



**IBI Group**  
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November 12, 2013

Mr. Ed Blaszyński  
Project Manager  
Infrastructure Approvals Development Review Urban Services Branch  
Planning and Growth Management Department  
City of Ottawa  
110 Laurier Avenue West  
Ottawa, ON  
K1P 1J1

Dear Mr. Blaszyński:

**RE: 4401 FALLOWFIELD ROAD TIS  
ADDENDUM LETTER**

**1.0 BACKGROUND**

The following addendum letter has been provided in support of the 4401 Fallowfield Road TIS Transportation Impact Study submitted in May 2013 on behalf of DCR Phoenix. The TIS followed the City of Ottawa Transportation Impact Assessment Guidelines (2006); all parameters and assumptions from the report were agreed to by City staff.

On August 8, 2013, the City responded with the following two comments to the TIS:

1. The TIS neglects other developments in vicinity – Regional's Citi Gate development, which have obtained OPA and ZBA approval, and subdivision approval is imminent. The TIS should take Citi Gate development into account.
2. O'Keefe Court is a 2-lane local road. Widening part of O'Keefe to a 4-lane in order to accommodate the proposed density is not an ideal solution, considering its conflicting abutting uses. The TIS should examine the development capacity for the subject lands based on O'Keefe remaining as a 2-lane road.

The client team responded to development application comments on September 12, 2013 and a meeting was held with the City on September 26, 2013 to discuss these comments. From this meeting, it was agreed that the following addendum letter be provided to address the TIS comments from the City. In addition, the meeting resulted in some modifications to the proposed site plan. Therefore, the following addendum letter will be based on the new density plan, which has been provided in the Appendix.

**2.0 SCOPE OF WORK**

To properly address the two TIS comments from the City, IBI Group (IBI) completed additional trip generation analysis to determine the 2-lane capacity limits of O'Keefe Court in three different density scenarios:

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1. Using the densities from the May 2013 TIS;
2. Using the densities allowed under existing zoning; and,
3. Using the new reduced density plan.

All three scenarios also added the estimated Regional Group development traffic on Fallowfield Road as required. Please note, an error was found in the density calculation for one block in the May 2013 TIS. This error has been addressed in the following addendum. Therefore, the trip generation results for Scenario 1 will differ slightly from the corresponding results in the May TIS.

The intersection capacity analysis was updated for each scenario (using Synchro v7.0), focusing specifically on the development accesses and the O’Keefe Court and Fallowfield Road intersection.

**3.0 TRAFFIC GENERATION**

The updated trip generation for each scenario was determined using standard peak hour trip generation rates from the ITE Manual, “Trip Generation”, 9<sup>th</sup> Edition, 2012, published by the Institute of Transportation Engineers (ITE), Washington. The resulting traffic generation for each scenario has been provided in the Appendix. A summary of the results is provided in Table 1 below.

**TABLE 1 – Traffic Generation by Scenario**

Scenario	Period	Traffic Generation (vph)		
		IN	OUT	TOTAL
1: May 2013 TIS Densities	AM	897	234	1,131
	PM	352	994	1,346
2: Permitted Density Under Current Zoning	AM	1,159	295	1,454
	PM	420	1,175	1,594
3: New Density Proposal	AM	780	202	983
	PM	316	910	1,226

vph = vehicles per hour.

The key result from Table 1 was that Scenario 2: Permitted Density Under Current Zoning, generates more traffic than the other two scenarios. Scenario 1: May 2013 TIS Densities, was already shown to trigger the widening of O’Keefe Court to a 4-lane cross section to accommodate expected development traffic. Therefore, developing to what is permitted under the current zoning would also trigger this requirement.

Scenario 3: The New Density Proposal, was indicated to reduce the amount of traffic generated by approximately 10% from the May 2013 TIS estimates in both morning and afternoon peak hour periods. Therefore, this scenario was analyzed further to determine whether the 4-lane widening of O’Keefe Court would likewise be triggered.

**4.0 SCENARIO 3 ANALYSIS**

The following section analyzes the impact of the new density proposal on the adjacent road network.

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### Base Road Network

The base road network assumes O'Keefe Court is a 2-lane roadway. MTO left-turn warrant procedure for unsignalized intersections was reviewed and confirmed that an auxiliary left-turn lane would be required at both Access 1 and Access 3 along the westbound approach. The results are shown in Table 2.

**TABLE 2 – Critical Peak Auxiliary Left-Turn Lane Analysis Results at Unsignalized Intersections**

Intersection	Movement	Design Speed (km/h)	Left-Turn Volume (vph)	Approach Volume (vph)	Opposing Volume (vph)	Left-Turn Storage (m)
O'Keefe Court and Access 1	WBL	60	236	869	110	40
O'Keefe Court and Access 3	WBL	60	418	633	30	25

Note: Left-turn storage does not include taper.

At this time, there is no formal City or MTO warrant procedure governing the application of auxiliary right-turn lanes. Referring to TAC standards, Section 2.3.5.2 suggests an auxiliary right-turn lane be considered at signalized intersections without a separate signal indication when the right-turn volume is 10% to 20% of the total approach volume.

In certain cases where approach volumes are low (e.g. site accesses), flaring or widening at the intersection without the addition of an auxiliary lane may be sufficient to reduce right-turn and through vehicle conflict. It is recommended that the type and length of the auxiliary right-turn lanes at all new intersections should be reviewed at detailed design to ensure City standards are met.

