MetroLink

Transport Infrastructure Ireland

Scheme Traffic Management Plan Update

R108 / Collins Avenue Extension / Glasnevin Avenue Junction Modelling

Malahide Road (R106) / R132 Junction Modelling

Griffith Park – BusConnects Bus Gate – Haulage Route

| P01.1

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1. R108 /Collins Ave/ Glasnevin Ave Junction Modelling

1.1 Introduction

Detailed below is an updated assessment of the Collins Avenue Station Scheme Traffic Management Plan (STMP) on the proposed BusConnects Scheme junction layout. When the assessment work for the EIAR was undertaken the analysis from the BusConnects Ballymun Finglas EIAR was not available. This was noted within Section 5.3.3. of Appendix D of Appendix A9.5 of the MetroLink EIAR. The data from the Ballymun BusConnects EIAR is now available, and this section contains an update on the analysis at this junction, following a review of the Ballymun BusConnects EIAR.

The junction capacity assessment which supported the Collins Avenue Station STMP incorporated proposed Dublin BusConnects Do-Minimum (BC-DM) scheme layout, illustrated by Figure 1, as the baseline junction layout.

The BusConnects Ballymun /Finglas EIAR has since been published by the NTA and the updated signal configuration for the proposed BC-DM junction layout is now available, Collins Avenue Station STMP traffic impacts has been reassessed using the proposed signal configuration data for the BusConnects scheme.

In addition, the Saturation Flow for the traffic lanes within the junction analysis needed to be updated to match the details within the BusConnects EIAR. The change in the Saturation Flows results in an increase in the capacity of the junction and the updated signal configurations results in a more efficient operation of the signals.

