1175 CABANA ROAD WEST MIXED-USE DEVELOPMENT WINDSOR, ON

TRAFFIC IMPACT BRIEF/ PARKING STUDY

Prepared by:

RC SPENCER ASSOCIATES INC.
Consulting Engineers
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File No.: 24-1708 December 2024

1175 CABANA ROAD WEST MIXED-USE DEVELOPMENT, WINDSOR, ON

TRAFFIC IMPACT BRIEF / PARKING STUDY (DECEMBER 2024)

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INTRODUCTION AND BACKGROUND

A residential apartment building with ground floor commercial space is proposed for development on the southeast corner of Casgrain Drive at Cabana Road West, in Windsor, Ontario. The site is currently occupied by two single-family residential dwellings. The area plan is illustrated on **Figure 1**. Cabana Road West is an east / west arterial roadway that begins at Huron Church Road and runs east to Dougall Avenue, where it transitions to Cabana Road East; it joins Division Road west of Walker Road and continues east through Essex County as County Road 42. Casgrain Drive is a local residential collector street. The site is located northwest of the Roseland Golf and Curling Club.

The most current site plan is illustrated on **Figure 2**; the development proposal consists of a 24-unit, four-storey apartment building with approximately 10,000 sq. ft. of first-floor commercial space (which will accommodate a clinic, a pharmacy, and a small office space). Two accesses are proposed to the development. One access is proposed to Cabana Road West at the north end of the development; however, due to concerns of the City regarding the safety and operations of an all-directional access to the arterial Cabana Road West, the site plan was updated to satisfy the road authority with a right-in / right-out only at this location (with a “pork chop” to prohibit left turns). Accordingly, the Casgrain Drive site access was redesigned to accommodate all-directional traffic. The developer is offering 60 parking spaces to accommodate the mixed land uses; the Windsor zoning bylaw requires a total of 68 spaces.

The purpose of the traffic impact brief is to evaluate the proposed development’s impact on area traffic operations; the purpose of the parking study is to evaluate the potential deficiency in the on-site parking supply with respect to the anticipated peak parking demand.

TRAFFIC DATA COLLECTION

As provided in **Appendix A**, RC Spencer Associates Inc. collected turning movement counts on 28 November 2023 for the intersection of Casgrain Drive at Cabana Road West.

METHODOLOGY

The collected turning movements counts provided the basis for industry-standard traffic operations analysis; the software package utilized for the analysis (Synchro 12) calculates various parameters of intersection performance, such as level of service (LOS), intersection capacity utilization (ICU), control delay, and queue lengths on individual approaches.

Unsignalized level of service results are reported based on the Highway Capacity Manual (7th Ed.), as summarized in the following excerpt:

Level of Service	Average Control Delay (sec/veh)
A	0 - 10
B	>10 - 15
C	>15 - 25
D	>25 - 35
E	>35 - 50
F	>50

TRIP GENERATION AND DISTRIBUTION

Trip generation was estimated from the Institute of Transportation Engineers (ITE) Trip Generation Manual (11th Edition). The dataset's average rate was used instead of the fitted curve equation because the value of the independent variables is in the lower range of the dataset; the fitted curve equation does not pass through the origin; calculations are provided in **Appendix B**.

ITE Land Use Code 221 – Multifamily Housing (Mid-Rise) is the most appropriate code for the residential portion of the proposed mixed-use building. This land use code provides trip generation rates of 0.37 trips per dwelling unit in the AM peak hour, with 23% entering and 77% exiting, and 0.39 trips per dwelling unit in the PM peak hour, with 61% entering and 39% exiting. Accordingly, this portion of the development is expected to generate 9 trips in the AM peak hour, with 2 entering and 7 exiting, and 9 trips in the PM peak hour, with 6 entering and 3 exiting.

ITE Land Use Code 712 – Small Office Building is the most appropriate code for the proposed office space within the development. This land use code provides trip generation rates of 1.67 trips per 1,000 Sq. Ft. GFA in the AM peak hour, with 82% entering and 18% exiting, and 2.16 trips per 1,000 Sq. Ft. GFA in the PM peak hour, with 34% entering and 66% exiting. Accordingly, this portion of the development is expected to generate 6 trips in the AM peak hour, with 5 entering and 1 exiting, and 8 trips in the PM peak hour, with 3 entering and 5 exiting.

ITE Land Use Code 720 – Medical-Dental Office Building is the most appropriate code for the proposed clinic and dental office space. This land use code provides trip generation rates of 3.10 trips per 1,000 Sq. Ft. GFA in the AM peak hour, with 79% entering and 21% exiting, and 3.93 trips per 1,000 Sq. Ft. GFA in the PM peak hour, with 30% entering and 70% exiting. Accordingly, this portion of the development is expected to generate 9 trips in the AM peak hour, with 7 entering and 2 exiting, and 11 trips in the PM peak hour, with 3 entering and 8 exiting.

ITE Land Use Code 880 – Pharmacy/Drugstore (without Drive-Through Window) is the most appropriate code for the proposed ground-floor pharmacy. This code provides trip generation rates of 2.94 trips per 1,000 Sq. Ft. GFA in the AM peak hour, with 65% entering and 35% exiting, and 8.51 trips per 1,000 Sq. Ft. GFA in the PM peak hour, with 49% entering and 51% exiting. Accordingly, this portion of the development is expected to generate 8 trips in the AM peak hour, with 5 entering and 3 exiting, and 23 trips in the PM peak hour, with 11 entering and 12 exiting.

Accordingly, the total trips generated by the proposed development are estimated to be 19 entering and 12 exiting during the AM peak hour and 23 entering and 28 exiting during the PM peak hour. To be conservative, no trip reduction was considered with respect to the existing residential land use; furthermore, potential modal split reductions were not applied. Site generated traffic was distributed to and from Cabana Road West via the two proposed accesses based on the access constraints and on the existing east / west distribution of traffic.

CAPACITY AND LEVEL OF SERVICE ANALYSIS

Figure 3 illustrates the "Site Generated Traffic", "Existing Traffic", and "Existing + Site Generated Traffic" for the respective weekday AM and PM peak hours. The corresponding Synchro 12 simulation reports are provided in **Appendix C**. To quantify the effect of traffic growth on individual intersections within the study area and to assess the need for geometric or traffic control improvements, the Synchro results were summarized as follows:

Casgrain Drive at Cabana Road West

The existing northbound stop-controlled tee intersection of Casgrain Drive at Cabana Road West is comprised of a shared lane on the northbound approach and a four-lane cross-section on Cabana Road West; there are no dedicated turning lanes on any approach. As reported in **Table 1**, even with the addition of site generated traffic, it is anticipated that the proposed development will have a nominal impact on traffic operations at this intersection. Although the level of service approaches "LOS D" with the addition of site generated traffic, the effective "average control delay increase" is less than seven more seconds in the critical PM peak hour with an anticipated 95th percentile queue length of less than two vehicles.

Table 1: Level of Service by Approach – Casgrain Drive at Cabana Road West

Scenario	Casgrain Drive at Cabana Road West							
	AM Peak Hour				PM Peak Hour			
	E/B	W/B	N/B	S/B	E/B	W/B	N/B	S/B
Existing Traffic	A	A	C	-	A	A	C	-
Existing + Site Gen. Traffic	A	A	D	-	A	A	D	-

Site Access at Cabana Road West

The proposed northbound stop-controlled (right-in / right-out) site access at Cabana Road West is to be comprised of a right turn lane on the northbound approach and a four-lane cross-section on Cabana Road West. There are no dedicated turning lanes on Cabana Road West; right-in access to the site will be from the outside right through lane. A "pork chop" is to be constructed at the access to discourage left turns in and out of the site at this location. Based on the anticipated site generated traffic volumes, the level of service results reported in **Table 2** suggest that the proposed site access will exhibit a good level of service during the critical peak hours.

Table 2: Level of Service by Approach – Site Access at Cabana Road West

Scenario	Site Access at Cabana Road West							
	AM Peak Hour				PM Peak Hour			
	E/B	W/B	N/B	S/B	E/B	W/B	N/B	S/B
Existing + Site Gen. Traffic	A	A	B	-	A	A	B	-

Site Access at Casgrain Drive

The proposed westbound stop-controlled access at Casgrain Drive will be comprised of a shared lane on all approaches. Based on the anticipated site generated traffic volumes and the low volumes on Casgrain Drive, the level of service results reported in **Table 3** suggest that the proposed site access will exhibit a good level of service during the critical peak hours.

Table 3: Level of Service by Approach – Site Access at Casgrain Drive

Scenario	Site Access at Casgrain Drive							
	AM Peak Hour				PM Peak Hour			
	E/B	W/B	N/B	S/B	E/B	W/B	N/B	S/B
Existing + Site Gen. Traffic	A	A	A	-	A	A	A	-

ITE PARKING GENERATION MANUAL VS. WINDSOR BYLAW REQUIREMENTS

The City's zoning bylaw requires 1.25 parking spaces per dwelling unit for the mid-rise residential land use. This means that 30 parking spaces are required to accommodate the 24 dwelling units on the second, third, and fourth floors. Additionally, Windsor's bylaw requires one parking space per 484 sq. ft. of office space, one parking space per 145 sq. ft. of medical / dental office space, and one parking space per 242 sq. ft. of pharmacy space. This means that the first-floor medical area requires a total of 38 parking spaces (7 + 20 + 11). Since a total of 68 spaces is required for the entire development (but the developer is only providing 60 spaces), a variance is required to address the shortfall of 8 parking spaces.

The Institute of Transportation Engineers (ITE) Parking Generation Manual (6th Edition) reports parking demand studies and statistics from various land uses across North America. The applicable land use codes are referenced in **Appendix D**. For Multi-family Housing (Mid-rise) – 2 Bedroom (Land Use Code 220), parking demand is estimated per 2-bedroom unit. The ITE's average rate and fitted curve equation suggest that a minimum of 30 parking spaces will suffice.

The first-floor office / medical / dental / pharmacy land uses were evaluated individually. For a small office building (Land Use Code 712), parking demand can be estimated per 1,000 sq. ft. of gross floor area (GFA); both equations suggest that a minimum of 6 parking spaces is sufficient.

For a medical-dental office building (Land Use Code 720), parking demand can be estimated per 1,000 sq. ft. of gross floor area (GFA); the ITE's average rate suggests a minimum of 7 parking spaces, while the fitted curve equation suggests that 11 parking spaces are sufficient.

For a pharmacy without a drive-through window (Land Use Code 880), parking demand can be estimated per 1,000 sq. ft. of gross floor area (GFA). The ITE's average rate suggests a minimum of 7 parking spaces are sufficient; the fitted curve equation is not provided.

Therefore, according to the ITE Parking Generation Manual (6th Edition), a minimum total of 50 parking spaces is required to adequately accommodate the peak parking demand for the proposed development. Based on the ITE's peak parking demand estimates, it is the engineers' opinion that the subject development's peak parking demand should not exceed the proposed 60-space parking supply.

Although the proposed parking supply should sufficiently accommodate the peak parking demand, transit and active transportation options were also evaluated. Currently, Windsor Transit provides stops for Routes 5, 6, and 7 within approximately 200m of the site: Route 5 stops at the northwest corner of Mt. Royal Drive at Cabana Road West, Route 6 stops on Cabana Road West on the west side of Mt. Royal Drive and on the west side of Longfellow Avenue, and Route 7 stops at the site access and at the southwest corner of Mt. Royal Drive at Cabana Road West. Active transportation facilities are also provided within the study area; sidewalks are provided on both sides of Cabana Road West.

Therefore, based on the ITE Parking Generation Manual estimates and the current modal split options, it is the engineers' opinion that the proposed on-site parking supply will adequately accommodate the subject development's peak parking demand; furthermore, the developer's proposed parking supply is consistent with provincial trends aimed at encouraging increased use of sustainable active transportation and transit options.

SIGHT LINE ANALYSIS

Sight line analyses were completed for the site accesses at Cabana Road West and Casgrain Drive. The analyses were completed per the TAC Geometric Design Guide for Canadian Roads (2017). The speed limit on Cabana Road West is 50 km/h, and the speed limit on Casgrain Drive is 40 km/h, so the analyses were completed for 60 km/h and 50 km/h design speeds; a passenger car was selected as the design vehicle. According to the TAC Geometric Design Guide for Canadian Roads (2017), the sight line should be evaluated with the design vehicle located at 4.4m from the edge of the nearest travelled lane.

As calculated in **Appendix E**, the minimum intersection sight distance is 108m for the right turn egress maneuver at Cabana Road West. Left turns at this site access will be prohibited. Based on the sight lines illustrated on **Figure 4**, it is the engineers' opinion that there is sufficient sight distance for safe egress from the proposed site access.

As also calculated in **Appendix E**, the minimum intersection sight distance is 104m for the worst-case left turn egress maneuver and 90m for the less-critical right turn egress maneuver at Casgrain Drive. Based on the sight lines illustrated on **Figure 5**, it is the engineers' opinion that there is sufficient sight distance for safe egress from the proposed site access (if the row of trees currently located at the proposed site access are all removed during construction).

CONCLUSIONS AND RECOMMENDATIONS

A residential apartment building with ground floor commercial space is proposed for development on the southeast corner of Casgrain Drive at Cabana Road West, in Windsor, Ontario. The site is currently occupied by two single-family residential dwellings. The development proposal consists of a 24-unit, four-storey apartment building with approximately 10,000 sq. ft. of first-floor commercial space. A right-in / right-out access is proposed at Cabana Road West, while an all-directional access is proposed at Casgrain Drive. The developer is offering 60 parking spaces.