The O'Keefe Court and Fallowfield Road intersection configuration was assumed to be as follows:

- 4-lane Fallowfield Road;
- Traffic Control Signal;
- Eastbound right-turn lane with potential for channelization and merge lane (to be confirmed at detailed design);
- Double left-turn lane on the eastbound approach;
- Single northbound and southbound left-turn lanes (on Fallowfield Road);
- Left-turn lane on westbound approach as per the Cobblehill Drive design by Tartan.

These assumptions were based on the results from the May 2013 TIS. The double left-turn lane was removed and the intersection was assessed with a single northbound left-turn lane.

The above base network assumptions were applied to the Intersection Capacity Analysis in the following section.

### Intersection Capacity Analysis

The intersection capacity analysis focused directly on the development accesses and the O'Keefe Court and Fallowfield Road intersection in the Future (2022) Background plus Site Generation Condition.

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Table 2 summarizes the intersection LOS results for the O'Keefe Court intersections during the morning and afternoon peak hour periods. The worst/ critical observed LOS movement at each study area intersection was recorded; if the LOS was E or lower (a v/c ratio greater than 0.90) it was compared to the intersection LOS. If the intersection LOS was also indicated to be below City standards, appropriate roadway modifications or measures were recommended.

Synchro analysis output files have been provided in the Appendix.

**TABLE 3 – Scenario 3: Intersection Capacity Analysis - Future (2022) Background plus Site Generated Traffic**

INTERSECTION	INTERSECTION CONTROL	PEAK HOUR	V/C RATIO		LEVEL OF SERVICE	
			CRITICAL MOVEMENT	INTERSECTION	CRITICAL MOVEMENT	INTERSECTION
Fallowfield Road and O'Keefe Court	Traffic Signal	AM	0.92	0.91	E	C
		PM	0.81	0.78	D	C
O'Keefe Court and Foxtail Road	SB Stop	AM	0.54	-	C	-
		PM	0.58	-	C	-
O'Keefe Court and Access 1	NB Stop	AM	0.69	-	A	-
		PM	0.68	-	D	-
Fallowfield Road and Access 2 (RIRO)	EB Stop	AM	0.43	-	A	-
		PM	0.40	-	B	-
O'Keefe Court and Access 3	NB Stop	AM	0.28	-	A	-
		PM	0.56	-	B	-

The intersection capacity results in Table 3 show that the Fallowfield Road and O'Keefe Court intersection operation slightly exceeds City standards in the morning peak hour. All other intersections were shown to operate within City requirements with the updated density proposal.

The sensitivity of the intersection results was assessed. All inbound and outbound development traffic on O'Keefe Court was reduced by 5% and the intersection was reassessed. The results indicated the intersection operated within City standards (critical v/c ratio 0.89). At a 10% reduction, the v/c ratio improves to 0.87. The conversion of 5% of development traffic equates to less than 3% of the total site density since not all site generated trips use O'Keefe Court to access/ egress the site.

The conservative approach taken in the overall traffic analysis (outlined in detail in the May 2013 TIS report) makes it reasonable to assume the results in Table 3 are the worst case scenario. Beyond the proposed development and the adjacent Simplicity Lands (to the west), there are no plans for any future development to access off O'Keefe Court at this time. Therefore, overdesigning this intersection may not be cost effective over the long term.

## 5.0 CLOSING

The overall conclusion of this Addendum Letter is that the new site plan proposed by DCR Phoenix for the 4401 Fallowfield Road development can be accommodated by the adjacent road network without widening O'Keefe Court to 4-lanes.

The key results of this addendum letter are as follows:

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- The current zoning permits densities that would trigger a 4-lane widening of O'Keefe Court.
- The new site plan proposed by DCR Phoenix is shown to generate the least amount of traffic of all scenarios analyzed;
- The Fallowfield Road and O'Keefe Court intersection was shown to operate slightly above the City limit using the new site plan traffic generation, however a less than 3% density reduction results in a level-of-service within City standards;
- The 4-lane widening of O'Keefe Court was not considered necessary to accommodate the new site plan;
- All access intersections are indicated to operate within City standards.

If you have any questions regarding the contents of this letter, please do not hesitate to contact undersigned at (613)-225-1311.