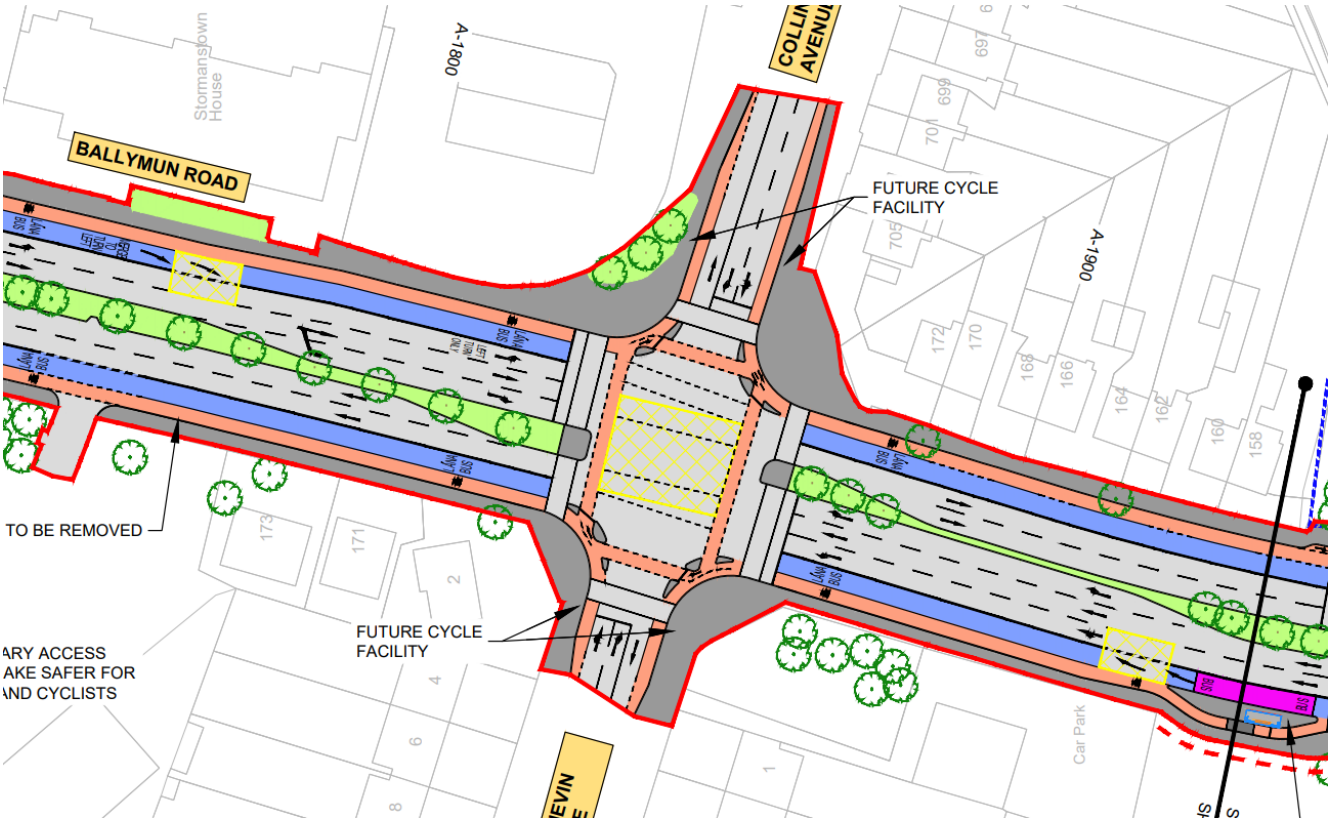

Figure 1 – BusConnects Scheme – Do-minimum (BC-DM) Baseline Junction Layout

1.2 Previous Junction Modelling Results

The junction modelling presented within the Metrolink EIAR, indicated that the junction would operate over capacity in the AM and PM peak period. The results reported delays of 96 seconds in the AM peak period and delays of 218 seconds and 422 seconds on Glasnevin Avenue and Ballymun Road in the PM peak. (Ref 7.4.6.3.1 of Appendix A9.5 of the EIAR).

The delays in the AM peak were assessed as having a slight impact and considered not likely to give rise to any significant impact.

The delay of 422 seconds in the PM was assessed as severe and considered likely to give rise to a significant impact. The delay of 218 seconds was assessed as moderate and was not considered likely to result in a significant impact.

1.3 Updated Junction Modelling Results

The updated modelling results are presented within the tables below. Table 1 and Table 2 summarise the junction modelling results for the '2028 Base + Construction' AM and PM peak hours with the junction layout options identified in this report. Signal timings were optimised in LinSig model for all scenarios.

The operational performances of the junctions are summarised as the Degree of Saturation (DoS), Mean Max Queue (MMQ), expressed in Passenger Car Unit (pcu) values, and Vehicle Delay, in seconds per vehicle. Practical Reserve Capacity (PRC), which measures spare capacity on the most congested link in the model. Queue lengths and vehicle delays have been rounded to the nearest whole number.

Table 1 – AM Peak Junction Operational Capacity Results

Arm	Lane	2028 AM Base plus Construction TTM BusConnects Layout Reassessment		
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)
R108 Northbound	Left / Ahead	0.0%	0	0
	Ahead	36.6%	7	34
	Right	88.0%	10	103
Collins Ave Ext.	Left Right Ahead	84.6%	9	98
R108 Southbound	Left / Ahead	0.2%	0	33
	Ahead / Right	90.0%	30	44
Glasnevin Ave	Ahead Left Right	90.0%	10	113

Arm	Lane	2028 AM Base plus Construction TTM BusConnects Layout Reassessment		
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)
Toucan Crossing				
R108 Northbound	Ahead	38.4%	4	5
R108 Southbound	Ahead	62.1%	8	11
Practical Reserve Capacity (%)		0.0%		

Results show that the junction would operate close to its practical capacity. In the AM peak hour, maximum queue length on the R108 is predicted to be around 30 pcus (170m) on the southbound approach under both junctions.

Vehicle delays are predicted as follows:

- R108 Southbound Arm – approximately 1 minute
- R108 Northbound Arm – up to 2 minutes
- Glasnevin Avenue – up to 2 minutes
- Collins Avenue Extension – up to 1.5 minutes

It should be noted that there would be minimal delays on the R108 at the toucan crossing and therefore no queue tail backs are predicted.

Table 2 – PM Peak Junction Operational Capacity Results

Arm	Lane	2028 PM Base plus Construction TTM BusConnects Layout Reassessment		
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)
R108 Northbound	Left / Ahead	1.6%	0	68
	Ahead	39.4%	6	42
	Right	75.7%	9	70
Collins Ave Ext.	Left Right Ahead	74.6%	7	62
R108 Southbound	Left Ahead	0.5%	0	44
	Ahead	77.1%	17	40
	Right			
Glasnevin Ave	Ahead Left Right	66.8%	8	62
Toucan Crossing				
R108 Northbound	Ahead	36.9%	4	8

Arm	Lane	2028 PM Base plus Construction TTM BusConnects Layout Reassessment		
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)
R108 Southbound	Ahead	37.4%	4	8
Practical Reserve Capacity (%)		16.8%		

PM peak results show that both junction layouts would operate within capacity with predicted queue lengths on all approaches within acceptable levels.

