MetroLink

Transport Infrastructure Ireland

New GDA Transport Strategy – Modelling Review

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1 Metrolink – GDA Strategy 2022 – 2042

1.1 Purpose

As part of the EIAR a Scenario B was assessed within the Traffic and Transport chapter. This Scenario B used the NTA GDA Transport Strategy 2016-2035 to develop the do-minimum transport network for the forecast years of 2050 and 2065.

The present Transport Strategy for the Greater Dublin Area 2022-2042 (Transport Strategy) updates and supersedes the previous Transport Strategy for the Greater Dublin Area 2016-2035 (Prior Strategy), which was approved by the then Minister for Transport, Tourism and Sport in 2016. The Transport Strategy was published after the submission of the Railway Order.

The Transport Strategy has been developed to be consistent with the spatial planning policies and objectives set out in the Regional Spatial and Economic Strategy (RSES) as adopted by the Eastern and Midland Regional Assembly and finalised in January 2020.

To comprehensively understand the effects of Metrolink, a series of tests were conducted with the implementation of the new GDA. These tests have been compared to the Scenario B results presented within the EIAR to understand the similarities or differences in terms of the impact of the Metrolink on the receiving environment with the new Transport Strategy in place.

1.2 Differences in Prior GDA v New GDA

In 2021, Jacobs-Systra conducted the GDA Strategic Modelling work using the ERM model version V3.0.74i, while the MetroLink modelling work utilized ERM model version V3.0.61. Notably, V3.0.74+ has introduced improvements to various modules, including the Park and Ride model. However, it hasn't been officially released to consultants for general scheme appraisal exercises.

Additionally, the GDA schemes were coded on a different infrastructure network in the GDA Strategic Modelling project. Due to this distinction, the Public Transport (PT) inputs applied in the GDA Strategic Modelling project cannot be directly adapted into the MetroLink project. Recognizing this, Jacobs undertook the task of updating the New GDA Assumptions specifically for the MetroLink Project, a process that underwent review by both Transport Infrastructure Ireland (TII) and the National Transport Authority (NTA).

Upon reaching a consensus on the agreed assumptions, the Metrolink's GDA scenarios were systematically retested in the RMS V74i. The following sub-sections provide a summary of the differences between the prior and new GDA assumptions.

1.2.1 Road Schemes

Proposed road schemes in the Transport Strategy are very similar to the previous Strategy. Therefore, the road network for GDA assumptions have remained the same. The following outline the main differences between the New GDA and the Prior GDA.

Demand Management:

- 50% reduction to free workplace parking is not included in previous GDA assumptions.
- 2.5€/h in every zone where parking charge applied is not included in previous GDA assumptions

However, the new GDA run shows the targeted mode share has been achieved while the DM4 is absent, therefore the DM4 is not implemented though it is registered in the updated Transport Modelling Plan (ML1-JAI-TRA-ROUT_XX-PL-Y-00001 | P08)

1.2.2 PT Schemes

The following outline the main differences between the New GDA and the Prior GDA.

Heavy Rail:

- DART+ and Dart Tunnel

  Dart Tunnel scheme is removed from the Transport Strategy

- Navan Rail

  New Navan Rail is included in the Transport Strategy

Luas (light Rail):

- Green Line extension: Bray-Charlestown

  Slight difference in alignment in the Transport Strategy

- Red Line extension:

  Poolbeg section was removed from the the Transport Strategy

Bus:

- Bus Connects "PLUS" – i.e. Bus Connects network with increased capacity (150 pass/bus) on the spines is proposed in the Transport Strategy

- Additional orbital bus network is proposed in the Transport Strategy . The plot below is the modelled orbital bus services.

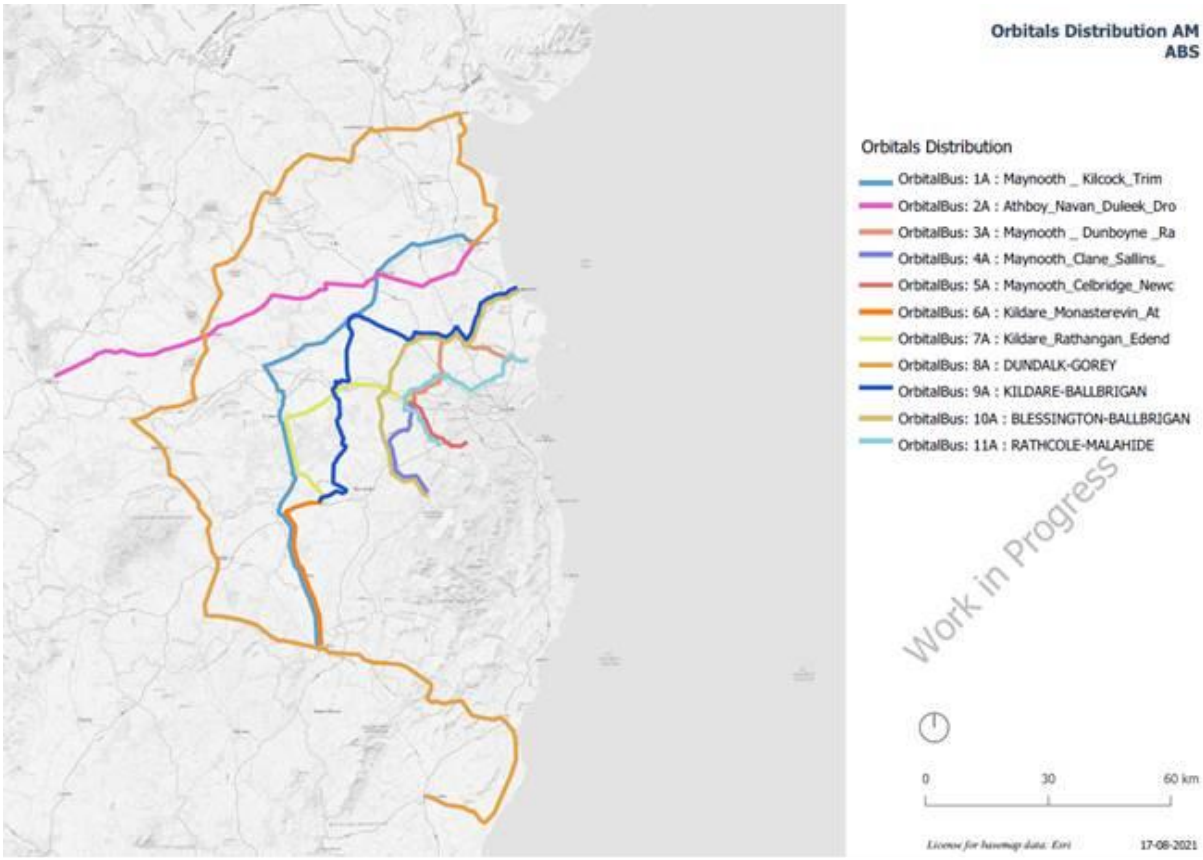


Figure 1—1: Proposed Orbital Bus in 2042 GDA Strategy Modelling Study

Other:

- Integrated fare system: flat fare system (short/long) (we will keep fare system consistency within Metrolink project fare, therefore we will not make change in fare rate and only include new station into the fare matrix)

1.2.3 Park and Ride Schemes

The following outline the main differences between the New GDA and the Prior GDA.

