

Project: Clongriffin to Tallaght BRT
Note Traffic Modelling Assessment
Author James Thompson

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Ref TRANSYT/CBC1

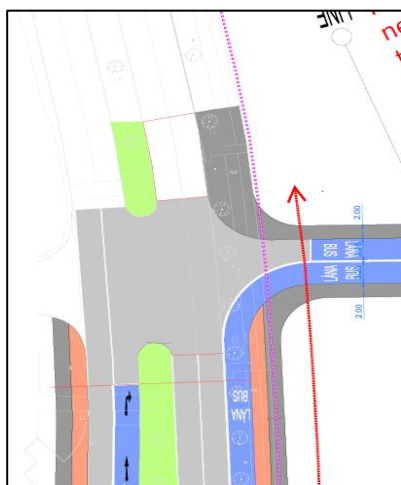
1 Introduction

- 1.1 Clongriffin to Tallaght BRT scheme is split into three sections. This report references CBC 1 - Clongriffin to City Centre (Custom House).
- 1.2 The purpose of this note is to summarise the results of preliminary junction assessments for the proposed route options. These preliminary assessments have been undertaken using an industry standard TRANSYT 15 software for signal controlled junction assessment.
- 1.3 The standard approach is to run the bus lane on the nearside lane except at junctions where there is a left turn flare for general traffic where the bus lane is in lane 2.
- 1.4 In a number of cases the bus lane replaces a general traffic lane which has visible impact on performance of the junction but a modal shift towards public transport is a driving factor for this scheme going forward.
- 1.5 Assessments have taken the day peak flows to model operation. AM and PM peak flows can be tested when the design progresses and timings are derived from the results.
- 1.6 All junctions will be accessed and any recommendations will be provided in this report.

Model 1	Model 2	Model 3
<i>Malahide Rd / Main St</i>	Artane Roundabout (Ardlea Rd / Gracefield Rd)	Malahide Rd / Clontarf Rd (Marino Mart)
<i>Malahide Rd / R139</i>		
Malahide Rd / Clarehall Shopping Centre		Fairview Rd / Fairview Strand
Malahide Rd / Blunden Dr.		

- 1.7 This note will also highlight the sensitivity of junction performance to current traffic levels, thereby identifying any design decisions that should be considered in future design stages
- 1.8 The results will present the Degree of Saturation (DoS) for each lane, which is the measure of how much demand the lane is experiencing compared to its total capacity. The Mean Max Queue (MMQ) is an indication of the typical maximum queue lengths that will be seen for that lane. However, when an approach is heavily oversaturated the MMQ value can increase exponentially and should be treated with caution as it may not give a true representation. Finally, the Practical Reserve Capacity (PRC) for the entire junction, gives an indication on the spare capacity there is through the junction or if a negative number is returned how much over- capacity the junction is.

2 Malahide Rd / Main St

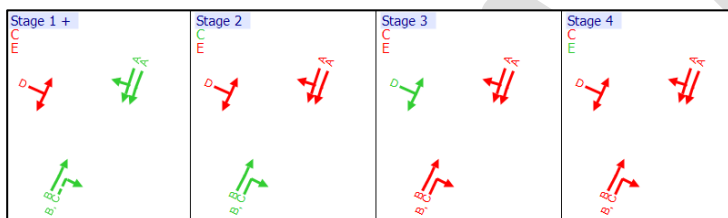


Currently:

- Priority T-Junction.
- Eastern Arm is new arm
- No Bus Lane currently through this junction.

2.1 Proposed Staging:

2.1.1 The proposed staging for the junction that has been taken forward in the modelling process is shown in the Figure below.



2.2 Flows

	A	B	C	D	Total
A	0	0	1104	20	1124
B	0	0	0	0	0
C	762	0	0	0	762
D	15	0	15	0	30
Total	777	0	1119	20	-

Zones are allocated clockwise with the northern arm being zone A

2.3 Network Results:

2.3.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

Arm	Lane	Peak		Reallocation of Downstream Lanes (See Junction 2 – for details)	
		Deg Sat (%)	Mean Max Queue (m)	Deg Sat (%)	Mean Max Queue (m)
Malahide Road Northbound	Nearside	58	6	37	6
	Offside (BUS)	2	6	5	0
Belgard Road Southbound	Nearside	235	960	34	25
	Offside	233	960	34	25
Bus Terminus (East Arm)	-	NA	NA	1	0
Access (West Arm)	-	4	6	23	6
PRC		-61		145%	

2.3.2 The results above are with only stages 1 (mainline) and 3 (access) running. Stage 2 is proposed to operate under a call/cancel loop and only demand the stage if a bus is waiting to turn in traffic gaps, however this may change depending on the level of priority is anticipated for the bus in this section. Stage 4 is the pedestrian stage.

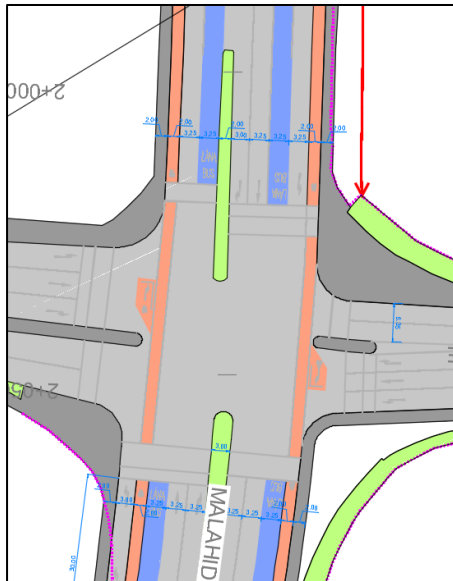
2.4 Recommendations:

2.4.1 Rather than have the offside bus lane the entire length of the lane to the upstream junction, we suggest that the lane starts half way up – this would reduce the need for a pre-signal at the upstream junction and have little impact to this junction.