Yours Truly,

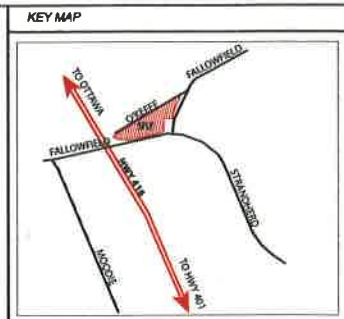
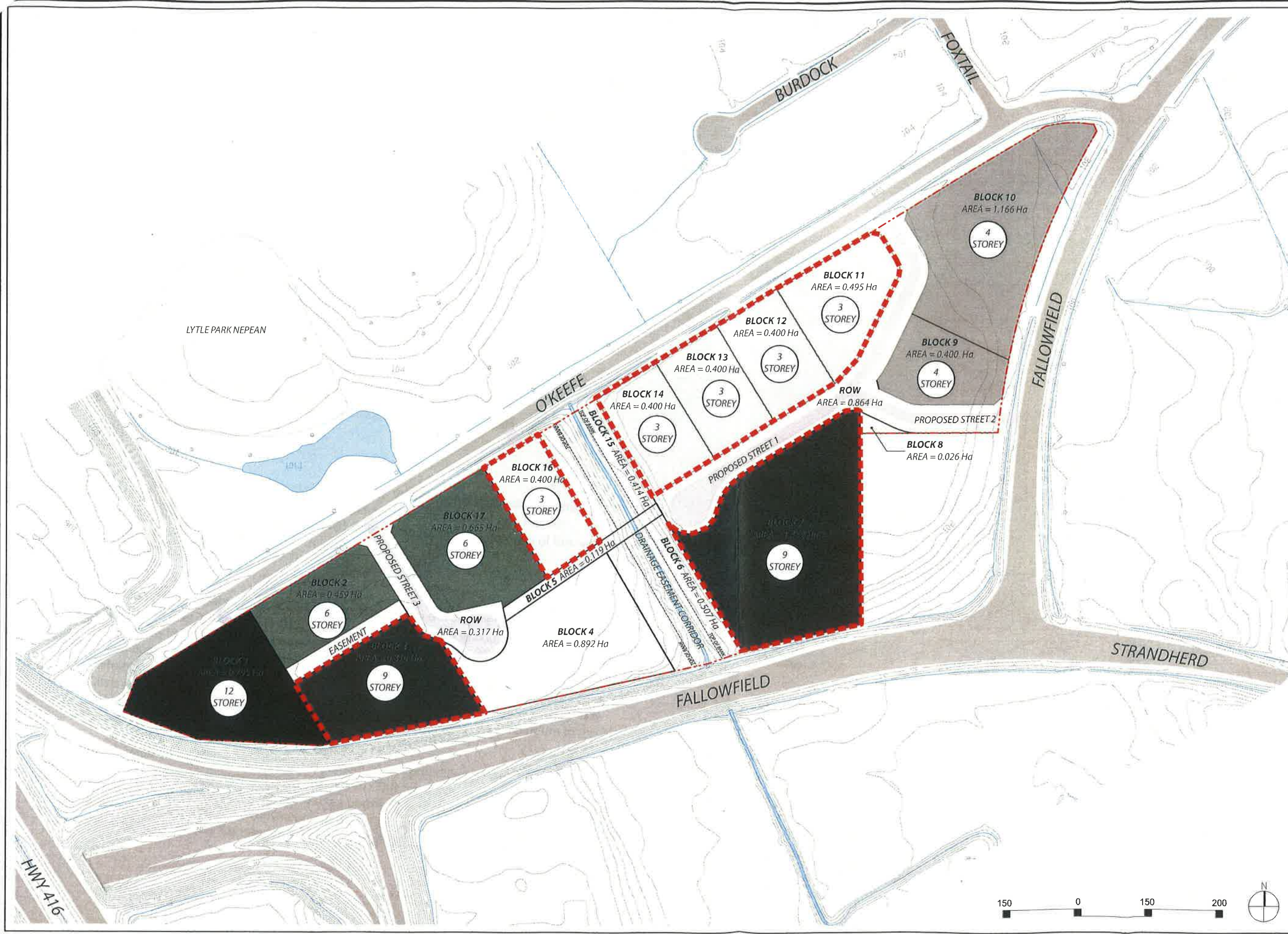
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Austin Shih, P.Eng.  
Project Engineer

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# APPENDIX



**LEGEND**

■ ■ ■ Revised Height Strategy

NO.	DATE	DESCRIPTION	BY
A	06/09/13	Revised Height Strategy	ML

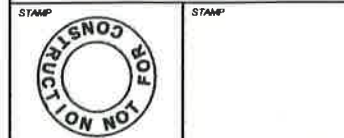
REVISIONS

CLIENT:  
2116885 ONTARIO LTD.

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PROJECT TITLE:  
4401 FALLOWFIELD ROAD

DRAWING TITLE:  
HEIGHT STRATEGY



DESIGNED ML/BL DRAWN BL CHECKED ML  
SCALE 1:2500 DATE September, 2013  
PROJECT NUMBER 1412252-001 DWG. NUMBER L1



2013/09/03 11:45 AM  
 Z:\Users\ML\Documents\1412252-001\1412252-001\1412252-001.dwg  
 User: ML  
 Plot: 1412252-001.dwg

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Scenario 1 - May 2013 TIS Densities: Traffic Generation

BLOCK	LAND USE	SIZE	SOURCE	RATE	PERIOD	SPLIT		GENERATED TRAFFIC (vph)		
						IN	OUT	IN	OUT	TOTAL
<b>West of Drain</b>										
1	Hotel	60 employees	ITE 310	Formula †	AM	60%	40%	44	29	74
					PM	54%	46%	40	34	74
2	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
3	General Office	149,134 sq.ft.	ITE 710	Formula †	AM	88%	12%	232	32	263
					PM	17%	83%	42	204	245
16	General Office	50,504 sq.ft.	ITE 710	Formula †	AM	88%	12%	97	13	111
					PM	17%	83%	23	112	135
17	General Office	63,130 sq.ft.	ITE 710	Formula †	AM	88%	12%	117	16	132
					PM	17%	83%	25	124	149
<b>East of Drain</b>										
7	Salvation Army *	155,904 sq.ft..	ITE 495 & 560	Formula **	AM	61%	39%	124	79	203
					PM	43%	57%	104	138	243
9	General Office	41,355 sq.ft.	ITE 710	Formula †	AM	88%	12%	83	11	94
					PM	17%	83%	21	104	125
10	Hotel	78 employees	ITE 310	Formula †	AM	60%	40%	49	33	82
					PM	54%	46%	48	41	89
11	General Office	38,427 sq.ft.	ITE 710	Formula †	AM	88%	12%	78	11	89
					PM	17%	83%	21	101	121
12	General Office	28,912 sq.ft.	ITE 710	Formula †	AM	88%	12%	62	9	71
					PM	17%	83%	19	92	111
13	General Office	28,912 sq.ft.	ITE 710	Formula †	AM	88%	12%	62	9	71
					PM	17%	83%	19	92	111
14	General Office	28,912 sq.ft.	ITE 710	Formula †	AM	88%	12%	62	9	71
					PM	17%	83%	19	92	111
SUBTOTAL						AM	1,124	265	1,389	
						PM	405	1,254	1,660	
<i>25% Transit Modal Split Reduction</i>						AM	-227	-31	-258	
						PM	-53	-260	-314	
TOTAL						AM	897	234	1,131	
						PM	352	994	1,346	

sq.ft. = square feet, vph = vehicles per hour.