Using recently obtained turning movement counts and applying the best available trip generation and distribution methodologies, an analysis was completed to quantify and qualify the potential impact of the proposed development on area traffic operations. Upon completion of the analysis, it was concluded that:

- The northbound stop-controlled tee intersection of Casgrain Drive at Cabana Road West will continue to operate satisfactorily; at worst, the northbound 95th percentile queue is less than two vehicles long;

- The proposed northbound stop-controlled right-in / right-out tee intersection of the site access at Cabana Road West will operate well; the proposed development will have a nominal impact on Cabana Road West traffic operations;
- The proposed westbound stop-controlled all-directional tee intersection of the site access at Casgrain Drive will operate well;
- The proposed on-site parking supply of 60 spaces will sufficiently accommodate the subject development's peak parking demand;
- There is sufficient sight distance for safe egress from the proposed site accesses at Cabana Road West and Casgrain Drive.

Therefore, based on the results of the technical work, it is the engineers' opinion that the proposed development will not adversely impact area traffic operations. Geometric and / or traffic control improvements are not required to support the proposed mixed-use development.

All of which is respectfully submitted,

RC Spencer Associates Inc.

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Associate / Leamington Office Manager

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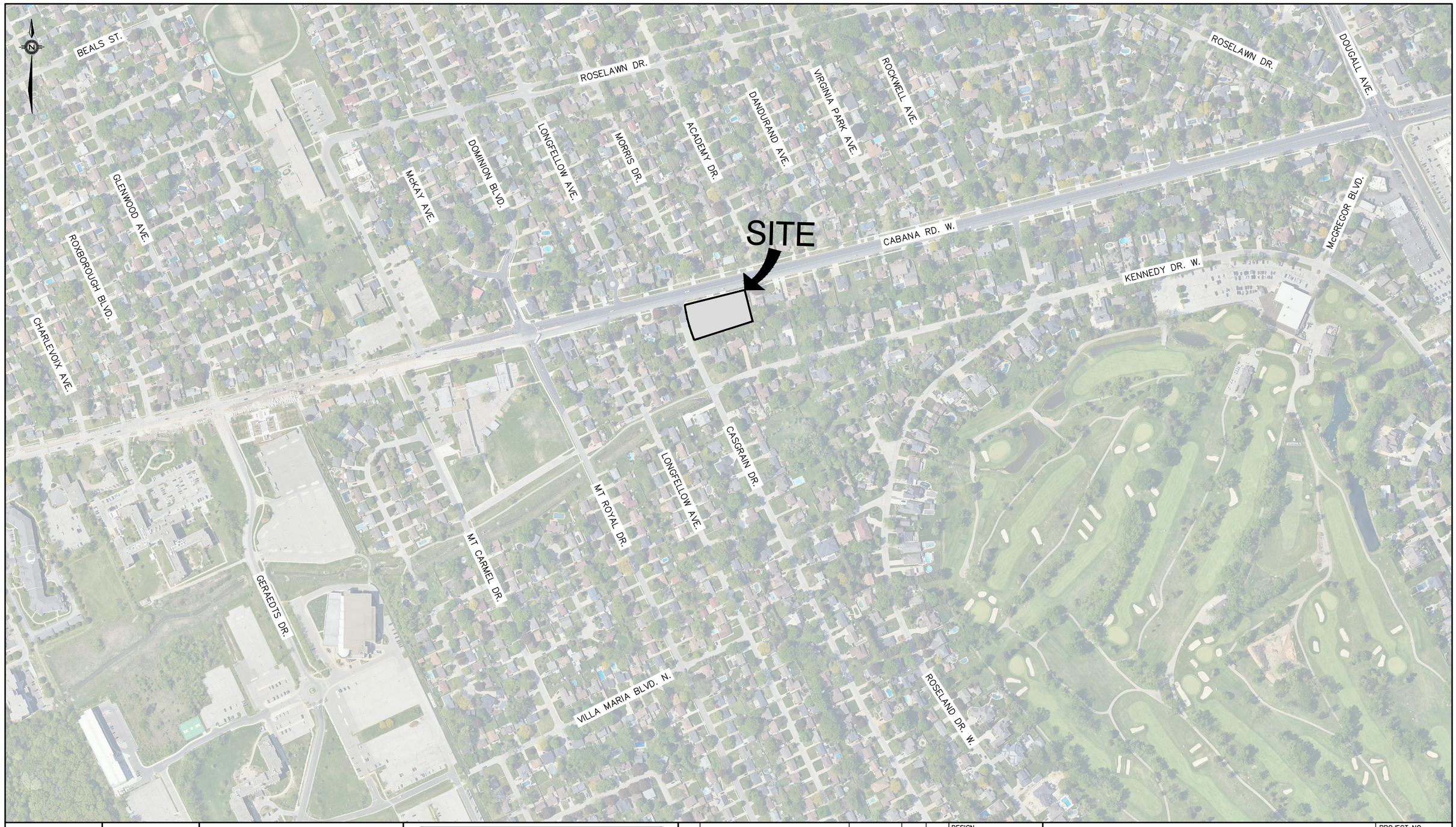
President / Windsor Office Manager



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1.	COMPLETED REPORT FIGURES	12 DEC 2024	E.A.R.	A.D.B.

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DRAWN	E.A.R.
CHECKED	A.D.B.
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SCALE	N.T.S.

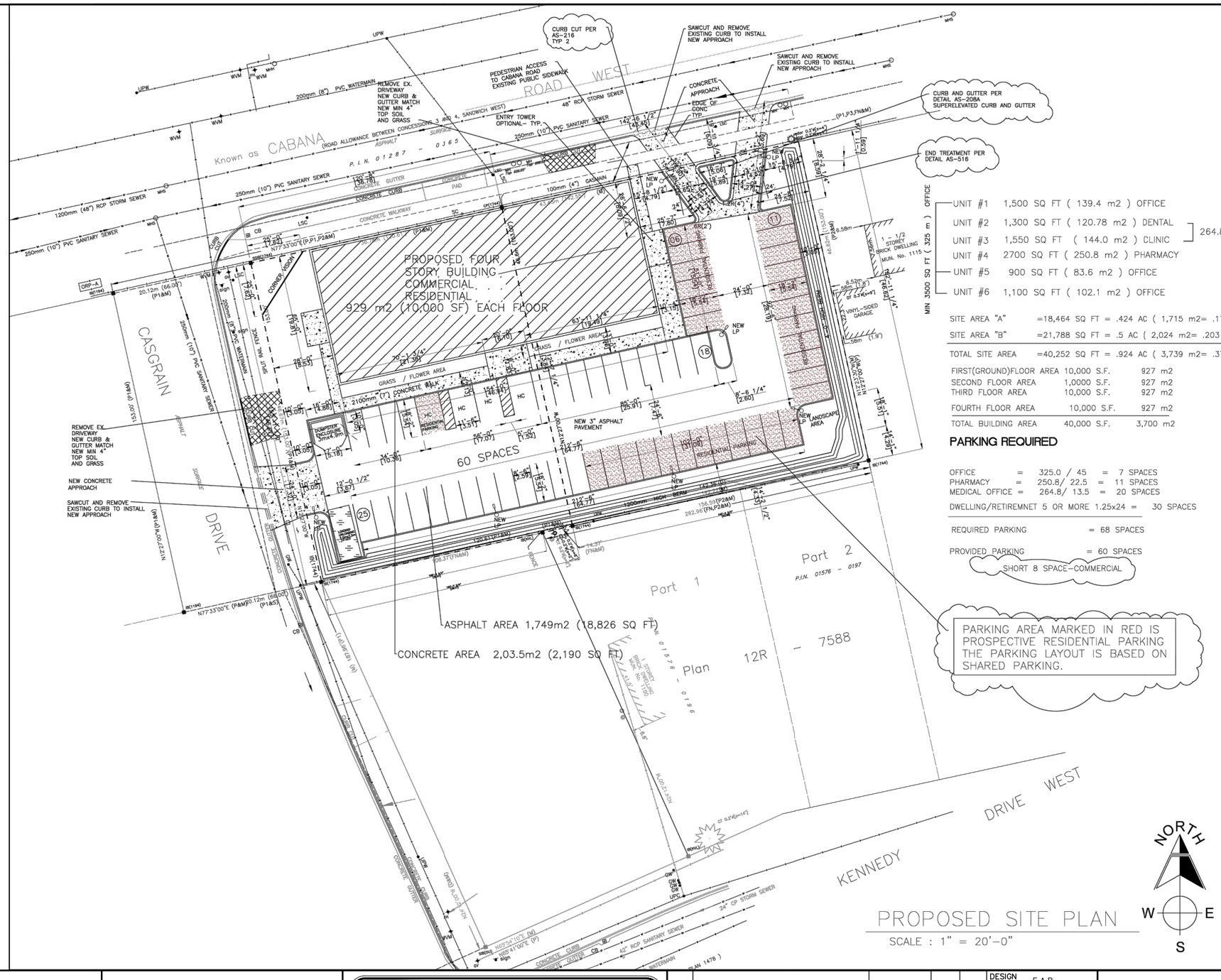
1175 CABANA ROAD, WINDSOR, ON

AREA PLAN

PROJECT NO. 24–1708

FIGURE NO. 1

OF 5



PROPOSED SITE PLAN

SCALE : 1" = 20'-0"

ZIAD EL-BABA ENGINEERING

674 GAUTHIER
TECUMSEH ONTARIO
N8N3P8 CANADA
CELL -313-938-8767
CELL -519-796-9882

DATE	REV. NO.	ISSUED FOR
APR.27.23		REZONING
MAR.13.24		REZONING
MAY.24.24		REZONING
NOV.20.24		REZONING
NOV.28.24		REZONING

Project:
NEW BUILDING COMPLEX
1175 CABANA W
WINDSOR ONT
OWNER

Drawing Title:
PROPOSED SITE PLAN

Project Number	
Scale	AS NOTED
Date	
Drawn By	
Checked By	

Drawing No.
SP-2

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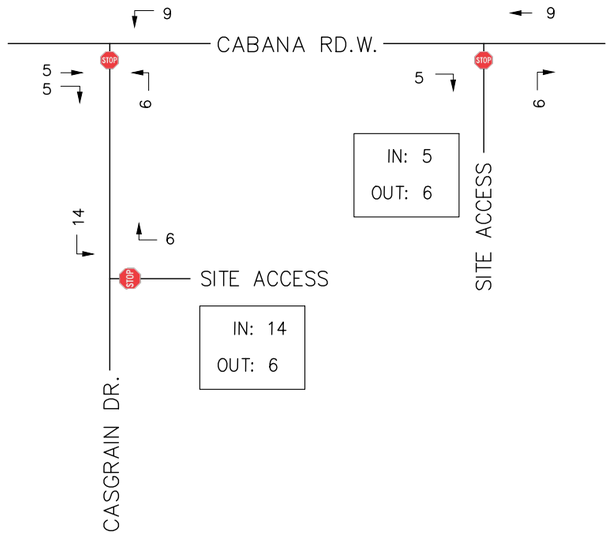
1175 CABANA ROAD, WINDSOR, ON

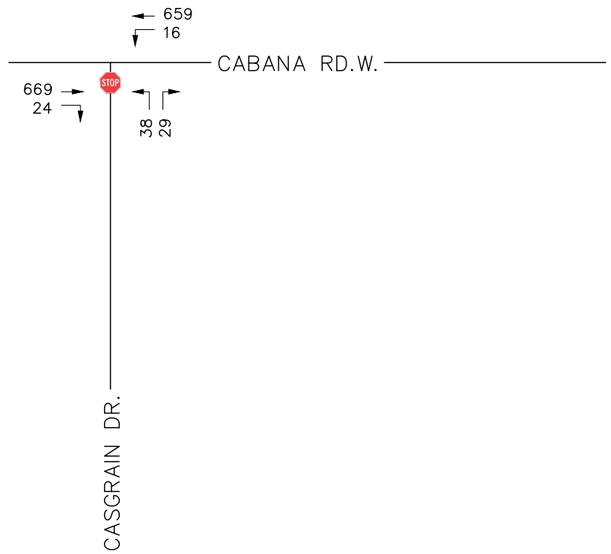
SITE PLAN

PROJECT NO. 24-1708
FIGURE NO. 2
OF 5

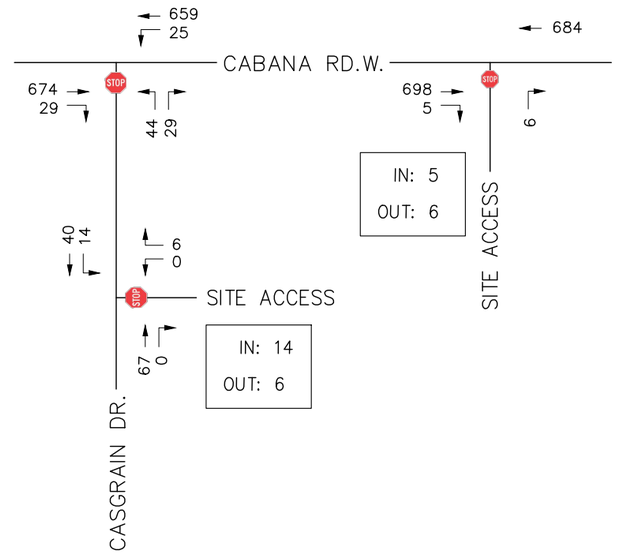
SITE GENERATED TRAFFIC (AM PEAK HOUR)



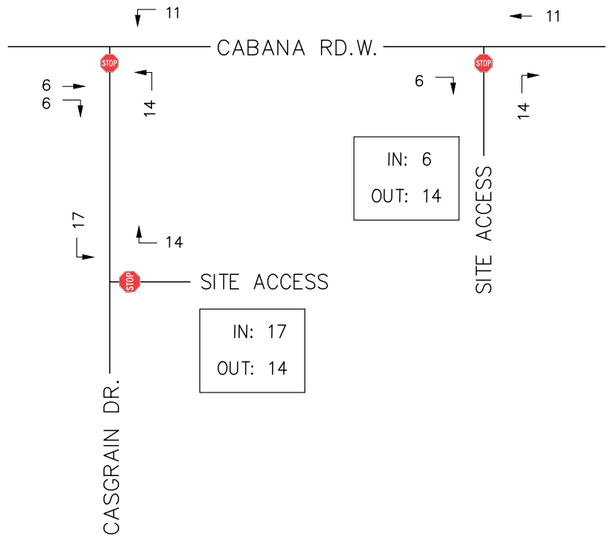
EXISTING TRAFFIC (AM PEAK HOUR)