Park & Ride:

- 11 additional sites as in the Park and Ride (P&R) strategy (incl. Lissenhall close to Metro Estuary Station) comparing to prior GDA. They are included in the P&R site list.

Figure 1—2: Park and Ride Site Modelled in New GDA

1.2.4 Activity Mode

The following outline the main differences between the New GDA and the Prior GDA.

Cycle:

- To represent the high quality of service and connected cycle network within the Transport Strategy – the cycle infrastructure is coded as 20kph cycle speed on all links within M50., and .
- Cycle propensity activated (75% of the High configuration).

There are also technical improvements within Model version 3.0.74i that change elements such as period to hour factors, mode destination choice and special zones, such as the Airport.

2 Metrolink – GDA Strategy 2022 – 2042

2.1 Model Reference

2.1.1 Prior GDA delivered in EIAR Report

	2050	2065
Do Minimum	AFM	AFO
Do Scheme	AFN	AFX

2.1.2 New GDA tested in V74i

	2050	2065
Do Minimum	G50DMTv74i_CYC	G65DMTv74i_CYC
Do Scheme	G50DSTv74i_CYC	G65DSTv74i_CYC

2.2 Convergence

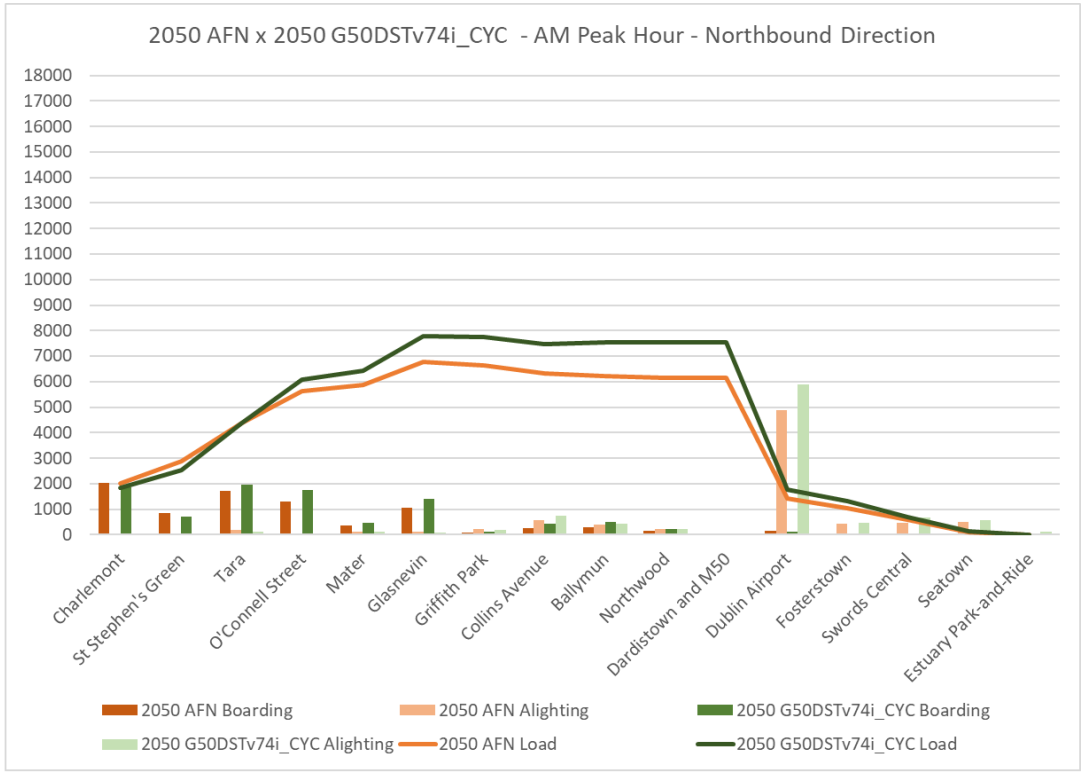
With similar assumptions being input and iterations, the v74i shows better level of convergence comparing to v61, which indicates the v74i is performing more stable than v61.

2.3 Metrolink Line Flows

Figure 2—1 to Figure 2—4 shows a comparison of the line flow on Metrolink for the Prior GDA v the New GDA for 2050 , the following is noted:

- The profiles are very similar for each time period in the New GDA compared to the Prior GDA
- In the AM peak the maximum line flow is approximately 13,000 (SB) in the new GDA , compared to 11,000 in the Prior GDA.
- The LT and SR periods have similar line flows.
- In the PM peak, the maximum line flow is approximately 7,000 (NB) in the new GDA compared to 8,000 in the Prior GDA

The changes in the peak hour flows are primarly due to differing technical factors in the model versions. The V61 and the V74i have different Period to Peak factors. V74i's factors are higher than V61 and as a results the demand allocated to the Peak hour is higher in V74i than v61. When all hourly demand factored to the 12 hours volume, v61 and v74i show very similar results.



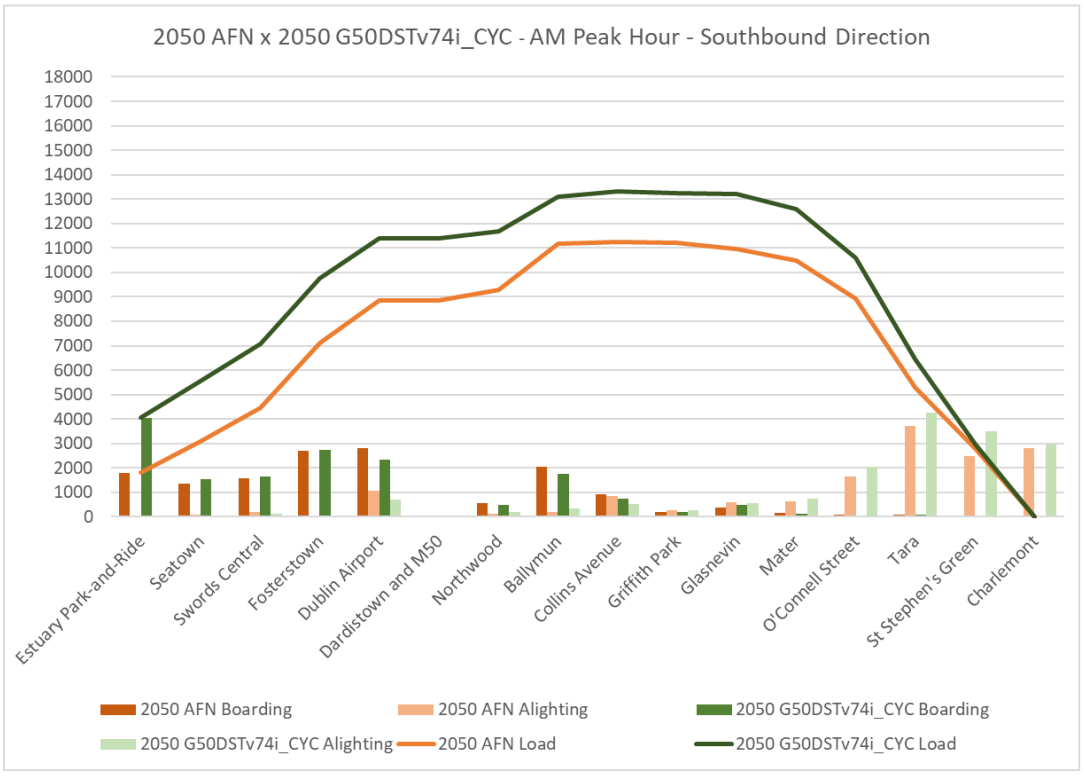


Figure 2—1: Metrolink - Line Flows - AM Peak - Prior GDA V New GDA (2050)