\* - Salvation Army Land Use does not exist in ITE Manual, a combination of ½ Church and ½ Recreation Centre was used.

\*\* Formula Rate for Church and Rec Centre Land Uses:

AM T=0.56(X)

PM T=0.34(X) + 5.24

T=1.26(X)

T=e\*(0.58Ln(X)+2.21)

† Formula Rate for General Office Land Use:

AM T=e\*(0.80Ln(X/1000)+1.57)

PM T= 1.12(X/1000)+78.85

‡ Formula Rate for Hotel Land Use:

AM T=0.46(X)+46

PM T=e\*(0.68Ln(X)+1.52)



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Scenario 2 - Permitted Densities Under Current Zoning: Traffic Generation

BLOCK	LAND USE	SIZE	SOURCE	RATE	PERIOD	SPLIT		GENERATED TRAFFIC (vph)		
						IN	OUT	IN	OUT	TOTAL
<b>West of Drain</b>										
1	Hotel	60 employees	ITE 310	Formula †	AM	60%	40%	44	29	74
					PM	54%	46%	40	34	74
2	General Office	69,292 sq.ft.	ITE 710	Formula †	AM	88%	12%	126	17	143
					PM	17%	83%	27	130	156
3	General Office	122,885 sq.ft.	ITE 710	Formula †	AM	88%	12%	199	27	226
					PM	17%	83%	37	179	216
16	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
17	General Office	100,391 sq.ft.	ITE 710	Formula †	AM	88%	12%	169	23	192
					PM	17%	83%	32	158	191
<b>East of Drain</b>										
7	Salvation Army *	219,199 sq.ft..	ITE 495 & 560	Formula **	AM	61%	39%	174	111	285
					PM	43%	57%	146	194	340
9	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
10	Hotel	78 employees	ITE 310	Formula †	AM	60%	40%	49	33	82
					PM	54%	46%	48	41	88
11	General Office	74,727 sq.ft.	ITE 710	Formula †	AM	88%	12%	133	18	152
					PM	17%	83%	28	135	162
12	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
13	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
14	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
SUBTOTAL						AM		1,456	355	1,791
						PM		481	1,477	1,958
<i>25% Transit Modal Split Reduction</i>						AM		-297	-41	-338
						PM		-62	-302	-364
TOTAL						AM		1,159	295	1,454
						PM		420	1,175	1,594

sq.ft. = square feet, vph = vehicles per hour.

\* - Salvation Army Land Use does not exist in ITE Manual, a combination of ½ Church and ½ Recreation Centre was used.

\*\* Formula Rate for Church and Rec Centre Land Uses:

AM T=0.56(X)

PM T=0.34(X) + 5.24

T=1.26(X)

T=e\*(0.58Ln(X)+2.21)

† Formula Rate for General Office Land Use:

AM T=e\*(0.80Ln(X/1000)+1.57)

PM T= 1.12(X/1000)+78.85

‡ Formula Rate for Hotel Land Use:

AM T=0.46(X)+46

PM T=e\*(0.68Ln(X)+1.52)

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Scenario 3 – New Density Proposal: Traffic Generation

BLOCK	LAND USE	SIZE	SOURCE	RATE	PERIOD	SPLIT		GENERATED TRAFFIC (vph)		
						IN	OUT	IN	OUT	TOTAL
<b>West of Drain</b>										
1	Hotel	60 employees	ITE 310	Formula †	AM	60%	40%	44	29	74
					PM	54%	46%	40	34	74
2	General Office	60,386 sq.ft.	ITE 710	Formula †	AM	88%	12%	112	15	128
					PM	17%	83%	25	121	146
3	General Office	134,221 sq.ft.	ITE 710	Formula †	AM	88%	12%	213	29	242
					PM	17%	83%	39	190	229
16	General Office	25,252 sq.ft.	ITE 710	Formula †	AM	88%	12%	56	8	64
					PM	17%	83%	18	89	107
17	General Office	61,130 sq.ft.	ITE 710	Formula †	AM	88%	12%	117	16	132
					PM	17%	83%	25	124	149
<b>East of Drain</b>										
7	Salvation Army *	116,928 sq.ft..	ITE 495 & 560	Formula **	AM	61%	39%	93	59	152
					PM	43%	57%	79	104	183
9	General Office	41,355 sq.ft.	ITE 710	Formula †	AM	88%	12%	83	11	94
					PM	17%	83%	21	104	125
10	Hotel	78 employees	ITE 310	Formula †	AM	60%	40%	79	33	82
					PM	54%	46%	48	41	88
11	General Office	28,820 sq.ft.	ITE 710	Formula †	AM	88%	12%	62	8	71
					PM	17%	83%	19	92	111
12	General Office	21,684 sq.ft.	ITE 710	Formula †	AM	88%	12%	50	7	56
					PM	17%	83%	17	85	103
13	General Office	21,684 sq.ft.	ITE 710	Formula †	AM	88%	12%	50	7	56
					PM	17%	83%	17	85	103
14	General Office	21,684 sq.ft.	ITE 710	Formula †	AM	88%	12%	50	7	56
					PM	17%	83%	17	85	103
SUBTOTAL						AM		987	229	1,208
						PM		366	1,154	1,520
<i>25% Transit Modal Split Reduction</i>						AM		-198	-27	-225
						PM		-50	-244	-294
TOTAL						AM		780	202	983
						PM		316	910	1,226

sq.ft. = square feet, vph = vehicles per hour.