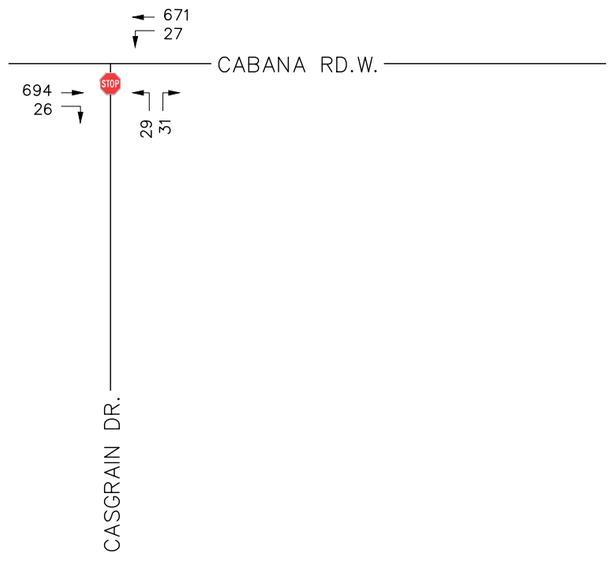
EXISTING + SITE GENERATED TRAFFIC (AM PEAK HOUR)



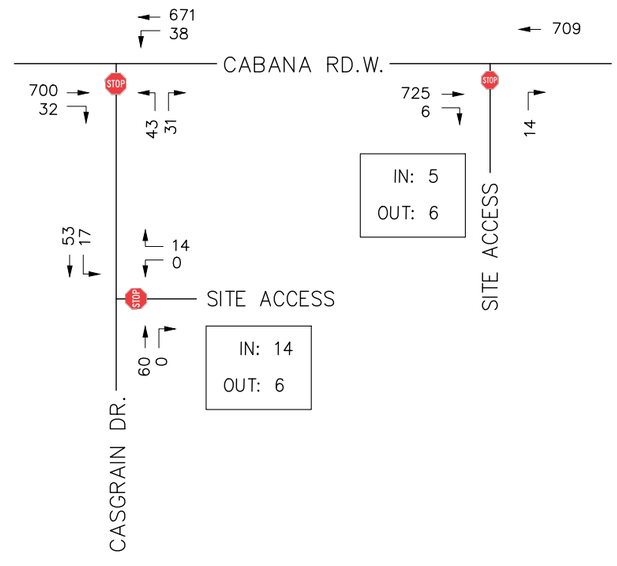
SITE GENERATED TRAFFIC (PM PEAK HOUR)



EXISTING TRAFFIC (PM PEAK HOUR)



EXISTING + SITE GENERATED TRAFFIC (PM PEAK HOUR)



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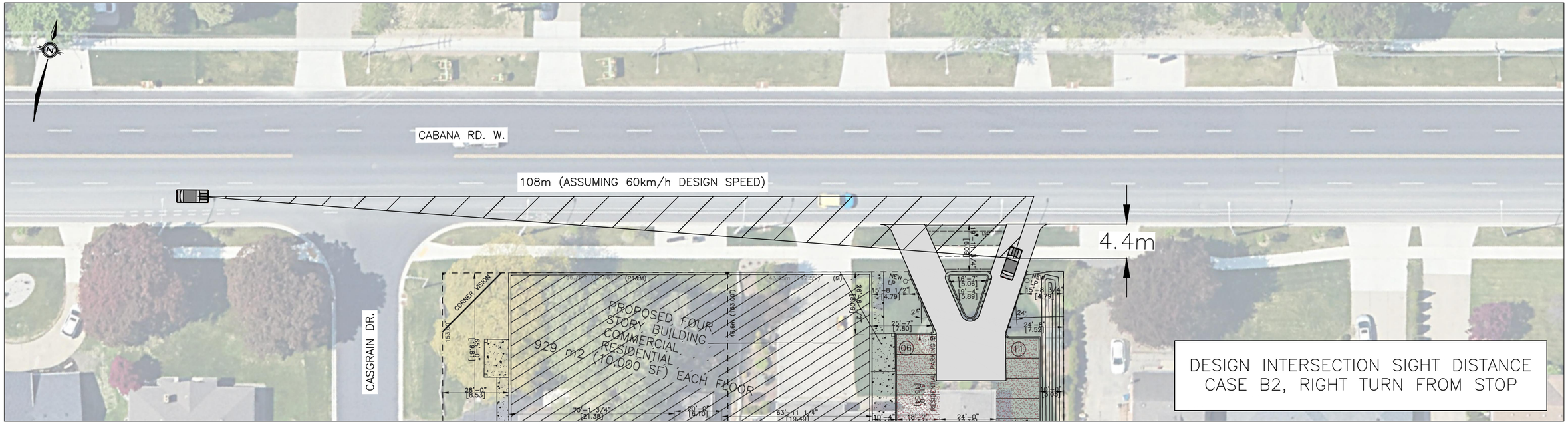
1175 CABANA ROAD, WINDSOR, ON

SITE TURNING MOVEMENTS (AM/PM PEAK HOUR)

PROJECT NO. 24-1708

FIGURE NO. 3

OF 5



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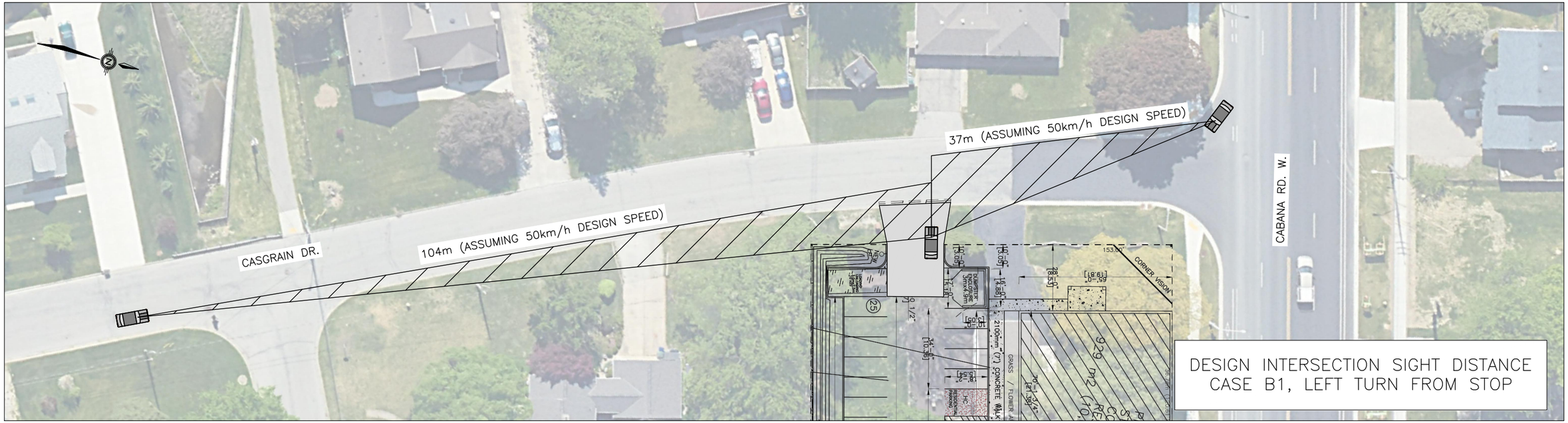
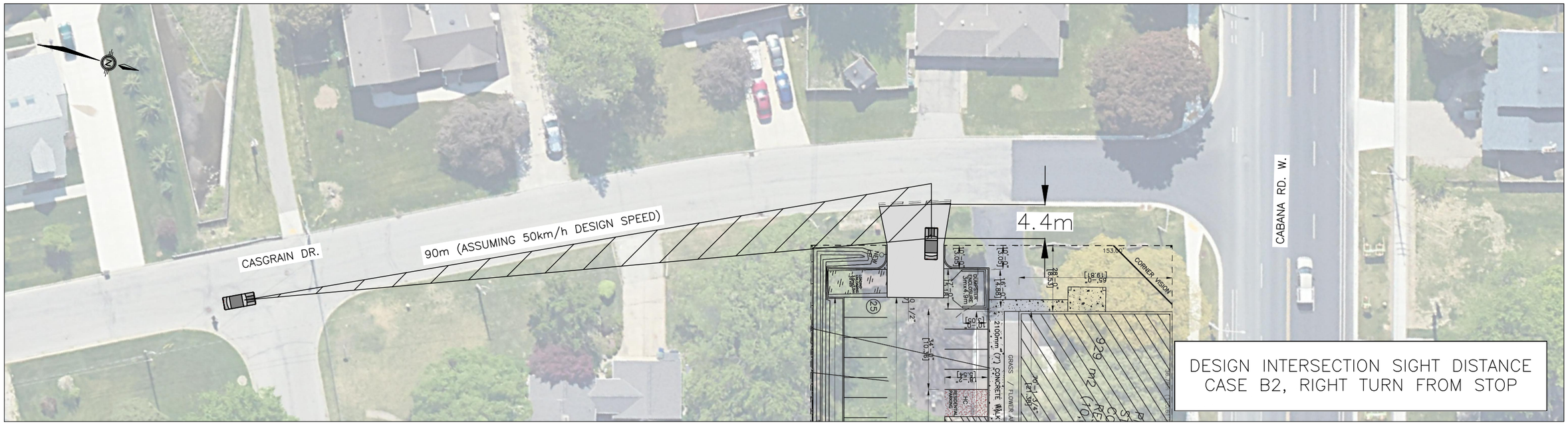
1175 CABANA ROAD, WINDSOR, ON

SIGHT LINE ANALYSIS: SITE ACCESS AT CABANA ROAD WEST

PROJECT NO. 24–1708
FIGURE NO. 4
OF 5



DESIGN INTERSECTION SIGHT DISTANCE
CASE B1, LEFT TURN FROM STOP



DESIGN INTERSECTION SIGHT DISTANCE
CASE B2, RIGHT TURN FROM STOP

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1175 CABANA ROAD, WINDSOR, ON

SIGHT LINE ANALYSIS: SITE ACCESS AT CASGRAIN DRIVE

PROJECT NO. 24–1708
FIGURE NO. 5
OF 5

Appendix A

TRAFFIC DATA COLLECTION

Casgrain Drive at Cabana Road West

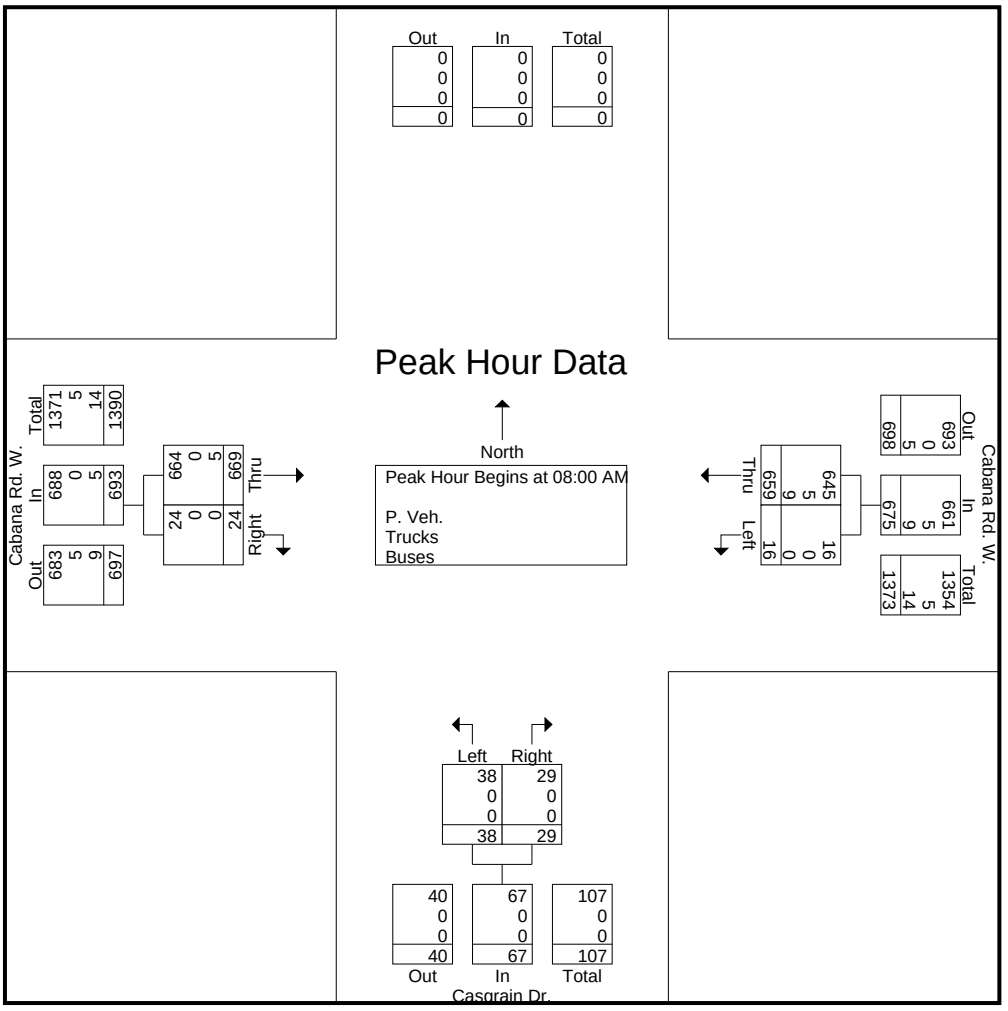
RC SPENCER ASSOCIATES INC.
Consulting Engineers

Date: 28 November 2023
Counted By: Mary K (CAM4)
Weather Conditions: Sunny
Casgrain Drive at Cabana Road West

