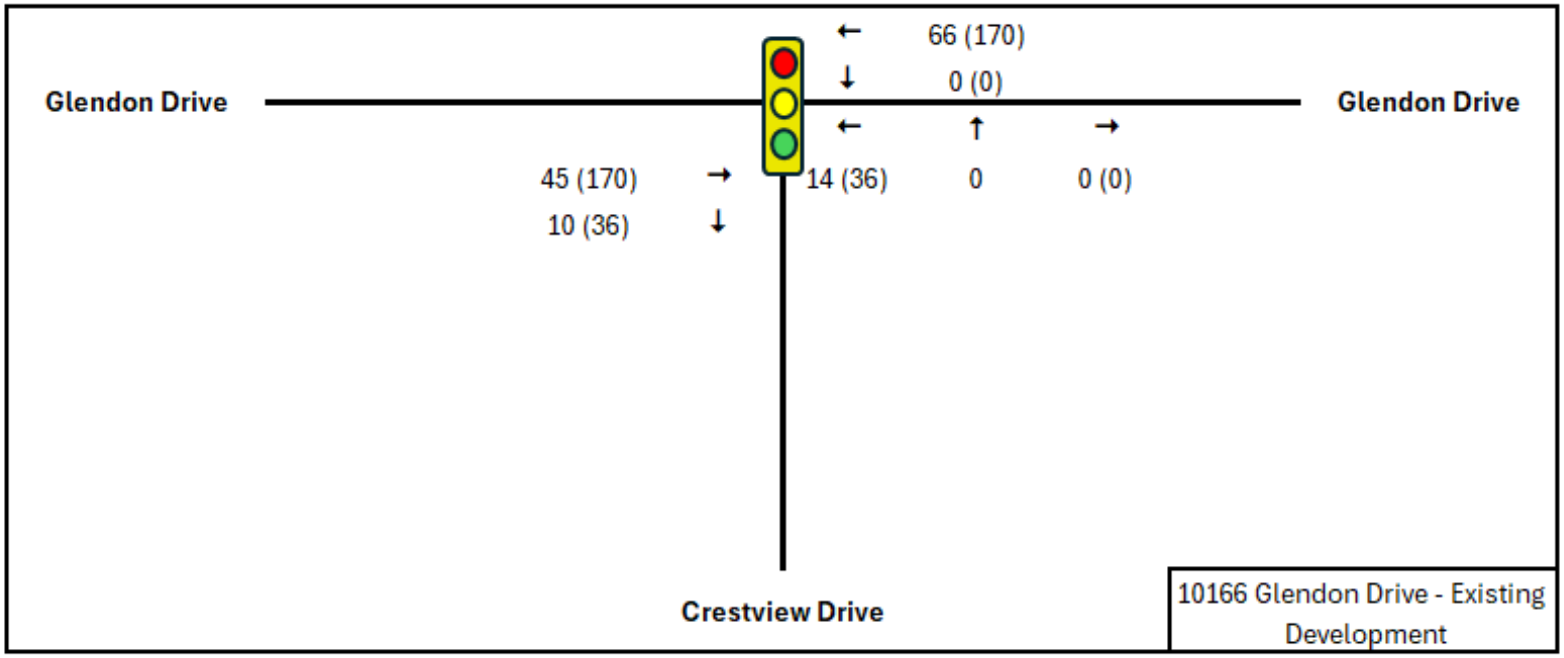
Tunks Lane
Black Property Street A
Springfield Way
CRESTVIEW DRIVE

12 Background Development
Frank Berry Commercial Development
2/3




Glendon Drive
Glendon Drive
66 (170)
0 (0)
45 (170)
10 (36)
14 (36)
0
0 (0)
Crestview Drive
10166 Glendon Drive - Existing Development

Appendix C Trip Generation Rates

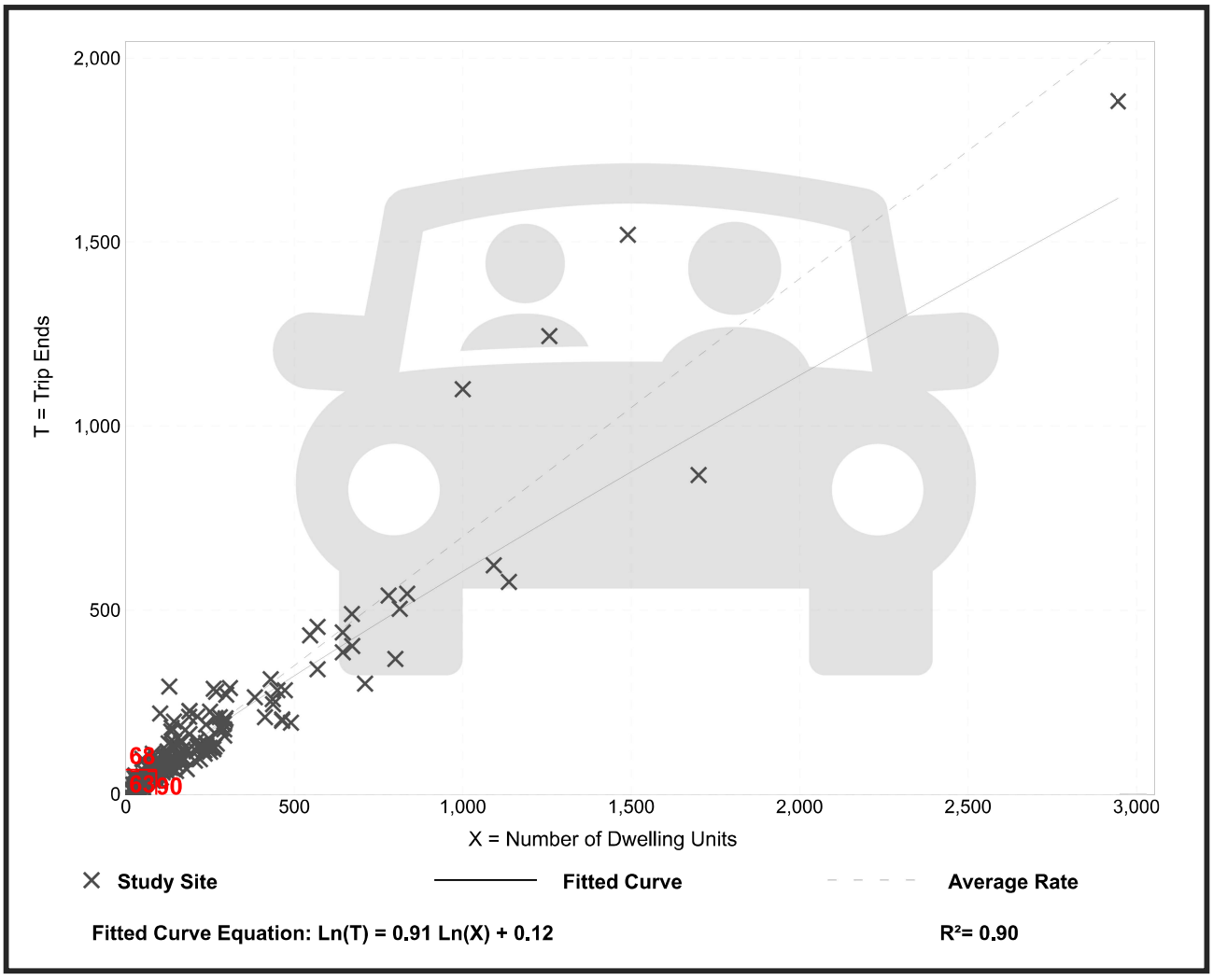
Single-Family Detached Housing
(210)

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: 192
Avg. Num. of Dwelling Units: 226
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.70	0.27 - 2.27	0.24