2.5 Further Observations:

2.5.1 The bus corridor is intended to have free flowing conditions around the left turn (which would require a physical island to segregate from general traffic. However, the only conflict this has is with the pedestrian crossing on the southern arm. It is intended to have a stop line immediately after the turn, the forward visibility to the traffic signals here would be substandard and therefore it would be suggested that the stopline be moved to the east arm to achieve the required visibility. This would not change the operation as this could remain free flowing unless a pedestrian demand is placed.

3 Malahide Rd / R139

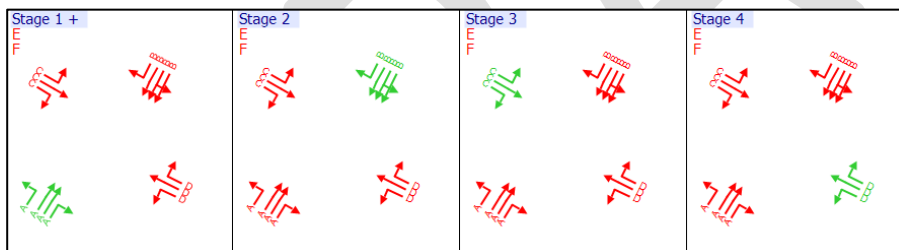


Currently:

- Three lanes at the stop line on the Northern, Southern and Western arms.
- Two lane approaches on the eastern arm.
- Each approach has additional flared left turn slip which gives way.

3.1 Proposed Staging:

3.1.1 The proposed staging for the junction that has been taken forward in the modelling process is shown in Figure below. Similar to the current arrangement each arm will operate separately due to the relatively high and similar turning movements and pedestrians can walk with traffic. Also by making the changes to the bus lanes and removing the need for a presignal a 4 stage operation can be used over a 5 stage operation. This is highlighted in the recommendations



3.2 Flows

	A	B	C	D	Total
A	0	48	737	334	1119
B	63	0	350	701	1114
C	490	279	0	482	1251
D	230	628	470	0	1328
Total	783	955	1557	1517	-

Zones are allocated clockwise with the northern arm being zone A

3.3 Network Results:

3.3.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide

a quick understanding on the capacity of each arm and if there is any excessive queuing in the peak period.

Arm	Lane	Peak		Results After Lane Reallocation		
		Deg Sat (%)	Mean Max Queue (m)	Lane	Deg Sat (%)	Mean Max Queue (m)
Malahide Northbound	Nearside Left	80	70	Nearside Left	87	70
	Lane 2 Ahead (BUS)	3	6	Lane 2 Ahead (BUS)	3	6
	Lane 3 Ahead	76	70	Lane 3 Ahead	82	70
	Offside Right	46	35	Offside Right	50	35
Malahide Southbound	Nearside – Left	15	10	Nearside – BUS & Left	14	10
	Lane 2 – Ahead (BUS)	1	6	Lane 2 – Ahead	85	70
	Lane 3 – Ahead	100	140	Lane 3 – Ahead	85	70
	Offside - Right	45	65	Offside - Right	88	65
Eastbound	Nearside – Left	50	40	Nearside – Ahead & Left	89	95
	Lane 2 – Ahead	113	340	Lane 2 – Ahead & Right	89	105
	Offside – Right	95	145	Offside – Right	89	95
Westbound	Nearside – Left	54	~2Km	Nearside – Left	91	950
	Lane 2 – Ahead	88		Lane 2 – Ahead	88	
	Offside - Right	9		Offside - Ahead & Right	85	
	Bottle Neck Approach	229		Bottle Neck Approach	142	
PRC		-61		-37		

3.3.2 The results show that the junction would benefit from lane reallocation as significant queuing would occur on the westbound approach. The reallocation reduces this queuing by over half but it should be noted that the Mean Max Queue could be exaggerated as the junction is over capacity.

3.4 Recommendations:

- 3.4.1 Southbound movement would benefit from moving bus lane into nearside lane and allowing the small number of left turners to enter the bus lane.
- 3.4.2 It would be recommended to start the northbound exit bus lane closer to the downstream junction. This removes the requirement for a pre-signal, as the bus would not need to move from the nearside to offside lane until after exiting the junction rather than through the junction.
- 3.4.3 There is potential to reinstate left turn slips on eastern and western arms.

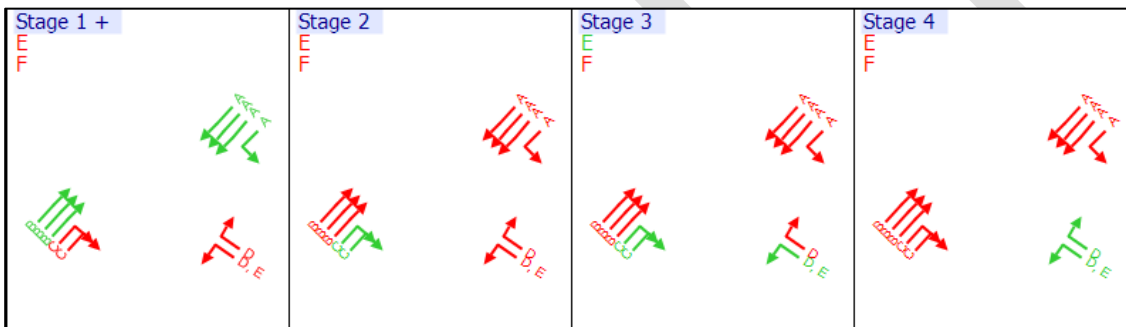
Malahide Rd / R139



Currently
No design changes proposed.