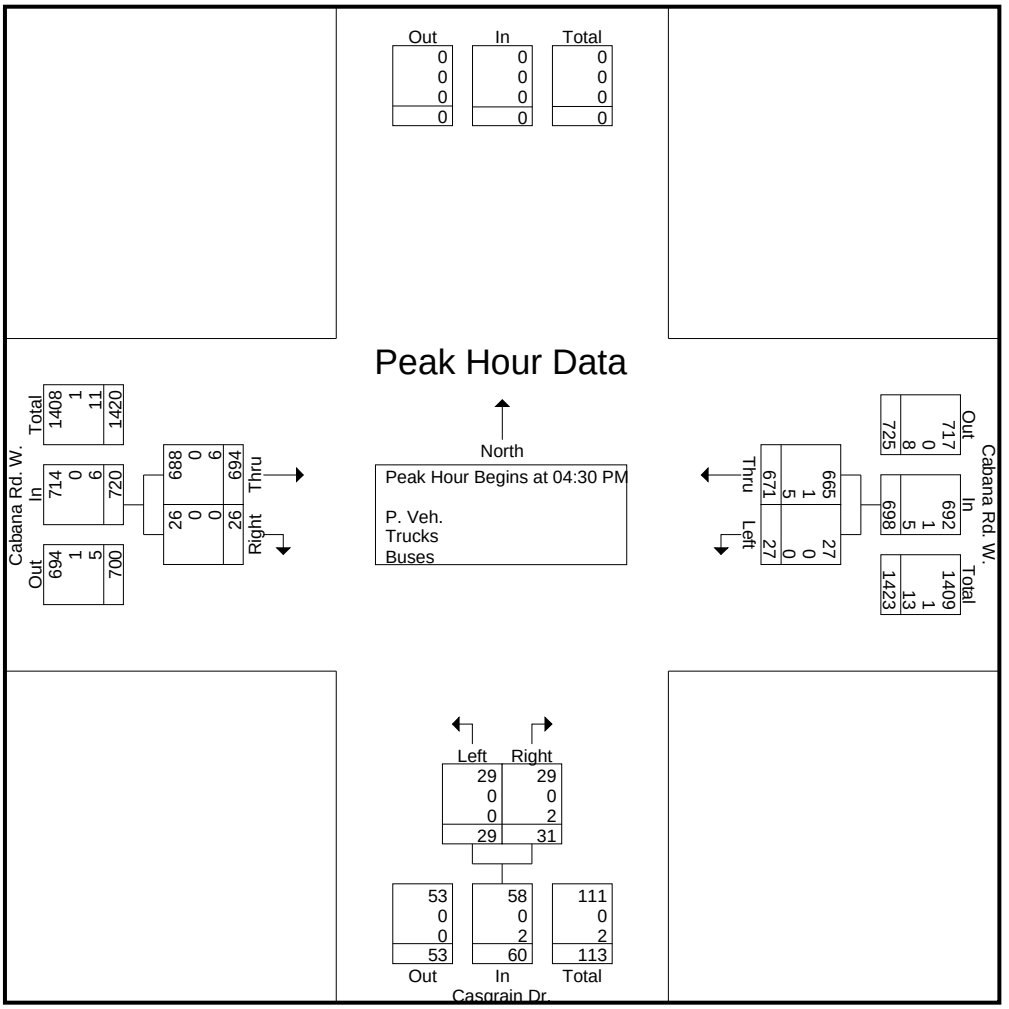
Groups Printed- P. Veh. - Trucks - Buses

	Cabana Rd. W. E/B				Cabana Rd. W. W/B				Casgrain Dr. N/B						
Start Time	Right	Thru	Peds	App. Total	Thru	Left	Peds	App. Total	Right	Left	Peds	App. Total	Exclu. Total	Inclu. Total	Int. Total
07:00 AM	1	56	(0)	57	57	1	(0)	58	3	6	(0)	9	0	124	124
07:15 AM	2	54	(0)	56	68	0	(0)	68	2	3	(0)	5	0	129	129
07:30 AM	1	82	(0)	83	132	0	(0)	132	5	16	(0)	21	0	236	236
07:45 AM	5	96	(0)	101	157	1	(0)	158	5	10	(1)	15	1	274	275
Total	9	288	(0)	297	414	2	(0)	416	15	35	(1)	50	1	763	764
08:00 AM	9	147	(1)	156	133	1	(0)	134	6	17	(4)	23	5	313	318
08:15 AM	5	149	(0)	154	159	10	(0)	169	8	11	(0)	19	0	342	342
08:30 AM	3	164	(0)	167	222	1	(0)	223	6	4	(1)	10	1	400	401
08:45 AM	7	209	(1)	216	145	4	(0)	149	9	6	(0)	15	1	380	381
Total	24	669	(2)	693	659	16	(0)	675	29	38	(5)	67	7	1435	1442
*** BREAK ***															
04:00 PM	6	187	(0)	193	166	4	(0)	170	10	2	(1)	12	1	375	376
04:15 PM	3	145	(0)	148	157	7	(0)	164	3	9	(0)	12	0	324	324
04:30 PM	7	182	(0)	189	166	6	(0)	172	6	9	(0)	15	0	376	376
04:45 PM	8	193	(0)	201	163	8	(0)	171	9	7	(0)	16	0	388	388
Total	24	707	(0)	731	652	25	(0)	677	28	27	(1)	55	1	1463	1464
05:00 PM	4	168	(0)	172	185	5	(0)	190	11	5	(0)	16	0	378	378
05:15 PM	7	151	(0)	158	157	8	(1)	165	5	8	(0)	13	1	336	337
05:30 PM	10	122	(1)	132	134	3	(0)	137	5	9	(0)	14	1	283	284
05:45 PM	10	126	(1)	136	154	7	(0)	161	8	3	(0)	11	1	308	309
Total	31	567	(2)	598	630	23	(1)	653	29	25	(0)	54	3	1305	1308
Grand Total	88	2231	(4)	2319	2355	66	(1)	2421	101	125	(7)	226	12	4966	4978
Apprch %	3.8	96.2			97.3	2.7			44.7	55.3					
Total %	1.8	44.9		46.7	47.4	1.3		48.8	2	2.5		4.6	0.2	99.8	
P. Veh.	88	2216		2308	2329	66		2396	99	125		231	0	0	4935
% P. Veh.	100	99.3	100	99.4	98.9	100	100	98.9	98	100	100	99.1	0	0	99.1
Trucks	0	0		0	6	0		6	0	0		0	0	0	6
% Trucks	0	0	0	0	0.3	0	0	0.2	0	0	0	0	0	0	0.1
Buses	0	15		15	20	0		20	2	0		2	0	0	37
% Buses	0	0.7	0	0.6	0.8	0	0	0.8	2	0	0	0.9	0	0	0.7

	Cabana Rd. W. E/B			Cabana Rd. W. W/B			Casgrain Dr. N/B			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 11:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 08:00 AM										
08:00 AM	**9**	147	156	133	1	134	6	**17**	**23**	313
08:15 AM	5	149	154	159	**10**	169	8	11	19	342
08:30 AM	3	164	167	**222**	1	**223**	6	4	10	**400**
08:45 AM	7	**209**	**216**	145	4	149	**9**	6	15	380
Total Volume	24	669	693	659	16	675	29	38	67	1435
% App. Total	3.5	96.5		97.6	2.4		43.3	56.7		
PHF	.667	.800	.802	.742	.400	.757	.806	.559	.728	.897
P. Veh.	24	664	688	645	16	661	29	38	67	1416
% P. Veh.	100	99.3	99.3	97.9	100	97.9	100	100	100	98.7
Trucks	0	0	0	5	0	5	0	0	0	5
% Trucks	0	0	0	0.8	0	0.7	0	0	0	0.3
Buses	0	5	5	9	0	9	0	0	0	14
% Buses	0	0.7	0.7	1.4	0	1.3	0	0	0	1.0



	Cabana Rd. W. E/B			Cabana Rd. W. W/B			Casgrain Dr. N/B			
Start Time	Right	Thru	App. Total	Thru	Left	App. Total	Right	Left	App. Total	Int. Total
Peak Hour Analysis From 12:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	7	182	189	166	6	172	6	**9**	15	376
04:45 PM	**8**	**193**	**201**	163	**8**	171	9	7	**16**	**388**
05:00 PM	4	168	172	**185**	5	**190**	**11**	5	16	378
05:15 PM	7	151	158	157	8	165	5	8	13	336
Total Volume	26	694	720	671	27	698	31	29	60	1478
% App. Total	3.6	96.4		96.1	3.9		51.7	48.3		
PHF	.813	.899	.896	.907	.844	.918	.705	.806	.938	.952
P. Veh.	26	688	714	665	27	692	29	29	58	1464
% P. Veh.	100	99.1	99.2	99.1	100	99.1	93.5	100	96.7	99.1
Trucks	0	0	0	1	0	1	0	0	0	1
% Trucks	0	0	0	0.1	0	0.1	0	0	0	0.1
Buses	0	6	6	5	0	5	2	0	2	13
% Buses	0	0.9	0.8	0.7	0	0.7	6.5	0	3.3	0.9



Appendix B

ITE TRIP GENERATION MANUAL – 11TH EDITION REFERENCES

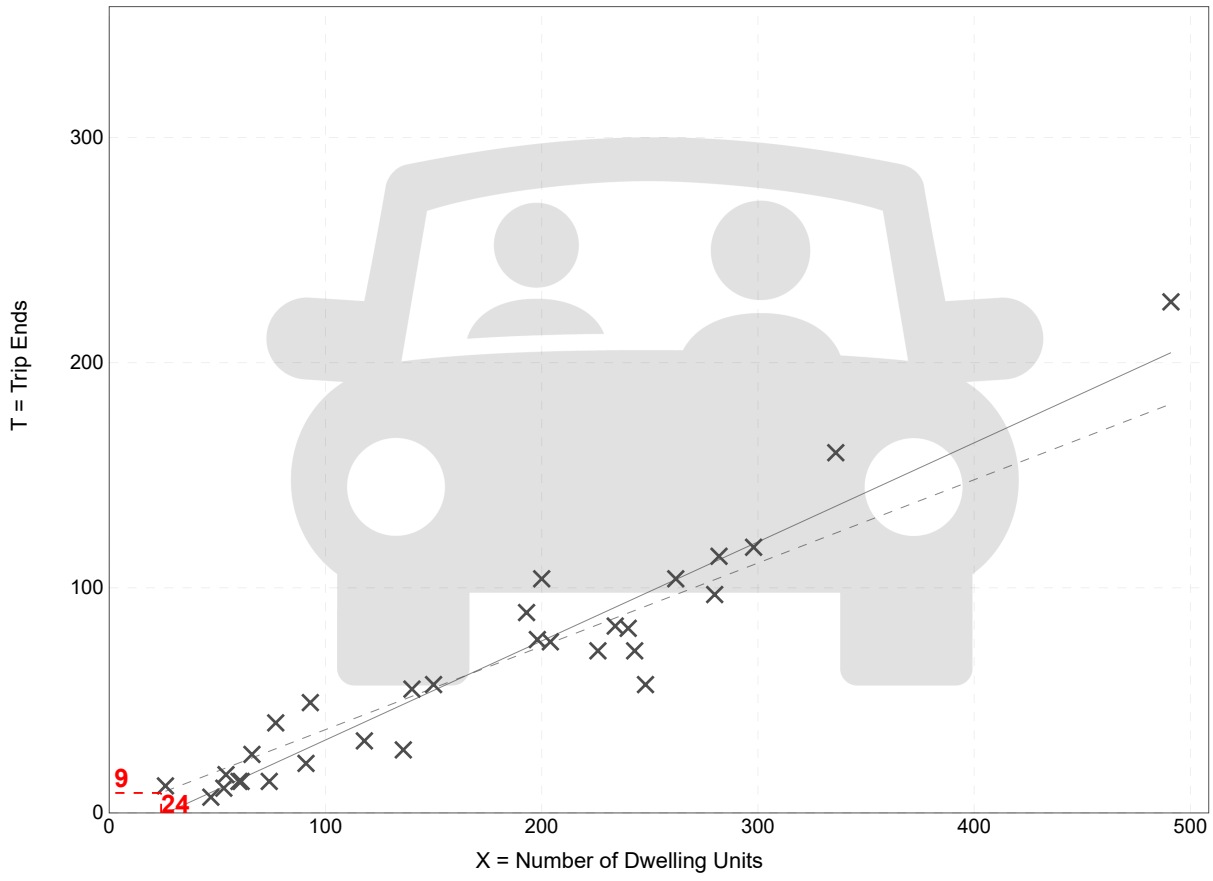
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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