Data Plot and Equation



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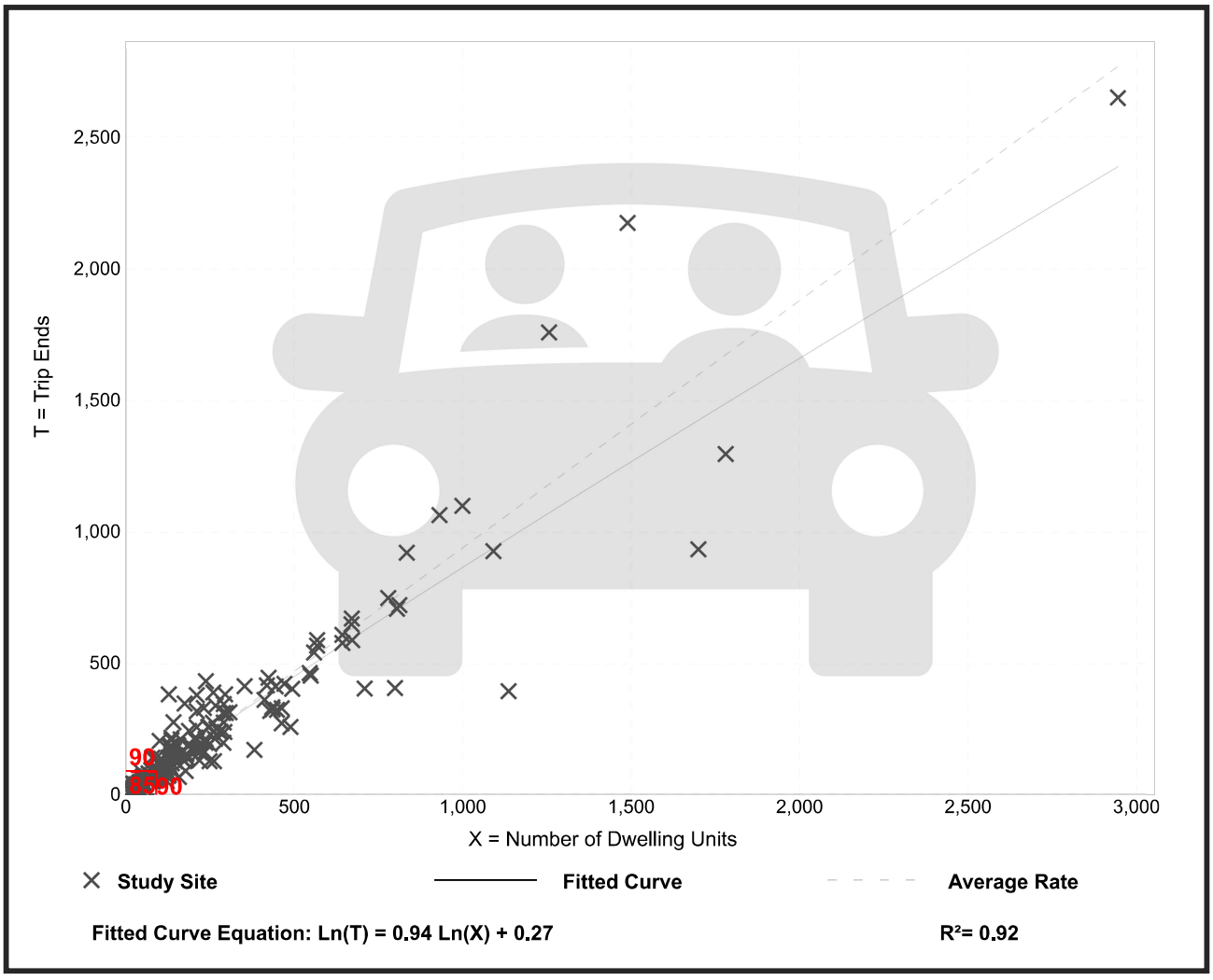
Single-Family Detached Housing
(210)

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:	208
Avg. Num. of Dwelling Units:	248
Directional Distribution:	63% entering, 37% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.94	0.35 - 2.98	0.31

Data Plot and Equation



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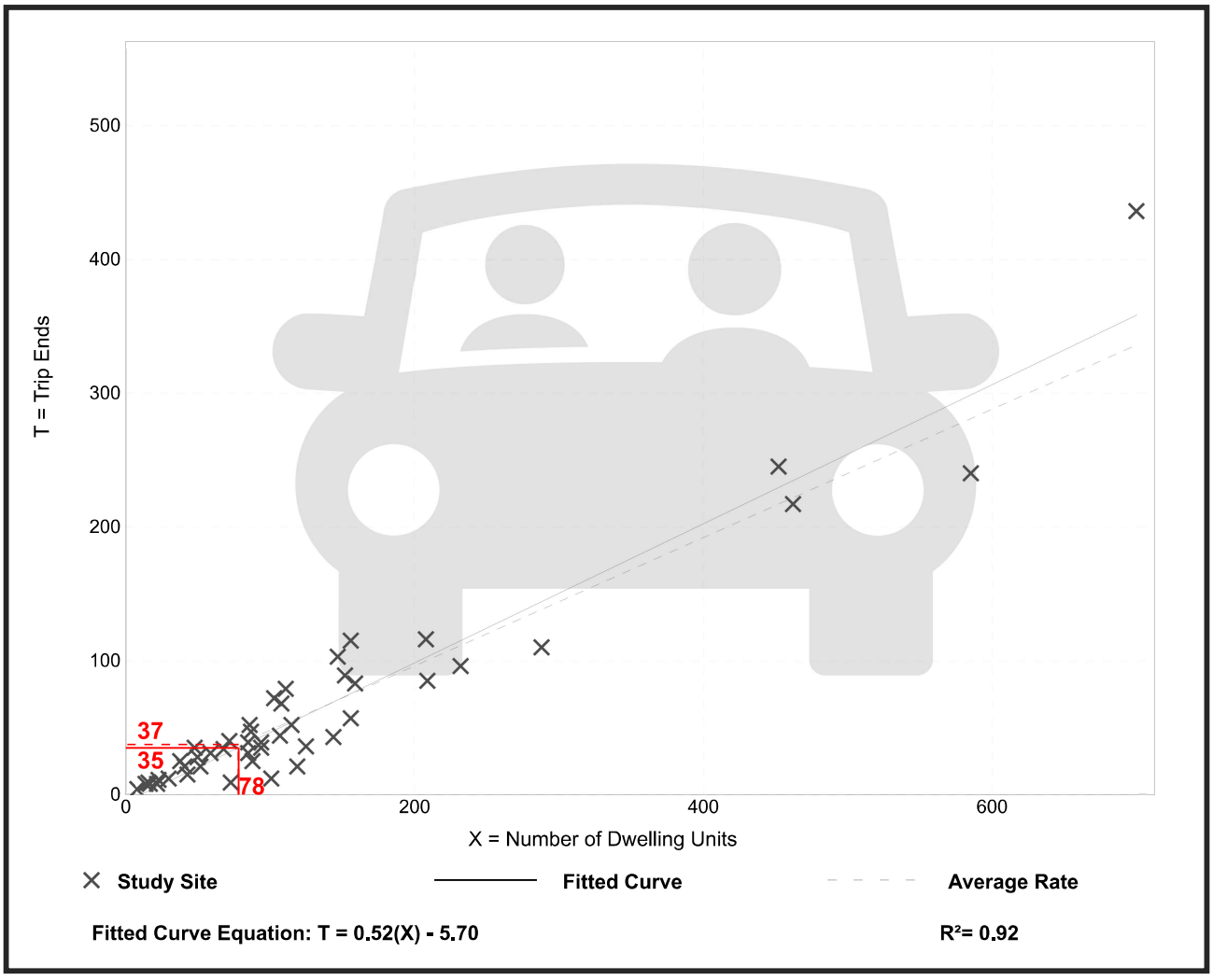
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 46
Avg. Num. of Dwelling Units: 135
Directional Distribution: 25% entering, 75% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.48	0.12 - 0.74	0.14

Data Plot and Equation



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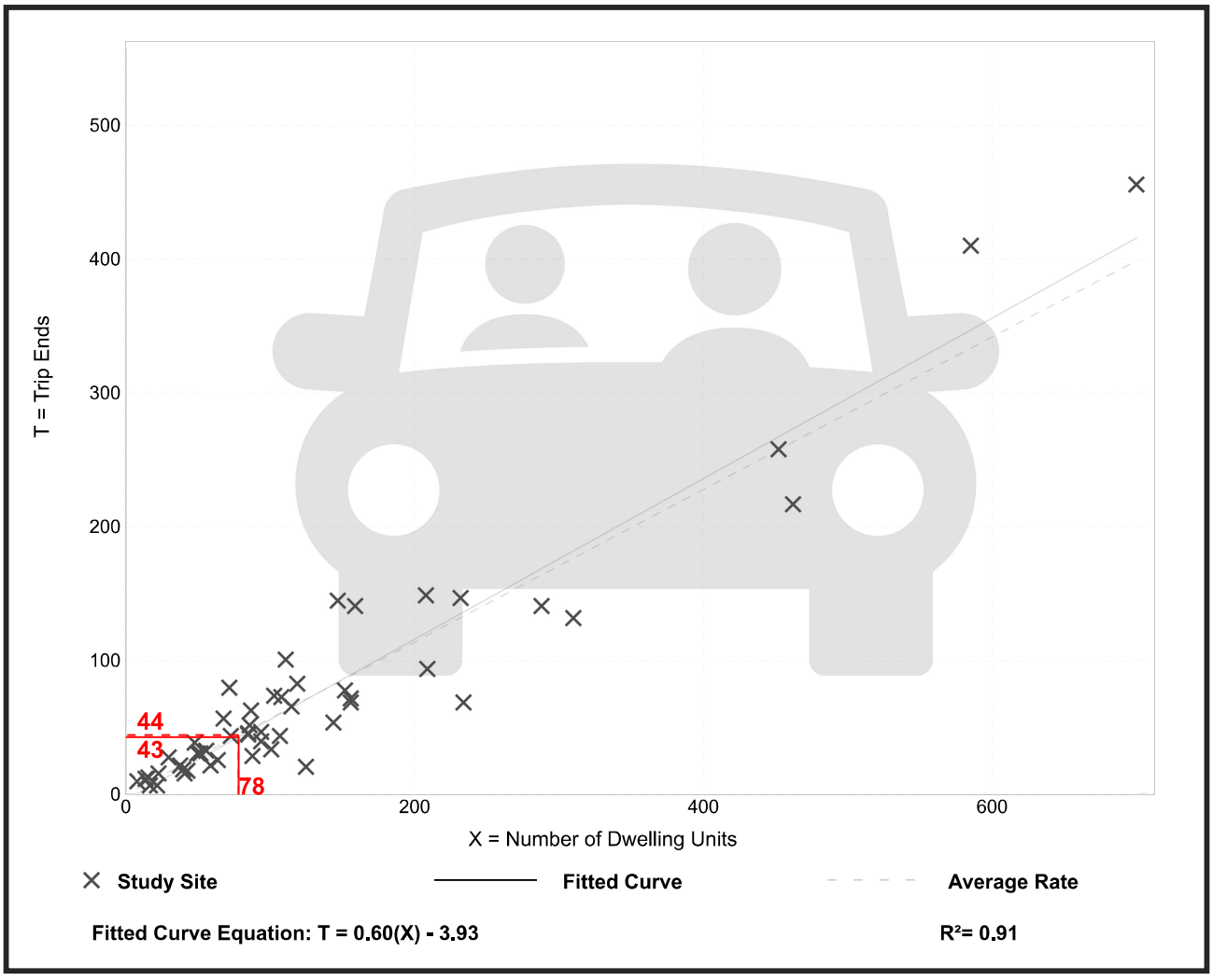
Single-Family Attached Housing
(215)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 51
Avg. Num. of Dwelling Units: 136
Directional Distribution: 59% entering, 41% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.57	0.17 - 1.25	0.18