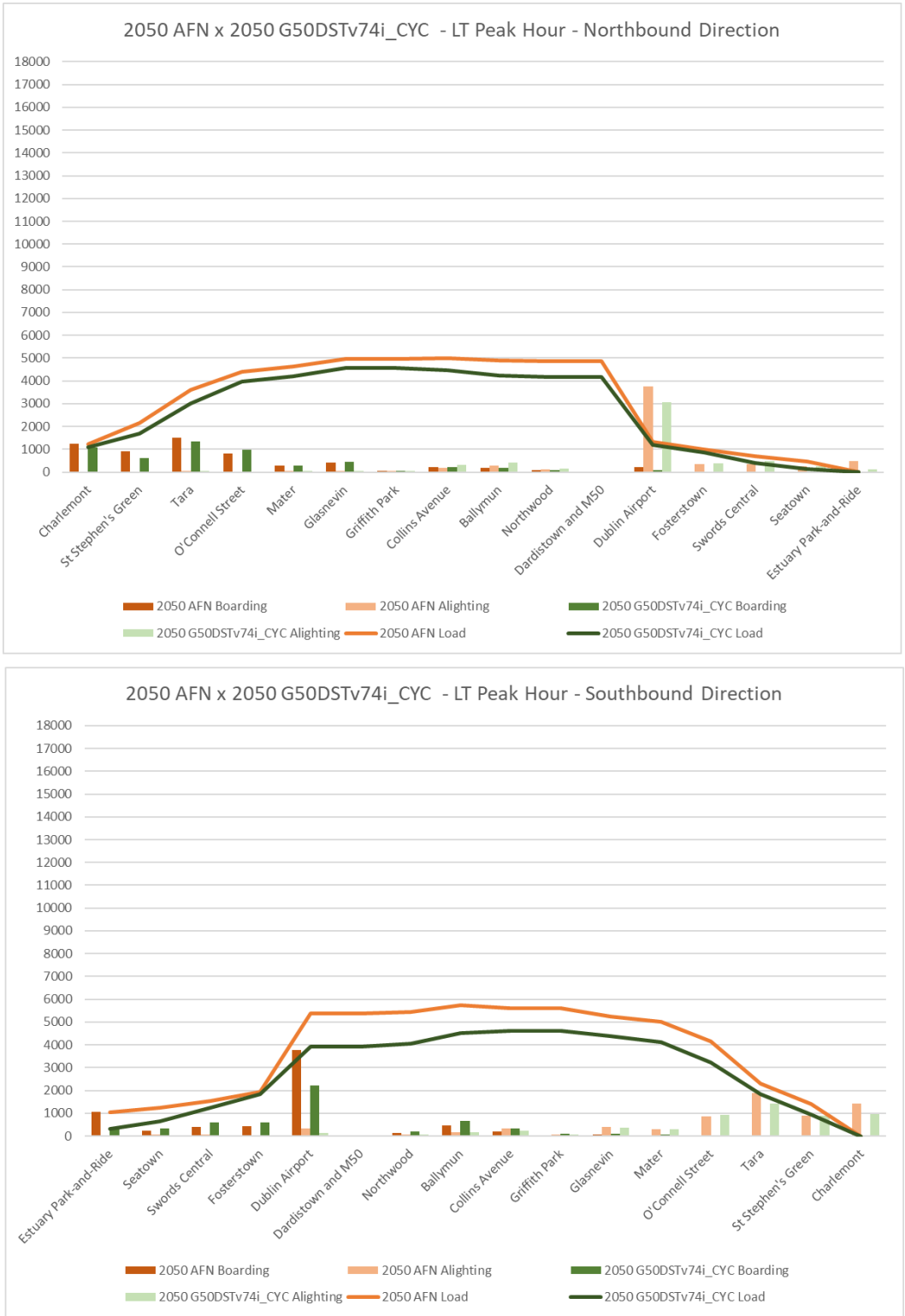


Figure 2—2: Metrolink - Line Flows - LT Peak - Prior GDA V New GDA (2050)