Vehicle delays are predicted as follows:

- R108 Southbound Arm – approximately 1 minute
- R108 Northbound Arm – approximately 1 minute
- Glasnevin Avenue – approximately 1 minute
- Collins Avenue Extension – approximately 1 minute

1.4 Updated Assessment

Based on the updated junction analysis, the STMP assessment is assessed as having a slight impact on all arms of the junction for both the AM and PM peak periods, and accordingly the construction phase would not have a significant impact on the operation of this junction and users of the junction.

1.5 Summary

The assessment within the EIAR has been reviewed to include data from the Ballymun Finglas BusConnects EIAR. This required an update to the junction analysis.

The Metrolink Construction Phase analysis has been revised to include for the updated data from the Ballymun Finglas BusConnects EIAR. The updated analysis demonstrates the Ballymun Road / Collins Ave / Glasnevin Ave will operate satisfactorily during the Metrolink construction period without any significant delays at this junction, with predicted delays under 2-minutes in the AM Peak, and approximately 1-minute in the PM Peak.

2. Malahide Road R106 / R132 Junction

2.1 Introduction

The MetroLink construction phase Temporary Traffic Management (TTM) measures at the R132 / Malahide Road junction comprised lane closures and reconfiguration of the Malahide Road east approach to the junction. Construction Phase 2 TTM measures at the Malahide signalised junction are illustrated by Figure 2.

The proposed R132 Connectivity signal scheme baseline signal configuration allowed Malahide Road east and west approach arms to run green at the same time, which resulted in an optimised four stage sequence for the junction. The STMP construction phase assessment considered a separate signal stage for the east and west approach arms, which increased the signal sequence to five stages. However, following discussions with the junction design team, it has been confirmed that appropriate safety measures can be implemented as part of the TTM in order to run an optimised four stage plan similar to the baseline scenario.

This technical note has been prepared to report junction operational analysis results of R132 / Malahide Road STMP measures, based on the four-stage sequence signal configuration.