Data Plot and Equation



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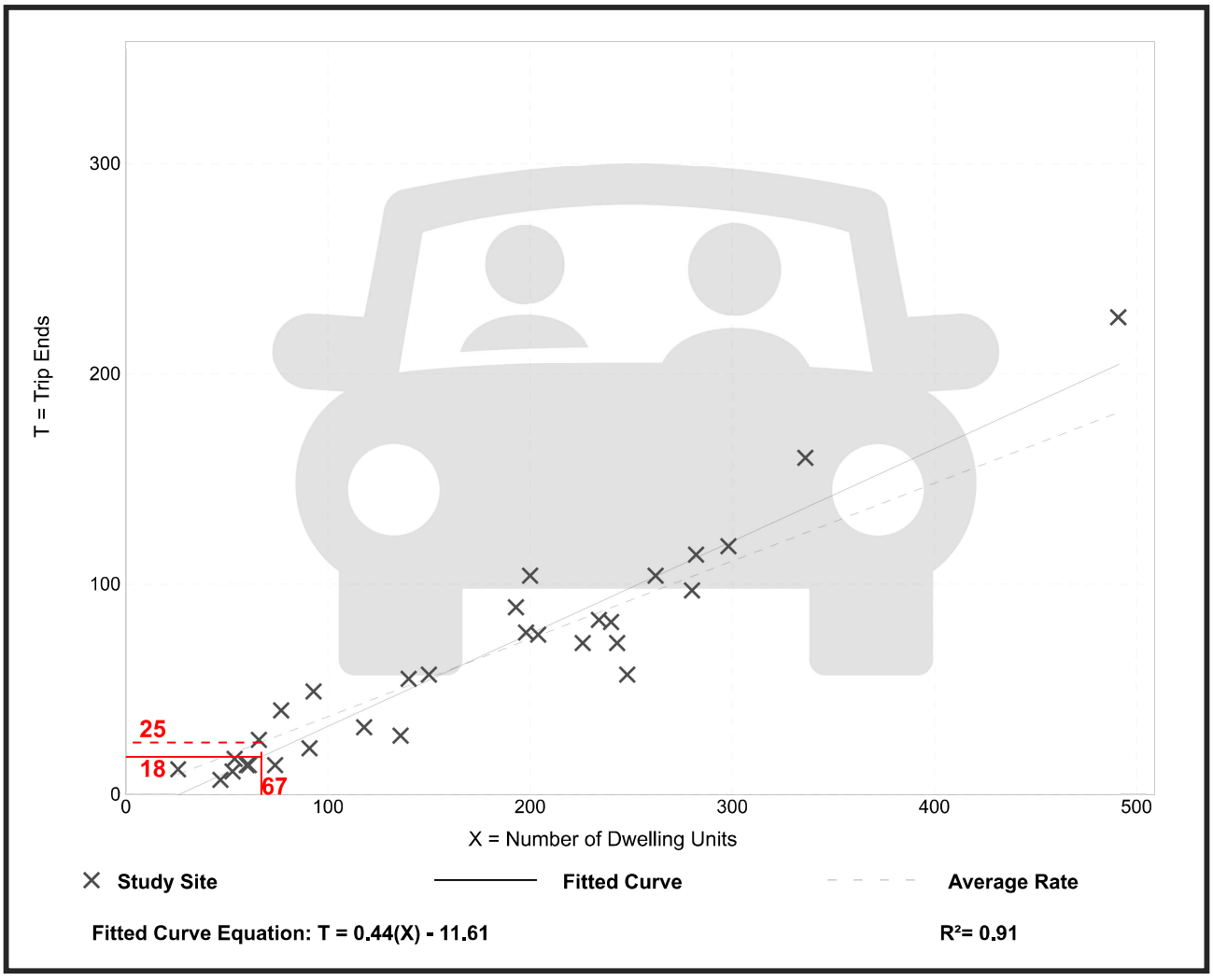
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



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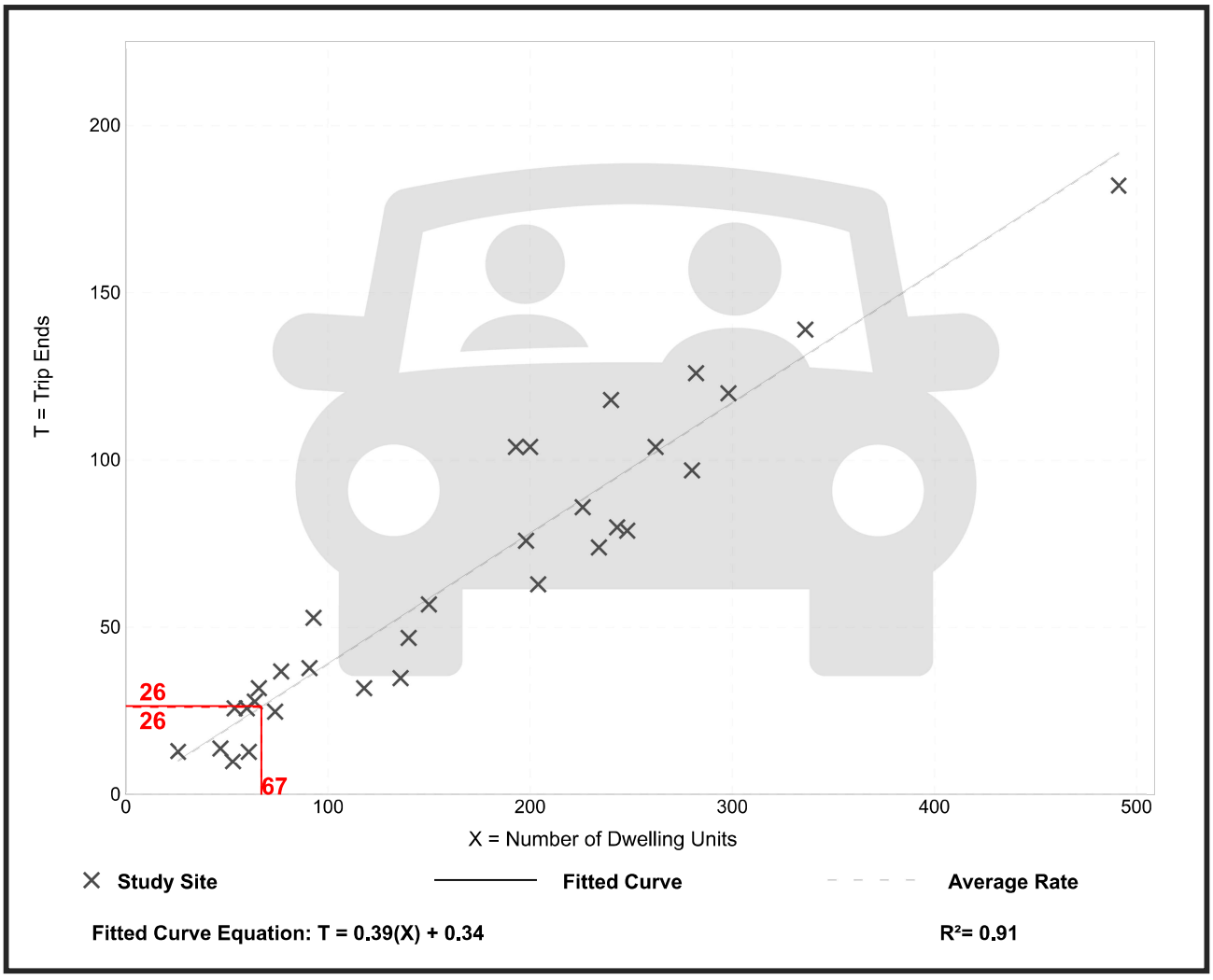
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