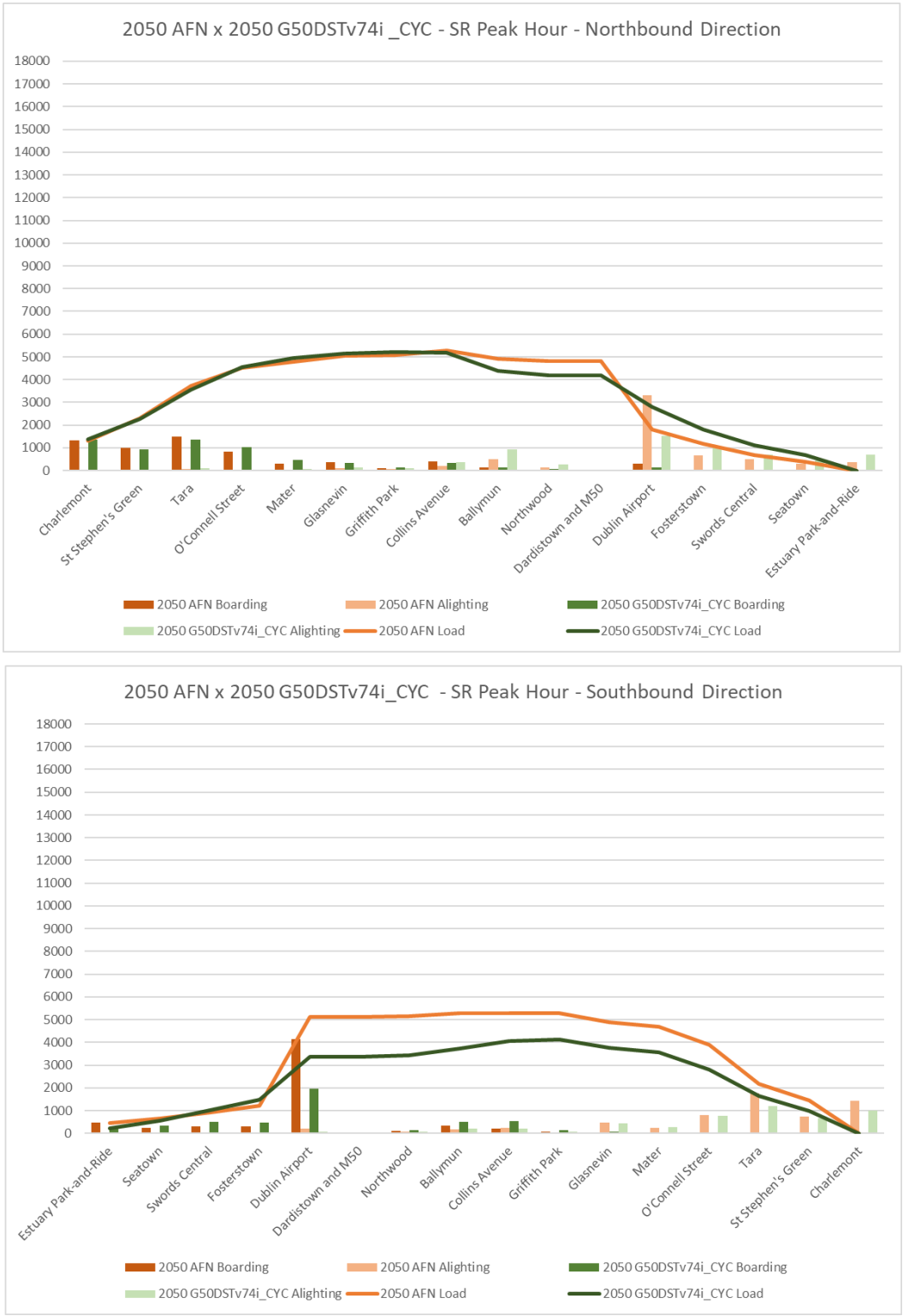


Figure 2—3: Metrolink - Line Flows - SR Peak - Prior GDA V New GDA (2050)

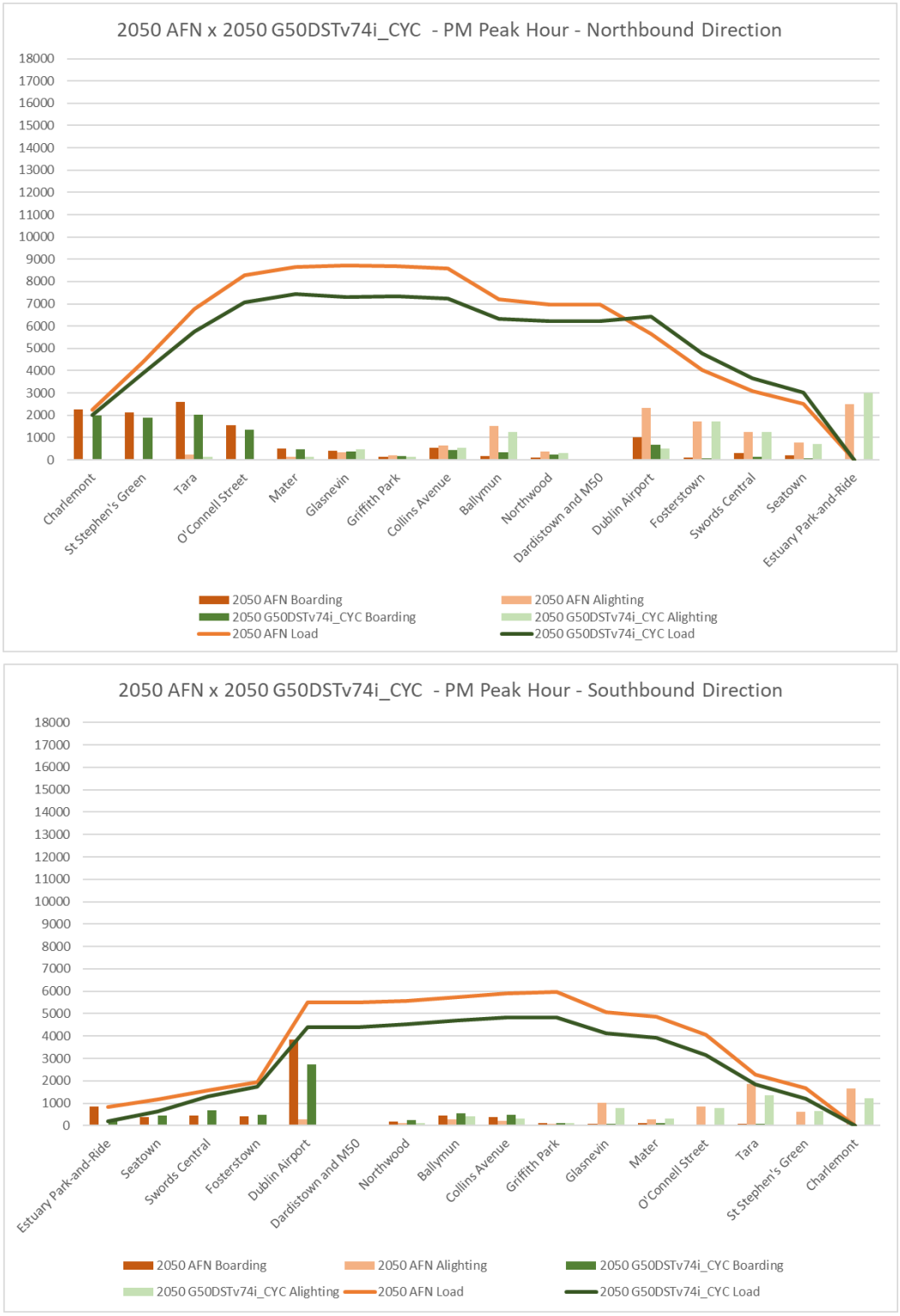
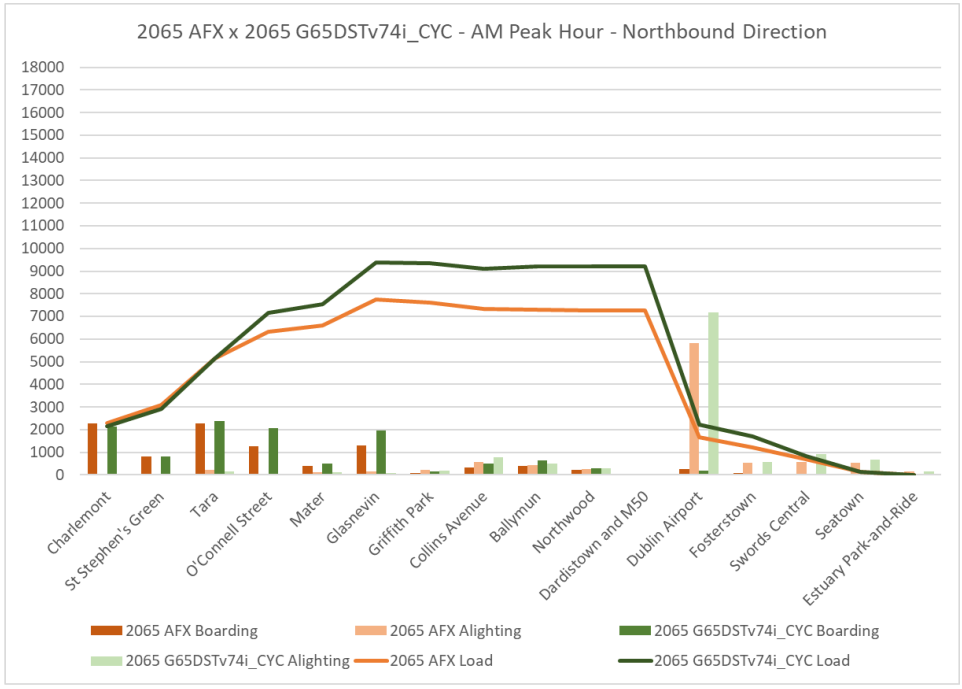