\* - Salvation Army Land Use does not exist in ITE Manual, a combination of ½ Church and ½ Recreation Centre was used.

\*\* Formula Rate for Church and Rec Centre Land Uses:

AM T=0.56(X)

PM T=0.34(X) + 5.24

T=1.26(X)

T=e\*(0.58Ln(X)+2.21)

† Formula Rate for General Office Land Use:





























AM T=e\*(0.80Ln(X/1000)+1.57)

PM T= 1.12(X/1000)+78.85

‡ Formula Rate for Hotel Land Use:

AM T=0.46(X)+46

PM T=e\*(0.68Ln(X)+1.52)

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 			 	 		 	 	
Volume (vph)	111	0	104	13	0	18	597	771	14	18	1016	284
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		15.0	30.0		0.0	150.0		30.0	120.0		50.0
Storage Lanes	2		1	1		0	1		0	1		1
Taper Length (m)	7.5		7.5	7.5		7.5	7.5		7.5	7.5		7.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.850			0.997				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3288	1784	1517	1695	1517	0	1695	3380	0	1695	3390	1517
Flt Permitted	0.950			0.757			0.078			0.340		
Satd. Flow (perm)	3288	1784	1517	1351	1517	0	139	3380	0	607	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			617		235			2				166
Link Speed (k/h)		48			48			80				80
Link Distance (m)		100.7			309.3			220.0				373.8
Travel Time (s)		7.6			23.2			9.9				16.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	117	0	109	14	0	19	628	812	15	19	1069	299
Shared Lane Traffic (%)												
Lane Group Flow (vph)	117	0	109	14	19	0	628	827	0	19	1069	299
Turn Type	Prot		Free	Perm			pm+pt			pm+pt		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			Free	8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.0	24.0		24.0	24.0		11.0	24.0		11.0	24.0	24.0
Total Split (s)	12.0	36.0	0.0	24.0	24.0	0.0	52.0	93.0	0.0	11.0	52.0	52.0
Total Split (%)	8.6%	25.7%	0.0%	17.1%	17.1%	0.0%	37.1%	66.4%	0.0%	7.9%	37.1%	37.1%
Maximum Green (s)	6.0	30.0		18.0	18.0		46.0	87.0		5.0	46.0	46.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effct Green (s)	7.8		125.3	10.1	10.1		96.4	92.2		49.1	44.1	44.1
Actuated g/C Ratio	0.06		1.00	0.08	0.08		0.77	0.74		0.39	0.35	0.35
v/c Ratio	0.57		0.07	0.13	0.06		0.92	0.33		0.07	0.90	0.47
Control Delay	71.0		0.1	59.8	0.3		52.8	7.4		13.7	49.9	16.4
Queue Delay	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.0		0.1	59.8	0.3		52.8	7.4		13.7	49.9	16.4
LOS	E		A	E	A		D	A		B	D	B

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					25.5			27.0				42.2
Approach LOS					C			C				D
Queue Length 50th (m)	14.5		0.0	3.2	0.0		132.9	31.2		1.5	127.9	23.4
Queue Length 95th (m)	#29.3		0.0	9.5	0.0		#204.1	53.8		4.1	#163.6	47.6
Internal Link Dist (m)		76.7			285.3			196.0			349.8	
Turn Bay Length (m)	60.0		15.0	30.0			150.0			120.0		50.0
Base Capacity (vph)	204		1517	195	420		681	2487		282	1251	665
Starvation Cap Reductn	0		0	0	0		0	0		0	0	0
Spillback Cap Reductn	0		0	0	0		0	0		0	0	0
Storage Cap Reductn	0		0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.57		0.07	0.07	0.05		0.92	0.33		0.07	0.85	0.45

**Intersection Summary**

Area Type: Other

Cycle Length: 140

Actuated Cycle Length: 125.3

Natural Cycle: 120

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 34.5      Intersection LOS: C




























Intersection Capacity Utilization 89.6%      ICU Level of Service E

Analysis Period (min) 15

# 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: O'Keefe Court & Fallowfield Road



												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 				 			 	
Volume (vph)	111	0	104	13	0	18	597	771	14	18	1016	284
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		15.0	30.0		0.0	150.0		30.0	120.0		50.0
Storage Lanes	2		1	1		0	1		0	1		1
Taper Length (m)	7.5		7.5	7.5		7.5	7.5		7.5	7.5		7.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Fr <sub>t</sub>			0.850		0.850			0.997				0.850
Fl <sub>t</sub> Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3288	1784	1517	1695	1517	0	1695	3380	0	1695	3390	1517
Fl <sub>t</sub> Permitted	0.950			0.757			0.081			0.340		
Satd. Flow (perm)	3288	1784	1517	1351	1517	0	145	3380	0	607	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			608		239			2				159
Link Speed (k/h)		48			48			80				80
Link Distance (m)		100.7			309.3			220.0				373.8
Travel Time (s)		7.6			23.2			9.9				16.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Growth Factor	95%	95%	95%	100%	95%	100%	95%	100%	100%	100%	100%	95%
Adj. Flow (vph)	111	0	104	14	0	19	597	812	15	19	1069	284
Shared Lane Traffic (%)												
Lane Group Flow (vph)	111	0	104	14	19	0	597	827	0	19	1069	284
Turn Type	Prot		Free	Perm			pm+pt			pm+pt		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			Free	8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.0	24.0		24.0	24.0		11.0	24.0		11.0	24.0	24.0
Total Split (s)	11.0	35.0	0.0	24.0	24.0	0.0	52.0	94.0	0.0	11.0	53.0	53.0
Total Split (%)	7.9%	25.0%	0.0%	17.1%	17.1%	0.0%	37.1%	67.1%	0.0%	7.9%	37.9%	37.9%
Maximum Green (s)	5.0	29.0		18.0	18.0		46.0	88.0		5.0	47.0	47.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effect Green (s)	7.2		124.2	10.1	10.1		95.8	91.7		49.0	44.0	44.0
Actuated g/C Ratio	0.06		1.00	0.08	0.08		0.77	0.74		0.39	0.35	0.35
v/c Ratio	0.58		0.07	0.13	0.06		0.87	0.33		0.07	0.89	0.44
Control Delay	71.9		0.1	59.7	0.3		45.7	7.1		13.5	48.7	15.7
Queue Delay	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	71.9		0.1	59.7	0.3		45.7	7.1		13.5	48.7	15.7