3.5 Proposed Staging:

3.5.1 The proposed staging for the junction that has been taken forward in the modelling process is shown in the Figure below. This is similar to the current arrangement.



3.6 Flows

	A	B	C	Total
A	0	50	1512	1562
B	52	0	12	64
C	1199	200	0	1399
Total	1251	250	1524	-

Zones are allocated clockwise with the northern arm being zone A

3.7 Network Results:

3.7.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

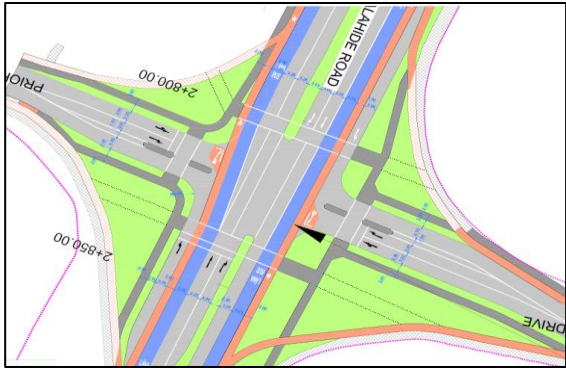
Arm	Lane	Peak	
		Deg Sat (%)	Mean Max Queue (m)
Malahide Rd Southbound	Nearside – Left	5	6
	Lane 2 BUS - Ahead	1	60
	Lane 3 – Ahead	60	55
	Offside – Ahead	64	70
Malahide Road Northbound	Nearside BUS - Ahead	1	6
	Lane 2 – Ahead	34	60
	Lane 3 – Ahead	31	60
	Lane 4 - Right	14	10
	Offside - Right	14	10
Tesco	Nearside – Left	2	6
	Offside - Right	40	10
PRC (%)		40	

3.7.2 The results indicate no issues with the junction

3.8 Recommendations:

3.8.1 No recommendations

Malahide Rd / Darndale

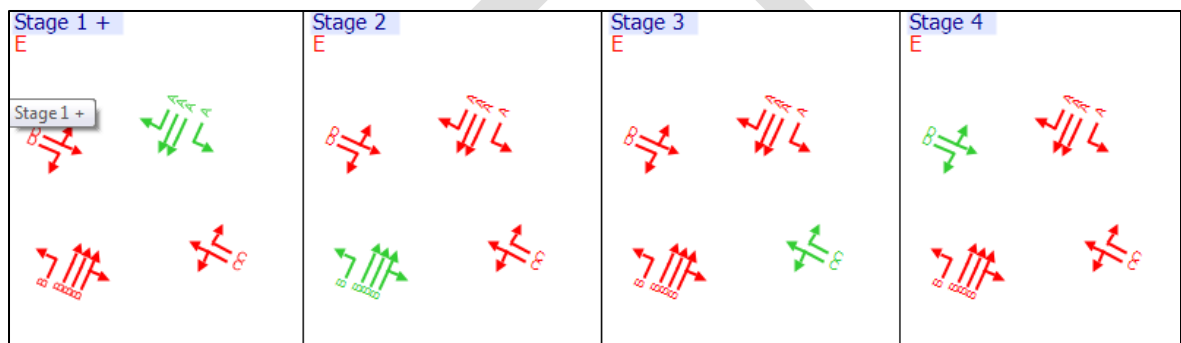


Currently.

- Unsignalised roundabout
- Two lane approaches on all arms
- Bus lanes on northern and southern arms – these terminate 100m before the junction to allow for increased capacity through the junction
- Northbound has additional left turn flare

3.9 Proposed Staging:

3.9.1 The proposed staging for the junction that has been taken forward in the modelling process as shown in the Figure below.



3.10 Flows

	A	B	C	D	Total
A	0	374	850	300	1524
B	377	0	138	200	715
C	824	62	0	121	1007
D	197	172	170	0	539
Total	1398	608	1158	621	-

Zones are allocated clockwise with the northern arm being zone A

3.11 Network Results:

3.11.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

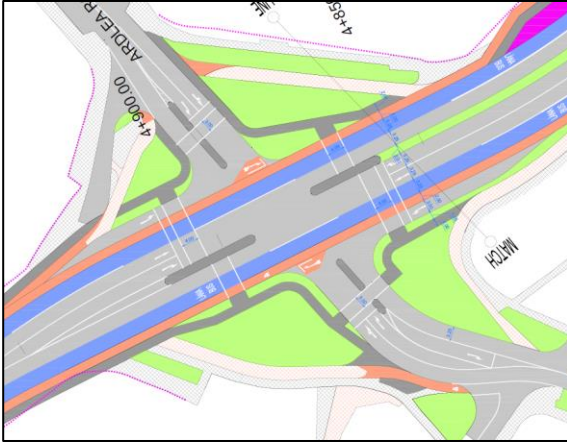
Arm	Lane	Peak		Lane	Peak	
		Deg Sat (%)	Mean Max Queue (m)		Deg Sat (%)	Mean Max Queue (m)
Malahide Northbound	Nearside – Left	15	2Km	Nearside – Left	27	1.3Km
	Lane 2 – BUS Ahead	4		Lane 2 – BUS Ahead	4	
	Lane 3 - Ahead	88		Lane 3 - Ahead	78	
	Offside - Right	7		Offside - Ahead & Right	87	
	Bottleneck Approach	290		Bottleneck Approach	178	
Malahide Southbound	Nearside – Left	59	60	Nearside – Left	59	60
	Lane 2 – Ahead	1	6	Lane 2 – Ahead	1	6
	Lane 3 – Ahead	113	425	Lane 3 – Ahead	113	425
	Offside – Right	45	50	Offside – Right	45	50
Eastbound	Nearside – Ahead & Left	98	115	Nearside – Ahead & Left	100	275
	Offside - Right	45		Offside - Right	45	
Westbound	Nearside – Ahead & Left	72	250	Nearside – Ahead & Left	84	685
	Offside - Right	81		Offside - Right	96	
PRC		-69		PRC		-49

3.11.2 The results indicate significant queuing on the northbound approach. This is due to the bottle neck that occurs with 2 lanes (1 bus, 3 general) flaring into 4 lanes (1 bus, 3 general). The left ahead and right movements have high volume of traffic and therefore require the junction to operate each arm individually.