Figure 2—4: Metrolink - Line Flows - PM Peak - Prior GDA V New GDA (2050)

Figure 2—5 to Figure 2—8 shows a comparison of the line flow on Metrolink for the Prior GDA v the New GDA for 2065 , the following is noted:

- The profiles are very similar for each time period in the New GDA compared to the Prior GDA
- In the AM peak the maximum line flow is approximately 16,000 (SB) in the new GDA , compared to 14,000 in the Prior GDA.
- The LT and SR periods have similar line flows.
- In the PM peak, the maximum line flow is approximately 9,000 (NB) in the new GDA compared to 9,500 in the Prior GDA



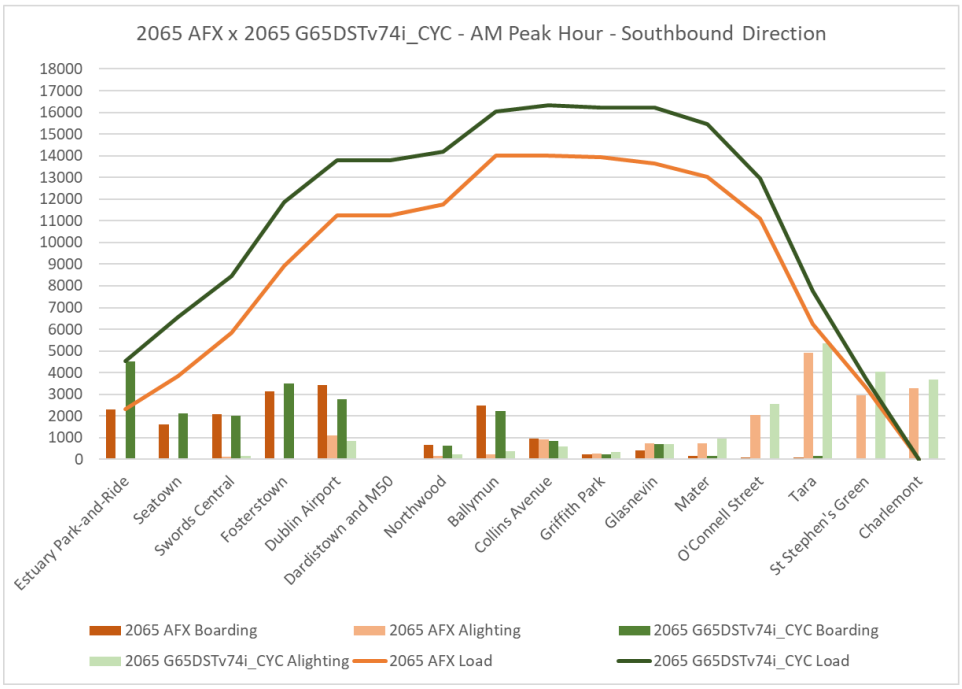
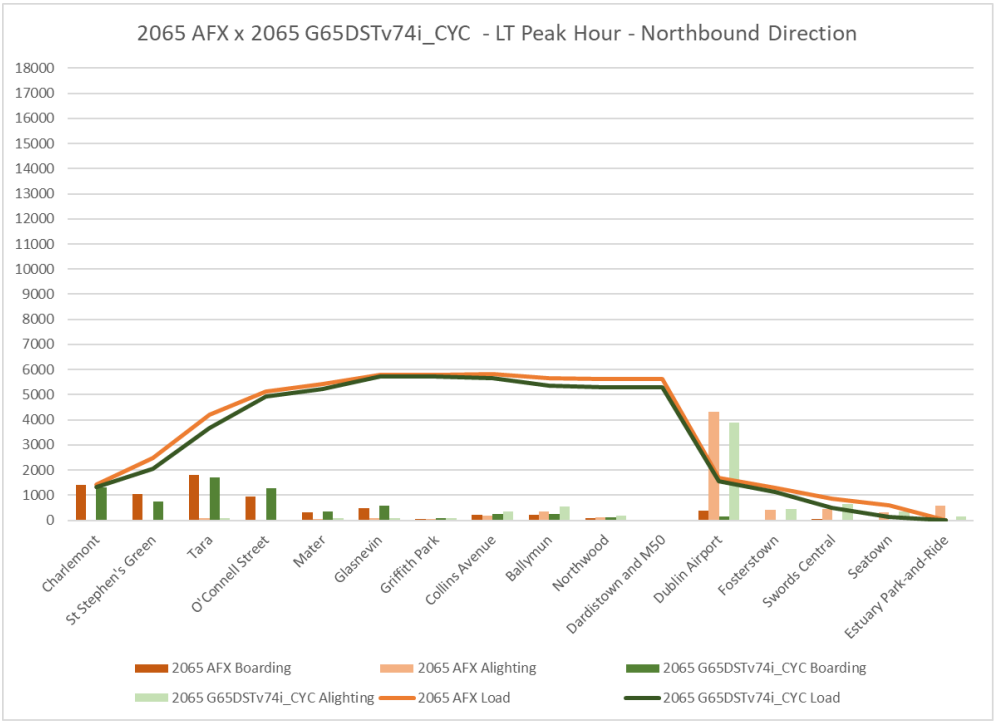


Figure 2—5: Metrolink - Line Flows - AM Peak - Prior GDA V New GDA (2065)