Fitted Curve Equation: T = 0.44(X) - 11.61

R^2= 0.91

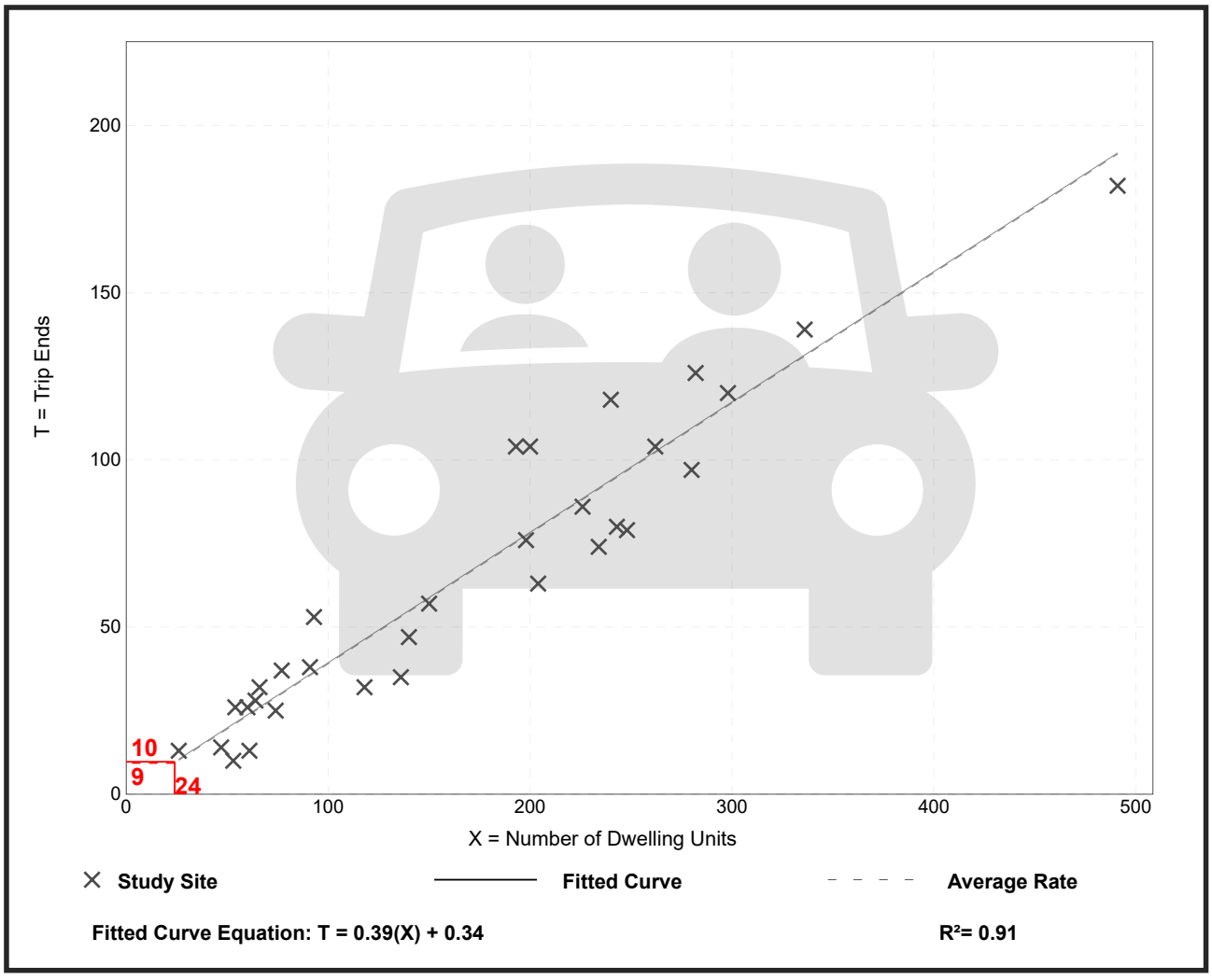
Multifamily Housing (Mid-Rise)
Not Close to Rail Transit (221)

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



Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

Assumed Land Use (1): Multifmaily Housing (Mid-Rise) - ITE No. 221

Average Vehicle Trip Ends vs.: Dwelling Units

ITE Trip Generation Data collected on a: Weekday

AM Peak Hour:	0.37	= Average Rate	23	% Entering
			77	% Exiting
PM Peak Hour:	0.39	= Average Rate	61	% Entering
			39	% Exiting

Assumed Land Use (1): Multifmaily Housing (Mid-Rise) - ITE No. 221				
	Dwelling Units	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	24	9	2	7
PM Peak	24	9	6	3

Total Trips		
	Trips Entering	**Trips Exiting**
AM Peak	2	7
PM Peak	6	3

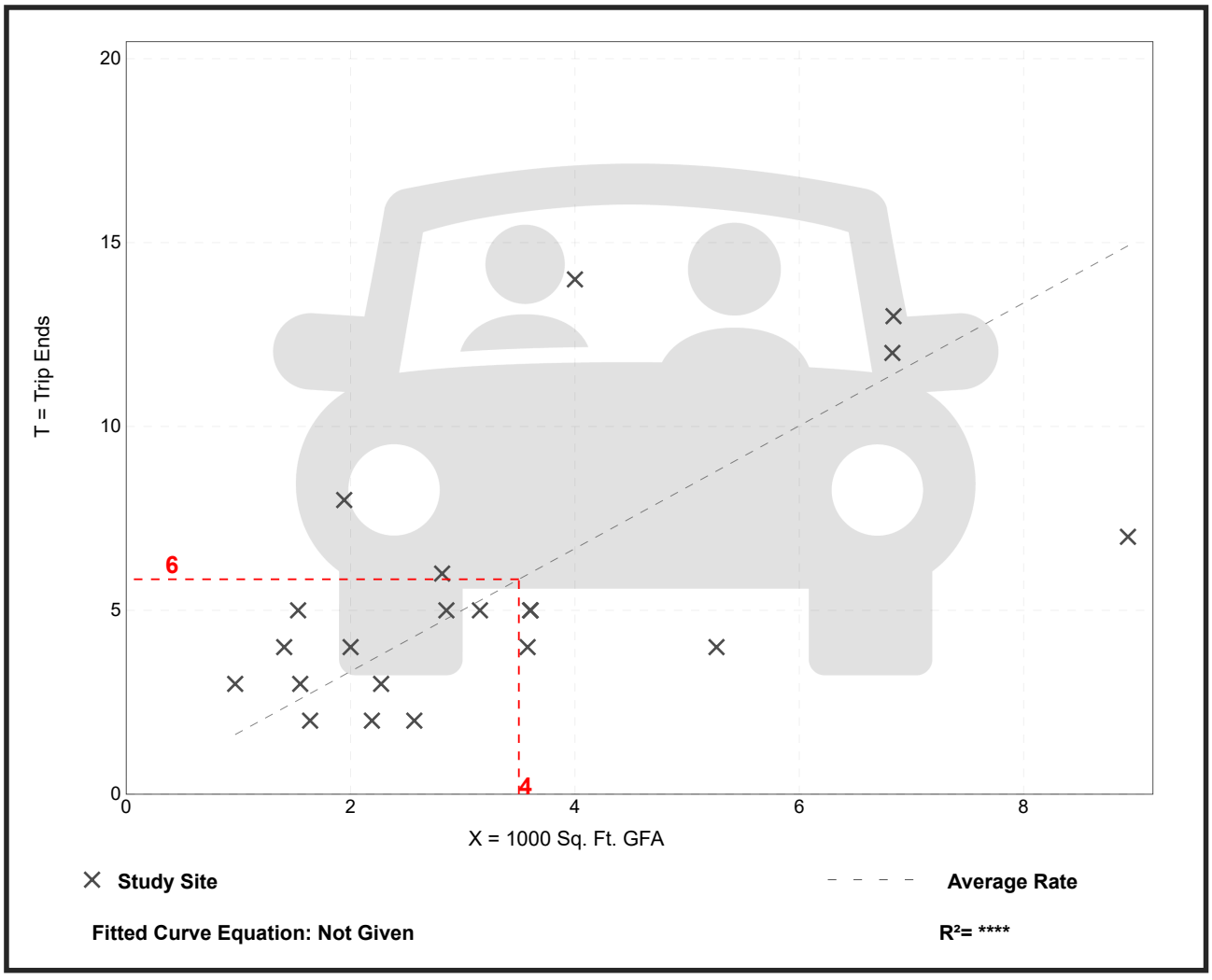
Small Office Building
(712)

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: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 82% entering, 18% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
1.67	0.76 - 4.12	0.88

Data Plot and Equation



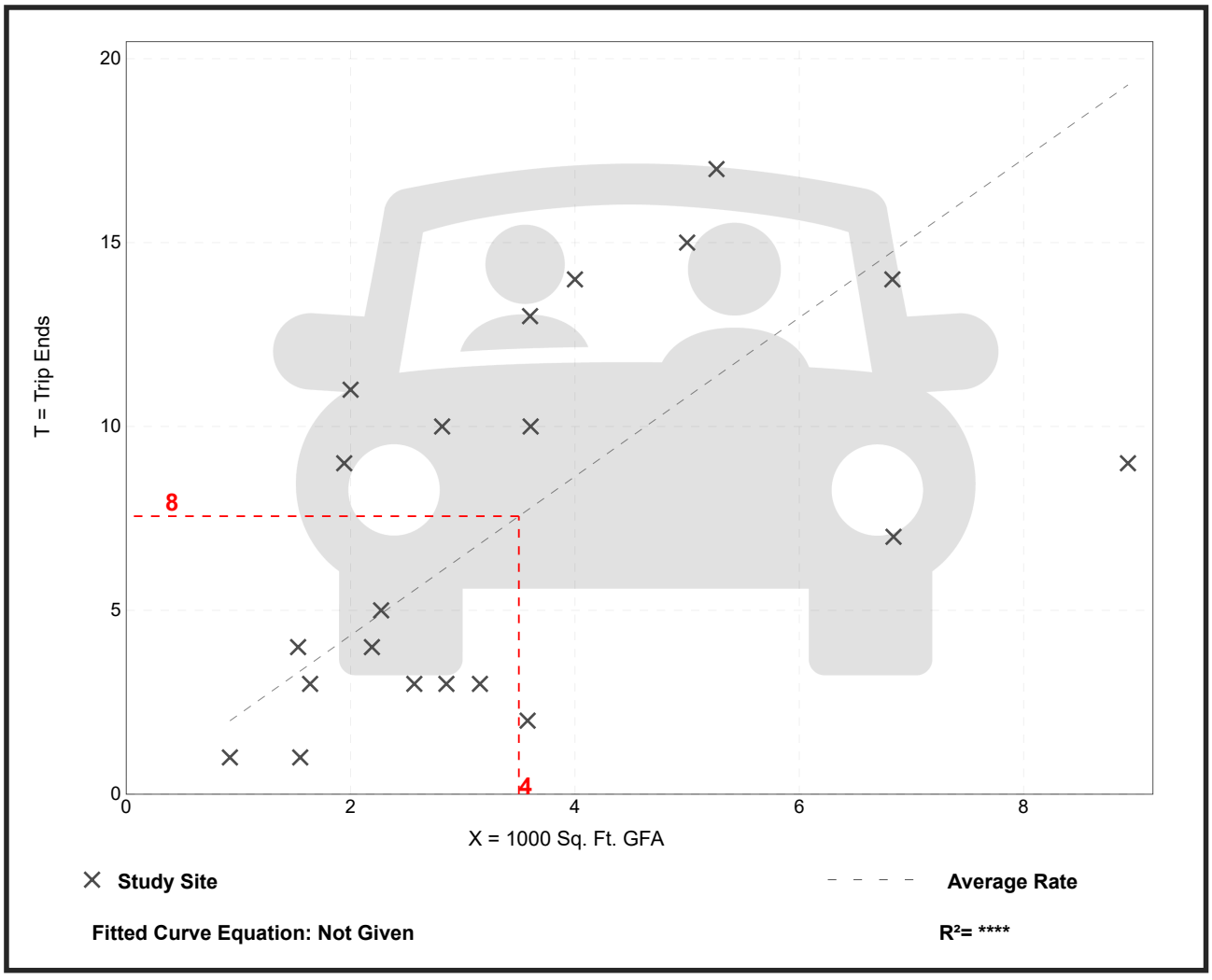
Small Office Building
(712)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 21
Avg. 1000 Sq. Ft. GFA: 3
Directional Distribution: 34% entering, 66% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.16	0.56 - 5.50	1.26

Data Plot and Equation



Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

Assumed Land Use (2): Small Office Building - ITE No. 712

Average Vehicle Trip Ends vs.: 1000 Sq. Ft. GFA

ITE Trip Generation Data collected on a: Weekday

AM Peak Hour:	1.67	= Average Rate	82	% Entering
			18	% Exiting
PM Peak Hour:	2.16	= Average Rate	34	% Entering
			66	% Exiting

Assumed Land Use (2): Small Office Building - ITE No. 712				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	3.5	6	5	1
PM Peak	3.5	8	3	5

Total Trips		
	Trips Entering	**Trips Exiting**
AM Peak	5	1
PM Peak	3	5

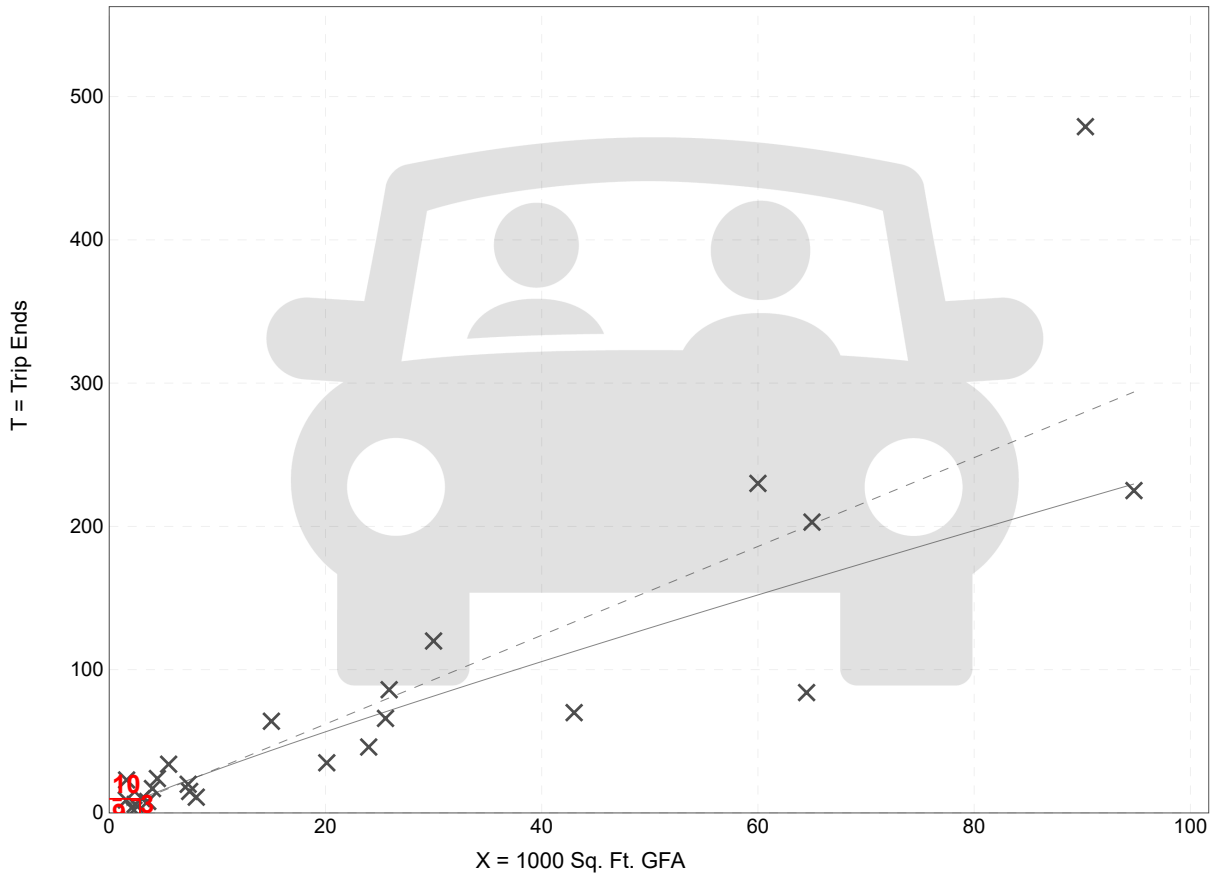
Medical-Dental Office Building - Stand-Alone
(720)