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
LOS	E		A	E	A		D	A		B	D	B
Approach Delay					25.5			23.3			41.4	
Approach LOS					C			C			D	
Queue Length 50th (m)	13.9		0.0	3.2	0.0		120.4	30.2		1.5	126.3	21.4
Queue Length 95th (m)	#30.7		0.0	9.5	0.0		#185.6	52.5		4.1	#154.7	44.3
Internal Link Dist (m)		76.7			285.3			196.0			349.8	
Turn Bay Length (m)	60.0		15.0	30.0			150.0			120.0		50.0
Base Capacity (vph)	192		1517	197	425		690	2508		283	1292	677
Starvation Cap Reductn	0		0	0	0		0	0		0	0	0
Spillback Cap Reductn	0		0	0	0		0	0		0	0	0
Storage Cap Reductn	0		0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.58		0.07	0.07	0.04		0.87	0.33		0.07	0.83	0.42

**Intersection Summary**































Area Type: Other  
 Cycle Length: 140  
 Actuated Cycle Length: 124.2  
 Natural Cycle: 120  
 Control Type: Actuated-Uncoordinated  
 Maximum v/c Ratio: 0.89  
 Intersection Signal Delay: 32.4  
 Intersection LOS: C  
 Intersection Capacity Utilization 87.7%  
 ICU Level of Service E  
 Analysis Period (min) 15  
 # 95th percentile volume exceeds capacity, queue may be longer.  
 Queue shown is maximum after two cycles.

Splits and Phases: 2: O'Keefe Court & Fallowfield Road



Lanes, Volumes, Timings  
2: O'Keefe Court & Fallowfield Road

Future (2022) Background plus Site Generated  
PM Peak Hour - 100% Development Traffic

												
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 		 	 			 	 		 	 	 
Volume (vph)	480	0	480	19	0	26	220	907	14	19	867	92
Ideal Flow (vphpl)	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800	1800
Storage Length (m)	60.0		15.0	30.0		0.0	150.0		30.0	120.0		50.0
Storage Lanes	2		1	1		0	1		0	1		1
Taper Length (m)	7.5		7.5	7.5		7.5	7.5		7.5	7.5		7.5
Lane Util. Factor	0.97	1.00	1.00	1.00	1.00	1.00	1.00	0.95	0.95	1.00	0.95	1.00
Frt			0.850		0.850			0.998				0.850
Flt Protected	0.950			0.950			0.950			0.950		
Satd. Flow (prot)	3288	1784	1517	1695	1517	0	1695	3383	0	1695	3390	1517
Flt Permitted	0.950			0.757			0.139			0.257		
Satd. Flow (perm)	3288	1784	1517	1351	1517	0	248	3383	0	459	3390	1517
Right Turn on Red			Yes			Yes			Yes			Yes
Satd. Flow (RTOR)			573		128			2				87
Link Speed (k/h)		48			48			80				80
Link Distance (m)		100.7			275.4			227.0				373.8
Travel Time (s)		7.6			20.7			10.2				16.8
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Adj. Flow (vph)	505	0	505	20	0	27	232	955	15	20	913	97
Shared Lane Traffic (%)												
Lane Group Flow (vph)	505	0	505	20	27	0	232	970	0	20	913	97
Turn Type	Prot		Free	Perm			pm+pt			pm+pt		Perm
Protected Phases	7	4			8		5	2		1	6	
Permitted Phases			Free	8			2			6		6
Detector Phase	7	4		8	8		5	2		1	6	6
Switch Phase												
Minimum Initial (s)	5.0	10.0		10.0	10.0		5.0	10.0		5.0	10.0	10.0
Minimum Split (s)	11.0	24.0		24.0	24.0		11.0	24.0		11.0	24.0	24.0
Total Split (s)	22.0	46.0	0.0	24.0	24.0	0.0	16.0	43.0	0.0	11.0	38.0	38.0
Total Split (%)	22.0%	46.0%	0.0%	24.0%	24.0%	0.0%	16.0%	43.0%	0.0%	11.0%	38.0%	38.0%
Maximum Green (s)	16.0	40.0		18.0	18.0		10.0	37.0		5.0	32.0	32.0
Yellow Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	4.0
All-Red Time (s)	2.0	2.0		2.0	2.0		2.0	2.0		2.0	2.0	2.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	4.0	6.0	6.0	6.0
Lead/Lag	Lead			Lag	Lag		Lead	Lag		Lead	Lag	Lag
Lead-Lag Optimize?	Yes			Yes	Yes		Yes	Yes		Yes	Yes	Yes
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	3.0
Recall Mode	None	None		None	None		None	Min		None	Min	Min
Walk Time (s)		7.0		7.0	7.0			7.0			7.0	7.0
Flash Dont Walk (s)		11.0		11.0	11.0			11.0			11.0	11.0
Pedestrian Calls (#/hr)		0		0	0			0			0	0
Act Effect Green (s)	16.2		80.2	10.3	10.3		42.9	39.4		31.8	26.7	26.7
Actuated g/C Ratio	0.20		1.00	0.13	0.13		0.53	0.49		0.40	0.33	0.33
v/c Ratio	0.76		0.33	0.11	0.09		0.73	0.58		0.08	0.81	0.17
Control Delay	41.9		0.6	38.6	0.6		29.9	18.9		12.0	31.7	7.0
Queue Delay	0.0		0.0	0.0	0.0		0.0	0.0		0.0	0.0	0.0
Total Delay	41.9		0.6	38.6	0.6		29.9	18.9		12.0	31.7	7.0
LOS	D		A	D	A		C	B		B	C	A