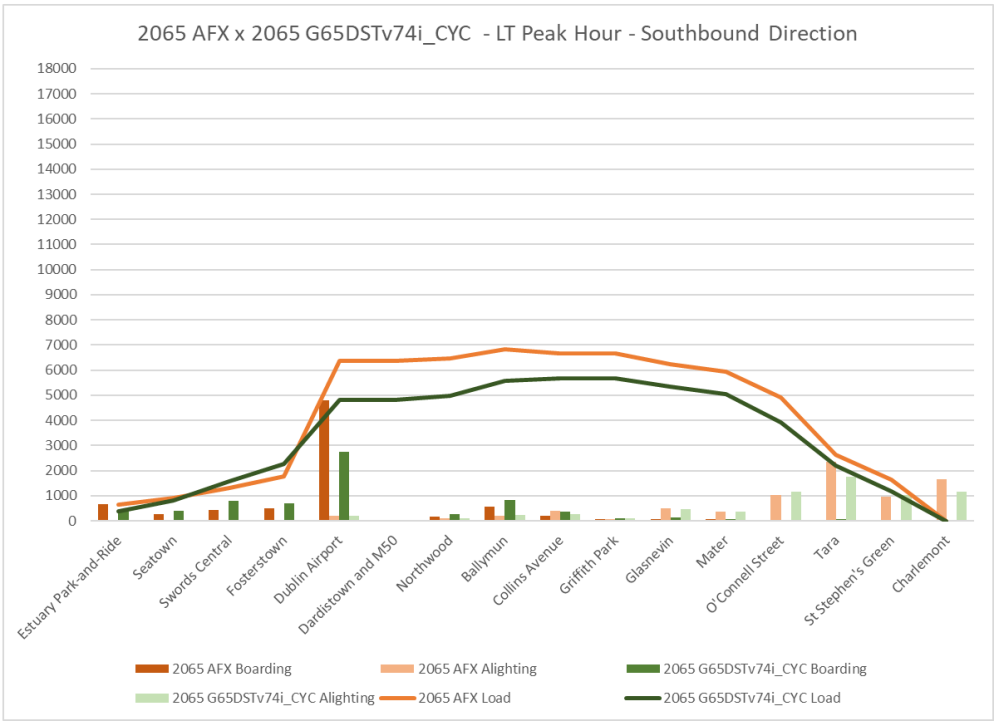
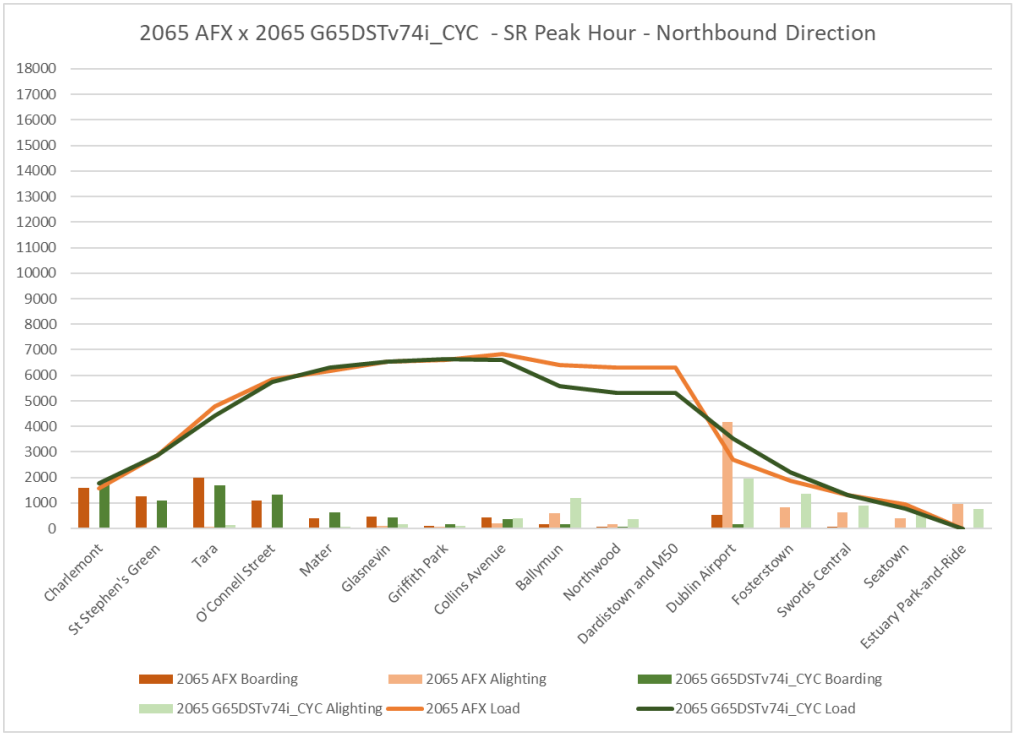


Figure 2—6: Metrolink - Line Flows - LT Peak - Prior GDA V New GDA (2065)



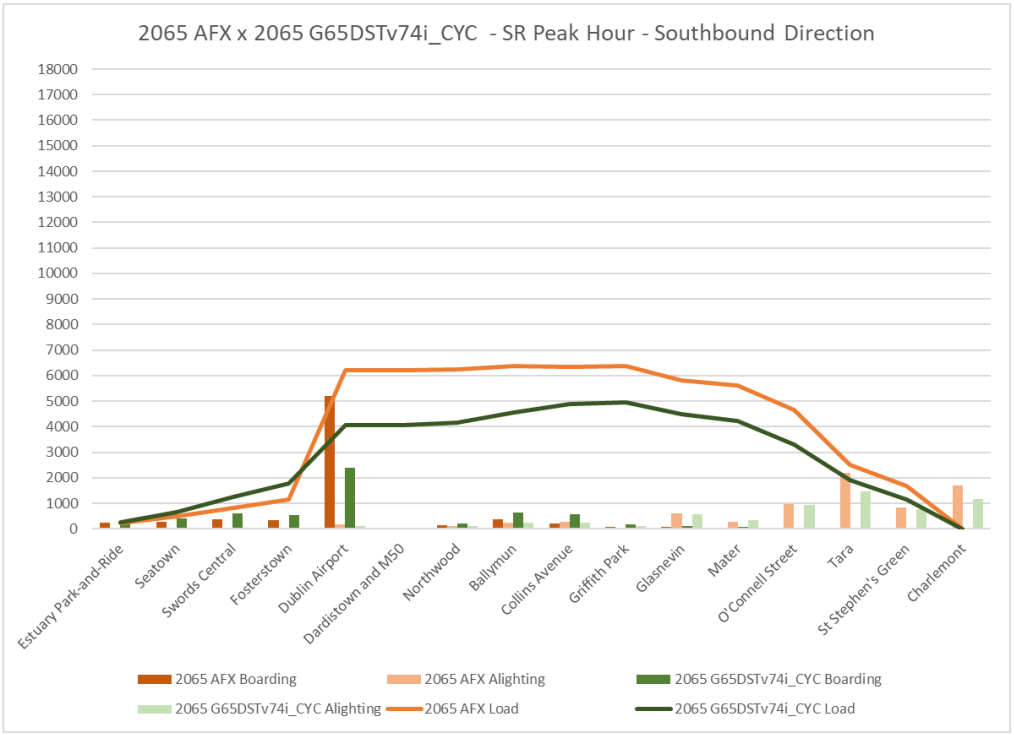
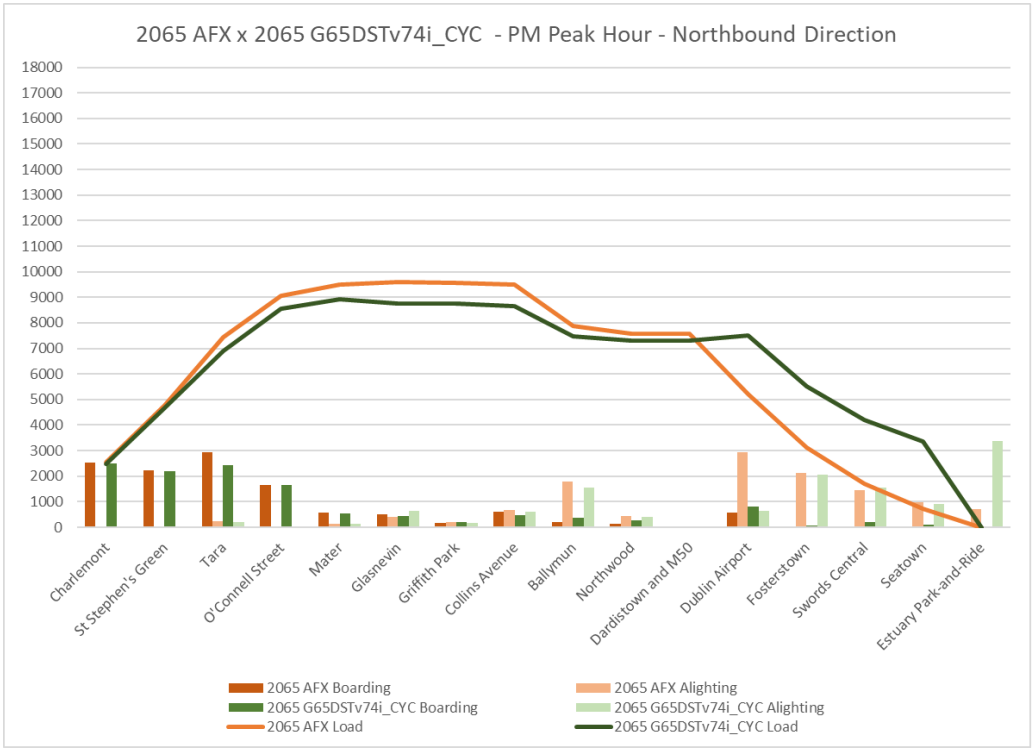