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: 24
Avg. 1000 Sq. Ft. GFA: 25
Directional Distribution: 79% entering, 21% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.10	0.87 - 14.30	1.49

Data Plot and Equation



Fitted Curve Equation: Ln(T) = 0.90 Ln(X) + 1.34 **R^2= 0.80**

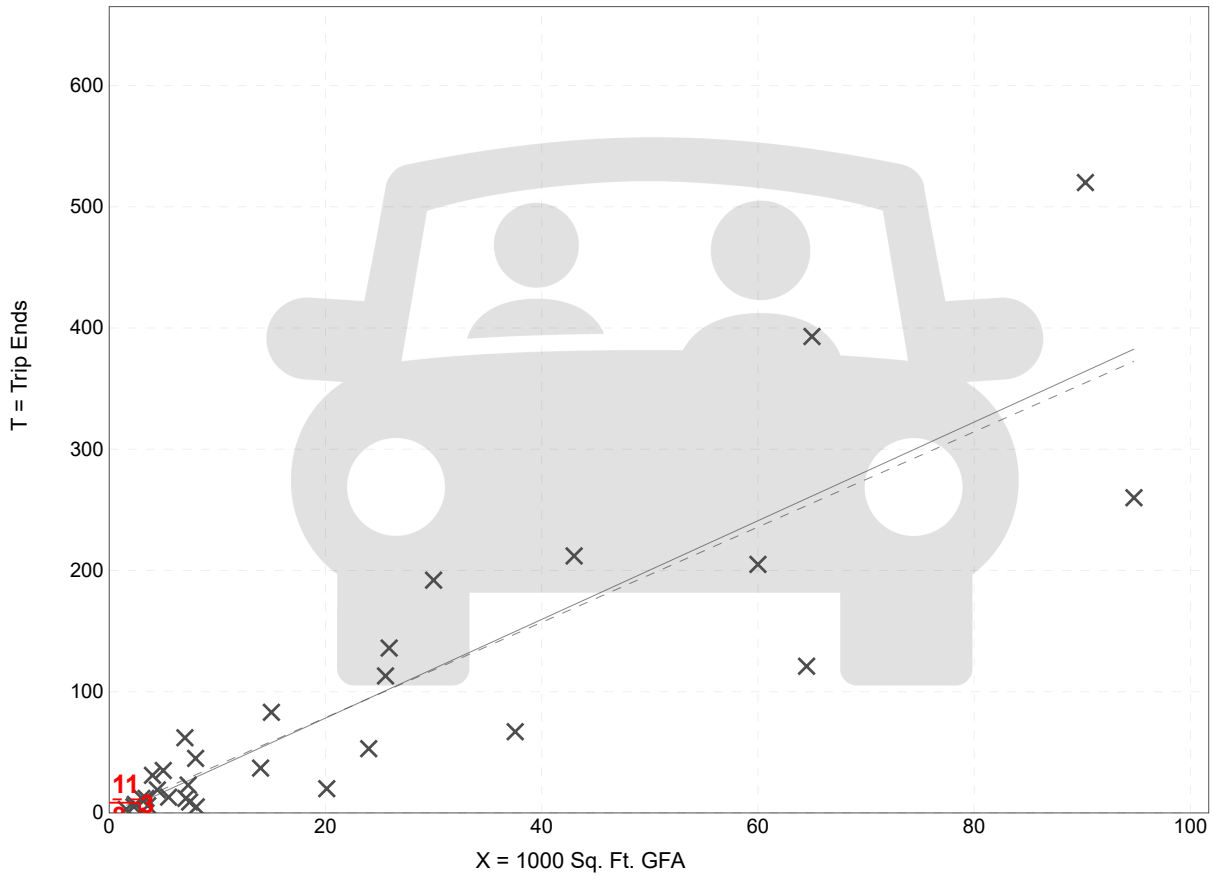
Medical-Dental Office Building - Stand-Alone
(720)

Vehicle Trip Ends vs: **1000 Sq. Ft. GFA**
On a: **Weekday,**
Peak Hour of Adjacent Street Traffic,
One Hour Between 4 and 6 p.m.
Setting/Location: **General Urban/Suburban**
Number of Studies: 30
Avg. 1000 Sq. Ft. GFA: 23
Directional Distribution: 30% entering, 70% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
3.93	0.62 - 8.86	1.86

Data Plot and Equation



Fitted Curve Equation: T = 4.07(X) - 3.17

R^2= 0.77

Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

Assumed Land Use (3): Medical-Dental Office Building - ITE No. 720

Average Vehicle Trip Ends vs.: 1000 Sq. Ft. GFA

ITE Trip Generation Data collected on a: Weekday

AM Peak Hour:	3.10	= Average Rate	79	% Entering
			21	% Exiting
PM Peak Hour:	3.93	= Average Rate	30	% Entering
			70	% Exiting

Assumed Land Use (3): Medical-Dental Office Building - ITE No. 720				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	2.85	9	7	2
PM Peak	2.85	11	3	8

Total Trips		
	Trips Entering	**Trips Exiting**
AM Peak	7	2
PM Peak	3	8

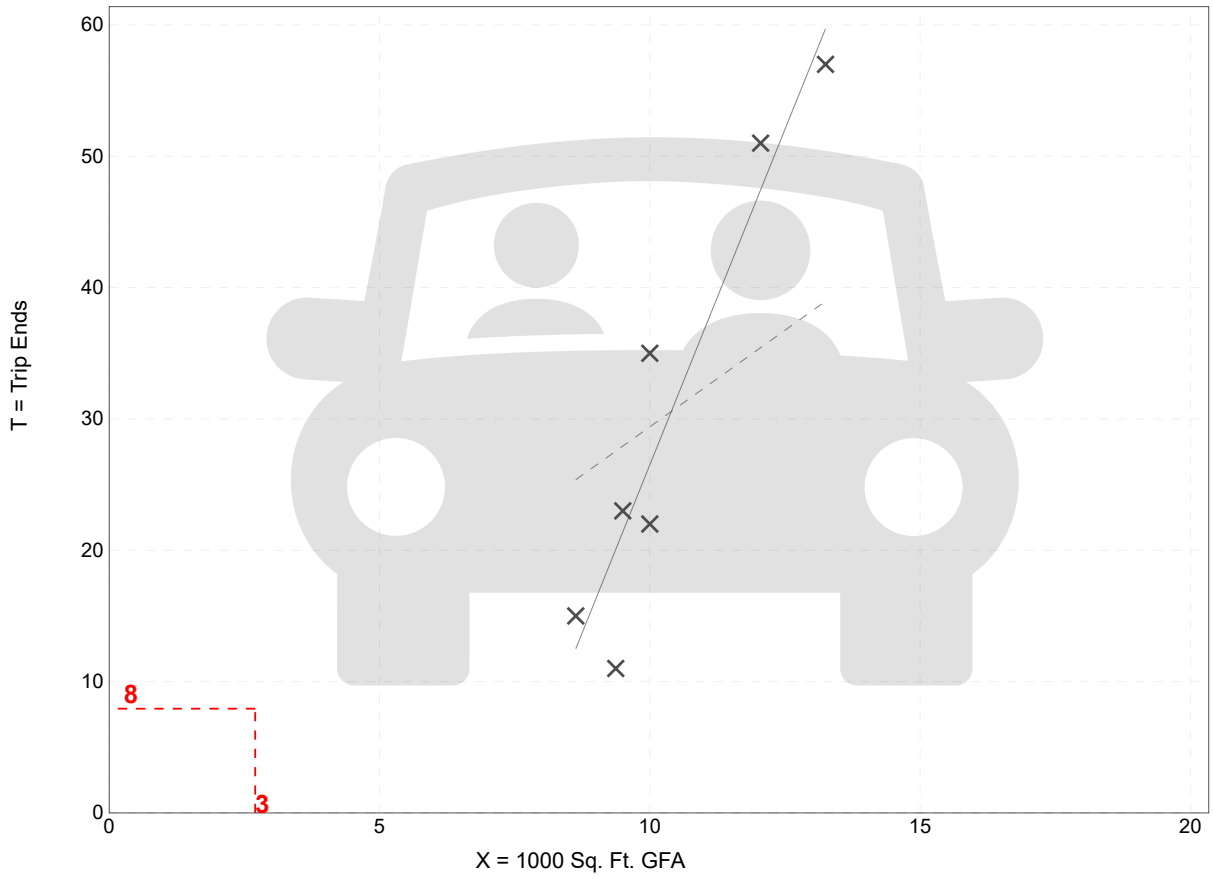
Pharmacy/Drugstore without Drive-Through Window
(880)

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: 7
Avg. 1000 Sq. Ft. GFA: 10
Directional Distribution: 65% entering, 35% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
2.94	1.17 - 4.30	1.25

Data Plot and Equation



Fitted Curve Equation: T = 10.22(X) - 75.70

R^2= 0.89

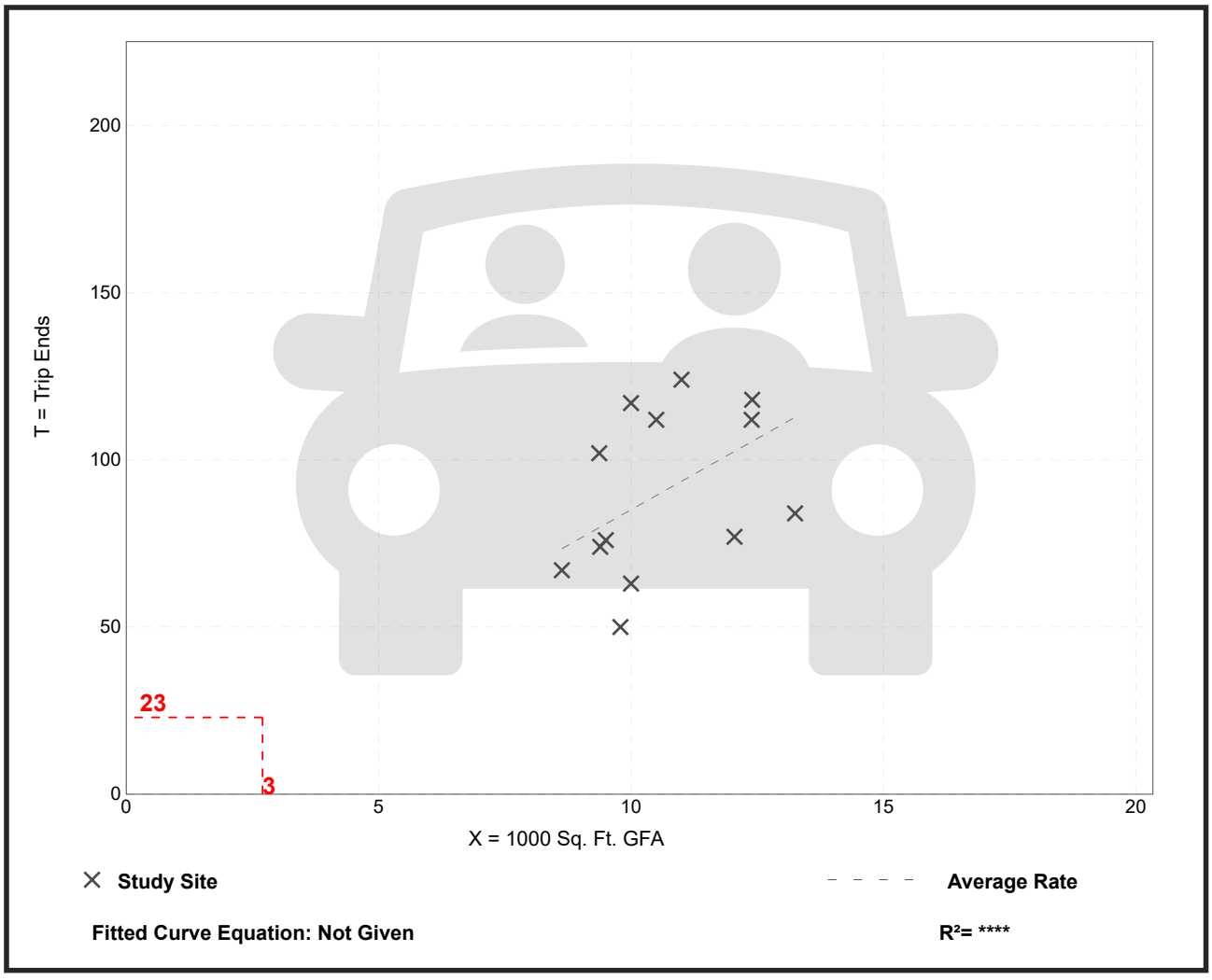
Pharmacy/Drugstore without Drive-Through Window
(880)