3.12 Recommendations:

- 3.12.1 There is currently only one ahead lane on the northbound approach however there are two exit lanes on this approach. The proposed cycle lane causes the alignment to be skewed and limits the progression of three vehicle lanes (1 bus and 2 general lanes) however if the cyclists were to be taken off road, cross at the crossing (which would require to be upgraded to a Toucan) then all 3 traffic lanes could progress.
- 3.12.2 Potential to introduce left turn slips on the east and western arms. This added capacity on these arms could provide extra green time to be allocated to this northern arm.

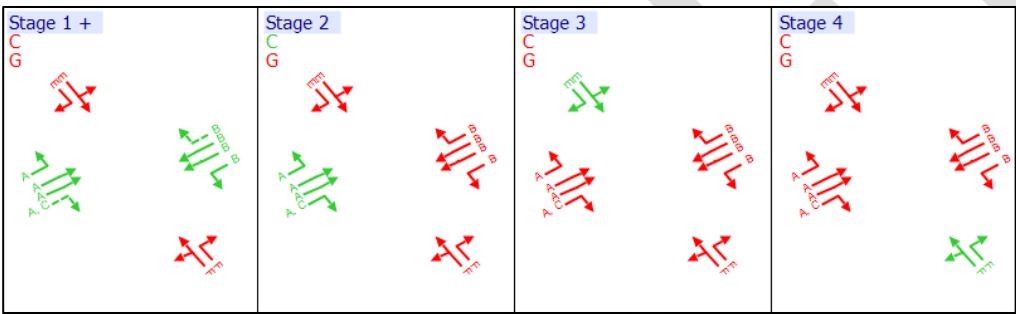
Artane X-Roads



- Currently
- Four-armed roundabout
 - Uncontrolled
 - Two lane approaches north and south
 - Single lane approaches east and west with short flare (approx. 15m)

3.13 Proposed Staging:

3.13.1 The proposed staging for the junction that has been taken forward in the modelling process as shown in the Figure below.



3.14 Flows

	A	B	C	D	Total
A	0	276	686	87	1049
B	277	0	66	253	596
C	581	182	0	106	869
D	75	331	50	0	456
Total	933	789	802	446	-

Zones are allocated clockwise with the northern arm being zone A

3.15 Network Results:

3.15.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

Arm	Lane	Peak	
		Deg Sat (%)	Mean Max Queue (m)
Malahide Northbound	Nearside- Left	14	100
	Lane 2 – BUS Ahead	2	
	Lane 3 – Ahead	62	
	Offside – Right	85	
Malahide Southbound	Nearside – Left	39	500
	Lane 2 – BUS Ahead	3	
	Lane 3 – Ahead	114	
	Offside- Right	87	
Ardlea Road Eastbound	Nearside – Left & Ahead	88	60
	Offside – Right	12	
Gracefield Westbound	Nearside – Left & Ahead	118	345
	Offside - Right	75	
PRC (%)		-24	

3.15.2 The results indicate a reasonable amount of queuing occurring on the northern and eastern arms. This junction requires to operate with each arm operating in its own stage.

3.16 Recommendations:

3.16.1 Limited recommendations with the downstream exits only having a single general traffic lane.

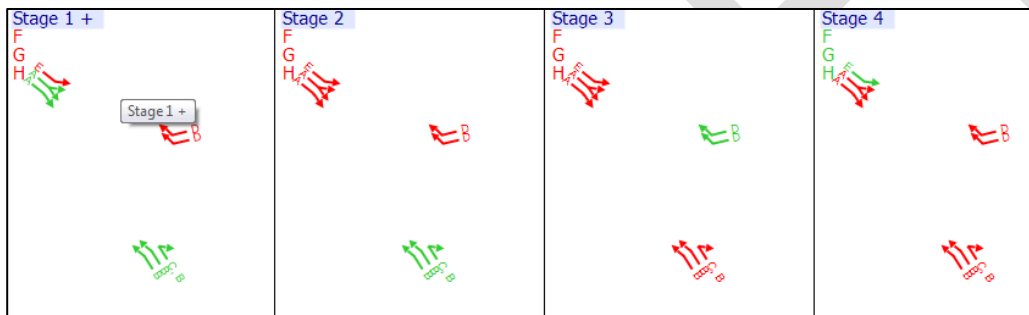
Malahide Rd / Fairview



- Currently
- Two lane approach southbound flaring to three lanes (2 general and 1 bus lane)
 - 3 lanes east and westbound (2 general and 1 bus lane)
 - Parking along northern side of Fairview Road

3.17 Proposed Staging:

3.17.1 The proposed staging for the junction that has been taken forward in the modelling process as shown in the Figure below.