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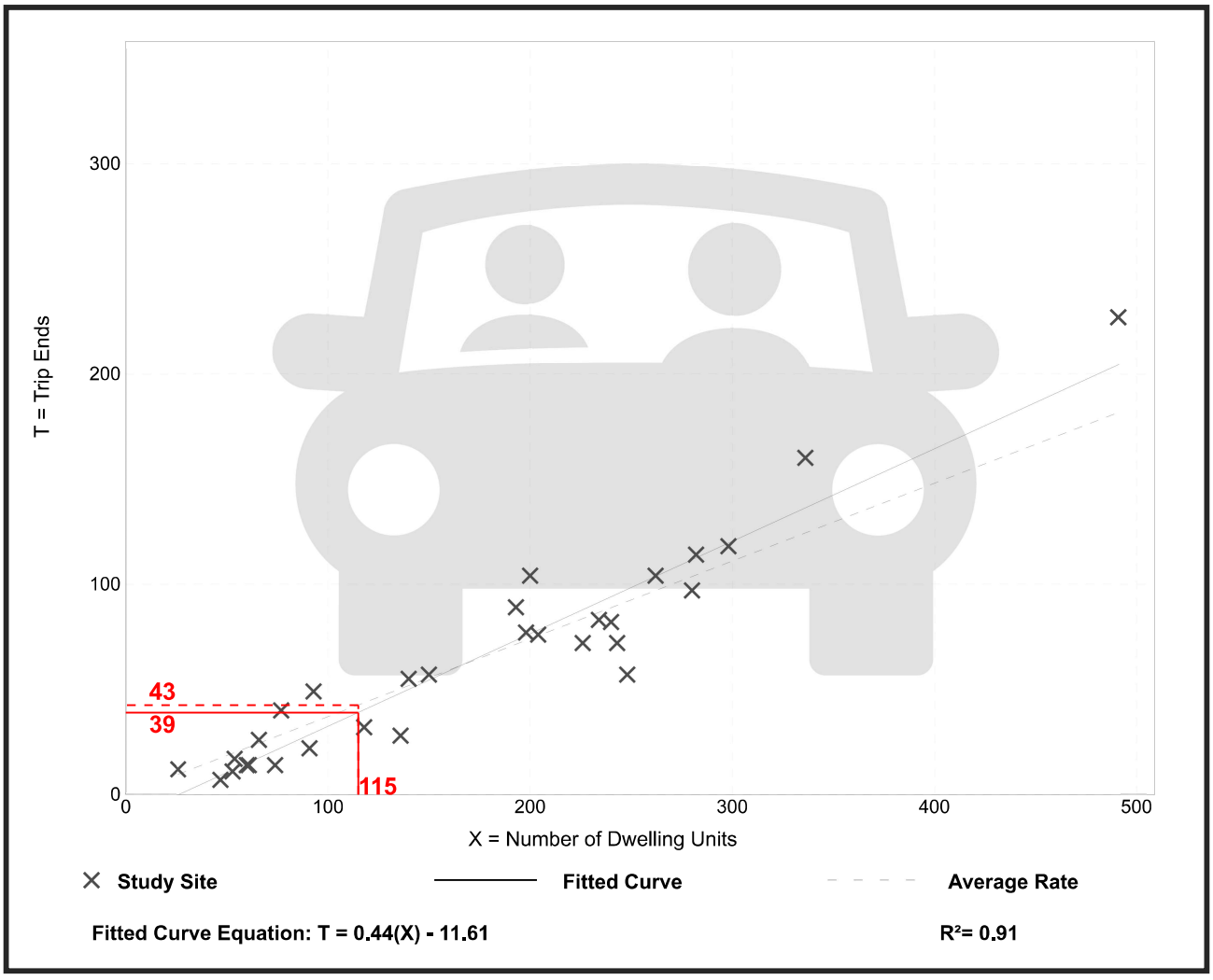
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 30
Avg. Num. of Dwelling Units: 173
Directional Distribution: 23% entering, 77% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



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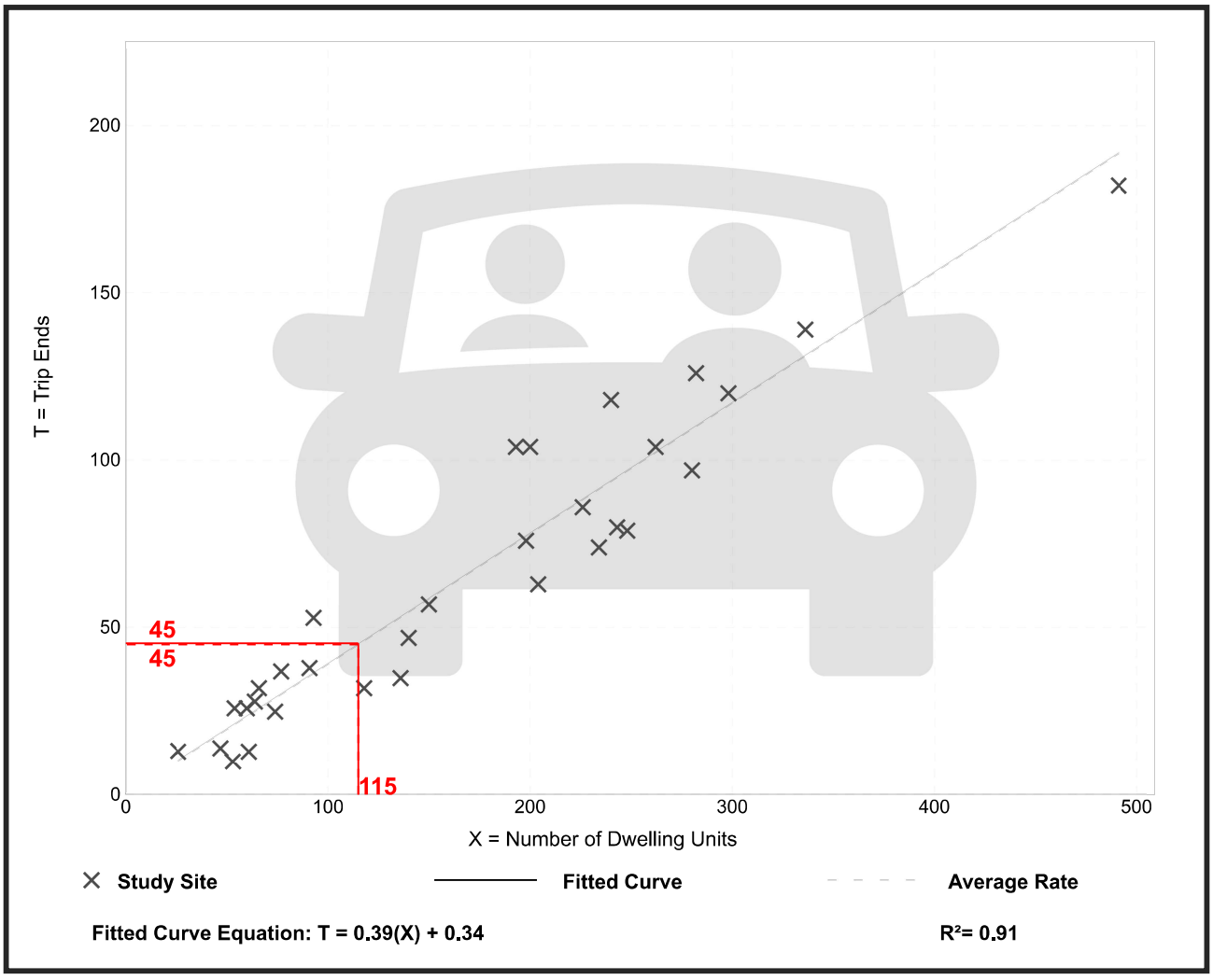
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

Vehicle Trip Ends vs: **Dwelling Units**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 31
Avg. Num. of Dwelling Units: 169
Directional Distribution: 61% entering, 39% exiting

Vehicle Trip Generation per Dwelling Unit

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

Data Plot and Equation



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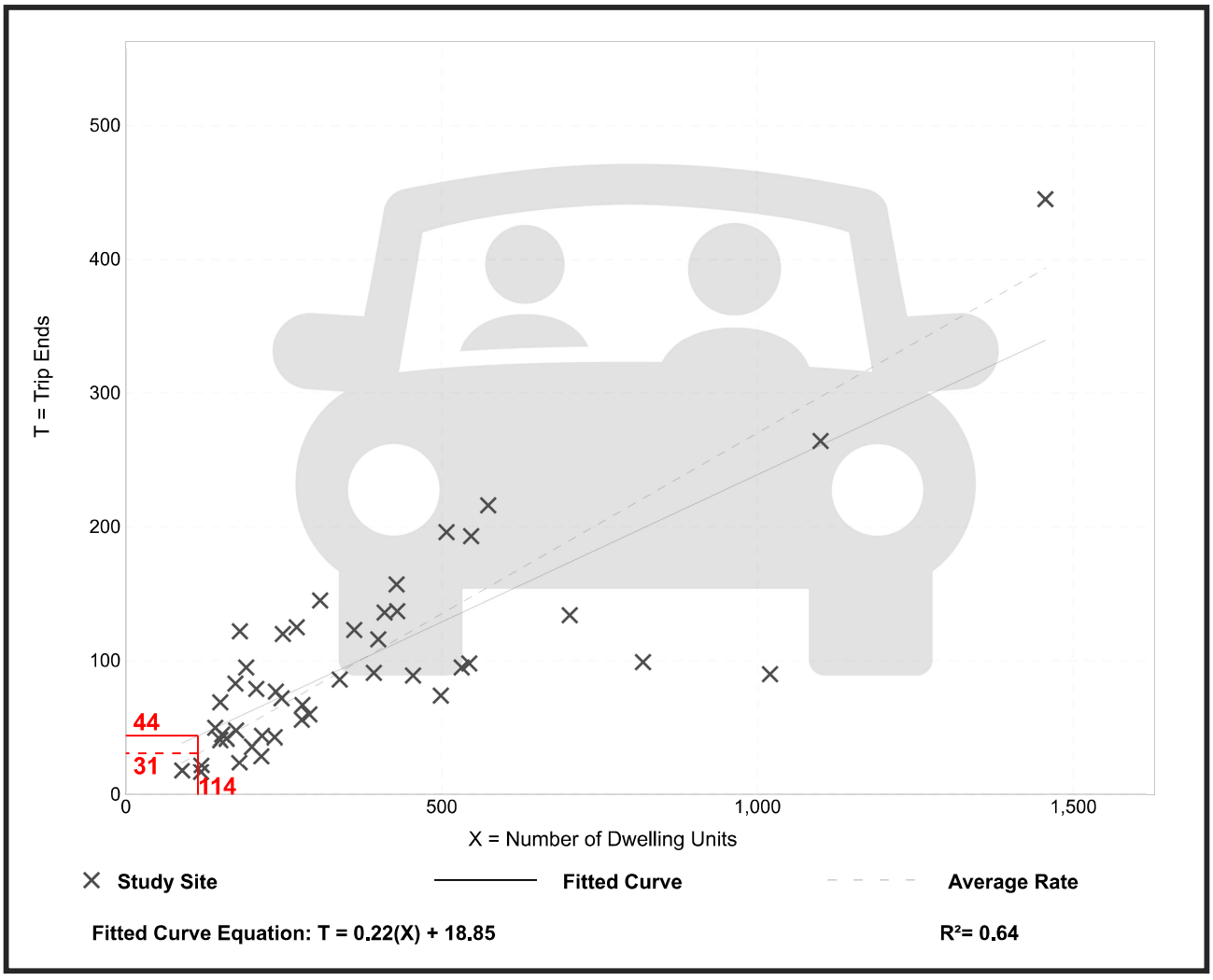
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.27	0.09 - 0.67	0.11