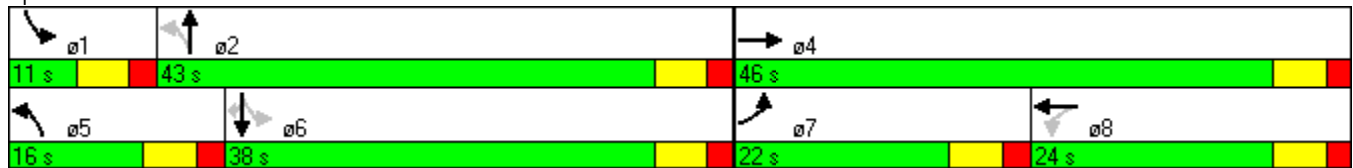


Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Approach Delay					16.8			21.0			29.0	
Approach LOS					B			C			C	
Queue Length 50th (m)	41.3		0.0	3.0	0.0		19.9	52.7		1.5	69.1	1.1
Queue Length 95th (m)	#66.3		0.0	9.1	0.0		#53.9	88.4		4.5	90.2	10.2
Internal Link Dist (m)		76.7			251.4			203.0			349.8	
Turn Bay Length (m)	60.0		15.0	30.0			150.0			120.0		50.0
Base Capacity (vph)	679		1517	314	451		319	1699		262	1399	677
Starvation Cap Reductn	0		0	0	0		0	0		0	0	0
Spillback Cap Reductn	0		0	0	0		0	0		0	0	0
Storage Cap Reductn	0		0	0	0		0	0		0	0	0
Reduced v/c Ratio	0.74		0.33	0.06	0.06		0.73	0.57		0.08	0.65	0.14

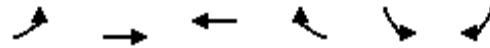
**Intersection Summary**

Area Type:	Other
Cycle Length:	100
Actuated Cycle Length:	80.2
Natural Cycle:	90
Control Type:	Actuated-Uncoordinated
Maximum v/c Ratio:	0.81
Intersection Signal Delay:	23.5
Intersection LOS:	C
Intersection Capacity Utilization:	74.3%
ICU Level of Service:	D
Analysis Period (min):	15
# 95th percentile volume exceeds capacity, queue may be longer.	
Queue shown is maximum after two cycles.	

Splits and Phases: 2: O'Keefe Court & Fallowfield Road







Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↖	↗	↖	↖	↘	↘
Volume (veh/h)	0	184	868	12	31	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	194	914	13	33	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)			101			
pX, platoon unblocked	0.82				0.82	0.82
vC, conflicting volume	926				1107	914
vC1, stage 1 conf vol					914	
vC2, stage 2 conf vol					194	
vCu, unblocked vol	802				1022	786
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				89	100
cM capacity (veh/h)	675				309	322

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	194	914	13	33
Volume Left	0	0	0	0	33
Volume Right	0	0	0	13	0
cSH	1700	1700	1700	1700	309
Volume to Capacity	0.00	0.11	0.54	0.01	0.11
Queue Length 95th (m)	0.0	0.0	0.0	0.0	2.5
Control Delay (s)	0.0	0.0	0.0	0.0	18.0
Lane LOS					C
Approach Delay (s)	0.0		0.0		18.0
Approach LOS					C

Intersection Summary					
Average Delay			0.5		
Intersection Capacity Utilization			58.2%	ICU Level of Service	B
Analysis Period (min)			15		



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↗	↑	↑	↗	↘	↘
Volume (veh/h)	0	937	282	30	23	0
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	986	297	32	24	0
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type		Raised	Raised			
Median storage veh		1	1			
Upstream signal (m)			101			
pX, platoon unblocked	0.93				0.93	0.93
vC, conflicting volume	328				1283	297
vC1, stage 1 conf vol					297	
vC2, stage 2 conf vol					986	
vCu, unblocked vol	246				1268	212
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)					5.4	
tF (s)	2.2				3.5	3.3
p0 queue free %	100				92	100
cM capacity (veh/h)	1233				289	774

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	SB 1
Volume Total	0	986	297	32	24
Volume Left	0	0	0	0	24
Volume Right	0	0	0	32	0
cSH	1700	1700	1700	1700	289
Volume to Capacity	0.00	0.58	0.17	0.02	0.08
Queue Length 95th (m)	0.0	0.0	0.0	0.0	1.9
Control Delay (s)	0.0	0.0	0.0	0.0	18.6
Lane LOS					C
Approach Delay (s)	0.0		0.0		18.6
Approach LOS					C

Intersection Summary					
Average Delay			0.3		
Intersection Capacity Utilization			62.1%	ICU Level of Service	B
Analysis Period (min)			15		