3.18 Flows

	A	B	C	Total
A	0	291	626	917
B	139	0	603	742
C	423	509	0	932
Total	562	800	1229	-

Zones are allocated clockwise with the northern arm being zone A

3.19 Network Results:

3.19.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

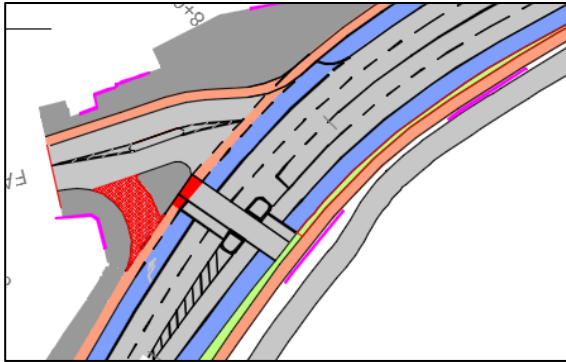
Arm	Lane	Peak	
		Deg Sat (%)	Mean Max Queue (m)
Malahide Southbound	Nearside BUS	3	6
	Offside	181	875
Eastbound	Nearside BUS	8	6
	Lane 2	87	75
	Offside	31	25
Westbound	Nearside BUS	1	6
	Lane 2	61	45
	Offside	15	15
PRC (%)		-50	

3.19.2 The results indicate that the southbound Malahide Road arm is causing the junction to be considerably over capacity. The current arrangement has three lanes southbound and continues with three lanes along Fairview. The removal of a general traffic lane across the entire stretch will have an impact on the performance of the network at this location.

3.20 Recommendations:

3.20.1 There may be potential to relocate the cycle lanes into the park, freeing up road space and retaining three lanes east and west bound.

Fairview Strand

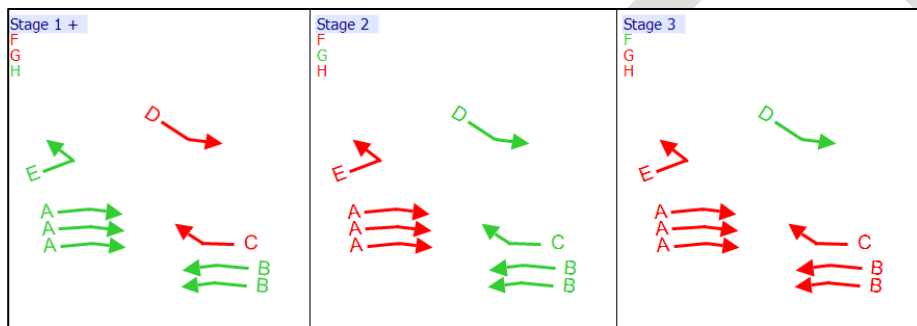


Currently

- Segregation island between the westbound traffic and the right turning traffic which will be removed.

3.21 Proposed Staging:

3.21.1 The proposed staging for the junction that has been taken forward in the modelling process as shown in the Figure below. Stage 3 is a demand dependent stage by the pedestrian



3.22 Flows

	A	B	C	Total
A	0	869	389	1258
B	586	0	42	628
C	362	0	0	362
Total	948	869	431	-

Zones are allocated clockwise with the northern arm being zone A

3.23 Network Results:

3.23.1 A full analysis has been undertaken however for the purposes of this report only the Degree of Saturation and Mean Maximum Queue on each arm has been shown, to provide a quick understanding on the capacity of each arm and if there is any excessive queuing in the Peak period.

Arm	Lane	Peak	
		Deg Sat (%)	Mean Max Queue (m)
Fairview Eastbound	Nearside - BUS	1	6
	Lane 2 - Left & Ahead	38	40
	Offside – Ahead	38	40
Fairview Westbound	Nearside – BUS	1	6
	Lane 2 – Ahead	50	40
	Offside - Right	66	65
Fairview Strand (Southbound)	Nearside - Left	47	35
PRC (%)		35	

3.23.2 The results indicate that this junction should operate within capacity. The reduction in capacity does not seem to cause an issue at this junction but is causing issues at the upstream junction and creating a suppressed demand on Malahide Road

DRAFT

TRANSYT OUTPUTS

TRANSYT 15

Version: 15.5.1.7048
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Path: c:\pw_workdir\lon002\thompsona\dms46781
Report generation date: 08/12/2017 10:08:03

- »Network Diagrams
- «A1 - (untitled) : D1 - (untitled)* :
- »Traffic Stream Results

Network Diagrams



(untitled)
Cycletime 0s / 120s , Timesteps 119 / 120
Diagram produced using TRANSYT 15.5.1.7048