Vehicle Trip Ends vs:	**1000 Sq. Ft. GFA**
On a:	**Weekday,**
	Peak Hour of Adjacent Street Traffic,
	One Hour Between 4 and 6 p.m.
Setting/Location:	**General Urban/Suburban**
Number of Studies:	13
Avg. 1000 Sq. Ft. GFA:	11
Directional Distribution:	49% entering, 51% exiting

Vehicle Trip Generation per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	Standard Deviation
8.51	5.11 - 11.70	2.16

Data Plot and Equation



Fitted Curve Equation: Not Given

R^2= **

Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

Assumed Land Use (4): Pharmacy/Drugstore without Drive-Through Window - ITE No. 880

Average Vehicle Trip Ends vs.: 1000 Sq. Ft. GFA

ITE Trip Generation Data collected on a: Weekday

AM Peak Hour:	2.94	= Average Rate	65	% Entering
			35	% Exiting
PM Peak Hour:	8.51	= Average Rate	49	% Entering
			51	% Exiting

Assumed Land Use (4): Pharmacy/Drugstore without Drive-Through Window - ITE No. 880				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	2.7	8	5	3
PM Peak	2.7	23	11	12

Total Trips		
	Trips Entering	**Trips Exiting**
AM Peak	5	3
PM Peak	11	12

Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

ITE Trip Generation Data collected on a: Weekday

Assumed Land Use (1): Multifmaily Housing (Mid-Rise) - ITE No. 221				
	Dwelling Units	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	24	9	2	7
PM Peak	24	9	6	3

Assumed Land Use (2): Small Office Building - ITE No. 712				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	3.5	6	5	1
PM Peak	3.5	8	3	5

Assumed Land Use (3): Medical-Dental Office Building - ITE No. 720				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	2.85	9	7	2
PM Peak	2.85	11	3	8

Assumed Land Use (4): Pharmacy/Drugstore without Drive-Through Window - ITE No. 880				
	1000 Sq. Ft. GFA	**Trips Generated**	**Trips Entering**	**Trips Exiting**
AM Peak	2.7	8	5	3
PM Peak	2.7	23	11	12

Total Trips		
	Trips Entering	**Trips Exiting**
AM Peak	19	12
PM Peak	23	28

Appendix C

DETAILED SYNCHRO RESULTS

Casgrain Drive at Cabana Road West

Site Access at Cabana Road West

Site Access at Casgrain Drive

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	669	24	16	659	38	29
Future Vol, veh/h	669	24	16	659	38	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	727	26	17	716	41	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	753	0	1133	377
Stage 1	-	-	-	-	740	-
Stage 2	-	-	-	-	393	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	853	-	196	621
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	651	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	853	-	191	621
Mov Cap-2 Maneuver	-	-	-	-	191	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	635	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.44	22.89
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	273	-	-	85	-
HCM Lane V/C Ratio	0.266	-	-	0.02	-
HCM Control Delay (s/veh)	22.9	-	-	9.3	0.2
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	1	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	694	26	27	671	29	31
Future Vol, veh/h	694	26	27	671	29	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	7
Mvmt Flow	754	28	29	729	32	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	783	0	1192	391
Stage 1	-	-	-	-	768	-
Stage 2	-	-	-	-	423	-
Critical Hdwy	-	-	4.14	-	6.84	7.04
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.37
Pot Cap-1 Maneuver	-	-	831	-	180	594
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	628	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	831	-	172	594
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	418	-
Stage 2	-	-	-	-	601	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.74	22.39
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	272	-	-	139	-
HCM Lane V/C Ratio	0.24	-	-	0.035	-
HCM Control Delay (s/veh)	22.4	-	-	9.5	0.4
HCM Lane LOS	C	-	-	A	A
HCM 95th %tile Q(veh)	0.9	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	674	29	25	659	44	29
Future Vol, veh/h	674	29	25	659	44	29
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	733	32	27	716	48	32

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	764	0	1161	382
Stage 1	-	-	-	-	748	-
Stage 2	-	-	-	-	412	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	845	-	188	616
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	636	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	845	-	181	616
Mov Cap-2 Maneuver	-	-	-	-	181	-
Stage 1	-	-	-	-	428	-
Stage 2	-	-	-	-	611	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0.68	25.78
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	251	-	-	132	-
HCM Lane V/C Ratio	0.316	-	-	0.032	-
HCM Control Delay (s/veh)	25.8	-	-	9.4	0.4
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.3	-	-	0.1	-

Intersection	
Int Delay, s/veh	1.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	700	32	38	671	43	31
Future Vol, veh/h	700	32	38	671	43	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	7
Mvmt Flow	761	35	41	729	47	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	796	0	1226	398
Stage 1	-	-	-	-	778	-
Stage 2	-	-	-	-	447	-
Critical Hdwy	-	-	4.14	-	6.84	7.04
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.37
Pot Cap-1 Maneuver	-	-	822	-	171	588
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	611	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	822	-	160	588
Mov Cap-2 Maneuver	-	-	-	-	160	-
Stage 1	-	-	-	-	413	-
Stage 2	-	-	-	-	573	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	1.03	28.77
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	230	-	-	193	-
HCM Lane V/C Ratio	0.349	-	-	0.05	-
HCM Control Delay (s/veh)	28.8	-	-	9.6	0.5
HCM Lane LOS	D	-	-	A	A
HCM 95th %tile Q(veh)	1.5	-	-	0.2	-

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	698	5	0	684	0	6
Future Vol, veh/h	698	5	0	684	0	6
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	759	5	0	743	0	7

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	382
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	616
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	616
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	10.91
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	616	-	-	-
HCM Lane V/C Ratio	0.011	-	-	-
HCM Control Delay (s/veh)	10.9	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0	-	-	-

Intersection	
Int Delay, s/veh	0.1

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	725	6	0	709	0	14
Future Vol, veh/h	725	6	0	709	0	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	788	7	0	771	0	15

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	-	-	-	397
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.32
Pot Cap-1 Maneuver	-	-	0	-	0	602
Stage 1	-	-	0	-	0	-
Stage 2	-	-	0	-	0	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	-	-	-	602
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s/v	0	0	11.13
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBT
Capacity (veh/h)	602	-	-	-
HCM Lane V/C Ratio	0.025	-	-	-
HCM Control Delay (s/veh)	11.1	-	-	-
HCM Lane LOS	B	-	-	-
HCM 95th %tile Q(veh)	0.1	-	-	-

Intersection	
Int Delay, s/veh	1.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	6	67	0	14	40
Future Vol, veh/h	0	6	67	0	14	40
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	7	73	0	15	43

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	147	73	0	0	73	0
Stage 1	73	-	-	-	-	-
Stage 2	74	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	846	989	-	-	1527	-
Stage 1	950	-	-	-	-	-
Stage 2	949	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	837	989	-	-	1527	-
Mov Cap-2 Maneuver	837	-	-	-	-	-
Stage 1	950	-	-	-	-	-
Stage 2	939	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.66	0	1.91
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	989	467	-
HCM Lane V/C Ratio	-	-	0.007	0.01	-
HCM Control Delay (s/veh)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Intersection	
Int Delay, s/veh	1.7

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	14	60	0	17	53
Future Vol, veh/h	0	14	60	0	17	53
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	15	65	0	18	58

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	160	65	0	0	65	0
Stage 1	65	-	-	-	-	-
Stage 2	95	-	-	-	-	-
Critical Hdwy	6.42	6.22	-	-	4.12	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	-	-	2.218	-
Pot Cap-1 Maneuver	831	999	-	-	1537	-
Stage 1	957	-	-	-	-	-
Stage 2	929	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	821	999	-	-	1537	-
Mov Cap-2 Maneuver	821	-	-	-	-	-
Stage 1	957	-	-	-	-	-
Stage 2	918	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s/v	8.66	0	1.79
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	999	437	-
HCM Lane V/C Ratio	-	-	0.015	0.012	-
HCM Control Delay (s/veh)	-	-	8.7	7.4	0
HCM Lane LOS	-	-	A	A	A
HCM 95th %tile Q(veh)	-	-	0	0	-

Appendix D

ITE PARKING GENERATION MANUAL – 6TH EDITION

REFERENCES

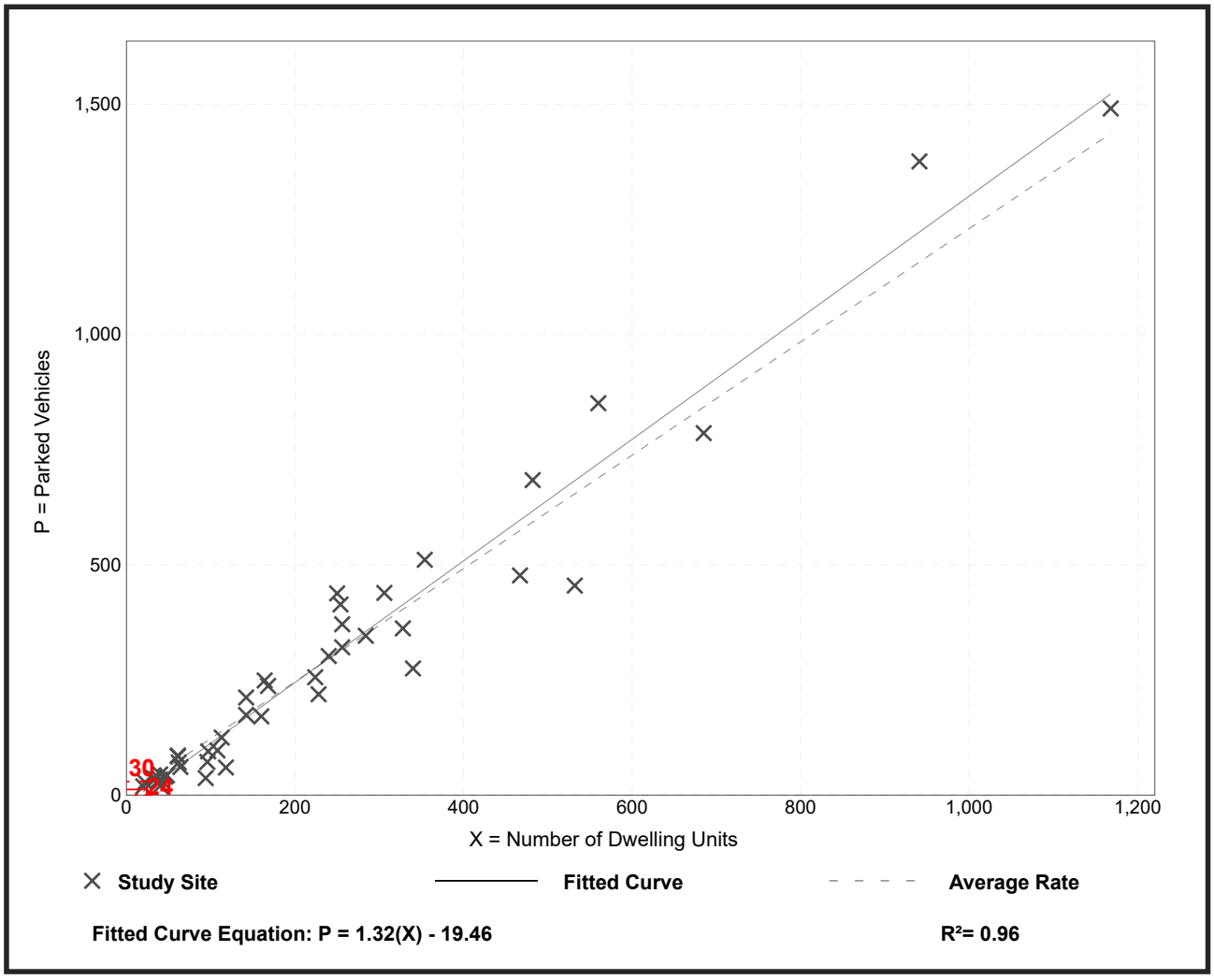
Multifamily Housing - 2+ BR (Mid-Rise) - Not Close to Rail Transit
(221)

Peak Period Parking Demand vs: **Dwelling Units**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 44
Avg. Num. of Dwelling Units: 231

Peak Period Parking Demand per Dwelling Unit

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.23	0.39 - 1.75	0.98 / 1.45	1.15 - 1.31	0.27 (22%)