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑↑	↑↑	↘
Volume (veh/h)	0	49	0	1381	1006	127
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	52	0	1454	1059	134
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage veh						
Upstream signal (m)				172	220	
pX, platoon unblocked	0.72	0.72	0.72			
vC, conflicting volume	1786	529	1193			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1311	0	486			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	93	100			
cM capacity (veh/h)	108	780	772			
Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	52	727	727	529	529	134
Volume Left	0	0	0	0	0	0
Volume Right	52	0	0	0	0	134
cSH	780	1700	1700	1700	1700	1700
Volume to Capacity	0.07	0.43	0.43	0.31	0.31	0.08
Queue Length 95th (m)	1.5	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	9.9	0.0	0.0	0.0	0.0	0.0
Lane LOS	A					
Approach Delay (s)	9.9	0.0		0.0		
Approach LOS	A					
Intersection Summary						
Average Delay			0.2			
Intersection Capacity Utilization			43.6%		ICU Level of Service	A
Analysis Period (min)			15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↕	↕	↗
Volume (veh/h)	0	193	0	1140	1298	68
Sign Control	Yield			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	0	203	0	1200	1366	72
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type				None	None	
Median storage (veh)						
Upstream signal (m)				165	227	
pX, platoon unblocked	0.77	0.77	0.77			
vC, conflicting volume	1966	683	1438			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1663	3	979			
tC, single (s)	6.8	6.9	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	100	76	100			
cM capacity (veh/h)	68	834	541			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1	SB 2	SB 3
Volume Total	203	600	600	683	683	72
Volume Left	0	0	0	0	0	0
Volume Right	203	0	0	0	0	72
cSH	834	1700	1700	1700	1700	1700
Volume to Capacity	0.24	0.35	0.35	0.40	0.40	0.04
Queue Length 95th (m)	6.7	0.0	0.0	0.0	0.0	0.0
Control Delay (s)	10.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	B					
Approach Delay (s)	10.7	0.0		0.0		
Approach LOS	B					

Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			57.2%	ICU Level of Service		B
Analysis Period (min)			15			



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↔		↔	↔	↔	
Volume (veh/h)	110	0	236	633	0	73
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	116	0	248	666	0	77
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)				231		
pX, platoon unblocked					0.90	
vC, conflicting volume			116		1279	116
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			116		1253	116
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			83		100	92
cM capacity (veh/h)			1473		141	937

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	116	248	666	77
Volume Left	0	248	0	0
Volume Right	0	0	0	77
cSH	1700	1473	1700	937
Volume to Capacity	0.07	0.17	0.39	0.08
Queue Length 95th (m)	0.0	4.2	0.0	1.9
Control Delay (s)	0.0	7.9	0.0	9.2
Lane LOS		A		A
Approach Delay (s)	0.0	2.2		9.2
Approach LOS				A

Intersection Summary			
Average Delay		2.4	
Intersection Capacity Utilization		46.6%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	647	0	127	154	0	290
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	681	0	134	162	0	305
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)	243					
pX, platoon unblocked						
vC, conflicting volume			681		1111	681
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			681		1111	681
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			85		100	32
cM capacity (veh/h)			912		198	450

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	681	134	162	305
Volume Left	0	134	0	0
Volume Right	0	0	0	305
cSH	1700	912	1700	450
Volume to Capacity	0.40	0.15	0.10	0.68
Queue Length 95th (m)	0.0	3.6	0.0	34.7
Control Delay (s)	0.0	9.6	0.0	28.2
Lane LOS	A		D	
Approach Delay (s)	0.0	4.4	28.2	
Approach LOS	D			

Intersection Summary			
Average Delay	7.7		
Intersection Capacity Utilization	72.3%	ICU Level of Service	C
Analysis Period (min)	15		



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↻		↻	↻	↻	
Volume (veh/h)	30	0	418	215	0	80
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	32	0	440	226	0	84
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			32	1138	32	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			32	1138	32	
tC, single (s)			4.1	6.4	6.2	
tC, 2 stage (s)						
tF (s)			2.2	3.5	3.3	
p0 queue free %			72	100	92	
cM capacity (veh/h)			1581	161	1042	

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	32	440	226	84
Volume Left	0	440	0	0
Volume Right	0	0	0	84
cSH	1700	1581	1700	1042
Volume to Capacity	0.02	0.28	0.13	0.08
Queue Length 95th (m)	0.0	8.0	0.0	1.8
Control Delay (s)	0.0	8.2	0.0	8.8
Lane LOS		A		A
Approach Delay (s)	0.0	5.4		8.8
Approach LOS				A

Intersection Summary			
Average Delay		5.5	
Intersection Capacity Utilization		43.0%	ICU Level of Service A
Analysis Period (min)		15	



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Volume (veh/h)	220	0	120	34	0	427
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	232	0	126	36	0	449
Pedestrians						
Lane Width (m)						
Walking Speed (m/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage (veh)						
Upstream signal (m)						
pX, platoon unblocked						
vC, conflicting volume			232		520	232
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			232		520	232
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			91		100	44
cM capacity (veh/h)			1336		468	808

Direction, Lane #	EB 1	WB 1	WB 2	NB 1
Volume Total	232	126	36	449
Volume Left	0	126	0	0
Volume Right	0	0	0	449
cSH	1700	1336	1700	808
Volume to Capacity	0.14	0.09	0.02	0.56
Queue Length 95th (m)	0.0	2.2	0.0	24.5
Control Delay (s)	0.0	8.0	0.0	14.9
Lane LOS	A		B	
Approach Delay (s)	0.0	6.2	14.9	
Approach LOS			B	

Intersection Summary			
Average Delay	9.1		
Intersection Capacity Utilization	57.1%	ICU Level of Service	B
Analysis Period (min)	15		