A1 - (untitled) D1 - (untitled)*

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)
08:00-09:00	39	4	92	-3	361	1733	26	83.36	13.65	134.46	118.58	4.94	123.52
	J	4	70	28	289	1824	26	50.24	8.22	80.57	57.33	2.97	60.30
		4-1	2	4171	9	1940	26	50.47	0.30	2.18	1.83	0.03	1.86
		4-2	175	-49	820	2080	26	799.77	191.83	1897.91	2585.67	25.61	2611.28
	J1 Access	1	23	288	30	1940	7	57.32	0.98	5.61	6.78	0.36	7.15
	J1 Bus EB	1	0	Unrestricted	10	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	J1 Bus WB	1	1	15218	10	1702	120	0.01	0.00	0.00	0.00	0.00	0.00
	J1 NB	1	37	145	618	1940	103	1.25	3.41	19.61	3.05	0.80	3.85
		2	5	1724	10	234	103	0.46	0.00	0.01	0.02	0.00	0.02
	J1 NB Exit	1	0	Unrestricted	617	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	J1 SB	1	34	165	562	1940	102	2.31	3.83	7.35	5.12	1.34	6.46
		2	34	166	562	1940	102	2.28	3.83	7.35	5.05	1.32	6.38
	J1 SB Exit	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
		2	28	223	1119	4020	120	0.17	0.05	0.22	0.76	0.00	0.76
	J1 WB Exit	1	2	4673	37	1940	120	0.02	0.00	0.00	0.00	0.00	0.00
	J2 - WB1	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
		2	130	-31	1114	1940	120	442.95	157.63	2705.32	1946.35	33.73	1980.08
	J2 EB	1	89	1	425	1845	30	69.75	16.75	431.77	116.93	6.17	123.10
		2	89	1	477	2071	30	67.12	18.45	475.62	126.30	6.81	133.10
		3	89	1	426	1847	30	69.99	16.81	433.46	117.61	6.19	123.80
	J2 EB EXIT	1	0	Unrestricted	869	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	J2 NB	1	3	3101	10	1940	21	31.13	0.21	0.88	1.23	0.02	1.25
		2	89	1	340	2080	21	114.40	14.36	82.58	153.21	5.33	158.54
		3	54	66	193	1940	21	85.86	6.76	38.90	65.48	2.54	68.02
	J2 NB EXIT	1	32	182	618	1940	120	0.49	6.06	33.91	1.19	0.25	1.44
		2	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	J2 NB LEFT	1	94	-4	334	1940	21	203.20	22.14	127.30	267.70	8.15	275.85
	J2 SB	1	14	527	58	1940	24	41.97	1.58	11.67	9.60	0.51	10.11
		2	85	6	369	2080	24	66.24	12.54	92.78	96.29	4.53	100.82
		3	85	6	369	2080	24	66.24	12.54	93.16	96.29	4.53	100.82
		4	88	3	334	1829	24	73.05	11.47	84.76	96.24	4.26	100.50
	J2 SB EXIT	1	1	9390	18	1940	120	0.01	0.00	0.00	0.00	0.00	0.00
		2	39	133	1501	3880	120	0.29	0.12	0.17	1.73	0.00	1.73
	J2 WB	1	93	-3	280	1814	19	125.99	13.65	45.48	139.06	4.86	143.92
		2	88	2	306	2080	19	219.75	23.11	110.71	265.28	8.67	273.96
		3	88	2	283	1923	19	102.38	13.10	10.08	114.26	4.80	119.06
	J2 WB EXIT	1	0	Unrestricted	1208	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	J3 - SB	2	1	10972	9	1940	69	4.19	0.11	0.65	0.15	0.01	0.16
		3	60	50	729	2080	69	10.90	9.75	77.45	31.34	3.10	34.44
		4	64	40	729	1940	69	11.83	12.50	99.23	34.02	3.73	37.75

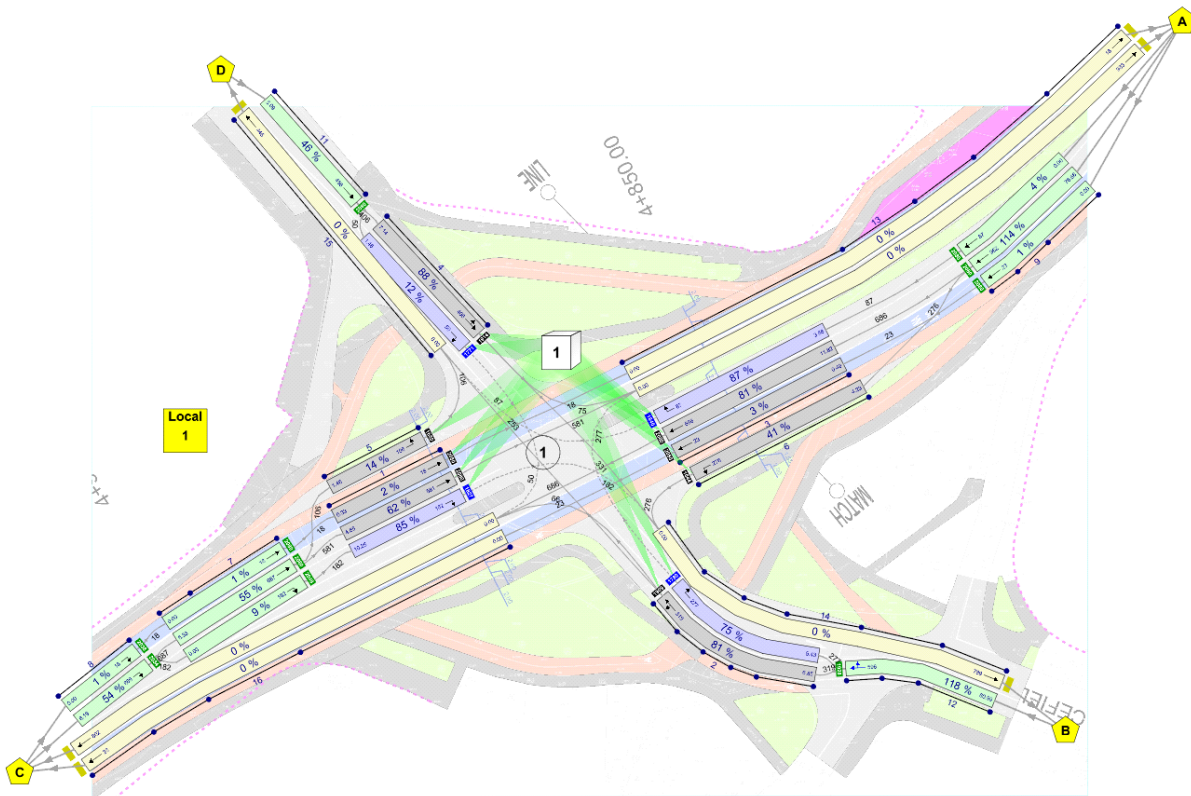
J3 -1	1	0	18880	9	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	37	146	1470	4020	120	0.26	0.11	0.21	1.49	0.00	1.49
J3 Entry	1	0	Unrestricted	194	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
J3 Exit	1	2	4025	12	1784	35	26.49	0.26	1.52	1.25	0.10	1.36
	2	40	128	52	1579	9	60.98	1.76	34.09	12.51	0.65	13.16
J3 NB	1	1	9940	10	1940	68	16.90	0.14	0.64	0.67	0.01	0.68
	2	39	130	436	1940	68	9.72	3.54	16.09	16.73	1.33	18.06
	3	36	147	436	2080	68	9.49	3.51	15.99	16.34	1.32	17.65
	4	17	434	73	1852	27	33.47	2.06	9.38	9.61	0.78	10.39
	5	17	434	73	1852	27	33.47	2.06	9.34	9.61	0.78	10.39
J3 NB Exit	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	24	278	925	3880	120	0.15	0.04	0.13	0.53	0.00	0.53
J3 NB-Exit	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	107	-16	925	3880	120	174.05	63.85	139.09	634.87	26.60	661.47
J3 SB Exit	4	0	18880	9	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	4-1	37	146	1470	4020	120	0.26	0.11	0.14	1.49	0.00	1.49
J3 SB Left	1	5	1756	48	1704	69	7.47	0.32	0.91	1.42	0.12	1.54
J4 EB	1	98	-9	369	1800	24	122.90	19.14	157.22	178.87	6.79	185.66
	3	45	102	170	1827	24	45.27	4.95	68.67	30.36	1.86	32.22
J4 EB Exit	1	0	Unrestricted	570	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
J4 EB-1	1	28	216	539	1940	120	0.40	0.66	23.42	0.84	0.08	0.93
J4 NB	2	3	3176	10	2080	20	41.39	0.28	2.87	1.63	0.03	1.66
	3	68	32	248	2080	20	73.71	6.51	93.97	72.10	2.44	74.54
	4	78	16	285	2095	20	79.18	7.97	113.41	89.11	2.98	92.09
J4 NB Exit	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	25	256	1018	4020	120	0.15	0.04	0.04	0.61	0.00	0.61
J4 NB Left	1	24	278	73	1749	20	64.37	1.80	24.77	18.49	0.68	19.17
J4 NB-1	1	1	17360	10	1940	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	156	-42	606	1940	120	1259.07	220.73	1639.20	3010.30	28.45	3038.75
J4 SB Exit	1	0	Unrestricted	9	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
	2	0	Unrestricted	757	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
J4 WB	1	74	21	291	1876	24	72.30	7.54	94.82	82.98	2.83	85.81
	2	84	7	325	1845	24	83.13	9.33	115.54	106.43	3.47	109.90
J4 WB Exit	1	0	Unrestricted	534	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00
J4 WB-1	1	116	-23	715	1940	120	298.56	66.06	1651.38	842.03	19.65	861.67