Figure 2—7: Metrolink - Line Flows - SR Peak - Prior GDA V New GDA (2065)



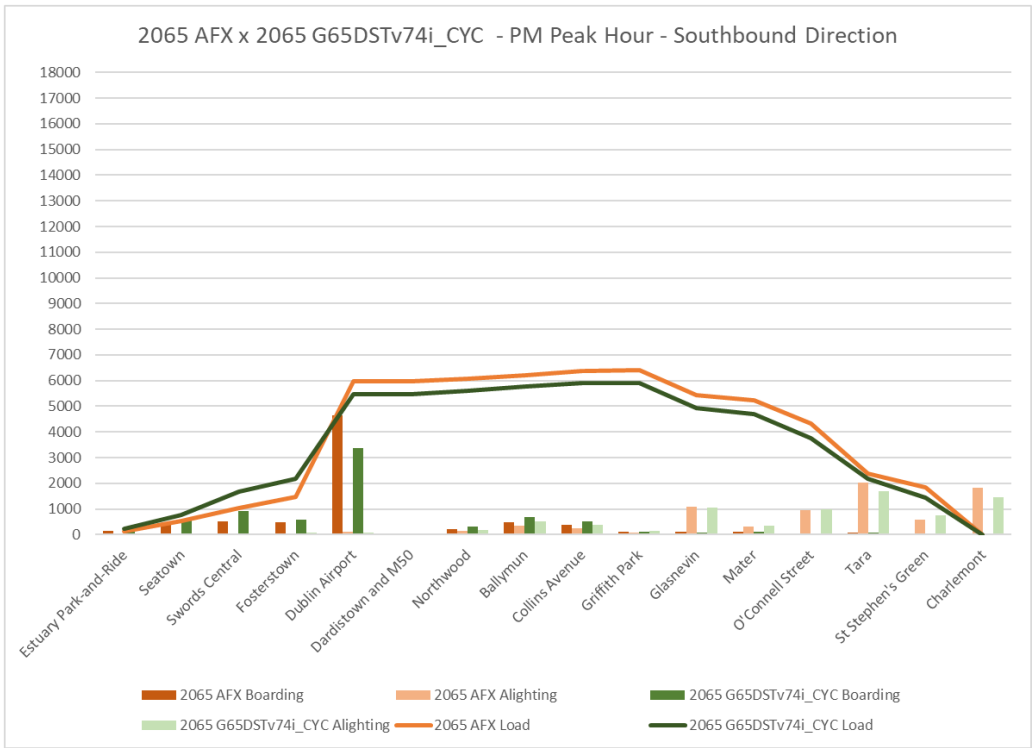


Figure 2—8: Metrolink - Line Flows - PM Peak - Prior GDA V New GDA (2065)

2.4 Metrolink Station by Station

The 12hr boarding and alighting numbers at the stations have also been reviewed for the 2050 and 2065 years. The results showed similar patterns at each of the stations for both forecast years. The only station with a notable difference is Dublin Airport, which has close to 20,000 additional movements in the Prior GDA modelling. This is probably due to the treatment of the Airport Special Zone in the v3.0.74 model.

Table 2.1 below provides the details for each station in the Prior GDA and the New GDA models for the 2065 year, in overall terms the New GDA has 1% higher boardings and alightings than the Prior GDA.

Table 2.1: Boarding and Alightings at Metrolink Stations - Prior GDA vs New GDA Transport Strategy

Run ID	AFX		G65DSTv74i_CYC	
Station	Boarding	Alighting	Boarding	Alighting
Charlemont	19678	21018	19392	18106
St Stephen's Green	13854	12918	12405	15724
Tara	23480	29999	21543	26241
O'Connell Street	13035	12683	16266	14134
Mater	5177	5035	6273	6013
Glasnevin	8297	9238	10682	9585
Griffith Park	2138	2520	3109	2928
Collins Avenue	8244	8533	9932	9034
Ballymun	11743	10641	14161	13295
Northwood	4134	3728	5303	4558
Dardistown and M50	0	0	0	0
Dublin Airport	51350	47325	32156	36511
Fosterstown	10641	10207	12966	11794
Swords Central	8512	8246	11280	10592
Seatown	6108	5808	8485	6373
Estuary Park-and-Ride	7858	6353	12202	11258
Total 12 Hours Passengers	194,249	194,252	196,155	196,146

2.5 Impact on Modal Share

The impact of the Metrolink on the Modal Share for the GDA model area in 2050 is shown in the table below. The main difference is the performance of the Do Minimum (DM) networks. In the new GDA Strategy, the cycle modal share is significantly higher than the prior GDA and the car model share is also significantly lower.

With the Metrolink in place, the impact in the new GDA Transport Strategy and the prior GDA Transport Strategy is similar, there is a reduction in the car, cycling, walking mode shares and an increase in the public transport mode share.