Data Plot and Equation



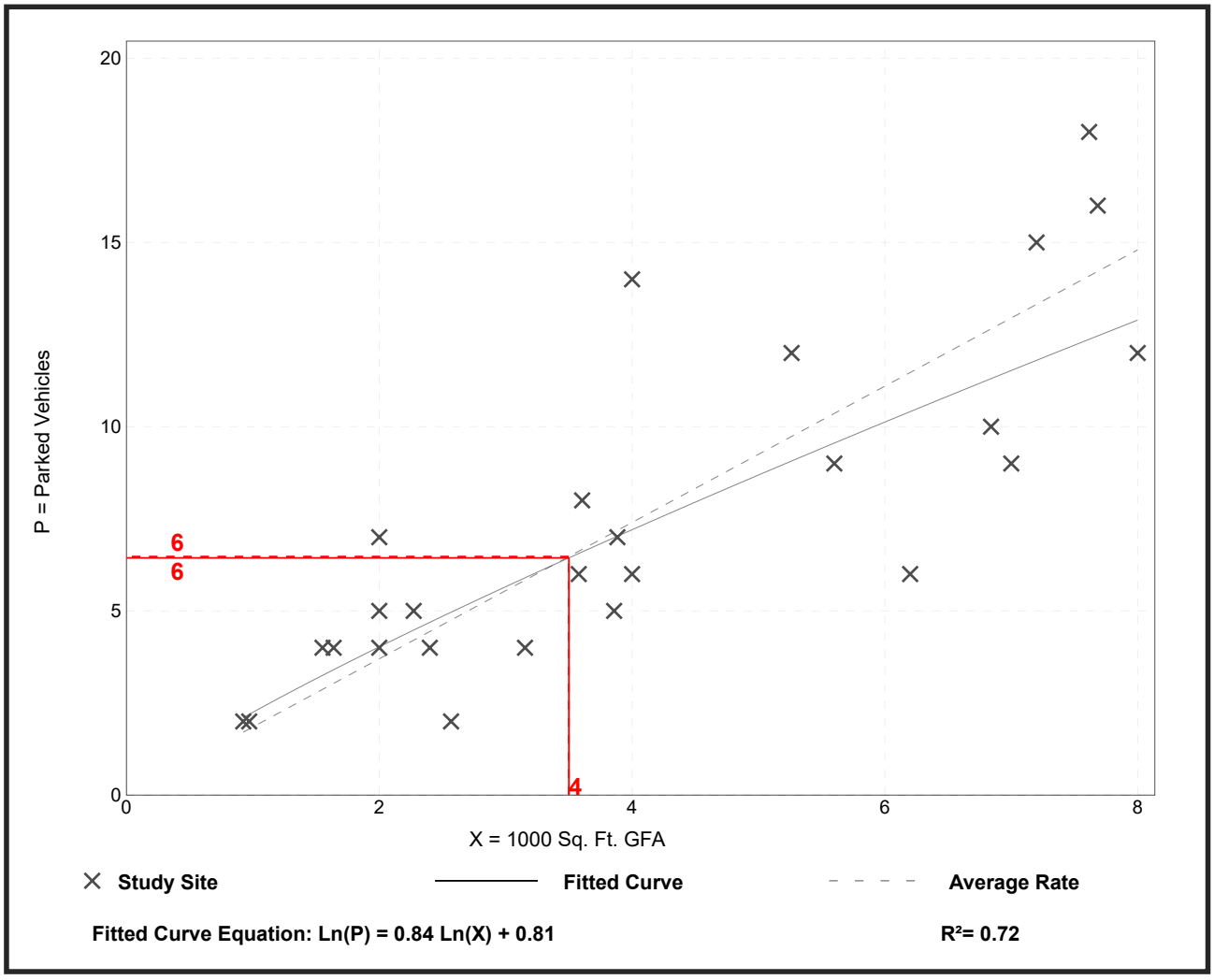
Small Office Building
(712)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 26
Avg. 1000 Sq. Ft. GFA: 4.0

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
1.85	0.78 - 3.50	1.60 / 2.50	1.61 - 2.09	0.62 (34%)

Data Plot and Equation



Fitted Curve Equation: Ln(P) = 0.84 Ln(X) + 0.81

R^2= 0.72

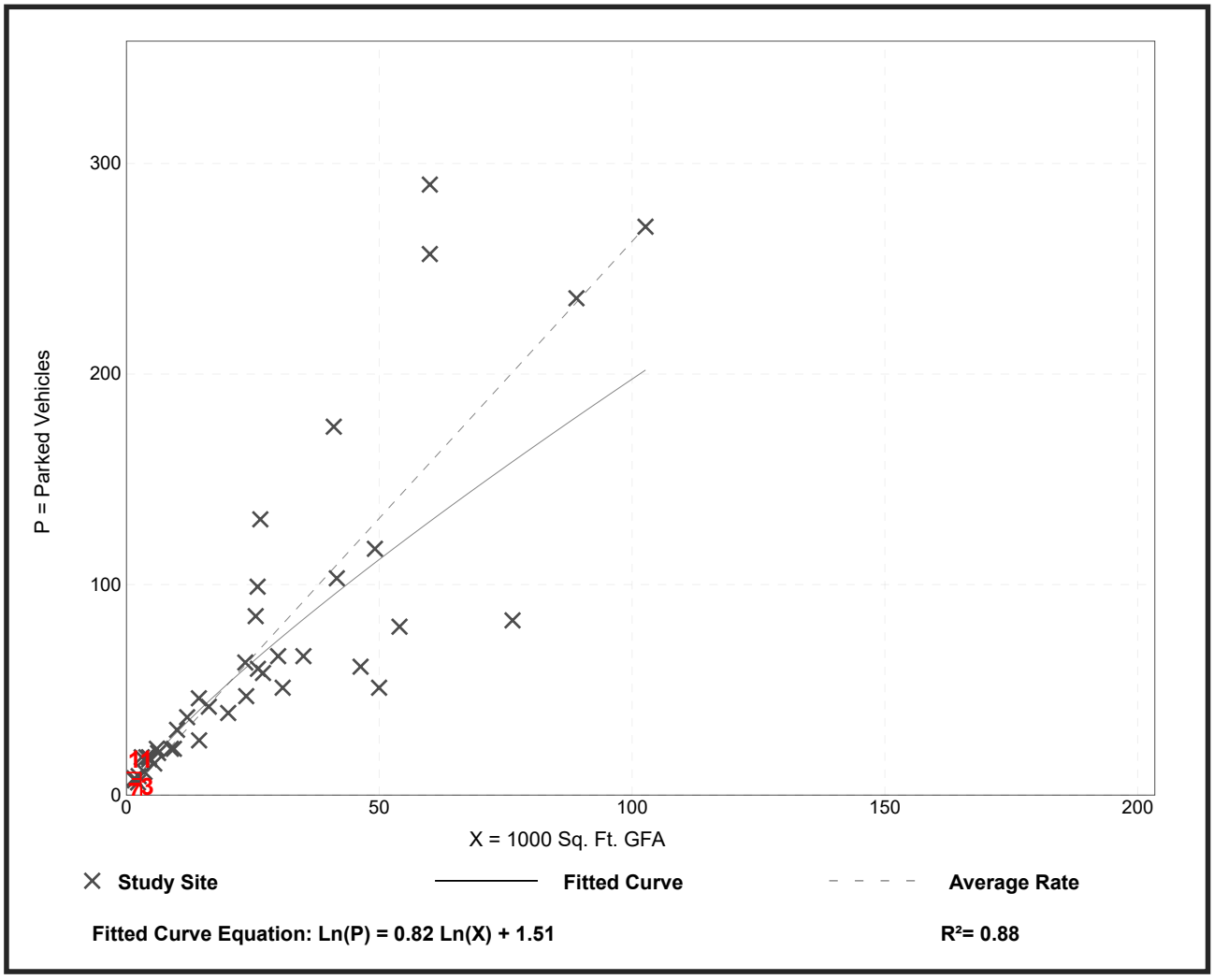
Medical-Dental Office Building - Standalone
(720)

Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 41
Avg. 1000 Sq. Ft. GFA: 27

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.63	1.02 - 5.97	2.38 / 4.28	2.28 - 2.98	1.15 (44%)

Data Plot and Equation



Fitted Curve Equation: Ln(P) = 0.82 Ln(X) + 1.51

R^2= 0.88

Pharmacy/Drugstore without Drive-Through Window
(880)

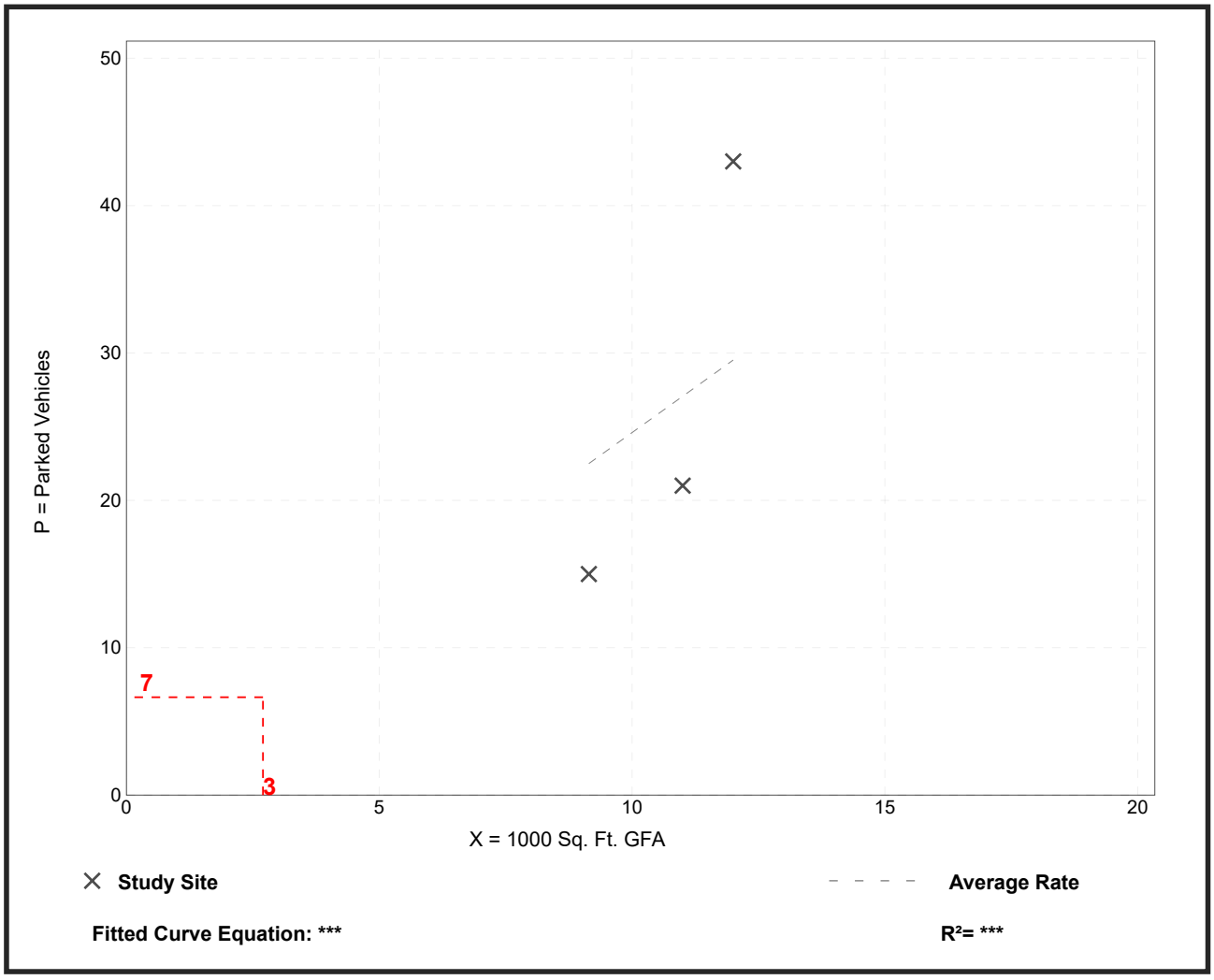
Peak Period Parking Demand vs: **1000 Sq. Ft. GFA**
On a: **Weekday (Monday - Friday)**
Setting/Location: **General Urban/Suburban**
Number of Studies: 3
Avg. 1000 Sq. Ft. GFA: 11

Peak Period Parking Demand per 1000 Sq. Ft. GFA

Average Rate	Range of Rates	33rd / 85th Percentile	95% Confidence Interval	Standard Deviation (Coeff. of Variation)
2.46	1.64 - 3.58	1.73 / 3.58	***	1.07 (43%)

Data Plot and Equation

Caution – Small Sample Size



Fitted Curve Equation: ***

R^2= ***

Proposed Site Development Trip Generation and Distribution

Project: 1175 Cabana Road West Mixed-Use Development

Site: Windsor, Ontario

ITE Peak Period Parking Demand collected on a: Weekday

Assumed Land Use (1): Multifamily Housing (Mid-Rise) - ITE No. 221

Peak Period Parking Demand vs.: Dwelling Units

Weekday: 1.23 = Average Rate

Multifamily Housing (Mid-Rise) - ITE No. 221		
	Dwelling Units	**Parking Required**
Weekday	24	30

Assumed Land Use (2): Small Office Building - ITE No. 712

Peak Period Parking Demand vs.: 1000 Sq. Ft. GFA

Weekday: 1.85 = Average Rate

Small Office Building - ITE No. 712		
	1000 Sq. Ft. GFA	**Parking Required**
Weekday	3.5	6

Assumed Land Use (3): Medical-Dental Office Building - ITE 720

Peak Period Parking Demand vs.: 1000 Sq. Ft. GFA

Weekday: 2.63 = Average Rate

Medical-Dental Office Building - ITE 720		
	1000 Sq. Ft. GFA	**Parking Required**
Weekday	2.85	7

Assumed Land Use (4): Pharmacy w/out Drive-Through Window - ITE 880

Peak Period Parking Demand vs.: 1000 Sq. Ft. GFA

Weekday: 2.46 = Average Rate

Pharmacy w/out Drive-Through Window - ITE 880		
	1000 Sq. Ft. GFA	**Parking Required**
Weekday	2.7	7

Total Peak Parking Demand	
	Total Parking Spaces Required
Weekday	50

Appendix E

SIGHT LINE CALCULATIONS

Site Access at Cabana Road West

Site Access at Casgrain Drive

24-1601: 1175 Cabana Rd. W. Mixed-Used, Windsor, Ontario - Sight Line Analysis

Design Intersection Sight Distance (TAC Geometric Design Guide for Canadian Roads)

Design Speed: 60km/h (Posted Speed Limit = 50 km/h)

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

Intersection Stopping Distance **(ISD)** = 0.278 V_{major} t_g

Where:

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

ISD $_{passenger\ car}$ (left turn from stop) = 0.278 x 60 x 7.5 = **125 m**

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

ISD $_{passenger\ car}$ (right turn from stop) = 0.278 x 60 x 6.5 = **108 m**

24-1601: 1175 Cabana Rd. W. Mixed-Used, Windsor, Ontario - Sight Line Analysis

Design Intersection Sight Distance (TAC Geometric Design Guide for Canadian Roads)

Design Speed: 50km/h (Posted Speed Limit = 40 km/h)

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

Intersection Stopping Distance **(ISD)** = 0.278 V_{major} t_g

Where:

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

ISD $_{passenger\ car}$ (left turn from stop) = 0.278 x 50 x 7.5 = **104 m**

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

ISD $_{passenger\ car}$ (right turn from stop) = 0.278 x 50 x 6.5 = **90 m**