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Report generation date: 08/12/2017 10:02:06

- »Network Diagrams
- »Traffic Stream Results

Network Diagrams



(untitled)
 Cycletime 0s / 120s , Timesteps 119 / 120
 Diagram produced using TRANSYT 15.5.1.7048

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s (per cycle))	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (€ per hr)	Weighted cost of stops (€ per hr)	Performance Index (€ per hr)	
08:00-09:00	1	1	2	4580	18	2080	53	18.46	0.33	4.40	1.31	0.03	1.34	
		2	62	45	581	2080	53	15.86	4.85	90.12	36.35	1.82	38.18	
		3	85	5	182	474	53	88.87	10.25	34.18	63.80	2.74	66.54	
	2	1	81	12	269	1909	20	76.98	6.85	112.32	81.75	2.55	84.30	
		2	75	20	234	1780	20	69.49	5.43	95.25	64.08	2.03	66.10	
	3	1	3	2817	23	2080	42	25.10	0.49	3.46	2.28	0.05	2.32	
		2	81	11	604	2080	42	47.56	11.82	115.58	113.33	4.43	117.76	
		3	87	4	87	280	42	117.04	3.88	38.27	40.16	1.71	41.87	
	4	1	88	3	406	1914	28	49.18	7.14	136.58	78.76	2.63	81.40	
		2	12	670	50	1771	28	23.78	1.46	26.93	4.69	0.20	4.89	
	5	1	14	534	106	1659	53	12.72	1.46	25.00	5.32	0.31	5.63	
	6	1	41	118	243	1644	42	36.94	4.23	40.82	35.41	1.59	37.00	
	7	1	1	10300	18	2080	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	55	64	687	2080	120	10.95	5.33	106.67	29.68	4.14	33.82	
		3	9	913	182	2048	120	0.09	0.00	0.08	0.06	0.00	0.06	
	8	1	1	10090	18	2038	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	54	66	869	2034	120	5.96	6.19	206.42	20.42	3.86	24.27	
	9	1	1	8039	23	2080	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	114	-21	962	2080	120	257.43	76.66	1916.55	976.82	25.25	1002.06	
		3	4	2052	87	2080	120	0.04	0.00	0.02	0.01	0.00	0.01	
	11	1	46	98	456	2080	120	21.78	3.09	77.13	39.18	1.16	40.34	
	12	1	118	-24	596	1928	120	331.96	60.99	1219.79	780.40	16.85	797.25	
	13	1	0	Unrestricted	18	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	0	Unrestricted	890	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	14	1	0	Unrestricted	756	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	15	1	0	Unrestricted	407	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	16	1	0	Unrestricted	23	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	0	Unrestricted	710	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TRANSYT 15