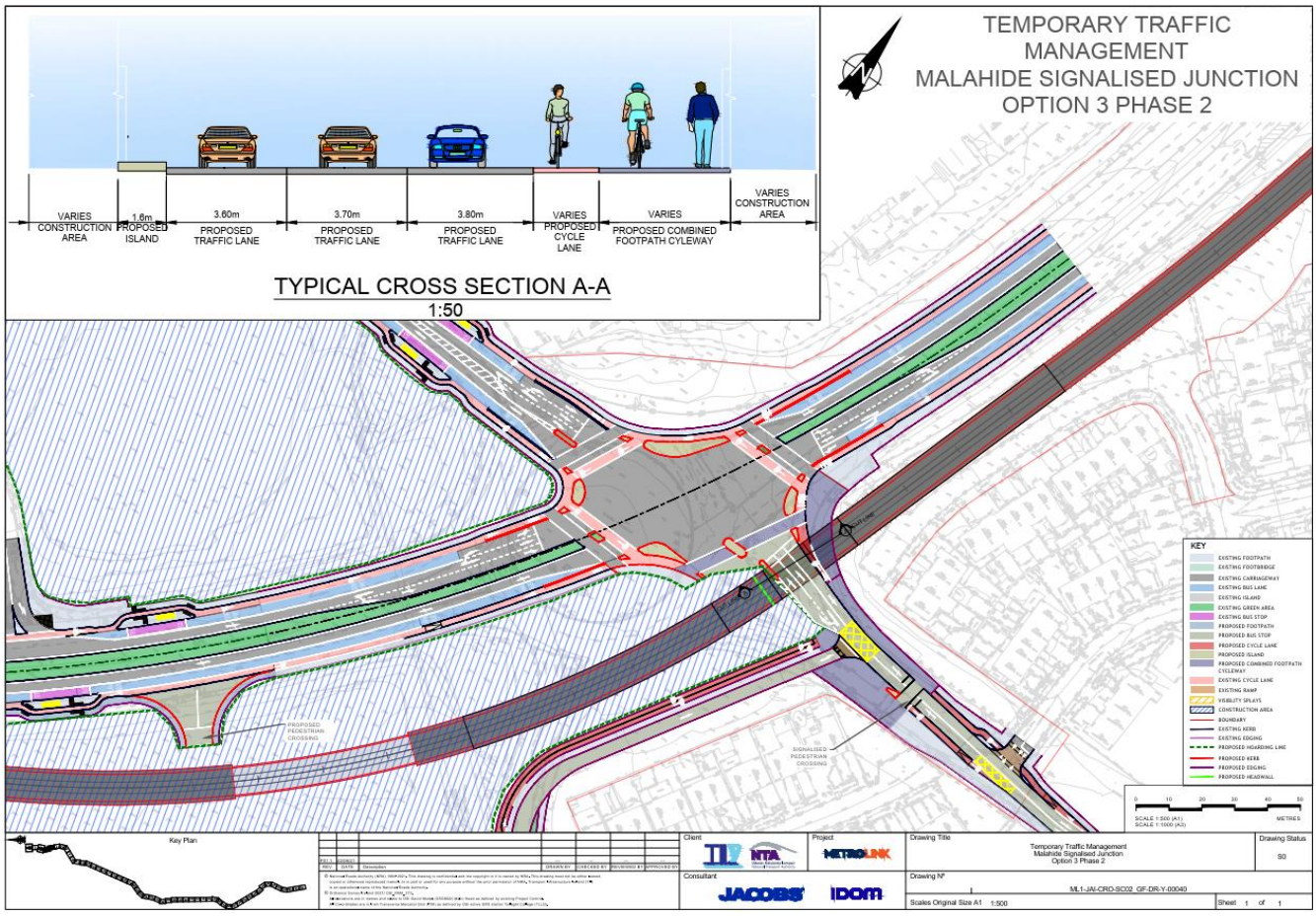

Figure 2: R132 / Malahide Road Signalised Junction Phase 2 Temporary Traffic Management

2.2 Junction Modelling Results

The construction phase traffic impact has been assessed using LinSig Version 3.2.40. Table 3 and Table 4 summarises the junction modelling results for the '2028 Base + Construction' in the AM and PM peak hours, it presents the 5 Stage sequence, the 4 Stage sequence and the DoMinimum results. The results for the AM peak are presented in Table 3 and the results for the PM peak are presented in Table 4.

The operational performances of the junctions are summarised as the Degree of Saturation (DoS), Mean Max Queue (MMQ), expressed in Passenger Car Unit (pcu) values, and Vehicle Delay, in seconds per vehicle. Practical Reserve Capacity (PRC), which measures spare capacity on the most congested link in the model. Queue lengths and vehicle delays have been rounded to the nearest whole number.

The DoMinimum baseline scenario, presented as "2028 Base DM Weekday (Without TTM)", indicated that this junction would operate overcapacity in 2028 without the Metrolink construction taking place. It showed the junction operating at a PRC of -41% and delay of 482 seconds on the R132 North Arm and similar on the R106 in the AM Peak. For the PM peak it had a PRC of -33%, and delays of 283 seconds, 362 seconds, 393 seconds on the R132 North, R106, and R132 South arms.

Table 3 – AM Peak Junction Operational Capacity Results

Lane Description	Movement	2028 AM Base plus Construction TTM						2028 Base DM Weekday AM (Without TTM)		
		STMP 5-Stage Sequence			STMP 4-Stage Sequence					
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)	DoS [%]	MMQ [PCU]	Delay (secs/pcu)	DoS [%]	MMQ [PCU]	Delay (secs/pcu)
R132 North	Ahead Left	179.1%	240	940	145.4%	177	666	127.5%	129	482.4
	Right	130.1%	33	552	130.1%	33	549	69.0%	4	90.4
R106 Swords Road	Ahead Left Right	178.0%	248	936	146.9%	161	602	126.2% 21.6%	119 1	464.5 54.4
R132 South	Ahead Left	121.1%	44	431	83.7%	13	73	88.5%	16	75.4
	Right	27.7%	2	66	27.7%	2	66	20.5	1	64.1
R106 Malahide Road	Ahead Left	169.9%	136	877	49.3%	14	35	49.2%	12	38.0
	Right	63.0%	4	85	81.2%	5	119	23.3%	1	99.4
PRC (%)		**-99%**			**-63%**			**-41.7%**		
Total Delay (pcuHr)		**665**			**381**			**237.93**		

Results for the Do Minimum baseline scenario show that the junction is predicted to operate over capacity without the MetroLink STMP TTM proposals, reference "2028 Base DM Weekday AM (Without TTM)".

With the TTM in place as shown in Table 3 for the AM Peak, the modelling indicates approximately 8% increase in traffic through the junction. Therefore, the Do Minimum capacity constraints at the junction would be impacted by the STMP measures. For the 4-stage scenario, the delay is 230 seconds greater than the DoMinimum baseline scenario for the R132 North Arm which is the most impacted arm of the junction. This increase in delay is classed as Moderate in the STMP. The delays are significantly less in the 4-Stage sequence than the 5-Stage sequence.