Data Plot and Equation



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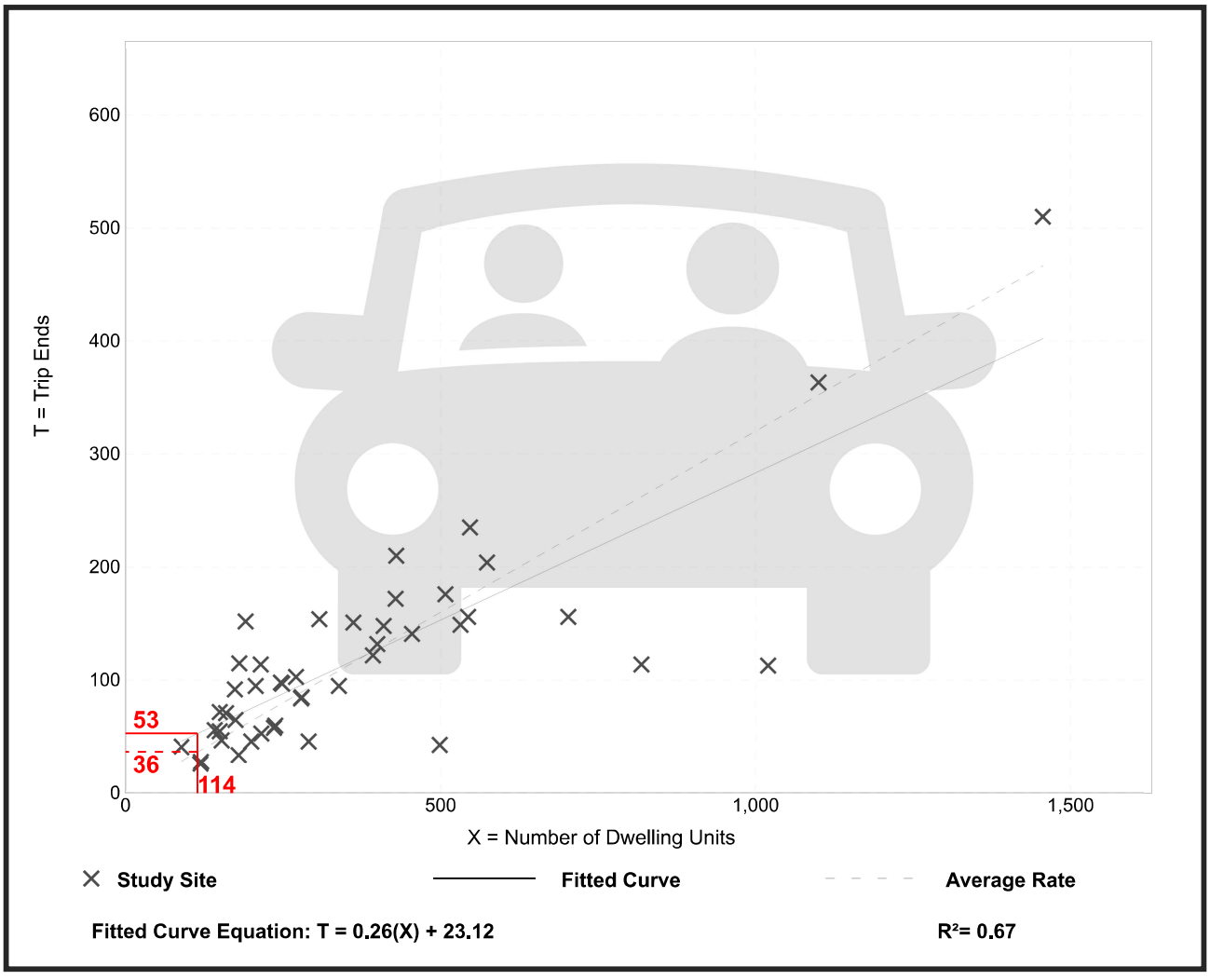
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.09 - 0.80	0.13

Data Plot and Equation



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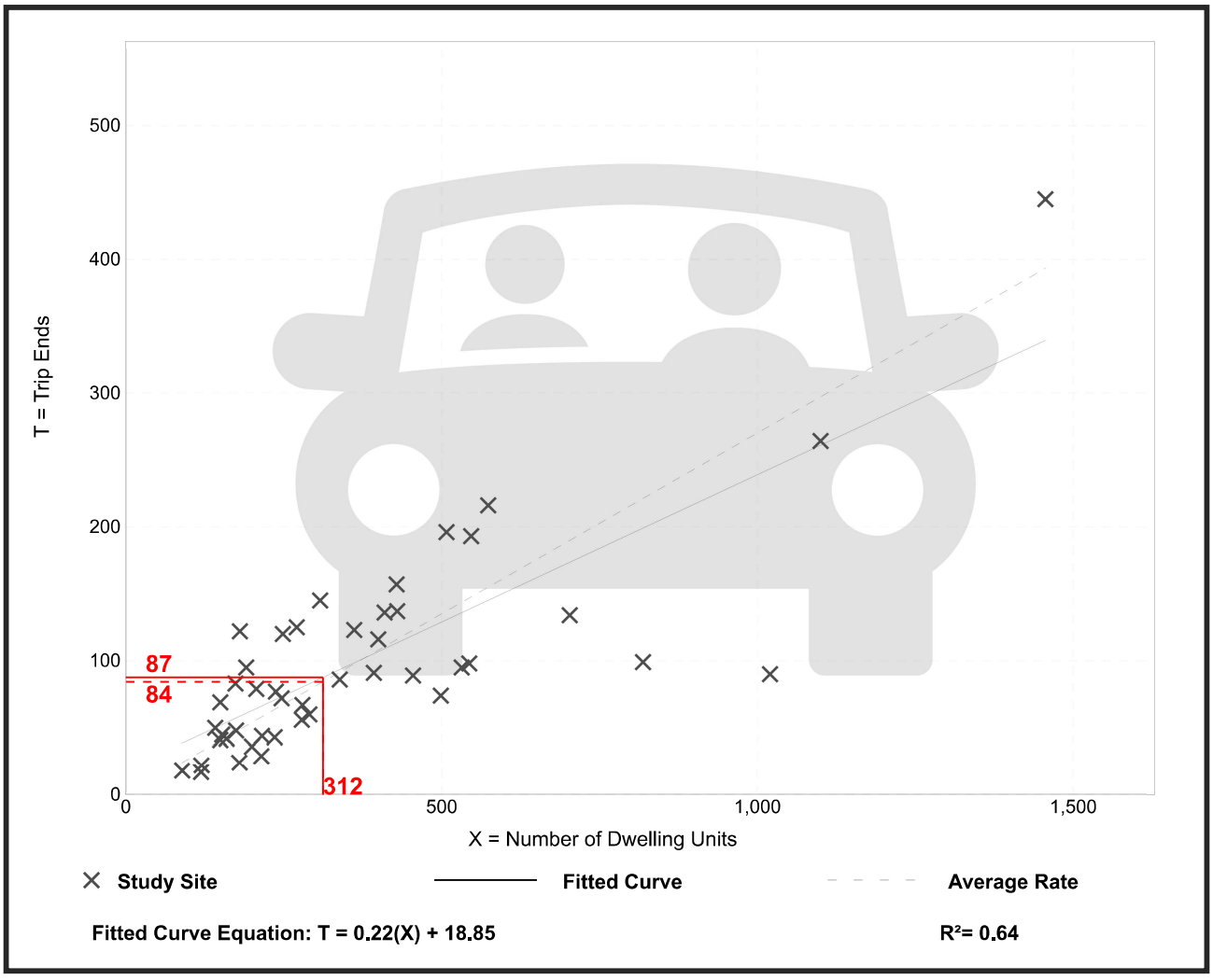
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 26% entering, 74% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.27	0.09 - 0.67	0.11