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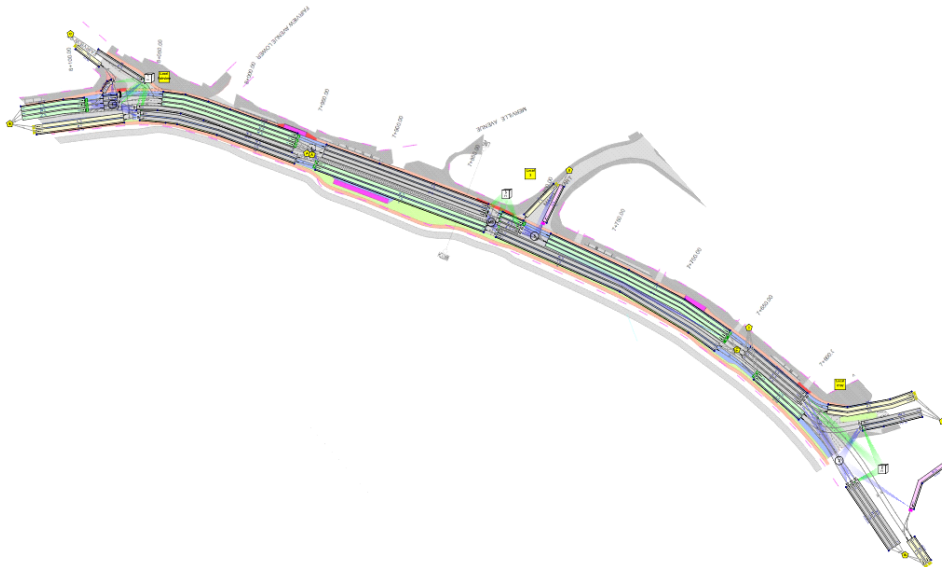
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Report generation date: 08/12/2017 10:19:17

- »Network Diagrams
- «A1 - (untitled) : D1 - (untitled)* :
- »Traffic Stream Results

Network Diagrams



(untitled)
Cycletime 0s / 120s , Timesteps 119 / 120
Diagram produced using TRANSYT 15.5.1.7048

Traffic Stream Results

Traffic Stream Results: Vehicle summary

Time Segment	Arm	Traffic Stream	Degree of saturation (%)	Practical reserve capacity (%)	Calculated flow entering (PCU/hr)	Calculated sat flow (PCU/hr)	Actual green (s per cycle)	Mean Delay per Veh (s)	Mean max queue (PCU)	Utilised storage (%)	Weighted cost of delay (£ per hr)	Weighted cost of stops (£ per hr)	Performance Index (£ per hr)	
08:00-09:00	18	1	1	13265	10	1800	98	2.24	0.06	0.21	0.09	0.01	0.09	
		2	31	186	928	3600	98	1.42	4.00	8.92	5.20	1.48	6.68	
	19	1	1	13265	10	1800	98	0.97	0.03	0.06	0.04	0.00	0.04	
		2	64	41	948	1800	98	7.11	10.71	32.60	26.60	3.21	29.81	
	20	1	1	16100	10	1800	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	39	129	917	3600	120	6.71	9.36	18.39	24.26	3.66	27.93	
	21	1	1	16100	10	1800	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	53	71	948	1800	120	1.11	0.29	1.37	4.15	0.00	4.15	
	22	1	2	3654	20	834	120	1.80	0.08	1.76	0.14	0.06	0.20	
	23	1	0	Unrestricted	31	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	24	1	1	16100	10	1800	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	32	179	480	1800	98	0.79	0.24	5.76	1.49	0.09	1.58	
		3	30	198	449	1800	98	0.74	0.22	5.12	1.30	0.08	1.38	
	BRT EB	1	0	18395	10	2055	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	28	223	335	1800	120	8.21	3.95	56.31	10.85	1.49	12.34	
		3	25	266	293	1800	120	8.06	3.45	49.42	9.31	1.30	10.61	
	EB	1	1	7301	10	1935	50	20.15	0.19	3.84	0.79	0.02	0.81	
		2	38	135	293	1800	50	17.58	3.02	83.50	20.32	1.13	21.46	
		3	38	135	293	1800	50	17.59	3.02	83.52	20.33	1.13	21.46	
	EB Exit	1	0	Unrestricted	401	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	0	Unrestricted	401	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Eastbound	1	8	980	10	1800	7	53.26	0.34	2.23	2.10	0.03	2.13	
		2	87	4	678	1800	53	30.61	12.79	117.18	81.79	4.78	86.57	
		3	31	186	255	1800	53	14.42	4.26	38.98	14.48	1.60	16.08	
	Exit EB	1	0	18395	10	2055	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	32	182	655	2055	120	0.41	0.07	0.39	1.06	0.00	1.06	
		3	16	453	293	1800	120	0.19	0.02	0.08	0.22	0.00	0.22	
	Exit NB	1	0	Unrestricted	431	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Exit WB	1	1	8000	20	1800	120	0.01	0.00	0.00	0.00	0.00	0.00	0.00
		2	46	95	948	2055	120	0.75	0.20	1.34	2.80	0.00	2.80	
	Giveway	1	34	166	292	864	120	9.43	3.10	44.31	10.86	1.82	12.67	
	Left Slip	1	5	1861	42	1800	60	12.46	0.42	9.95	2.06	0.16	2.22	
	NB Exit	1	0	Unrestricted	10	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	0	Unrestricted	562	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	R107 SB	1	3	3005	10	1800	22	39.76	0.27	2.90	1.57	0.03	1.59	
		2	181	-50	345	1800	22	1537.79	152.50	2267.54	2092.67	17.35	2110.02	
	SB	1	47	90	362	1800	50	26.94	6.01	98.29	38.47	2.26	40.73	
	WB	1	1	11915	10	1800	88	2.07	0.04	0.15	0.08	0.00	0.09	
		2	50	79	670	1800	88	3.63	6.18	30.25	9.60	2.21	11.81	
	WB Exit	1	0	Unrestricted	10	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		2	0	Unrestricted	670	Unrestricted	120	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	WB RT	1	66	35	389	1800	38	40.90	11.15	61.85	62.76	4.17	66.93	
Westbound	1	1	8810	10	1800	65	12.39	0.15	1.29	0.49	0.01	0.50		
	2	61	48	603	1800	65	21.09	7.72	91.24	50.16	2.90	53.06		
	3	15	497	139	1800	65	14.72	2.18	25.72	8.07	0.82	8.89		