Mode Share	Run ID	Do Min (Prior GDA)	Do Scheme (Prior GDA)	Change	Do Min (New GDA)	Do Scheme (New GDA)	Change
Shares	*Car*	54.54%	54.13%	-0.4	45.43%	45.23%	-0.2
	PT	18.55%	19.42%	+0.9	17.26%	17.99%	+0.7
	Cycle	2.76%	2.67%	-0.1	13.91%	13.65%	-0.3
	Walk	24.14%	23.77%	-0.7	23.40%	23.13%	-0.3

2.6 Impact on PT line Flows and Road Network

The changes on the various public transport networks in the new GDA Do Something (DS) compared to the Do Minimum (DM) are shown in Figure 2—9 below. The changes show a similar pattern to the Prior GDA Transport Strategy modeling with increases on LUAS green line, DART Maynooth line and Kildare line, and with decreases on the DART northern line and on the bus lines from Swords and Dublin Airport.

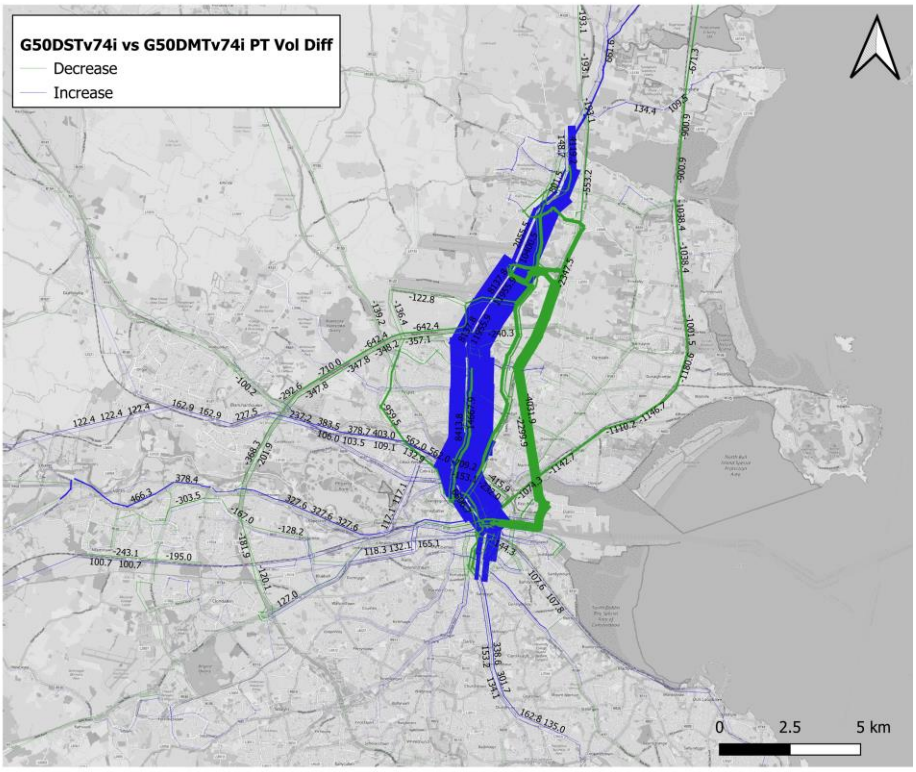


Figure 2—9: Flow changes on Public Transport Network with Metrolink - New GDA (2050)

The changes on the highways network for the New GDA DS compared to the DM are shown in Figure 2—10 below. The changes show a similar pattern to the Prior GDA modeling decreases on the M1 south of the Lissenhall Interchange, decreases on the M50 and N2, with increases on the M1 and some of the local roads north of the Estuary Park and Ride.

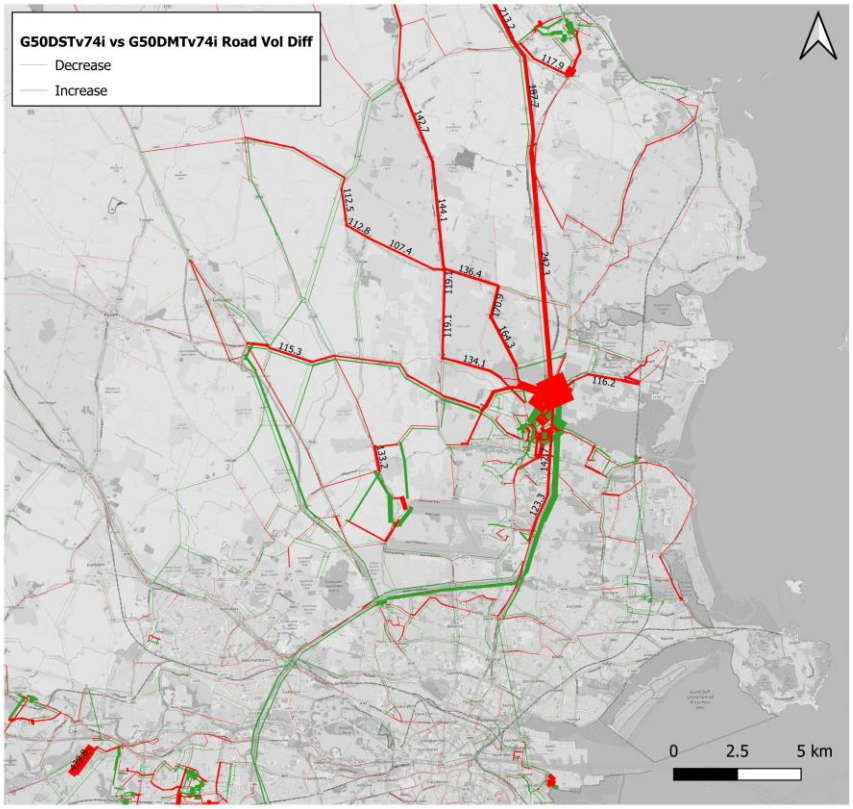


Figure 2—10: Flow changes on Highway Network with Metrolink - New GDA (2050)

2.7 Summary

The strategic-level appraisal of the Metrolink project primarily relied on evidence gathered from strategic modelling using the East Regional Model v3.0.61 from 2020 onwards. In 2023, the NTA published the new Greater Dublin Area (GDA) strategy, subject to testing and examination by the National Transport Authority (NTA) through the East Regional Model v3.0.74i. Recognizing the potential impact of the new GDA on the Metrolink project, a dedicated modelling exercise was conducted on the ERM v3.0.74i.

Key Findings:

a) Fitness for Appraisal:

Both the original and new GDA models are deemed suitable for the Metrolink appraisal, ensuring robust analysis and decision-making. The latter version shows better level of convergence than the former one.

b) Consistency in Passenger Distribution:

The distribution of passengers through metro stations remains consistent in both GDA scenarios, providing stability in expected travel patterns.

c) Impact of New GDA Changes:

The modifications introduced in the new GDA contribute significantly to non-car modes, presenting favourable implications for the Metrolink project.

d) Similar Impact on Road Traffic:

The Metrolink project demonstrates a consistent impact on road infrastructure in both GDA scenarios, ensuring a balanced assessment of transportation implications.

Based on the above, the impact of the Metrolink project with the new GDA Transport Strategy is considered to be to be of a similar quality, significance and duration to the effects presented within the Scenario B of the EIAR, which used the Prior GDA Transport Strategy.