Data Plot and Equation



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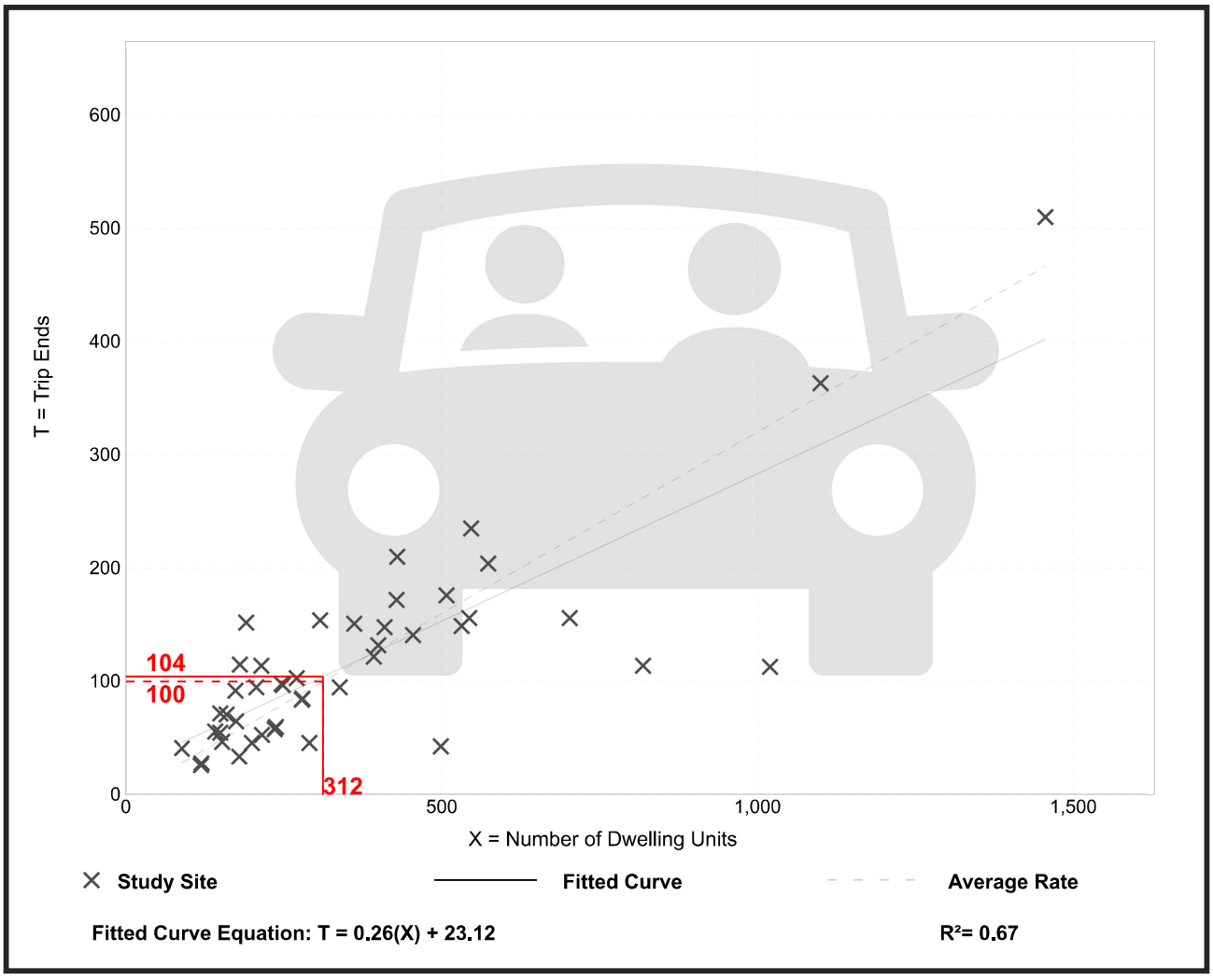
Multifamily Housing (High-Rise)
Not Close to Rail Transit (222)

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: 45
Avg. Num. of Dwelling Units: 372
Directional Distribution: 62% entering, 38% exiting

Vehicle Trip Generation per Dwelling Unit

Average Rate	Range of Rates	Standard Deviation
0.32	0.09 - 0.80	0.13

Data Plot and Equation



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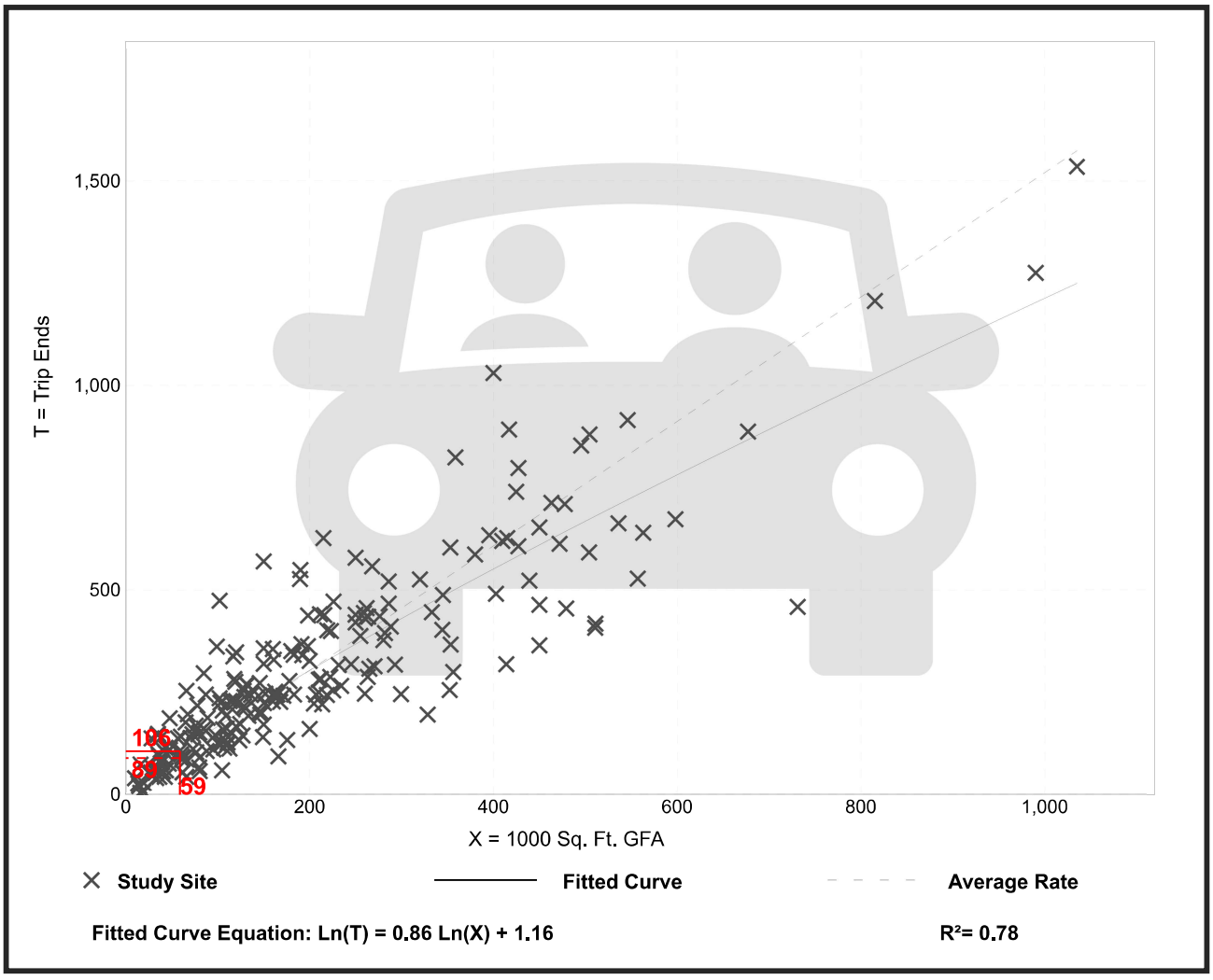
General Office Building
(710)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 7 and 9 a.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 221
Avg. 1000 Sq. Ft. GFA: 201
Directional Distribution: 88% entering, 12% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.52	0.32 - 4.93	0.58