The PM Peak results are shown in Table 4. For the PM Peak, in the 4 Stage sequence arrangement, only one arm turning lane, R132 North right turn, will have additional delays of greater than 300 seconds, (336 seconds), compared to the DoMinimum. All of the other arms of the junction will operate with delays of less than 300 seconds and the increase in delay is classed as Moderate within the STMP.

Table 4 – PM Peak Junction Operational Capacity Results

Lane Description	Movement	2028 PM Base plus Construction TTM						2028 Base DM Weekday PM (Without TTM)		
		STMP 5-Stage Sequence			STMP 4-Stage Sequence					
		DoS [%]	MMQ [PCU]	Delay (secs/pcu)	DoS [%]	MMQ [PCU]	Delay (secs/pcu)	DoS [%]	MMQ [PCU]	Delay (secs/pcu)
R132 North	Ahead Left	170.8%	276	878	129.6%	170	493	112.9%	82	283.6
	Right	136.7%	38	618	124.3%	31	485	92.3%	8	149.4
R106 Swords Road	Ahead Left Right	200.5%	179	1082	131.7%	95	550	118.3% 23.3%	86 1	362.9 99.4
R132 South	Ahead Left	196.6%	248	1036	131.6%	136	523	120.4%	82	398.3
	Right	86.1%	7	118	78.9%	6	96	75.3%	6	94.1
R106 Malahide Road	Ahead Left	191.6%	217	1018	99%	36	106	106.1%	57	187.1
	Right	12.2%	1	61	36.7%	1	107	23.3%	1	99.4
PRC (%)		**-123%**			**-99%**			**-33.7%**		
Total Delay (pcuHr)		**922**			**667**			**264.64**		

2.3 Summary

Re-assessment of the R132 / Malahide Road junction has been carried out which considers the baseline four stage signal configuration sequence.

The four stage sequence results show reduction in delays and queue at the junction compared to the five-stage sequence junction analysis results for both the AM and PM Peak. These impacts though are still greater than the baseline DoMinimum Scenario, with moderate impacts seen for AM and PM Peak scenarios respectively, an improvement compared to the five stage sequence arrangement.

3. Griffith Park HGV Construction Diversion – BusConnects Bus Gate

As part of the BusConnects Scheme, a bus gate will be introduced at the end of St Mobhi Road and will be operational between 16:00 and 20:00 daily which will allow through traffic of buses only. Currently, HGV movements leaving the construction site for Griffith Park station will no longer be able to use the proposed route, as listed in section 7.5.3 of the Scheme Traffic Management Plan, when the bus gate is operational.

HGV movements at the site location will end by 18:30, to allow for the 30-minute site tidy at the end of the day, therefore the HGVs will only be affected by this bus gate for 2.5 hours daily. The average number of HGV movements affected by this diversion is 3 per hour, as only HGVs exiting the site will be affected.

The normal haulage route, as stated within the STMP, is to travel north to St Mobhi Road and onto to the R108 using the same route to enter and exit the site. Due to the bus gate, an alternative route must be provided between the hours of operation of 16:00 to 20:00.

Multiple options were considered for the HGV diversion. Initially, in the STMP it was proposed that HGVs would travel along the Finglas Road, or the N1.

While both of these are possible routes, the route to the Finglas Road is the preferred route. The advantages include fewer left turns to be made by the HGVs and it avoids additional HGVs taking routes through Glasnevin and Phibsborough villages.

Whilst the bus gate is in operation, HGVs will take the diversion shown below. The proposed HGV route from the site is to travel southbound along the R108, St Mobhi Road and turn right to R135 Finglas Road at the triangle in Glasnevin. From here, the HGV alignment will be the same route taken by HGVs from Glasnevin station to junction 5 on the M50.

The average number of movements for the Glasnevin station is 7 movements per an hour, for example 4 exit and 3 entry movements.

The R135 is also the haulage route for vehicles accessing the Mater construction site, the average number of HGV movements from the Mater site is 2.5 per hour.

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The routing of the Griffith Park exit HGVs will result in an average of 3 HGVs per hour during the 2.5 hour overlap period.

The increase in the HGV movements along this corridor will see the number of movements increase to an average of 12.5 movements per an hour, during the construction phase and a slight increase of usage on the road of 2%. The small increase in HGVs now taking the route proposed above will have a minimal impact for other road users, and does not change any of the impacts presented within the EIAR.