Data Plot and Equation



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On a:	.
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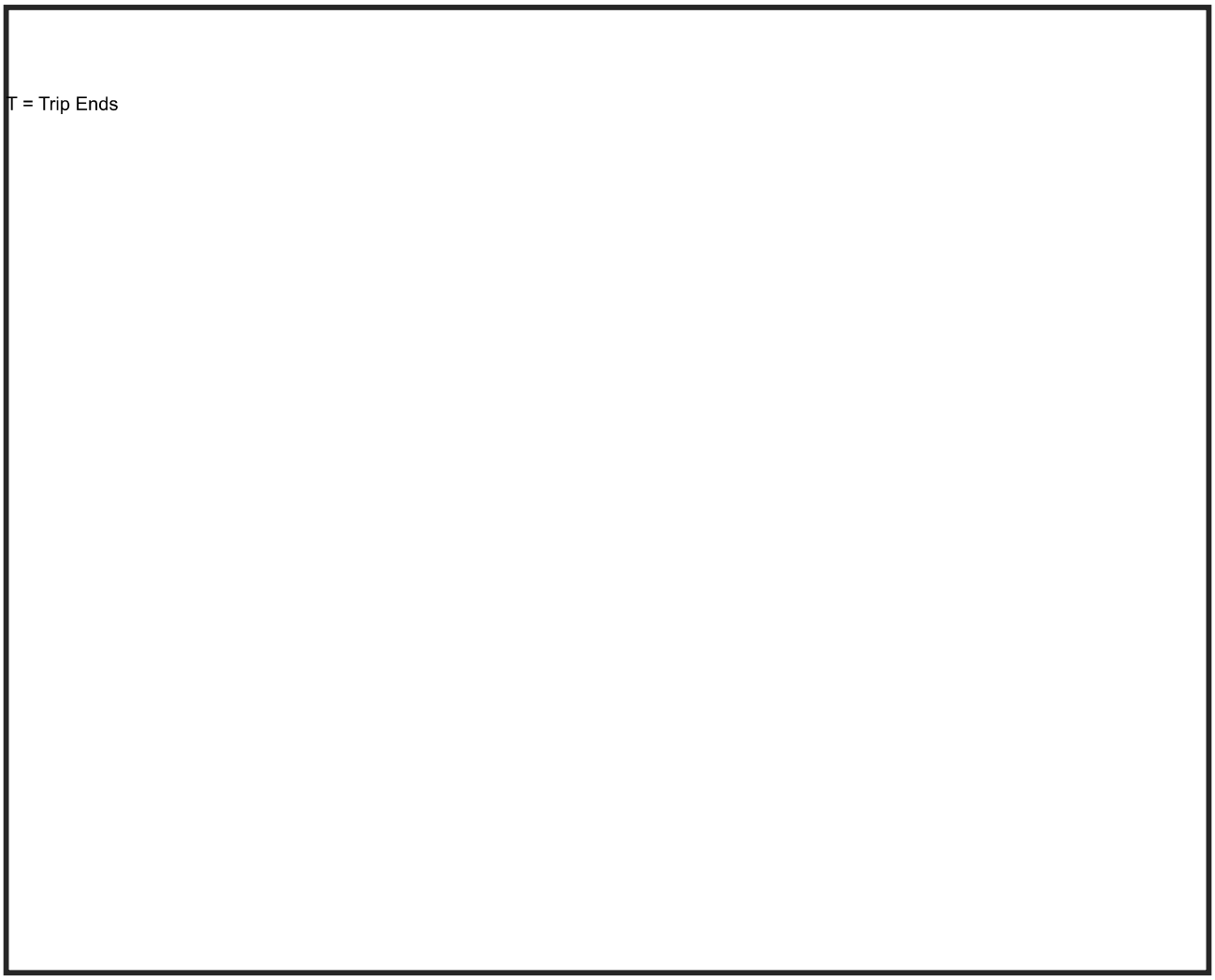
Setting/Location:	.
Number of Studies:	
Directional Distribution:	

Average Rate	Range of Rates	Standard Deviation

Data Plot and Equation



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Appendix D Synchro Output Reports

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	806	54	121	605	140	322
Future Volume (vph)	806	54	121	605	140	322
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.2	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.18	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	331	1883	1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	876	59	132	658	152	350
RTOR Reduction (vph)	0	21	0	0	0	303
Lane Group Flow (vph)	876	38	132	658	152	47
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	55.3	55.3	67.6	67.6	10.9	10.9
Effective Green, g (s)	57.7	57.7	70.0	70.0	12.0	12.0
Actuated g/C Ratio	0.64	0.64	0.78	0.78	0.13	0.13
Clearance Time (s)	6.4	6.4	4.6	6.4	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1207	1026	421	1464	238	213
v/s Ratio Prot	c0.47		0.04	c0.35	c0.08	
v/s Ratio Perm		0.02	0.21			0.03
v/c Ratio	0.73	0.04	0.31	0.45	0.64	0.22
Uniform Delay, d1	10.8	5.9	8.2	3.4	36.9	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	0.1	0.4	1.0	12.4	2.4
Delay (s)	14.7	6.0	8.6	4.4	49.4	37.2
Level of Service	B	A	A	A	D	D
Approach Delay (s/veh)	14.1			5.1	40.9	
Approach LOS	B			A	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	17.0	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	69.0%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	804	195	434	947	142	277
Future Volume (vph)	804	195	434	947	142	277
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.2	4.0	4.0	4.0
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	1883	1601	1789	1883	1789	1601
Flt Permitted	1.00	1.00	0.11	1.00	0.95	1.00
Satd. Flow (perm)	1883	1601	203	1883	1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	874	212	472	1029	154	301
RTOR Reduction (vph)	0	94	0	0	0	268
Lane Group Flow (vph)	874	118	472	1029	154	33
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	47.8	47.8	69.6	69.6	8.9	8.9
Effective Green, g (s)	50.2	50.2	72.0	72.0	10.0	10.0
Actuated g/C Ratio	0.56	0.56	0.80	0.80	0.11	0.11
Clearance Time (s)	6.4	6.4	4.6	6.4	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1050	893	507	1506	198	177
v/s Ratio Prot	c0.46		c0.20	0.55	c0.09	
v/s Ratio Perm		0.07	0.54			0.02
v/c Ratio	0.83	0.13	0.93	0.68	0.78	0.19
Uniform Delay, d1	16.4	9.5	25.5	4.0	38.9	36.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.7	0.3	24.0	2.5	25.4	2.4
Delay (s)	24.1	9.8	49.5	6.5	64.3	38.7
Level of Service	C	A	D	A	E	D
Approach Delay (s/veh)	21.4			20.0	47.3	
Approach LOS	C			C	D	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	24.6	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.85		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	84.2%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	826	72	141	730	193	363
Future Volume (vph)	826	72	141	730	193	363
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.2	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3579	1601	1789	3579	1789	1601
Flt Permitted	1.00	1.00	0.26	1.00	0.95	1.00
Satd. Flow (perm)	3579	1601	498	3579	1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	898	78	153	793	210	395
RTOR Reduction (vph)	0	28	0	0	0	332
Lane Group Flow (vph)	898	50	153	793	210	63
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	54.9	54.9	66.8	66.8	11.7	11.7
Effective Green, g (s)	57.3	57.3	69.2	69.2	12.8	12.8
Actuated g/C Ratio	0.64	0.64	0.77	0.77	0.14	0.14
Clearance Time (s)	6.4	6.4	4.6	6.4	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	2278	1019	522	2751	254	227
v/s Ratio Prot	c0.25		c0.03	0.22	c0.12	
v/s Ratio Perm		0.03	0.19			0.04
v/c Ratio	0.39	0.05	0.29	0.29	0.83	0.28
Uniform Delay, d1	7.9	6.1	3.4	3.1	37.5	34.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.5	0.1	0.3	0.3	25.5	3.0
Delay (s)	8.4	6.2	3.7	3.4	63.0	37.5
Level of Service	A	A	A	A	E	D
Approach Delay (s/veh)	8.3			3.4	46.4	
Approach LOS	A			A	D	

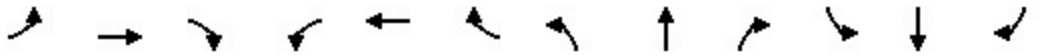
Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.6	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.45		
Actuated Cycle Length (s)	90.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (vph)	980	255	502	1038	177	304
Future Volume (vph)	980	255	502	1038	177	304
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	2.2	4.0	4.0	4.0
Lane Util. Factor	0.95	1.00	1.00	0.95	1.00	1.00
Frt	1.00	0.85	1.00	1.00	1.00	0.85
Flt Protected	1.00	1.00	0.95	1.00	0.95	1.00
Satd. Flow (prot)	3579	1601	1789	3579	1789	1601
Flt Permitted	1.00	1.00	0.18	1.00	0.95	1.00
Satd. Flow (perm)	3579	1601	333	3579	1789	1601
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	1065	277	546	1128	192	330
RTOR Reduction (vph)	0	164	0	0	0	286
Lane Group Flow (vph)	1065	113	546	1128	192	44
Turn Type	NA	Perm	pm+pt	NA	Prot	Perm
Protected Phases	4		3	8	2	
Permitted Phases		4	8			2
Actuated Green, G (s)	18.0	18.0	33.0	33.0	5.5	5.5
Effective Green, g (s)	20.4	20.4	35.4	35.4	6.6	6.6
Actuated g/C Ratio	0.41	0.41	0.71	0.71	0.13	0.13
Clearance Time (s)	6.4	6.4	4.6	6.4	5.1	5.1
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	3.0
Lane Grp Cap (vph)	1460	653	608	2533	236	211
v/s Ratio Prot	c0.30		c0.23	0.32	c0.11	
v/s Ratio Perm		0.07	0.41			0.03
v/c Ratio	0.73	0.17	0.90	0.45	0.81	0.21
Uniform Delay, d1	12.5	9.4	10.7	3.1	21.1	19.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.2	0.6	15.9	0.6	25.5	2.2
Delay (s)	15.7	10.0	26.6	3.7	46.6	21.6
Level of Service	B	B	C	A	D	C
Approach Delay (s/veh)	14.5			11.2	30.8	
Approach LOS	B			B	C	

Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	50.0	Sum of lost time (s)	10.2
Intersection Capacity Utilization	74.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	870	72	141	791	80	193	0	363	151	0	17
Future Volume (vph)	6	870	72	141	791	80	193	0	363	151	0	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	6.4	6.4	6.4	6.4	6.4		5.1	5.1		4.5	4.5	
Lane Util. Factor	1.00	0.95	1.00	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.99		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3579	1601	1789	3529		1789	1601		1789	1601	
Flt Permitted	0.25	1.00	1.00	0.25	1.00		0.75	1.00		0.33	1.00	
Satd. Flow (perm)	471	3579	1601	472	3529		1404	1601		622	1601	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	946	78	153	860	87	210	0	395	164	0	18
RTOR Reduction (vph)	0	0	37	0	7	0	0	43	0	0	12	0
Lane Group Flow (vph)	7	946	41	153	940	0	210	352	0	164	6	0
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	35.9	35.9	35.9	35.9	35.9		21.3	21.3		21.9	21.9	
Effective Green, g (s)	35.9	35.9	35.9	35.9	35.9		21.3	21.3		21.9	21.9	
Actuated g/C Ratio	0.52	0.52	0.52	0.52	0.52		0.31	0.31		0.32	0.32	
Clearance Time (s)	6.4	6.4	6.4	6.4	6.4		5.1	5.1		4.5	4.5	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	246	1870	836	246	1844		435	496		198	510	
v/s Ratio Prot		0.26			0.27			0.22			0.00	
v/s Ratio Perm	0.01		0.03	c0.32			0.15			c0.26		
v/c Ratio	0.03	0.51	0.05	0.62	0.51		0.48	0.71		0.83	0.01	
Uniform Delay, d1	7.9	10.6	8.0	11.6	10.7		19.2	21.0		21.7	16.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.2	0.0	4.8	0.2		0.8	4.6		23.9	0.0	
Delay (s)	8.0	10.9	8.1	16.4	10.9		20.1	25.6		45.5	16.0	
Level of Service	A	B	A	B	B		C	C		D	B	
Approach Delay (s/veh)		10.6			11.7			23.7			42.6	
Approach LOS		B			B			C			D	

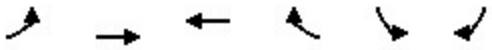
Intersection Summary			
HCM 2000 Control Delay (s/veh)	15.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.71		
Actuated Cycle Length (s)	68.7	Sum of lost time (s)	11.5
Intersection Capacity Utilization	81.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	61	0	86	107	0
Future Volume (Veh/h)	0	61	0	86	107	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	66	0	93	116	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				67		
pX, platoon unblocked						
vC, conflicting volume	209	116	116			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	209	116	116			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	779	936	1473			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	66	93	116
Volume Left	0	0	0
Volume Right	66	0	0
cSH	936	1700	1700
Volume to Capacity	0.07	0.05	0.07
Queue Length 95th (m)	1.7	0.0	0.0
Control Delay (s/veh)	9.1	0.0	0.0
Lane LOS	A		
Approach Delay (s/veh)	9.1	0.0	0.0
Approach LOS	A		

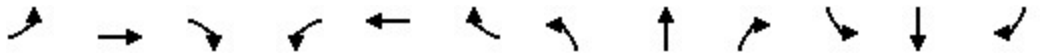
Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	16.1%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	904	940	61	44	19
Future Volume (Veh/h)	19	904	940	61	44	19
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	983	1022	66	48	21
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)			136			
pX, platoon unblocked	0.84				0.84	0.84
vC, conflicting volume	1088				1589	544
vC1, stage 1 conf vol					1055	
vC2, stage 2 conf vol					534	
vCu, unblocked vol	718				1315	69
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	97				85	97
cM capacity (veh/h)	736				328	821

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	492	492	681	407	69
Volume Left	21	0	0	0	0	48
Volume Right	0	0	0	0	66	21
cSH	736	1700	1700	1700	1700	401
Volume to Capacity	0.03	0.29	0.29	0.40	0.24	0.17
Queue Length 95th (m)	0.7	0.0	0.0	0.0	0.0	4.7
Control Delay (s/veh)	10.0	0.0	0.0	0.0	0.0	15.8
Lane LOS	B					C
Approach Delay (s/veh)	0.2			0.0		15.8
Approach LOS						C

Intersection Summary			
Average Delay	0.6		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	1049	255	502	1084	157	177	0	304	124	0	12
Future Volume (vph)	18	1049	255	502	1084	157	177	0	304	124	0	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	3.6	3.6	3.6	4.0	3.6		2.4	3.0		3.3	3.0	
Lane Util. Factor	1.00	0.91	0.91	1.00	0.95		1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85	1.00	0.98		1.00	0.85		1.00	0.85	
Flt Protected	0.95	1.00	1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1789	3416	1457	1789	3510		1789	1601		1789	1601	
Flt Permitted	0.20	1.00	1.00	0.08	1.00		0.52	1.00		1.00	1.00	
Satd. Flow (perm)	381	3416	1457	155	3510		977	1601		1883	1601	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	1140	277	546	1178	171	192	0	330	135	0	13
RTOR Reduction (vph)	0	1	85	0	8	0	0	299	0	0	12	0
Lane Group Flow (vph)	20	1167	164	546	1341	0	192	31	0	135	1	0
Turn Type	Perm	NA	Perm	pm+pt	NA		pm+pt	NA		pm+pt	NA	
Protected Phases		4		3	8		5	2		1	6	
Permitted Phases	4		4	8			2			6		
Actuated Green, G (s)	44.0	44.0	44.0	82.0	82.0		21.4	8.6		12.8	3.3	
Effective Green, g (s)	46.8	46.8	46.8	82.6	84.8		23.5	10.7		12.8	5.4	
Actuated g/C Ratio	0.41	0.41	0.41	0.72	0.74		0.20	0.09		0.11	0.05	
Clearance Time (s)	6.4	6.4	6.4	4.6	6.4		4.5	5.1		3.3	5.1	
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	155	1391	593	594	2590		310	149		201	75	
v/s Ratio Prot		0.34		c0.27	0.38		c0.08	0.02		0.06	0.00	
v/s Ratio Perm	0.05		0.11	c0.39			0.04			0.02		
v/c Ratio	0.13	0.84	0.28	0.92	0.52		0.62	0.21		0.67	0.01	
Uniform Delay, d1	21.3	30.7	22.7	32.6	6.4		40.8	48.2		49.1	52.2	
Progression Factor	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	4.6	0.3	19.3	0.2		3.7	0.7		8.5	0.0	
Delay (s)	21.7	35.3	23.0	51.9	6.6		44.4	48.9		57.6	52.2	
Level of Service	C	D	C	D	A		D	D		E	D	
Approach Delay (s/veh)		32.9			19.6			47.2			57.1	
Approach LOS		C			B			D			E	

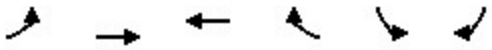
Intersection Summary			
HCM 2000 Control Delay (s/veh)	29.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.86		
Actuated Cycle Length (s)	114.9	Sum of lost time (s)	13.9
Intersection Capacity Utilization	98.5%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	65	0	175	71	0
Future Volume (Veh/h)	0	65	0	175	71	0
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	71	0	190	77	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh)						
Upstream signal (m)				67		
pX, platoon unblocked						
vC, conflicting volume	267	77	77			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267	77	77			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	722	984	1522			

Direction, Lane #	EB 1	NB 1	SB 1
Volume Total	71	190	77
Volume Left	0	0	0
Volume Right	71	0	0
cSH	984	1522	1700
Volume to Capacity	0.07	0.00	0.05
Queue Length 95th (m)	1.8	0.0	0.0
Control Delay (s/veh)	8.9	0.0	0.0
Lane LOS	A		
Approach Delay (s/veh)	8.9	0.0	0.0
Approach LOS	A		

Intersection Summary			
Average Delay	1.9		
Intersection Capacity Utilization	14.4%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	1253	1227	46	69	23
Future Volume (Veh/h)	19	1253	1227	46	69	23
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	1362	1334	50	75	25
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		TWLTL	TWLTL			
Median storage veh)		2	2			
Upstream signal (m)			136			
pX, platoon unblocked	0.84				0.84	0.84
vC, conflicting volume	1384				2082	692
vC1, stage 1 conf vol					1359	
vC2, stage 2 conf vol					723	
vCu, unblocked vol	1082				1911	261
tC, single (s)	4.1				6.8	6.9
tC, 2 stage (s)					5.8	
tF (s)	2.2				3.5	3.3
p0 queue free %	96				65	96
cM capacity (veh/h)	539				213	621

Direction, Lane #	EB 1	EB 2	EB 3	WB 1	WB 2	SB 1
Volume Total	21	681	681	889	495	100
Volume Left	21	0	0	0	0	75
Volume Right	0	0	0	0	50	25
cSH	539	1700	1700	1700	1700	255
Volume to Capacity	0.04	0.40	0.40	0.52	0.29	0.39
Queue Length 95th (m)	0.9	0.0	0.0	0.0	0.0	13.5
Control Delay (s/veh)	11.9	0.0	0.0	0.0	0.0	27.9
Lane LOS	B					D
Approach Delay (s/veh)	0.2			0.0		27.9
Approach LOS						D

Intersection Summary			
Average Delay	1.1		
Intersection Capacity Utilization	47.3%	ICU Level of Service	A
Analysis Period (min)	15		

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